Geocortex Essentials 4.4

Administrator Guide

Geocortex® | by Latitude Geographics®

Latitude Geographics®

Contents

31 Workflows   236

32 Charts   243

1 Welcome to Geocortex Essentials

Engineered from the ground up to work with Esri ArcGIS, Geocortex Essentials provides cutting edge tools, processes, and features that dramatically reduce the time and effort it takes to create and maintain quality ArcGIS applications.

The Geocortex viewers that ship with Essentials—the Geocortex Viewer for HTML5 and the Geocortex Viewer for Silverlight—enable you to create working, configurable, web mapping applications with a few clicks.

1.1 Assumptions

This document assumes that:

- The server that Geocortex Essentials is installed on is a Windows server with the IIS web server application installed and running. The host server must be properly configured in terms of security and desired functionality as an Internet or intranet web server.

- You have a level of knowledge and comfort with the platform and related technologies used by Geocortex Essentials, specifically, knowledge of Microsoft$^®$ Windows$^®$ with basic administration skills, like assigning user rights to files and folders.

- You have a basic understanding of GIS concepts.

1.2 About this Guide

This guide is for **Geocortex Essentials 4.4**. Although much of the information in this guide also applies to other versions of Essentials, some of the information is specific to version 4.4. To obtain the Administrator Guide for a different version of Essentials, download the guide form the Geocortex Support Center.

1.2.1 Who Should Read this Guide?

This guide is written for an administrator who is responsible for configuring and maintaining one or more Geocortex Essentials installations.

This guide provides instructions for configuring and maintaining Geocortex software only. For help installing or configuring third-party software, consult the documentation provided by the third-party vendor.

The configuration instructions provided in this guide are also available in the Geocortex Essentials Manager help. To open the help system, launch Manager, and then click the Help hyperlink at the top of the page.

1.2.2 Assumptions

This guide assumes that:

- The server that Geocortex Essentials is installed on is a Windows server with the IIS web server application installed and running. The host server must be properly configured in terms of security and desired functionality as an Internet or intranet web server.

- You have a level of knowledge and comfort with the platform and related technologies used by Geocortex Essentials, specifically, knowledge of Microsoft® Windows® with basic administration skills, like assigning user rights to files and folders.

- You have a basic understanding of GIS concepts.

1.2.3 Conventions Used in this Guide

This guide uses the following conventions:

- **User input and interface references:** In procedural sections, when you are instructed to do something in the user interface, the UI components are in bold typeface to stand out from the rest of the text, for example:

    On the **Data Links** tab, click **Import Data Link**.

- **Shorthand notation:** Shorthand notation is used to refer to the locations of Geocortex Essentials files and folders. For example, the location in your file system where Essentials is installed is represented as:

    <GE_INSTALL>

    A complete list of the shorthand notation is given in **Locations of Essentials Files and Folders** on page **441**.

- **Cross-references:** Cross-references refer you to related documentation. Different conventions are used depending on what is being referred to:

    - **Section in the same publication:** Cross-references to sections within the publication are hyperlinks. If you view the publication online, you can click the title or page number to navigate to the referenced section. The following example shows how cross-references to a section are represented:

        For instructions on creating sites, see **Create a Site** on page **54**.

    - **Another publication:** Cross-references to entire publications are represented as follows:

        Refer to the *Geocortex Essentials Installation Guide* for instructions on migrating sites.

    - **Section in another publication:** References to a section in another publication are represented as follows:

        Refer to "Installation Options" in the *Geocortex Viewer for HTML5 Installation Guide*.

- **Code examples:** Code snippets are presented in a different typeface and may have background shading, for example:

```
<ElementName ID="1" DisplayName="My Component" />
```

- **Cautions, Notes, and Tips**: Information that is useful or important is set apart and emphasized by adding an icon to draw attention to it and identify what type of information it is. There are three levels of information:

    Cautions are indicated by the exclamation icon on a yellow background. Cautions indicate information that could cause you to lose data or damage software or hardware if you do not follow the instructions.

    Notes are indicated by the sticky note icon. Notes include information that is important for you to notice and pay attention to.

    Tips are indicated by the light bulb icon. Tips contain information that makes a task easier or provides extra information that is useful but not critical.

1.3 Getting Help

1.3.1 Related Resources

The following documentation is provided to support Geocortex Essentials installations. The documentation is organized by intended audience. Some publications are directed at both administrators and developers.

For Administrators

- **Geocortex Essentials Installation Guide**: Provides instructions for installing Essentials and performing post installation configuration, including activation, configuring IIS settings for Essentials web components, adding viewer templates, migrating sites, and re-licensing the software.

- **Geocortex Essentials Administrator Guide:** (this guide) Describes the key concepts that administrators need to be familiar with to use Essentials effectively, provides instructions for configuring and managing sites, and discusses how to extend Essentials with custom development.
  The Administrator Guide is installed with Essentials.

- **Geocortex Essentials Manager Help System:** A web version of the Geocortex Essentials Administrator Guide, excluding the information about extending Essentials with custom development. To open the help system, launch Manager, and then click the Help hyperlink at the top of the page.

- **Geocortex Viewer for Silverlight Administrator and Developer Guide**: Contains information about the installation and configuration of the Silverlight Viewer, as well as information about extending the Viewer with custom development.

- **Geocortex Viewer for HTML5 Administrator and Developer Guide**: Contains information about the installation and configuration of the HTML5 Viewer, as well as information about extending the Viewer with custom development.

- **Geocortex SDK for HTML5 API Reference**: Contains information about the commands and events available in the Geocortex Viewer for HTML5, as well as other information about the two APIs upon which the HTML5 Viewer is built: Geocortex Essentials JavaScript API and Geocortex HTML5 Framework API.
  The Geocortex SDK for HTML5 API Reference is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

For Developers

- **Geocortex Workflow Designer Help System**: Provides conceptual information about workflows and instructions for creating workflows.

- **Geocortex Viewer for Silverlight Administrator and Developer Guide**: Contains information about the installation and configuration of the Silverlight Viewer, as well as information about extending the Viewer with custom development.

- **Geocortex Viewer for HTML5 Administrator and Developer Guide**: Contains information about the installation and configuration of the HTML5 Viewer, as well as information about extending the Viewer with custom development.

- **Geocortex Resource Center**: Provides information on the Geocortex Essentials JavaScript and Silverlight client APIs and the server-side architecture that supports them. For the client APIs, the Resource Center provides conceptual discussion of the APIs, thoroughly commented code samples, live samples to run, and complete API

references. Documentation for the server side includes conceptual discussions of the REST interface that the client APIs interact with, a reference for the REST API, and tutorials for advanced topics such as extending Geocortex Essentials with custom functionality. Although directed primarily at developers, the Resource Center might also be of interest to site administrators and the personnel responsible for evaluating and purchasing GIS tools.

- **Site XML Reference**: Provides a reference for the XML documents that contain the site configuration, which are called `Site.xml`. `Site.xml` files are consumed by Geocortex Essentials and exposed to the Essentials REST API. All elements and attributes allowable within the `Site.xml` document are described in the Site XML Reference. Because all aspects of a site except for custom site extensions are configured using Geocortex Essentials Manager, you will only need to refer to this reference if you are implementing custom site extensions.

  The Site XML Reference is installed with Essentials, in the `Docs` folder. In the default installation, the `Docs` folder is here:

  ```
  C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\Docs
  ```

- **REST Resources XML Reference**: Provides a reference for configuring the `RestResources.xml` document that defines a site's custom REST endpoints. All elements and attributes that are allowed in the `RestResources.xml` document are described in the REST Resources XML Reference. Since custom REST endpoints are optional, you will only need to use this reference if you are setting up a site that has custom endpoints.

  The REST Resources XML Reference is installed with Essentials, in the `Docs` folder. In the default installation, the `Docs` folder is here:

  ```
  C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\Docs
  ```

- **Essentials REST API Reference**: The primary source for information on the Geocortex Essentials API, Essentials's general-purpose, server-side API for building GIS applications. Advanced developers can use the API to extend the Geocortex Essentials REST API and provide more advanced server-side functionality to end users.

  The Essentials REST API Reference is installed with Essentials, in the `Docs` folder. In the default installation, the `Docs` folder is here:

  ```
  C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\Docs
  ```

- **Geocortex SDK for HTML5 API Reference**: Provides information about the namespaces, objects, methods, properties, parameters, commands and events available in the Geocortex Viewer for HTML5 and the two APIs upon which the HTML5 Viewer is built: Geocortex Essentials JavaScript API and Geocortex HTML5 Framework API.

  The Geocortex SDK for HTML5 API Reference is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

1.3.2   Use the Discussion Forum

The Geocortex Support Center has an Essentials discussion forum where you can post questions about Geocortex Essentials. The forum is a great place to get answers from the Geocortex community.

1.3.3   Communicate by Email

If you have a question that is not suitable for posting to the forum, and you have an active Support agreement, send an email message to the Geocortex Support team at support@geocortex.com. The Support team will respond by email.

1.3.4 Provide Feedback on Documentation

Send comments, suggestions, and requests regarding Geocortex product documentation to documentation@geocortex.com.

1.4 Disclaimer

Essentials works with other licensed software products. You are responsible for ensuring that all the required software licenses are in place and appropriate for your chosen system configuration.

Any software installation involves some risk to your system. Make sure you back up all software and data before you install any Essentials components.

Please refer to your Essentials software license agreement for information about limitations on liability and other legal considerations.

2 Quick Start for Administrators

The Quick Start for Administrators describes two different ways to get started with Essentials:

- **Create and View a Simple Site:** Create and deploy a simple web mapping application in Essentials.
- **Explore the Sample Sites:** Use the sample sites that ship with Essentials to see how particular features are configured, and then launch the viewer to see what the features look like to the end user.

These two approaches demonstrate different aspects of Essentials, so you may want to do both parts of the Quick Start. They are independent of each other, so the order that you do them does not matter.

The Quick Start uses public map services that are available on the Internet. This means that you can do the Quick Start without having published any services yourself—all you need is an Internet connection.

2.1 Create and View a Simple Site

This part of the Quick Start shows you how to create and deploy a simple web mapping application in Essentials. The site that you create will reference the ArcGIS Online web map of your choice. When you have finished, you will be able to launch the application in a browser, navigate the map, identify and search for features, create markup, export the map, and more.

The main steps to create and view a site are:

1. **Create the Site:** A site is a technology-neutral (XML) configuration of a web mapping application. Creating a site in Essentials gives you a ready-to-use configuration for a web mapping application.

2. **Add a Viewer to the Site:** Viewers are the web applications that end users run to interact with the site and its map. Viewers use the configuration defined in the site. In this step, you add one of Geocortex's out-of-the-box viewers to the site.

3. **Launch the Viewer:** In this step, you launch the viewer in a web browser. This enables you to see and interact with the map and the other out-of-the-box features that are configured in the site.

You can create the Quick Start site just for the practice and delete it later, or you can use the site as the basis of an actual site that you plan to develop. You can expand and modify the site's configuration at any time. This includes changing the map services and web maps that the site uses.

> If you encounter a problem creating your site, refer to Manager's log files for possible causes. See **Locations of Essentials Files and Folders** on page **441** for information on where to find the log files.

2.1.1   Create a Site

▶ **To create a site:**

1. Launch Geocortex Essentials Manager. Follow the instructions that apply to you:

   - **Windows Server 2012 or Windows 8, and Newer Versions:**
     On the **Start** screen, type **Geocortex**, and then click **Geocortex Essentials Manager**.

   - **Windows Server 2008 or Windows 7, and Older Versions:**
     In the **Start** menu, select **All Programs** | **Latitude Geographics** | **Geocortex Essentials [Version] [Instance]** | **Geocortex Essentials Manager**.
     [Version] is the Essentials version number. [Instance] is the instance name, if Essentials is installed as a named instance. The default installation does not have an instance name.

2. If you are prompted to sign in, enter your user name and password.
   Depending on how Essentials is configured in the Post Installer, you either sign in using an ArcGIS account or a Windows account.

3. Click the **Sites** tab. If a site is open for editing, click **Save Site**, and then click **Close Site**.
   The Site List displays.

4. Click **Add New Site**.

5. Type a display name for your site, for example **Quick Start**, and then click **Next**.

6. Select **Reference a web map from ArcGIS Online or Portal for ArcGIS**, and then click **Next**.

7. Type a search term, for example, **hurricane**.
   The search results start to display while you are typing the search term.
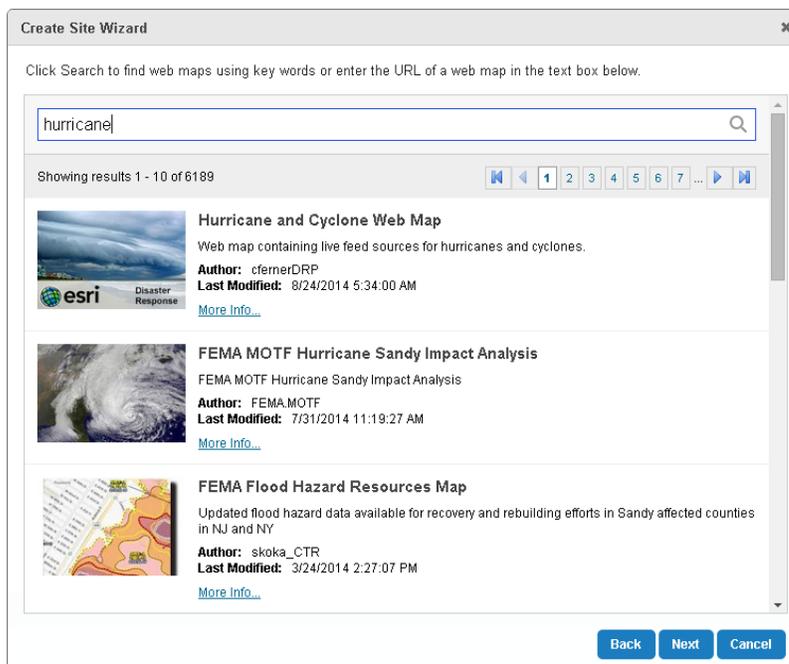
Search ArcGIS Online from Manager

8. Select one of the search results, and then click **Next**.

   The wizard displays a success message when it connects to the web map.
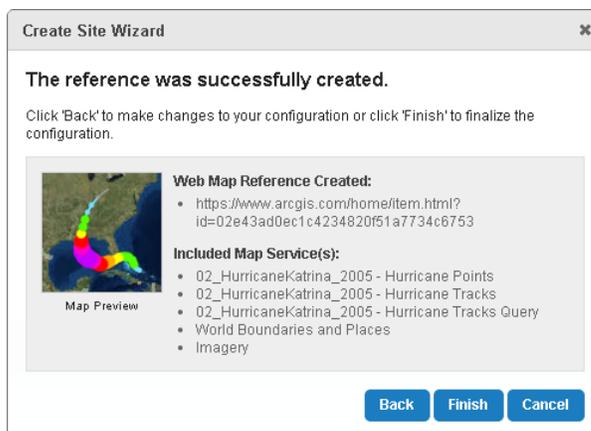
The final panel summarizes the web map's services

9. Click **Finish**.

   You have successfully created a site. Manager's Map page opens.
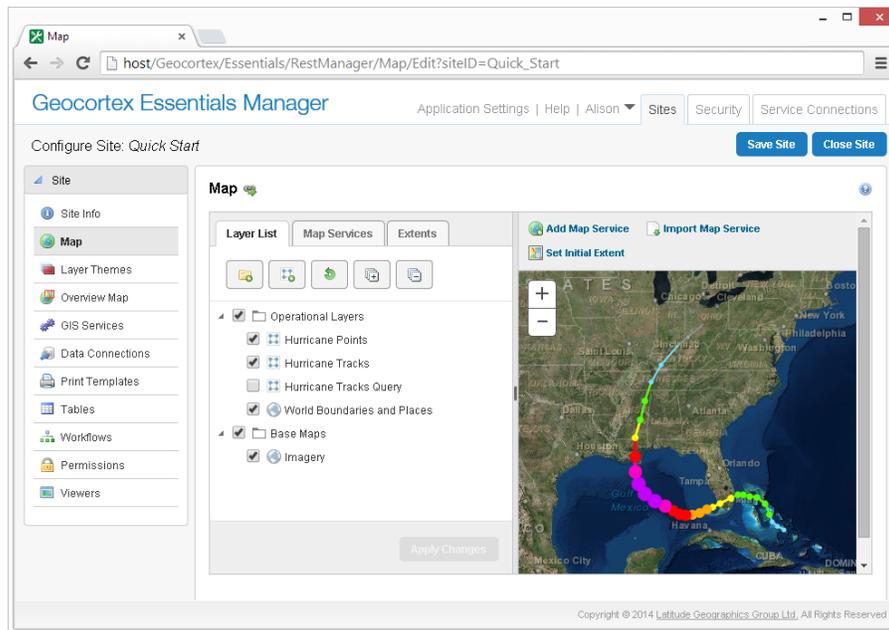
New site open for editing at the Map page

2.1.2 Add a Viewer to the Site

Before you can configure a Geocortex viewer for your site, you must install the viewer template. HTML5 Viewer templates enable you to add HTML5 viewers to your sites. Silverlight Viewer templates enable you to add Silverlight viewers to your sites. Viewer templates are installed using the Geocortex Post-Installation Configuration tool.

If you install both types of viewer template, you can add both a Silverlight viewer and an HTML5 viewer to your site and compare the viewers.

If you have not yet installed the viewer templates, follow the instructions below to download and install the templates.

To download a viewer template:

1. Open the Geocortex Essentials Downloads page in the Geocortex Support Center.

2. Download the most recent version of the desired type of viewer template—Geocortex Viewer for HTML5 or Geocortex Viewer for Silverlight.
   The downloads are ZIP archives.

3. Extract the files from the archive.
   The file with the `.vte` extension is the viewer template. You will use the viewer template to install the viewer framework.

▶ **To install a viewer template:**

1. Launch the Post Installer:

   • **Windows Server 2012 or Windows 8, and Newer Versions:**
     On the **Start** screen, type **Post Install**, and then click **Post Installer**.

   • **Windows Server 2008 or Windows 7, and Older Versions:**
     In the **Start** menu, click **All Programs | Latitude Geographics | Geocortex Essentials [Version] [Instance] | Post Installer**.
     [Version] is the Essentials version number. [Instance] is the name of the instance name, if Essentials is installed as a named instance. The default installation does not have an instance name.

2. Click **Configure Templates** in the side panel.

3. Click **Add**.

4. Browse to the folder where you extracted the files from the installation package.

5. Select the template file (`.vte` file), and then click **Open**.
   You are prompted to install the Management Pack.

6. Click **Yes**.
   You are prompted to deploy the template to an IIS virtual directory.

7. Click **Yes**.
   The Deploy Template to IIS dialog box opens.

Deploy Template to IIS dialog box

8. If the virtual directory listed in the **Select Virtual Directory** box already exists, type a name for a new virtual directory.
   Each viewer template must be deployed to a virtual directory that does not yet exist in the selected website.

9. Click **Deploy**, and then close the success message that displays.
   The template is listed in the Installed Templates area.

10. Click **Finish**. If prompted to review your settings, click **OK**, and then click **OK** again to close the Post Installer.

▶ **To add a viewer to the site:**

1. If your Manager session has timed out, re-open Manager and make sure the site is open for editing.

2. In Manager's side panel, click **Viewers**.
   The Viewers page opens.

3. Click **Add Viewer**.

4. In the **Display Name** box, type a name for the viewer.
   Display names can have spaces and special characters in them.

5. In the **Template** box, select the desired viewer template.
   The Template box only lists viewer templates that are installed.

6. Click **OK**.
   You have successfully created a viewer. The Viewer Info page opens.

2.1.3 Launch the Viewer

▶ **To launch the viewer:**

1. There are several ways to launch a viewer in Manager:

   - **On the Viewer Info Page:**

     - **HTML5:** Click the **Launch in Browser** hyperlink in the **Online Launch Links** area.

     - **Silverlight:** Click the hyperlink in the **Launch Links** area.

   - **On the Viewers Page:**
     Click the viewer's hyperlink in the **Launch URL** column.

   - **In the Site List:**
     Click the viewer's hyperlink in the **Site Summary**. To show the Site Summary, click the down arrow ⊙ beside the site's name in Tiled View. In List View, click the plus sign ⊞.

   The viewer opens in a new browser tab.
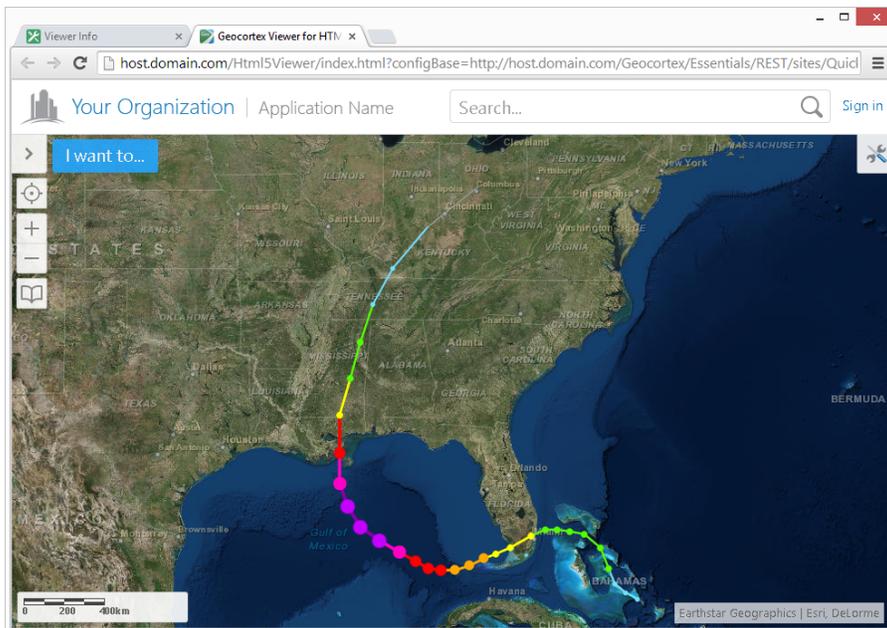
The new site in an HTML5 viewer

If you added an HTML5 viewer that you want to use in a production system, you must set up a proxy page. Refer to "Set up a Proxy Page" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

If you added a Silverlight viewer that you want to use in a production system, you must set up cross-domain support. Refer to "Enable Cross-Domain Support" in the *Geocortex Essentials Installation Guide*.

2.2 Explore a Sample Site

One way to learn about Essentials is to experiment with an existing site. The LA County sample site that ships with Essentials gives you a place to start.

The LA County site includes examples of many Essentials features, such as different service types, print templates, workflows, and more. Use the LA County site to see how particular features are configured, and then launch a viewer to see what the features look like to the end user.

After you have explored the LA County site's default configuration, try modifying the configuration. Each time you make some modifications, save the site and refresh the viewer so you can see the effect of your changes in the viewer.

2.2.1 Deploy a Sample Site

In order to see a sample site in Manager, you must deploy it. To deploy a sample site, you copy the site's folder from the Sample Sites folder to the Sites folder.

▶ **To deploy a sample site:**

1. In the file system, navigate to the **REST Elements** folder.
   By default, the `REST Elements` folder is in:
   `Program Files (x86)/Latitude Geographics/Geocortex Essentials/[instance]/`
   where `[instance]` is the name of the Essentials instance. If you did not specify an instance name when you installed Essentials, then `[instance]` is `Default`.
   The `REST Elements` folder contains a `Sites` folder and a `Sample Sites` folder.
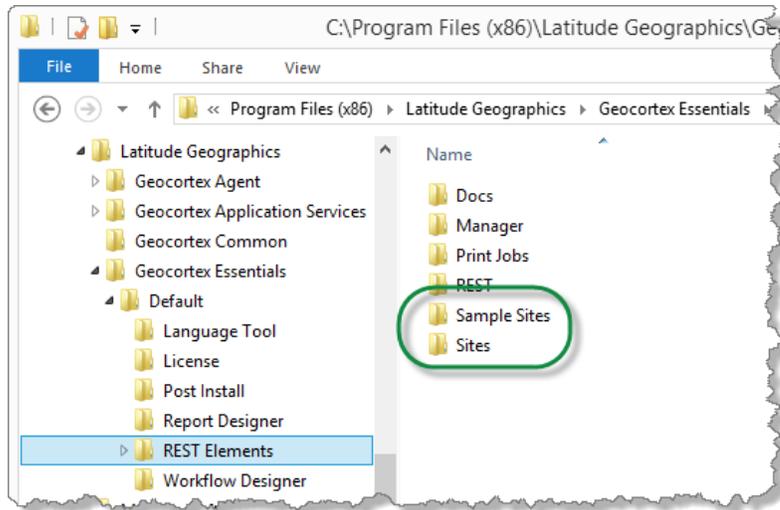
Sample Sites folder and Sites folder in the default installation

2. Open the **Sample Sites** folder.

3. Copy the folder for a sample site in the **Sample Sites** folder to the **Sites** folder.
   To deploy the LA County sample site, copy the `LA_County` folder from `Sample Sites` to `Sites`.
   You have now deployed the sample site.

2.2.2   Explore a Sample Site's Configuration

Editing a site in Manager enables you to explore the site's configuration.

▶ **To explore a sample site's configuration:**

1. Launch Geocortex Essentials Manager:

   - **Windows Server 2012 or Windows 8, and Newer Versions:**
     On the **Start** screen, type **Geocortex**, and then click **Geocortex Essentials Manager**.

   - **Windows Server 2008 or Windows 7, and Older Versions:**
     In the **Start** menu, select **All Programs** | **Latitude Geographics** | **Geocortex Essentials [Version] [Instance]** | **Geocortex Essentials Manager**.
     [Version] is the Essentials version number. [Instance] is the instance name, if Essentials is installed as a named instance. The default installation does not have an instance name.

2. If you are prompted to sign in, enter your user name and password.

   Depending on how Essentials is configured in the Post Installer, you either sign in using an ArcGIS account or a Windows account.

3. Click the **Sites** tab.

4. If Manager is not open at the Site List, click **Close Site**.

5. Click the **Edit** icon beside the sample site that you want to edit.
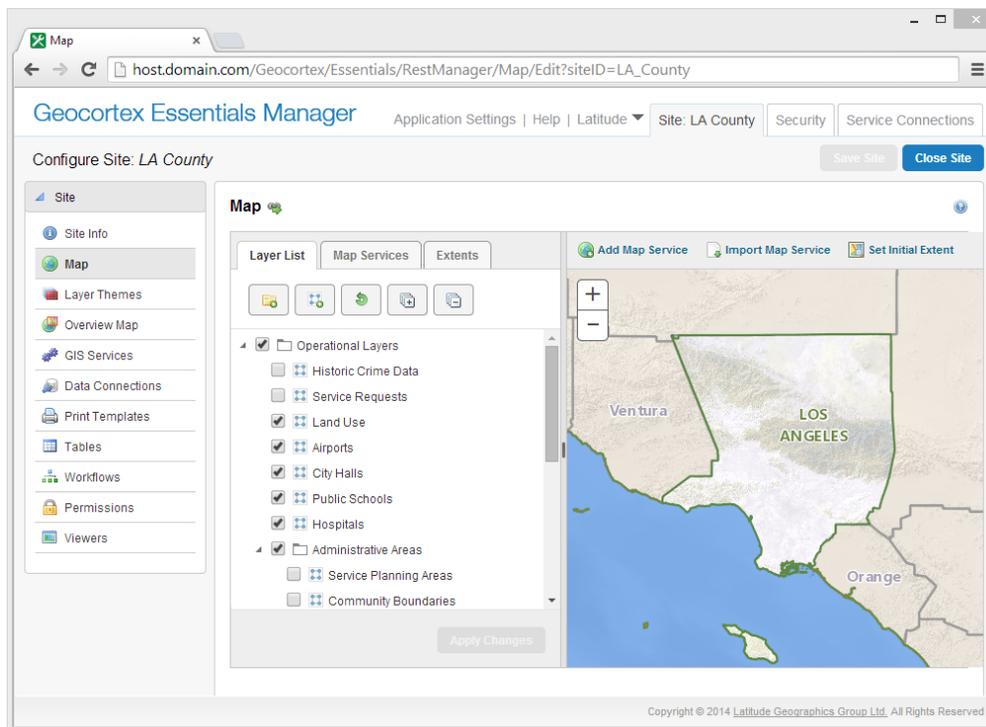
Example of a sample site that is open for editing in Manager

6. Click items in Manager's side panel to go to different pages of the site's configuration.

   Click Edit icons to see the configuration of individual components and features.

2.2.3 Launch a Sample Site's Viewer

If the sample site already has one or more viewers configured, and you have already installed the (required version of the) viewer templates, you can launch the viewer.

▶ **To launch the viewer if the site already has a working viewer:**

1. If you are no longer editing the site in Manager, edit it now.

2. In Manager's side panel, click **Viewers**.

3. If the Viewers page lists one or more viewers and each viewer has its template, you do not need to do anything—the viewers are ready to launch.

Two viewers configured and ready to launch

4. Click the **Launch URL** hyperlink for the viewer that you want to launch.

The viewer opens in a new browser window or tab. You can now explore the sample site in the viewer.
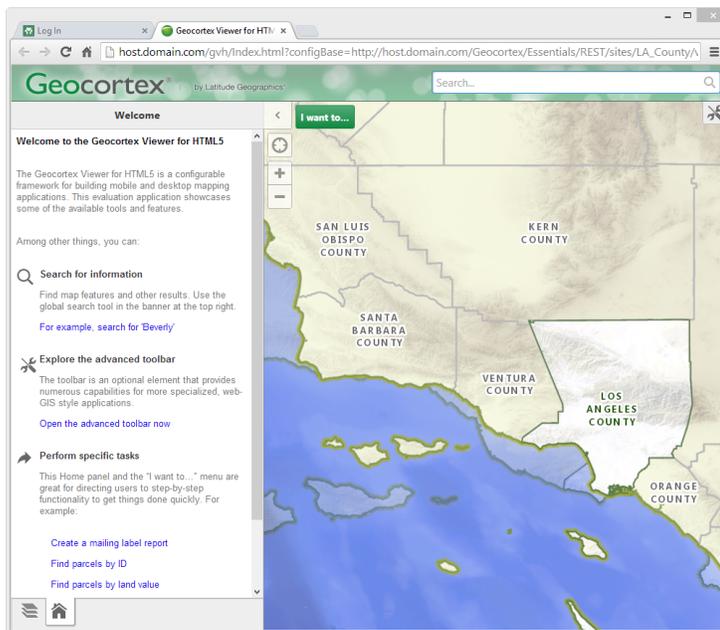
Example of a sample site in a viewer

2.2.4 If the Sample Site Does Not Have a Working Viewer

Before you can configure a Geocortex viewer for your site, you must install the viewer template. HTML5 Viewer templates enable you to add HTML5 viewers to your sites. Silverlight Viewer templates enable you to add Silverlight viewers to your sites. Viewer templates are installed using the Geocortex Post-Installation Configuration tool.

> If you install both types of viewer template, you can add both a Silverlight viewer and an HTML5 viewer to your site and compare the viewers.

The next steps to take depend on whether the sample site already has one or more viewers configured, and whether you have installed the viewer templates yet.

> **To determine what you have to do to configure a working viewer:**

1. Look at the Viewers page to see which of the following situations applies to you:

   Template is Not Found

   If the Viewers page lists a viewer but the template is not found, you must install the viewer template to be able to use the viewer. Follow the instructions below to download and install the template. After you have installed the template, refresh the Viewers page in Manager—the Template Not Found message should be replaced by the name of the viewer template.

   Viewer that is missing its template

   •

   - **No Templates are Installed**

     If the Viewers page displays a warning that there are no templates installed, you must download and install at least one viewer framework, and then add a viewer. Follow the instructions below to download and install a viewer framework, and then add a viewer.

     Warning that displays when no viewer templates are installed

   - **No Viewers are Configured**

     If the Viewers page displays a message that no viewers are configured, at least one viewer framework is installed but no viewers have been configured. Follow the instructions below to add a viewer.

     No viewers are configured yet, but at least one viewer framework is installed

> **To download a viewer template:**

1. Open the Geocortex Essentials Downloads page in the Geocortex Support Center.

2. Download the most recent version of the desired type of viewer template—Geocortex Viewer for HTML5 or Geocortex Viewer for Silverlight.
   The downloads are ZIP archives.

3. Extract the files from the archive.
   The file with the `.vte` extension is the viewer template. You will use the viewer template to install the viewer framework.

▶ **To install a viewer template:**

1. Launch the Post Installer:

   - **Windows Server 2012 or Windows 8, and Newer Versions:**
     On the **Start** screen, type **Post Install**, and then click **Post Installer**.

   - **Windows Server 2008 or Windows 7, and Older Versions:**
     In the **Start** menu, click **All Programs | Latitude Geographics | Geocortex Essentials [Version] [Instance] | Post Installer**.
     [Version] is the Essentials version number. [Instance] is the name of the instance name, if Essentials is installed as a named instance. The default installation does not have an instance name.

2. Click **Configure Templates** in the side panel.

3. Click **Add**.

4. Browse to the folder where you extracted the files from the installation package.

5. Select the template file (`.vte` file), and then click **Open**.
   You are prompted to install the Management Pack.

6. Click **Yes**.
   You are prompted to deploy the template to an IIS virtual directory.

7. Click **Yes**.
   The Deploy Template to IIS dialog box opens.

Deploy Template to IIS dialog box

8. If the virtual directory listed in the **Select Virtual Directory** box already exists, type a name for a new virtual directory.
   Each viewer template must be deployed to a virtual directory that does not yet exist in the selected website.

9. Click **Deploy**, and then close the success message that displays.
   The template is listed in the Installed Templates area.

10. Click **Finish**. If prompted to review your settings, click **OK**, and then click **OK** again to close the Post Installer.

To add a viewer to the site:

1. If your Manager session has timed out, re-open Manager and make sure the site is open for editing.

2. In Manager's side panel, click **Viewers**.
   The Viewers page opens.

3. Click **Add Viewer**.

4. In the **Display Name** box, type a name for the viewer.
   Display names can have spaces and special characters in them.

5. In the **Template** box, select the desired viewer template.
   The Template box only lists viewer templates that are installed.

6. Click **OK**.
   You have successfully created a viewer. The Viewer Info page opens.

To launch the viewer:

1. There are several ways to launch a viewer in Manager:

   - **On the Viewer Info Page:**

     - **HTML5:** Click the **Launch in Browser** hyperlink in the **Online Launch Links** area.

     - **Silverlight:** Click the hyperlink in the **Launch Links** area.

   - **On the Viewers Page:**

     Click the viewer's hyperlink in the **Launch URL** column.

   - **In the Site List:**

     Click the viewer's hyperlink in the **Site Summary**. To show the Site Summary, click the down arrow ⊙ beside the site's name in Tiled View. In List View, click the plus sign ⊞.

   The viewer opens in a new browser window or tab. You can now explore the sample site in the viewer.
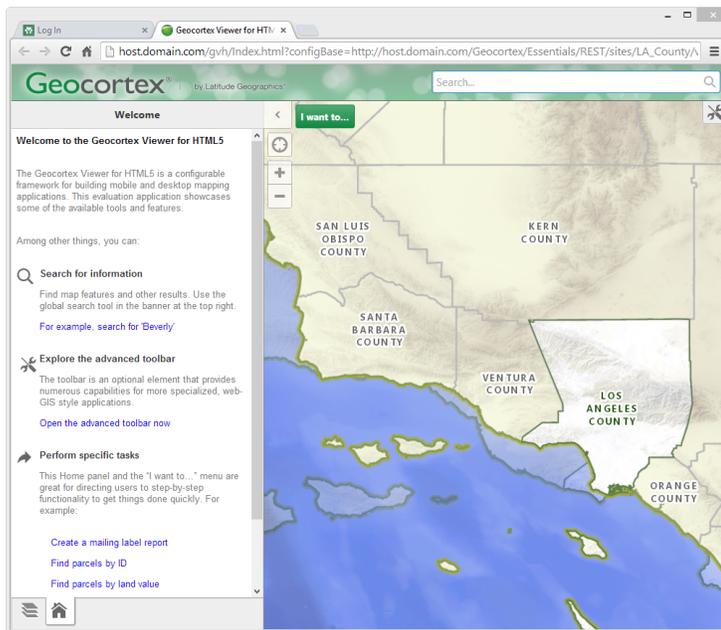
Example of a sample site in a viewer

2.3 After the Quick Start

After you have finished the Quick Start, we recommend that you add service connections for the services that you use frequently. For example, if your organization runs ArcGIS Server, add a service connection for the ArcGIS Server catalog.

Service connections enable you to search for services to add to sites. If a service is secured, you must add a service connection before you can search for the service or add the service to the map. Service connections also serve as bookmarks to your favorite services and catalogs.

For more information, see **Service Connections** on page **115**.

3 Overview of Geocortex Essentials

Geocortex Essentials is a framework for designing, developing, and maintaining web mapping applications. Built to work with Esri's REST technology, Essentials enhances and extends the ArcGIS platform with the addition of a number of powerful features for building real-world GIS applications:

- **Workflows**: Workflows provide a quick way to program complex, interactive, GIS and business procedures. Workflow Designer's drag-and-drop interface, library of activities, and built-in simulator accelerate development and free the programmer from handling low-level details like client-server communications.

- **Instant Search:** Instant Search is a very fast, indexed search engine that enables users to search for attributes from multiple map services and feature services. Instant Search provides search suggestions to users as they type. The search results are sorted by relevance and search results are plotted on the map instantly.

- **Data Linking**: Data linking provides the ability to retrieve non-spatial data from external data sources such as databases and spreadsheets, and link the external data to attributes of spatial data.

- **Reporting**: Template-based reporting allows the user to generate reports based on templates configured by an administrator. Each template defines a standard layout for reporting on a layer's features, attributes, and data (both linked and computed).

- **Printing**: Configured by the administrator, print templates enable the user to create printable maps, including large-format output, using standard layouts.

- **Charting:** Charting enables users to view graphs of attribute data. Essentials supports bar charts, pie charts, and a variety of line charts. Charts update dynamically depending on the features that the user has selected.

Central to Essentials is the notion of a **site**. A site is a technology-neutral configuration of a web mapping application. Sites supply the configuration of the services and other components that are available in your web applications. Complex sites may have many services with hundreds of layers, as well as any number of the other components.

Essentials provides two viewer frameworks that enable you to add fully functioning viewers to your sites with a few clicks:

- **Geocortex Viewer for HTML5:** Viewers created using the HTML5 Viewer framework are implemented in HTML5 and JavaScript. HTML5 viewers can run in a browser, or they can run as a native iOS application or Windows application in the Geocortex Mobile App Framework. The HTML5 Viewer is designed to run on different types of device—desktop computers, tablets, and handheld devices like smart phones.

- **Geocortex Viewer for Silverlight:** Viewers created using the Silverlight Viewer framework are implemented in Microsoft$^®$ Silverlight$^®$. Silverlight viewers run in any browser that has the Silverlight plug-in.

The viewer frameworks are built on the Geocortex Essentials client APIs, the JavaScript API and the Silverlight API. The client APIs work in conjunction with Esri's JavaScript and Silverlight APIs. Geocortex Essentials is the server-side architecture that supports the Essentials client APIs.

3.1 Architecture

The term **architecture** refers to the structure or organization of a software system. Architecture focuses on the system's major components and how they interact with each other.

The diagram below shows the architecture of Geocortex Essentials.
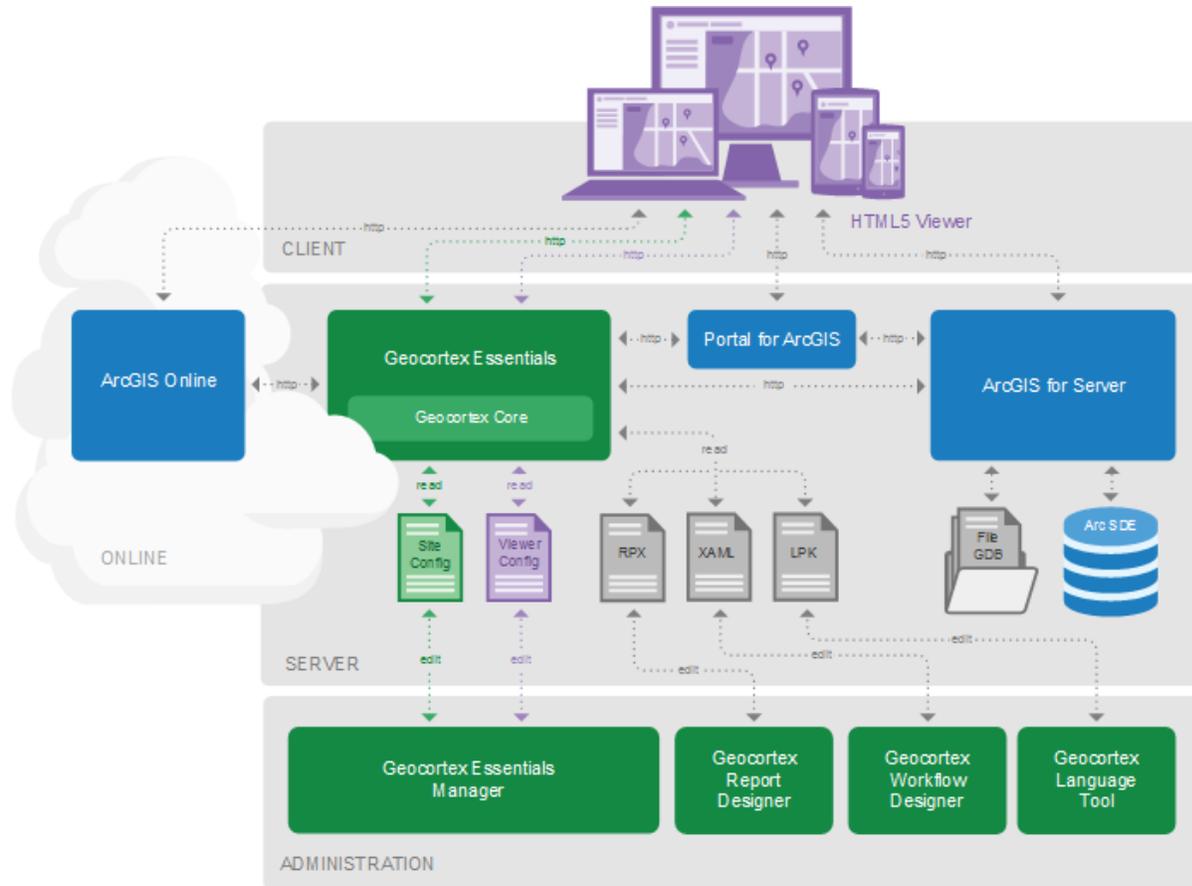
Geocortex Essentials architecture

Like all web-based systems, Geocortex Essentials follows the **client-server** architectural model. The client-server model describes a run-time system in which servers provide resources or services to clients over a network:

1. A client sends a request to a server.

2. The server performs the processing required to generate the result.

3. The server sends the response to the client.

4. The client processes the response.

The architecture diagram shows the **Client** tier, the **Server** tier (which includes the Online cloud), and also a layer that is labelled **Administration**.

Client Tier

In the world of web mapping, clients are called **viewers**. Viewers are run by **end users** on a wide variety of devices and platforms. Viewers that are based on the Geocortex Viewer for HTML5 framework work on desktop computers, laptops, smart phones, and tablets running different operating systems. This is represented in the diagram by the variety of devices in the Client tier.

HTML5 viewers running on a variety of devices

The HTML5 Viewer framework enables you to create viewers that are implemented using HTML5 and JavaScript. Geocortex also has a Silverlight Viewer framework for creating viewers that run on Silverlight.

In the diagram, the viewers are shown communicating with the Server-tier components via HTTP. If a server enforces Secure Socket Layer (SSL), viewers communicate with the server via HTTPS instead of HTTP. For more detailed information about how viewers communicate with Essentials and ArcGIS, see **APIs** on page **23**.

Server Tier

The Server tier provides services and data for the Client tier. At the heart of the Server tier is Geocortex Essentials itself. Geocortex Essentials runs on Geocortex Core—installing Essentials also installs Geocortex Core.

Essentials provides access to your **sites**. A site is a technology-neutral configuration of the resources that are available in your viewers. These resources can include map services, workflows, report and print templates, and so on.

Essentials itself is not a map server. Rather, Essentials draws on the power of the ArcGIS platform. Sites provide the connection information that viewers require to connect to map services and other GIS-related services, like geocoding services. This is illustrated in the architecture diagram by the connections between Essentials and ArcGIS Online, Portal for ArcGIS, and ArcGIS Server.

In the diagram, Essentials is shown communicating with the ArcGIS components via HTTP. If a component enforces SSL, HTTPS would be used. For detailed information about how Essentials communicates with ArcGIS, see **APIs** on page **23**.

An Essentials installation can have more than one Essentials server. For information, see "Deployment" in the *Geocortex Essentials Installation Guide*.

Administration

The Administration layer provides tools for customizing Essentials sites and viewers. The administrative tools are not part of the run-time system described by the client-server model. The tools underlie the Server tier—they are the means by which administrators create the client and server components that comprise the run-time system.

The administrative tools are:

- **Geocortex Essentials Manager:** Geocortex Essentials Manager is a web-based application that you use to create and configure Essentials sites and viewers.

  Each site is defined in its own configuration file, `Site.xml`, that is created when you create the site. In the diagram, the **Site Config** box represents site configuration files. The Site Config box is colored green to associate it with the Essentials server.

  Similarly, each viewer has its own configuration file that is created when you add a viewer to a site. The **Viewer Config** box represents the viewer configuration files and is colored purple to associate it with the viewers.

- **Geocortex Report Designer:** Geocortex Report Designer is a desktop application that you use to create report templates and print templates. The box in the diagram that represents report and print templates is labelled **RPX** because report and print templates are `.rpx` files. For a viewer to generate output based on a template, the template must be referenced in the configuration for the site that the viewer belongs to.

- **Geocortex Workflow Designer:**Geocortex Workflow Designer is a desktop application that you use to create and maintain Geocortex workflows. The box in the diagram that represents workflows is labelled **XAML** because workflows are `.xaml` files. For a viewer to run a workflow, the workflow must be referenced in the configuration for the site that the viewer belongs to.

- **Geocortex Language Tool:** The Geocortex Language Tool is a desktop application that enables you to internationalize Geocortex Essentials Manager and the Geocortex Viewer for Silverlight. The box in the diagram that represents language files is labelled **LPK** because language files are `.lpk` (language pack) files.

3.2 REST

REST is an architectural style used in the design of network applications. Geocortex Essentials is based on REST. The ArcGIS platform—ArcGIS Server, Portal for ArcGIS, and ArcGIS Online—also uses REST.

Most REST applications are implemented as a hierarchy of **resources**, with increasingly specific resources lower in the hierarchy. A REST **endpoint** is a URL to a REST resource. Every resource is located at a unique URL. A **REST API** is a web interface to a set of REST resources. Like most REST applications, Essentials clients and servers use HTTP to communicate.

In an Essentials REST API, the top-level resource is a list of sites. Each **site** is a technology-neutral configuration of a GIS application. The next level has individual sites, followed by each site's top-level components, and so on. Other resources in the REST API include map services, layers, print templates, and workflows. REST resources can also be properties, for example, a layer's default visibility, or operations, for example, an operation to export the map.

You can think of REST resources as the business objects in your sites and the operations that operate on them. When you save the configuration for a site, Essentials translates the configuration to a form that can be consumed by REST-based applications and then deploys the translated configuration to the REST API. Viewers obtain information about the site and its components by making web requests (HTTP requests) to specific URLs in the REST API.

3.2.1 Browse the REST API

The Geocortex Essentials REST API makes Essentials **sites** available to **viewers** through the REST API. The **Geocortex Essentials Sites Directory** is a human-readable representation of the REST API. The Sites Directory shows a detailed breakdown of every site and viewer that you have configured. Browsing the Geocortex Essentials Sites Directory is analogous to browsing the ArcGIS Server Services Directory to find information about ArcGIS Server services.

You can open the Sites Directory from Geocortex Manager. To open the Sites Directory, click the **Open the Site's REST Endpoint** icon anywhere that it appears in Manager (usually at the top of the center panel).
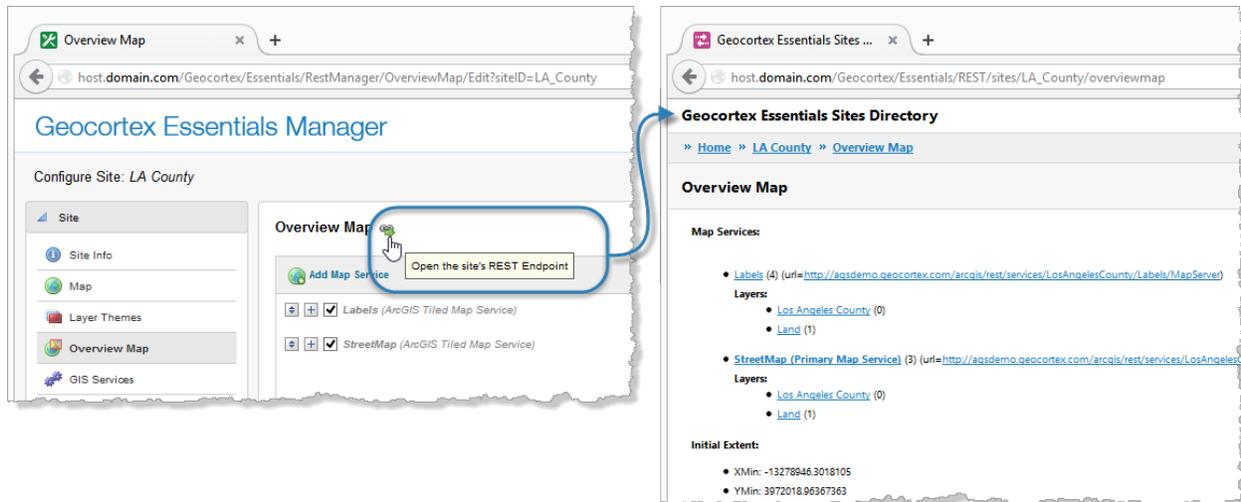
Geocortex Essentials Sites Directory opened from Manager's Overview Map page

To browse down in the Sites Directory, click hyperlinks. Use the breadcrumbs at the top of the page to go up one or more levels. You can navigate from any site to any other site, provided the sites are configured in the same instance of Essentials.

> If you configured a site but the site does not appear in the REST API Sites Directory, then the site did not deploy. You can use this fact to test for successful deployment.

3.3 APIs

If you are extending Geocortex Essentials or the HTML5 Viewer with custom development, you need to know how components in an Essentials installation communicate with each other. Essentials, viewers, and ArcGIS communicate with each other using Application Programming Interfaces (**APIs**). An API is the interface that an application provides to allow other applications to access it.

The diagram below shows the most important APIs in an Essentials system.
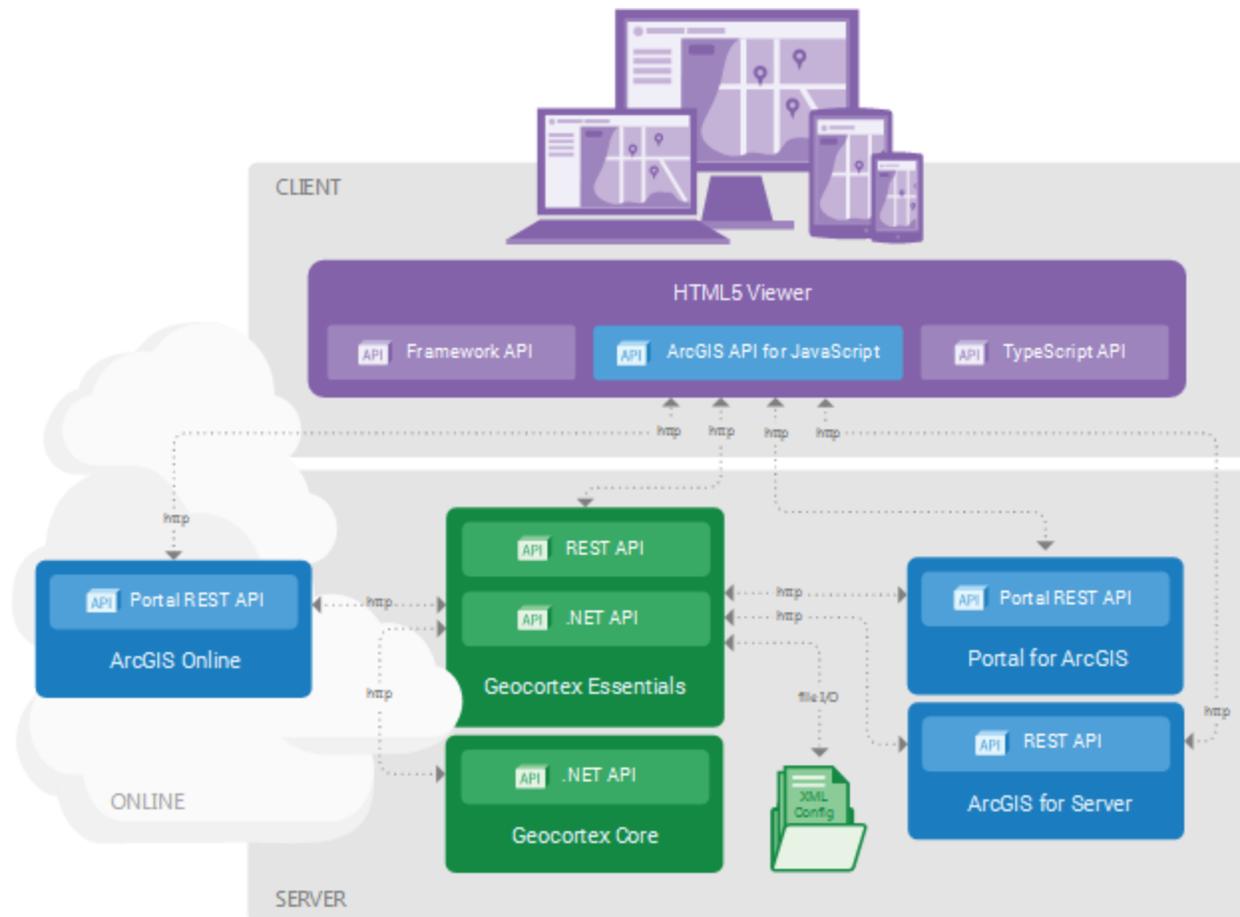
APIs used by Geocortex Essentials and ArcGIS

Geocortex Essentials communicates with the ArcGIS platform using the **Geocortex Essentials REST API**:

- **ArcGIS Server:** To obtain information about map services and layers from ArcGIS Server, the Essentials REST API makes requests to the ArcGIS Server REST API, which in turn obtains information from ArcGIS Server.

- **Portal for ArcGIS:** To obtain information about services and web maps and other items from Portal for ArcGIS, the Essentials REST API makes requests to the Portal for ArcGIS REST API, which in turn obtains information from Portal for ArcGIS.

- **ArcGIS Online:** To obtain information about services and web maps and other items from ArcGIS Online, the Essentials REST API makes requests to the Portal for ArcGIS REST API hosted at ArcGIS Online, which in turn obtains information from ArcGIS Online.

Geocortex Essentials and Geocortex Core communicate via their respective **.NET APIs**.

In the API diagram, the HTML5 Viewer has three APIs. The ArcGIS API for JavaScript and the **Geocortex TypeScript API** are used to obtain information from Essentials, ArcGIS Server, Portal for ArcGIS, and ArcGIS Online via their respective REST APIs. The Geocortex **Framework API** is used for creating modules and views, which structure HTML5 viewer applications. For more information about the architecture of HTML5 viewers, refer to the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

For the sake of simplicity, the API diagram shows the HTML5 Viewer only. The Silverlight Viewer uses two APIs—the Geocortex Silverlight API and the ArcGIS API for Silverlight. The **Geocortex Silverlight API** is used to make requests to the Essentials REST API. The ArcGIS API for Silverlight is used to obtain information from ArcGIS Server, Portal for ArcGIS,

and ArcGIS Online via their respective REST APIs.

3.4 Overview of Security

Many web applications that are created using Essentials contain sensitive information. Security is concerned with protecting your data, while still making the data available to specific users.

There are two sides to security:

- **Essentials Security:** Essentials security controls who accesses your Essentials sites and their components. You can secure an entire site, or individual components in a site, including services, layers, workflows, and more.

  You must add the components to your site before you can secure the components. See **Essentials Security** on page **396** for instructions on configuring security for sites and their components.

- **External Security:** Essentials and the viewers can access secured map services, including ArcGIS Server map services, OGC map services, and ArcGIS web maps.

  Before you can add a secured service to a site, you must configure the service's connection information in Essentials so Essentials can connect to the service. For more information, see **Service Connections** on page **115**.

  Essentials can also access external ADO.NET data sources that are secured. See **Data Linking** on page **226** for information.

Essentials security is one part of the security solution for a site that references ArcGIS Server or OGC services. Essentials security and external security work together to secure your Essentials sites. If you are the owner of a service that contains sensitive information, we recommend that you secure the service.

The diagram below shows an Essentials installation with ArcGIS Server. The padlocks in the diagram indicate points at which access is secured.
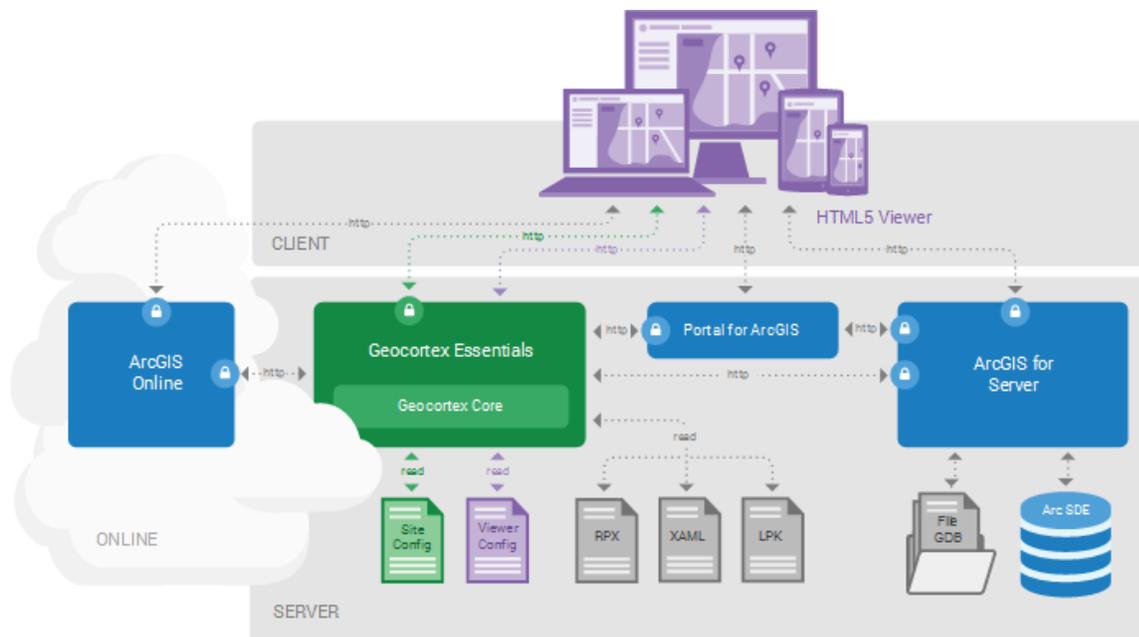
Points to secure in an Essentials installation with ArcGIS

The diagram illustrates security for:

- **ArcGIS Online:** Secure your organization's sensitive content in ArcGIS Online.
  For information on using ArcGIS Online content in Essentials, see **ArcGIS Online** on page **92**.

- **Geocortex Essentials**: Secure your sites and individual components within your sites.
  For information, see **Essentials Security** on page **396**.

- **Portal for ArcGIS:** Secure your Portal for ArcGIS web maps.
  For information on using Portal for ArcGIS content in Essentials, see **Portal for ArcGIS** on page **89**.

- **ArcGIS Server:** Secure your sensitive ArcGIS Server services.
  For instructions on configuring access to secured ArcGIS Server services for Essentials, see **ArcGIS Server Service Connections** on page **118**.

You can use different security methods for Essentials security and external security. For example, you could use Integrated Windows Authentication to secure your services, and SQL Server security providers for Essentials security. The fact that you use Integrated Windows Authentication to secure your services does not mean you have to use Integrated Windows Authentication for Essentials security.

> You can use either secured ArcGIS Online content or secured Portal for ArcGIS content with an instance of Essentials, but not both.

3.4.1 ArcGIS Server Security

Web applications like Essentials access ArcGIS Server via a REST endpoint. To prevent malicious users from accessing the endpoint directly by typing the address into a browser's address bar, you must secure the REST endpoint.

ArcGIS Server has a token security service that you can use to secure the REST endpoint. If you do not enable the token security service, ArcGIS Server defers authentication to IIS. This is called Web Tier authentication. Depending on how you configure IIS, IIS uses one or more of the following authentication methods: Digest, Basic, or Integrated Windows Authentication. In ArcGIS Server 10.1 and higher, Web Tier authentication is handled by the ArcGIS Web Adapter.

Both Essentials and the end user's web browser need to have access to ArcGIS Server. If ArcGIS Server is secured, you must configure the connection information in Essentials so Essentials can access ArcGIS Server.

3.4.2 ArcGIS Server and Essentials Security Compared

Essentials Security

- Essentials security secures the REST API.

- End users must authenticate to access the REST API. To access a particular endpoint in the REST API, the user must have permission.

- Essentials security supports the following authentication methods:

  - **Integrated Windows Authentication:** Authenticates using Windows users and groups.

  - **Geocortex Identity Server:** Uses dedicated security software that is installed with Essentials. Authenticates using whatever membership provider Geocortex Identity Server is configured to use.

  - **ArcGIS:** Authenticates using Portal for ArcGIS or ArcGIS Online.

ArcGIS Server Security

- You must use a security method for Internet connections, because Essentials accesses ArcGIS Server via the ArcGIS Server REST endpoint.

- Both Essentials and the end user's browser need to have access to ArcGIS Server.

- ArcGIS Server security applies to a folder or a service—you cannot secure individual layers or features in ArcGIS Server. In Essentials, you can filter individual layers and features so they do not appear in the viewer. To complete the security provided by filtering, you must secure the ArcGIS Server REST endpoint.

3.4.3   Frequently Asked Questions

Can I use my Windows Authentication-secured ArcGIS Server with Essentials?

Yes, you can. Configure the Essentials web applications in IIS to use an application pool that uses an identity with access to ArcGIS Server.

Can I use my Active Directory users for Essentials security?

Yes, there are two ways this can work.

If Essentials is configured to use Integrated Windows Authentication, integration with Active Directory is automatic. Whenever you type a user or role in Manager, specify the network domain.

If Essentials is not configured to use Integrated Windows Authentication, you can use a .NET Active Directory membership provider and Geocortex Active Directory role provider. This enables Essentials to connect to Active Directory over LDAP to validate users and roles. This method does not support single sign-on, and is usually used only if Integrated Windows Authentication is not available.

Can I use Active Directory Federation Services (ADFS) for Essentials security?

Yes, using Active Directory Federation Services (ADFS) to provide authentication to your site is supported in Essentials 3.10 and higher.

Can I use my non-Active Directory LDAP server's users for Essentials security?

Yes, you can use any LDAP server that has a .NET membership and role provider. However, you must use token security with those providers. This method does not support single sign-on.

Does Essentials support Kerberos or NTLM authentication?

Kerberos authentication is a part of Integrated Windows Authentication. Essentials security uses Kerberos if possible, or NTLM authentication if Kerberos is not available.

4 About Configuration

4.1 Geocortex Essentials Configuration Tools

Geocortex Essentials ships with the following configuration tools:

- **Geocortex Essentials Manager:** Geocortex Essentials Manager is a web-based application that you use to create and manage Essentials sites and viewers.

- **Geocortex Workflow Designer:** Geocortex Workflow Designer is a desktop application that you use to create and maintain Geocortex workflows. Workflow Designer has a built-in help system with instructions for creating workflows.

- **Geocortex Report Designer:** Geocortex Report Designer is a desktop application that you use to create report templates and print templates. Report Designer has a built-in help system with instructions for creating templates.

- **Geocortex Post Installer:** The Geocortex Post Installer is a desktop application that you use to activate the Essentials software, configure the web server that hosts the Essentials web applications, configure the method for signing in to Manager, and more. The *Geocortex Essentials Installation Guide* includes documentation for post-installation configuration.

You need a user name and password to run Manager. You do not need a user name and password to run the Post Installer, Report Designer, or Workflow Designer.

In addition to the configuration tools, Geocortex has a Language Tool. The Geocortex Language Tool enables you to internationalize Geocortex Essentials Manager and the Geocortex Viewer for Silverlight. You can download the Language Tool from the Geocortex Support Center.

4.1.1 Launch Manager and Sign In

To run Manager, you require a user name and password. The type of account that you use to sign in to Manager depends on the sign-in method that is configured in the Post Installer. There are three sign-in methods:

- **Portal for ArcGIS:** Use a Portal for ArcGIS account to sign in to Manager. Portal for ArcGIS performs the authentication.

- **ArcGIS Online:** Use an ArcGIS Online account to sign in to Manager. ArcGIS Online performs the authentication.

- **Windows:** Use a Windows account to sign in to Manager. Windows handles the authentication.

Windows supports single sign-on. If the Windows feature **Windows Authentication** is enabled, you may be signed in to Manager automatically. For information, see "Configure Single Sign-On to Manager" in the *Geocortex Essentials Installation Guide*.

▶ **To launch Geocortex Essentials Manager and sign in:**

1. Follow the instructions for the operating system you are using:

   - **Windows Server 2012 or Windows 8, and Newer Versions:**
     On the **Start** screen, type **Geocortex**, and then click **Geocortex Essentials Manager**.

   - **Windows Server 2008 or Windows 7, and Older Versions:**
     In the **Start** menu, select **All Programs** | **Latitude Geographics** | **Geocortex Essentials [Version] [Instance]** | **Geocortex Essentials Manager**.
     [Version] is the Essentials version number. [Instance] is the instance name, if Essentials is installed as a named instance. The default installation does not have an instance name.

2. If you are prompted to sign in, enter your user name and password, and then click **Sign In**.
   Depending on how Essentials is configured in the Post Installer, you either sign in using an ArcGIS account or a Windows account.

   When you are signed in, the user icon ⊚ appears in the banner area. You can click the user icon to see the identity of the current user.
   The first time you sign in to Manager, it opens to the Site List, the list of your configured sites.

▶ **To sign out of Manager:**

1. Click the down arrow ⯆ beside the user icon ⊚ in the banner area.

2. Click **Sign Out**.
   You are signed out immediately.

4.1.2 Launch Report Designer

▶ **To launch Geocortex Report Designer:**

1. Follow the instructions for the operating system you are using:

   - **Windows Server 2012 or Windows 8, and Newer Versions:**
     On the **Start** screen, type **Geocortex**, and then click **Geocortex Report Designer**.

   - **Windows Server 2008 or Windows 7, and Older Versions:**
     In the **Start** menu, select **All Programs** | **Latitude Geographics** | **Geocortex Essentials [Version] [Instance]** | **Geocortex Report Designer**.
     [Version] is the Essentials version number. [Instance] is the instance name, if Essentials is installed as a named instance. The default installation does not have an instance name.

2. To open the Report Designer documentation, select **Open Help** in the **Help** menu.

4.1.3   Launch Workflow Designer

▶ **To launch Geocortex Workflow Designer:**

1. Follow the instructions for the operating system you are using:

   - **Windows Server 2012 or Windows 8, and Newer Versions:**
     On the **Start** screen, type **Geocortex**, and then click **Geocortex Workflow Designer**.

   - **Windows Server 2008 or Windows 7, and Older Versions:**
     In the **Start** menu, select **All Programs** | **Latitude Geographics** | **Geocortex Essentials [Version] [Instance]** | **Geocortex Workflow Designer**.
     [Version] is the Essentials version number. [Instance] is the instance name, if Essentials is installed as a named instance. The default installation does not have an instance name.

2. To open the Workflow Designer documentation, click the **Help** icon 🔵.

4.1.4   Launch the Post Installer

You can launch the Post Installer from the Windows Start screen or Start menu at any time after Essentials is installed.

▶ **To launch the Post Installer:**

1. Follow the instructions for the operating system that you are using:

   - **Windows Server 2012 or Windows 8, and Newer Versions:**
     On the **Start** screen, type **Post Install**, and then click **Post Installer**.

   - **Windows Server 2008 or Windows 7, and Older Versions:**
     In the **Start** menu, click **All Programs | Latitude Geographics | Geocortex Essentials [Version] [Instance] | Post Installer**.
     [Version] is the Essentials version number. [Instance] is the name of the instance name, if Essentials is installed as a named instance. The default installation does not have an instance name.

4.2   Ways to Configure Sites

There are two ways to configure sites:

- **Use Manager:** Essentials ships with a web-based tool for authoring and managing Essentials sites, Manager for Geocortex Essentials (Manager, for short).
  This is the recommended method for configuring sites. For most applications, you can do all your configuration in Manager.

- **Edit the Site Configuration File (`Site.xml`):** You can edit site configuration files in a text editor or XML editor.
  This method is recommended for advanced users only—it is very easy to introduce errors into XML by mistake. If you are developing a custom extension, you must use this method.

⚠️ If the configuration file contains invalid XML, the site will not work—you will not be able to edit the site in Manager or load the site in a viewer.

4.3 Ways to Add Components to a Site

Manager has three methods of adding components to a site:

- Add
- Import
- Inherit (reference)

4.3.1 Add Components

Adding a component to a site adds the component with its default configuration.

In most cases, Manager uses wizards to add components to your site. The purpose of wizards is to step you through the configuration of a particular component's required settings or most important settings.

Some components have less important or optional settings that are not included in the wizard. Any setting that is not in the Add wizard is assigned a default value which you can modify after you finish the wizard.

Editing an item after you have added it to your site enables you to:

- Change the values of settings that you configured in the Add wizard.
- Change the values of settings that the wizard did not allow you to set.
- Add sub components, if the item you added supports any.

4.3.2 Import Components

After you have configured a component in one site using the Add function, you can import the component into as many other sites as you want. Importing a component copies the component and its configuration from the other site.

After you have imported the component, you can change its configuration. The original component and the imported copy are independent of each other—changing the configuration of one has no effect on the other.

Importing is often quicker and easier than adding, because it saves you from having to configure all of the component's settings. Also, you can import multiple components of a particular type at one time, as long as they are configured in the same site.

4.3.3 Inherit (Reference) Components

Referencing has two purposes:

- **Site Inheritance:** It enables a site to inherit the configuration of another site so you do not have to reconfigure components in multiple sites. See **Inherit Components from Another Site** for information.
- **ArcGIS Web Maps:** It enables you to include ArcGIS web maps in your sites. The web map can be from ArcGIS Online or Portal for ArcGIS. See **About ArcGIS Online Web Maps** for information.

See Also...

4.4 Virtual Directories

Essentials supports the use of virtual directories to serve static content, such as images or other data files. For example, you could use a virtual directory for the images that you use in your viewers.

Virtual directories improve site portability and ease of deployment:

- **Portability:** Using a virtual directory enables you to keep your static content with the site configuration file, so you can put all the files needed for your site in a single zip file, port the zip file, and then extract the files directly to their correct locations.

- **Ease of deployment:** Using a virtual directory saves you from having to set up a web server to serve static content.

> **NOTE** Do not put files containing sensitive content in virtual directories—security does not apply to virtual directories.

> **NOTE** Essentials will not serve a site configuration file.

Essentials supports virtual directories for global content (content that is shared by sites), site content, and viewer content.
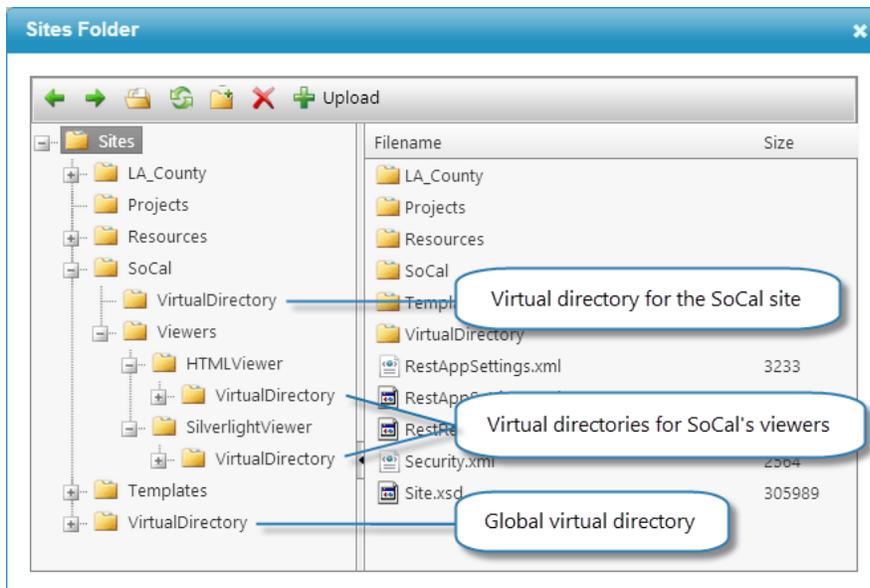
Virtual directories in the file system, shown using Manager's Browse Sites Folder function

The Global Virtual Directory

Essentials provides a predefined, global virtual directory, the REST Virtual Directory. The global virtual directory is used to store content that is shared between sites.

The global virtual directory is called `VirtualDirectory` and is located in the `Sites` folder.

In Manager, there is a Browse button anywhere that you can configure a URI to static content, for example, where you select the icon to represent a layer in the viewer. Click the Browse button to open a dialog box for selecting and managing virtual directory files. The management tools include tools to create new folders 📁, upload files ➕, and delete files and folders ✖.
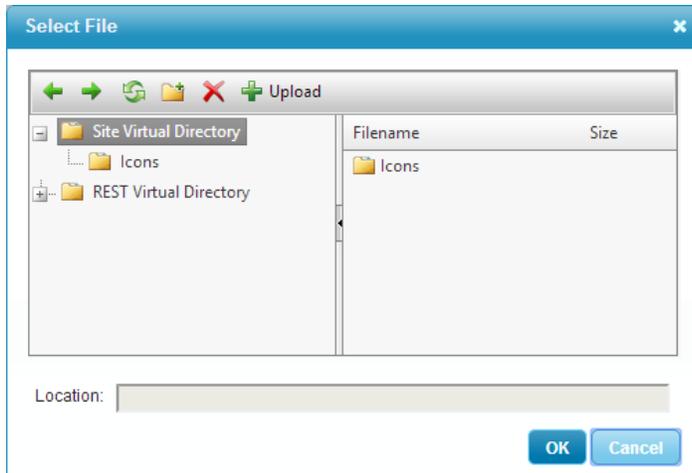
Dialog box to work with the global (REST) virtual directory and the site's virtual directory

When you select a file, Manager displays the file's location in the Location box. The location contains a client token in the file path, which represents the URL of the selected virtual directory.

In the default Essentials deployment, the global virtual directory's URL is:

```
http://[host]/Geocortex/Essentials/REST/virtualdirectory
```

where `[host]` is the Essentials web server.

Virtual Directories for Sites

Each site can have a virtual directory. A site's virtual directory is used for content that is specific to the site.

A site's virtual directory can have sub directories. This means you can keep the static content for your sites organized according to the standard scheme for websites.

Unlike the global virtual directory and viewer virtual directories, which are created by Essentials, you must add the virtual directories for sites. See **Create a Virtual Directory for a Site** on page **34** for instructions.

By convention, virtual directories for sites are named `VirtualDirectory` in the file system, like the global and viewer virtual directories. If you use a different name for a site's virtual directory, the virtual directory is still referred to as `virtualdirectory` in URLs—virtual directories for sites are always referred to as `virtualdirectory` in URLs, no matter what name you have given the folder in the file system.

In the default Essentials deployment, the URL for a site's virtual directory is:

```
http://[host]/Geocortex/Essentials/REST/sites/[SiteID]/virtualdirectory
```

where `[host]` is the Essentials web server and `[SiteID]` is the site's ID.

Virtual Directories for Viewers

Essentials creates a virtual directory for each Geocortex viewer that you add to a site. When you configure a viewer in Manager, there is a Browse button anywhere that you can configure a URI to static content, for example, where you

select the viewer's banner images. Click the Browse button to open a dialog box for selecting and managing files in the viewer's virtual directory.
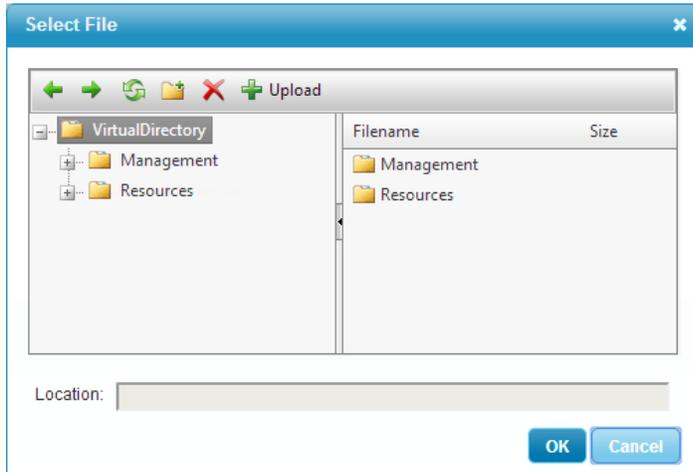
Dialog box to work with a viewer's virtual directory

In the default Essentials deployment, the URL for a viewer's virtual directory is:

```
http://[host]/Geocortex/Essentials/REST/sites/[SiteID]/viewers/[ViewerID]
/virtualdirectory
```

where `[host]` is the Essentials web server, `[SiteID]` is the site's ID, and `[ViewerID]` is the viewer's ID.

4.4.1 Create a Virtual Directory for a Site

▶ **To create a virtual directory for a site:**

1. If you already have a folder that contains the site's static content, move the folder to the site's folder.
   Otherwise, create a new subfolder in the site's folder. By convention, the folders for virtual directories are named `VirtualDirectory`.
   By default, the site's folder is:
   ```
   C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST
   Elements\Sites\[site name]
   ```

2. In Manager, edit the site that you want to configure, and then click **Site Info** in the side panel.

3. In the **Additional Information** area, click the **Select** hyperlink near **Virtual Directory**.

4. Select the folder that you want to use as the virtual directory.
   The folder's location appears in the Selected Path box. The path uses the {RootPath} server token.

5. Click **OK**.

6. Click **Save Site**.

4.5 Replacement Tokens

Replacement tokens are placeholders that represent different aspects of a site and its data.

- **Server and Client Tokens:** Represent file locations and URIs in your Essentials installation. Manager uses tokens when displaying file locations, and you can use tokens when you configure file paths and URLs in Manager.

  Using server and client tokens improves the portability of your site—it makes it possible to migrate your site from one installation of Essentials to another without having to update file paths or URIs. It also reduces the possibility of spelling and typing errors.

  The Essentials server replaces server and client tokens with the values that they represent—viewers never process server and client tokens.

- **Map Service, Layer, Field, Object, and Data Link Tokens:** Represent aspects of the item that is currently being processed. These tokens are replaced by the viewer, not the Essentials server.

  For example, suppose an end user performs an identify operation that finds several features—a **hospital**, a **county**, and so on. You have used layer tokens, map service tokens, and field tokens in the feature descriptions.

  When the viewer displays the **hospital** feature in the Results List, the viewer interprets the layer tokens in the feature description to represent aspects of the **Hospitals** layer. When the viewer displays the **county** feature, the viewer interprets layer tokens to represent aspects of the **Counties** layer. Similarly, for the **hospital** feature, map service tokens represent the map service that the **Hospitals** layer belongs to, and field tokens represent the **hospital** feature's fields. For the **county** feature, map service tokens represent the map service that the **Counties** layer belongs to, and field tokens represent the **county** feature's fields.

  Using map service, layer, field, object, and data link tokens make it easier to maintain your site. They also improve the usability of your viewers.

> Replacement tokens are case sensitive. To ensure you use the correct capitalization, use the Rich Text Editor to insert replacement tokens into the configuration.

VIEWER SUPPORT

- The Geocortex Viewer for HTML5 supports replacement tokens.
- The Geocortex Viewer for Silverlight supports replacement tokens.

4.5.1 Server Replacement Tokens

Server tokens are values that are replaced on the server. Server tokens allow you to substitute server paths and URIs with actual values, without having to know where Essentials is installed on the disk. When a site is loaded, Essentials replaces any server tokens that appear in the site configuration with the actual values that the tokens represent.

Server tokens are usually used to reference resources which reside on the server and are not publicly accessible.

Essentials supports the following server tokens:

- **{RootPath}:** Represents the fully qualified path of the Geocortex Essentials sites folder, using file path notation.
  Example: `{RootPath}\Viewers\SilverlightViewer`

- **{SitePath}:** Represents the fully qualified path to the directory containing the site configuration file.
  Example: `{SitePath}\Resources`

- **{RootUri}:** Represents the URI to the REST API Sites directory in the file system (not the HTTP- based URL to the root REST endpoint).
  Example: `{RootUri}Workflows/SearchForSchools.xaml`

- **{SiteUri}:** Represents the URI to the site within the REST API Sites directory in the file system (not the HTTP-based URL to the site's REST endpoint).
  Example: `{SiteUri}/Resources/TemplateReports/LowIncome.rpx`

Use the {RootUri} and {SiteUri} tokens when the property requires a web URI, such as when using print templates. The URIs generated by these tokens are not publicly accessible web URLs.

Use the {RootPath} and {SitePath} tokens when a file system path is required.

4.5.2 Client Tokens

Client tokens are values that are replaced on the client (the viewer) at run time. They are usually used to represent publicly accessible resources such as images needed for a viewer application.

Essentials supports the following client tokens:

- **{VirtualDirectoryUrl}:** Represents the URL to the site's virtual directory.

- **{SiteRestUrl}:** Represents the URL to the site.

- **{RestVirtualDirectoryUrl}:** Represents the URL to the global virtual directory of the Essentials REST application.

- **{HostUri}:** Represents the URL of the web application or website that is hosting the viewer, or the file system root URI of the application if you are consuming the site through a WPF application.

- **{RestToken}:** Represents the Essentials access token. Applications must supply the access token to access Essentials when Layer Security is in force and Anonymous Access is disabled. Use {RestToken} with the `token` URL parameter to configure URLs that point back to the Essentials server from a viewer.
  For example, if the layer is secured and Anonymous Access is disabled, the URL that a viewer would use to access a feature attachment might look like this:
  ```
  http://server.domain.com/sites/mysite/map/mapservices/0/MapServer/26/attachments/3601?token={RestToken}
  ```

See also...

Example 1 in **Layer Tokens** on page **38**

4.5.3 Map Service Tokens

Map service tokens are placeholders that represent properties of the map service that the current layer belongs to. They enable you to configure text and hyperlinks that Essentials interprets differently for different map services, even though the configuration is identical. Map service tokens can be used in feature labels and feature descriptions, feature hyperlinks, and layer hyperlinks.

Essentials supports the following map service tokens:

- **{MapServiceDisplayName}:** Represents the display name that is configured for the current map service. The display name is configured in the Display Name box on the map service's Details tab.
  The {MapServiceDisplayName} token is useful if you are presenting information about the map service to the end user.

- **{MapServiceId}:** Represents the ID of the current map service. The ID is shown on the map service's Details tab.
  The {MapServiceId} token is useful for operating on the current map service.

- **{MapServiceUrl}:** Represents the URL for the current map service, without the protocol (`http` or `https`). For example, if an ArcGIS Server map service called MapServer is deployed to the default location in ArcGIS Server, then {MapServiceURL} represents `server.domain.com/arcgis/rest/services/MapServer`.
  The URL is configured in the Service URL box when you edit the map service's connection settings.

- **{MapServiceToken}:** Represents the security token for the current map service.

The {MapServiceToken} replacement token is useful for accessing the current service when the service is secured using ArcGIS token security.

Example: Show Images from a Token-Secured Service

Suppose you have a site that includes a token-secured ArcGIS Server map service with a Tax Parcels layer. Each feature in the Tax Parcels layer has a photo that is configured as a feature attachment. You want the photo to be displayed in search and identify results, so end users can easily scan the results. Specifically, you want the parcel's address to appear at the top, followed by the photo, and then the owner's name.

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Desired appearance of a Tax Parcels feature in search and identify results

To configure this, you use the Tax Parcels layer's **Feature Label** setting and **Feature Description** setting.

The Feature Label appears above the Feature Description in search and identify results, so you use the Feature Label for the parcel's address. To show the address for the current feature, you use a field token. The field in the Tax Parcels layer that contains the address is called SITEADDRESS, so you enter **{SITEADDRESS}** as the Feature Label.

The Feature Description has two parts: the photo and the owner's name. For the photo, you define an HTML image tag (`<img>`) that specifies the URL for the attachment file that contains the photo. You use a combination of map service tokens, layer tokens, and field tokens. The image tag looks like this:

```
<img src="https://{MapServiceURL}/{LayerID}/{OBJECTID}/attachments/{PHOTOID}?token=
{MapServiceToken}" alt="Image" height="200" width="300">
```

where:

- **{MapServiceUrl}** is the map service token that represents the map service's URL, for example, `server.domain.com/arcgis/rest/services/MyCity/MapServer`.
- **{LayerId}** is the layer token that represents the ID of the current layer, in this case, the Tax Parcels layer.
- **{OBJECTID}** is the field token that represents the OBJECTID field. Each feature in the Tax Parcels layer has a unique OBJECTID. The {OBJECTID} token identifies the current feature.
- **{PHOTOID}** is the field token that represents the PHOTOID field, which contains the ID of the attachment to display in the feature description.
- **{MapServiceToken}** is the security token that Essentials uses to access the map service in ArcGIS Server.

To display the owner's name, you use field tokens for the OWNERFIRSTNAME and OWNERLASTNAME fields.

Feature Label:	{SITEADDRESS}	Edit...
Feature Description:	`<img src="https://{MapServiceUrl}/{LayerId}/{OBJECTID}/attachments/{PHOTOID}?token={MapServiceToken}" alt="Image" height="200" width="300"> <span style="font-style: normal; font-weight: bold; line-height=150%">{OWNERFIRSTNAME} {OWNERLASTNAME}</span>`	Edit...

Configuration that controls the content and appearance of search and identify results

There is one last detail to attend to. Your site has two viewers—a Silverlight viewer and an HTML5 viewer. By default, the HTML5 Viewer shows the Feature Long Description in search and identify results, not the Feature Description. (The Silverlight Viewer shows the Feature Description by default.) To make the HTML5 viewer show the Feature Description instead of the Feature Long Description, you set the Results List Content Field setting for the viewer to **Feature Description**.

▶ **To insert map service tokens using the Rich Text Editor:**

If you know the name of the map service token you want to insert, you can simply type it in. Make sure you use the correct capitalization when you type in a map service token—Essentials will not recognize the token if the capitalization is wrong.

1. Click the **Edit** button beside the item that you are configuring.
   Every configuration item that can contain map service tokens has an Edit button beside it.

2. In the bottom box, type as much of the item's configuration as you can, omitting the map service tokens.

3. Position the cursor where you want to insert a map service token.

4. In the **Replacement Token** box, click the down arrow ▾ and select the map service token that you want to use.

5. Click **Insert**.
   The map service token is inserted at the cursor position.

6. Continue to insert as many map service tokens as you want.

7. Click **OK**.

See also...

About Feature Descriptions on page **171**

Feature Hyperlinks on page **211**

Layer Hyperlinks on page **207**

Custom Properties on page **431**

4.5.4 Layer Tokens

Layer tokens are placeholders that represent properties of the current layer, including any custom properties that you have defined. They enable you to configure text and hyperlinks that viewers interpret differently for different layers, even though the configuration is identical. Layer tokens can be used in feature labels and feature descriptions, feature hyperlinks, and layer hyperlinks.

For example, suppose you configure the feature descriptions in both the Cities layer and the Streams layer to say **This feature is in the {LayerDisplayName} layer**. In a viewer, a city's feature description appears as **This feature is in the Cities layer**. A stream's feature description appears as **This feature is in the Streams layer**. Now suppose you change the display name of the Cities layer to **Urban Areas** in Essentials. When a user selects a feature on the Cities layer, the feature description now appears as **This feature is in the Urban Areas layer**.

Essentials supports the following predefined layer tokens:

- **{LayerDisplayName}:** Represents the display name that is configured for the current layer. The display name is configured in the Display Name box on the layer's Details tab.

The {LayerDisplayName} token is useful if you are presenting information about the layer to the end user.

- **{LayerId}:** Represents the ID of the current layer. The Layer ID is shown on the layer's <u>Details tab</u>.
  The {LayerId} token is useful for operating on the current layer.

- **{LayerName}:** Represents the current layer's name in the underlying map service. The Layer Name is shown on the layer's <u>Details tab</u>.

- **{LayerDescription}:** Represents the description that is configured for the current layer. The description is configured in the Description box on the layer's <u>Details tab</u>.
  The {LayerDescription} token is useful if you are presenting information about the layer to the end user.

Example 1: Use Layer Tokens to Construct URLs and User Interface Text

This example uses layer tokens to construct a hyperlink that points to the metadata for the current layer.

To start, you name each metadata file after its layer. For example, the metadata for the Airports layer is in a file called `Airports.html`. You create a `Metadata` folder in the site's virtual directory where you place the metadata files. You also have an `Icons` folder in the virtual directory, where you place the image file for the hyperlink's icon.

Now you edit the Airports layer in Manager and add a layer hyperlink. You use the {LayerDisplayName} token in the hyperlink text and the tool tip, and the {LayerName} token in the hyperlink's URI and the icon's URI. To construct the URIs, you use the {VirtualDirectoryUrl} <u>client token</u> to point to the site's <u>virtual directory</u>, and the {LayerName} layer token to construct the file names:

- **Hyperlink URI:** `{VirtualDirectoryUrl}/Metadata/{LayerName}.html`

- **Icon URI:** `{VirtualDirectoryUrl}/Icons/{LayerName}.png`

Layer hyperlink configuration containing layer tokens

Example 2: Use a Layer Token as a Workflow Argument

This example uses a layer token as a workflow argument.

Suppose you are creating a workflow that operates on a layer. You name the workflow **OperateOnLayer**. To allow the workflow to operate on different layers, you define an input parameter that takes the ID of the layer to operate on. You name the parameter **LayerID**.

You could make the workflow operate on a specific layer by specifying the layer ID. For example, you could configure a hyperlink that makes the workflow operate on layer 19 by specifying `LayerId=19`, and then you could configure another hyperlink that makes the workflow operate on `LayerId=23`, and so on. You need to configure the hyperlink differently for each layer.

To create a single, generic, hyperlink that makes the workflow operate on the current layer, you use the {LayerId} token instead of a specific layer ID:

```
<a href="command:RunWorkflowWithArguments?workflowId=OperateOnLayer&LayerID={LayerId}
">Run workflow on {LayerDisplayName} layer</a>
```

You could use a hyperlink like this in feature descriptions.

> **To insert layer tokens using the Rich Text Editor:**
>
> If you know the name of the layer token you want to insert, you can simply type it in. Make sure you use the correct capitalization when you type in a layer token—Essentials will not recognize the token if the capitalization is wrong.

1. Click the **Edit** button beside the item that you are configuring.
   Every configuration item that can contain layer tokens has an Edit button beside it.

2. In the **Replacement Token** box, click the down arrow ▾ and select the layer token that you want to use.

3. In the bottom box, type as much of the item's configuration as you can, omitting the layer tokens.

4. Position the cursor where you want to insert the layer token that you selected.

5. Click **Insert**.
   The layer token is inserted at the cursor position.

6. Continue to insert as many layer tokens as you want.

7. Click **OK**.

See also...

4.5.5 Field Tokens

Field tokens are placeholders that represent a layer's fields, in other words, feature attributes. They enable you to create text and hyperlinks that vary according to attributes of the current feature.

Field tokens can be embedded into the configuration of some text items and URIs. When the item is displayed in the viewer, the token is replaced with the field's value for the selected layer. For example, if the user selects Gastonia on the Cities layer, the {CITY_WEBSITE} field token is replaced by `http://www.cityofgastonia.com`.

Field tokens can be used to configure feature labels and feature descriptions, and in feature hyperlinks.

Example: Use Field Tokens to Display Feature Information

This example uses field tokens to display feature information for a site's Parcels layer.

To start, you edit the Parcels layer in Manager. This opens the page where you configure the Feature Label, Feature Description, and Feature Long Description.

You want the Feature Label to say "Parcel ID:", followed by the parcel's ID. You type **Parcel ID:**, and then click Edit to open the Rich Text Editor. You select the Parcel ID field from the Field Token drop-down list, click Insert to insert it into the feature label, and then click OK to close the Editor. The Feature Layer box now contains **Parcel ID: {PID}**. In the viewer, the **{PID}** part will be replaced by the current parcel's ID.

You follow a similar procedure for the Feature Description and Feature Long Description. The Feature Description will say **Owner:** followed by the owner's name. The Feature Long Description will give the owner's name and the address, each appropriately labelled. The configuration is shown below.

Feature settings containing field tokens

After applying your changes and saving the site, you launch the viewer to verify your configuration. You zoom in close enough to see individual parcels, and then you use an Identify tool to identify some parcels. You also click one of the feature labels in the results list to open the feature details window. This allows you to check that the feature information is presented the way you want it.
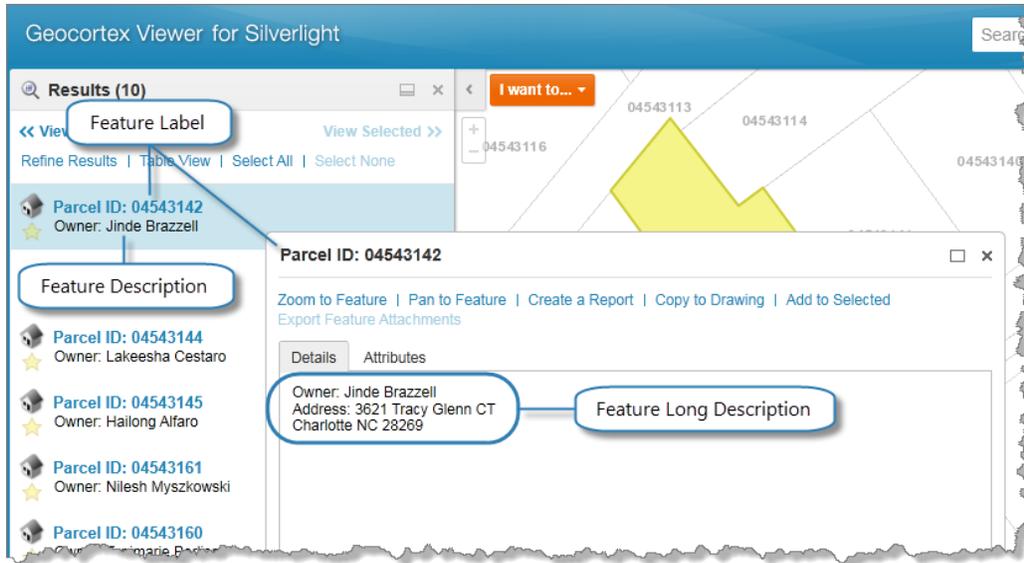
Feature information in the Silverlight viewer, with the field tokens replaced by data

▶ **To insert field tokens using the Rich Text Editor:**

💡 If you know the names of the field tokens that you want to insert, you can simply type them in. Make sure you use the correct capitalization when you type in a field token—Essentials will not recognize the token if the capitalization is different than in the map service. For example, the field token for the CITY field is {CITY}, not {City} or {city}.

1. Click the **Edit** button beside the item that you are configuring.
   Every configuration item that can contain field tokens has an Edit button beside it.

2. In the **Replacement Token** box, click the down arrow ▾ and select the field token that you want to use.

3. In the bottom box, type as much of the item's configuration as you can, omitting the field tokens.

4. Position the cursor where you want to insert the field token that you selected.

5. Click **Insert**.
   The field token is inserted at the cursor position.

6. Continue to insert as many field tokens as you want.

7. Click **OK**.

See also...

4.5.6   Object Tokens

Object tokens are placeholders that represent GIS objects, specifically features, graphics, and geometries. They enable you to define hyperlinked viewer commands that take objects related to the current feature as parameters.

In the viewer, each object token is replaced with the object that the token represents, for the current layer. For example, you could create a Zoom to Feature hyperlink that executes the `ZoomToFeature` command on the current feature when a user clicks the hyperlink.

Essentials has three object tokens:

- **{$Feature}:** Represents the current feature.
- **{$Graphic}:** Represents the graphics object associated with the current feature.
- **{$Geometry}:** Represents the geometry of the graphics object associated with the current feature.

> **NOTE** You can use the {$Graphic} and {$Geometry} object tokens with the `RunWorkflowWithArguments` command. You cannot use the {$Feature} object token with the `RunWorkflowWithArguments` command.

> **NOTE** You cannot use the Rich Text Editor to enter object tokens—you must type object tokens into the HTML markup. Make sure you use the correct capitalization when you type in an object token—Essentials will not recognize the token if the capitalization is wrong.

Example: {$Geometry}

Because workflows can take geometries as parameters, the {$Geometry} token is particularly useful for hyperlinks that run workflows. This example illustrates how to pass the geometry of the current feature to a workflow. The workflow is run using the `RunWorkflowWithArguments` command.

Suppose you are working on a project to remediate contaminated soil at an old industrial site. In addition to the parcel itself, you are responsible for an area surrounding the parcel where contaminants have seeped. To help you define the area to be remediated, you have a workflow that buffers the current parcel. The workflow takes the parcel's geometry as an argument.

You have already added the workflow to your site. The workflow's ID is BufferParcel.

To make the workflow available in the viewer, you edit the Parcels layer and define a hyperlink in the Feature Description that runs the workflow. The markup for the hyperlink is:

```
<a href="command:RunWorkflowWithArguments?workflowId=BufferParcel&ParcelGeometry=
{$Geometry}">Create Remediation Buffer</a>
```

After applying your changes and saving the site, you launch the viewer to verify your configuration. You zoom in close enough to see individual parcels, and then you use an Identify tool to identify a parcel. You also click the parcel on the map to see its map tip. To test the workflow, you click one of the hyperlinks.
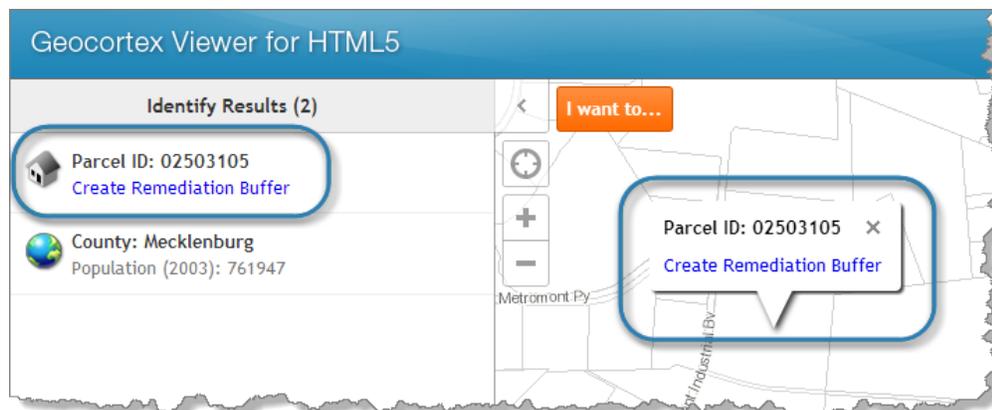
Hyperlink that runs a workflow, in the results list (left) and in a map tip

4.5.7 Data Link Tokens

Data link tokens are placeholders that represent the fields in a data link. They are similar to field tokens, except that they represent the fields in a data link instead of a layer.

Data link tokens enable you to create text and hyperlinks that vary according to the current feature. When an item that contains a data link token is displayed in a viewer, the viewer replaces the token with the value of the specified field in the specified data link. The data link must be configured for the layer that the current feature belongs to.

Like field tokens, you can embed data link tokens in the Feature Label, Feature Description, and Feature Long Description, and in feature hyperlinks.

The form of a data link token is **{DataLinkID.FieldName}**. You can find out the data link ID from Manager. You must get the field name from the data source itself—data link field names are not available in Manager. Because Manager does not know the field names in data links, you cannot use the Rich Text Editor to insert data link tokens—you must type them in.

For example, suppose a user identifies a particular parcel on the **Parcels** layer. The Parcels layer does not have owner information in it, however, it has an **OwnerInfo** data link configured for it, which links to a database of owner information. If the feature description for the Parcels layer contains the **{OwnerInfo.PrimaryName}** data link token, the token is replaced by the value of the **OwnerInfo** data link's **PrimaryName** field when it is displayed in the Results List.

Suppose that, instead of a **PrimaryName** field that contains the name of the primary owner, the database has an **OwnerNames** field that can contain multiple names. This is a **one-to-many** relationship—one field can contain many values. In this case, the viewer would replace the **{OwnerInfo.OwnerNames}** token with the **first** name in the **OwnerNames** field. Viewers always display the first value if there is more than one.

4.6 Hyperlinks in the Viewer

Including hyperlinks in your application's user interface is a powerful way to improve the usability of the viewer.

Whenever possible, Essentials creates hyperlinks out of configured URLs that are displayed in the viewer. In addition, Essentials has a variety of features and tools for creating links in the viewer:

- **Layer Hyperlinks:** Links to web pages that are relevant to the layer. Layer hyperlinks appear in a layer's or map service's context menu in the Layer List. Layer hyperlinks can contain layer tokens. For more information, see **Layer Hyperlinks** on page **207**

- **Feature Hyperlinks:** Links to web pages containing information that is relevant to the feature. Feature hyperlinks appear in the feature's details. Feature hyperlinks can contain field tokens. For more information, see **Feature Hyperlinks** on page **211**.

- **HTML anchor tags:** Some settings that you configure in Manager can contain HTML markup, including anchor elements. Specifically, the Feature Label, Feature Description, and Feature Long Description boxes on a layer's Details tab support HTML markup. Manager has a built-in Rich Text Editor that converts your configuration to HTML markup. To open a layer's Details tab, edit the layer. Note: HTML markup in the Feature Label box is supported by the Geocortex Viewer for HTML5 only (not the Geocortex Viewer for Silverlight).

- **Viewer Commands in Hyperlinks:** Viewer commands can be embedded in HTML anchor elements. The command executes when the user clicks the hyperlink. For more information, see **Viewer Commands in Hyperlinks** on page **45**.

- **Layer Tokens:** Placeholders that represent layer properties. Layer tokens enable you to define dynamically generated hyperlinks that depend on the current layer. For more information, see **Layer Tokens** on page **38**.

- **Field Tokens:** Placeholders that represent feature attributes. Field tokens enable you to define dynamically generated hyperlinks that depend on the current feature. For more information, see **Field Tokens** on page **40**.

- **Object Tokens:** Placeholders that represent objects. Object tokens let you pass an object representing the current feature to a viewer command. For more information, see **Object Tokens** on page **42**.

- **Data Link Tokens:** Placeholders that represent the fields in a data link. Data link tokens enable you to define dynamically generated hyperlinks that depend on the current feature's data links. For more information, see **Data Link Tokens** on page **44**.

The Geocortex Viewer for HTML5 and Geocortex Viewer for Silverlight have links for common operations built into them, for example, Zoom to Feature.

See also...

About Feature Descriptions on page **171**

4.6.1   Viewer Commands in Hyperlinks

Viewer commands can be embedded in HTML anchor elements. When the user clicks the hyperlink, the command executes. For example, an anchor element with a call to the `ZoomToInitialExtent` command in it returns the map to its initial extent when the user clicks the hyperlink.

Viewer commands can be used in the Feature Description and Feature Long Description boxes on a layer's Details tab in Manager—these two boxes can have HTML markup entered in them. To open a layer's Details tab, edit the layer.

You can use any HTML5 Viewer or Silverlight Viewer command in feature descriptions and feature long descriptions. For a complete list of available commands, refer to the *Geocortex Viewer for HTML5 Administrator and Developer Guide* and *Geocortex Viewer for Silverlight Administrator and Developer Guide*.

To configure a viewer command in an HTML anchor element, you put **command:CommandName** in the `href` attribute, where CommandName is the name of the viewer command. In its simplest form, an anchor element containing a viewer command looks like this: `<a href="command:CommandName">Hyperlink Text</a>`. In this case, the viewer command does not have any parameters.

For a command that takes parameters, the command name is followed by a question mark and a query string that specifies the parameters:

```
<a href="command:CommandName?QueryString">Hyperlink Text</a>
```

Query strings:

- must be HTML encoded and URL encoded

- can contain field tokens and object tokens

- can use HTTP query string syntax or JSON encoding

You cannot use Manager's built-in Rich Text Editor to enter viewer commands—you must type them in.
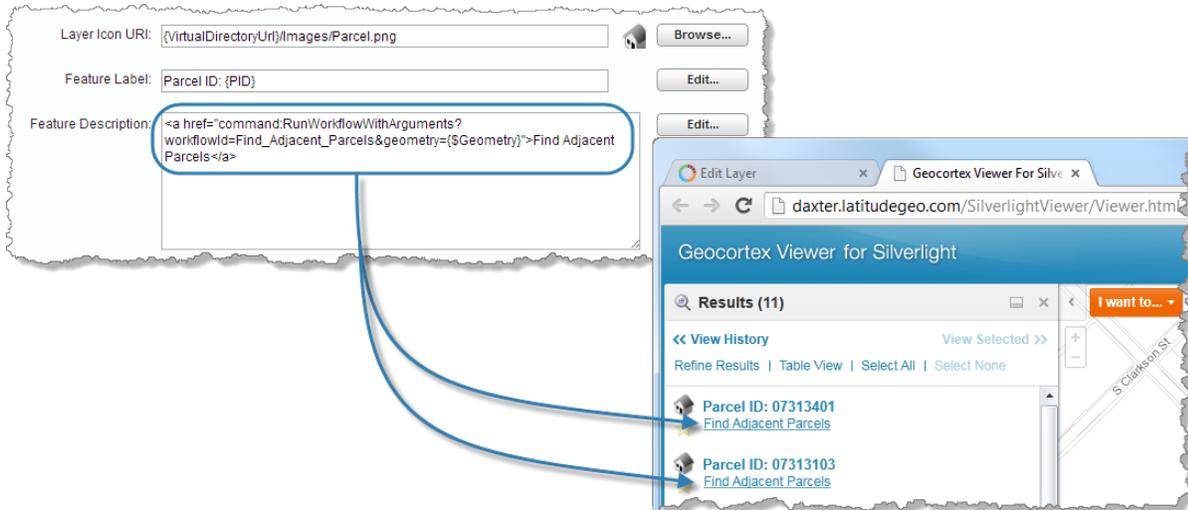
Hyperlinked viewer command in Manager (top) and in the viewer

Examples

- **Commands with no parameters:**

```
<a href="command:OpenOverviewMap">Open Overview Map</a>
```

- **Commands with parameters:**

  - **Parameter is a string:**

```
<a href="command:RunWorkflowById?Basic_Workflow">Basic Workflow</a>
```

  - **Parameter contains an object token:**

```
<a href="command:ShowFeatureDetails?{$Feature}">Show Details</a>
```

  - **Parameters for the RunWorkflowWithArguments command:**

    The `RunWorkflowWithArguments` command is used to run workflows that take one or more arguments. In this case, the command parameters are key-value pairs, where the key is the argument's name that you defined in Workflow Designer.

    In the following example, the workflow takes two arguments: parcelId and geometry. {PID} is a field token that represents the parcel ID of the currently selected parcel. {$Geometry} is an object token that represents the geometry of the currently selected feature—in this context the feature is a parcel.

```
<a href="command:RunWorkflowWithArguments?workflowId=Workflow1&parcelId={PID}
&geometry={$Geometry}">Run Workflow</a>
```

    > To run a workflow, you must specify the workflow ID in addition to the workflow arguments.

    > {$Geometry} is the only object token you can use with the `RunWorkflowWithArguments` command—you cannot use the {$Feature} or {$Graphic} object token.

  - **Parameters are JSON encoded:**

NOTE In the Geocortex Viewer for Silverlight, JSON encoding can be used for data contract commands only. In the HTML5 Viewer, you can use JSON encoding for all commands.

```
<a href="command:ZoomToExtent?{&quot;xmin&quot; : 1384615, &quot;ymin&quot; :
460976, &quot;xmax&quot; : 1536998, &quot;ymax&quot; : 646328 }">Zoom to
Extent</a>
```

See Also...

Field Tokens on page **40**

Object Tokens on page **42**

About Feature Descriptions on page **171**

4.7 The Geocortex Services Enhancement Proxy

The Geocortex Services Enhancement Proxy is a reverse proxy that standardize how map data is represented in Essentials, so the data can be consistently represented in viewers. The Services Enhancement Proxy offers the following enhancements:

- **Coded Value Domains:** Display values from coded value domains, and search for domain values using Global Search or any other type of query that returns features.

- **Date/Time Formatting:** Adjust date/time data to the user's time zone.

- **Number Formatting:** Format numeric data for the user's locale, for example, use commas instead of decimal points for French locales.

- **Pixel Tolerance:** Apply pixel tolerance to line and polygon identify operations.

- **Global Search Word Order:** Compensate for word order in Global Search.

Configuring the Services Enhancement Proxy provides all of the enhancements to both HTML5 viewers and Silverlight viewers, with one exception—you do not need to configure the Services Enhancement Proxy to show domain values in HTML5 viewers. The HTML5 Viewer has built-in support for coded value domains.

NOTE The Geocortex Services Enhancement Proxy works with ArcGIS Server map services only.

4.7.1 Coded Value Domains

The Silverlight Viewer and HTML5 Viewer provide different support for coded value domains. Both types of viewer are capable of displaying and searching on domain values, including domain values in subtypes.

You do not need to use the Services Enhancement Proxy to include domain values in reports. For information, see **Coded Value Domains in Reports** on page **48**.

Coded Value Domains in Silverlight Viewers

To display or query on domain values in Silverlight viewers, you must configure the Geocortex Services Enhancement Proxy. You can configure a map service to show only values, only codes, or both values and codes in Silverlight viewers.

When you enable the Services Enhancement Proxy, Essentials creates a field for the domain value. You can use the layer's Fields tab to configure the visibility and searchability of the field itself, which contains the code, and the field that Essentials creates, which contains the value. This allows you to configure settings for codes and values separately. You can also use the fields that Essentials creates in workflows.

By default, all of a layer's fields are visible and searchable. This means that, by default, Silverlight viewers show and search both the code and the value.

> The fields that Essentials creates are local to Essentials—they are not added to the source map service.

For instructions on hiding codes, see **Hide Coded Value Domain Codes** on page **289**.

Coded Value Domains in HTML5 Viewers

The HTML5 Viewer has built-in support for coded value domains. You do not need to configure the Geocortex Services Enhancement Proxy to show domain values in HTML5 viewers.

- HTML5 viewers display domain values in all contexts.
- To search for features with a particular domain value, users search on the value, not the code.

You cannot display or search on codes in an HTML5 viewer.

Coded Value Domains in Reports

Reports have built-in support for coded value domains. You do not need to configure the Geocortex Services Enhancement Proxy to show domain values in reports.

When you create a report template in Geocortex Report Designer, the DataField property for components that you drag from the Controls panel is initially blank. You must type in the name of the field that you want to show in that component:

- **Code:** To show a field's code in the component, type the ArcGIS Server field name in the DataField box.
- **Value:** To show the field's value in the component, type the ArcGIS Server field name in the DataField box and append **.name()** to the field name.

For example, suppose your site has an Emergency Calls layer. The layer has a **CallType** field with coded values **1: Fire**, **2: Medical**, **3: Police**. You want to show the values (Fire, Medical, Police) in the report. You drag a TextBox component from the Controls panel (1) in the screen capture below) to the design surface (2)) and type **CallType.name()** in the text box's **DataField** box (3)).

You can configure a report template to show only values, only codes, or both values and codes. To also show the code, you would drag another text box to the design surface and type **CallType** in the **DataField** box.
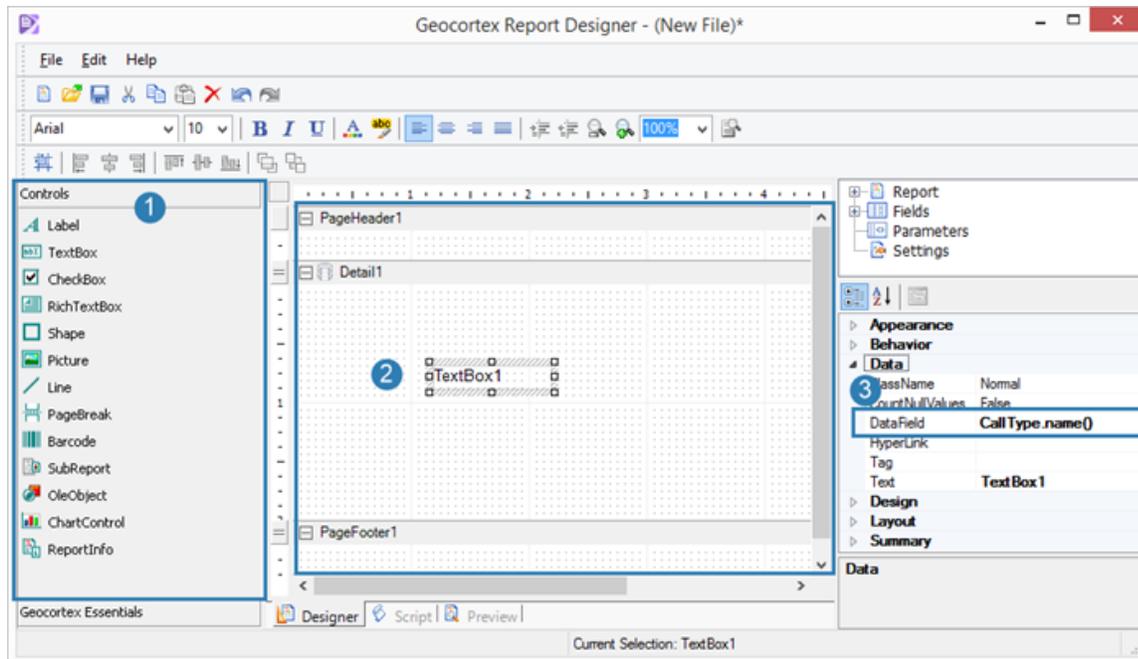
Report template that will show domain values from the CallType field

4.7.2   Date/Time Formatting

When the Geocortex Services Enhancement Proxy is configured, the viewer adjusts date/time data to the end user's locale. HTML5 viewers use a different locale setting than Silverlight viewers:

- **HTML5 Viewer:** Uses the locale set in the operating system of the user's device.
- **Silverlight Viewer:** Uses the Silverlight plug-in's locale.

4.7.3   Number Formatting

When the Geocortex Services Enhancement Proxy is configured, the formatting of numeric data is based on the user's locale. HTML5 viewers use a different locale setting than Silverlight viewers:

- **HTML5 Viewer:** Uses the locale set in the operating system of the user's device.
- **Silverlight Viewer:** Uses the Silverlight plug-in's locale.

4.7.4   Pixel Tolerance for Line and Polygon Identify Operations

The Geocortex Services Enhancement Proxy extends buffering for identify operations to lines and polygons. This makes it easier for the user to identify features with a line or polygon geometry. When the Services Enhancement Proxy is not configured, pixel tolerance applies to point geometries only.

4.7.5 Word Order in Global Search

The Geocortex Services Enhancement Proxy enhances Global Search in two ways:

- It extends Global Search to search different word orders.

  For example, suppose the user is trying to find properties owned by **Kim Bell**. If names are stored with the last name first (**Bell, Kim**) and the Services Enhancement Proxy is configured, Global Search will successfully match **Kim Bell** to **Bell, Kim**. If the Services Enhancement Proxy is not configured, Global Search will not find any features that match **Kim Bell**.

- In Silverlight viewers, the Services Enhancement Proxy enables users to search using the values in coded value domains.

  See **Coded Value Domains** on page **47** for more information.

4.7.6 Configure the Services Enhancement Proxy

The Services Enhancement Proxy is configured at the map service level. This means you can use the Services Enhancement Proxy for some of a site's map services but not others.

When you turn on the Services Enhancement Proxy for a map service in Manager, two additional options become available:

- **Forward Requests Using Application Pool Identity:** You cannot use the Services Enhancement Proxy at the same time as a proxy page. If the map service is secured and you do not want users to be prompted for their credentials, select the Forward Requests Using Application Pool Identity check box. Essentials will use the Essentials application pool identity to access the map service.

  > **NOTE** Using a proxy to manage security is not recommended. For a map service to be truly secure, the security that is configured should be enforced.

- **Resolve Coded Domains:** Select this check box to turn on the enhancements—resolution of coded value domains, date and number formatting, pixel tolerance, and Global Search enhancements.

Options related to the Geocortex Services Enhancement Proxy

There are two common ways to use the Services Enhancement Proxy:

- To enable the enhancements offered by the Services Enhancement Proxy, select **Geocortex Services Enhancement Proxy** and **Resolve Coded Domains**.

- To enable the enhancements offered by the Services Enhancement Proxy, and use the Proxy to manage access to the map service (like a proxy page), select **Geocortex Services Enhancement Proxy**, **Resolve Coded Domains**, and **Forward Requests using Application Pool Identity**.

> **NOTE** If you are using the Services Enhancement Proxy with a token-secured ArcGIS Server map service, you must specify the Token URL when you configure the authentication settings for the map service.

▶ **To configure the Services Enhancement Proxy:**

1. In Manager, edit the map service that you want to configure.

2. Click the **Edit Connection Settings** button below the **Connection String** box.

3. Select **Geocortex Services Enhancement Proxy**.
   The Behaviors check boxes display.

4. If the map service is secured and you do not want users to be prompted for their credentials, select the **Forward Requests Using Application Pool Identity** check box.

5. If you want to enable the enhancements offered by the Proxy, select the **Resolve Coded Domains** check box.

6. Click **OK**.

7. Click **Apply Details**.

8. Click **Save Site**.

5 Sites

A site is a technology-neutral configuration of a GIS application. A site's configuration can include any of the features and functions offered by Essentials, such as workflows, data links, and print templates. You can also extend Essentials with custom functionality.

Central to a site is its map. The map can combine layers from different map services, including ArcGIS Server, Bing Maps, WMS, and others. Map services can be dynamic or cached, or you can combine the two. The map can also include ArcGIS web maps, feature services, and image services.

This ability to mix and match layers from different services enables you to tailor a site to precisely what is needed for a particular application. An organization that delivers multiple applications usually has multiple sites, often one for each application.

5.1 The Site List

The **Site List** is Manager's list of your configured sites. To show the Site List, click the leftmost tab in the banner area. If a site is open for editing, save and close the site to show the Site List.

The Site List has two views: **Tiled View** and **List View**. You can switch between the two views by clicking the 🗋 **List View** and 🔡 **Tiled View** buttons.

Tiled View

By default, the Site List displays in Tiled View. Tiled View shows a thumbnail image of each site's map.
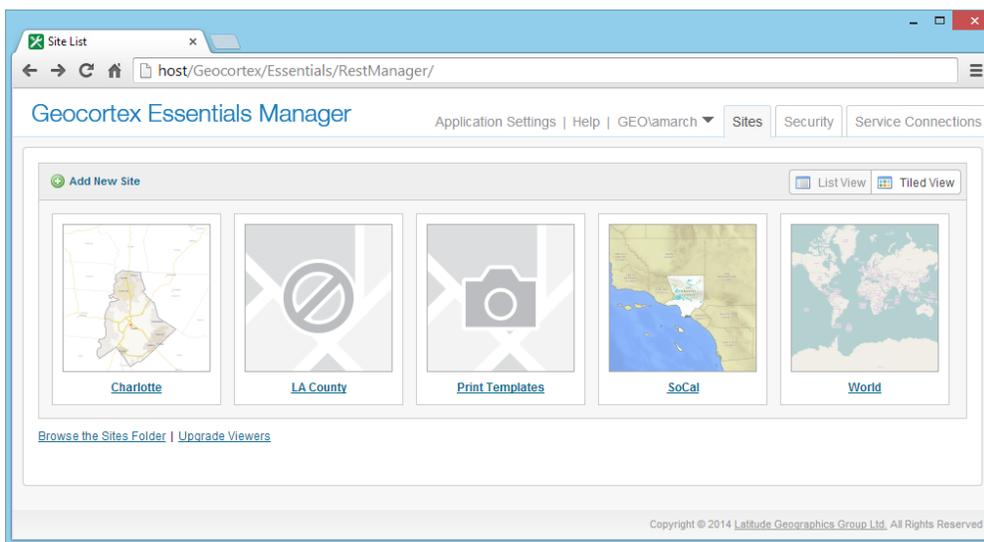
The Site List in Tiled View, showing five sites

In some cases, instead of an image of the map, you may see:

This means that Manager has not yet created the thumbnail image, or cannot create the image for some reason.

This means that the site does not have a map (no map services have been added to the site).

To show icons to manage a site, hover over the site's thumbnail image.
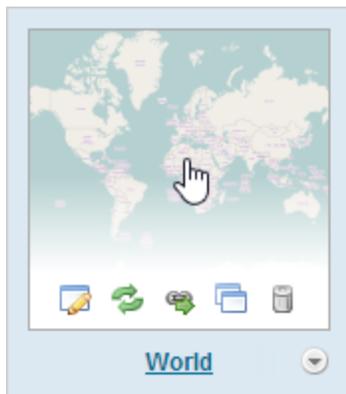
Site management tools in Tiled View

▶ **To edit the site:**

- Click the map image, or

- Click the site's name, or

- Click the **Edit** icon .

▶ **To show the Site Summary:**

Click the down arrow .

The Site Summary includes hyperlinks to launch the site's viewers.

List View

List View is more compact than Tiled View, so it is useful if you have a large number of sites. It is also useful if the maps for many of your sites look similar.
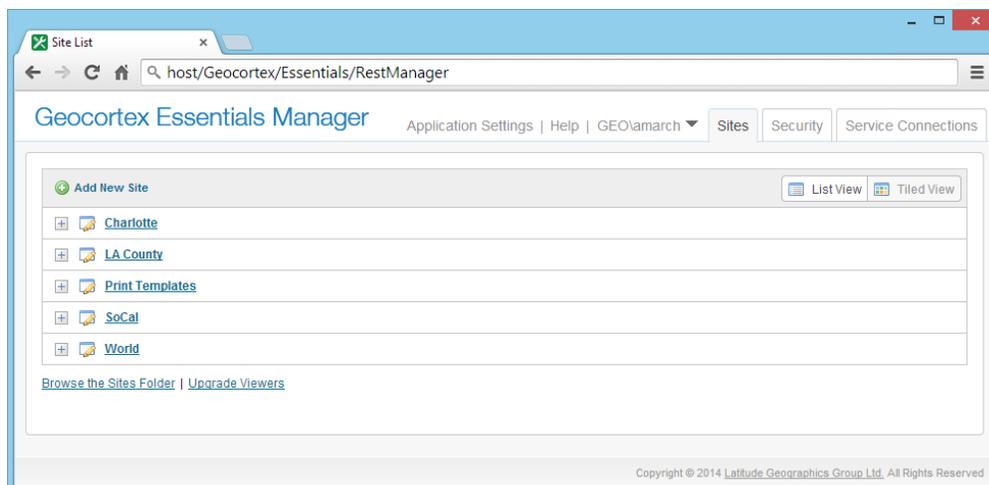
The Site List in List View, showing five sites

To show the Site Summary for a site, click the plus sign beside the site.

Actions and Site Summary for a site called World

5.2 Create a Site

There are two ways to create a new site in Manager:

- **Use the Wizard:** Use Manager's Create Site wizard to step through the creation of a simple site that can be modified and extended later.

- **Copy an Existing Site:** In Manager, create a copy of an existing site, and then modify the copy.
  This method is useful if you want to create a site that is similar to a site that you have already configured.

> **NOTE:** You can also create a site by copying an existing `Site.xml` file and saving the copy to a new subfolder in the `Sites` folder. Manager will detect the new site and include it in the Site List the next time the Site List loads.

5.2.1 Create a Site Using the Wizard

The Create Site wizard enables you to create:

- **An Empty Site:** Create a site that does not have any map services or other components.
  Use this option when you want to build a site starting with nothing, or you want to create a site that other sites will reference. For example, to create a Print Templates site, which contains print templates that are used by multiple sites, you would start with an empty site.

- **A Site with an ArcGIS Online or Portal for ArcGIS Web Map:** Create a site that references an ArcGIS web map.

- **A Site that References Another Site:** Create a site that references an existing site. The new site will inherit the configuration of the referenced site.

▶ **To create a site using the Create Site wizard:**

1. In Manager, click the **Sites** tab. If a site is open for editing, click **Save Site** if necessary, and then click **Close Site**.

2. Click **Add New Site**.
   The Create Site wizard opens.

3. Type a display name and optional description for your site.

> **NOTE** Try keep the site's display name reasonably short. The site's folder is named after the site's ID, which is based on the site's display name. Windows folder names must be less than 248 characters and Windows path names must be less than 260 characters.

4. Click **Next**.

5. Follow the instructions for the option that applies to you:

Create an empty site

1. Select **Create an empty site**, and then click **Next**.

2. Click **Finish**.
   The wizard closes. Manager opens the site for editing.

Reference an ArcGIS Web Map

1. Select **Reference a web map from ArcGIS Online or Portal for ArcGIS**, and then click **Next**.

2. Do one of the following:

   #### Enter URL

   a. Type or paste the web map's URL into the box, and then click **Next**.

   #### Search

   a. To limit the search to web maps that belong to your ArcGIS organization, select the **Organization content only** check box.
      If you clear the check box, the search includes your organization's content and public content from outside your organization.

   b. If Essentials is registered with ArcGIS Online and you have added a Portal for ArcGIS service connection, select the portal that you want to search—search **Portal for ArcGIS** (based on the service connection) or search **ArcGIS Online** (based on the ability to search that comes with registration).

   c. Type the term that you want to search for.
      Search results display while you are typing. The more information that you type, the smaller the list of search results. You can stop typing at any time and browse the results.

      > In the search results, a padlock 🔒 beside a web map means that the web map is private.

   d. In the search results, select the web map that you want to add.

   e. Click **Next**.

3. Click **Finish**.
   The wizard closes. Manager opens the site for editing.

Reference another site

1. Select **Reference another site**, and then click **Next**.

2. Select the site you want to reference, and then click **Next**.

3. Click **Finish**.
   The wizard closes. Manager opens the site for editing.

See also...

> **Add a Map Service to the Map** on page **98**
>
> **Import Map Services from Another Site** on page **101**

5.2.2 Create a Site by Copying an Existing Site

▶ **To use Manager to create a site that is based on an existing site:**

1. In Manager, click the **Sites** tab. If a site is open for editing, click **Save Site** if necessary, and then click **Close Site**.

2. In the **Site List**, show the tools for the site that you want to copy.
   To show the tools in Tiled View, hover over the thumbnail image of the site that you want to copy. In List View, click the plus sign ⊞ beside the site.

3. Click the **Copy Site** icon 🗐.

4. Type a display name for your new site.

   > **NOTE** Try keep the site's display name reasonably short. The site's folder is named after the site's ID, which is based on the site's display name. Windows folder names must be less than 248 characters and Windows path names must be less than 260 characters.

5. Click **OK**.
   The dialog box closes and your new site appears in the Site List. You can now edit the site and make whatever modifications you want.

5.3 Configure Sites

Site configuration is the process of specifying the components that make up a site, and their behavior and availability. Essentials stores a site's configuration in an XML file called `Site.xml`. Each site has its own `Site.xml` file.

Site configuration files are kept in subfolders of the Geocortex Essentials Sites folder. For example, an Essentials installation with three sites might have the following folder structure (other Essentials files are not shown):
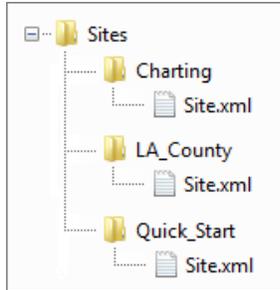
Example of a Sites folder

5.3.1   Inherit Components from Another Site

Site inheritance is the ability to make one site inherit another site's configuration, including all its configured components and settings. If you want Site A to inherit Site B's configuration, you edit Site A and add a reference to Site B. This example is used throughout this section—Site A contains a reference to Site B, so Site B is inherited.
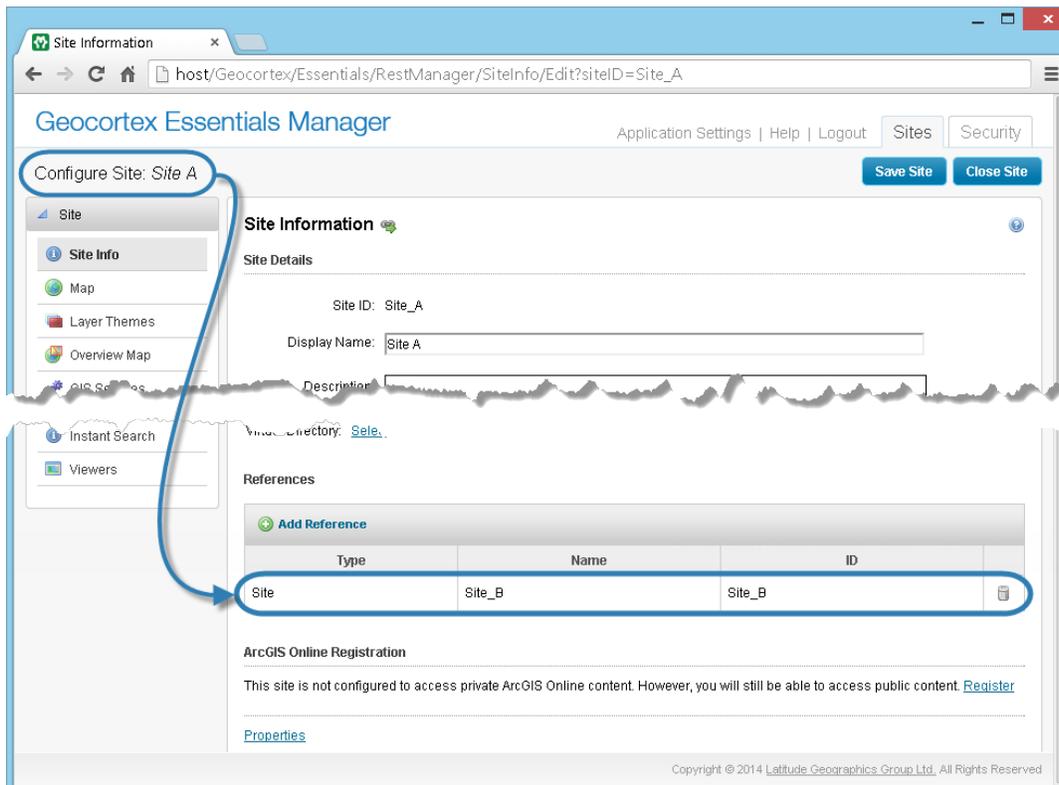
Site A references Site B, so A inherits B's components and settings

Usually the components and settings in the inherited site (B) are added to the components and settings in the site that contains the reference (A). For example, if Site A references Site B, Site A will include all its own configured components and settings, as well as all of Site B's components and settings. If a particular component is configured in both sites, Site A will have two instances of the component—one configured in Site A and one inherited from Site B.

Example: Inherited Components

The following table illustrates how adding a reference affects the components in a site. The leftmost column shows the components initially configured in Site A. The middle column shows the components configured in Site B. The last column shows the components in Site A after you configure a reference to Site B.

Configured Components for Site A, Site B, and Site A after a Reference to Site B is Added

Site A	Site B	Site A with Reference to Site B
"Charlotte" ArcGIS map service	"Charlotte" ArcGIS map service	"Charlotte" ArcGIS map service (configured)
"Charlotte" Silverlight viewer	"Streets" Bing Maps map service	"Charlotte" Silverlight Viewer (configured)
	"Imagery" Bing Maps map service	"Charlotte" ArcGIS map service (inherited)
	"Ledger" Print Template	"Streets" Bing Maps map service (inherited)
	"CharlotteBing" HTML5 Viewer	"Imagery" Bing Maps map service (inherited)
		"Ledger" Print Template (inherited)
		"CharlotteBing" HTML5 Viewer (inherited) *****

* Inheritance works differently for viewers than for other components. See **Viewer Inheritance** on page **59**.

Note that the Charlotte map service appears twice in Site A—one instance is configured in A and the other is inherited from B. The two instances can be configured differently, for example, they could have different visibility settings for their layers, different settings for inclusion in global search, and so on.

References can be chained.

Example: Chained Inheritance

Suppose Site A references Site B and Site B references sites C and D. Site A inherits the configuration of all three sites, B, C, and D.

5.3.1.1   Unique Components and Settings

Some components and settings can occur only once in a site. For example, a site can only have one initial extent for the map, one full extent, one north arrow, and one overview map. This means that Essentials cannot simply add these components and settings to the site that contains the reference—special rules are required:

- If Site A's component or setting still has its default value but you have changed the component or setting in Site B, Essentials uses Site B's component or setting.

- In all other cases, Essentials uses Site A's component or setting.

The rules ensure that Essentials preserves any customization you have made to the component or setting, with preference given to the Site A.

Note that these rules are for a simple, unchained scenario. In more complicated scenarios, where inheritance is chained, Essentials uses the last non-default value in the chain.

Example: Chained Inheritance of Unique Components

Suppose A references B, B references C and D (in that order), and C references E. Site A inherits the configurations of B, C, D, and E. If A, B, and C use the default initial extent, and D and E have configured values for the initial extent, then D's value is used (not E's, because E is inherited as part of C's configuration, which comes before D's configuration).

5.3.1.2   Change the Inherited Configuration

You can modify or remove inherited components and settings. Modifications you make to inherited components and settings override the inherited configuration, but do not affect the source configuration.

> ⚠️ Inheritance works differently for viewers than for other components—when you modify the configuration of an inherited viewer, the configuration of the source viewer is also modified. See Viewer Inheritance below.

> 💡 To disambiguate multiple components with the same name or multiple copies of the same component, you might want to modify or remove the inherited component.

Example: Modify an Inherited Component

Suppose Site B has a map service with a layer called "Navigable Waters", and Site A references Site B. If you edit Site A and change the inherited layer's display name to "Waterways", the layer will appear as "Waterways" in Site A and "Navigable Waters" in Site B.

If you then edit Site B and change the layer's name from "Navigable Waters" to "Navigation", the layer still appears as "Waterways" in site A—your change is preserved.

Example: Remove an Inherited Component

Suppose sites A and B both have a map service called Land Use. After you add a reference to Site B, Site A has two map services called Land Use, one from A and the other inherited from B. In Site A, you remove the inherited Land Use map service, so A's map only has one instance of Land Use in it.

5.3.1.3   Viewer Inheritance

> ⚠️ Inheritance works differently for viewers than for other components in one respect—when you modify the configuration of an inherited viewer, the configuration of the source viewer is also modified.

Deleting an inherited viewer does not affect the source viewer.

Example: Modify an Inherited Viewer

Suppose Site A references Site B and Site B has a viewer called B_Viewer configured for it. Site A inherits B_Viewer. You edit Site A and add an item to the I Want To menu of the inherited B_Viewer. Now you save Site A and edit Site B. You see that the I Want To menu for B_Viewer in Site B has the new item that you added in Site A.

Example: Delete an Inherited Viewer

Suppose Site A inherits a viewer from Site B. You edit Site A and delete the inherited viewer. Now you save Site A and edit Site B. You see that the viewer has not been deleted or changed in any way in Site B.

5.3.1.4   Change the Source (Referenced) Configuration

When one site references another, it remains linked to the referenced site. For example, if Site A references Site B, then A is linked to B. This means that if B's configuration changes, the change is reflected in A.

Changes made in Site B appear immediately in Site A in Manager. In the REST API, there can be a short delay before the changes appear.

Example: Modify the Referenced Configuration

Suppose Site A inherits a viewer from Site B. If you edit Site B and add a Run Workflow item to the viewer's I Want To menu, the Run Workflow item is automatically added to the viewer's I Want To menu in Site A's configuration. Similarly, if you change the title of the I Want To menu to "Tasks" in B, the menu's title is automatically changed to "Tasks" in A.

Example: Delete a Component in the Referenced Configuration

Site A inherits three map services from Site B, including one called Roadways. You edit Site B and remove Roadways from the map. Now you save Site B and edit Site A. Site A no longer has the Roadways map service in it.

See Also...

5.3.2 Edit a Site

You can only edit one site at a time.

▶ **To edit a site:**

1. Launch Manager, following the instructions that apply to you:

   - **Windows Server 2012 or Windows 8, and Newer Versions:**
     On the **Start** screen, type **Geocortex**, and then click **Geocortex Essentials Manager**.

   - **Windows Server 2008 or Windows 7, and Older Versions:**
     In the **Start** menu, select **All Programs** | **Latitude Geographics** | **Geocortex Essentials [Version] [Instance]** | **Geocortex Essentials Manager**.
     [Version] is the Essentials version number. [Instance] is the instance name, if Essentials is installed as a named instance. The default installation does not have an instance name.

2. Edit the site that you want to configure:

    a. Click the **Sites** tab.

    b. If a different site is open for editing, click **Save Site**, and then click **Close Site**.

    c. Follow the instructions for the view of the Site List that you are using:

        - **Tiled View:**

            World site in Tiled View

            - Click the thumbnail image of the site that you want to edit, or

            - Click the site's name, or

            - Position the pointer over the thumbnail image of the site that you want to edit, and then click the **Edit** icon .

        - **List View:**

            World site in List View

            - Click the site's name, or

            - Click the **Edit** icon .

See also...

5.3.3 Edit Site Information

The Site Information page allows you to:

- Modify the site's display name and description.
- Change the site's data provider. For information, see below.
- Open the REST API Sites Directory.
- Select a virtual directory to serve the site's static content.
- Add references to other sites and to ArcGIS web maps.
- Define or modify custom properties for the site.

Change a Site's Data Provider

(Default) Data Provider: (ArcGIS Server dynamic and tiled map services) The (Default) Data Provider is the type of data provider that you use to store feature data. This setting is used by the HTML5 and Silverlight Viewers. It enables the Query Builder and Filter Builder to construct queries using the correct syntax for your data provider.

You can configure this setting at the site level, the map service level, or the layer level. At the site and map service level, the setting is called **Default Data Provider**. At the layer level, it is called **Data Provider**.

Map services inherit the setting from the site, and layers inherit the setting from the map service that they belong to, or from the site if the setting is not configured at the map service level. For example, if all the site's services use the same data provider to store their feature data, you could configure the Default Data Provider at the site level—the map services and layers will inherit the configuration. This saves you from having to configure the setting for every map service and layer in the site.

By default, the provider is **Default**. The **Default** provider uses the ANSI SQL default syntax. If the Default provider does not work in your system, delete **Default** from the **Default Data Provider** box to open a drop-down list of providers. If the type of provider that you use appears in the list, select the provider—the Query and Filter Builders will use the well-known syntax for the provider that you select. If your provider does not appear in the list, re-enter **Default** in the **Default Data Provider** box, and configure the Viewer's QueryBuilder Module. For instructions, refer to the *Administrator and Developer Guide* for the Viewer that you are using.

> **NOTE** If the map service only has one layer, the Default Data Provider setting is not available at the map service level. For example, feature services do not have a Default Data Provider setting, but feature layers do.

▶ **To open a site's Site Information page:**

1. In Manager, edit the site that you want to configure, and then click **Site Info** in the side panel.

5.3.4   Verify your Configuration

Manager provides an easy way to verify your configuration when you add elements to your site. If you have configured at least one component of a particular type, Manager displays an icon 🔄 that links to the page in the REST API Sites Directory that lists these components. For example, if you click the icon on Manager's Print Templates page, the Sites Directory opens to the page that lists the print templates that are configured for that site.

> 💡 Save your site before you open the Sites Directory. New components do not appear in the Sites Directory until the site is saved.

5.3.5   Delete a Site

> ⚠️ When you delete a functioning site, users immediately lose access to the site. **Deletion is permanent.**

▶ **To delete a site:**

1. In Manager, click the **Sites** tab. If a site is open for editing, click **Save Site** if necessary, and then click **Close Site**.

2. Follow the instructions for the view of the Site List that you are using:

   - **Tiled View:** Position the pointer over the thumbnail image of the site that you want to delete, and then click the **Remove Site** icon 🗑.

   - **List View:** Click the ⊞ icon beside the site that you want to delete, and then click 🗑 **Remove Site**. When you are prompted to confirm, click **OK**.

5.4 # Site Initialization and Loading

The site configuration that you define in Manager cannot be used directly by viewers. To prepare a site so it can be used by applications, Essentials performs the following steps ("loads" the site):

1. **Initialize:** Initialization converts the site configuration to a form that applications can work with (the "site object") and gathers information about the components in the site.
   See **Initialization** on page **63** for more information.

2. **Cache:** Caching stores the site object on disk.
   See **Caching** on page **65** for more information.
   The site is now ready to serve to applications.

The load sequence occurs when an application requests a site and the cached information about the site is out of date or does not exist. The request could come from a client application (a viewer), or from the server (Manager). When an application requests a site:

1. Essentials looks for the site in the cache for the current version of Essentials.

2. **Cache Missing:** If the cache for the current version of Essentials is missing, Essentials loads the site, which creates the cache.
   Cache Found: If the cache exists:
   a. Essentials checks to see if the `Site.xml` file has been modified since the cache was created.
   b. If the site configuration has been modified, Essentials loads the site, which updates the cache.

3. Essentials serves a copy of the cached site to the application that made the request.

Initialization

Initialization is the process of converting the site configuration defined in the `Site.xml` file into objects that viewer applications can work with. These objects are called business objects because they represent the entities in the business domain that the GIS system is designed to support.

Essentials provides a number of classes of business object out of the box, some of which are common GIS entities, like map services and layers. Others correspond to Essentials features, like workflows and data links.

When you configure a site, you are configuring instances of the business objects that you want to be included in your site. For example, if you configure a Zip Codes layer, you are instructing Essentials to create an instance of the Layer class (in other words, create a Layer business object) and name it Zip Codes.

As part of the initialization process, Essentials communicates with each component configured in the site to gather the information it requires about the component. This includes connecting to each service. For example, Essentials connects to each map service to get information about the service's layers, metadata, spatial reference, and so on.

If Essentials cannot connect to a service during initialization because the network or the service is down, Essentials attempts to perform the initialization using previously cached information about the service.

If a service is unavailable during initialization:

1. Essentials checks to see if the site was previously cached.

2. Essentials uses the cached information, if it exists.

Previously Cached

If the site was previously cached, Essentials gets the information about the service from the most recent, valid copy of the cache.
To identify the service in the copy of the cache, Essentials looks for the service's:

- ID
- provider invariant name
- connection string

All three attributes must match. If you have changed one or more of these attributes in the configuration, Essentials will not find the service in the copy of the cache.
If Essentials finds the service in the copy of the cache, the information about the service is carried forward from the old cache to the new cache when the cached is updated, instead of getting fresh information from the service itself.

Never Cached

If the site has never been cached, site initialization fails because Essentials has no information about the unavailable service, and no way to obtain the information. The first time a new site is initialized, Essentials must be able to connect to each service that is configured in the site.

Starting in Essentials 3.14, you can configure a site (including its services) when its services are unavailable, provided the site has been initialized and cached at least once. (In Essentials 3.13 and earlier versions, site initialization failed if a service was unavailable, regardless of whether cached information about the service was available. This prevented you from configuring a site when one or more of its services was unavailable.)

To determine whether a service was available when a site was initialized, compare the Site Loaded time in the REST API Sites Directory to the Service Loaded time—if the two times are the same, the service was available when the site was initialized. (You can also get the Site Loaded time from the Site Summary in the Site List.)

In the following screen capture, the Charlotte map service last loaded at 2:25 and the site loaded over an hour later, at 3:37. This indicates that the map service was not available the last time the site loaded, so Essentials used cached information about the map service.
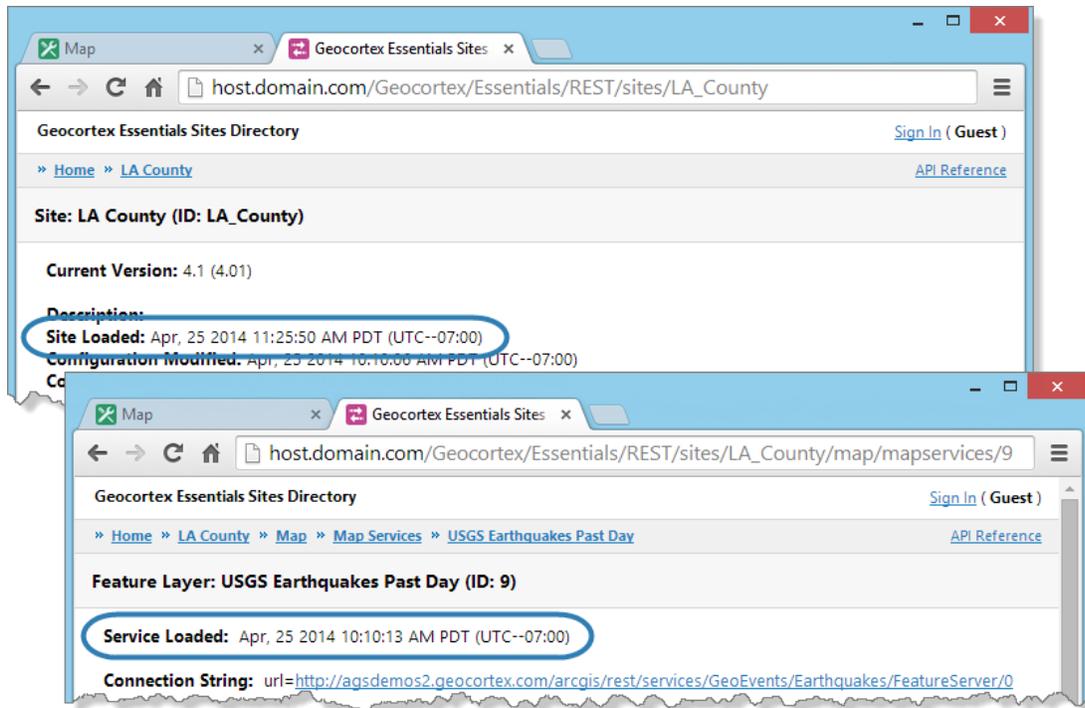
The map service was not available when the site was last loaded

For instructions on opening the REST API Sites Directory, see **REST API Sites Directory** on page **1**.

Caching

After a site is initialized, Essentials writes the site to disk ("caches" the site). Essentials uses (copies of) cached sites to fulfill site requests. This improves performance, because a site does not have to be converted from XML and initialized every time an application requests the site. The copies of cached sites that are served are kept in memory, which also improves performance.

Sites are cached in a file called `SiteCache.xml`. The information for a particular site is added to the file the first time the site is loaded.

Essentials creates or updates `SiteCache.xml` as needed during the load sequence, specifically:

- If the site is missing from the cache because the site is new and has not yet been cached, or the `SiteCache.xml` file has been moved or deleted.

- If the `Site.xml` file has been modified since the site was cached.

- If one or more Essentials assemblies (.dll files) have been modified. Assemblies are modified when you upgrade Essentials.
  Because the site cache is tied to a particular version of Essentials, the cache will be recreated after you upgrade.

Site caching is built into Essentials—you cannot disable it.

You can force Essentials to refresh a site's cache. There are several ways to do this:

- Edit the site in Manager, make a change to the site, and then save the site.
  Changing the site's description on the Site Info page is an easy change to make that does not affect the content or behavior of the site.

- Edit the `Site.xml` file in a text editor and save it.
- Click the Reload Site icon ♻ in the Site List.
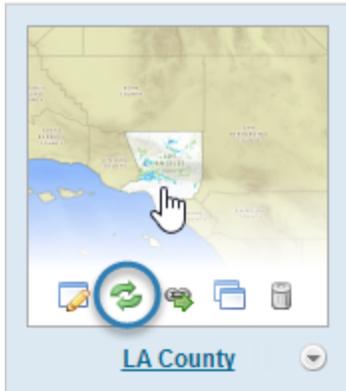
Location of Reload Site icon

> **NOTE** Before Essentials 3.5, the Sites folder contained `Site.cache` files, and the `web.config` file had a `CacheSitesToDisk` setting. These are no longer supported.

6 The Map

The map is configured on Manager's Map page. When you create an empty site, the Map page is initially empty. The map is created automatically when you add the first service.
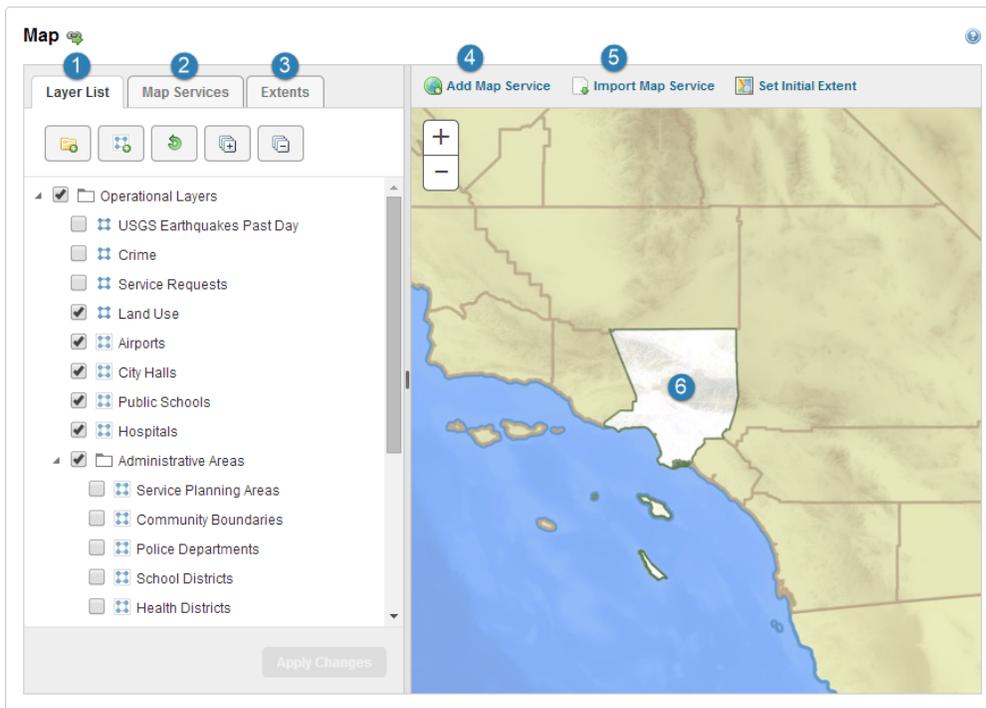
Manager's Map page, with the main parts numbered

The main parts of the Map page are:

① **Layer List Tab -** The Layer List tab is used to configure the Layer List that appears in viewers. You can specify which services and layers you want to appear in the Layer List, reorder them, and organize them into folders. In addition, the Layer List tab gives you access to some common settings, and allows you to batch edit the settings for multiple layers at one time.

② **Map Services Tab -** The Map Services tab lists all the services that you have added to the map, and their layers. You can reorder the services on the Map Services tab. The order of the services determines the drawing order and the map's spatial reference. In addition, the Map Services tab gives you access to some common settings, and allows you to batch edit the settings for multiple layers at one time.

③ **Extents Tab -** The Extents tab is used to set the map's initial extent and full extent, and to configure bookmarks.

④ **Add Map Service -** The Add Map Service function allows you to add map services and layers to the map, and to create and manage service connections.

⑤ **Import Map Service -** The Import Map Service function allows you to import map services and layers to the map from other sites where they are already configured.

⑥ **Map Preview -** The map preview shows a preview of what the map will look like in viewers. The preview is live—if you add or remove services from the map, or you change the visibility of layers, your changes appear immediately in the preview.

6.1 About the Map's Spatial Reference

The bottom-most service listed on the Map page's Map Services tab is the **primary service**. The primary service determines the map's spatial reference. If you move a service with a different spatial reference to the bottom of the Map Services list, the map's spatial reference changes.
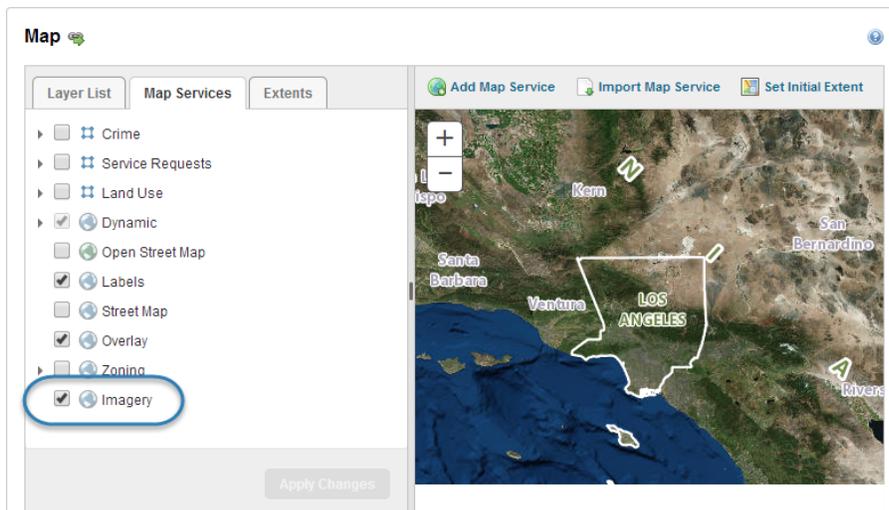
The primary service

Each service in the map must be compatible with the primary service. For a service to be compatible, either the service has the same spatial reference as the primary service, or the service can be reprojected to the primary service's spatial reference. Essentials automatically reprojects services to the primary service's spatial reference when necessary. This ensures that all the services in the map display in the same spatial reference.

Manager will warn you if you add a service that cannot be reprojected to the primary service's spatial reference. If you save the site when it contains a service that is not compatible with the primary service, the incompatible service will not show on the map.

Because tiled services cannot be reprojected, tiled services are often placed at the bottom of the list on the Map Services tab. To move a service to a different position in the list, drag the service and drop it in its new position.

In addition to determining the map's spatial reference, the primary service's full extent and initial extent are used as the default for the map's full extent and initial extent. For instructions on overriding the default extents, see **Set the Map's Initial Extent** on page **71** and **Set the Map's Full Extent** on page **69**.

To find out the map's spatial reference using Manager:

There are several ways to find out the map's spatial reference using Manager.

Method 1: Edit the Primary Service

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.

2. Position the pointer over the primary service.
   The management tools show.

3. Click the **Edit** tool .
   The spatial reference is shown on the Details tab.

Method 2: Edit an Extent or Bookmark

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.

2. Position the pointer over **Initial Extent**, or **Full Extent**, or a bookmark.
   The management tools show.

3. Click the **Edit** tool .
   The spatial reference is shown in the dialog box that opens.

Method 3: Look in the REST API Sites Directory

1. In Manager, edit the site that you want to configure, and then click **Map** in the side panel.

2. Click the **View REST Endpoint** tool beside **Map**.
   The spatial reference is labelled **Coordinate System**.

To change the primary service:

If you change the primary service to a service with a different spatial reference, you will have to reconfigure the map's initial extent and full extent, and any bookmarks that you have configured.

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.

2. Click and hold the service that you want to be the primary service.

3. Drag the service to the bottom of the list.
   A guideline shows where the service can be placed.

4. Release the mouse button.
   The service is moved to the position where you dropped it.

5. Click **Apply Changes**.

6. Click **Save Site**.

6.2 Set the Map's Full Extent

The **full extent** is the extent that displays when an end user clicks a Full Extent tool in a viewer.

By default, the map's full extent is the full extent of the primary service. You can change the full extent to show the part of the map that you want end users to see when they zoom to the full extent.

> Setting the full extent to a subset of the primary service's full extent does not limit end users to working in that area—users can pan the map beyond the full extent that you configure, search and query operations can return results from outside the full extent, and so on.

There are two approaches to configuring the map's full extent:

- Navigate the map preview to the desired extent.
- Enter the coordinates of the desired extent.

You can also reset the full extent to the default value.

Manager's Map page has an Extents tab where you configure the full extent.

▶ **To zoom the map preview to the full extent:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.

2. Click **Full Extent**.
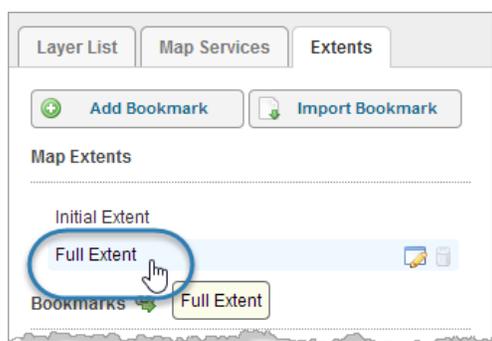
Zoom the map preview to the full extent

▶ **To set the map's full extent using the map preview:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.

2. Pan and zoom the map preview to show the extent that you want to use as the full extent.

3. On the **Extents** tab, position the pointer over **Full Extent**. The management tools show.

4. Click the **Edit** icon 🖉.

5. Click **Use Current View**.

6. Click **OK**.

7. Click **Apply Changes**.

8. Click **Save Site**.

▶ **To set the map's full extent to the extent of a map service or layer:**

This is a variation of using the map preview to configure the full extent.

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.

2. Click the down arrow ⊙ beside the map service or layer whose extent you want to use.

3. To use the initial extent, click **Zoom to Initial Extent**. To use the full extent, click **Zoom to Full Extent**. The map preview zooms to the extent.

Zoom to an extent that is defined in the map service

4. Click the **Extents** tab.

5. Position the pointer over **Full Extent**. The management tools show.

6. Click the **Edit** icon 🖉.

7. Click **Use Current View**.

8. Click **OK**.

9. Click **Apply Changes**.

10. Click **Save Site**.

▶ **To set the map's full extent using coordinates:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.

2. Position the pointer over **Full Extent**.
    The management tools show.

3. Click the **Edit** icon 🖉.

4. Edit each coordinate that you want to change. To change a coordinate, click in the box and edit the value.
    The coordinates that you enter must be in the same spatial reference as the map.

    💡 You can edit all four coordinates at one time using copy and paste (Ctrl-C and Ctrl-V). Copy them as a comma-delimited list, for example, **-80, -160, 80, 160**. Paste them into any one of the boxes. Manager will sort them into the correct boxes.

5. Click **OK**.

6. On the **Extents** tab, click **Full Extent**.
    The map preview updates to show the full extent, so you can verify it.

7. Click **Apply Changes**.

8. Click **Save Site**.

▶ **To reset the map's full extent to the default:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.

2. Position the pointer over **Full Extent**.
    The management tools show.

3. Click the **Edit** icon 🖉.

4. Click **Reset Default**.

5. Click **OK**.

6. On the **Extents** tab, click **Full Extent**.
    The map preview updates to show the default full extent.

7. Click **Apply Changes**.

8. Click **Save Site**.

6.3 Set the Map's Initial Extent

The **initial extent** is the extent that shows when the map first loads in a viewer. It is the first view of the map that end users see.

By default, the map's initial extent is the initial extent of the [primary map service](#). You can change the initial extent to show the part of the map that you want end users to see when the map loads.

The initial extent is configured on Manager's Map page. There are two approaches to configuring the initial extent:

- Navigate the map preview to the desired extent.
- Enter the coordinates of the desired extent.

You can also [reset the initial extent](#) to the default value.

> **NOTE** There are other ways to set the extent when the viewer loads, for example, by running a startup workflow that sets the extent, or by using the `extent` URL parameter. Using multiple methods of setting the extent may lead to unexpected results.

To zoom the map preview to the initial extent:

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.
2. Click **Initial Extent**.
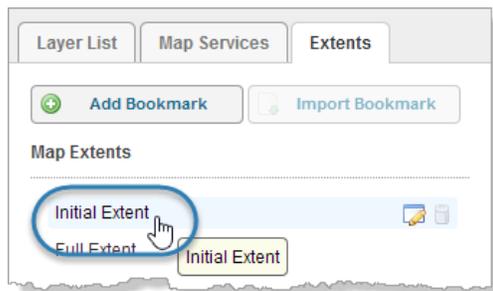
Zoom the map preview to the initial extent

To set the map's initial extent using the map preview:

This procedure explains how to set the initial extent using the **Set Initial Extent** function on the Map page. You can also set the initial extent by editing the initial extent and clicking **Use Current View**.

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.
2. Pan and zoom the map preview to show the extent that you want to use as the initial extent.
3. Click **Set Initial Extent**.
4. Click **Save Site**.

To set the map's initial extent to the extent of a map service or layer:

This is a variation of using the map preview to configure the initial extent.

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.
2. Click the down arrow beside the map service or layer whose extent you want to use.

3. To use the initial extent, click **Zoom to Initial Extent**. To use the full extent, click **Zoom to Full Extent**. The map preview zooms to the extent.

> Some layers do not have an initial extent. In this case, there is no Zoom to Initial Extent option.

Zoom to an extent that is defined in the map service

4. Click the **Extents** tab.

5. Position the pointer over **Initial Extent**.
   The management tools show.

6. Click the **Edit** icon .

7. Click **Use Current View**.

8. Click **OK**.

9. Click **Apply Changes**.

10. Click **Save Site**.

▶ **To set the map's initial extent using coordinates:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.

2. Position the pointer over **Initial Extent**.
   The management tools show.

3. Click the **Edit** icon .

4. Edit each coordinate that you want to change. To change a coordinate, click in the box and edit the value.
   The coordinates that you enter must be in the same spatial reference as the map.

> You can edit all four coordinates at one time using copy and paste (Ctrl-C and Ctrl-V). Copy them as a comma-delimited list, for example, **-80, -160, 80, 160**. Paste them into any one of the boxes. Manager will sort them into the correct boxes.

5. Click **OK**.

6. On the **Extents** tab, click **Initial Extent**.

The map preview updates to show the initial extent, so you can verify it.

7. Click **Apply Changes**.

8. Click **Save Site**.

▶ **To reset the map's initial extent to the default:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.

2. Position the pointer over **Initial Extent**.
    The management tools show.

3. Click the **Edit** icon .

4. Click **Reset Default**.

5. Click **OK**.

6. On the **Extents** tab, click **Initial Extent**.
    The map preview updates to show the default initial extent.

7. Click **Apply Changes**.

8. Click **Save Site**.

6.4 Create Bookmarks

Bookmarks used to be called **named extents** in Essentials.

A bookmark is a shortcut that enables end users to jump the map to a particular map extent.

For example, you could configure a bookmark named **Downtown** that encompasses the city center. When an end user selects the Downtown bookmark, the map automatically pans and zooms to the extent of Downtown.

If there are particular bookmarks that you want to make available to end users, you can configure them in Manager. This saves the bookmarks in the site configuration so that all users have access to them. In addition, end users can create their own bookmarks.

The HTML5 Viewer and Silverlight Viewer both support the Bookmarks feature. If you want a particular viewer to support bookmarks, you must make the Bookmarks tool or map widget available in the viewer.

The steps to configure bookmarks are:

- **Create Bookmarks in Manager:** See **Add or Import a Bookmark** on page **75**.

- **Configure Bookmarks in an HTML5 Viewer:** See **Configure Map Widgets for an HTML5 Viewer** on page **309** for instructions. For more information, refer to the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

- **Configure Bookmarks in a Silverlight Viewer:** Add the Advanced Controls Region to the viewer's toolbar. See **Configure the Toolbar for a Silverlight Viewer** on page **357** for instructions. For more information, refer to the *Geocortex Viewer for Silverlight Administrator and Developer Guide*.

6.4.1 Add or Import a Bookmark

You can either add a new bookmark, or import bookmarks that are already configured in another site. There are two approaches to adding new bookmarks:

- Navigate the map preview to the desired extent.
- Enter the coordinates of the desired extent.

Manager's Map page has an Extents tab where you configure bookmarks. To zoom the map preview to a bookmark, click the bookmark on the **Extents** tab.
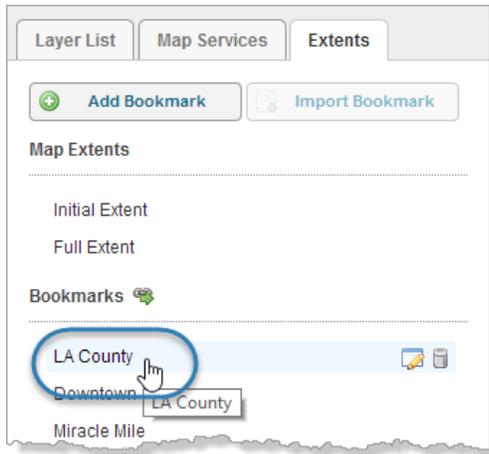
Zoom the map preview to the LA County bookmark

▶ **To add a bookmark using the map preview:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.

2. Pan and zoom the map preview to show the extent that you want to add a bookmark for.

3. Click **Add Bookmark**.
   A new bookmark appears at the bottom of the list on the Extents tab. The new bookmark has the same extent as the map preview.

4. Type a name for the bookmark and press **Enter**.
   Bookmark names can contain spaces and special characters.

5. Click **Apply Changes**.

6. Click **Save Site**.

▶ **To add a bookmark using coordinates:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.

2. Click **Add Bookmark**.
   A new bookmark appears at the bottom of the list on the Extents tab.

3. Type a name for the bookmark and press **Enter**.

Bookmark names can contain spaces and special characters.

4. Click the **Edit** icon beside the new bookmark.

5. Edit each coordinate that you want to change. To change a coordinate, click in the box and edit the value.

    > The coordinates that you enter must be in the same spatial reference as the map.

    > You can edit all four coordinates at one time using copy and paste (Ctrl-C and Ctrl-V). Copy them as a comma-delimited list, for example, **-80, -160, 80, 160**. Paste them into any one of the boxes. Manager will sort them into the correct boxes.

6. Click **OK**.

7. On the **Extents** tab, click the new bookmark.
    The map preview updates to show the bookmark, so you can verify it.

8. Click **Apply Changes**.

9. Click **Save Site**.

▶ **To import bookmarks:**

> For an imported bookmark to work, it must be in the same spatial reference as the map.

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab..

2. Click **Import Bookmark**.
    If the Import Bookmark button is grayed out, click Apply Changes to make the button available.

3. Select the site where the bookmarks are configured, and then click **Next**.

4. Select the bookmarks that you want to import.
    To select multiple bookmarks, hold the Ctrl key down while selecting.

5. Click **Finish**.
    The bookmarks are added to the bottom of the list on the Extents tab.

6. Click **Save Site**.

6.4.2 Change a Bookmark

▶ **To change a bookmark's display name:**

This procedure explains how to change the bookmark's display name by editing the bookmark.

> You can also change a bookmark's display name by double-clicking the bookmark on the Extents tab.

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.

2. Position the pointer over the bookmark.
   The management tools show.

3. Click the **Edit** tool .

4. Click in the **Display Name** box and edit the name.

5. Click **OK**.

6. Click **Apply Changes**.

7. Click **Save Site**.

▶ **To change a bookmark's extent using the map preview:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.

2. Pan and zoom the map preview to show the extent that you want to use.

3. On the **Extents** tab, position the pointer over the bookmark.
   The management tools show.

4. Click the **Edit** tool .

5. Click **Use Current View**.

6. Click **OK**.

7. Click **Apply Changes**.

8. Click **Save Site**.

▶ **To change a bookmark's extent using coordinates:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.

2. Position the pointer over the bookmark.
   The management tools show.

3. Click the **Edit** icon .

4. Edit each coordinate that you want to change. To change a coordinate, click in the box and edit the value.

   The coordinates that you enter must be in the same spatial reference as the map.

   You can edit all four coordinates at one time using copy and paste (Ctrl-C and Ctrl-V). Copy them as a comma-delimited list, for example, **-80, -160, 80, 160**. Paste them into any one of the boxes. Manager will sort them into the correct boxes.

5. Click **OK**.

6. On the **Extents** tab, click the bookmark.
   The map preview updates to show the bookmark, so you can verify it.

7. Click **Apply Changes**.

8. Click **Save Site**.

6.4.3 Remove a Bookmark

▶ **To remove a bookmark:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.

2. Position the pointer over the bookmark that you want to remove.
   The management tools show.

3. Click the **Remove** tool 🗑.

4. You are prompted to confirm.

5. Click **OK**.

6.4.4 Reorder the List of Bookmarks

Bookmarks appear in the viewer in the same order that they appear on the Map page's Extents tab. You can change the list of bookmarks so they appear in a sensible order. For example, you could order the list with the bookmarks that you expect to be used the most at the top of the list. If the list is long, this saves the end user having to scroll the list.

▶ **To change the order of the list of bookmarks:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.

2. Click and hold a bookmark that you want to move to a different position in the list.

3. Drag the bookmark to the desired position.
   A guideline shows where the bookmark can be placed.

4. Release the mouse button.

5. Continue to move bookmarks until the list is sorted the way that you want it.

6. Click **Apply Changes**.

7. Click **Save Site**.

6.5 Change the Map's Drawing Order

The map's drawing order is determined by the order of the services listed on the Map page's Map Services tab. When a service lies on top of other services, the upper service's layers may obscure the layers in the services underneath it.

You can also change the drawing order of dynamic layers.

▶ **To change the map's drawing order:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.

2. Click the ▸ icon beside each service to hide their layers.
   This makes it easier to see the list of services.

3. Click and hold a service you want to move in the list.

4. Drag the service to the desired position in the list.
   A guideline shows where the service can be placed.

5. Release the mouse button.
   The service is moved to the position where you dropped it.

6. Continue dragging and dropping services until the list is sorted the way you want it.

7. Click **Apply Changes**.

6.6 Configure Map Tips

Map tips are pop-up windows that appear on the map when the user clicks on the map. If there are spatial features where the user clicked, the map tip contains information about the features. The features can belong to the same layer, or different layers.

Map tips can appear at a fixed location on the map (fixed-location map tips), or at the location where the user clicked (callout-style map tips). Fixed-location map tips appear in the top right corner of the map by default. The map tip's currently selected feature is either marked with a pushpin 📍 or highlighted on the map, depending on the feature's geometry. In the screen capture below, the feature is marked with a pushpin because it is a point.
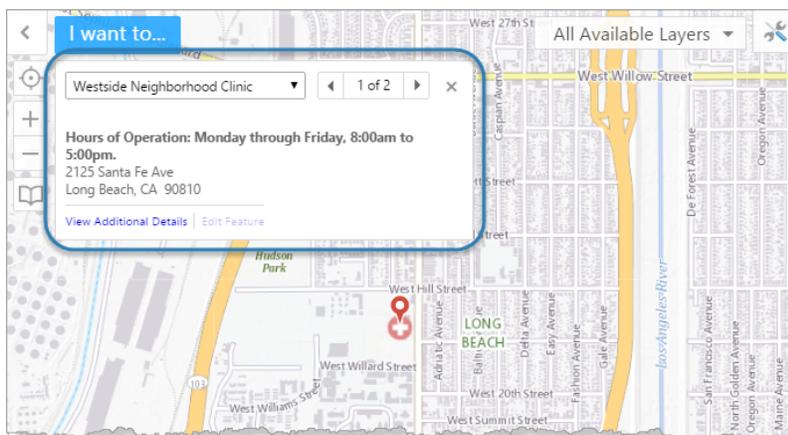
Example of a fixed-location map tip for a point feature, shown in an HTML5 viewer

Callout-style map tips point to where the user clicked.
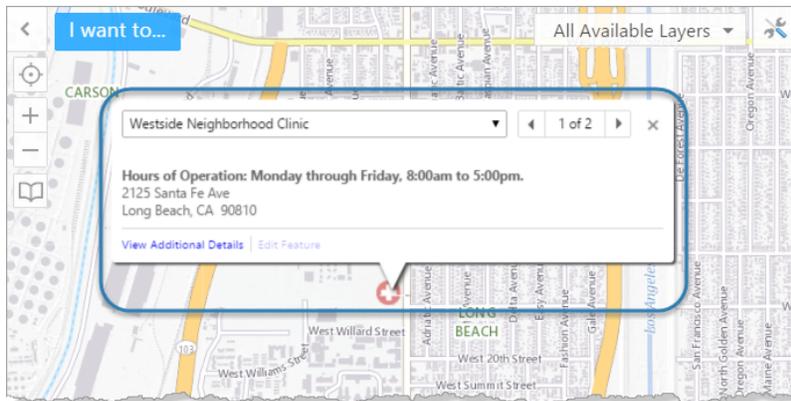
Example of a callout-style map tip shown in an HTML5 viewer

NOTE The HTML5 Viewer and Silverlight Viewer both support map tips. The HTML5 Viewer uses fixed-location map tips by default. You can configure HTML5 viewers to use callout-style map tips instead of fixed-location map tips. The Silverlight Viewer does not support fixed-location map tips.

Map tips have three parts—the header, main content, and footer.

Parts of a map tip
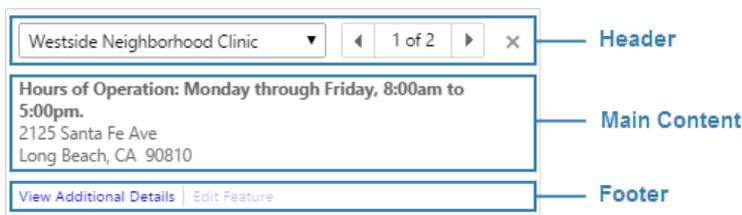
Header - The header contains the Feature Label, as well as components that allow the user to browse the features when more than one result is returned.

Main Content - The main content area contains the Feature Description or Feature Long Description.

Footer - The footer contains hyperlinks to related information and tasks.

The main steps to configure map tips for a layer are:

1. Enable map tips for the layer.
   The layer must belong to a dynamic map service.
   Follow the instructions given below to enable map tips.

   NOTE For performance reasons, map tips are disabled by default for most types of map service. KML and GeoRSS layers are exceptions—map tips are always enabled for GeoRSS and KML layers.

2. Configure the header and main content that you want to show in the layer's map tips.
   For information, see **About Feature Descriptions** on page **171**.

3. Configure map tips in each of the site's viewers:

   - **HTML5 Viewer:** For instructions, see "MapTips Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

   - **Silverlight Viewer:** For map tips to work in a Silverlight viewer, you must turn on the viewer's Map Tips Enabled setting. You can configure Map Tips Enabled and some other map tip settings in Manager. For instructions, see **Configure a Silverlight Viewer's Map Widgets** on page **376**. To see the full list of map tip

settings, refer to "Map Tips Module" in the *Geocortex Viewer for Silverlight Administrator and Developer Guide*.

> You cannot configure the footer in Silverlight viewers—the footer's content is preconfigured in the Silverlight Viewer.

▶ To enable map tips for a layer:

> Map tips are always enabled for KML and GeoRSS layers. You cannot disable map tips for KML and GeoRSS layers.

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.

   > If the layer is in the Layer List, you can also enable map tips on the Layer List tab.

2. Position the pointer over the layer.
   The management tools show.

3. Click the down arrow .

4. Select the **Show Map Tips** check box.

5. Click **Apply Changes**.
   Map tips are enabled for the layer.

▶ To enable map tips for all of a map service's layers at one time:

> ⚠ Batch editing overwrites the existing configuration for every layer in the folder or service. The only way to restore the previous configuration after you click Apply Changes is to individually reconfigure each setting in each layer.

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.

   > If the map service is in the Layer List, you can also enable map tips using the map service's folder on the Layer List tab.

2. Position the pointer over the map service whose layers you want to configure.
   The management tools show.

3. Click the down arrow .

4. Select the **Show Map Tips** check box.

5. Click **Apply Changes**.
   Map tips are enabled for all the layers in the map service.

_{6.7} Configure Map Export

The Map Export feature allows end users to export the current map image to a file. End users can select the file format to export to—BMP, JPEG, PNG, TIFF, GeoTIFF, or PDF.

If you want, you can allow end users to export georeference data with BMP, JPEG, PNG, and TIFF images. GeoTIFF images always includes georeference data. Essentials does not support the export of georeference data with PDFs.

The HTML5 Viewer and Silverlight Viewer both support Map Export. Both viewer frameworks have an Export tool which is included in the default toolbar. You can also create menu items, hyperlinks, or workflows that export the map image using the `ShowExportMapDialog` command.

Map Export Settings

The Map Export feature has the following settings:

- **Allow Including Georeference Data:** When this check box is selected, the user has the option to include georeference data with the exported map image. Exporting georeference data allows the exported image to be accurately positioned in GIS applications.

  If you do not want the user to be able to export georeference data with the map image, clear the Allow Including Georeference Data check box.

  > iOS does not support ZIP files. To use Export features that produce ZIP files in iOS, you must install third-party software to handle ZIP files, such as iZip.

- **Default Map Output Format:** The file format that is initially selected when the user requests a map export. Users can change the file format. After a user has changed the output file format once, the viewer remembers the user's preference.

The HTML5 Viewer and Silverlight Viewer both have the settings listed above. However, the export settings are configured in different places in Manager. In a site that has both HTML5 and Silverlight viewers, you must configure the export settings separately for the two types of viewer.

▶ **To configure map export settings for HTML5 viewers:**

1. In Manager, edit the site that you want to configure, click **GIS Services** in the side panel, and then click the **Export** tab.

2. Configure the settings.

3. Click **Apply Changes**.
   Your configuration applies to all of the HTML5 viewers in the site.

▶ **To configure map export settings for a Silverlight viewer:**

1. In Manager, edit the viewer that you want to configure.

2. Click **Tool Behavior** in the side panel.

3. In the **Export** area, configure the settings.

4. Click **Apply Changes**.

   Your configuration applies only to the one Silverlight viewer.

6.8 Base Maps

Base maps provide background and context in support of a map's operational layers. They help to orient users. Aerial imagery, terrain layers, and street maps are often used as base maps.

In Essentials, a base map can contain multiple map services. When a user selects a base map in an HTML5 viewer's Base Map Switcher, the map services in that base map turn on and the map services in the other base maps turn off.

> **NOTE** The HTML5 Viewer supports base maps with multiple map services. Silverlight viewers present each base map service as a separate base map.

In addition to individual map services, a base map can contain one sub-group of map services called a **transparency slider group**. Transparency slider groups present their map services in a slider that the user can drag to fade out one map service and fade in the next map service.

> **NOTE** The HTML5 Viewer supports transparency slider groups. The Silverlight Viewer does not support transparency slider groups—Silverlight viewers present the map services in a transparency slider group as separate base maps.

Base maps are configured on Manager's Base Maps page. You can configure as many base maps as you want, and a base map can contain as many map services as you want. Each base map can contain at most one transparency slider group. A map service can belong to more than one base map.

Starting in Essentials 4.4, to make a map service function as a base map, you include the map service in at least one base map on Manager's Base Maps page. Map services that are not included in a base map are operational. (Before Essentials 4.4, you set the map service's Function setting either to Base Map or Operational.)

> **NOTE** ArcGIS Server feature layers, KML layers, and GeoRSS layers cannot be used in base maps in Essentials.

6.8.1 Base Map Switcher

> **NOTE** The Base Map Switcher is the HTML5 Viewer's base map control. For information about the Silverlight Viewer's base map control, see "Basemap Module" in the *Geocortex Viewer for Silverlight Administrator and Developer Guide*.

The Base Map Switcher provides a quick way for users to select a base map to make visible. Selecting a base map turns on the base map's map services and turns off all other base map services.

When the Base Map Switcher is closed, it shows the currently selected base map. The user clicks or taps the Base Map Switcher to open the Switcher and select a different base map. In the screen capture below, the **Streets** base map is selected.

Example of the Base Map Switcher in an HTML5 viewer, closed (left) and open (right)

By default, the Base Map Switcher shows in the viewer whenever two or more (non-empty) base maps are configured in the site. You can configure the Base Map Switcher to show when a single base map is configured. For information, see "Basemap Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

Interaction Between the Base Map Switcher and the Layer List

If you include base map services in the Layer List, then there are two ways for users to change the visibility of base map services—by changing the visibility check boxes in the Layer List, or by selecting a base map in the Base Map Switcher.

The Layer List and Base Map Switcher are synchronized. When a user selects a base map in the Base Map Switcher, the base map's map services turn on in the Layer List and the other base map services turn off in the Layer List. Conversely, if the user uses the Layer List to turn on exactly those map services that make up a particular base map (and turn off all other base map services), then the Base Map Switcher updates to show the base map that the user turned on in the Layer List.

Any combination of visibilities that do not turn on exactly one base map (for example, turning on map services from different base maps, or turning on a subset of a base map's map services) results in the Base Map Switcher displaying the default Base Maps icon. The default icon indicates that no single base map is currently selected. Note that, to show a transparency slider, you must turn on exactly one of the map services in the slider group—the slider does not show when more than one of its map services are turned on in the Layer List.
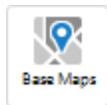
Default icon shown in the Base Map Switcher

Interaction Between the Base Map Switcher and Layer Themes

The particular base maps that appear in the Base Map Switcher depend on the [layer theme](#) that is selected. If the built-in **All Available Layers** layer theme is selected, then the Switcher shows all the (non-empty) base maps that are configured in the site. When a user selects a base map in the Switcher, all of the map services in that base map turn on, and all of the map services in all of the other base maps turn off.

When the user changes the layer theme, the base maps that are available in the new layer theme are loaded into the Base Map Switcher, replacing the base maps from the previous layer theme. A base map is available in a layer theme if one or more of its map services is included in the layer theme.

If all of a base map's map services are excluded from a layer theme, then the base map does not show in the Base Map Switcher.

6.8.2 Transparency Slider Groups

> The HTML5 Viewer supports transparency slider groups. The Silverlight Viewer does not support transparency slider groups—Silverlight viewers present the map services in a transparency slider group as separate base maps.

Base maps can contain **transparency slider groups**—groups of related map services whose relative transparency is controlled by a slider. Dragging the slider fades out one map service (increases the transparency) and simultaneously fades in the next map service (decreases the transparency). This provides a smooth transition from one map service to the next.

For example, suppose you have aerial photographs of your town that were taken every two years between 2005 and 2011. You publish the aerial photographs in four map services called **2005**, **2007**, **2009**, and **2011**. In Essentials, you put the four map services in a transparency slider group and add the slider group to a base map. When an end user selects the base map that contains the slider group, the slider opens.

Example of a transparency slider in an HTML5 viewer

In the screen capture, the **2009** map service is currently visible. If the user drags the slider to the right, 2009 starts to fade out and 2011 starts to fade in. 2011 becomes fully visible (0% transparency) at the same time that 2009's transparency reaches 100%. At this point, 2009's visibility check box is cleared.

Transparency sliders have very little space to display the map service's names. For this reason, only the names of the first and last map service show in the slider. If you configure a map service's Short Display Name, the short name is used in transparency sliders.

> **NOTE** If a slider group's map services are in a folder and you set the visibility behavior to **Only One Visible at a Time**, the slider will snap from one map service to the next instead of transitioning smoothly.

6.8.3 Configure Base Maps

> **To add a base map:**

1. In Manager, edit the site that you want to configure, and then click **Base Maps** in the side panel.

2. Click **Add Base Map**.

3. In the **Map Services** area, select the check box for each map service that you want to include in the base map. You can also include one transparency slider group, if you have configured one.

4. In the **Display Name** box, type a name for the base map.
   In HTML5 viewers, the display name appears in the Base Map Switcher, so keep the name short.

5. In the **Icon URI** box, type or paste the URI for the icon that will represent the base map in the Base Map Switcher.

6. Click **OK**.

7. Click **Apply Changes**.

8. Click **Save Site**.

> **To edit a base map:**

1. In Manager, edit the site that you want to configure, and then click **Base Maps** in the side panel.

2. In the list of base maps, click the base map that you want to edit, or hover the pointer over the base map. The management tools show.

3. Click the **Edit** tool.

4. Edit the settings as desired:

    - **Map Services:** Indicates which items are included in the base map. A base map can include any number of map services and at most one transparency slider group. To add an item to the base map, select the item's check box. To exclude an item, clear the item's check box.

       The Map Services area lists every map service that can be used in a base map. ArcGIS Server feature layers, KML layers, and GeoRSS layers cannot be used in base maps.

    - **Display Name:** The name that is used to refer to the base map in viewers. In HTML5 viewers, the display name appears in the Base Map Switcher, so a short name is recommended.

    - **Icon URI:** The URI for the icon that will represent the base map in an HTML5 viewer's Base Map Switcher.

5. Click **OK**.

6. Click **Apply Changes**.

7. Click **Save Site**.

▶ **To create a base map when you add a map service:**

This procedure adds a map service to the map and creates a base map that contains the map service.

1. In Manager, edit the site that you want to configure, and then click **Map** in the side panel.

2. Click **Add Map Service**.

3. Search or browse for the map service that you want to add.

4. Select the **Add as Base Map** check box.

    The Add as Base Map check box appears when you have located the map service that you want to add.

5. Add the map service.

6. Click **Apply Changes**.

7. Click **Save Site**.

▶ **To configure a default base map:**

If each map service in a particular base map is turned on by default, and all other base map services are turned off by default, then the base map is selected in the Base Map Switcher when the viewer launches. You can use this fact to configure a default base map. For example, the following screen capture shows how to configure the default visibility to make Base Map 1 the default.
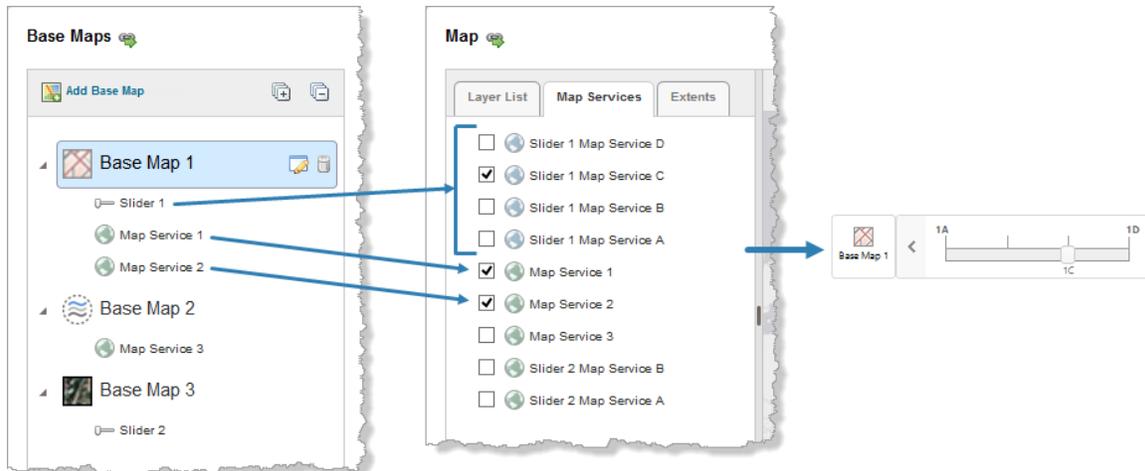
Configuration to make Base Map 1 the default (left and middle), and the initial view of the Base Map Picker in the viewer (right)

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.

2. Clear the visibility check box for each map service that is not in the default base map.

3. Select the visibility check box for each map service that is in the default base map, but is not in a transparency slider group.

   If the default base map contains a transparency slider group, select the visibility for exactly one of the map services in the slider group. The map service that you select is the slider's default.

4. Click **OK**.

5. Click **Apply Changes**.

6. Click **Save Site**.

▶ **To re-order base maps:**

The HTML5 Viewer supports the base map ordering described below. The Silverlight Viewer's base map control does not use the ordering on Manager's Base Maps page.

The order that base maps appear on Manager's Base Maps page determines the order that they appear in the Base Map Switcher. Top-to-bottom order in Manager corresponds to left-to-right order in the Base Map Switcher.
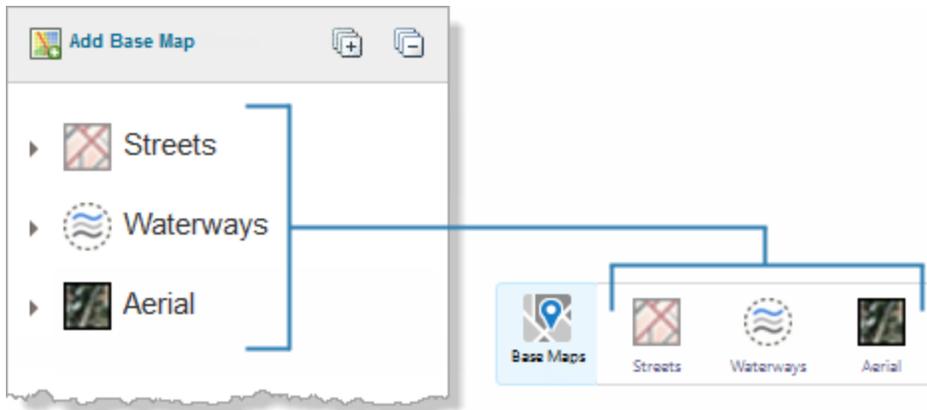
Base maps in Manager (left) and their order in the Base Map Switcher (right)

1. In Manager, edit the site that you want to configure, and then click **Base Maps** in the side panel.

2. Click the **Collapse All** tool at the top of the list of base maps.

3. Click the base map that you want to appear left-most in the Base Map Switcher and drag it to the top of the list. As you drag the base map, a marker shows you where the base map will be placed when you release the mouse button.

4. Continue dragging base maps until they are ordered the way you want.
   Top-to-bottom in Manager appears left-to-right in the Base Map Switcher.

5. Click **Apply Changes**.

6. Click **Save Site**.

▶ **To remove a base map:**

1. In Manager, edit the site that you want to configure, and then click **Base Maps** in the side panel.

2. In the list of base maps, click the base map that you want to remove, or hover the pointer over the base map. The management tools show.

3. Click the **Remove** tool.

4. Click **OK** to confirm.

5. Click **Apply Changes**.

6. Click **Save Site**.

▶ **To configure a base map transparency slider group:**

1. Edit each map service that you want to include in the slider group:
   a. On the map service's Functional tab, set the **Base Map Transparency Slider Group** setting to the name of the slider group.
      To create a new slider group, type in the name. To select an existing group, click in the Base Map

Transparency Slider Group box and select the group from the drop-down list.

    b. On the map service's Details tab, enter a **Short Display Name** for the map service (recommended). The short display name is used in the transparency slider.

2. Change the map's drawing order so that the map services are in reverse order on the Map Services tab. Reading down the Map Services tab, the slider group's map services are in right-to-left order.
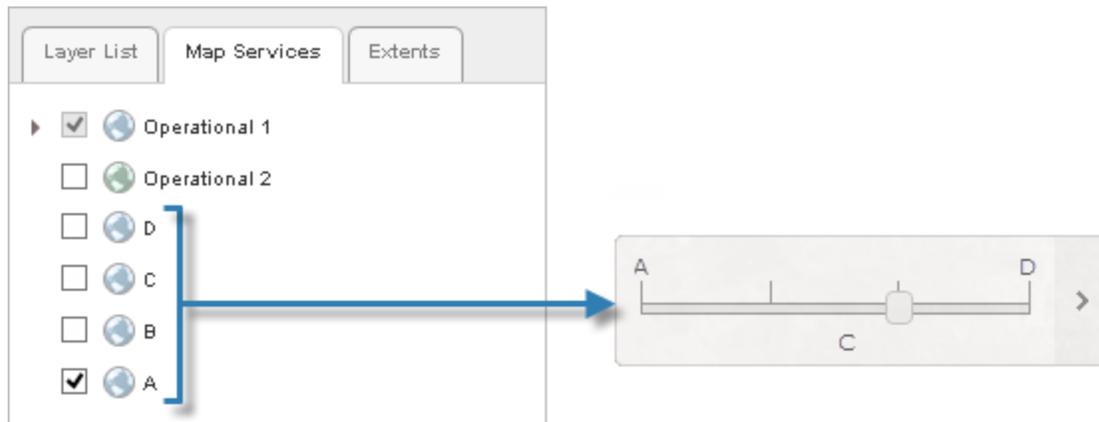
Drawing order for the map services in a transparency slider group

3. Add the slider group to a base map.

4. Save the site.

▶ **To remove a base map transparency slider group:**

When you remove all the map services from a base map transparency slider group, the transparency group no longer exists in the site.

1. In Manager, edit one of the map services that belong to the transparency slider group, and then click the **Functional** tab.

2. Click in the **Base Map Transparency Slider Group** box and delete the name of the slider group.

3. Click **Apply Settings**.

4. Repeat the above steps for each map service that is in the slider group.

5. Click **Save Site**.

7 Portal for ArcGIS

You can add services and web maps that are hosted in an ArcGIS portal to Essentials sites. Essentials supports:

- **Public Portal for ArcGIS Content:** Web maps and services that are hosted in your Portal for ArcGIS portal and are shared with **Everyone (public)**.

- **Private Portal for ArcGIS Content:** Web maps and services that are hosted in your Portal for ArcGIS portal and are not shared with **Everyone (public)**.

In order to add private Portal for ArcGIS content, you must configure the Portal for ArcGIS sign-in method in the Post Installer. For more information, see "Choose a Method to Sign In to Manager" in the *Geocortex Essentials Installation Guide*.

See also...

Add a Map Service to the Map on page **98**

Add a Reference to an ArcGIS Web Map on page **167**

7.1 About Portal for ArcGIS Web Maps

Portal for ArcGIS web maps are web-based maps that you create in Portal for ArcGIS.

> In Essentials, Web maps created in Portal for ArcGIS behave the same as web maps created in ArcGIS Online—they are added the same way, the inheritance works the same, and so on. When you understand how one works, you also understand how the other works.

You can add Portal for ArcGIS web maps to your Essentials sites.

> To add a private Portal for ArcGIS web map, or a web map that contains one or more private services, Essentials must be registered with Portal for ArcGIS. For instructions, see "Choose a Method to Sign In to Manager" in the *Geocortex Essentials Installation Guide*.

To add a Portal for ArcGIS web map to a site, you configure a reference to the web map. When a site references a web map, the site includes all its own configured components and settings, as well as components and settings that it inherits from the web map. The site inherits:

- **Map Services and Layers: ***
  - ArcGIS Server tiled and dynamic map services, feature layers, and image services
  - OGC WMS and WMTS
  - KML
  - Bing Maps **
  - Web tiled layers, including Open Street Maps and MapQuest
  - GeoRSS (Simple and GML)
  - Layers from shapefiles
  - Layers from CSV and TXT files
  - GPX waypoints, tracks, and routes
  - Routes, Route Stops, and Route Directions
  - Map notes

- **Bookmarks**
- **Pop-ups:** Pop-ups appear in the site as field settings for the layer. If the pop-up contains media links, the links are added to the layer as feature hyperlinks.

* Essentials does not support presentations in web maps.

** In order to reference a web map that contains one or more Bing Maps layers, you must first add a Bing Maps service connection.

Override the Inherited Configuration

You can modify or remove components and settings that a site inherits from a Portal for ArcGIS web map.

For example, suppose a web map has a bookmark called **City Center**, and your site references the web map. If you edit your site and change the inherited bookmark's display name to **Downtown**, the bookmark will appear as **Downtown** in Manager and in the site's viewers. If you then edit the source web map and change the bookmark's name from **City Center** to **Central Donville**, Manager and the viewers will continue to refer to the bookmark as **Downtown**—your change in the site is preserved.

Removing the bookmark from the source web map removes the bookmark from your site.

See Also...

> **References** on page **167**

When the source web map changes, the changes are not automatically reflected in a site that references the web map. You must manually refresh web maps to see the changes in your site.

> **To refresh web maps:**

1. In Manager, edit the site that you want to configure, and then click **Site Info** in the side panel.

2. In the **References** area, click **Refresh Web Maps**.

   Essentials updates the site with any changes that have been made in the source web maps that the site references.

7.2 Set Up Access to Private Portal for ArcGIS Content

When you create content in Portal for ArcGIS, by default only you can access it. If you share your content with **Everyone (public)**, then any person or application, including Essentials, can access it. No special setup is needed for Essentials to access public content.

If your content is not shared with Everyone (public), then it is considered to be private. For example, content that is shared with your organization or with one or more groups is considered to be private.

In order to add private Portal for ArcGIS content to an Essentials site, you must register Essentials with Portal for ArcGIS.

To register Essentials with Portal for ArcGIS, you configure the Portal for ArcGIS method of signing in to Manager in the Post Installer. The Portal for ArcGIS sign-in method enables you to:

- Use your private Portal for ArcGIS content in your Essentials sites.

- Secure your Essentials sites using Portal for ArcGIS to authenticate end users.

- Sign in to Manager using one of the following types of account:
    - Administrative accounts for your Portal for ArcGIS organization.
    - The account that you use to set up access to Portal for ArcGIS in the Post Installer.

  You can change the Portal for ArcGIS account types that are allowed to sign in to Manager. For instructions, refer to the *Geocortex Essentials Installation Guide*.

For information on configuring the sign-in method, refer to "Choose a Method to Sign In to Manager" in the *Geocortex Essentials Installation Guide*.

8 ArcGIS Online

You can add ArcGIS Online services and web maps to your Essentials sites. Essentials supports:

- **Public ArcGIS Online Content:** Public web maps, map services, and feature layers that are available at ArcGIS Online (www.arcgis.com).

- **Private ArcGIS Online Content:** Private web maps, map services, and feature layers that are hosted by ArcGIS Online.

  In order to add private ArcGIS Online content, you must configure the ArcGIS Online sign-in method in the Post Installer. For more information, see "Choose a Method to Sign In to Manager" in the *Geocortex Essentials Installation Guide*.

- **ArcGIS Online World Geocoding Service:** The geocoding service at:

      http://geocode.arcgis.com/arcgis/rest/services/World/GeocodeServer.

See also...

8.1 About ArcGIS Online Web Maps

ArcGIS Online web maps are web-based maps that you create in ArcGIS Online.

> In Essentials, Web maps created in Portal for ArcGIS behave the same as web maps created in ArcGIS Online—they are added the same way, the inheritance works the same, and so on. When you understand how one works, you also understand how the other works.

You can add ArcGIS Online web maps to your Essentials sites.

> To add a private ArcGIS Online web map, or a web map that contains one or more private services, Essentials must be registered with ArcGIS Online. For instructions, see "Choose a Method to Sign In to Manager" in the *Geocortex Essentials Installation Guide*.

To add an ArcGIS Online web map to a site, you configure a reference to the web map. When a site references a web map, the site includes all its own configured components and settings, as well as components and settings that it inherits from the web map. The site inherits:

- **Map Services and Layers: ***
  - ArcGIS Server tiled and dynamic map services, feature layers, and image services
  - OGC WMS and WMTS
  - KML
  - Bing Maps **
  - Web tiled layers, including Open Street Maps and MapQuest

- GeoRSS (Simple and GML)

- Layers from shapefiles

- Layers from CSV and TXT files

- GPX waypoints, tracks, and routes

- Routes, Route Stops, and Route Directions

- Map notes

- **Bookmarks**

- **Pop-ups:** Pop-ups appear in the site as field settings for the layer. If the pop-up contains media links, the links are added to the layer as feature hyperlinks.

* Essentials does not support presentations in web maps.

** In order to reference a web map that contains one or more Bing Maps layers, you must first add a Bing Maps service connection.

Override the Inherited Configuration

You can modify or remove components and settings that a site inherits from an ArcGIS Online web map.

For example, suppose a web map has a bookmark called **City Center**, and your site references the web map. If you edit your site and change the inherited bookmark's display name to **Downtown**, the bookmark will appear as **Downtown** in Manager and in the site's viewers. If you then edit the source web map and change the bookmark's name from **City Center** to **Central Donville**, Manager and the viewers will continue to refer to the bookmark as **Downtown**—your change in the site is preserved.

Removing the bookmark from the source web map removes the bookmark from your site.

See Also...

> **References** on page **167**

8.1.1 ## Refresh Web Maps

When the source web map changes, the changes are not automatically reflected in a site that references the web map. You must manually refresh web maps to see the changes in your site.

▶ **To refresh web maps:**

1. In Manager, edit the site that you want to configure, and then click **Site Info** in the side panel.

2. In the **References** area, click ↻ **Refresh Web Maps**.

   Essentials updates the site with any changes that have been made in the source web maps that the site references.

8.2 Set Up Access to Private ArcGIS Online Content

When you create content in ArcGIS Online, by default only you can access it. If you share your content with **Everyone (public)**, then any person or application, including Essentials, can access it. No special setup is needed for Essentials to access public content.

If your content is not shared with Everyone (public), then it is considered to be private. For example, content that is shared with your organization or with one or more groups is considered to be private.

In order to add private ArcGIS Online content to an Essentials site, you must register Essentials with ArcGIS Online.

To register Essentials with ArcGIS Online, you configure the ArcGIS Online method of signing in to Manager in the Post Installer. The ArcGIS Online sign-in method enables you to:

- Use your private ArcGIS Online content, such as web maps and services, in your Essentials sites.

- Secure your Essentials sites using ArcGIS Online to authenticate end users.

- Sign in to Manager using one of the following types of account:

    - Administrative accounts for your ArcGIS Online organization.

    - The account that you use to set up access to ArcGIS Online in the Post Installer.

    You can change the ArcGIS Online account types that are allowed to sign in to Manager. For instructions, refer to the *Geocortex Essentials Installation Guide*.

For information on configuring the sign-in method, refer to "Choose a Method to Sign In to Manager" in the *Geocortex Essentials Installation Guide*.

9 Supported Types of Services

In the context of web mapping, services are GIS resources that are located on a server and accessed over a network.

Essentials supports the following types of service:

- **Map Services:**
    You can add the following types of service to a site's map:

    - **ArcGIS Server Services:**

        - **Dynamic Map Services:** Dynamic map services render map images in response to map image requests from client mapping applications. Map images are rendered on the server and served to the client. ArcGIS Server dynamic map services can be queried.

        - **Tiled (Cached) Map Services:** Tiled map services serve map images that are pre-rendered and cached on the server. ArcGIS Server tiled map services can be queried.

        - **Feature Layers:** ArcGIS Server feature services serve feature attributes, geometry, and symbology. Geometries are rendered on the client. ArcGIS Server feature services can be queried.

        - **Image Services:** ArcGIS Server image services serve raster and mosaic images that are pre-rendered on the server. Essentials supports identify operations on ArcGIS Server image services. Other forms of query are not supported.

    - **Open Geospatial Consortium (OGC) Services:**

- **Web Map Service (WMS):** WMS is an OGC standard for dynamic map services. WMS services render map images in response to map image requests from client mapping applications. Map images are rendered on the server and served to the client. When used with a Web Feature Service (WFS), WMS services can be queried. Without a WFS service, WMS services support limited query.

- **Web Map Tiled Services (WMTS):** WMTS is an OGC standard for tiled map services. WMTS services serve map images that are usually pre-rendered and cached on the server. WMTS services support point Identify requests only—they do not support any other queries. Essentials does not support the use of WFS services with WMTS services.

- **Bing Maps:** Bing Maps are tiled map services—they serve map images that are pre-rendered and cached on the server. Essentials supports the Bing Maps **Road**, **Aerial**, and **Aerial with Labels** services. Bing Maps cannot be queried.

- **Web Tiled Layers:** Web tiled layers are tiled map services that use the Google tiling scheme. They serve map images that are pre-rendered and cached on the server. For example, **Open Street Map** (OSM) and **MapQuest** services can be added to the map as web tiled layers in Essentials.

- **KML Layers:** KML layers are defined using the XML-based Keyhole Markup Language, which is designed to store geographic data. Many mapping applications support KML, including ArcGIS Server, Google Earth, and Google Maps.

- **GeoRSS Services:** RSS is a technology for delivering text, audio, and media over the Internet. **Feeds** provide automatic notification of updated content. GeoRSS services provide geographic data in RSS feeds, so the data can be plotted by web mapping applications.

- **GIS Services:**
  You can add the following types of service to a site. These service types are configured separately from the map.

  - **Geometry Services:** Geometry services perform geometric calculations such as buffering, projection, and measurement. Essentials supports ArcGIS Server geometry services.

  - **Geocoding Services:** Geocoding services convert between addresses and spatial data. Essentials supports ArcGIS Server and Bing Maps geocoding services. Geocoding services are also known as address locators or geocoders.

> **NOTE** Starting in Essentials 3.15, you cannot configure geoprocessing services in Manager.

In order to add a service to your site or the site's map, the service must be one of the types listed above. The service must also be web-based, on a network that Essentials has access to. If the service is secured, you must configure the security information in Manager so Essentials knows how to access the service.

You can add services from your corporate network, from the Internet, or from other networks that your organization has access to. You can also add services from ArcGIS Online.

See also...

10 Map Services

A site's map can include:

- ArcGIS Server map services (tiled and dynamic)
- ArcGIS Server feature layers
- ArcGIS Server image services
- OGC WMS services
- OGC WMTS services
- Bing Maps
- Web tiled layers, such as Open Street Maps and MapQuest
- KML layers
- GeoRSS feeds (Simple and GML)

You can combine different types of service in a single site, and you can combine dynamic and tiled map services.

Most Essentials sites have multiple services in the map, but this is not a requirement—a site's map can have a single service, or no services. Essentials does not place an upper limit on the number of services a site can have.

You can add an entire map service to the map at one time. This adds all the layers in the service to the map. You can then exclude individual layers if you want.

You can also add a single layer as a dynamic map service. This is useful for adding a single annotation layer or a single raster layer.

To add services to a site's map, you use Manager's Add Map Service function, which allows you to search for services and store connection information.

After you have added a service to the map, you can edit the service to configure the service's settings.

See Also...

10.1 Accessing Secured Services

In order for Essentials to access a secured map service, Essentials needs to know how to access the service, for example, what user name and password to use or where to get a security token. The specific information depends on the method that is used to secure the service.

Before you can add a secured service to a site, you must configure the connection information in Essentials. Similarly, if you add an unsecured service to a site and later secure the service, you must configure the connection information. The method that you use to configure the connection information depends on whether you are adding a secured service or changing the connection information for an existing service:

- **New Service:** Before you add the service, add a service connection and configure the connection information in the service connection. See **Service Connections** on page **115**.

- **Existing Service:** If you have already added a service to your site and later secure the site or change the security, edit the connection settings in the service. See **Edit a Map Service's Connection Settings** on page **103**.

10.2 Searching for Map Services to Add to Add to a Site

Manager's Add Map Service dialog box provides a Search function that enables you to search for services that can be added to the map. To open the Add Map Service dialog box, click **Map** in the side panel, and then click **Add Map Service**.

There are two ways to search:

- **Search by Location:** You can search by **URL** or by network address, such as the host name or IP address. This searches the specified location for all the services that you can add to the map. To search by location, you do not need to have any service connections configured.

- **Search by Keyword:** If you have one or more service connections configured, you can enter a keyword to search for. This searches all the configured service connections for services whose display name or URL matches the search term.

The search results list the services that were found, and the layers in each service. You can browse the services and layers, view and navigate a preview of the selected service or layer, and view additional details such as the spatial reference and service type. To add a service or layer to the map, you select the service or layer in the search results and then click the Add button.
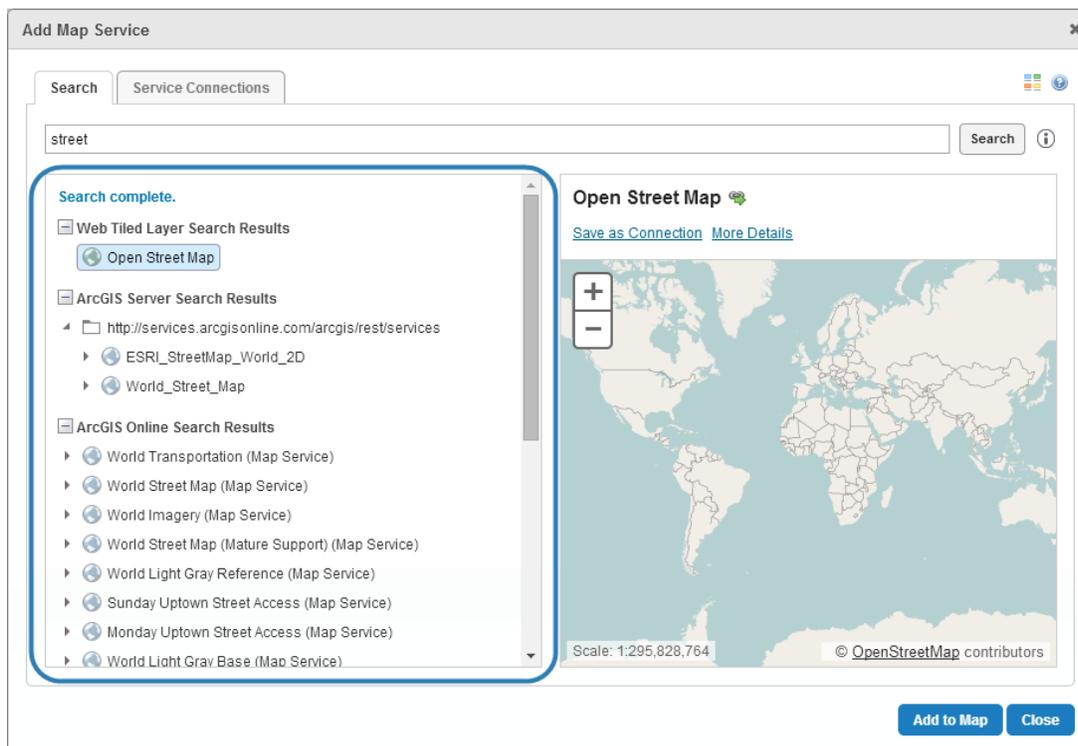
Add Map Service dialog box showing search results on the Search tab

The icons in the search results identify the type of service or layer. To show a legend that identifies what each icon represents, hover over the legend icon .

> In order to search for a **secured** service, you must first add a service connection for the service. The service connection contains the security information that enables Manager to connect to the service, such as the authentication method and credentials.

In order for the Search function to return a service in the search results, Manager must be able to connect to the service. This means the service must be available when you perform the search. The exception is when the service connection has an index to search, such as ArcGIS Online has.

See also...

    Service Connections on page **115**

10.3 Add a Map Service to the Map

To add a map service to the map, Manager must be able to connect to the map service—you cannot add a map service when the map service is offline. The exception is when the service connection has an index to search, such as ArcGIS Online has. In this case, Manager searches the index, not the service.

If a map service is secured, you must add a service connection before you can add the map service to the map. Depending on the type of map service, the service connection can be for the service itself, for a catalog that contains the service, or for the server that hosts the service.

> You cannot add service connections for KML layers or GeoRSS layers. Essentials supports public KML and GeoRSS layers only. To add a KML or GeoRSS layer to the map, you must enter the layer's URL.

There are two ways to add a map service to the map—by browsing service connections, or by searching. The search option allows you to enter the exact URL of the service that you want to add, or you can enter a keyword to search for in the service connections that you have configured.

Instructions for both browsing and searching are given below.

▶ **To add a map service to the map by searching:**

1. In Manager, edit the site that you want to configure, and then click **Map** in the side panel.

2. Click **Add Map Service**, and then click the **Search** tab.

3. Type a URL or keyword in the **Search** box:

   - **URL:** Enter the URL for the map service, or for a catalog of map services.

   - **Keyword:** Enter the text that you want to search for, for example, the name of the service.
   The keyword search function searches service connections. You cannot use this method to add KML or GeoRSS layers to the map, because they do not have service connections.

4. Click the **Search** tool   🔍 .

5. If Essentials is registered with ArcGIS Online, and you want to search only your organization's content, select the **Limit ArcGIS Online results to your organization** check box.
   If you clear the check box, Manager searches both your organization's content and public ArcGIS Online content belonging to other organizations.

6. Browse the search results:

    - Click ⊞ and ⊟ to show and hide the search results from a particular type of service connection.

    - Click ▸ and ◂ to show and hide items within a search result, for example, the layers in a map service.

    - Select a service or layer in the search results to see a preview, if a preview is available.
      You can navigate the preview. Click and drag in the preview frame to pan the preview. To zoom, use your mouse's scroll wheel or the zoom control in the preview pane.

        > If there is nothing to display at the given scale, the preview is blank. You can still add the service to the map when the preview is blank. For WMS services, the preview is blank until you turn on some layers.

    - Position the pointer over **More Details** to see additional details about the selected service or layer, such as the spatial reference.

7. When you find a map service or layer that you want to add to the map, select it in the search results.
    Depending on the type of service or layer you selected, one or two Add buttons will display.
    If the Add button is not available, you have selected something that cannot be added to the map, such as a folder.

    > If you are adding a WMS map service, you can set the default visibility of the layers using the check boxes in the search result. Alternatively, you can set the default visibility after you have added the service.

8. If you want to use the map service as a base map, select the **Add as Base Map** check box.
    This creates a base map containing the map service on Manager's Base Maps page.
    To use the map service as an operational layer, clear the **Add as Base Map** check box.
    If there is no Add as Base Map check box, the type of map service or layer that you are adding cannot be used as a base map.

9. Do one of the following:

    - If you selected a feature layer from an ArcGIS feature server, the button says **Add as Feature Layer**.
      Click the button.

    - If you selected a feature layer from an ArcGIS map service, there are two buttons:

        - If you are not going to configure any of the additional features that are available only for feature layers, such as charting, clustering, or heat maps, click **Add as Map Service**.

        - If you want to be able to configure one or more of the additional features that are available only for feature layers, such as charting, clustering, or heat maps, click **Add as Feature Layer**.

    - Otherwise, there is one button—**Add to Map**. Click the button.

    The dialog box closes and the map service is added to the list of map services in the map. If you added the map service as a base map, a base map containing the map service is created on Manager's Base Maps page.

10. Click **Apply Changes**.

11. Click **Save Site**.

▶ **To add a map service to the map by browsing the service connections:**

You cannot use this method to add KML or GeoRSS layers to the map.

1. In Manager, edit the site that you want to configure, and then click **Map** in the side panel.

2. Click **Add Map Service**, and then click the **Service Connections** tab.

3. Browse the service connections:

   - Click ▶ to show the contents of a service connection, including the layers within each service.
   Click ◢ to hide the contents.

   - Select a map service or layer in the service connections to see a preview, if a preview is available. You can navigate the preview. Click and drag in the preview frame to pan the preview. To zoom, use your mouse's scroll wheel or the zoom control in the preview pane.

     > If there is nothing to display at the given scale, the preview is blank. You can still add the map service to the map when the preview is blank.

   - Position the pointer over **More Details** to see additional details about the selected map service or layer, such as the spatial reference.

     > You can change the order of the connections listed on the Service Connections tab. To move a service connection to a different position in the list, drag the connection to its new position.

4. When you find a map service or layer that you want to add to the map, select it in the service connections.
   Depending on the type of map service or layer you selected, one or two Add buttons will display.
   If the Add button is not available, you have selected something that cannot be added to the map, such as a folder.

   > If you are adding a WMS, you can set the default visibility of the layers using the check boxes in the service connection. Alternatively, you can set the default visibility after you have added the service.

5. If you want to use the map service as a base map, select the **Add as Base Map** check box.
   This creates a base map containing the map service on Manager's Base Maps page.
   To use the map service as an operational layer, clear the **Add as Base Map** check box.
   If there is no Add as Base Map check box, the type of map service or layer that you are adding cannot be used as a base map.

6. Do one of the following:

   - If you selected a layer from an ArcGIS feature server, click **Add as Feature Layer**.

   - If you selected a layer from an ArcGIS map service, you can add it as a map service or as a feature layer:

     - If you are not going to configure any of the additional features that are available only for feature layers, such as charting, clustering, or heat maps, click **Add as Map Service**.

     - If you want to be able to configure one or more of the additional features that are available only for feature layers, such as charting, clustering, or heat maps, click **Add as Feature Layer**.

   - Otherwise, there is one button—**Add to Map**. Click the button.

The dialog box closes and the map service is added to the list of map services in the map. If you added the map service as a base map, a base containing the map service is created on Manager's Base Maps page.

7. Click **Apply Changes**.

8. Click **Save Site**.

See also...

Map Service Settings on page **103**

10.4 Import Map Services from Another Site

You can import multiple map services to the map at one time. The services can be different types. For example, you could import two ArcGIS map services, a GeoRSS service, and five feature layers at one time.

▶ **To import one or more services that are configured in another site:**

1. In Manager, edit the site that you want to configure, and then click **Map** in the side panel.

2. Click **Import Map Service**.

3. Select the site that contains the services you want to import, and then click **Next**.

4. Select the services that you want to import.
   To select a service, click on it in the **Services** list. To select multiple services, hold the **Ctrl** key down and click each service, or hold the **Shift** key down to select services that are beside each other in the list.

5. Click **Next**.

6. Click **Finish**.

7. Click **Apply Changes**.

10.5 Edit a Map Service

▶ **To edit a service in the map:**

1. Launch Manager, following the instructions that apply to you:

   - **Windows Server 2012 or Windows 8, and Newer Versions:**
     On the **Start** screen, type **Geocortex**, and then click **Geocortex Essentials Manager**.

   - **Windows Server 2008 or Windows 7, and Older Versions:**
     In the **Start** menu, select **All Programs** | **Latitude Geographics** | **Geocortex Essentials [Version] [Instance]** | **Geocortex Essentials Manager**.
     [Version] is the Essentials version number. [Instance] is the instance name, if Essentials is installed as a named instance. The default installation does not have an instance name.

2. Edit the site that you want to configure:

   a. Click the **Sites** tab.

   b. If a different site is open for editing, click **Save Site**, and then click **Close Site**.

   c. Follow the instructions for the view of the Site List that you are using:

- **Tiled View:**

World site in Tiled View

- Click the thumbnail image of the site that you want to edit, or
- Click the site's name, or
- Position the pointer over the thumbnail image of the site that you want to edit, and then click the **Edit** icon.

- **List View:**

World site in List View

- Click the site's name, or
- Click the **Edit** icon.

3. Click **Map** in the side panel.

4. Click the **Map Services** tab.

5. Click the **Edit Map Service** icon beside the map service that you want to edit.

Make sure you are editing the map service, not a layer. The tool tip should say **Edit Map Service**.

The map service opens for editing.

Map service settings are organized into tabs. The specific tabs and settings depend on the type of service.

See also...

10.6 Edit a Map Service's Connection Settings

If a map service's URL or security settings changes, Essentials cannot access the service any more. You must edit the service and update the connection settings so Essentials can access the service.

▶ **To edit the connection settings for a service in the map:**

1. In Manager, edit the map service that you want to configure.

2. On the **Details** tab, scroll down and click the **Edit Connection Settings** button.

3. Update the settings.

4. Click **OK**.

5. Click **Apply Details**.

10.7 Map Service Settings

> Modifying a service that has already been added to the map has no effect on existing service connections. See **Edit a Service Connection** on page **124** for instructions on changing a service connection.

Editing a service opens a page with several tabs containing configurable settings. The specific tabs that are available depend on the type of service. The tabs are:

- **Details Tab:** See **Map Service Details Tab** on page **104**.

- **Display Settings Tab:** See **Map Service Display Settings Tab** on page **108**.

- **Functional Tab:** See **Map Service Functional Tab** on page **109**.

- **Add/Remove Layers Tab:** See **Exclude Layers from a Dynamic Map Service** on page **113**.
  If the map service supports ArcGIS Server's Dynamic Layers feature, the Add/Remove Layers tab has additional functions for adding and importing dynamic layers. See **Dynamic Layers-Enabled Map Services** on page **213** for information.

- **Drawing Order Tab:** See **Dynamic Layers-Enabled Map Services** on page **213**.

- **Feature Clustering Tab:** See **Add Clustering to a Feature Layer** on page **127**.

- **Feature Heat Maps Tab:** See **Add Heat Maps** on page **132**.

- **Filtering Tab:** See **Filter a Layer's Features** on page **428**.

- **Instant Search Tab:** See **Global Search** on page **195**.

- **Layer Hyperlinks Tab:** See **Layer Hyperlinks** on page **207**.

You can change a map service's display name without editing the service—click the ⦿ icon beside the map service on the Map page's Map Services tab and select **Rename**.

10.7.1 Map Service Details Tab

All map services have a Details tab. The particular settings that show on the Details tab depend on the type of map service. To open the Details tab, edit the map service.

The settings on the Details tab are:

- **ID:** (for information only) The unique identifier for this service in the REST API.

- **Display Name:** The name that is used to refer to this map service in Manager and in viewers. The Display Name can contain spaces and special characters.

- **Short Display Name:** The name that is used to refer to this map service in small spaces in the viewer, for example, in a base map transparency slider. If you do not configure the Short Display Name, the Display Name is used in small spaces. The Short Display Name can contain spaces and special characters.

- **Description:** A short description of the service. The description is optional.

- **Copyright:** Some organizations, such as Open Street Map (openstreetmap.org), require anyone using their data to credit the organization. Use the Copyright setting to configure the attribution. The copyright appears in the lower right corner of the map in Manager and in viewers. If you also want the copyright to appear in exported and printed map images, select the **Include Copyright in Print/Export** check box.

  The copyright can include simple HTML markup, such as bold text and anchor elements. Using an anchor element enables you to include a hyperlink to the organization's website, for example:

  ```
  © <a href="http://www.openstreetmap.org/copyright" target="_
  blank">OpenStreetMap</a> contributors
  ```

  This appears on the map as: © OpenStreetMap contributors.

  If a map service has a copyright built into it, the built-in copyright appears in the Copyright box by default. You can override the built-in copyright by typing a new copyright in the Copyright box. To restore the default copyright, delete the custom copyright that you entered.

  If more than one map service in a site has a copyright (either built in or configured in Manager), the copyrights appear one after another on the map.

- **Include Copyright in Print/Export:** If you want the copyright for this map service to appear on the map image when the map is exported, select the Include Copyright in Print/Export check box. For printing, you must also add a **TextBox** to each print template, and set the TextBox's **DataField** property to **_CopyrightText**:

  Open the print template in Report Designer.

  Drag a **TextBox** onto the print template and position it where you want it. You may also have to resize the TextBox to fit your needs.

  With the TextBox selected, scroll down the properties list in the lower right corner of Report Designer until you see the **Data** section.

  Click to the right of **DataField** and type **_CopyrightText**.

  Save the print template.

- **Data Source Type:** (for information only) The type of service that provides the map data, for example, ArcGIS Server REST or OGC WMTS.

- **Service Type:** (ArcGIS Server tiled map services) If the service supports dynamic capabilities and you want the service to render dynamically, select **Dynamic**. This is useful if you have two tiled services with incompatible

spatial references. When the Service Type setting is set to Dynamic, Essentials tries to reproject the service, and applications try to project the service, to a compatible spatial reference.

- **Spatial Reference:** The service's spatial reference.

  WMS services sometimes support more spatial references than are indicated in the service's metadata. If the service is not compatible with the map's spatial reference, you can try changing the service's spatial reference to see if a different spatial reference works. To change the click **Change Spatial Reference** and enter the spatial reference that you want to use. The format is usually an EPSG code, for example, **EPSG:4326**, but this depends on the service.

  For WMTS services, if the WMTS is the bottom-most service in the list of services on the Map page's Map Services tab, then changing the tile matrix set changes the spatial reference of the map. However, when the WMTS is displayed on top of another map service, the WMTS attempts to use the spatial reference of the bottom-most service, regardless of what you configure for the tile matrix set.

- **Supports Dynamic Layers:** (for information only) Indicates whether dynamic layers are enabled for this service in ArcMap.

- **Connection String:** (for information only) The connection string to connect to this service.

  To open the service's REST endpoint, click the 🐢 icon beside the Connection String box.

- **Edit Connection Settings:** Click **Edit Connection Settings** and modify the settings as desired. The settings that are available depend on the type of map service.

  > 💡 After you have configured the connection settings, click the **Test Connection** button to verify the settings.

  - **Service URL:** Type or paste the map service's URL.

  - **Layer Mask(s)** (optional): If you add a single layer to the map, Essentials uses layer masks to mask the other layers in the map service. This is an advanced setting that requires a good understanding of layer masks.

  - **Authentication Settings:** If the service is secured, select the authentication method for Essentials to use when connecting to the service.

    > 📌 **NOTE** If you are using a proxy page, Essentials uses the settings that you configure here to access the proxy page, rather than to access the service itself.

    - **Web Tier (default or anonymous credentials):** Select this option if:
      - the service is secured using Integrated Windows Authentication and you want Essentials to authenticate as the application pool user, or,
      - the service is not secured.

    - **Web Tier (configured credentials):** Select this option if:
      - the service is secured using basic or digest authentication, or,
      - the service is secured using Integrated Windows Authentication and you want to configure the credentials for Essentials to use when authenticating.

    In the **Username** and **Password** boxes, type the credentials that you want Essentials to use.

- **Token Security (by user):** Select this option if the service is secured using token security. In the **Username** and **Password** boxes, type the credentials that you want Essentials to use when authenticating. If you have changed the location where tokens are issued, type the URL of the location in the **Token URL** box.

- **Token Security (explicit tokens):** In the **Server Token** box, type or paste the long-lived server token that Essentials will use to authenticate. You can also optionally configure a long-lived client token.

  Select this option if the service is secured using token security and you want to use long-lived tokens. This method stores the token(s) in the site.

  > **NOTE** This method is not practical for ArcGIS Server 10.1 and newer. In ArcGIS Server 10.1, the life span of long-lived tokens was shortened to 24 hours. This means you would have to configure a new token at least once a day.

- **Proxy Settings:** You can use a proxy page, or the Geocortex Services Enhancement Proxy, or neither. You cannot use both.

  - **No Proxy:** If you are not using a proxy page and you do not want to use the Geocortex Services Enhancement Proxy, select **No Proxy**.

  - **Geocortex Services Enhancement Proxy:** The Services Enhancement Proxy is a reverse proxy that supports a variety of enhancements that appear in HTML5 and Silverlight viewers. The enhancements are:

    - Display and query the values in coded value domains.

      > **NOTE** You do not need to configure the Services Enhancement Proxy to display and query domain values in HTML5 viewers—the HTML5 Viewer has support for domain values built into it.

    - Format dates and numeric data for the user's locale.

    - Implement pixel tolerance for identify operations on line and polygon geometries.

    - Compensate for word order variations in Global Search.

    If you are not using a proxy page and you want to use the Services Enhancement Proxy, select the **Geocortex Services Enhancement Proxy** check box.

    When the Services Enhancement Proxy is enabled, two additional settings are visible in Manager:

    - **Forward Requests using Application Pool Identity:** Select this check box to use the Essentials application pool's identity to access the service.

    - **Resolve Coded Domains:** Select this check box to turn on the full set of enhancements.

    For more information, see **The Geocortex Services Enhancement Proxy** on page **47**.

  - **Proxy URL:** If you are using a proxy page, type or paste the proxy page's URL.

    For example, `http://host.domain.com/MapServiceProxy/proxy.ashx`.

- **Get Map URL** (optional): Type or paste in the URL to use if the WMS URL fails. WMS operations can be at different locations and this option allows you to attempt to connect at another location if the URL provided by the WMS is inaccurate or you want your `GetMap` requests to target a different location for

other reasons. This parameter makes it possible to override the URL used for `GetMap` requests, to any URL that you want to use.

> The `GetMap` parameter is optional. If you do not specify a URL, Essentials uses the URL from the capabilities of the WMS. Parameters from the service address are appended to `GetMap` requests.

The `GetMap` parameter is part of the connection string, for example:

```
ConnectionString="url=http://myserver/geoserver/wms;mapUrl=http://myserver/g
eoserver/wms/getmap"
```

- **WFS URL:** If you are using either the WFS: ArcGIS Server or WFS: Name Correlation query provider, you must provide the WFS's URL here. If you are using the WFS query provider, this URL will override the URL in the capabilities document.

  The `WFSServer` parameter is part of the connection string parameter, for example:

  ```
  ConnectionString="url=http://myserver/ArcGIS/services/myservice/MapServer/WM
  SServer;wfsUrl=http://myserver/ArcGIS/services/myservice/MapServer/WFSServe
  r"
  ```

- **WFS Version** (optional): Select the version of WFS to use. If you do not set a version of WFS, the system uses the most recent supported version of WFS - up to version 2.0.

  > If the map service you are connecting to does not support the version of WFS selected in this field, the system uses an earlier version of WFS.

- **Proxy URL:** If the map service is secured with a proxy, type or paste the proxy's URL.

  For example, `http://host.domain.com/MapServiceProxy/proxy.ashx`.

- **WMS Version** (optional): Select the version of the WMS specification to use in order to communicate to the server. If you do not set a version, the most recent supported version of WMS is used - up to version 1.3.0.

- **Authentication Settings:** If the service is secured, configure the credentials that you want Essentials to use when authenticating. If you want Essentials to authenticate as the application pool user, leave the Username and Password boxes blank.

  > If you are using a proxy page, Essentials uses the settings that you configure here to access the proxy page, rather than to access the service itself.

- **KVP Tile URL Override:** Use this option if the URL that is advertised by the service does not work or you want to use a different URL.

- **RESTful Tile URL Template Override**: Use this option if the URL that is advertised by the service does not work or you want to use a different URL.

- **Map Style:** Select the Bing Maps service that you want to connect to.

- **Key:** Type or paste your Bing Maps key.

- **URL Template:** Type the URL template for the tile server.

  The URL template must contain the `{level}`, `{col}`, and `{row}` tokens. For example, a URL template might have the following form:

  ```
  http://{subdomain}.server.domain.com/{level}/{col}/{row}.png
  ```

See **Web Tiled Layers** on page **139** for more information.

> Some web tiled services use dollar signs ($) in their URL templates. Dollar signs are optional in Essentials.

- **Subdomains:** If the URL template contains the `{subdomain}` token, list the subdomains that you want to submit tile requests to. Separate the subdomains in the list using commas.

- **Security Provider Name:** *Reserved use.* For information on configuring security providers, see **Security Providers** on page **401**.

- **Filter Workflow URI:** (ArcGIS Server dynamic map services that support dynamic layers) The URI of a workflow for filtering features in one or more of this map service's dynamic layers.

  Use this setting to configure a layer filter workflow that filters dynamic layers only. For filtering non-dynamic layers, configure the layer filter workflow at the layer level.

  See **Filter a Layer's Features** on page **428** for more information.

10.7.2   Map Service Display Settings Tab

All map services have a Display Settings tab. The particular settings that show on the Display Settings tab depend on the type of map service. To open the Display Settings tab, edit the map service.

The settings on the Display Settings tab are:

- **Icon URI**: The URI to the icon that you want to use to represent this service. Click **Browse** to navigate to the icon file, or **Upload** the file to the site.

- **Opacity:** Sets the map service's default opacity. For example, if you set the opacity to 30% in Manager, then end users initially see the map service at 30% opacity in the viewer, and the map service's opacity slider is initially set to 30%. End users can drag the opacity slider to change the map service's opacity.

- **Override Scale:** The Override Scale settings allow you to restrict the scale range of the map service in Essentials. These settings override the scale settings that are defined in the map service itself.
  - **Override Minimum Scale:** The minimum scale at which the map service is visible in viewers. If a user zooms out farther than the Override Minimum Scale setting, the map service no longer shows on the map. If the map service is in the Layer List, the map service's Visibility check box becomes grayed out to indicate that the map service is not visible at the current scale.

    For example, if the minimum scale defined in the map service itself is 1:10,000,000, you could restrict the minimum scale to 1:5,000,000 in Essentials.

    To configure the minimum scale, enter the scale's denominator, without commas or other punctuation. For example, to set the minimum scale to 1:5,000,000, enter **5000000** in the **Override Minimum Scale** box. If you leave the Override Minimum Scale box blank, Essentials uses the minimum scale that is defined in the map service itself.

  - **Override Maximum Scale:** The maximum scale at which the map service is visible in viewers. If a user zooms in closer than the Override Maximum Scale setting, the map service no longer shows on the map. If the map service is in the Layer List, the map service's Visibility check box becomes grayed out to indicate that the map service is not visible at the current scale.

    For example, if the maximum scale defined in a map service is 1:500, you could restrict the maximum scale to 1:2,000 in Essentials.

To configure the maximum scale, enter the scale's denominator, without commas or other punctuation. For example, to set the maximum scale to 1:2,000, enter **2000** in the **Override Maximum Scale** box. If you leave the Override Maximum Scale box blank, Essentials uses the maximum scale that is defined in the map service itself.

A common use for the Override Scale settings is to make one base map become visible when another loses visibility as the user zooms the map. To configure this, set Override Maximum Scale for one base map to the same scale as Override Minimum Scale for the next base map.

> In addition to these settings, which control the scale range of a **map service**, the Geocortex viewers have settings that enable you to restrict or extend the scale range of the **map** (`minScale` and `maxScale` in the HTML5 Viewer; `MinimumResolution` and `MaximumResolution` in the Silverlight Viewer). For information, refer to the "Map Module" section in the viewer's *Administrator and Developer Guide*.

> The Silverlight Viewer supports the Override Minimum Scale and Override Maximum Scale settings for tiled ArcGIS-based base maps only. The HTML5 Viewer supports these settings for all map services—tiled and dynamic map services, operational map services and base maps, and all map service types.

- **Maximum Image Size:** ArcGIS Server has a default maximum size for the map images that it exports. ArcGIS Server provides settings to override the default size. If you have configured a **smaller** size for map images in ArcGIS Server, you must configure the size here. If you have configured the image size to be larger, or you are using ArcGIS Server's default size, you do not need to configure these settings.

  - **Maximum Image Width:** If the map image width that is configured in ArcGIS Server is smaller than ArcGIS Server's default map image width, enter the width in the Maximum Image Width box.

  - **Maximum Image Height:** If the map image height that is configured in ArcGIS Server is smaller than ArcGIS Server's default map image height, enter the height in the Maximum Image Height box.

- **Brush Color:** Select the color for markers and geometries in the layer. This color is also applied to shapes, if the feed has them.

- **Image Format:** Specifies the image format to use when displaying the map.

- **Color:** Specifies the color of a feature layer. Type in the hexadecimal value of the number or click the color picker and select a color.

  When the feature color is set, any renderer that is not a Simple renderer is replaced with a Simple renderer. So Class Break, Unique Value, or custom renderers are converted to Simple renderers. This means that properties assigned to the feature that require non-simple renderers will not display. For example, a city feature layer with points representing cities would show different point sizes based on the population of the city. If the feature color of the city points was then set to blue, the cities would be shown as blue dots of the same size.

- **Color Alpha:** Specifies the transparency/opacity of a feature. Move the slider to the left to increase the transparency of the feature.

- **Selection Color:** Specifies the color to use when the feature is selected. Type in the hex value of the number or click the color picker and select a color. This setting only works within the context of editing.

10.7.3 Map Service Functional Tab

All map services have a Functional tab. The particular settings that show on the Functional tab depend on the type of map service. To open the Functional tab, edit the map service.

The Functional tab's settings are:

- **Failure Action:** Specifies the behavior of the site's viewers if this service is not available when the site is loaded. The failure action does not affect user sessions that are already in progress when a service goes down. The possible failure actions are:

    - **Ignore:** The viewer does not warn the user that the service is not available. The user can proceed to use the application. (The service will not work).

    - **Warn:** The viewer displays a warning to the user that says the service is not available. The user can close the warning and proceed to use the application. (The service will not work). This is the default value.

    - **Error:** The viewer displays a warning to the user that says the service is not available. The user cannot close the warning, and cannot use the application.

- **Default Allow Symbolization:** (ArcGIS Server map services with dynamic layer support) Specifies whether or not to allow symbolization of this map service in the Geocortex Viewer for Silverlight.

- **(Default) Data Provider:** (ArcGIS Server dynamic and tiled map services) The (Default) Data Provider is the type of data provider that you use to store feature data. This setting is used by the HTML5 and Silverlight Viewers. It enables the Query Builder and Filter Builder to construct queries using the correct syntax for your data provider.

    You can configure this setting at the site level, the map service level, or the layer level. At the site and map service level, the setting is called **Default Data Provider**. At the layer level, it is called **Data Provider**.

    Map services inherit the setting from the site, and layers inherit the setting from the map service that they belong to, or from the site if the setting is not configured at the map service level. For example, if all the site's services use the same data provider to store their feature data, you could configure the Default Data Provider at the site level—the map services and layers will inherit the configuration. This saves you from having to configure the setting for every map service and layer in the site.

    By default, the provider is **Default**. The **Default** provider uses the ANSI SQL default syntax. If the Default provider does not work in your system, delete **Default** from the **Default Data Provider** box to open a drop-down list of providers. If the type of provider that you use appears in the list, select the provider—the Query and Filter Builders will use the well-known syntax for the provider that you select. If your provider does not appear in the list, re-enter **Default** in the **Default Data Provider** box, and configure the Viewer's QueryBuilder Module. For instructions, refer to the *Administrator and Developer Guide* for the Viewer that you are using.

    NOTE If the map service only has one layer, the Default Data Provider setting is not available at the map service level. For example, feature services do not have a Default Data Provider setting, but feature layers do.

- **Tile Matrix Set:** (WMTS) Select the tile matrix set to use for the WMTS. The `TileMatrixSet` parameter sets the tile matrix set to use, for example, `TileMatrixSet="EPSG:900913"`.

    NOTE If you add a second WMTS on top of another tiled service, Essentials attempts to find a tile matrix set that is compatible with the tiled service that is lowest in the list of services on Manager's Map page.

    If you do not specify a tile matrix set for the primary service, Essentials uses the first matrix set for the configured layer that has a supported spatial reference.

- **Request Encoding:** (WMTS) Currently, only KVP (Key-Value Pairs) is supported.

- **Update interval:** The frequency for the viewer to refresh the map image, in seconds. If you do not set an interval, the map refreshes only when a user performs an action that forces the map to redraw, like pan or zoom.

- **Override Time Settings:** (ArcGIS Server time-aware map services) Specifies the time extent for Silverlight viewers to use as the extent of the time-aware slider. The range that you configure here overrides the time extent that is

set in the map service.

- **Start Time** and **End Time:** The date for the time slider to start and end. Click in the Start Time or End Time box to open a calendar for that setting.

- **Base Map Transparency Slider Group:** (does not apply to ArcGIS Server feature layers, KML layers, or GeoRSS layers) The name of the base map transparency slider group for the map service to belong to, if you want the map service to appear in a transparency slider with other related map services. Entering a new slider group name creates the slider group. The slider group name appears in the Base Map Switcher, so choose a name that is short, and also meaningful to end users. To add the map service to an existing slider group, click in the Base Map Transparency Slider Group box and select the group from the drop-down list.

  If you do not want to use the map service in a transparency slider, leave the Base Map Transparency Slider Group box empty.

- **Layer Catalog Provider Name:** (ArcGIS Server map services that support dynamic layers) The fully qualified type name of the Layer Catalog implementation, if there is one.

  > **NOTE** Adding a layer catalog requires custom development. For information, contact your Account Manager.

Queries

- **Query Provider:** (ArcGIS Server map services and feature layers, WMS and WMTS) For WMS services, select the data source that you want Essentials to query. You must configure this setting for WMS services regardless of whether you are using a WFS. See **OGC Query** on page **149** for information about specific options.

  The `QueryProviderName` URL parameter specifies the query provider to use. For example, `QueryProviderName="WFS: ArcGIS"` or `QueryProviderName="WMS: text/plain"`.

  You do not need to change this setting for other types of service. This setting is used for server-side queries only.

- **Query Transform Workflow URI:** (WMS) If you created a Query Transform workflow to modify the results of WMS `GetFeatureInfo` requests, enter the workflow's location. For more information about Query Transform workflows, see "Create a Query Transform Workflow" in the Workflow Designer help system.

- **Search Non-Text Fields:** (ArcGIS Server feature layers) When this check box is selected, Global Search searches all types of field, instead of just text fields.

- **Disable Client Caching:** (ArcGIS Server dynamic map services, feature layers, and image services) When this check box is selected, map images and feature data are never loaded from the browser's cache—the data is always requested from the server. This is useful if the map service changes frequently and end users need to see the most up-to-date map data.

  > **NOTE** Client caching improves performance. If you disable client caching, performance will be slower.

  > **NOTE** In the HTML5 Viewer, Disable Client Caching is not supported for feature layers.

- **Output Fields:** (ArcGIS Server feature layers) Output fields are the fields in a feature layer that are available in the viewer for client-side operations like editing.

For example, suppose a feature layer has five fields and you configure two of the fields as output fields. When a viewer requests the feature layer, the server only sends the two output fields for each feature. This means the other three fields cannot be used in client-side operations like editing. The excluded fields are still available for server-side operations like search and identify.

By default, all the fields in the layer are output fields. This is represented in Manager by an asterisk (*****) in the Output Fields box. If there are some fields that you do not want to be available in viewers, replace the asterisk with a comma-separated list of field names.

- **Query Mode:** (ArcGIS Server feature layers) The query mode determines when the viewer requests feature data from the server:

    - **Snapshot:** The viewer gets all the available features at one time. This is useful if the map extent does not change.

    - **Selection Only:** The viewer gets the currently selected feature. The viewer requests one feature at a time.

    - **On Demand:** The viewer gets the features for the current extent, as well as On Demand Cache Size additional features. The viewer requests more features as the map extent changes.
    The On Demand query mode has additional settings:

        - **On Demand Cache Size:** The number of features to cache, in addition to the features in the current extent.

            > **NOTE** The On Demand Cache Size setting applies to Silverlight viewers only—the HTML5 Viewer does not support this setting.

        - **Tile Height** and **Tile Width:** If the feature layer takes a long time to load, adjusting the tile size may improve the performance. A layer whose features are sparsely distributed may load faster with a larger size. If the features are densely distributed, a smaller tile size may improve load times. The default tile size is 512 px X 512 px. For more information, refer to the ArcGIS documentation on Vector Tiling.

            > **NOTE** The Tile Height and Tile Width settings apply to HTML5 viewers only.

Editing

In order to be editable, a feature layer must have editing enabled in ArcGIS Server.

The HTML5 and Silverlight Viewers both support editing of feature layers. The HTML5 Viewer also supports offline editing. For more information, refer to the *Geocortex Viewer for HTML5 Administrator and Developer Guide* and the *Geocortex Viewer for Silverlight Administrator and Developer Guide*.

- **Auto Save:** (ArcGIS Server feature layers) When this check box is selected, an end user's editing changes are submitted immediately, without the user having to save the changes.

    > **NOTE** The Auto Save setting applies to Silverlight viewers only—the HTML5 Viewer does not support Auto Save.

- **Move Enabled:** (ArcGIS Server feature layers) When this check box is selected, the end user can move the layer's features on the map.

- **Rotate Enabled:** (ArcGIS Server feature layers, excluding point layers) When this check box is selected, the end

user can rotate the layer's features.

- **Scale Enabled:** (ArcGIS Server feature layers, excluding point layers) When this check box is selected, the end user can scale the layer's features.

- **Edit Vertices Enabled:** (ArcGIS Server feature layers, excluding point layers) When this check box is selected, the end user can change feature geometries by moving a feature's vertices.

10.8 Set a Map Service's Default Visibility

A map service's visibility setting controls whether the map service is initially turned on in the Layer List when the end user launches a viewer. A map service must be turned on in the Layer List for the user to be able to see the map service's layers on the map. The layers only show on the map if they are visible at the initial extent's zoom level—the user may have to zoom the map in or out to see a layer's features.

If you include a map service in the Layer List, the end user can change the visibility of the map service or its folder. See **Configure the Layer List** on page **185** for instructions.

▶ **To configure a map service's default visibility:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.

   You cannot change the default visibility of dynamic map services on the Map Services tab. Instead, click the Layer List tab and set the default visibility for the map service's folder.

2. Configure the visibility:

   - To configure the map service to be turned on initially, select the check box to the left of the map service's name.

   - To configure the map service to be turned off initially, clear the check box to the left of the map service's name.
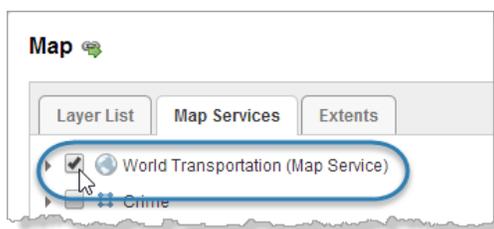
Set the initial visibility for the World Transportation map service

3. Click **Apply Changes**.

4. Click **Save Site**.

10.9 Exclude Layers from a Dynamic Map Service

In Essentials, you can exclude individual map layers that belong to dynamic services, such as ArcGIS Server dynamic map services and WMS services. If you exclude a layer, it cannot be accessed by client applications.

Excluding a layer does not remove it. You can re-include a layer that was previously excluded. By default, all layers are included.

▶ **To exclude and re-include layers:**

1. In Manager, edit the map service that you want to configure.

2. Click the **Add/Remove Layers** tab.

3. To exclude one or more layers, select the layers in the **Included Layers** column, and then click the **»** button.
   To re-include layers that have been excluded, select the layers in the **Excluded Layers** column, and then click the **«** button.
   To select multiple layers, hold the **Ctrl** key down while selecting layers.

   > You cannot include or exclude individual sub-layers within a group layer. You must include or exclude the entire group layer.

4. Click **Submit Layer Changes**.

5. Click **Save Site**.

10.10 Remove a Map Service

Removing a map service does not remove the map service's folder from the Layer List. This ensures that any other items in the folder are not affected when you remove the service. If there were no other items in the folder, the folder will be empty after you remove the map service. Empty folders do not show in viewers.

▶ **To remove a map service from a site:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.

2. Click the **Remove** tool 🗑 beside the map service that you want to remove.
   You are prompted to confirm.

3. Click **OK**.
   The map service is removed from the Map Services tab.

4. If removing the map service left an empty folder in the Layer List, and you want to remove the folder:

   > 💡 Viewers do not display empty folders in the list of map layers.

   a. Click the **Layer List** tab.

   b. Click the **Remove** tool 🗑 beside the empty folder.
      You are prompted to confirm.

   c. Click **OK**.
      The folder is removed from the Layer List.

5. Click **Apply Changes**.

6. Click **Save Site**.

11 Service Connections

Service connections store the information that Essentials needs in order to connect to services. This information includes a service's URL, security information if the service is secured, and, depending on the service type, possibly some other information.

Service connections have three purposes:

- **Search by Keyword:** Service connections enable you to search for services using search terms (keywords) when you are adding services to the map. For example, searching for **Street** searches all your configured service connections for services that have "Street" in the service name or URL. If a service connection is configured to search for layers in addition to services, the Search function also searches layer names.

- **Access Secured Services:** If a service is secured, you must add a service connection before you can search for the service or add the service to the map.

- **Bookmark Favorite Services:** Service connections enable you to save the connection information for services that you work with frequently. You can also sort your service connections, so you can put the connections that you use the most at the top of the list.

Service connections are shared by all the sites in an instance of Essentials. When you add a service connection to one site in an instance of Essentials, it becomes available in all the sites in that instance of Essentials. If you remove a service connection in one site, the service connection is removed from the other sites.

> You cannot add service connections for GeoRSS layers. This means that you cannot search for GeoRSS layers by keyword in Manager. To add a GeoRSS layer to the map, you must enter the URL.

11.1 Access Service Connections in Manager

There are two places in Manager where you can manage service connections:

- **Main Service Connections Tab:** You can click the main Service Connections tab from any page in Manager.

- **Add Map Service Dialog Box:** The Add Map Service dialog has a Service Connections tab that provides access to the same list of service connections that appears on the main Service Connections tab.

The two Service Connections tabs are synchronized—when you change the service connections on one Service Connections tab, the change is reflected on the other Service Connections tab.

Both Service Connections tabs provide the same functions for managing service connections, such as adding new service connections and viewing layer previews. The Service Connections tab in the Add Map Service dialog box has an additional function—it allows you to select a map service or layer and add it to the map.

▶ **To open the Add Map Service dialog box:**

1. In Manager, edit a site, and then click **Map** in the side panel.

2. Click **Add Map Service**.

11.2 Add Service Connections

Follow the instructions for the type of service connection that you want to add.

11.2.1 Portal for ArcGIS Service Connections

Portal for ArcGIS service connections allow you to search Portal for ArcGIS portals for web maps to add to the map.

When Essentials is registered with Portal for ArcGIS, your Essentials installation has a built-in Portal for ArcGIS service connection which does not appear in the list of service connections. The built-in connection enables you to search your private Portal for ArcGIS content, as well as public Portal for ArcGIS content.

In addition, the built-in Portal for ArcGIS service connection can be searched from viewers that allow end users to add layers to the map. For more information, see **Configure User Layer Addition in a Silverlight Viewer** on page **385**

The only way to use **private** Portal for ArcGIS content in Essentials sites is to register Essentials with Portal for ArcGIS. For information about registering Essentials with Portal for ArcGIS, see "Choose a Sign-In Method" in the *Geocortex Essentials Installation Guide*.

Regardless of whether Essentials is registered with Portal for ArcGIS, you can configure as many Portal for ArcGIS service connections as you want.

> ▶ **To add a Portal for ArcGIS service connection:**

1. In Manager, click the **Service Connections** tab.

   💡 You can also add service connections when you are adding a map service—the Add Map Service dialog box has a Service Connections tab where you can manage service connections.

2. Click ⊕ **Add Connection**.

3. In the **Display Name** box, type a name for the service connection.

   Manager uses the display name in the list of service connections on the Service Connections tab and in the Add Map Service dialog box. In addition, if you enable the end user to search this service connection when adding a layer to the map, the display name may appear in the viewer. For information, see **Configure User Layer Addition in a Silverlight Viewer** on page **385**.

   If you leave the Display Name box empty, the name is the service type followed by the service's URL.

4. In the **Connection Type** box, select **Portal for ArcGIS**.

5. **URL:** Type or paste the portal's URL.

   For example, `https://server.domain.com/sharing/rest/`, where `server.domain.com` is the Portal for ArcGIS host name.

6. **Service Discovery Settings:**

   - **Search In:** If you want the Search function to be able to search this service connection in Manager only, select **Manager**. If you also want viewers to be able to search this service connection, select **Manager and Viewers**. The ability to search service connections from a viewer is used by the User Layer Addition feature.

     📌 The Geocortex Viewer for Silverlight 2.0 and higher supports User Layer Addition. The Geocortex Viewer for HTML5 does not support User Layer Addition.

7. Click **OK**.

   Manager connects to the service using the settings that you have configured. The dialog box closes and the service connection appears at the bottom of the list of connections.

8. In the list of connections, drag the new connection to the position in the list that you want it.

See also...

11.2.2 ArcGIS Online Service Connections

ArcGIS Online service connections allow you to search ArcGIS Online for services and web maps to add to the map.

When Essentials is registered with ArcGIS Online, your Essentials installation has a built-in ArcGIS Online service connection which does not appear in the list of service connections. The built-in connection enables you to search your private ArcGIS Online content, as well as public ArcGIS Online content.

The only way to use private ArcGIS Online content in Essentials sites is to register Essentials with ArcGIS Online. For information about registering Essentials with ArcGIS Online, see "Choose a Sign-In Method" in the *Geocortex Essentials Installation Guide*.

> You cannot add an ArcGIS Online service connection when Essentials is registered with ArcGIS Online—there is no reason to, when your site has a built-in connection.

The built-in ArcGIS Online service connection can be searched from viewers that allow end users to add layers to the map. For more information, see **Configure User Layer Addition in a Silverlight Viewer** on page **385**

If Essentials is not registered with ArcGIS Online, your Essentials installation has an ArcGIS Online service connection by default. If you delete the default ArcGIS Online connection, you can add it back following the instructions below.

▶ **To add an ArcGIS Online service connection:**

1. In Manager, click the **Service Connections** tab.

   > You can also add service connections when you are adding a map service—the Add Map Service dialog box has a Service Connections tab where you can manage service connections.

2. Click ⊕ **Add Connection**.

3. In the **Connection Type** box, select **ArcGIS Online**.

4. **Service Discovery Settings:**

   - **Search In:** If you want the Search function to be able to search this service connection in Manager only, select **Manager**. If you also want viewers to be able to search this service connection, select **Manager and Viewers**. The ability to search service connections from a viewer is used by the User Layer Addition feature.

     > The Geocortex Viewer for Silverlight 2.0 and higher supports User Layer Addition. The Geocortex Viewer for HTML5 does not support User Layer Addition.

5. Click **OK**.

Manager connects to the service using the settings that you have configured. The dialog box closes and the service connection appears at the bottom of the list of connections.

6. In the list of connections, drag the new connection to the position in the list that you want it.

See also...

[Add a Map Service to the Map](#) on page **98**

11.2.3 ArcGIS Server Service Connections

Adding an ArcGIS Server service connection allows you to search ArcGIS Server catalogs and folders for services and layers to add to the map.

> If the ArcGIS Server service is hosted on ArcGIS Online, you must add an ArcGIS Online service connection, not an ArcGIS Server service connection.

To add an ArcGIS Server service connection:

1. In Manager, click the **Service Connections** tab.

    > You can also add service connections when you are adding a map service—the Add Map Service dialog box has a Service Connections tab where you can manage service connections.

2. Click ⊕ **Add Connection**.

3. In the **Display Name** box, type a name for the service connection.

    Manager uses the display name in the list of service connections on the Service Connections tab and in the Add Map Service dialog box. In addition, if you enable the end user to search this service connection when adding a layer to the map, the display name may appear in the viewer. For information, see **[Configure User Layer Addition in a Silverlight Viewer](#)** on page **385**.

    If you leave the Display Name box empty, the name is the service type followed by the service's URL.

4. In the **Connection Type** box, select **ArcGIS Server**.

5. **URL:** Type or paste the URL for the service, catalog, or folder.

    For example, `http://server.domain.com/arcgis/rest/services`, where `server.domain.com` is the ArcGIS Server host name.

6. **Authentication Settings:** If the map service is secured, select the authentication method for Essentials to use when connecting to the service.

    > If you are using a proxy page, Essentials uses the settings that you configure here to access the proxy page, rather than to access the service itself.

    -   **Web Tier (default or anonymous credentials):** Select this option if:
        -   the service is secured using Integrated Windows Authentication and you want Essentials to authenticate as the application pool user, or,
        -   the service is not secured.

- **Web Tier (configured credentials):** Select this option if:
  - the service is secured using basic or digest authentication, or,
  - the service is secured using Integrated Windows Authentication and you want to configure the credentials for Essentials to use when authenticating.

  In the **Username** and **Password** boxes, type the credentials that you want Essentials to use.

  - **Token Security (by user):** Select this option if the service is secured using token security. In the **Username** and **Password** boxes, type the credentials that you want Essentials to use when authenticating. If you have changed the location where tokens are issued, type the URL of the location in the **Token URL** box.

7. **Proxy Settings:** If you are using a proxy page, type or paste the proxy page's URL in the **Proxy URL** box. For example, `http://host.domain.com/MapServiceProxy/proxy.ashx`.

8. **Service Discovery Settings:**

- **Search In:** If you want the Search function to be able to search this service connection in Manager only, select **Manager**. If you also want viewers to be able to search this service connection, select **Manager and Viewers**. The ability to search service connections from a viewer is used by the User Layer Addition feature.

  > The Geocortex Viewer for Silverlight 2.0 and higher supports User Layer Addition. The Geocortex Viewer for HTML5 does not support User Layer Addition.

- **Search For:** If you want the Search function to search for services only, select **Map Services**. If you want the Search function to also search for layers, select **Map Services and Layers**.

  > Searching for layers affects the performance of the Search function. You should only enable searching for layers if the catalog is reasonably small.

9. Click **OK**.
   Manager connects to the service using the settings that you have configured. The dialog box closes and the service connection appears at the bottom of the list of connections.

10. In the list of connections, drag the new connection to the position in the list that you want it.

See also...

[**Add a Map Service to the Map** on page **98**](#)

11.2.4 WMS Service Connections

> **To add a WMS service connection:**

1. In Manager, click the **Service Connections** tab.

   > You can also add service connections when you are adding a map service—the Add Map Service dialog box has a Service Connections tab where you can manage service connections.

2. Click ⊕ **Add Connection**.

3. In the **Display Name** box, type a name for the service connection.

   Manager uses the display name in the list of service connections on the Service Connections tab and in the Add Map Service dialog box. In addition, if you enable the end user to search this service connection when adding a layer to the map, the display name may appear in the viewer. For information, see **Configure User Layer Addition in a Silverlight Viewer** on page **385**.

   If you leave the Display Name box empty, the name is the service type followed by the service's URL.

4. In the **Connection Type** box, select **WMS (Web Map Service)**.

5. **URL:** Type or paste the service's URL.

   For example, `http://server.domain.com/ows/wms`, where `server.domain.com` is the host name.

6. **Authentication Settings:** If the map service is secured, select the authentication method for Essentials to use when connecting to the service.

   > **NOTE** If you are using a proxy page, Essentials uses the settings that you configure here to access the proxy page, rather than to access the service itself.

   - **Web Tier (default or anonymous credentials):** Select this option if:
     - the service is secured using Integrated Windows Authentication and you want Essentials to authenticate as the application pool user, or,
     - the service is not secured.

   - **Web Tier (configured credentials):** Select this option if:
     - the service is secured using basic or digest authentication, or,
     - the service is secured using Integrated Windows Authentication and you want to configure the credentials for Essentials to use when authenticating.

     In the **Username** and **Password** boxes, type the credentials that you want Essentials to use.

7. **Proxy Settings:** If you are using a proxy page, type or paste the proxy page's URL in the **Proxy URL** box.

   For example, `http://host.domain.com/MapServiceProxy/proxy.ashx`.

8. **Service Discovery Settings:**

   - **Search In:** If you want the Search function to be able to search this service connection in Manager only, select **Manager**. If you also want viewers to be able to search this service connection, select **Manager and Viewers**. The ability to search service connections from a viewer is used by the User Layer Addition feature.

     > **NOTE** The Geocortex Viewer for Silverlight 2.0 and higher supports User Layer Addition. The Geocortex Viewer for HTML5 does not support User Layer Addition.

   - **Search For:** If you want the Search function to search for services only, select **Map Services**. If you want the Search function to also search for layers, select **Map Services and Layers**.

     > **NOTE** Searching for layers affects the performance of the Search function. You should only enable searching for layers if the catalog is reasonably small.

9. Click **OK**.

   Manager connects to the service using the settings that you have configured. The dialog box closes and the service connection appears at the bottom of the list of connections.

10. In the list of connections, drag the new connection to the position in the list that you want it.

    WMS service connections have check boxes to set the default visibility for the layers. If you use the service connection to add the service, the service inherits the visibility settings from the service connection. You can also change the visibility settings for the service after you have added it.

See also...

Add a Map Service to the Map on page **98**

11.2.5 WMTS Service Connections

▶ **To add a WMTS service connection:**

1. In Manager, click the **Service Connections** tab.

   You can also add service connections when you are adding a map service—the Add Map Service dialog box has a Service Connections tab where you can manage service connections.

2. Click ⊕ **Add Connection**.

3. In the **Display Name** box, type a name for the service connection.

   Manager uses the display name in the list of service connections on the Service Connections tab and in the Add Map Service dialog box. In addition, if you enable the end user to search this service connection when adding a layer to the map, the display name may appear in the viewer. For information, see **Configure User Layer Addition in a Silverlight Viewer** on page **385**.

   If you leave the Display Name box empty, the name is the service type followed by the service's URL.

4. In the **Connection Type** box, select **WMTS (Web Map Tiled Service)**.

5. **URL:** Type or paste the service's URL.

   For example, `http://server.domain.com/ows/wms`, where `server.domain.com` is the host name.

6. **Authentication Settings:** If the map service is secured, select the authentication method for Essentials to use when connecting to the service.

   If you are using a proxy page, Essentials uses the settings that you configure here to access the proxy page, rather than to access the service itself.

   • **Web Tier (default or anonymous credentials):** Select this option if:

     • the service is secured using Integrated Windows Authentication and you want Essentials to authenticate as the application pool user, or,

     • the service is not secured.

- **Web Tier (configured credentials):** Select this option if:
    - the service is secured using basic or digest authentication, or,
    - the service is secured using Integrated Windows Authentication and you want to configure the credentials for Essentials to use when authenticating.

    In the **Username** and **Password** boxes, type the credentials that you want Essentials to use.

7. **Proxy Settings:** If you are using a proxy page, type or paste the proxy page's URL in the **Proxy URL** box.

    For example, `http://host.domain.com/MapServiceProxy/proxy.ashx`.

8. **Service Discovery Settings:**

    - **Search In:** If you want the Search function to be able to search this service connection in Manager only, select **Manager**. If you also want viewers to be able to search this service connection, select **Manager and Viewers**. The ability to search service connections from a viewer is used by the User Layer Addition feature.

        > **NOTE** The Geocortex Viewer for Silverlight 2.0 and higher supports User Layer Addition. The Geocortex Viewer for HTML5 does not support User Layer Addition.

    - **Search For:** If you want the Search function to search for services only, select **Map Services**. If you want the Search function to also search for layers, select **Map Services and Layers**.

        > **NOTE** Searching for layers affects the performance of the Search function. You should only enable searching for layers if the catalog is reasonably small.

9. Click **OK**.

    Manager connects to the service using the settings that you have configured. The dialog box closes and the service connection appears at the bottom of the list of connections.

10. In the list of connections, drag the new connection to the position in the list that you want it.

See also...

11.2.6 Bing Maps Service Connections

Adding a Bing Maps service connection allows you to search for Bing Maps layers, and ArcGIS web maps that contain Bing Maps layers, to add to the map.

> **To add a Bing Maps service connection:**

1. In Manager, click the **Service Connections** tab.

    > You can also add service connections when you are adding a map service—the Add Map Service dialog box has a Service Connections tab where you can manage service connections.

2. Click ⊕ **Add Connection**.

3. In the **Connection Type** box, select **Bing Maps**.

4. Type your Bing Maps key in the **Bing Maps Key** box.

5. **Service Discovery Settings:**

   - **Search In:** If you want the Search function to be able to search this service connection in Manager only, select **Manager**. If you also want viewers to be able to search this service connection, select **Manager and Viewers**. The ability to search service connections from a viewer is used by the User Layer Addition feature.

     > **NOTE** The Geocortex Viewer for Silverlight 2.0 and higher supports User Layer Addition. The Geocortex Viewer for HTML5 does not support User Layer Addition.

6. Click **OK**.

   Manager connects to the service using the settings that you have configured. The dialog box closes and the service connection appears at the bottom of the list of connections.

7. In the list of connections, drag the new connection to the position in the list that you want it.

See also...

11.2.7 Web Tiled Layer Service Connections

▶ **To add a web tiled layer service connection:**

1. In Manager, click the **Service Connections** tab.

   > 💡 You can also add service connections when you are adding a map service—the Add Map Service dialog box has a Service Connections tab where you can manage service connections.

2. Click ⊕ **Add Connection**.

3. In the **Display Name** box, type a name for the service connection.

   Manager uses the display name in the list of service connections on the Service Connections tab and in the Add Map Service dialog box. In addition, if you enable the end user to search this service connection when adding a layer to the map, the display name may appear in the viewer. For information, see **Configure User Layer Addition in a Silverlight Viewer** on page **385**.

   If you leave the Display Name box empty, the name is the service type followed by the service's URL.

4. In the **Connection Type** box, select **Web Tiled Layer**.

5. **Display Name:** Type a display name for the web tiled layer.

   The display name appears in Manager, and in the Layer List in the viewer. When you search for services by keyword, the display name is searched.

6. **URL Template:** Type the URL template for the tile server.

   The URL template must contain the `{level}`, `{col}`, and `{row}` tokens. For example, a URL template might have the following form:

   ```
   http://{subdomain}.server.domain.com/{level}/{col}/{row}.png
   ```

See **Web Tiled Layers** on page **139** for more information.

Some web tiled services use dollar signs ($) in their URL templates. Dollar signs are optional in Essentials.

7. **Subdomains:** If the URL template contains the `{subdomain}` token, list the subdomains that you want to submit tile requests to. Separate the subdomains in the list using commas.

8. **Copyright:** If you want to credit the organization that publishes the web tiled service, type the copyright statement in the Copyright box. The copyright appears in the lower right corner of the map.

   The copyright can include HTML markup. This means you can include a hyperlink to the organization's website. For example:

   ```
   © <a href="http://www.openstreetmap.org/copyright" target="_
   blank">OpenStreetMap</a> contributors
   ```

   appears on the map as: **© OpenStreetMap contributors**.

9. **Service Discovery Settings:**

   - **Search In:** If you want the Search function to be able to search this service connection in Manager only, select **Manager**. If you also want viewers to be able to search this service connection, select **Manager and Viewers**. The ability to search service connections from a viewer is used by the User Layer Addition feature.

     The Geocortex Viewer for Silverlight 2.0 and higher supports User Layer Addition. The Geocortex Viewer for HTML5 does not support User Layer Addition.

10. Click **OK**.

    Manager connects to the service using the settings that you have configured. The dialog box closes and the service connection appears at the bottom of the list of connections.

11. In the list of connections, drag the new connection to the position in the list that you want it.

See also...

Add a Map Service to the Map on page **98**

11.3 Edit a Service Connection

Modifying a service connection has no effect on services that have already been added to the map—the changes only affect newly added services and layers. To modify a service that has already been added to the map, edit the service.

▶ **To edit a service connection:**

1. In Manager, click the **Service Connections** tab.

2. In the list of service connections, select the service connection that you want to edit.

3. Click the **Edit Connection** hyperlink.

4. Update the settings.

Your changes take effect immediately.

For information on individual settings, refer to the section on adding a service connection.

See also...

Edit a Map Service on page **101**

11.4   Enable Searching a Service Connection from Viewers

To search service connections from a viewer, the viewer must support the User Layer Addition feature. The Geocortex Viewer for Silverlight 2.0 and higher supports User Layer Addition. The Geocortex Viewer for HTML5 does not support User Layer Addition.

The ability to search a service connection from a viewer is controlled by the service connection's **Search In** setting. By default, a service connection can be searched in **Manager** only. You can change the setting to search in **Manager and Viewers**.

When an end user performs a keyword search to add services, the viewer searches all the configured service connections that have the Search In setting set to **Manager and Viewers**. The user can select a service in the search results and add it to the map.

You can change the Search In setting at any time by editing the service connection. Follow the instructions below.

▶ **To enable a service connection to be searched from Geocortex viewers:**

If Essentials is registered with Portal for ArcGIS, your Essentials installation has a built-in Portal for ArcGIS service connection. The built-in Portal for ArcGIS service connection can be searched from viewers. If you have configured additional Portal for ArcGIS service connections, you can configure whether they can be searched from viewers.

Similarly, if Essentials is registered with ArcGIS Online, your Essentials installation has a built-in ArcGIS Online service connection that can be searched by viewers.

1. In Manager, click the **Service Connections** tab.

2. In the list of service connections, select the service connection that you want to configure.

3. Click the **Edit Connection** hyperlink.

4. Select **Manager and Viewers** for the **Search In** setting.
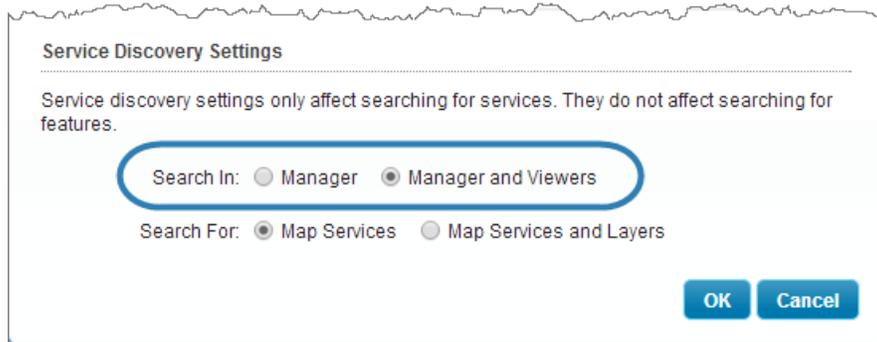
Enable searching the service connection in viewers

The change takes effect immediately.

12 ArcGIS Server Feature Layers

A feature layer is a special type of graphics layer that automatically retrieves data from an ArcGIS Server layer and then renders the geometry on the client.

Feature layers support rich client-side functionality, such as dynamic re-symbolization, charts, clustering, heat maps, and client-side editing that can be applied back to the server.

Essentials supports feature layers from ArcGIS Server feature services and ArcGIS Server map services.

- **Feature Layer from Feature Service:**
    - Layers from feature services must be added to the map as feature layers.
    - You can only add one layer from a feature service at a time. To add multiple feature layers from a feature service, add them one at a time.
    - Feature layers from feature services can support the full range of client-side functionality, including client-side editing.

- **Feature Layer from Map Service:**
    - Layers from map services can be added to the map as feature layers, or as map services.
    - You can only add one layer from a map service as a feature layer at one time.
    - Feature layers from map services can support all the client-side functionality except editing.

12.1 Edit a Feature Layer

On the Map Services tab, feature layers have two parts:

- **Service Component:** The service component of a feature layer allows you to configure service settings, such as connection settings, and service-level features, such as clustering and heat maps.
- **Layer Component:** The layer component of a feature layer allows you to configure layer settings, such as the information to display in feature descriptions, and layer-level features such as charts, reports, and data links.

The service component does not appear on the Layer List tab. This makes the feature layer appear as a single item in a viewer's Layer List.
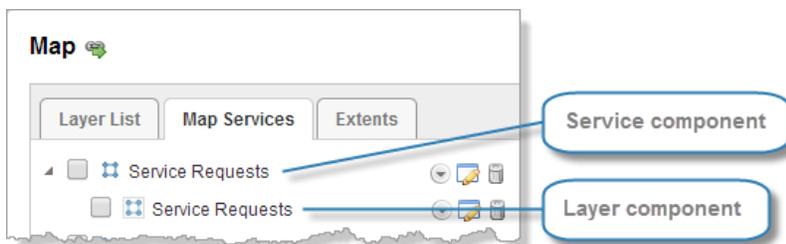
Feature layer shown on the Map Services tab on Manager's Map pge

▶ **To edit the service component of a feature layer:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.

2. Click the **Edit Map Service** icon beside the service component of the feature layer that you want to edit.

▶ **To edit the layer component of a feature layer:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.

   💡 You can also edit the layer component on the Layer List tab, if the feature layer is in the Layer List.

2. Click the **Edit Layer** icon beside the layer component of the feature layer that you want to edit.

See also...

Map Service Settings on page **103**

12.2 Add Clustering to a Feature Layer

If the features in a feature layer are close together at the current zoom level, their symbols overlap. This makes the features difficult to distinguish. Clustering resolves this issue by using a single symbol to represent features that are close together. The cluster symbol displays the number of features that it represents. Users can click a cluster symbol to see the feature descriptions of the features in the cluster. Panning or zooming the map updates the clusters.
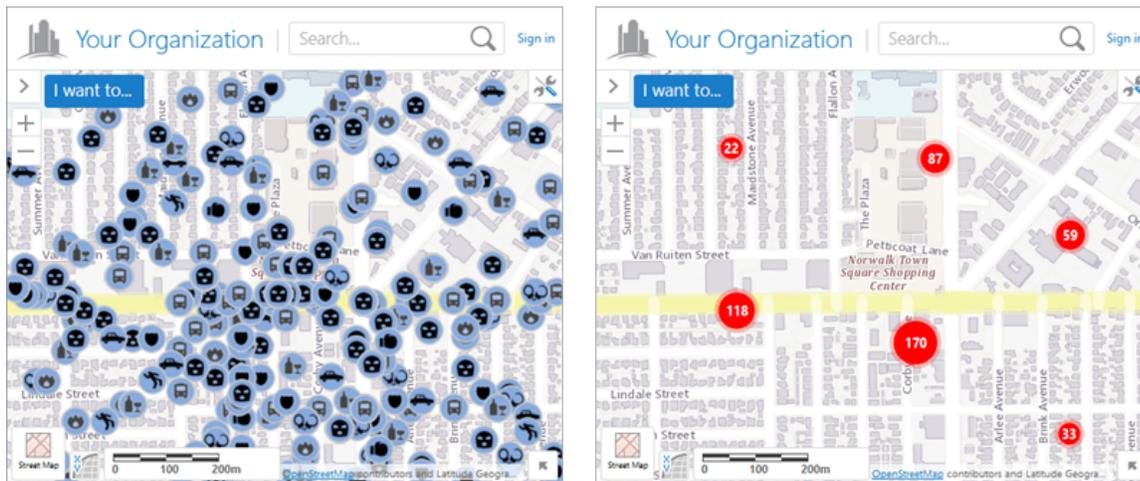
Crime data unclustered (left) and clustered (right), shown in an HTML5 viewer

You can configure the default visibility of clustering, and you can enable end users to turn clustering on and off.

Clustering is one method of visualizing data. Heat mapping is another method.

12.2.1 Clustering in the HTML5 Viewer

In HTML5 viewers, clustering works for feature layers from feature services only. It does not work for feature layers from map services or for other types of service or layer.

When a user clicks a cluster symbol in an HTML5 viewer, the cluster symbol is replaced by the symbols for the individual features and all of the other clusters are hidden. A map tip that lists the cluster's features opens, as well.

Clicking a cluster symbol (left) shows the individual features and a map tip (right)

Cluster symbols show in the map legend and in legend swatches in the Layer List. At most four cluster symbols show.
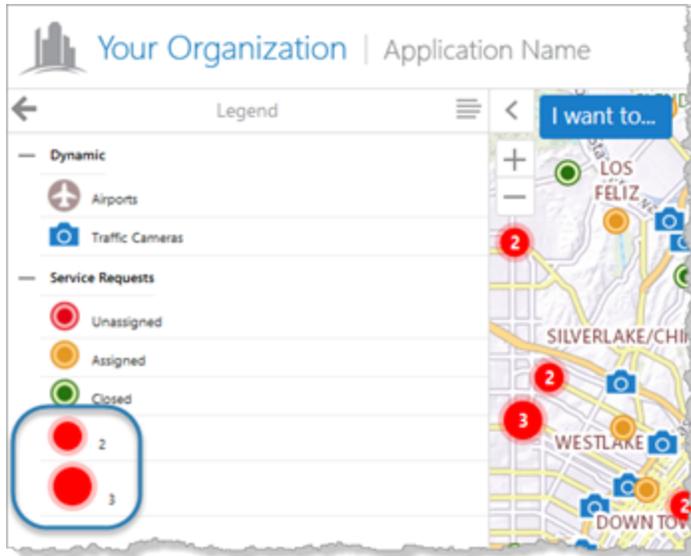
Cluster symbols in the map legend

The HTML5 Viewer supports exporting, printing, a reporting of map images with clusters. Exporting the map image when clusters show on the map produces an image that is nearly identical to the map image in the viewer. Map images in printouts and reports may not look exactly like the map in the viewer. The map image has to fit in the frame that is defined in the print or report template, and the frame's proportions may be different than the map's proportions in the

viewer. As well, the scale in the viewer may be different than the scale that is used to produce the printout or report. Printing and reporting recalculate the clusters so the clusters are accurate for the scale and proportions used in the printout or report.

The HTML5 Viewer supports clustering on point layers only. The HTML5 Viewer does not support clustering on line and polygon layers.

> You may want to remove clustering from line and polygon feature layers. If you allow end users to turn on clustering for a line or polygon layer, it will not have any effect on the map.

12.2.2 Clustering in the Silverlight Viewer

In Silverlight viewers, clustering works for feature layers from feature services, imported CSV files, and shapefiles. Clustering does not work for feature layers from map services.

Symbols for small clusters are interactive in Silverlight viewers. When the user hovers the pointer over the cluster symbol, the symbol fans out to show symbols for the individual features in the cluster. Clicking one of the feature symbols shows the feature description for that feature in the Results List. The user can also click the cluster symbol itself to see the feature descriptions for all the features in that cluster.
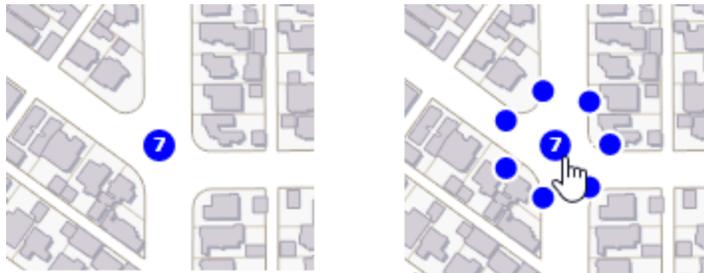
Cluster with seven features (left), shown fanned out (right)

Symbols for large clusters do not fan out when the pointer hovers over the symbol. Users can click the cluster symbol to see the feature descriptions for all the cluster's features. The Silverlight Viewer displays the feature descriptions in the Results List.

By default, to be represented by an interactive symbol, a cluster can contain at most 10 features. You can change this value.
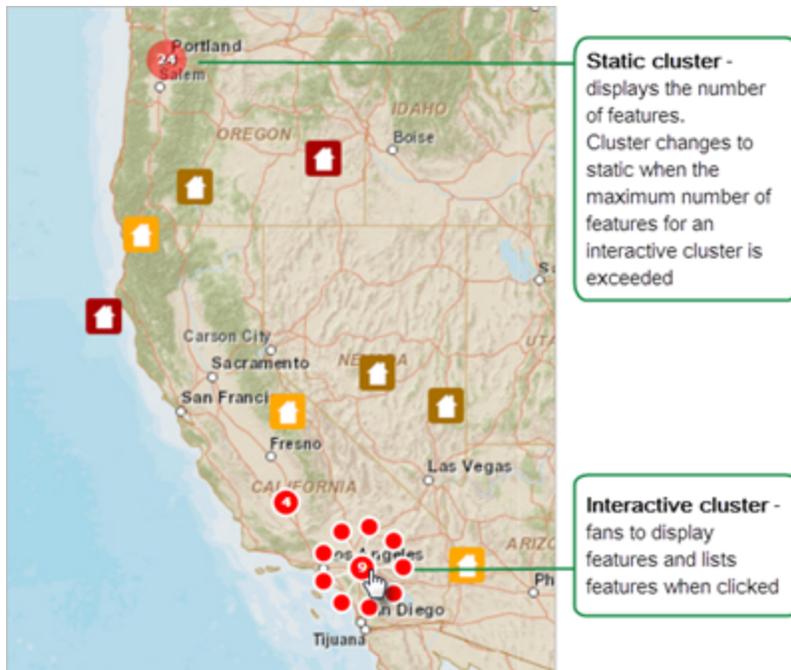
Cluster symbols shown in a Silverlight viewer

You can configure the color of interactive cluster symbols. You cannot change the appearance of static cluster symbols. The color of static symbols is based on a gradient that depends on the number of features in the cluster.

For clustering to work in the Geocortex Viewer for Silverlight, the Feature Clustering Module must be present in the `Viewer.Defaults.xml` file.

The Silverlight Viewer supports clustering on point, line, and polygon feature layers that belong to a feature service. The Silverlight Viewer also supports clustering on user-added layers and on features that the user adds by importing a CSV file or shapefile.

The Silverlight Viewer does not support exporting and printing of clusters—features appear individually in exported map images and printouts.

12.2.3 Configure Clustering

▶ **To configure clustering:**

1. In Manager, edit the map service that you want to configure.
   Make sure you edit the feature layer's map service component, not the layer component.

2. Click the **Feature Clustering** tab.

3. Configure the settings:

   - **Enabled**: Specifies whether clustering is initially turned on or off. If you want features to be clustered when end users first view the layer, select the check box. By default, clustering is turned off initially.

   > **NOTE** If you enable clustering, make sure that heat maps are disabled for this layer—clustering and heat maps cannot both show at the same time.

- **User Can Enable/Disable**: Specifies whether end users can turn clustering on and off. In HTML5 viewers, enabling this setting also allows users to change the radius and maximum cluster size. By default, users can turn clustering on and off. If you do not want users to be able to turn clustering on and off, clear the check box.

  > **NOTE** If you do not want users to be able to turn clustering off, you must clear the User Can Enable/Disable check boxes for both clustering and heat maps. When a user turns on heat maps, clustering turns off, regardless of whether users can enable and disable clustering. The screen capture below shows the configuration to use if you do not want users to be able to turn clustering off by any means.
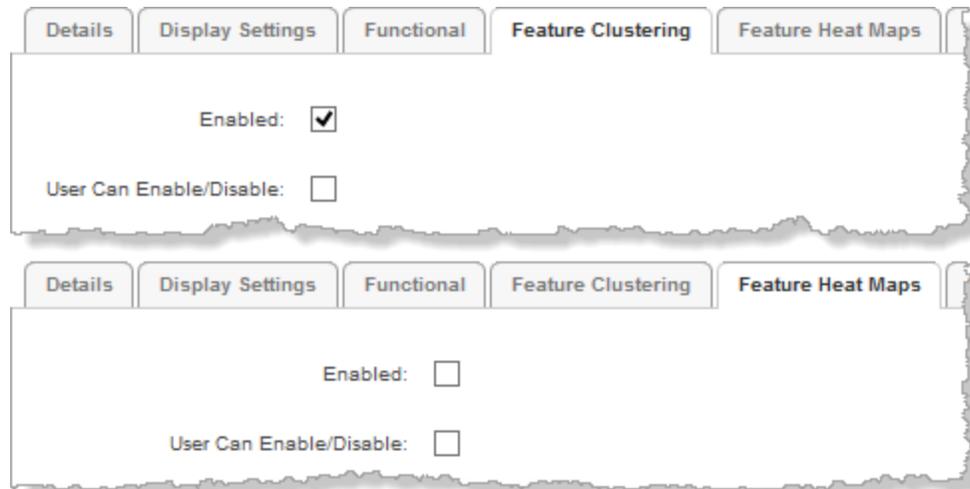
  Settings to use if you want clustering always turned on

- **Background Color**: Sets the fill color of the cluster symbol. Click the color picker to select a color, or type in the color's HTML name (for example, **red**) or hex value (for example, **#FF0000**). The default is red. In Silverlight viewers, this setting applies to the symbols for interactive clusters only.

- **Label Color**: Sets the color of the number on cluster symbols. Click the color picker to select a color, or type in the color's HTML name (for example, **white**) or hex value (for example, **#FFFFFF**). The default is white.
  In Silverlight viewers, this setting also sets the symbol's border color. This setting applies to the symbols for interactive clusters only.

- **Radius**: Defines the maximum screen area within which features can be clustered in a single cluster. Increasing the radius can include more features in each cluster. Decreasing the radius can reduce the number of features in each cluster. If there is exactly one feature within the specified radius, the feature is represented on the map using the default symbol instead of a cluster symbol. The default radius is **20** pixels. In Silverlight viewers, this setting applies to both interactive and static clusters.

- **Cluster Size (HTML5)**: Specifies the maximum number of features that can be included in a cluster. If there are more than Cluster Size features within the area defined by Radius, multiple cluster symbols show for that radius.
  If you set Cluster Size to **0** (zero), there is no upper limit on the number of features in a cluster. The default cluster size for HTML5 viewers is **0**.

- **Cluster Size (Silverlight)**: Specifies the maximum number of features in a cluster that is represented by an interactive symbol. If a cluster has more than Cluster Size features, the cluster is represented by a static symbol. The default cluster size is **10**.

4. Click **Apply Settings**.

5. Click **Save Site**.

6. Test your configuration in the viewer to make sure that the radius and cluster size are appropriate for the layer's visible scales.

   The effectiveness of clustering depends on balancing the radius with the cluster size, so the clusters are dense enough but not too dense at the layer's visible scales.

▶ **To remove clustering from a layer:**

> The Silverlight Viewer supports clustering on line and polygon feature layers from feature services. The HTML5 Viewer does not support clustering on line and polygon layers. If you are using the HTML5 Viewer only, you may want to remove clustering from line and polygon feature layers. If you do not remove clustering, users will be able to select clustering in the Visualization Options panel, but it will not have any effect.

1. In Manager, edit the map service that you want to configure.

   Make sure you edit the feature layer's map service component, not the layer component.

2. Click the **Feature Clustering** tab.

3. Clear the **Enabled** check box.

4. Clear the **User Can Enable/Disable** check box.

5. Click **Apply Settings**.

6. Click **Save Site**.

   Clustering will be turned off for this feature layer and users will not be able to turn clustering on.

12.3 Add Heat Maps

Large amounts of point data on a map tend to overlap and can be difficult to interpret. Heat maps resolve this issue by representing data densities instead of individual features.

In heat maps, different colors are used to represent different density ranges—the highest density, medium density, and lowest density. The colors are configurable. In the screen capture below, the heat map uses yellow to represent the highest density of features, red to represent medium density, and blue to represent the lowest (non-zero) density.
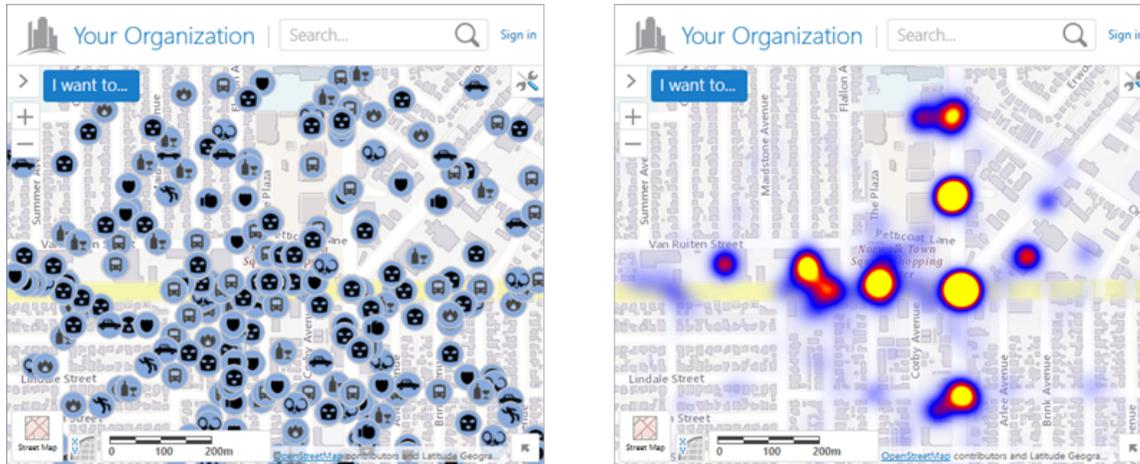
Crime data shown individually (left) and in a heat map (right), in an HTML5 viewer

You can configure the default visibility of heat maps, and you can enable end users to turn heat maps on and off. You can also configure settings that control the appearance of hot areas on the map, such as the colors and intensity. End users can change the intensity-related settings, and, in Silverlight viewers, the colors.

> If you do not configure the appearance settings in Manager, viewers use the default settings that are defined in the viewer's heat maps module. For information, refer to the *Geocortex Viewer for HTML5 Administrator and Developer Guide* and the *Geocortex Viewer for Silverlight Administrator and Developer Guide*.

Heat mapping works for point layers only—you cannot show heat maps for line or polygon layers. In HTML5 viewers, heat mapping works for feature layers from feature services only. In Silverlight viewers, heat mapping works for feature layers from feature services, imported CSV files, and shapefiles.

In HTML5 viewers, the colors that are used for a layer's heat maps show in the map legend and in legend swatches in the Layer List.
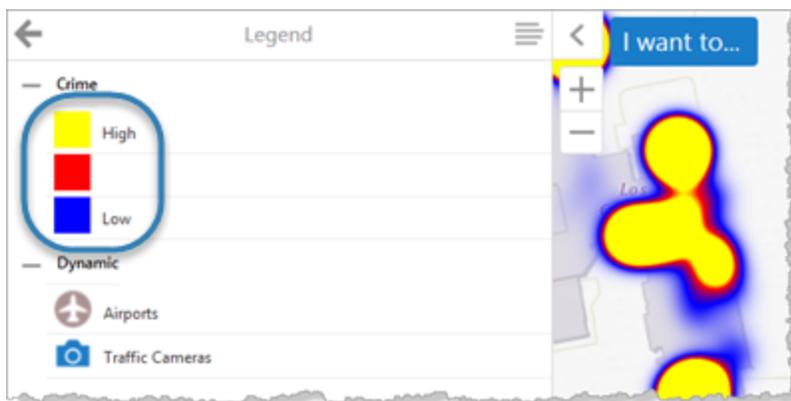
Heat mapping colors in the map legend of an HTML5 viewer

Heat mapping is one method of visualizing data. Clustering is another method.

▶ **To configure heat maps on a layer:**

1. In Manager, edit the map service that you want to configure.
   Make sure you edit the feature layer's map service component, not the layer component.

2. Click the **Feature Heat Maps** tab.

3. Configure the settings:

- **Enabled**: Specifies whether heat mapping is initially turned on or off. If you want features to be presented as a heat map when end users first view the layer, select the check box. By default, the check box is initially cleared.

  > If you enable heat maps, you should disable clustering for this layer—clustering and heat maps cannot both show at the same time.

- **User Can Enable/Disable**: Specifies whether users can turn heat mapping on and off. In HTML5 viewers, enabling this setting also allows users to change the intensity and intensity multiplier. In Silverlight viewers, enabling this setting also allows users to change the intensity, colors, and opacity. By default, users can turn heat mapping on and off. If you do not want users to be able to turn heat mapping on and off, clear the check box.

  > If you do not want users to be able to turn heat mapping off, you must clear the User Can Enable/Disable check boxes for both clustering and heat maps. When a user turns on clustering, heat mapping turns off, regardless of whether users can enable and disable heat maps. The screen capture below shows the configuration to use if you do not want users to be able to turn heat mapping off by any means.
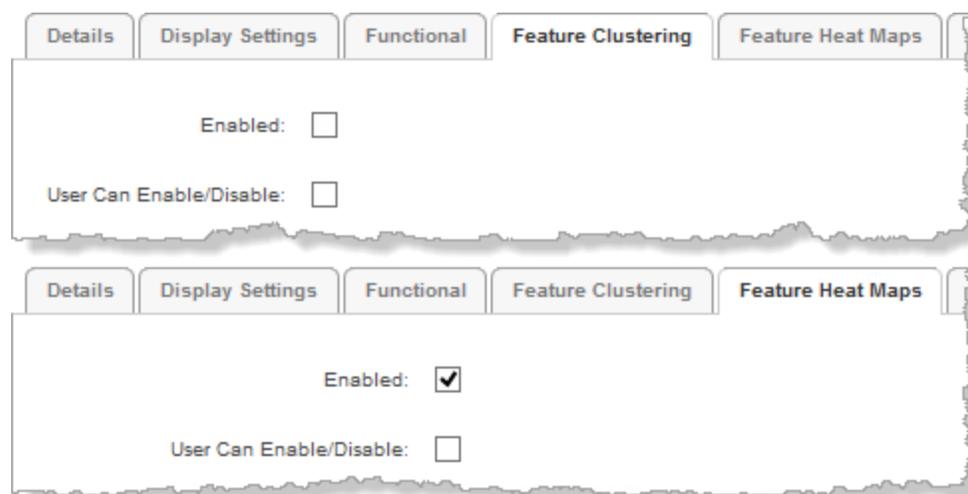
Settings to use if you want heat mapping always turned on

- **Respect Layer Scale Range**: If you want heat maps to show only when the layer is visible on the map, select the check box. If you want heat maps to show when the map is zoomed in or zoomed out beyond the layer's scale range, clear the check box. By default, the check box is cleared.

  > This setting uses the scale range that is defined in the Esri layer, not the scale range defined by the Override Minimum Scale and Override Maximum Scale settings on the layer's Display Settings tab in Manager.

- **Intensity:** Controls the area that hot areas cover, in pixels. The greater the intensity, the larger the area of coverage. Enter a number from 1 to 100. The default is **30** pixels.

Use a lower intensity for feature layers with a high concentration of data and higher intensity for feature layers with sparse data.
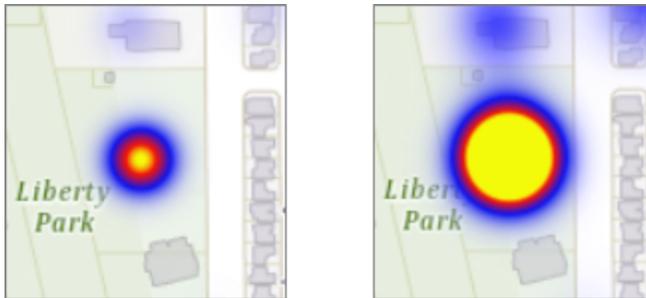
Lower intensity (left) and increased intensity (right)

- **Field:** A numeric field in the feature layer to use to multiply the intensity. For example, you might want to multiply the intensity in an earthquakes layer by the magnitudes of the earthquakes. This increases the intensity of the hot areas proportionately, based on the magnitude.
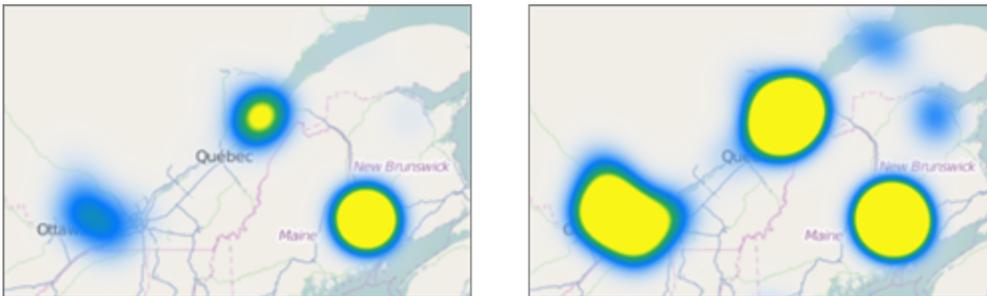
Earthquakes heat map with no multiplier (left) and multiplied by the magnitude (right)

By default, the Field setting is blank, which means that the intensity is not multiplied. If you want to multiply the intensity, select the name of the field to multiply the intensity by.

- **Gradient Options:** Controls the colors that represent the hot areas on this layer. You can also configure the opacity for each color. The viewer creates gradients using the colors that you configure.
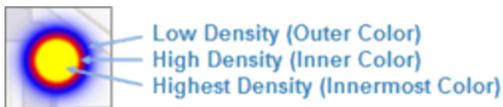
Default gradient—transparent, blue, red, yellow

- **Color:** For each color that you want to use to represent hot areas on the map, click the color picker to select a color, or type in the color's HTML name (for example, **red**) or hex value (for example, **#FF0000**). The color picker shows a preview of the color and opacity that you have selected. If the color picker for a setting does not show, drag the Color Alpha slider to the right.

The Lowest Density (Outermost Color) is completely transparent by default, to ensure that the

> **NOTE** outer color changes gradually. We recommend using the default value for the outermost color.

- **Color Alpha:** Controls the opacity of each color in the gradient. Drag the slider to the left to decrease the opacity.

4. Click **Apply Settings**.

5. Click **Save Site**.

To remove heat maps from a layer:

1. In Manager, edit the map service that you want to configure.
   Make sure you edit the feature layer's map service component, not the layer component.

2. Click the **Feature Heat Maps** tab.

3. Clear the **Enabled** check box.

4. Clear the **User Can Enable/Disable** check box.

5. Click **Apply Settings**.

6. Click **Save Site**.
   Heat maps will be turned off for this feature layer and users will not be able to turn heat maps on.

13 ArcGIS Server Image Services

ArcGIS Server image services serve raster and mosaic images that are pre-rendered on the server. You can add ArcGIS Server image services to a site's map.

In Essentials, image services have a map service component, but no layer component. This means that you can configure map service settings for an image service, but there are no layer settings.

You can configure an image service to allow identify operations. Essentials does not support any other type of query besides identify on image services.

13.1 Identify Operations on ArcGIS Server Image Services

Geocortex Essentials and the HTML5 Viewer support identify operations on ArcGIS Server image services. At a minimum, identify operations return the value of the raster cell that is being identified. You can configure identify operations to also return the catalog information and, if the image service has a mosaic dataset, the dataset's individual values.
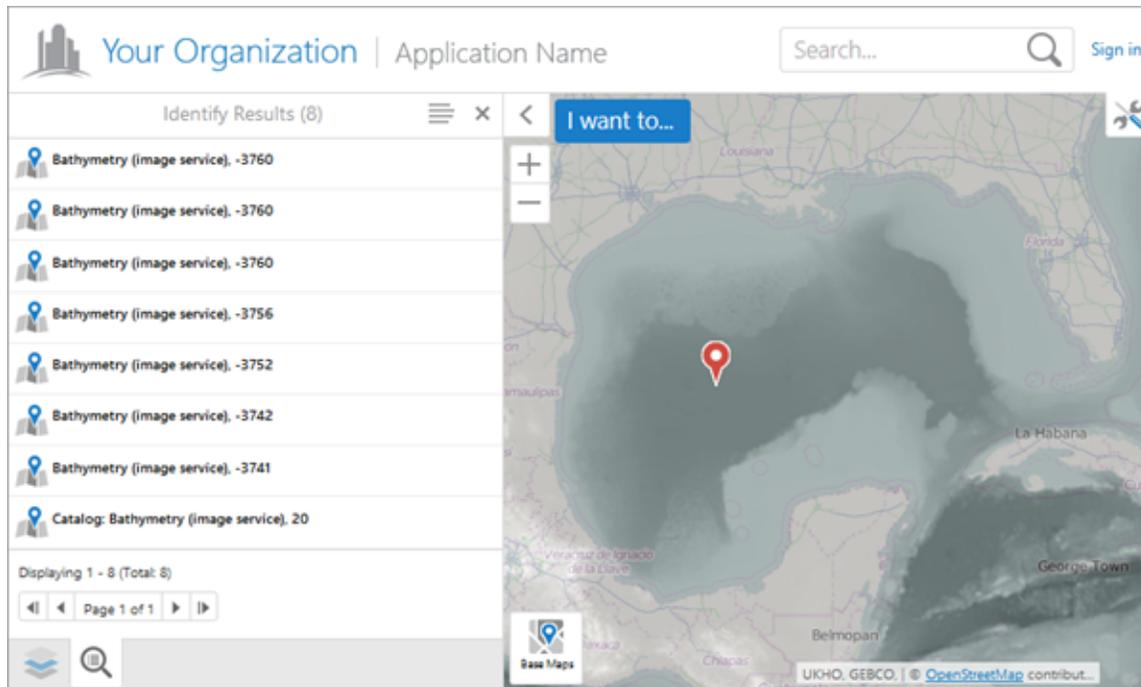
Identify results for an image service

The screen capture above shows identify results on a bathymetry (water depth) image service that has a mosaic dataset. The topmost result is the result after the mosaic function is applied. The individual values that were used to calculate the mosaic function are next in the list. The catalog is the last result in the list. The pushpin marks the identified location, which is the location of the dataset values and function result. There is a second pushpin outside the current extent, which marks the catalog.

By default, users can identify by point only. If the user performs some other type of identify, such as a polygon identify, no results are returned from the image service. You can configure an HTML5 viewer to return image service results for line-based and polygon-based identify operations. The viewer's Identify Module has a property called `restrictRasterIdentifyToPoint` that controls this. For information, see "Identify Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

Performing identify operations on image services is disabled by default. Image services have an **Identify Settings** tab where you enable identify operations and configure any additional types of result that you want to show.

The Silverlight Viewer does not support identify operations on ArcGIS Server image services.

▶ **To configure identify operations for an image service:**

1. In Manager, edit the map service that you want to configure.

2. Click the **Identify Settings** tab.

3. Configure the settings:

    - **Allow Identify Operations:** If you want end users to be able to perform identify operations on the image service, select the check box. By default, users cannot perform identify operations on image services.

    - **Include Mosaic Dataset Values:** If you want identify results to list the mosaic dataset's individual values, in

addition to the mosaic function's result, select the check box. For this setting to work, **Allow Identify Operations** must be selected.

The Include Mosaic Dataset Values setting only appears on the Identify Settings tab when the image service has a mosaic dataset.

- **Include Catalog Items:** If you want identify results to list the catalog, select the check box. Users will be able to click the catalog item in the results list to show the catalog's properties and highlight the catalog on the map. For this setting to work, **Allow Identify Operations** must be selected.

4. Click **Apply Details**.

5. Click **Save Site**.

14 ArcGIS Server Raster Layers

You can add ArcGIS Server raster layers to a site's map, either by adding the map service that the raster layer belongs to, or by adding the raster layer alone.

> The Silverlight Viewer does not support identify operations on ArcGIS Server raster layers.

14.1 Identify Operations on ArcGIS Server Raster Layers

Geocortex Essentials and the HTML5 Viewer support identify operations on ArcGIS Server raster layers. Identify operations are enabled by default for all layer types. If you do not want users to be able to identify on a raster layer, clear the layer's Allow Identify Operations check box on Manager's Map Services tab.

By default, users can identify by point only. If the user performs some other type of identify, such as a polygon identify, no results are returned from the raster layer. You can configure an HTML5 viewer to return raster layer results for line-based and polygon-based identify operations. The viewer's Identify Module has a property called `restrictRasterIdentifyToPoint` that controls this. For information, see "Identify Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

ArcGIS Server raster layers have Feature Label, Feature Description, and Feature Long Description settings so you can configure the content and appearance of identify results. For information about these settings, see **About Feature Descriptions** on page **171**.

> Although raster layers do not have fields, ArcGIS Server creates fields and returns them in query results. If you are comfortable with web inspection tools, you can use this fact to find out the field names and use them in field tokens. To find out the field names, run your web inspection tool and perform an identify operation—the field names will show in the tool's console. For example, if a `count` field is returned, you can use a **{count}** field token in the feature description. You cannot use the Rich Text Editor to enter raster layer field tokens—you must type them in.

See also...

ArcGIS Server Image Services on page **136**

15 Web Tiled Layers

Web tiled layers are tiled map services that use the Google Maps default tiling scheme.

To add a web tiled layer to a site's map, you must first add a service connection for the service. Essentials provides out-of-the-box connections for some popular Google Maps-compatible services, including Open Street Maps and MapQuest. You are not limited to the out-of-the-box services—you can add other web tiled services as well.

When you add a service connection for a web tiled service, you configure the service's location using a URL template, instead of the actual URL. URL templates contain placeholders that are substituted by the actual values when a tile is requested. In order to be able to use a web tiled service in Essentials, the service's URL must contain the `{level}`, `{col}`, and `{row}` tokens. These tokens are placeholders for the tile's zoom level, column, and row.

Subdomains

Some web tiled services run multiple servers on different subdomains. This allows applications to make simultaneous tile requests without exceeding the conventional limit for a single domain.

Manager has a `{subdomain}` token that allows you to use multiple subdomains. To use the `{subdomain}` token, you insert the token in the URL template where the subdomain would normally go, and then you configure a list of the subdomains that you want to use.

For example, `openstreetmap.org` has three subdomains—a, b, and c. An application can send tile requests to any of the three following servers:

    a.tile.openstreetmap.org

    b.tile.openstreetmap.org

    c.tile.openstreetmap.org

To configure Essentials to send tile requests to all three servers, enter the URL template as `http://{subdomain}.tile.openstreetmap.org/{level}/{col}/{row}.png`, and then list the subdomains that you want to use in the Subdomains box.

Open Street Map service connection configured to use multiple subdomains

MapQuest has four subdomains—otile1, otile2, otile3, and otile4. Refer to the MapQuest developer documentation (`http://developer.mapquest.com/web/products/open/map`) for information.

Copyright

Some web tile services require that you display a copyright or other attribution on the map when you use the service in a web mapping application.

When you configure a service connection for a web tiled service, you can define the attribution that you want to appear on the map. The copyright can include HTML markup. This means you can include a hyperlink to the organization's website. For example:

```
© <a href="http://www.openstreetmap.org/copyright" target="_blank">OpenStreetMap</a>
contributors
```

appears on the map as: © OpenStreetMap contributors. The copyright appears in the lower right corner of the map.

> Some services require attribution. For information, refer to the service's documentation.

15.1 Configure a Web Tiled Layer

To configure a web tiled layer:

- **Add a Web Tiled Layer Service Connection:** See **Web Tiled Layer Service Connections** on page **123**.
- **Add a Web Tiled Layer to the Map:** See **Add a Map Service to the Map** on page **98**.
- **Configure Web Tiled Layer Settings:** See **Map Service Settings** on page **103**.

16 KML Layers

KML layers are defined using the XML-based Keyhole Markup Language, which is designed to store geographic data. Many mapping applications support KML, including Google Earth, Google Maps, and ArcGIS Server.

To add a KML layer to an Essentials site, the file must have a `.kml` or `.kmz` file extension. KMZ files are archives that contain a KML file and other associated files. In addition to adding KML layers to a site, sites can inherit KML layers from web maps.

In Essentials, KML layers have a map service component, but no layer component. If the KML definition contains folders (`Folder` elements), the folders show on the Layer List tab in Manager, but they do not show on the Map Services tab or in layer themes. You cannot edit KML folders or change their visibility in Manager, however, end users can turn the visibility of KML folders on and off in the viewer.

In the legend for a KML layer, viewers use the value of the style's ID (`Style id`) to label the color swatches. If you own the KML layer, you can pick IDs that are meaningful representations of the style. For example, in a KML layer whose features are earthquakes classified by magnitude, you could set the IDs to `M1`, `M2`, `M3`, and so on, to represent Magnitude 1, Magnitude 2, Magnitude 3. (Note that style IDs cannot contain spaces or special characters.)

Map tips display the balloon (`BalloonStyle` element), if one is defined. If a balloon is not defined, then map tips display the `description`. You can use the Snippet in map tips instead of the `description`, if you want.

Similarly, the Results List displays the `description`, but you can use the Snippet in the Results List instead.

Supported Features

- Essentials supports public KML layers only. You cannot add private KML layers to an Essentials site.

- Essentials uses the Esri JavaScript API to implement KML support. KML features that are not supported by the Esri JavaScript API are also not supported by Essentials. For information, see "Supported Features" at `https://developers.arcgis.com/javascript/jsapi/kmllayer.html`.

Viewer Support

- The Geocortex Viewer for HTML5 supports KML layers, specifically:
  - KML layers show in the map.
  - Identify operations on KML layers are supported. Search, query, and filter operations are not supported.
  - KML layers cannot be used offline.

- The Geocortex Viewer for Silverlight does not support KML layers. If you add a KML layer to a site's map, the layer will not appear in the site's Silverlight viewers.

16.1 Add a KML Layer to the Map

To add a KML layer to the map, Manager must be able to connect to the layer—you cannot add a KML layer when the layer is unavailable.

Essentials does not support service connections for KML layers. This means that you cannot add secured KML layers to the map, and you cannot use keyword search to add a KML layer to the map. To add a KML layer, you must specify the layer's URL.

▶ **To add a KML layer to the map:**

1. In Manager, edit the site that you want to configure, and then click **Map** in the side panel.

2. Click **Add Map Service.**

3. Click the **Search** tab.

4. Type or paste the service's URL in the **Search** box.

   We recommend that you use the same protocol (HTTP or HTTPS) for all the map services that you add to a site. Browsers might not display all of a site's content if you use different protocols within one site. Silverlight has similar restrictions. The protocol that you use for map services should be the same as the protocol that you use for viewer URLs.

5. Click the **Search** tool 🔍.

6. Click **Add to Map**.
   The dialog box closes and the service is added to the list of services in the map.

7. Click **Apply Changes**.

16.2 Edit a KML Layer

In Essentials, KML layers have a map service component, but no layer component. To edit a KML layer, you edit the map service component.

▶ **To edit a KML layer:**

1. In Manager, edit the site that you want to configure, and then click **Map** in the side panel.

2. Click the **Map Services** tab.

   💡 If the KML layer that you want to edit is in the Layer List, you can also edit the layer from the Layer List tab.

3. Click the **Edit Map Service** icon 🖉 beside the KML layer that you want to edit.

   The layer opens for editing.

16.3 Configuration Settings for KML Layers

Details Tab Settings for KML Layers

To open the Details tab, edit the KML layer and click the Details tab.

KML layers have the following settings on the Details tab:

- **ID:** (for information only) The unique identifier for this service in the REST API.

- **Display Name:** The name that is used to refer to this map service in Manager and in viewers. The Display Name can contain spaces and special characters.

- **Short Display Name:** The name that is used to refer to this map service in small spaces in the viewer, for example, in a base map transparency slider. If you do not configure the Short Display Name, the Display Name is used in small spaces. The Short Display Name can contain spaces and special characters.

- **Description:** A short description of the service. The description is optional.

- **Copyright:** Some organizations, such as Open Street Map (openstreetmap.org), require anyone using their data to credit the organization. Use the Copyright setting to configure the attribution. The copyright appears in the lower right corner of the map in Manager and in viewers. If you also want the copyright to appear in exported and printed map images, select the **Include Copyright in Print/Export** check box.

  The copyright can include simple HTML markup, such as bold text and anchor elements. Using an anchor element enables you to include a hyperlink to the organization's website, for example:

  ```
  © <a href="http://www.openstreetmap.org/copyright" target="_
  blank">OpenStreetMap</a> contributors
  ```

  This appears on the map as: © OpenStreetMap contributors.

  If a map service has a copyright built into it, the built-in copyright appears in the Copyright box by default. You can override the built-in copyright by typing a new copyright in the Copyright box. To restore the default copyright, delete the custom copyright that you entered.

If more than one map service in a site has a copyright (either built in or configured in Manager), the copyrights appear one after another on the map.

- **Include Copyright in Print/Export:** If you want the copyright for this map service to appear on the map image when the map is exported, select the Include Copyright in Print/Export check box. For printing, you must also add a **TextBox** to each print template, and set the TextBox's **DataField** property to **_CopyrightText**:

  Open the print template in Report Designer.

  Drag a **TextBox** onto the print template and position it where you want it. You may also have to resize the TextBox to fit your needs.

  With the TextBox selected, scroll down the properties list in the lower right corner of Report Designer until you see the **Data** section.

  Click to the right of **DataField** and type **_CopyrightText**.

  Save the print template.

- **Data Source Type:** (for information only) The type of service that provides the map data, for example, ArcGIS Server REST or OGC WMTS.

- **Spatial Reference:** The service's spatial reference.

- **Connection String:** (for information only) The connection string to connect to this service.

- **Edit Connection Settings:** Click **Edit Connection Settings** and modify the settings as desired. The settings that are available depend on the type of map service.

  > After you have configured the connection settings, click the **Test Connection** button to verify the settings.

  - **Service URL:** Type or paste the map service's URL.

- **Security Provider Name:** *Reserved use.* For information on configuring security providers, see **Security Providers** on page **401**.

Display Settings Tab for KML Layers

To open the Display Settings tab, edit the KML layer and click the Display Settings tab.

KML layers have the following settings on the Display Settings tab:

- **Icon URI**: The URI to the icon that you want to use to represent this service. Click **Browse** to navigate to the icon file, or **Upload** the file to the site.

- **Opacity:** Sets the map service's default opacity. For example, if you set the opacity to 30% in Manager, then end users initially see the map service at 30% opacity in the viewer, and the map service's opacity slider is initially set to 30%. End users can drag the opacity slider to change the map service's opacity.

- **Override Scale:** The Override Scale settings allow you to restrict the scale range of the map service in Essentials. These settings override the scale settings that are defined in the map service itself.

  - **Override Minimum Scale:** The minimum scale at which the map service is visible in viewers. If a user zooms out farther than the Override Minimum Scale setting, the map service no longer shows on the map. If the map service is in the Layer List, the map service's Visibility check box becomes grayed out to indicate that the map service is not visible at the current scale.

    For example, if the minimum scale defined in the map service itself is 1:10,000,000, you could restrict the minimum scale to 1:5,000,000 in Essentials.

To configure the minimum scale, enter the scale's denominator, without commas or other punctuation. For example, to set the minimum scale to 1:5,000,000, enter **5000000** in the **Override Minimum Scale** box. If you leave the Override Minimum Scale box blank, Essentials uses the minimum scale that is defined in the map service itself.

- **Override Maximum Scale:** The maximum scale at which the map service is visible in viewers. If a user zooms in closer than the Override Maximum Scale setting, the map service no longer shows on the map. If the map service is in the Layer List, the map service's Visibility check box becomes grayed out to indicate that the map service is not visible at the current scale.

    For example, if the maximum scale defined in a map service is 1:500, you could restrict the maximum scale to 1:2,000 in Essentials.

    To configure the maximum scale, enter the scale's denominator, without commas or other punctuation. For example, to set the maximum scale to 1:2,000, enter **2000** in the **Override Maximum Scale** box. If you leave the Override Maximum Scale box blank, Essentials uses the maximum scale that is defined in the map service itself.

A common use for the Override Scale settings is to make one base map become visible when another loses visibility as the user zooms the map. To configure this, set Override Maximum Scale for one base map to the same scale as Override Minimum Scale for the next base map.

In addition to these settings, which control the scale range of a **map service**, the Geocortex viewers have settings that enable you to restrict or extend the scale range of the **map** (`minScale` and `maxScale` in the HTML5 Viewer; `MinimumResolution` and `MaximumResolution` in the Silverlight Viewer). For information, refer to the "Map Module" section in the viewer's *Administrator and Developer Guide*.

The Silverlight Viewer supports the Override Minimum Scale and Override Maximum Scale settings for tiled ArcGIS-based base maps only. The HTML5 Viewer supports these settings for all map services—tiled and dynamic map services, operational map services and base maps, and all map service types.

Functional Tab Settings for KML Layers

To open the Functional tab, edit the KML layer and click the Functional tab.

KML layers have the following settings on the Functional tab:

- **Failure Action:** Specifies the behavior of the site's viewers if this service is not available when the site is loaded. The failure action does not affect user sessions that are already in progress when a service goes down. The possible failure actions are:

    - **Ignore:** The viewer does not warn the user that the service is not available. The user can proceed to use the application. (The service will not work).

    - **Warn:** The viewer displays a warning to the user that says the service is not available. The user can close the warning and proceed to use the application. (The service will not work). This is the default value.

    - **Error:** The viewer displays a warning to the user that says the service is not available. The user cannot close the warning, and cannot use the application.

- **Update interval:** The frequency for the viewer to refresh the map image, in seconds. If you do not set an interval, the map refreshes only when a user performs an action that forces the map to redraw, like pan or zoom.

- **Base Map Transparency Slider Group:** (does not apply to ArcGIS Server feature layers, KML layers, or GeoRSS layers) The name of the base map transparency slider group for the map service to belong to, if you want the map service to appear in a transparency slider with other related map services. Entering a new slider group name

creates the slider group. The slider group name appears in the Base Map Switcher, so choose a name that is short, and also meaningful to end users. To add the map service to an existing slider group, click in the Base Map Transparency Slider Group box and select the group from the drop-down list.

If you do not want to use the map service in a transparency slider, leave the Base Map Transparency Slider Group box empty.

16.4 Update the URL for a KML Layer

If the KML or KMZ file that defines a KML layer is moved to a new location, for example to a different server, you must update the layer's URL in Manager. Another reason to update the URL is to change the protocol (HTTP, HTTPS) that you use.

▶ **To update the URL for a KML layer:**

1. In Manager, edit the KML layer that you want to configure.

2. On the **Details** tab, scroll down and click the **Edit Connection Settings** button.

3. Update the URL.

4. Click **OK**.

5. Click **Apply Details**.

16.5 Enable HTML Rendering in an HTML5 Viewer

By default, viewers display the value of a KML feature's `description` element in the Results List and in map tips. KML `description` elements can contain HTML markup. For an HTML5 viewer to render the markup, the viewer's **Allow Unsafe Content** setting must be enabled. If Allow Unsafe Content is disabled, end users will see the markup, instead of what the markup represents.

Example of KML features without HTML rendering (left) and with HTML rendering (right)

💡 If you use the `Snippet` element instead of the `description` element in the Results List and map tips, you do not need to enable HTML rendering, because the `Snippet` element cannot contain HTML markup. See **Use the Snippet Element in an HTML5 Viewer's Results List** on page **146** and **Use the Snippet Element in an HTML5**

Viewer's Map Tips on page **146**.

To enable HTML rendering in an HTML5 viewer:

Enabling HTML rendering in a viewer enables HTML rendering for **all** of the KML and GeoRSS layers in the site that the viewer belongs to.

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Application**.

3. Select the **Allow Unsafe Content** check box.

4. Click **Apply Changes**.

16.6 Use the Snippet Element in an HTML5 Viewer's Results List

By default, HTML5 viewers display the value of a KML feature's `description` element in the Results List. You can configure an HTML viewer to display a KML layer's `Snippet` element in the Results List, instead of the `description` element.

To use the Snippet element in an HTML5 viewer's Results List:

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Look and Feel**.

3. In the **Results List** area, select **Feature Description** from the **Content Field** drop-down list.

4. Click **Apply Changes**.

16.7 Use the Snippet Element in an HTML5 Viewer's Map Tips

By default, HTML5 viewers display the value of a KML feature's `description` element in map tips. You can configure an HTML viewer to display a KML layer's `Snippet` element in map tips, instead of the `description` element.

To use the Snippet element in an HTML5 viewer's map tips:

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Look and Feel**.

3. In the **Map Tips** area, select **Feature Description** from the **Content Field** drop-down list.

4. Click **Apply Changes**.

See also...

Import Map Services from Another Site on page **101**

Add a Reference to an ArcGIS Web Map on page **167**

17 OGC Map Services (WMS and WMTS)

Geocortex Essentials supports the following types of OGC (Open Geospatial Consortium) service:

- **WMS (Web Map Service):** WMS services provide dynamic map service capabilities.
- **WFS (Web Feature Service):** WFS provides querying for an associated WMS.
- **WMTS (Web Map Tiled Service):** WMTS provides OGC-style tiled services.

From version 4.0 of Geocortex Essentials there is support for the following OGC specifications:

- WMS 1.0.0, 1.1.0, 1.1.1, 1.3.0
- WFS 1.0.0, 1.1.0, 2.0 (Get Feature operation)
- WMTS 1.0.0

17.1 About WMS

To make full use of WMS capabilities, you need to associate the WMS with a WFS. With a WMS and associated WFS, it is possible to:

- Use data linking and reporting.
- Use legends and in print templates.
- Identify, search and query.
- Configure the image format.
- Configure the spatial reference.
- Add parameters to the map URL.
- Use HTTP (web tier) authentication.
- Operate without a proxy.

Printing and Legends

No configuration is required for printing and legends to work in the Silverlight Viewer and in print templates, provided you are running Manager version 3.10 or higher, and the version 3.10 or higher `Legend.rpx` file is installed in your `PrintTemplates` folder.

If you upgrade from a version of Essentials that is older than version 3.10, you must manually copy the new `Legend.rpx` to your `PrintTemplates` folder—the new version of the `Legend.rpx` file will not be copied into the `PrintTemplates` folder during the upgrade.

A copy of the new `Legend.rpx` file can be found in the Sample Sites directory. The default location for the file is `C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST Elements\Sample Sites\Resources\PrintTemplates`.

Identify, Query, Search, Data Links, and Reporting

To use identifying, querying, searching, data linking, and reporting, your WMS must be associated with a WFS. (Limited querying may be possible without a WFS. See **OGC Query** on page **149** for information.)

Essentials will use an associated WFS provided:

- The WMS supports `DescribeLayer`, which Essentials uses to obtain the URL of the WFS.
- The WMS has layers that correspond to feature types on the WFS.
- For query and search, you configure a WFS query provider.
  See **OGC Map Services (WMS and WMTS)** on page **147** for information about query providers.

> **NOTE** ArcGIS Server WMSs do not support `DescribeLayer`. To associate an ArcGIS WMS with a WFS, edit the map service in Manager. On the Details tab, select **WFS:ArcGIS** from the **Query Provider** drop-down list. Click **Edit Connection Settings** and enter the WFS's URL in the **WFS URL** box.

WFS Requirements

To make full use of all the functionality available in the Geocortex Viewers, the WFS must support:

- **Logical Operators**: And, Or.
- **Spatial Operators**: Intersects.
- **Other Operators**: `FeatureId`, `PropertyIsLike`, `PropertyIsEqualTo`.
- **Literal Types**: `xs:string`, `xs:integer`, `xs:double`.
- **Geometry Types**: Envelope, Point, MultiPoint, MultiPolygon, MultiLineString, LineString, Polygon.

WMTS

Currently WMTS:

- Can use KVP request encoding only.
- Cannot use SOAP.
- Cannot use legends.
- Can use only point-identify queries.
- Cannot use reports and data links.

> **NOTE** The HTML5 Viewer does not support WMTS identifying, querying or searching.

Proxies

Usually, when adding an OGC web service to your web application, you would need to use a proxy. This is because services are usually hosted on a different domain than the host mapping application and web browsers usually obey the single-origin policy. The single-origin policy stipulates that you cannot make cross-domain requests for XML data, such as service metadata. (Image requests in a browser are not subject to the same cross-domain restrictions.)

Geocortex Essentials is able to work around this stipulation by including all the necessary service metadata in the site response. This means that you do not need a proxy to access a WMS or WMTS. You can specify a proxy if you want to, but it is not necessary.

Secured WMS and WMTS

In order to add a secured WMS or WMTS to an Essentials site, you must first add a service connection. The service connection stores the information that Essentials needs to be able to connect to the service, including the information that allows Essentials to authenticate. See **WMS Service Connections** on page **119** or **WMTS Service Connections** on page **121** for instructions.

Essentials is capable of accessing WMS and WMTS that are secured using one of the following methods:

- **Web Tier (default or anonymous credentials):** Select this option if:
  - the service is secured using Integrated Windows Authentication and you want Essentials to authenticate as the application pool user, or,
  - the service is not secured.

- **Web Tier (configured credentials):** Select this option if:
  - the service is secured using basic or digest authentication, or,
  - the service is secured using Integrated Windows Authentication and you want to configure the credentials for Essentials to use when authenticating.

  In the **Username** and **Password** boxes, type the credentials that you want Essentials to use.

- **Proxy Settings:** If you are using a proxy page, type or paste the proxy page's URL in the **Proxy URL** box. For example, `http://host.domain.com/MapServiceProxy/proxy.ashx`.

17.2 OGC Query

17.2.1 Direct Query vs. WFS Query

Essentials supports two methods of querying a WMS:

- **Direct:** Query the WMS directly using a `GetFeatureInfo` operation.
- **WFS:** Send feature requests to a WFS that is associated with the WMS.

WFS is a more powerful way to query than direct query. WFS supports full text searches and complex spatial filtering, and searches and queries return full attribute data and metadata. WFS also supports data linking and reporting. Having full attribute data enables you to define rich feature descriptions to display in results lists, map tips, and reports.

If a WFS is not available for the WMS and the WMS supports the `GetFeatureInfo` operation, Essentials can query the WMS directly. Direct querying supports only limited spatial querying—the only identify operation that `GetFeatureInfo` supports is point identify. Direct querying does not support text search. As well, the output format is limited to display-only formats such as plain text or HTML in some cases.

> **NOTE** WMS layers that are not associated with a WFS only support point identify, and do not support query or search, whereas WMS layers associated with a WFS support all types of identify, query and search operations.

When using direct query, use GML output if possible—GML output works well with Geocortex Essentials and Geocortex viewers.

Because you cannot use a WFS with a tiled service, WMTS query is direct—it uses `GetFeatureInfo`.

17.2.2 Query Providers

When you configure a WMS, you need to specify the query provider to use. This is required whether or not you are using a WFS. Essentials uses this information to query the WMS.

There are many options and your choice will depend on the WMS you are configuring. In Essentials, when you select an option that begins with WFS, Essentials attempts to use WFS for querying. If the WMS supports `GetFeatureInfo`, you will have options available that start with WMS. If you choose one of these options, Essentials will use WMS to query the WMS, using the specified information format. For example, if you choose "WMS: text/html", then Essentials will query the WMS and return the data in HTML format.

The query provider is configured on the map service's Functional tab. For instructions on configuring the query provider, see **Configure a WMS Map Service** on page **151** or **Configure a WMTS Map Service** on page **152**.

WMS Query Providers

There are two categories of WMS query providers:

- **WFS:** When you select an option that begins with **WFS**, Essentials uses WFS for querying. WFS options are always available for you to configure.

- **WMS:** If the WMS supports `GetFeatureInfo`, you will have options that start with **WMS**. If you choose one of these options, Essentials queries the WMS directly, using the specified information format. For example, if you choose `WMS: text/plain`, then Essentials queries the WMS directly and returns the data in plain text format.

You can disable query and search by selecting **Disabled**—when the query provider is set to Disabled, the user can still perform queries and searches, but no results are returned.

The WFS query provider options and some common WMS query provider options are described below. The WFS query providers return equivalent data.

- **WFS:** Specifies that you want to use a fully compliant, non-ArcGIS WFS with your WMS. If the WMS correctly publishes the location of the WFS, then Essentials automatically connects your WMS to the WFS. In order to use this option:
    - The WMS must support `DescribeLayer`, which Essentials uses to obtain the URL of the WFS.
    - The WMS's layers must correspond to feature types on the WFS.

- **WFS: ArcGIS:** If your WMS layer is published via ArcGIS Server, you must use this option. You must also specify the WFS's URL. To specify the URL, edit the map service in Manager. On the Details tab, click **Edit Connection Settings** and enter the URL in the **WFS URL** box.
  The WFS: ArcGIS option uses the Title attribute to correlate WMS layers and WFS feature types.

- **WFS: Name Correlation:** Use this option if you are using a non-ArcGIS WMS that does not support `DescribeLayer` or has `DescribeLayer` disabled. You must also specify the WFS's URL. To specify the URL, edit the map service in Manager. On the Details tab, click **Edit Connection Settings** and enter the URL in the **WFS URL** box.

GeoServer does not support `DescribeLayer`.

The WFS: Name Correlation option uses the Name attribute to correlate WMS layers and WFS feature types.

- **WMS: application/vnd.ogc.gml:** Use this option if it is available and the WFS options do not work. This option returns results that are suitable for feature details and map tips.

- **WMS: text/html:** Returns the results in pre-formatted HTML.

    You can create a Query Transform workflow that modifies the results of a WMS: text/html query before the results are returned to the viewer. For example, when a WMS: text/html query returns non-GML data, Essentials adds the raw data as a column in the `DataSet`. This raw data appears as a single `ows:data` attribute. You could create a Query Transform workflow that converts the HTML text to attribute data in rows and columns. For more information, see "Create a Query Transform Workflow" in the Workflow Designer help system.

    The WMS: text/html option is not suitable for the Silverlight viewer.

- **WMS: text/plain:** Returns the results in plain text.

    You can create a Query Transform workflow that modifies the results of a WMS: text/plain query before the results are returned to the viewer. For example, when a WMS: text/plain query returns non-GML data, Essentials adds the raw data as a column in the `DataSet`. This raw data appears as a single `ows:data` attribute. You could create a Query Transform workflow that converts the HTML text to attribute data in rows and columns. For more information, see "Create a Query Transform Workflow" in the Workflow Designer help system.

WMTS Query Providers

Some common WMTS query provider options are described below:

- **WMTS: application/vnd.ogc.gml:** Returns results in GML format.

- **WMTS: text/html:** Returns results in pre formatted HTML.

    The WMTS: text/html option is not suitable for the Silverlight viewer.

- **WMTS: text/plain:** Returns the results in plain text.

17.3 Configure a WMS Map Service

To configure a WMS map service:

- **Add a WMS Service Connection:** If the WMS is secured, you must add a service connection before you can add the service to the map. See **WMS Service Connections** on page **119**.

- **Add a WMS Service to the Map:** See **Add a Map Service to the Map** on page **98**.

- **Configure WMS Settings:** See **Map Service Settings** on page **103**.

- **Configure WMS Connection Settings:** See **Edit a Map Service's Connection Settings** on page **103**.

- **Exclude Layers from a WMS Service:** See **Exclude Layers from a Dynamic Map Service** on page **113**.

- **Configure WMS Layer Styles:** See **To configure the styles on a WMS layer:** on page **152**

▶ **To configure the styles on a WMS layer:**

If different styles have been set up for a particular WMS layer, you can select the styles to use from a list of options.

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.

2. Expand the map service to show the sublayers, and then click **Edit Layer**.

3. To set the style to use on the layer, click the down arrow in the **Style** box and select the style you want to use.

4. Click **Apply Changes**.

5. Click **Save Site**.

17.4 Configure a WMTS Map Service

To configure a WMTS map service:

- **Add a WMTS Service Connection:** If the WMTS is secured, you must add a service connection before you can add the service to the map. See **WMTS Service Connections** on page **121**.

- **Add a WMTS Service to the Map:** See **Add a Map Service to the Map** on page **98**.

- **Configure WMTS Settings:** See **Map Service Settings** on page **103**.

- **Configure WMTS Connection Settings:** See **Edit a Map Service's Connection Settings** on page **103**.

18 GeoRSS Layers

GeoRSS services provide geographic data in RSS feeds, so the data can be plotted by web mapping applications running in RSS-enabled browsers. RSS is a technology for delivering text, audio, and media over the Internet.

In Essentials, GeoRSS services are added to the map as layers. Each feed is a layer, and each feed item is a feature.

You can also add non-geographic RSS feeds to the map using a web service like GeoNames.

You can configure GeoRSS layers to automatically update at regular time intervals so the information on the map is always current.

GeoRSS layers can display mixed geometries for different feed items on the same layer.

Essentials supports Simple GeoRSS and GeoRSS GML (Geography Markup Language) formats in RSS 1.0, RSS 2.0, and Atom. For more information, refer to http://www.georss.org/.

> The HTML5 Viewer and Silverlight Viewer both support GeoRSS layers, The HTML5 Viewer supports point geometries only.

See also...

Map Service Settings on page **103**

18.1 Convert RSS to GeoRSS

You can also add non-geographic RSS feeds to the map using a web service like GeoNames. The web service converts the feed data from the RSS feed into geographic data that can be displayed as a GeoRSS layer.

It is possible to use the Geocortex Viewer for Silverlight with regular RSS feeds such as Reuters using a web service called GeoNames, for example Reuters: World News (`http://feeds.reuters.com/reuters/worldNews/`). In this case, the web service converts the feed data from the RSS feed into geographic data that can be displayed as a GeoRSS layer in Essentials.

For example, the following URL displays in the viewer as a world map with the news events clustered and numbered in specific places:

> http://ws.geonames.org/rssToGeoRSS?feedUrl=http://feeds.reuters.com/reuters/worldNews

This is shown in the screen capture below.

Reuters news feed in the viewer converted to GeoRSS feeds via the GeoNames web service

A customizable menu is associated with every GeoRSS layer. You can select a specific GeoRSS layer and the map automatically zooms to an extent that includes all the feed items on that layer. If several feeds are too close together, they are clustered as shown. As you zoom in to this point, the feeds separate. You can hover over a feed cluster to see the details of each feed within the cluster.

Hover over a node to reveal details about that feed

For instructions on adding a GeoRSS layer to the map, follow the general instructions in **Add a Map Service to the Map on page 98**

18.2 Configure a GeoRSS Layer

To configure a GeoRSS layer, follow the instructions in the following sections:

- **Add a GeoRSS Layer to the Map:** See **Add a Map Service to the Map** on page **98**.
- **Configure GeoRSS Settings:** See **Map Service Settings** on page **103**.

> **NOTE** You cannot add service connections for GeoRSS layers. This means that you cannot search for GeoRSS layers by keyword in Manager. To add a GeoRSS layer to the map, you must enter the URL.

19 GIS Services

Manager's GIS Services page allows you to configure:

- **Geocoding Services:** Add geocoding services to the site. Geocoding services convert between addresses and spatial data.
- **Geometry Service:** Add a geometry service to the site. Geometry services perform geometric calculations.
- **Export Map Image:** Configure settings for the Export Map feature. See **Configure Map Export** on page **82**.

> **NOTE** Starting in Essentials 3.15, you cannot configure geoprocessing services in Manager.

19.1 Geometry Services

Geometry services perform geometric calculations, such as buffering, projection, and measurement.

Essentials supports the configuration of a single ArcGIS geometry service—other types of geometry service are not supported. The geometry service can be unsecured or secured.

> **NOTE** Starting in Essentials 3.15, you can only configure one geometry service. If you had multiple geometry services configured in a site, they will continue to work, unless you edit the geometry service in Manager. Editing the geometry service replaces all the old geometry services with the new service—you lose all the old geometry services.

> **NOTE** As of version 2.5 of the HTML5 Viewer, the geometry service configured in the site overrides the one configured in the viewer, and configuring the geometry service in the viewer has been deprecated.

19.1.1 Add an ArcGIS Geometry Service

▶ **To add an ArcGIS geometry service:**

1. In Manager, edit the site that you want to configure, and then click **GIS Services** in the side panel.
2. Click the **Geometry** tab.

3. In the **Service URL** box, enter the geometry service's URL.

> **NOTE** We strongly recommend using your own geometry service instead of relying on the default Esri sample geometry service, which may become unavailable without warning.

4. **Authentication Settings:** If the geometry service is secured, select the authentication method for Essentials to use when connecting to the service.

-   **Web Tier (default or anonymous credentials):** Select this option if:

    -   the service is secured using Integrated Windows Authentication and you want Essentials to authenticate as the application pool user, or,

    -   the service is not secured.

-   **Web Tier (configured credentials):** Select this option if:

    -   the service is secured using basic or digest authentication, or,

    -   the service is secured using Integrated Windows Authentication and you want to configure the credentials for Essentials to use when authenticating.

    In the **Username** and **Password** boxes, type the credentials that you want Essentials to use.

-   **Token Security (by user):** Select this option if the service is secured using token security. In the **Username** and **Password** boxes, type the credentials that you want Essentials to use when authenticating. If you have changed the location where tokens are issued, type the URL of the location in the **Token URL** box.

-   **Token Security (explicit tokens):** In the **Server Token** box, type or paste the long-lived server token that Essentials will use to authenticate. You can also optionally configure a long-lived client token.

    Select this option if the service is secured using token security and you want to use long-lived tokens. This method stores the token(s) in the site.

    > **NOTE** This method is not practical for ArcGIS Server 10.1 and newer. In ArcGIS Server 10.1, the life span of long-lived tokens was shortened to 24 hours. This means you would have to configure a new token at least once a day.

5. Click **Apply Changes**.
    Manager validates the configuration by connecting to the geometry service.

6. Click **Save Site**.

19.1.2 Remove the Geometry Service

▶ **To remove the site's geometry service:**

1. In Manager, edit the site that you want to configure, and then click **GIS Services** in the side panel.

2. Click the **Geometry** tab.

3. Delete the Service URL.
    The Service URL box is now blank.

4. Click **Apply Changes**.

5. Click **Save Site**.

19.2 Geocoding Services

Geocoding services ("geocoders") convert between addresses and spatial data. Converting an address to spatial data enables the address to be shown on the map. This is called "forward geocoding". Converting from spatial data (a geographic location) to an address is called "reverse geocoding".

In order for a site's viewers to do operations that involve geocoding, you must configure at least one geocoding service in the site. Essentials supports unsecured and secured ArcGIS geocoding services, and the Bing Maps geocoding service.

About Configuration Settings for Geocoding Services

After you have added a geocoding service to a site, you might need to configure additional settings. This depends on what type of viewer you are using and which geocoding-dependent features you configure.

Additional geocoding service settings (other settings are omitted)

The settings are summarized in the table below. In the table, the geocoding service settings are identified by number. The numbers relate to the screen capture above.

To use the table, first look in the Feature column to find the feature that you want to configure. Now read across the row for that feature to find out which settings to configure. In addition to configuring the geocoding settings, you must configure the feature itself. Follow the link given in the Feature column to configure the feature.

The table uses the following values:

- **Yes:** You must configure the settings that say **Yes** for that feature.

- **Optional:** Settings that are **Optional** allow you to configure optional aspects of that feature. You do not need to configure Optional settings.

- **No Effect:** If you configure a setting that has **No effect**, the setting will not have any effect on the feature (it might affect other features, if you configure more than one of the features listed in the table). For example, configuring a Display Name for Global Search has no effect. You do not need to configure settings that have no effect, but there is no harm if you do.

For information about what the individual settings do, see **Configuration Settings for ArcGIS Geocoding Services** on page **158** and **Configuration Settings for the Bing Maps Geocoding Service** on page **159**.

Geocoding Service Settings to Configure Geocoding Features

Feature More Information	Silverlight Viewer	HTML5 Viewer	❶	❷	❸	❹	❺	❻
Global Search (text search) See **Global Search** on page **195**. For the Silverlight Viewer, also see "Configure the Global Search Box" in the *Geocortex Viewer for Silverlight Administrator Guide*.	Yes	Yes	Yes	Yes	No effect	Optional	No effect	No effect
Reverse geocoding in the Global Search box See "Configure the Global Search Box" in the *Geocortex Viewer for Silverlight Administrator Guide*.	Yes	No	Yes	No effect	No effect	No effect	No effect	No effect
Address Search See "Configure Address Search" in the *Geocortex Viewer for Silverlight Administrator Guide*.	Yes	No	No effect	No effect	Optional	Optional	Optional	Yes *
Address By Location See "Configure the Address By Location Tool" in the *Geocortex Viewer for Silverlight Administrator Guide*.	Yes	No	No effect	No effect	No effect	No effect	No effect	No effect
Batch Geocoding See "Configure Batch Geocoding" in the *Geocortex Viewer for Silverlight Administrator Guide*.	Yes	No	No effect	No effect	No effect	Optional	No effect	No effect

* You must configure the Visible setting for at least one parameter.

19.2.1 Configuration Settings for ArcGIS Geocoding Services

ArcGIS geocoding services have the following settings:

- **Service Type:** (for information only) The service type is **ArcGISGeocoder**.

- **Display Name:** The name that is used to refer to this geocoding service.
  Choose a display name that end users will understand.

- **Service URL:** The geocoding service's URL. Features that use this geocoding service send geocode requests to this URL.

- **Include in Global Search:** When this checkbox is selected, the geocoding service can be searched in Global Search operations.

- **Global Search Key:** The attribute to search in Global Search. This setting is only available when the Include in Global Search check box is selected.

- **Authentication Settings:** If the geocoding service is secured, select the authentication method for Essentials to use when connecting to the service.
  - **Web Tier (default or anonymous credentials):** Select this option if:
    - the service is secured using Integrated Windows Authentication and you want Essentials to authenticate as the application pool user, or,
    - the service is not secured.

  - **Web Tier (configured credentials):** Select this option if:
    - the service is secured using basic or digest authentication, or,
    - the service is secured using Integrated Windows Authentication and you want to configure the credentials for Essentials to use when authenticating.

    In the **Username** and **Password** boxes, type the credentials that you want Essentials to use.

  - **Token Security (by user):** Select this option if the service is secured using token security. In the **Username** and **Password** boxes, type the credentials that you want Essentials to use when authenticating. If you have changed the location where tokens are issued, type the URL of the location in the **Token URL** box.

  - **Token Security (explicit tokens):** In the **Server Token** box, type or paste the long-lived server token that Essentials will use to authenticate. You can also optionally configure a long-lived client token.
    Select this option if the service is secured using token security and you want to use long-lived tokens. This method stores the token(s) in the site.

    > **NOTE** This method is not practical for ArcGIS Server 10.1 and newer. In ArcGIS Server 10.1, the life span of long-lived tokens was shortened to 24 hours. This means you would have to configure a new token at least once a day.

- **Parameters Table:** Use this table to configure the geocoding service to be used by features that perform forward geocoding.

- **Parameter:** (for information only) The geocoding service's Address Fields.
- **Display Name:** (used by Address Search) The label to display beside the box where the user enters the value for this parameter. For example, if the geocoding service has a Zip field, you could set the display name to "Zip/Postal Code".
- **Value:** (used by Global Search, Address Search, and Batch Geocoding) (optional) The value to search for (Global Search) or to use in geocoding (Address Search, Batch Geocoding).
- **Required:** (used by Address Search) (optional) When this checkbox is selected, the parameter must have a value before an Address Search can be done. The value can either come from the configuration (the parameter's Value setting) or from the user.
- **Visible:** (used by Address Search) When this checkbox is selected, the Address Search panel has a text box for the user to enter a value.

19.2.2   Configuration Settings for the Bing Maps Geocoding Service

The Bing Maps geocoding service has the following settings:

- **Service Type:** (for information only) The service type is **BingGeocoder**.
- **Display Name:** The display name that is used to refer to this geocoding service. Choose a display name that end users will understand.
- **Service URL:** The URL for the Bing Maps geocoding service. If you leave this setting blank, the URL for the public Bing Maps geocoding service over HTTP is used.
- **Bing Maps Key:** Your Bing Maps Key.
- **Culture:** The culture to use to translate and prioritize the results.
- **Include in Global Search:** When this checkbox is selected, the geocoding service can be searched in Global Search operations.
- **Global Search Key:** (used by the Silverlight Viewer only) The attribute to search in Global Search. This setting is only available when the Include in Global Search check box is selected.
- **Parameters Table:** (used by the Silverlight Viewer only) Use this table to configure the geocoding service to be used by features that perform forward geocoding.
    - **Parameter:** (for information only) The geocoding service's Address Fields.
    - **Display Name:** (used by the Address Search Tool) The label to display beside the box where the user enters the value for that parameter. For example, if the geocoding service has a Zip field, you could set the display name to "Zip/Postal Code".
    - **Value:** (used by Global Search and Address Search) (optional) The value to search for (Global Search) or to use in geocoding (Address Search).
    - **Required:** (used by Address Search) (optional) When this checkbox is selected, the parameter must have a value before an Address Search can be done. The value can either come from the configuration (the parameter's Value setting) or from the user.
    - **Visible:** (used by Address Search) When this checkbox is selected, the Address Search panel has a text box for the user to enter a value.

19.2.3 Add an ArcGIS Geocoding Service

As of version 2.5, the HTML5 Viewer supports both single-line and multi-line ArcGIS geocoding services.

If you are using the HTML5 Viewer with a proxy page, you must register the geocoding service with the proxy. The enables the proxy to forward requests to the geocoding service. For instructions, see "Set Up a Proxy Page" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

▶ **To add an ArcGIS geocoding service to a site:**

1. In Manager, edit the site that you want to configure, and then click **GIS Services** in the side panel.

2. On the **Geocoding** tab, click **Add Geocoding Service**.
   The Geocoding Service Wizard opens.

3. With **ArcGIS Geocoding Service** selected, click **Next**.

4. Type a **Display Name** for the geocoding service.
   Choose a display name that end users will understand.

5. Click **Next**.

6. Type in the URL of the ArcGIS REST services endpoint. By default, this is:
   ```
   http://[server.domain.com]/ArcGIS/rest/services
   ```
   where `[server.domain.com]` is the fully qualified host where the service is located.

   The URL for the ArcGIS Online World Geocoding Service is
   `http://geocode.arcgis.com/arcgis/rest/services/World/GeocodeServer`.

7. Click **Next**.
   Manager discovers the geocoding services at the specified URL.

8. Select a geocoding service from the **Service Name** drop-down list.

9. Click **Finish**.
   The wizard closes and the Edit Geocoding Service page for the new geocoding service opens.

10. Click **Save Site**.

19.2.4 Configure an ArcGIS Geocoding Service

When you add an ArcGIS geocoding service to a site, the wizard prompts you to configure the Display Name and Service URL settings. Instructions for changing the Display Name and URL are given below.

Depending on which features you configure that use the geocoding service, you might need to configure additional settings after the wizard has completed. For information about which settings to configure, see **Geocoding Services** on page **156**.

Additional settings for ArcGIS geocoding services

As of version 2.5, the HTML5 Viewer supports both single-line and multi-line ArcGIS geocoding services.

▶ **To edit an ArcGIS geocoding service:**

1. In Manager, edit the site that you want to configure, and then click **GIS Services** in the side panel.

2. On the **Geocoding** tab, click the **Edit** tool 🖉 beside the geocoding service that you want to edit.

3. In the **Display Name** box, change the geocoding service's name if you want.
   Choose a display name that end users will understand.

4. In the **Service URL** box, change the geocoding service's URL if you want.
   Use a fully qualified URL. If you are using the HTML5 Viewer with a proxy page, update the geocoding service's URL in the `proxy.config` file.
   Manager will connect to the URL. If the geocoding service's Address Fields are different than the Address Fields at the previous URL, Manager highlights the fields that do not exist at the current URL. You can remove the highlighted fields by clicking the Remove tool 🗑 beside each field.

Fields that are not present at the updated URL are highlighted

5. If you want to use this geocoding service in Global Search, select the **Include in Global Search** checkbox and then select the attribute to search on from the **Global Search Key** drop-down list.

6. Fill in the desired search parameters in the table.

> For detailed information about the settings on the Edit Geocoding Service page, see **Geocoding Services on page 156**. For more information about the geocoding features available in the Silverlight Viewer, see "Geocoding and Search Tools" in the *Geocortex Viewer for Silverlight Administrator Guide*.

7. Click **Apply Changes**.

8. Click **Save Site**.

19.2.5 Add a Bing Maps Geocoding Service

> **NOTE**
> If you are using the HTML5 Viewer with a proxy page, you must register the geocoding service with the proxy. The enables the proxy to forward requests to the geocoding service. For instructions, see "Set Up a Proxy Page" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

> **To add a Bing Maps geocoding service to a site:**

1. In Manager, edit the site that you want to configure, and then click **GIS Services** in the side panel.

2. On the **Geocoding** tab, click **Add Geocoding Service**.
   The Geocoding Service Wizard opens.

3. Select **Bing Geocoding Service**, and then click **Next**.

4. Type a **Display Name** for the geocoding service.
   Choose a display name that end users will understand.

5. Click **Next**.

6. Type or paste your Bing Maps key in the **Bing Maps Key** box.
   To obtain a key or to learn more about Bing Maps, go to Getting a Bing Maps Key (http://msdn.microsoft.com/en-us/library/ff428642.aspx).

7. Click **Finish**.
   Manager validates the Bing Maps Key. If it is invalid, re-enter the key. The geocoding service will not be added to the site if the key is not valid.
   When the key validates, the wizard closes and the Edit Geocoding Service page opens. You have successfully added the Bing Maps geocoding service.

19.2.6 Configure a Bing Maps Geocoding Service

When you add a Bing Maps geocoding service to a site, the wizard prompts you to configure a display name and specify the Bing Maps Key.

You can also set a culture to attach to geocoding requests. The Bing Maps geocoding service uses the culture to translate and prioritize the results it returns. For information, refer to the Microsoft documentation on the Culture Parameter.

Instructions on configuring the display name, service URL, key, and culture are given below.

Depending on which features you configure that use the geocoding service, you might need to configure additional settings.

Additional settings for the Bing Maps geocoding service

The Silverlight Viewer has several features that use the geocoding services you configure. For information, refer to "Geocoding and Search Tools" in the *Geocortex Viewer for Silverlight Administrator Guide*.

The HTML5 Viewer has only one feature that uses geocoding services—Global Search. For Global Search to work, all you have to do is add a geocoding service to your site—no additional configuration is required.

▶ To edit the Bing Maps geocoding service:

1. In Manager, edit the site that you want to configure, and then click **GIS Services** in the side panel.

2. On the **Geocoding** tab, click the **Edit** icon 🖉 beside the geocoding service that you want to configure.

3. In the **Display Name** box, change the geocoding service's name if you want.
   Choose a display name that end users will understand.

4. In the **Service URL** box, type or paste the URL for the Bing Maps geocoding service that you are using.
   You only need to configure the URL if you are hosting the Bing Maps geocoding service, or you want to enforce the use of SSL with the public Bing Maps service.

> **NOTE** The Service URL setting is supported by the Geocortex Viewer for Silverlight. You cannot use a configured service URL with the Geocortex Viewer for HTML5.

5. If you want to use this geocoding service in Global Search, select the **Include in Global Search** check box. and then select the attribute to search on from the **Global Search Key** drop-down list.

6. In the **Bing Maps Key** box, change the key if you want.
   Manager will verify the key when you apply the changes.

7. Enter a culture code if you want.
   For information, refer to the Microsoft documentation on Supported Culture Codes.

8. For information on configuring the remaining settings on the Edit Geocoding Service page, such as Include in Global Search, refer to "Geocoding and Search Tools" in the *Geocortex Viewer for Silverlight Administrator Guide*. The HTML5 Viewer does not use any of the remaining settings.

9. Click **Apply Changes**.

10. Click **Save Site**.

19.2.7 Troubleshooting Geocoders

Limit the Geographic Area

Some geocoding services may not be able to find addresses unless you specify the geographic area to geocode within. If you find that features that do forward geocoding do not return the results you expect, try configuring the Value setting for one or more parameters.

> **NOTE** Configuring Value settings for a geocoding service's parameters affects all the configured features that use this service to do forward geocoding—the values are sent to the geocoding service as part of the geocoding request.

▶ **To specify the geographic area for forward geocoding:**

1. In Manager, edit the site that you want to configure, and then click **GIS Services** in the side panel.

2. On the **Geocoding** tab, click the **Edit icon** beside the geocoding service that you want to configure.

3. Enter values for one or more of the parameters in the parameter's **Value** box.
   For example, in the screen capture below, the City and State are specified.

Specify the area to geocode within

4. Click **Apply Changes**.

5. Click **Save Site**.

Use the Geocoding Service's Fully Qualified URL

Make sure you have configured the geocoding service's fully qualified URL. To check, edit the geocoding service—the URL is given in the **Service URL** box. Note that the Service URL box will be blank for the public Bing Maps geocoding service. (In this case, the URL is provided by Essentials.)

Register the Geocoding Service with an HTML5 Viewer Proxy Page

If you are using the HTML5 Viewer with a proxy page, you must register the geocoding service with the proxy. Otherwise, the proxy will not forward requests to the geocoding service. For instructions on adding the geocoding service's URL to the proxy, see "Set Up a Proxy Page" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

19.2.8   Remove a Geocoding Service

 If you are using the HTML5 Viewer with a proxy page, you may want to remove the geocoding service from the `proxy.config` file after you have removed it form the site.

▶ **To remove a geocoding service:**

1. In Manager, edit the site that you want to configure, and then click **GIS Services** in the side panel.

2. On the **Geocoding** tab, click the **Remove** icon ▯ beside the geocoding service that you want to delete. You will be prompted to confirm the deletion.

3. Click **OK**.

4. Click **Save Site**.

20 References

References enable you to include other sites and ArcGIS web maps in a site. The web maps can be from ArcGIS Online or Portal for ArcGIS.

When a site references another Essentials site, the site inherits the other site's configuration. Similarly, a site with a reference to a web map inherits the web map's services, bookmarks, and pop-up windows.

You can modify the inherited configuration. Your changes override the inherited configuration.

Inherited components and settings are modified and removed in exactly the same way configured components and settings are modified and removed. For example, to modify the default visibility of an inherited map service, edit the map service, change the Visible setting, and save your change. Similarly, to remove an inherited workflow, go to Manager's Workflows page and remove the workflow, just as you would any other workflow.

When a site references another site, the site remains linked to the source—if the source site is modified, the change is reflected in the site that references it. Web map references behave differently—when a source web map changes, the change is not automatically reflected int he site. You must manually refresh the web to see the changes in your site. For instructions on refreshing web maps, see **About Portal for ArcGIS Web Maps** on page **90** or **About ArcGIS Online Web Maps** on page **92**.

If a referenced site is removed, you are forced to remove the reference from your site the next time you edit the site— you cannot make any other changes to the site until you have removed the reference.

References can be chained. For example, if site A references site B and site B references web map C and site D, then A inherits B, C, and D.

See Also...

Inherit Components from Another Site on page **57**

About Portal for ArcGIS Web Maps on page **90**

About ArcGIS Online Web Maps on page **92**

20.1 Add a Reference to an ArcGIS Web Map

To add a reference to a web map from Portal for ArcGIS, you must either know the URL, or have a service connection configured for the portal. Configuring a service connection allows you to search the portal by keyword.

To add a reference to an ArcGIS web map that contains one or more Bing Maps layers, you must first configure a Bing Maps service connection. The service connection stores the Bing Maps key that Essentials requires to access the layers. For instructions, see **Bing Maps Service Connections** on page **122**.

To add a reference to a web map from ArcGIS Online or Portal for ArcGIS:

1. In Manager, edit the site that you want to configure, and then click **Site Info** in the side panel.

2. In the **References** area, click ⊕ **Add Reference**.

3. Select **Reference a web map from ArcGIS Online or Portal for ArcGIS**, and then click **Next**.

4. Do one of the following:

    Enter URL

    a. Type or paste the web map's URL into the box, and then click **Next**.

    Search

    a. To limit the search to web maps that belong to your ArcGIS organization, select the **Organization content only** check box.
    If you clear the check box, the search includes your organization's content and public content from outside your organization.

    b. If Essentials is registered with ArcGIS Online and you have added a Portal for ArcGIS service connection, select the portal that you want to search—search **Portal for ArcGIS** (based on the service connection) or search **ArcGIS Online** (based on the ability to search that comes with registration).

    c. Type the term that you want to search for.
    Search results display while you are typing. The more information that you type, the smaller the list of search results. You can stop typing at any time and browse the results.

    In the search results, a padlock 🔒 beside a web map means that the web map is private.

    d. In the search results, select the web map that you want to add.

    e. Click **Next**.

5. Click **Finish**.

6. Click **Save Site**.

20.2 Add a Reference to a Site

When you add a reference to another site, the site's map services are added to the Map Services and Layer List tabs on Manager's Map page. This can affect the Layer List and the map's drawing order. After you add the reference, you may want to update the Layer List and drawing order.

▶ **To add a reference to a site:**

1. In Manager, edit the site that you want to configure, and then click **Site Info** in the side panel.

2. In the **References** area, click **Add Reference**.
   The Create Reference wizard opens.

3. Select **Reference another site**, and then click **Next**.

4. Select the site you want to reference from the **Site** list, and then click **Next**.

5. Click **Finish**.
   The wizard closes.

6. Click **Save Site**.

20.3 Modify the Inherited Configuration

Inherited components and settings are modified and removed in exactly the same way configured components and settings are modified and removed. For example, to modify the default visibility of an inherited map service, edit the map service, change the Visible setting, and save your change. To remove an inherited workflow, go to Manager's Workflows page and remove the workflow, just as you would any other workflow.

20.4 Refresh Web Maps

When the source web map changes, the changes are not automatically reflected in a site that references the web map. You must manually refresh web maps to see the changes in your site.

▶ **To refresh web maps:**

1. In Manager, edit the site that you want to configure, and then click **Site Info** in the side panel.

2. In the **References** area, click ⟳ **Refresh Web Maps**.
   Essentials updates the site with any changes that have been made in the source web maps that the site references.

20.5 Remove a Reference

▶ **To remove a reference:**

1. In Manager, edit the site that you want to configure, and then click **Site Info** in the side panel.

2. In the **References** section, click the **Remove** icon 🗑 beside the reference that you want to remove.
   You are prompted to confirm.

3. Click **OK**.

4. Click **Save Site**.

₂₁ The Overview Map

An Overview Map is not recommended for most modern applications, as it is easy to zoom out for quick context. One exception is a map that opens to a specific feature of interest—for example, a property parcel—from a third-party system, where the user does not have any idea where the feature is located and has no other reason to zoom out.

The overview map is a small map that is inset in the main map. Often the overview map shows the main map in its larger context. The end user can show and hide the overview map.

The overview map is fully configurable—you can add and remove map services and feature layers, edit display settings, and add and remove layers, just as you do when you configure the main map.

> **NOTE** The spatial reference of the overview map must match that of the primary service.

₂₁.₁ Configure the Overview Map

▶ **To configure the overview map:**

1. In Manager, edit the site that you want to configure.
   If you are already editing the site, click **Overview Map** in the side panel.
   The Overview Map page opens.
2. Add and import map services that you want to appear in the overview map.
3. Reorder the map services.
4. Set the initial extent and full extent.
5. Edit a map service or feature layer to change its settings. See **Map Services** on page **96** for a list of settings.
6. Pan and zoom the map image to the extent that you want to use for the overview map.
7. Click **Apply Changes**.
8. Click **Save Site**.

₂₂ Layers

When you add a map service to your site, all the map service's layers are added. The Map Services tab on Manager's Map page lists the layers for each service.

▶ **To view a map service's layers In Manager:**

1. In Manager, edit the site that you want to configure, and then click **Map** in the side panel.
2. Click the **Map Services** tab.
3. Click the ▶ icon beside the map service whose layers you want to see.

22.1 About Feature Descriptions

Feature descriptions present information about features to end users. They appear in search and identify results, in map tips, and in feature details.

Feature descriptions are key to the usability of your site. A well constructed description acts as a summary of the feature's most important attributes. Feature descriptions can also include images and hyperlinks to related information.

Example of the feature description for a parcel, shown in search results in a Silverlight viewer

There are several parts to a feature description, illustrated below.

1 **Icon** - The icon that represents the layer that the feature belongs to. The icon appears beside the feature's title in search and identify results when the results are listed in the viewer's side panel.

The icon is controlled by the **Layer Icon** setting.

2 **Header** - The title that appears at the top of the description.

The header is controlled by the **Feature Label** setting.

3 **Main Content** - The main content that summarizes the feature. The main content typically includes important attributes, and can also include images and hyperlinks.

You can choose which setting you want to display as the main content—**Feature Description** or **Feature Long Description**.

Settings that control how this layer's features are presented in viewers

Having two settings for the main content allows you to configure two different ways of presenting a feature's information to users. The settings are used in different contexts in viewers. The table below summarizes where the two settings are used.

Where Feature Descriptions and Feature Long Descriptions are Used in the Geocortex Viewers

Viewer	Search and Identify Results (List View only, not Table View)	Map Tips	Feature Details
Geocortex Viewer for HTML5 *	By default, the HTML5 Viewer uses the Feature Long Description in the Results List.	By default, the HTML5 Viewer's Desktop and Tablet interfaces use the Feature Long Description in map tips, and the Handheld interface uses the Feature Description.	By default, feature details do not show a description in the HTML5 Viewer.
Geocortex Viewer for Silverlight	The Silverlight Viewer uses the Feature Description in the Results List.	By default, the Silverlight Viewer uses the Feature Long Description in map tips. If the Feature Long Description is not configured, then the Feature Description is used.	By default, the Silverlight Viewer uses the Feature Long Description in feature details. If the Feature Long Description is not configured, then the Feature Description is used.

* The HTML5 Viewer allows you to configure which setting you use in each of the three contexts.

The Layer Icon, Feature Label, Feature Description, and Feature Long Description are configured on the layer's Details tab. To open a layer's Details tab, edit the layer.

Essentials provides a variety of tools and functions to help you create effective feature descriptions:

- **Support for HTML markup:** The Feature Description and Feature Long Description settings support HTML markup, including anchor elements (hyperlinks) and image elements.

- **Rich Text Editor:** Manager has a built-in Rich Text Editor that you can use to create and format most of the content for the description fields. The Editor converts your content into HTML markup, and also provides some error checking. To open the Editor, click the **Edit** button beside the setting that you want to configure.
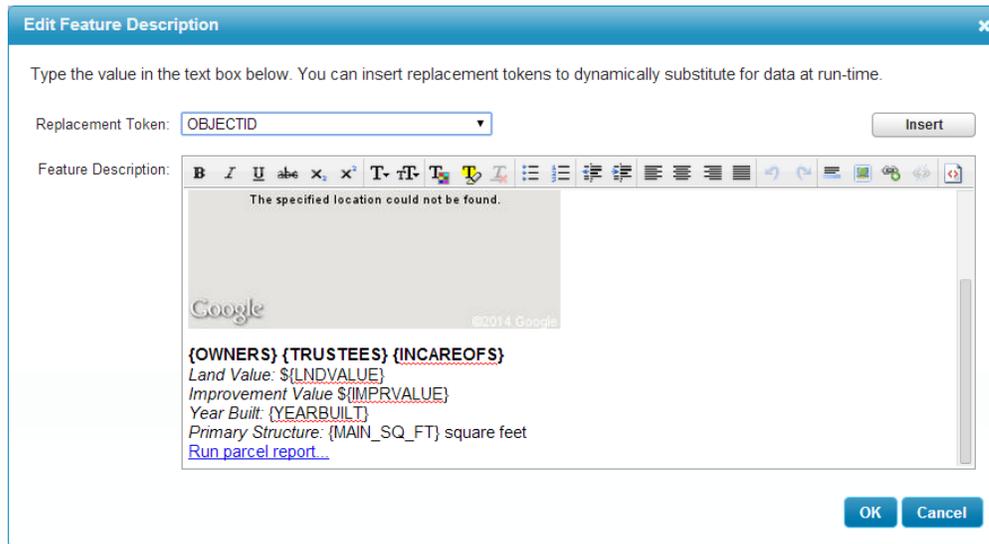
Rich Text Editor for creating feature descriptions

If the Rich Text Editor does not have a particular tool that you want, or you prefer to work directly in the HTML markup, click the **Show Source** icon at the end of the toolbar. This displays the HTML markup so you can edit the markup directly. Drag the corner of the dialog box to make it bigger—this allows you to see more of your markup. To return to the Rich Text Editor, click the icon again. You can switch back and forth between the Rich Text Editor and the HTML markup.

When you are working in the HTML markup, you can paste HTML markup from other sources.

- **Viewer Commands in Hyperlinks:** Viewer commands can be embedded in HTML anchor elements. The command executes when the user clicks the hyperlink. The Geocortex Viewer for HTML5 and Geocortex Viewer for Silverlight both support viewer commands in anchor elements. For more information, see **Viewer Commands in Hyperlinks** on page **45**.

You cannot use the Rich Text Editor to enter viewer commands—you must type viewer commands into the HTML markup.

- **Field Tokens:** Field tokens are placeholders that represent feature attributes. Field tokens enable you to define dynamically generated hyperlinks that depend on the current feature. For more information, see **Field Tokens** on page **40**.

- **Object Tokens:** Object tokens are placeholders that represent objects—feature objects, graphics objects, and geometry objects. Object tokens enable you to define hyperlinked viewer commands that execute a command

that takes an object related to the current feature as a parameter. For more information, see **Object Tokens** on page **42**.

22.2 Edit a Layer

▶ **To edit a layer:**

1. Launch Manager, following the instructions that apply to you:

   - **Windows Server 2012 or Windows 8, and Newer Versions:**
     On the **Start** screen, type **Geocortex**, and then click **Geocortex Essentials Manager**.

   - **Windows Server 2008 or Windows 7, and Older Versions:**
     In the **Start** menu, select **All Programs** | **Latitude Geographics** | **Geocortex Essentials [Version] [Instance]** | **Geocortex Essentials Manager**.

     [Version] is the Essentials version number. [Instance] is the instance name, if Essentials is installed as a named instance. The default installation does not have an instance name.

2. Edit the site that you want to configure:

   a. Click the **Sites** tab.

   b. If a different site is open for editing, click **Save Site**, and then click **Close Site**.

   c. Follow the instructions for the view of the Site List that you are using:

      - **Tiled View:**

        World site in Tiled View

        - Click the thumbnail image of the site that you want to edit, or
        - Click the site's name, or
        - Position the pointer over the thumbnail image of the site that you want to edit, and then click the **Edit** icon .

      - **List View:**

        World site in List View

        - Click the site's name, or
        - Click the **Edit** icon .

3. Click **Map** in the side panel.

4. Click the **Map Services** tab.

> If the layer is in the Layer List, you can also edit the layer from the Layer List tab.

5. Click the ▶ icon beside the map service that the layer belongs to.
    The map service's layers show.

6. Locate the layer that you want to configure and click the **Edit Layer** icon 🖉 beside the layer.

> Make sure you are editing the layer, not a map service. The tool tip should say **Edit Layer**.
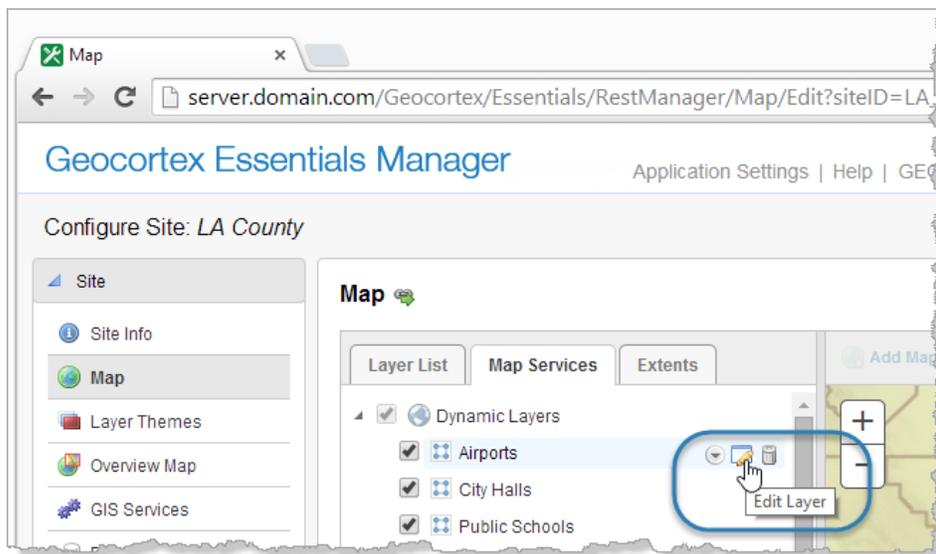
Edit Layer icon for the Airports layer

The layer opens for editing.
Layer settings are organized into tabs. The specific tabs and settings depend on the type of layer.

See also...

22.3 Layer Settings

Editing a service opens a page with several tabs containing configurable settings. The specific tabs that are available depend on the type of service. The tabs are:

22.3.1 How to Configure Layer Settings

Manager offers several ways to configure a layer's settings:

- **Edit:** Edit the layer. This method gives you access to all of the layer's settings.

- **Layer Drop-Down Menu:** Use the layer's drop-down menu on the Layer List tab or the Map Services tab to configure settings for that layer. This method gives you access to a subset of the layer's settings. The particular settings depend on the type of layer.

- **Batch Editing:** Use a folder or service's drop-down menu to edit the settings for all the layers in that folder or service. This method gives you access to a subset of layer settings, for multiple layers. The particular settings depend on the type of layer.

> The different places in Manager where you can change settings are synchronized—if you change a setting in one place, it is automatically changed everywhere else that you can edit it.

Layer Drop-Down Menu

▶ **To change the settings for a single layer using the layer's drop-down menu:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.

   > If the layer is in the Layer List, you can also use the layer's drop-down menu on the Layer List tab.

2. Position the pointer over the layer that you want to configure.
   The management tools show.

3. Click the down arrow ⌄ .
   The menu opens.
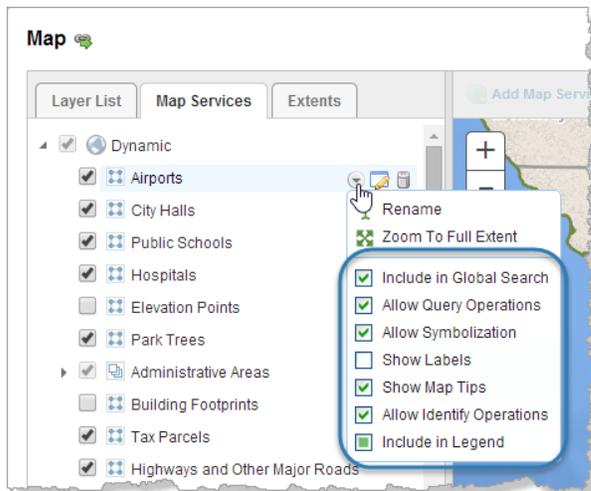
Settings for the Airports layer

4. Select or clear the checkbox beside the setting that you want to configure.

    If the setting that you want to configure is not in the menu, you must edit the layer to configure that setting.

5. Repeat these steps to configure as many of the settings as you want.

6. Click **Apply Changes**.

7. Click **Save Site**.

Batch Editing

▶ **To batch edit the settings for all the layers in a map service:**

⚠ Batch editing overwrites the existing configuration for every layer in the folder or service. The only way to restore the previous configuration after you click Apply Changes is to individually reconfigure each setting in each layer.

📝 Batch editing applies to all the layers in the map service, regardless of how deeply nested the layers are.

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.

2. Position the pointer over the map service whose layers you want to configure.

    The management tools show.

3. Click the down arrow ⊙.

    The menu opens.
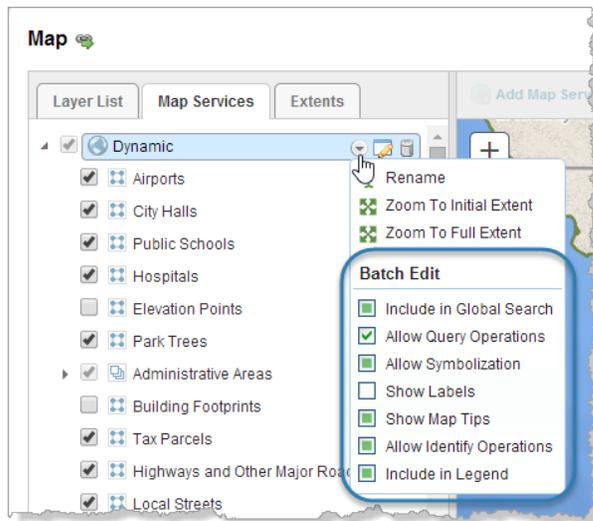
Common settings for all the layers in the Dynamic map service

A selected checkbox ☑ means that the setting is enabled for all the layers in the map service.

A cleared checkbox ☐ means that the setting is disabled for all the layers.

If the setting is enabled for some layers and disabled for others, the checkbox looks like this: ▣.

4. Select or clear the checkbox beside the setting that you want to configure.

5. Repeat these steps to configure as many of the settings as you want.

6. Click **Apply Changes**.

7. Click **Save Site**.

▶ **To batch edit the settings for all the layers in a folder:**

⚠ Batch editing overwrites the existing configuration for every layer in the folder or service. The only way to restore the previous configuration after you click Apply Changes is to individually reconfigure each setting in each layer.

📌 Batch editing applies to all the layers in the folder, regardless of how deeply nested the layers are.

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Layer List** tab.

2. Position the pointer over the folder whose layers you want to configure.
   The management tools show.

3. Click the down arrow ⦿.
   The menu opens.
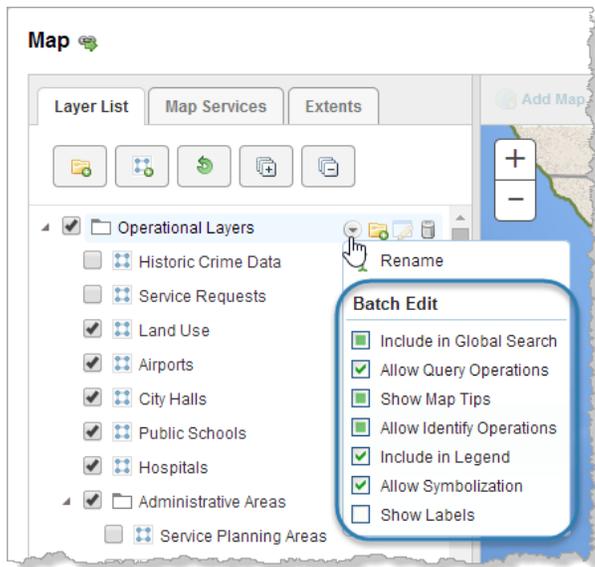
Common settings for all the layers in the Operational Layers folder

A selected checkbox ☑ means that the setting is enabled for all the layers in the map service.

A cleared checkbox ☐ means that the setting is disabled for all the layers.

If the setting is enabled for some layers and disabled for others, the checkbox looks like this: ▣.

4. Select or clear the checkbox beside the setting that you want to configure.

5. Repeat these steps to configure as many of the settings as you want.

6. Click **Apply Changes**.

7. Click **Save Site**.

22.3.2 Layer Details Tab

In addition to configurable settings, the Details tab provides static information about the layer.

> Different types of layer can have different information and settings.

Layers have the following settings on the Details tab:

- **Map Service:** The map service that the layer belongs to. When you add a map service to a site, all the map service's layers are added to the site.

- **Layer Name:** The name of the layer in the map service. By default, this is the name used in Manager and in the viewer. You can override this name using the Display Name setting.

- **Layer ID:** The layer's ID in the REST API. The ID is used to access the layer programmatically, for example, in a workflow, URL parameter, or custom-developed functionality.

- **Feature Type:** The type of geometry that features in this layer have—polygon, polyline, or point.

- **Visible:** When this checkbox is selected, the layer is initially turned on in the viewer, in other words, its visibility

checkbox in the Layer List is selected. Users will be able to see the layer in the map image, provided the map is zoomed to a scale at which the layer's features can be seen. For example, parcels cannot be seen when the map is zoomed out very far, even though the Parcels layer is turned on.

A quicker method of setting a layer's default visibility uses the layer's visibility checkbox on Manager's Map page. See **Set a Layer's Default Visibility** on page **183** for instructions.

- **Display Name:** The name to use for the layer in Manager and in the viewer. For example, a layer named "ZIP" in the map service could appear as "Zip/Postal Code" in Manager and the viewer.

  If you leave the Display Name box blank, the name is inherited from the map service.

  You can also define display names for a layer's fields. See **Fields** on page **285** for information.

- **Description:** A description of the layer, to use as layer metadata. This overrides the layer description that is configured in the underlying map service, if there is one.

- **Dynamic Definition:** (dynamic layers only) The JSON code that identifies the dynamic layer and controls the appearance of the symbols that represent this layer on the map.

- **Layer Icon URI:** The URI of the icon that is used to represent the layer in viewers. The icon appears in the feature details. The URI can contain client replacement tokens.

- **Style:** (WMS layers only) The style to select for a WMS layer, if the layer has styles configured for it.

- **Feature Label:** The text to display in the viewer to identify the feature. The feature label is used like a title—it appears at the top of feature details and in the title of map tips.

  You can use field tokens in the Feature Label box. Click **Edit** to select from a list of available tokens.

  You can also use HTML markup in the Feature Label. The HTML5 Viewer renders the HTML markup. The Silverlight Viewer does not render the HTML markup.

- **Feature Description:** The text to display in the list of search or identify results. The Feature Description box can contain HTML markup that contains field tokens, object tokens, and hyperlinked viewer commands. Click the **Edit** button to open a Rich Text Editor that creates HTML markup. See **About Feature Descriptions** on page **171** for more information.

- **Feature Long Description:** The text to display in map tips and feature details. The Feature Long Description box can contain HTML markup that contains field tokens, object tokens, and hyperlinked viewer commands. Click the **Edit** button to open a Rich Text Editor that creates HTML markup. See **About Feature Descriptions** on page **171** for more information.

- **Feature Zoom Factor:** (polygon and polyline layers only) The factor to zoom in by when the user zooms to a feature on this layer. The smaller the zoom factor, the closer in to the feature you zoom. The larger the number, the farther out from the feature you zoom. At a zoom factor of 1, the feature touches the edges of the map viewport.

- **Feature Zoom Scale:** The scale to display the feature at when the user zooms to the feature. The scale is expressed as an integer, specifically, the scale's second term. For example, if you want the map to zoom to 1:20,000 when the user zooms to a feature on this layer, enter **20000** in the Feature Zoom Scale box.

  For polygon and polyline layers, you can use the Feature Zoom Factor or the Feature Zoom Scale setting (or neither), but not both.

- **Feature Border Color:** The border color used to highlight the features of a layer. The highlight outlines the feature on the map when the user hovers the pointer over the feature in the Results list, hovers the pointer over the feature on the map to display its map tip, or adds a feature to their selection. You can enter a web color, a 6-

digit hexadecimal color, or an 8-digit ARGB hexadecimal color with the alpha value at the beginning. For example, to make the fill blue, you can enter **blue** or **#0000FF** or **#FF0000FF**. This color setting takes precedence over any highlight color set in the Viewer Look and Feel settings.

- **Feature Border Width**: The width of the border of the highlight that outlines a feature on the map. Type in the number of pixels wide to display the polygon border or line width when a feature is highlighted.

- **Feature Fill Color:** (polygon layers only) The fill color used to highlight the features of a layer. The highlight color that fills the feature on the map when the user hovers the pointer over the feature in the Results list, hovers the pointer over the feature on the map to display its map tip, or adds a feature to their selection. You can enter a web color, a 6-digit hexadecimal color, or an 8-digit ARGB hexadecimal color with the alpha value at the beginning. For example, to make the fill turquoise, you can enter **turquoise** or **#40E0D0** or **#FF40E0D0**. This color setting takes precedence over any highlight color set in the Viewer Look and Feel settings.

- **(Default) Data Provider:** (ArcGIS Server dynamic and tiled map services) The (Default) Data Provider is the type of data provider that you use to store feature data. This setting is used by the HTML5 and Silverlight Viewers. It enables the Query Builder and Filter Builder to construct queries using the correct syntax for your data provider.

  You can configure this setting at the site level, the map service level, or the layer level. At the site and map service level, the setting is called **Default Data Provider**. At the layer level, it is called **Data Provider**.

  Map services inherit the setting from the site, and layers inherit the setting from the map service that they belong to, or from the site if the setting is not configured at the map service level. For example, if all the site's services use the same data provider to store their feature data, you could configure the Default Data Provider at the site level—the map services and layers will inherit the configuration. This saves you from having to configure the setting for every map service and layer in the site.

  By default, the provider is **Default**. The **Default** provider uses the ANSI SQL default syntax. If the Default provider does not work in your system, delete **Default** from the **Default Data Provider** box to open a drop-down list of providers. If the type of provider that you use appears in the list, select the provider—the Query and Filter Builders will use the well-known syntax for the provider that you select. If your provider does not appear in the list, re-enter **Default** in the **Default Data Provider** box, and configure the Viewer's QueryBuilder Module. For instructions, refer to the *Administrator and Developer Guide* for the Viewer that you are using.

  > **NOTE** If the map service only has one layer, the Default Data Provider setting is not available at the map service level. For example, feature services do not have a Default Data Provider setting, but feature layers do.

- **Include in Legend:** When this checkbox is selected, the layer appears in the legend in print templates. If you do not want this layer included in print template legends, clear the Include in Legend checkbox. By default, layers are included in print template legends.

  You can also configure this setting from the layer's drop-down menu ⊙ on the Map page's Map Services tab. To open the Map page, click Map in the sidebar.

- **Show Relationships by Default:** When this checkbox is selected, any relationships of this layer that have not been explicitly configured will be displayed to the end user.

- **Show Labels:** (ArcGIS Server dynamic map services with dynamic layers enabled only) When this checkbox is selected, the layer's labels show on the map, provided the layer has labels defined and enabled in the map service. If you do not want the labels to show, clear the Show Labels checkbox.

- **Include in Global Search:** When this checkbox is selected, the attributes of features in this layer are searched during global searches. If you do not want this layer's features to be searched when a global search is performed, clear the Include in Global Search checkbox. By default, layers are not included in global search operations.

You can also configure this setting from the layer's drop-down menu ⊙ on the Map page's Map Services tab. To open the Map page, click Map in the sidebar.

- **Allow Identify Operations:** When this checkbox is selected, features in this layer can be identified. If you do not want the user to be able to identify features in this layer, clear the Allow Identify Operations checkbox. By default, identify operations are not allowed.

  You can also configure this setting from the layer's drop-down menu ⊙ on the Map page's Map Services tab. To open the Map page, click Map in the sidebar.

- **Allow Query Operations:** When this checkbox is selected, the attributes of the layer's features are searched during queries. If you do not want this layer's features to be searched when a query is performed, clear the Allow Query Operations checkbox. By default, layers are included in query operations.

- **Allow Symbolization:** (dynamic layers only) When this checkbox is selected, users can symbolize the layer in the viewer. If you do not want users to be able to symbolize the layer, clear the Allow Symbolization checkbox.

  You can set a default value for all the dynamic layers in this map service by configuring the Default Allow Symbolization setting on the map service's Details tab. To open the map service's Details tab, edit the map service.

  > 💡 To save configuration effort, first set the Default Allow Symbolization setting to the value most of the dynamic layers in this map service will have. Then you only need to configure the Allow Symbolization setting for the remaining dynamic layers.

- **Show Map Tips:** When this checkbox is selected, map tips are enabled for this layer. You can also configure this setting from the layer's drop-down menu ⊙ on the Map page's Map Services tab. For information about additional map tips configuration, see **Configure Map Tips** on page **79**.

- **Filter Workflow URI:** (static layers only) The URI of a workflow for filtering the layer's features. Use this setting to configure a layer filter workflow for a static layer. For dynamic layers, configure the layer filter workflow at the map service level.

  See **Filter a Layer's Features** on page **428** for more information.

- **Features Can be Copied to Edit Layer:** (Silverlight Viewer only) Select this checkbox if you want to allow features from this layer to be copied to the edit layer; otherwise, clear this checkbox. For more information about the editing tools, see the *Geocortex Viewer for Silverlight Administrator and Developer Guide*, which you can download from the Geocortex Support Center.

- **Allow Snapping:** Select this checkbox if you want to allow snapping for features in this layer; otherwise, clear this checkbox.

- **Snapping Enabled:** Select this checkbox if you want snapping to apply to features in this layer by default; otherwise, clear this checkbox.

22.3.3 Group Layer Settings

Group layers have the following settings:

> 📌 The following descriptions apply to the group layer only, not its sublayers. The settings for sublayers are the same as for other layers.

- **Display Name:** The name to use for the group layer in Manager and in the viewer. For example, a layer named "Streams" in the map service could appear as "Streams and Rivers" in Manager and the viewer.

If you leave the Display Name box blank, the name is inherited from the map service.

- **Map Service:** (information only) The type of map service that the group layer belongs to.

- **Layer Name:** (information only) The layer's name that is defined in the underlying map service.

- **Layer ID:** (information only) The layer's ID in the REST API.

- **Layer Icon URI:** The URI of the icon that is used to represent the group layer in viewers. The icon appears in the feature details. The URI can contain client replacement tokens.

See Also...

Exclude Layers from a Dynamic Map Service on page **113**

22.4 Set a Layer's Default Visibility

A layer's visibility setting controls whether the layer is initially turned on in the Layer List when the end user launches a viewer. A layer must be turned on in the Layer List for the user to be able to see the layer on the map. The layer only shows on the map if it is visible at the initial extent's zoom level—the user may have to zoom the map in or out to see the layer's features.

If you include a layer in the Layer List, the end user can change the layer's visibility. See **Configure the Layer List** on page **185** for instructions.

▶ **To configure a layer's default visibility:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.

   You cannot change the default visibility of group layers on the Map Services tab. Instead, click the Layer List tab and set the default visibility for the group layer's folder. You can set the default visibility for the group layer's sublayers on either tab.

   For layers other than group layers, if the layer is included in the Layer List, you can also configure the layer's visibility on the Layer List tab, or you can edit the layer and set the Visible setting on the Details tab. When you change the visibility in one place, the change is reflected in the other places.

2. Configure the visibility:

   - To configure the layer to be turned on initially, select the check box to the left of the layer's name.

   - To configure the layer to be turned off initially, clear the check box to the left of the layer's name.
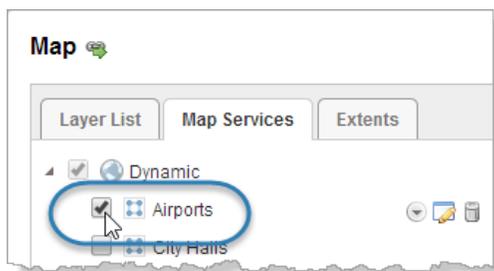
Set the initial visibility for the Airports layer

3. Click **Apply Changes**.

4. Click **Save Site**.

23 The Layer List

The Layer List is a list of map services and layers, which is displayed in viewers.
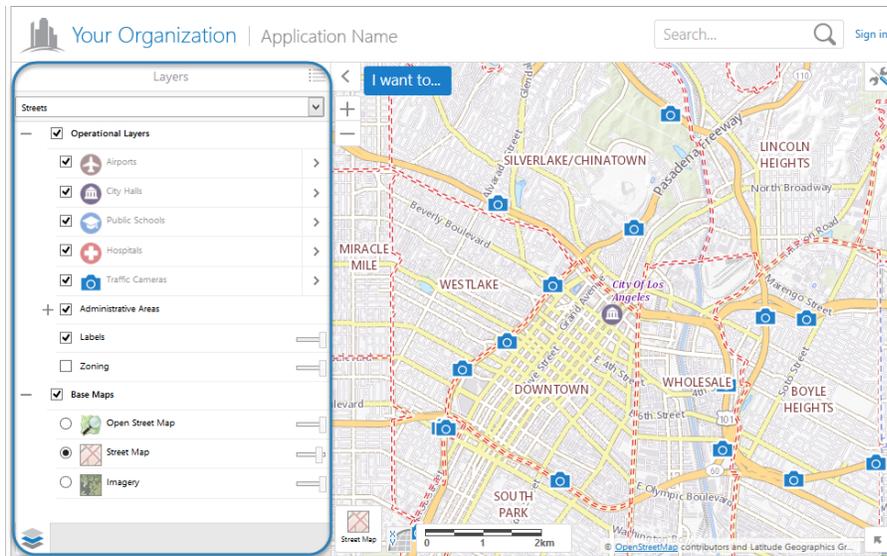
Example of the Layer List in an HTML5 viewer

One of the main functions of the Layer List is to enable end users to turn layers on and off, in other words, control the visibility of layers. When a layer is turned off, it does not show on the map.

The Layer List also has other functions associated with it, like zooming the map to the extent of a layer, or adjusting the transparency of layers. The other functions that are available for a particular layer depend on the type of layer or map service. For information, see **Map Service Settings** on page **103** and **Layer Settings** on page **176**. Also see **Set a Map Service's Default Visibility** on page **113** and **Set a Layer's Default Visibility** on page **183**.

You can configure settings for multiple layers at one time in the Layer List. See **Batch Editing** on page **177** for information.

Layer List Configuration

The Layer List is configurable. You can specify which map services and layers to include in the Layer List, organize them into folders, and reorder them. By default, the Layer List contains all of the map services that you have added to the map, in the same order that they appear on the Map page's Map Services tab.

Usually, when you add a new map service to the map, it automatically appears in the Layer List. If you have changed the order extensively, Manager may not know where to add the new map service. In this case, you can manually include the map service in the Layer List.

Some types of layers and map services look and behave differently in the Layer List than on the Map Services tab. It is important to understand the differences:

- **Dynamic Services:** Dynamic map services appear as folders in the Layer List.

- **Tiled Services:** By default, the layers in a tiled map service do not appear in the Layer List—only the map service appears. You can include the layers in the Layer List if you want. You can re-order tiled layers within the map service that they belong to. You cannot move the layers out of the map service.
  You can add other items such as folders to a tiled map service.

- **Feature Layers:** Only the layer component of a feature layer appears in the Layer List—the map service component does not appear in the Layer List. You cannot include the service component in the Layer List. This means that, to configure the service component, you must go to the Map Services tab.

- **Group Layers:** Group layers appear as folders in the Layer List. You can move the group layer's sublayers out of the group layer's folder if you want, and you can move other items in.

- **Annotation Layers:** Annotation layers look and behave the same in the Layer List as on the Map Services tab.

- **Raster Layers:** Raster layers look and behave the same in the Layer List as on the Map Services tab.

- **Image Services:** Image services look and behave the same in the Layer List as on the Map Services tab.

- **Web Tiled Layers:** Web tiled layers look and behave the same in the Layer List as on the Map Services tab.

- **Bing Maps:** Bing Maps look and behave the same in the Layer List as on the Map Services tab.

- **KML Layers:** KML Layers look and behave the same in the Layer List as on the Map Services tab.

- **GeoRSS Layers:** GeoRSS layers look and behave the same in the Layer List as on the Map Services tab.

You can configure different views of the Layer List called **layer themes**. For information, see **Layer Themes** on page **189**.

Folders in the Layer List

Organizing layers into folders makes it easier for end users to find layers in the Layer List, especially if the Layer List is large. You can mix different types of layer within a folder, and you can nest folders.

In a viewer, folders look like any other item in the Layer List. Like layers and map services, folders have a visibility check box that the user can use to show and hide the folder's layers and map services on the map. You can configure a folder's default visibility in Manager, just as you would for a layer or map service.

To appear in viewers, a folder must contain at least one item—if a folder is empty, viewers do not display the folder in the Layer List.

23.1 Configure the Layer List

You can customize the Layer List. Specifically, you can:

- Configure which map services and layers appear in the Layer List.

- Organize map services and layers into folders with meaningful names.

- Change the order of map services and layers in the Layer List.

- Change the display names of map services and layers.

- Change the names of folders.

- Configure a folder icon.
- Configure whether more than one of a folder's items can be visible at a time.
- Hide a folder's items, or hide the folder and its items.

If you are not satisfied with how you have customized the Layer List, you can reset the Layer List to its default configuration.

The Layer List is configured on the Layer List tab on Manager's Map page.

▶ **To configure the Layer List:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Layer List** tab.

2. Customize the Layer List as desired:

Create a New Folder

a. Click the **Add Folder** tool .

If you click the Add Folder tool beside an existing folder, layer, or map service, the new folder is added within that item. If you click the Add Folder tool at the top of the Layer List tab, the new folder is added at the bottom of the Layer List.

b. Type a name for the folder.

c. Press **Enter**, or click away from the folder's name.

After you add a folder, you can drag it to a new position in the Layer List if you want.

Configure a Folder Icon

The icon that you configure appears to the left of the folder name in the Layer List.

a. Click the **Edit** tool beside the folder.

b. In the **Folder Icon URI** box, type or paste the full path to the icon's image file, or click **Browse** to browse to the file.

c. Click **Apply Changes**.

d. Click **Map** in the side panel to return to the Layer List.

Place Items in a Folder

a. Click and hold a layer, map service, or folder that you want to place in a folder.

b. Drag the item to the folder and release the mouse button.

The Layer List prevents you from moving items to an invalid location.

Configure a Folder's Default Visibility

If you hide the folder in the Layer List, end users will not be able to change the folder's visibility.

a. Do one of the following:

- To turn on the folder's default visibility, select the check box to the right of the folder in the Layer List.
- To turn off the folder's by default, clear the check box to the right of the folder in the Layer List.

Configure the Visibility Behavior of a Folder's Items

This controls how many of the folder's items can be visible at one time.

a. Click the down arrow ⊙ beside the folder.

b. Click **Sub-item Visibility**.

c. Select the behavior that you want:

- **Multiple Visible at a Time:** The visibility of the folder items is controlled using check boxes. This allows users to turn on as many of the folder's items as desired.

- **Only One Visible at a Time:** The visibility of the folder items is controlled using radio buttons. Users can only turn on one item at a time.

  If the folder contains items that belong to a base map group and you set the behavior to Only One Visible at a Time, the slider will snap from one base map to the next instead of transitioning smoothly.

Hide a Folder's Items in the Layer List

This controls whether the folder's items show in the Layer List—it does not affect the visibility of the items on the map.

When you hide a folder's items and at least one of the items has an opacity slider, then the folder will have an opacity slider that controls the opacity of the folder's items. The folder's opacity slider preserves the ratio of the opacities of the hidden items. For example, if the folder contains two layers, one with its opacity set to 25% and the other with its opacity set to 60%, decreasing the folder's opacity by 50% would decrease the opacity of the individual map services by 50% each, to 12.5% and 30% respectively.

a. Click the down arrow ⊙ beside the folder.

b. Click **Hide Sub-items in Layer List**.

Hide a Folder and its Items in the Layer List

This controls whether the folder and its items show in the Layer List—it does not affect the visibility of the items on the map.

a. Click the down arrow ⊙ beside the folder.

b. Clear the **Show in Layer List** check box.

Re-Order the Layer List

a. Click and hold a layer, map service, or folder that you want to move.

b. Drag the item to its new position.

   A guideline shows you where the item will be placed when you release the mouse button. If a guideline does not appear, you cannot place the item there.

c. Release the mouse button.

Expand/Collapse a Folder by Default

If a folder is expanded on the Layer List tab when you save the site, it will appear expanded in the viewer by default. If a folder is collapsed, it will appear collapsed by default.

a. Click ▸ or ◂ to expand or collapse an individual folder.

Alternatively, expand ⊞ or collapse ⊟ all of the folders at one time.

Exclude a Layer or Map Service from the Layer List

a. Click the **Remove from Layer List** tool 🗑 beside the layer or map service.

You can re-include layers and map services that you have excluded from the Layer List.

> 📌 **NOTE** Excluding a layer or map service from the Layer List does not remove it from the map.

Re-Include Layers that were Previously Excluded

a. Click the **Include Layers and Map Services** tool ⊞ at the top of the Layer List tab.

b. In the **Excluded Items** column, click and hold the item that you want to re-include in the Layer List.
Layers and map services that are already included in the Layer List appear gray in the Excluded Items column. A layer can only appear once in the Layer List.

c. Drag the item from the **Excluded Items** column to the **Layer List** column.
A guideline shows you where the item will be placed when you release the mouse button. If a guideline does not appear, you cannot place the item there.

d. When the guideline is in the desired position, release the mouse button.

e. Click **Close** when you are finished.

Change the Display Name for a Layer or Map Service

You can also rename layers and map services by clicking the item's down arrow ⊙ and selecting **Rename**.

a. Double-click the name of the layer or map service that you want to change.

b. Edit the name, or type a new name.

c. Press **Enter**, or click away from the name.

Change a Folder's Name

You can also rename folders by clicking the folder's down arrow ⊙ and selecting **Rename**, or by editing the folder and changing the **Display Name** setting.

a. Double-click the folder's name that you want to change.

b. Edit the name, or type a new name.

c. Press **Enter**, or click away from the name.

Remove a Folder and All of its Contents

a. Click the **Remove from Layer List** tool 🗑 beside the folder.

b. Select **Remove Item and All Sub-Items**.

Remove a Folder, but Keep its Contents

This moves the folder's items to the left one level and removes the folder.

a. Click the **Remove from Layer List** tool 🗑 beside the folder.

b. Select **Remove Item and Keep Sub-Items**.

3. When you are satisfied with your customization, click **Apply Changes**.

▶ **To reset the Layer List to its default configuration:**

If the site was created in Essentials version 4.2 or newer, by default, the Layer List contains all the layers and map services that you have added to the map, in the same order that they appear on the Map Services tab. If you upgraded the site from an older version of Essentials, the default Layer List configuration is the configuration that was carried forward when you upgraded Essentials.

⚠ If you reset the Layer List, you will lose all the customization that you have done.

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Layer List** tab.

2. Click the **Reset** tool ↻ at the top of the Layer List tab.

   You will be prompted to confirm.

3. Click **OK**.

4. Click **Apply Changes**.

₂₄ Layer Themes

A layer theme is a subset of the Layer List, optionally with different visibility settings for the layers. The layers that are included in a layer theme usually have some theme in common. For example, you could define a Hydrography layer theme that turns on the map's water-related layers, such as layers for streams, lakes, and watersheds, and turns off layers that are not related to water.

Layer themes make it possible to quickly flip between sets of layers that are defined for different purposes. When a user selects a layer theme, the map redraws to show the layers in the layer theme, and the Layer List refreshes to list the layers that are included in the layer theme. This streamlines and specializes layer selection.

Layer themes are securable. If the site is secured, you can give some users permission to use a particular theme, and deny permission to other users. For information, see **Essentials Security** on page **396**.

📝 Layer themes are supported by the HTML5 Viewer and the Silverlight Viewer.
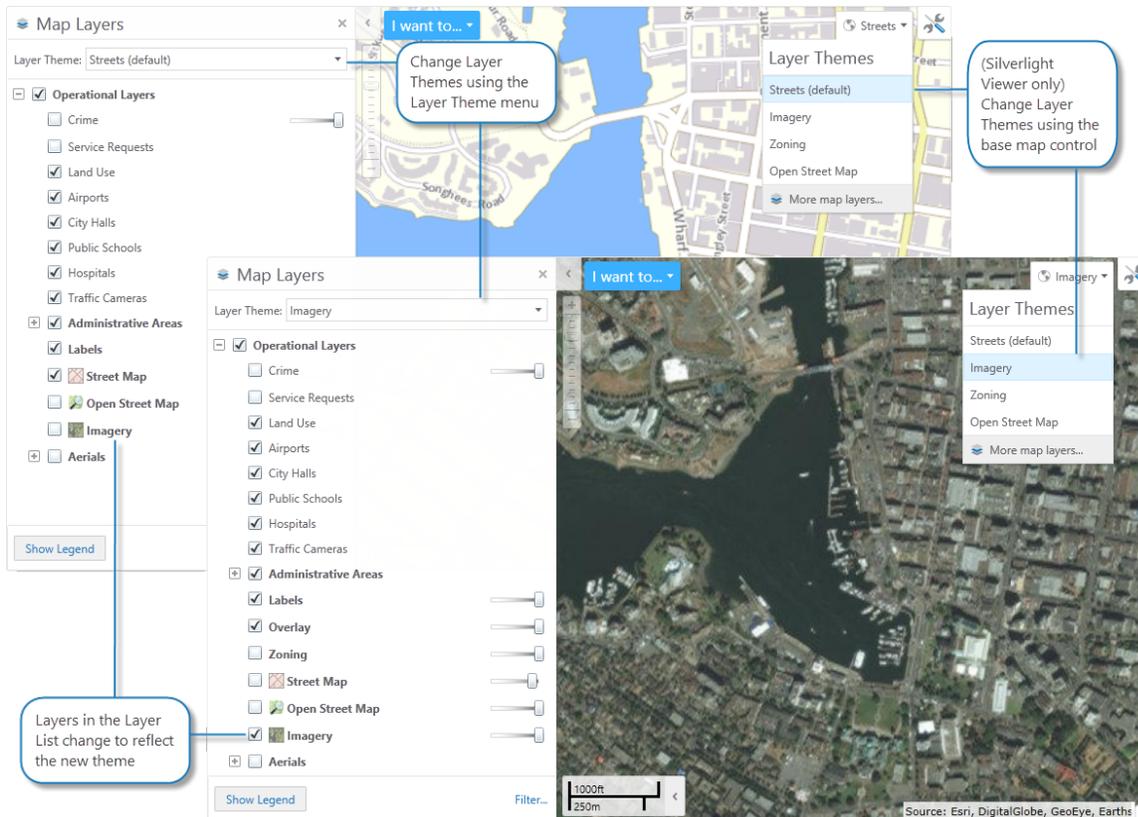
Switch quickly between different layer themes, shown in a Silverlight viewer

Some common uses for layer themes are:

- Configure layer themes that display only those layers that are needed for a specific task, analysis, or business need. This eliminates unneeded layers and makes it easier for users to quickly flip between the layers that they need when performing a particular task.

- Group frequently used layers into the default theme. Group the other layers by specialized functions in order of priority or business needs. The reduction in the number of layers in the default theme provides performance benefits.

- Configure multiple layer themes with the same layers, but different visibility settings. In this case, toggling between themes changes the visibility settings of multiple layers simultaneously.

- Configure a set of layer themes that allow users to change the context of the map. This simplifies the viewer for users who are not familiar with the concept of map layers.

24.1 Layer Theme Configuration and Behavior

Layer themes are configured on Manager's Layer Themes page. A site must have at least one layer theme. By default, every site has a layer theme called **All Available Layers**, which corresponds to the full Layer List—it includes all the layers that the Layer List includes, with the same visibility settings as the Layer List. If you add or remove a layer from the Layer List or you change a visibility setting, your changes are reflected in the All Available layers theme. You can hide the All Available Layers theme so it does not appear in viewers.

One layer theme is configured to be the default theme. The default layer theme is the theme that loads when the viewer launches. Initially, the All Available Layers theme is the default theme.

Initially, when you add a new layer theme, all the map services, layers, and folders that are included in the Layer List are also included in the theme. You can exclude any map services, layers, and folders that you want. When you exclude a layer, the layer does not show in the map or in the list of layers, and the layer's data is not available for client-side operations like search. If you exclude an item that contains other items, all the contained items are also excluded. Layer themes automatically appear in the drop-down menu of available themes at the top of the Layer List.

Each map service and layer that is included in a layer theme has a visibility setting in the theme. The visibility that you configure in the layer theme overrides the visibility that is configured in the Layer List.

When a viewer launches, it loads the default layer theme. If the user selects a different layer theme, the map redraws and the list of layers changes to the layer theme's list. If there are search results, selections, markup, and user-added layers when the user changes the theme, these items may no longer be available, depending on whether the layer is included and visible in the new layer theme.

The layer theme affects which base maps show in the HTML5 Viewer's Base Map Switcher. When the user changes the layer theme, the base maps that are available in the new layer theme are loaded into the Base Map Switcher, replacing the base maps from the previous layer theme. A base map is available in a layer theme if one or more of its map services is included in the layer theme. When a user selects a base map with a mix of included and excluded map services, only the map services that are included in the layer theme show on the map. If all of a base map's map services are excluded from a layer theme, then the base map does not show in the Base Map Switcher when that layer theme is selected.

24.2 Layer Themes in the Viewer

Layer themes behave in the Viewer in the following ways:

- In Silverlight viewers, you can configure the Base Map Control to display only base maps. If you have configured both layer themes and base maps and the Base Map Control is enabled, both the layer themes and base maps show in the Base Map Control.
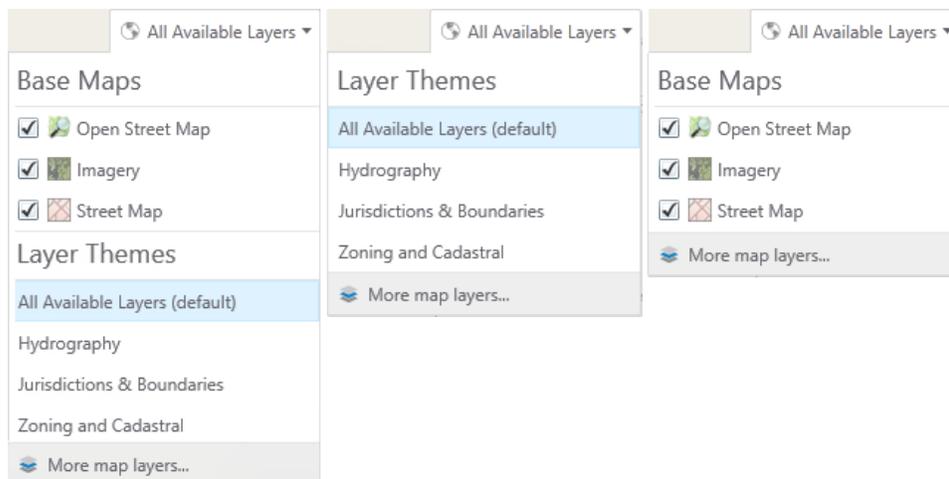
Configurations for the Base Map Control in the Silverlight Viewer

- In Silverlight viewers, projects save the current theme. When the project is opened, the saved theme displays.

- It is possible to launch a viewer with a particular layer theme applied. This is done by adding the `layerTheme` parameter to the URL. The URL parameter uses the *ID* or *Display Name* of the layer theme. For example, if the layer theme you want to apply when the viewer starts has an *ID* of **2**, you might use a URL similar to:

- HTML5 Viewer:
  ```
  http://myserver/Html5Viewer/Index.html?configBase=http://myserver/Geocortex/Ess
  entials/REST/sites/mysite/viewers/myviewer/virtualdirectory/Resources/Config/De
  fault&layerTheme=2
  ```

- Silverlight Viewer:
  ```
  http://myserver/Geocortex/SilverlightViewer/Viewer.html?Viewer=MyViewer
  &layerTheme=2
  ```

Alternatively, if the layer theme's *Display Name* is **Zoning**, you might use a URL similar to:

- HTML5 Viewer:
  ```
  http://myserver/Html5Viewer/Index.html?configBase=http://myserver/Geocortex/Ess
  entials/REST/sites/mysite/viewers/myviewer/virtualdirectory/Resources/Config/De
  fault&layerTheme=Zoning
  ```

- Silverlight Viewer:
  ```
  http://myserver/Geocortex/SilverlightViewer/Viewer.html?Viewer=MyViewer
  &layerTheme=Zoning
  ```

For more information, refer to the *Geocortex Viewer for Silverlight Administrator and Developer Guide*.

24.3   Add a Layer Theme

▶ **To add a layer theme to a site:**

1. In Manager, edit the site that you want to configure, and then click **Layer Themes** in the side panel.

2. Click the 🖉 icon near the top of the Layer Themes page.
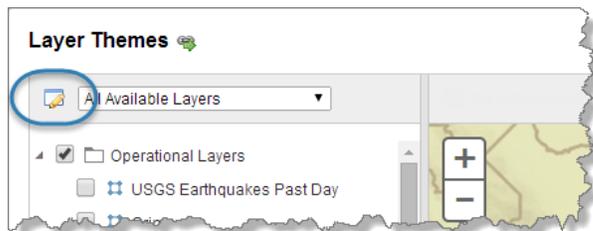
Location of icon to add, edit, and remove layer themes

3. Click ⊕ **Add New Layer Theme**.
   A new theme appears at the bottom of the list.

4. Type in a name for the layer theme.
   Choose a name that is meaningful to end users—the name appears in the list of themes in the viewer.

5. If you want the new layer theme to load when the viewer is launched, select the **Default** button beside the theme.

6. If you want to move the layer theme to a different position in the list, click the **Sort Layer Theme** icon ⬍ beside the theme and drag it to its new position in the list.
   Layer themes appear in the viewer in the same order that they appear in Manager.

7. Click **OK**.

   The layer theme is created.

8. Select the new theme in the drop-down list near the top of the Layer Themes page.

   Additional icons appear beside the drop-down list (👁 ✖). If you do not see these icons, make sure you have selected a custom layer theme—these icons are not present when the predefined All Available Layers theme is selected.

9. Configure which map services, layers, and folders you want to have in the theme:

   ### Exclude Items

   - To exclude an item (and all the items it contains, if there are any), click the ✔ icon beside the item that you want to exclude.

     You must hover the pointer over the item to see the icon. When you exclude an item, the item's typeface changes and the icon appears dimmed.
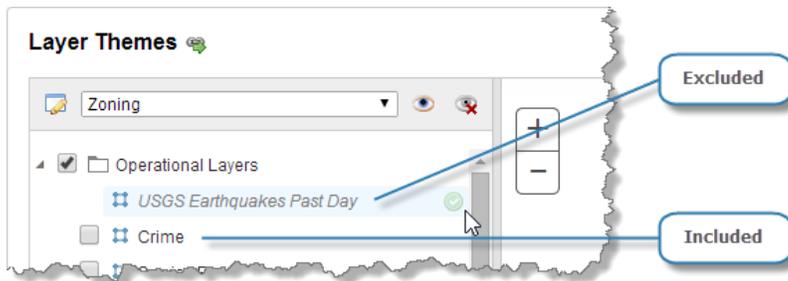
     Excluded layers appear in a different typeface than included layers

   - To exclude all items, click the ✖ icon.

     💡 If the list contains many items, most of which will be excluded, it is quicker to exclude them all and then re-include individual items than it is to exclude individual items.

   ### Include Items

   - To re-include an item that you have excluded, click the ✔ icon beside the item.

     If the item contains other items, the contained items will also be re-included.

   - To include all items, click the 👁 icon.

     Initially, all items are included.

10. Configure the visibility of the layers that are included in the layer theme:

    - To configure a layer to be turned on in the map when the layer theme loads, select the check box beside the layer name ☑.

    - To configure a layer to be turned off when the layer theme loads, clear the check box beside the layer name ☐.

11. Click **Apply Changes**.

12. Click **Save Site**.

24.4 Hide the "All Available Layers" Theme

Every site has a layer theme called **All Available Layers**. The All Available Layers theme corresponds to the Layer List—it includes all the layers that the Layer List includes, with the same visibility settings as the Layer List. If you add or remove a layer from the Layer List or you change a visibility setting, your changes are reflected in the All Available layers theme.

You cannot remove the All Available Layers theme, but you can hide it so that it does not appear in viewers. A site must have at least one layer theme—in order to hide the All Available Layers theme, the site must have at least one other layer theme configured.

▶ **To hide the All Available Layers theme:**

1. In Manager, edit the site that you want to configure, and then click **Layer Themes** in the side panel.

2. Click the 📝 icon near the top of the Layer Themes page.

3. Clear the **Allow All Layers** check box.
   When you clear the check box, the next layer theme in the list becomes the default layer theme.

Location of check box to clear

4. Select the **Default** button for the layer theme that you want to load when the viewer is launched.

5. Click **OK**.

6. Click **Save Site**.

24.5 Reorder the List of Layer Themes

Layer themes appear in the viewer in the same order that they appear in Manager. You can reorder the list of layer themes by moving individual layer themes within the list.

▶ **To reorder the list of layer themes:**

1. In Manager, edit the site that you want to configure, and then click **Layer Themes** in the side panel.

2. Click the 🖉 icon near the top of the Layer Themes page.

3. Click the **Sort Layer Theme** icon ⬍ beside a layer theme that you want to move, and hold the mouse button down.

4. Drag the layer theme to its new position and release the mouse button.

5. Continue dragging and dropping layer themes until the list is sorted the way you want it.

6. Click **OK**.

7. Click **Save Site**.

25 Global Search

The Global Search feature enables end users to search for features. Global Search searches layers that have Global Search enabled and that are visible at the current scale. It returns a list of the features with attributes that match the user's search text. The HTML5 Viewer and Silverlight Viewer both have a built-in Global Search box for the user to enter search terms.

Global Search box and search results, shown in an HTML5 viewer

Global Search is capable of searching multiple sources, including both map services and geocoding services, if the site has geocoding services configured. If a particular feature is returned by more than one source, it will appear more than once in the results list—duplicates are not removed from the results list. For more information about searching geocoders, see **Geocoding Services** on page **156**.

Layer Search and Instant Search

Global Search supports two methods for performing searches:

- **Use the Map Service's Search Feature (Layer Search):** In this method, Essentials sends a search request directly to the map service that is being searched, or to the map service's search service if it has one (for example, ArcGIS Search). The service performs the search, and then returns the search results to Essentials.
  This method is called **Layer Search**. Layer Search is the default method used for Global Search.

- **Maintain an Index to Search (Instant Search):** (ArcGIS map services only) In this method, Essentials maintains an index of feature data that Global Search searches. This method is called **Instant Search**. If you enable Instant Search for a particular map service, Essentials uses Instant Search to search that service, instead of Layer Search. If you want to use Instant Search to search a particular map service, you must turn it on for that map service.

> Instant Search works with ArcGIS map services only. This includes ArcGIS Server, Portal for ArcGIS, and ArcGIS Online map services.

The results from the different search methods and services are aggregated—they are listed together in one list. The viewer adds results to the list as the results are received. Because Instant Search is so fast compared to Layer Search, the results returned by Instant Search are usually at the top of the list. Layer Search results appear at the bottom of the list as the viewer receives them.

See also...

25.1 Configure Global Search

In order for end users to be able to search a layer's features, Global Search must be turned on for that layer. You must turn on Global Search for both Layer Search and Instant Search to work.

Global Search is turned off by default, because not every layer has relevant search data. You must turn on Global Search for each layer that you want to be searchable. You must then activate Instant Search for each service that you want to use Instant Search rather than Layer search.

When you turn on Global Search for a layer, by default, each field in the layer is searched. You can turn off Global Search for individual fields. If there are some fields that you do not want to be searched, turn off Global Search for those fields.

> Global Search switches search on for both Layer Search and for Instant Search. If you are using Instant Search, and want to turn off search without disabling and then re-indexing the data, you can use Global Search to turn search on or off.

▶ **To enable Global Search for a single layer:**

1. In Manager, edit the site that you want to configure, and then click **Map** in the side panel.
2. There are two ways to enable Global Search for a single layer:

Shortcut Method

   a. Click the layer's drop-down menu ⊙.
   b. Select **Include in Global Search**.

By Editing the Layer

   a. In the list of map services, click ⊞ icons as needed to show the layer that you want to configure.
   b. Click the **Edit** tool 🖊 beside the layer.
   For group layers, you must edit the sublayer, not the group layer.
   c. On the **Details** tab, scroll to the **Supported Operations** section.
   d. Select the **Include in Global Search** check box.

3. Click **Apply Changes**.
4. Click **Save Site**.

▶ **To disable Global Search for particular fields in a layer:**

1. In Manager, edit the site that you want to configure, and then click **Map** in the side panel.
2. Click the **Fields** tab.
3. Click ⊕ **Add/Remove Fields**.
4. In the **Excluded Fields** column, select each field that you want to include in Global Search.
   To select multiple fields, hold the Ctrl key down while selecting.
5. Click the « button between the two columns.
6. Click **OK**.
   Each field that you moved to the Included Fields column is listed individually and has the Include in Global Search setting turned on 🔩. There is an <all other fields> item at the top of the list.
7. Click the **Include in Global Search** icon 🔩 beside **<all other fields>**.

   The Include in Global Search setting is turned off 🔩 for the fields that you left in the Excluded Fields column. these fields will not be searched by Global Search.

8. Click **Submit Field Changes**.
9. Click **Save Site**.

25.2 Instant Search

> **NOTE** Instant Search works with ArcGIS map services only. This includes ArcGIS Server, Portal for ArcGIS, and ArcGIS Online map services.

By default, when an end user performs a Global Search on an ArcGIS Server map service, Essentials sends a search request to the ArcGIS Search service. The service performs the search, and then returns the search results to Essentials. This method is called Layer Search.

Instant Search uses a completely different method. Instant Search creates and maintains an index of feature data. Instead of sending a search request to the service, Global Search searches the index. This makes Instant Search very fast. End users see search suggestions as they type and the results are plotted on the map immediately. The results are sorted with the most relevant results at the top.

You can select whether to use Layer Search or Instant Search method to use per map service. If a map service has Instant Search enabled, searches are performed using Instant Search. If Instant Search is not enabled, searches are performed by sending a search request to the service.

Instant Search supports searching for values in coded value domains.

Search Hints

Instant Search provides search hints that help the user find features quickly. Search hints are suggested search terms—they suggest what the user might be searching for.

> **NOTE** The HTML5 Viewer and Silverlight Viewer both support search hints. The Silverlight Viewer does not support the Refine Search function.
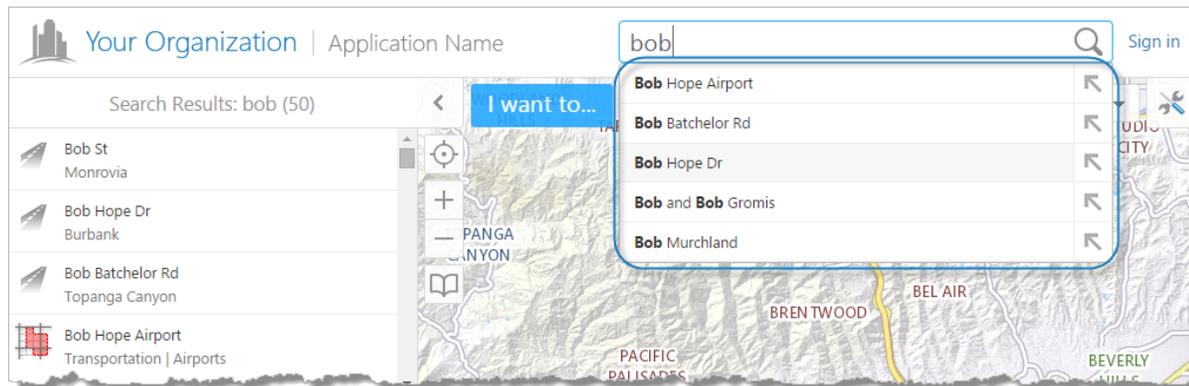
Search hints shown in an HTML5 viewer

For example, in the screen capture above, the user has entered **bob** in the Global Search box. The search hints suggestions to search for features with Bob in the name, street name, first name and so on. The user can click a hint to search for the term given in the hint.

In HTML5 viewers, search hints have a Refine Search icon ⬉ that the user can click to copy the search hint to the Global Search box. This causes the search hints to update. The user can then click another Refine Search icon, which again causes the search hints to update, and so on. Because search hints are usually more complex than the search term, search hints refine the search. By successively clicking Refine Search icons, the user can build a complex (highly refined) search term without having to type it in.

Note that clicking a Refine Search icon does not search for the term. To perform the search, the user must either click a search hint, click the Search icon 🔍, or press Enter.

You can navigate between search hints by pressing the **up arrow** (↑) or **down arrow** (↓) keys.

25.2.1 About the Instant Search Index

Before you can enable Instant Search for a map service, you must scan that service to add its data to the index. Instant Search is designed to create the index in the background so it does not affect the server that hosts the map service. For example, when the LA County demo site was indexed, it took 7.5 hours to index 5,867,896 features. The resulting index was 19 GB in size.

Based on this, Instant Search can conservatively index a 750 000 features per hour. The index can store a bit over 300,000 features per GB (308,836 features per GB). In general, features per hour and features per GB depend on the size of a feature.

The Instant Search index is comprehensive—it includes all the data on every layer in a map service. Essentials may not use all the data in the index as Essentials only searches those layers and fields that have Global Search turned on. Because the index is comprehensive, you can turn Global Search on and off for layers and fields without having to update the index. Similarly, you can disable and re-enable Instant Search for a map service without having to rescan the service.

Before version 2.2, Instant Search could only process a single map service at a time. With the 2.2 release, multiple map services can be processed at the same time. Only three map services on the same server can be indexed simultaneously. If this limit is reached, the remainder of the map services are queued until a slot is available for indexing. Queuing prevents excessive traffic to a single server.

Index Updating

Instant Search keeps the index up to date by periodically scanning the services that are included in the index. The index is automatically updated once a week. The progress bar on the Instant Search tab indicates how many features are scanned and already in the database. When a scheduled process is halted manually, you have the option of restarting it manually or waiting until the next scheduled update.

When the data of a map service changes, for example, a parcel is sub-divided, there is a delay before Instant Search can find the updated features. For this reason, Instant Search is not suited to map services whose data changes frequently or if the data is used to generate reports based on search results.

Status Indicators

To make it easier to track the scanning process, it is now divided into different states, with each state being identified on the Instant Search tab.
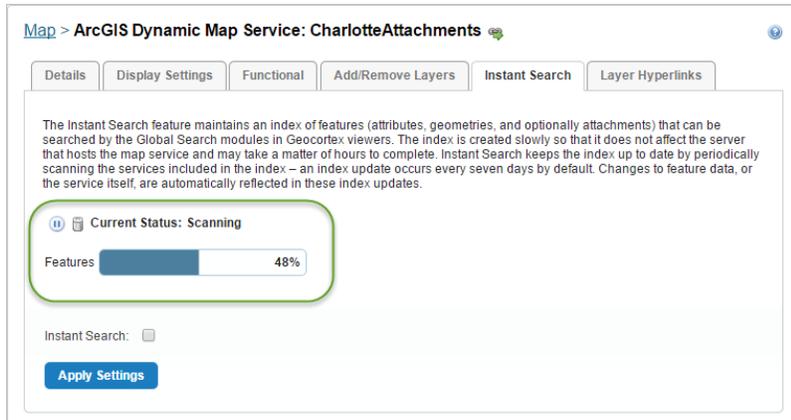
The status indicators include:

- **Idle**: The indexing process is inactive.

- **Pending**: The indexing process is starting up or queueing.

- **Scanning**: The indexing process is performing web requests to download feature data.

- **Indexing**: The indexing process is parsing feature data and storing it in the database.

- **Finished (Scheduled)**: The indexing process is complete and the features will be re-indexed at the next scheduled time, approximately a week after the previous scan was started. You can start a scan manually at any time that the status indicates Finished (Scheduled).

- **Paused**: The indexing process has been paused manually. You can restart the process manually or leave it to start automatically at the next scheduled time.
  If a scanner process is unexpectedly terminated, Instant Search attempts to update the status to Paused in Essentials to reflect this change.

- **Error!**: The indexing process has been halted for a variety of reasons.

Error Messages

If an error occurs because a map service is not available, an error message displays on the Instant Search tab of the map service.
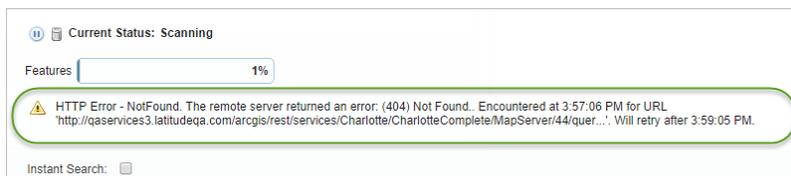
There are two main types of errors that occur when a map service is being indexed:

- **ArcGIS Server is Unavailable**: The error occurs when the actual server is unavailable. The indexer retries the request in 5 minutes, then 15 minutes, 1 hour, 6 hours, 24 hours, after which it indicates Failure. When this error type occurs, all indexing pauses until the retry time has passed, after which the indexing resumes.

- **ArcGIS Server Element is Temporarily Unavailable**: The error occurs when a layer is not available or a single feature request fails. For example, this can happen if the SDE database used by a feature service is not available. The indexer retries the request in 2 minutes, then 15 minutes, 1 hour, 3 hours, 12 hours, after which it indicates Failure. When this error occurs, Indexing continues as normal for the remaining features, while only the problematic request is queued up so that it can be retried later.

There are different error formats for different error levels. A typical error message for credential issues would be:

```
HTTP Error - Unauthorized or Forbidden. Please check your credentials. Encountered at
9:50:10 AM for URL
'http://qaservices3.latitudeqa.com/arcgis/rest/services/Charlotte/MapServer?f=pjson'.
Will retry on 9:55:09 AM.
```

A typical error message for a fatal error would be:

```
HTTP Error — The service is unavailable. Encountered at 10:41:22 AM for URL '
http://qaservices3.latitudeqa.com/arcgis/rest/services/Charlotte/MapServer/0?f=pjson'.
Attempted maximum number of retries; index may be incomplete.
```

After a fatal error message, no more retries take place and the error remains until it is re-indexed.

Common Error Messages	
Message	**Cause/Fix**
HTTP Error – Error performing query operation.	An ArcGIS Server-related problem. The service may be temporarily unavailable, or a common issue is that the result set from the query may exceed the specified maximum. For more information see: Esri Knowledge Base: Error Performing Query Operation
HTTP Error - Unauthorized or Forbidden. Please check your credentials.	The credentials supplied to Instant Search are not valid. Please change the user credentials in Essentials Manager and manually resume indexing on this service.
HTTP Error – The service is unavailable.	The ArcGIS server is offline or temporarily unavailable.

25.2.2 Supported Types of Map Service

Instant Search works with ArcGIS Server 10.0 and higher map services and feature services in hosted ArcGIS Server installations as well as ArcGIS Online and Portal for ArcGIS.

For each hosted ArcGIS Server 10.0 or higher map service and feature layer in a site, you have the choice of enabling Instant Search for the service or layer, or allowing searches to use ArcGIS Search.

The following table lists the differences between how ArcGIS Search and Instant Search work.

Differences between Instant Search and ArcGIS Search

Instant Search	**ArcGIS Search**
The search is near instant—typically under 100 ms—often much faster. Search times do not increase appreciably as the number of features grows.	Search time is proportional to the number of features being searched, typically several seconds.
Searches all fields, regardless of the data type.	Searches text fields only, except when searching a feature layer with the Search Non-Text Fields setting enabled.
Does not compensate for word order when searching. For example, **Lee Burton** does not match **Burton, Lee**.	Compensates for word order only if the Services Enhancement Proxy is enabled for this map service.
Does exact and partial matches. For example, **dr** can match **Dr**, **Drew** or **Dresden**.	Does exact and partial matches.

Secured Map Services

You can use Instant Search with unsecured services, as well as the following secured services:

- **ArcGIS Online and Portal**: If Essentials is registered with Portal for ArcGIS or ArcGIS Online, then Instant Search can index private services from those resources with no further steps.
  For more information, see:
    - **The ArcGIS Security Provider** on page **415**
    - **Portal for ArcGIS Service Connections** on page **116**
    - **ArcGIS Online Service Connections** on page **117**

- **ArcGIS Server - Web Tier Configured Credentials**: A service on ArcGIS Server can be secured via web tier (configured credentials) if the service is secured using basic or digest authentication, or if the service is secured using integrated Windows Authentication. You must ensure that the **Username** and **Password** is specified for the service in one of the following:
    - On the Service Connections tab. See **ArcGIS Server Service Connections** on page **118**
    - In the Connection Settings dialog for the Map Service Details tab. See **Edit a Map Service's Connection Settings** on page **103**.

- **ArcGIS Token Security**: A service on ArcGIS Server can be secured using token security. You must specify the **Username**, **Password**, and **Token URL** for the service in one of the following:
    - The Service Connections tab. See **ArcGIS Server Service Connections** on page **118**
    - In the Connection Settings dialog for the Map Service Details tab. See **Edit a Map Service's Connection Settings** on page **103**.

> **NOTE** User impersonation is not supported by Instant Search.

25.2.3 Overview of Configuration

The main steps to configure Instant Search are:

1. Turn Global Search on for the layers and fields.
   See **Configure Global Search** on page **196** for instructions.

   > You can turn Global Search on or off at any time for layers and fields in an indexed map service, without having to rescan the service.

2. Build the Instant Search index for the first time.
   See **Configure Instant Search** on page **203** for instructions.

3. Enable Instant Search.
   See **Configure Instant Search** on page **203** for instructions.

4. If necessary, modify the Instant Search settings for individual viewers.
   For HTML5 viewers, follow the instructions in **Configure Instant Search in the HTML5 Viewer** on page **320**.
   For Silverlight viewers, follow the instructions in **Configure Instant Search in the Silverlight Viewer** on page **382**.

See also...

25.2.4   Configure Instant Search

▶ **To build the Instant Search index for the first time:**

1. In Manager, edit the map service that you want to configure.

2. Click the **Instant Search** tab.

3. Click the **Scan** icon ⊙ beside the **Search Index** progress bar.

    If the service is secured, a prompt appears for you to confirm that you want the secure credentials passed to Core.

    The Scan icon changes to a Pause icon ⊙. Instant Search is now scanning the map service and adding its data to the search index.

    💡 You can pause ⊙ and resume ⊙ scanning.

4. Continue editing and scanning map services in this site until you are scanning each service that you want to include in the index. You can scan multiple map services simultaneously.

    💡 Keep a record of the map services that you include in the Instant Search index. When the index is built, you will need to enable Instant Search for each service.

5. Continue editing sites and scanning map services until you are scanning each service that you want to include in the index.

    💡 If a particular map service appears in more than one site, you only need to start scanning in one site—the sites will share the index.

    You must now wait for scanning to complete. Instant Search is designed to create the index slowly so it does not affect the servers that host the map services. Each map service has a progress bar on the map service's Instant Search tab.

    Search Index: [▓▓▓▓▓▓   44%] ⊙

    Search Index progress bar for a map service that is being scanned

    📌 Indexing can take a long time—sometimes overnight and there may be extended periods of time where you may not see any visible progress.

▶ **To enable Instant Search:**

1. In Manager, edit the map service that you want to configure.

2. Click the **Instant Search** tab.

3. If the Search Index progress bar indicates that scanning is 100% complete, select the **Instant Search** check box.

Search Index progress bar when scanning is complete

4. Click **Apply Settings**.

5. Continue enabling Instant Search for map services in this site until you have enabled it for every service that you want to use Instant Search.

6. Click **Save Site**.

7. Continue editing sites and enabling Instant Search until you have enabled it for every service that you want to use Instant Search.

See also...

25.2.5 Optimize Instant Search

Instant Search is I/O bound. When serving search requests, Instant Search accesses both system memory (RAM) and the storage drive. You can improve the performance of Instant Search by increasing RAM and upgrading the storage drive.

> **NOTE** Instant Search is not CPU bound—improving the server's CPU does not significantly improve the performance of Instant Search.

To improve Instant Search performance:

- **Upgrade to a Solid-State Drive:** Instant Search reads from the storage drive where the index is stored. Reading from a solid-state drive (SSD) is much faster than reading from a hard disk drive. To ensure the quickest access times, set up the Geocortex Core data folder on a partition on a solid-state drive. To do this, change the location of the data folder to point to the SSD partition.

  You can change the location of the data folder when you run the Geocortex Core installer. For instructions on changing the location of the data folder, see "Install Essentials for the First Time" in the *Geocortex Essentials Installation Guide* .

- **Increase Server RAM:** Increasing the server's RAM allows you to allocate more RAM to Instant Search, and have more RAM for the other processes that the server runs.

- **Increase the RAM Available to Instant Search:** Instant Search uses the amount of RAM that is configured for it in Geocortex Core. You can increase the amount of RAM that Geocortex Core allocates to Instant Search. Follow the instructions below.

Increase the RAM that is Available to Instant Search

The more RAM that Instant Search has, the faster it is able to serve search requests. By default, Geocortex Core allocates a minimum of 256 MB and a maximum of 3 GB to Instant Search.

We recommend that you allocate half the RAM that is available when the Geocortex Core service is stopped. This provides well for Instant Search, and also ensures that adequate RAM is available for the other processes that the server runs. Allocating more than half the available RAM to Instant Search is not recommended.

> **To increase the RAM that is allocated to Instant Search:**

Step 1: Stop the Windows Service that Runs Geocortex Core

1. Open the Windows **Services** panel.
   To open the Services panel in Windows Server 2012, open Server Manager and select Services in the Tools menu.

2. Right-click the **Geocortex Core** service and select **Stop**.

Step 2: Modify the Memory Settings

1. Run a text editor or XML editor as an administrator.

2. Open the `Geocortex Core\Roles\Search\role.config` file in the editor.
   If you installed Geocortex Core in the default location, the full path is:

   `C:\Program Files\Latitude Geographics\Geocortex Core\Roles\Search\role.config.`

3. Locate the `MinMemory` and `MaxMemory` keys.

   ```
   <Setting Key="MinMemory" Value="256m" />
   <Setting Key="MaxMemory" Value="3g" />
   ```

4. Set the `Value` attributes to the minimum and maximum RAM that you want to allocate to Instant Search.
   We recommend that you allocate half the available RAM. For example, if your server has 8 GB of available memory when the Geocortex Core service is stopped, set `MinMemory` and `MaxMemory` each to 4 GB (represented as **4g** in the `role.config` file).

   ```
   <Setting Key="MinMemory" Value="4g" />
   <Setting Key="MaxMemory" Value="4g" />
   ```

5. Save the file.

Step 3: Restart the Windows Service that Runs Geocortex Core

1. In the Windows **Services** panel, right-click the **Geocortex Core** service and select **Start**.

Step 4: Test that Instant Search is Working

1. Type **http://localhost:9200/** into your browser's address bar and press **Enter**.
   If your browser prompts you to open or save a file called `localhost.json`, Instant Search is working. You can now close the Windows Services panel.
   If the open or save message does not appear, verify that you made the configuration changes correctly. If you need to make corrections to the `role.config` file, repeat the steps starting at Step 1.

25.2.6 Disable Instant Search for a Map Service

If you want to return to using the default search method for a particular map service, you can disable Instant Search for that service.

If a particular map service appears in more than one site, you can use the default method for one instance of the service and Instant Search for another instance—they do not need to use the same search method.

▶ **To disable Instant Search for a map service:**

1. In Manager, edit the map service that you want to configure.

2. Click the **Instant Search** tab.

3. Clear the **Instant Search** check box.

4. Click **Apply Settings**.

5. Click **Save Site**.
   Global searches will now be performed using the default method, instead of Instant Search. You can re-enable Instant Search at any time by selecting the Instant Search check box.

25.2.7 Delete a Map Service from the Index

If you no longer want to use Instant Search for a map service, you can delete the map service from the index.

⚠ If you delete a map service from the index, and then you want to start using Instant Search again for that map service, you must re-scan the service to add it back to the index. It may be more than a week before your features are available again in Instant Search.

⚠ If a map service appears in more than one site and you delete the map service from the Instant Search index in one site, Instant Search will no longer work for the other instances—the different instances share one index.

▶ **To delete a map service from the Instant Search index:**

1. In Manager, edit the map service that you want to configure.

2. Click the **Instant Search** tab.

3. Click the **Delete** icon 🗑 beside the **Search Index** progress bar.

   If there is no Delete icon beside the progress bar, the map service is not in the index—there is nothing to delete.

4. Click **Delete Index** when prompted.

5. Click **Apply Settings**.

6. Click **Save Site**.
   The map service is deleted from the existing index and the Delete icon disappears. Instant Search will no longer scan this service when updating the index.

26 Layer Hyperlinks

Layer hyperlinks are links to web pages that are relevant to the layer. They give the end user easy access to information related to the current layer. For example, if a layer has a metadata URL, you could create a layer hyperlink that points to it.

Layer hyperlinks are supported by the Geocortex Viewer for Silverlight only—they are not supported by the Geocortex Viewer for HTML5.

Layer hyperlinks appear in the layer's context menu in the Layer List. The user clicks or right-clicks the layer to open its context menu.

Layer hyperlinks can be static URIs, or they can be generated at run-time in the viewer. Generating the URI at run time makes it possible to build URIs that contain values specific to the selected layer. This is done by including layer tokens into the configured URI. Layer tokens are replaced at run time with the value of the property for the selected layer. Layer tokens can also be used in the hyperlink's text and tool tip.

Layer hyperlinks can be configured for individual layers (see Example 1), or they can be configured at the level of the parent map service (see Example 2). Adding a layer hyperlink to the map service makes the link available on each layer in the service.

Example 1: Link to an Individual Layer's Metadata

Suppose your site's Parcels layer has metadata that you want to make available to end users. You configure a layer hyperlink like the one shown below.

Configuration of a layer hyperlink to display layer metadata

The user clicks the Parcels layer in the Layer List to open the layer's context menu. The layer hyperlink is in the context menu with other layer-specific information and actions.
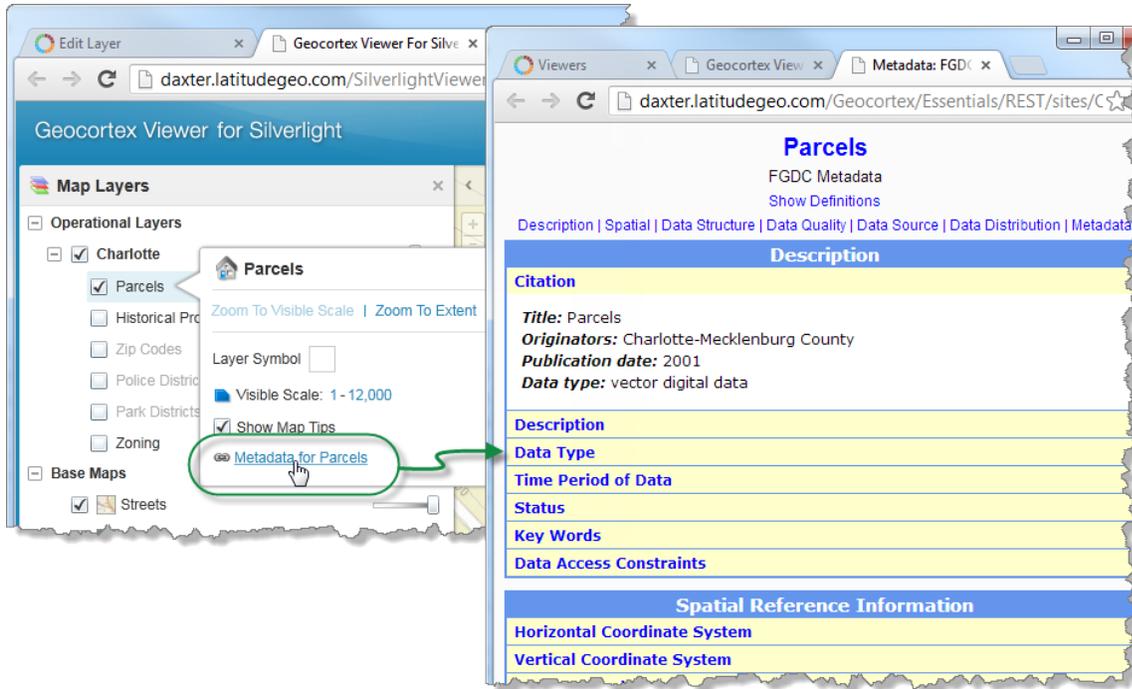
Layer hyperlink in the Parcels layer's context menu, and its metadata in a new window

Example 2: Link to the Metadata for Each Layer in a Map Service

Suppose you want every layer in a map service to have a link to its metadata. Configuring a layer hyperlink for every layer is tedious and time consuming, so you add the layer hyperlink to the map service. This makes the hyperlink available on every layer in the map service and saves a lot of configuration work.

This approach depends on consistency in the naming and location of the metadata files. The easiest scheme is to name each file after its layer and place the files in a common folder. Naming the files for their layers enables you to use the {LayerName} layer token to match the correct metadata file to each layer. If you host the metadata folder in your site's virtual directory, you can use the {VirtualDirectoryUri} client token in the layer hyperlink's URI, which makes configuration easier and maintains your site's portability.

The configuration for the layer hyperlink is shown below. In this example, the metadata files are located in a subfolder of the site's virtual directory called Metadata. The files are named after the layers, for example, Cities.html, Parcels.html, and so on.

Configuration for a layer hyperlink that applies to all layers

In the user interface, the text for the Parcels layer's hyperlink is **Metadata for Parcels** (shown below). The URI it links to ends with **/Metadata/Parcels.html**. The {LayerName} token has been replaced with "Parcels". Similarly, the text for the Cities layer's hyperlink is **Metadata for Zip Codes** and the URI it links to ends with **/Metadata/Zip%20Codes.html**—the {LayerName} token is replaced with "Zip Codes".
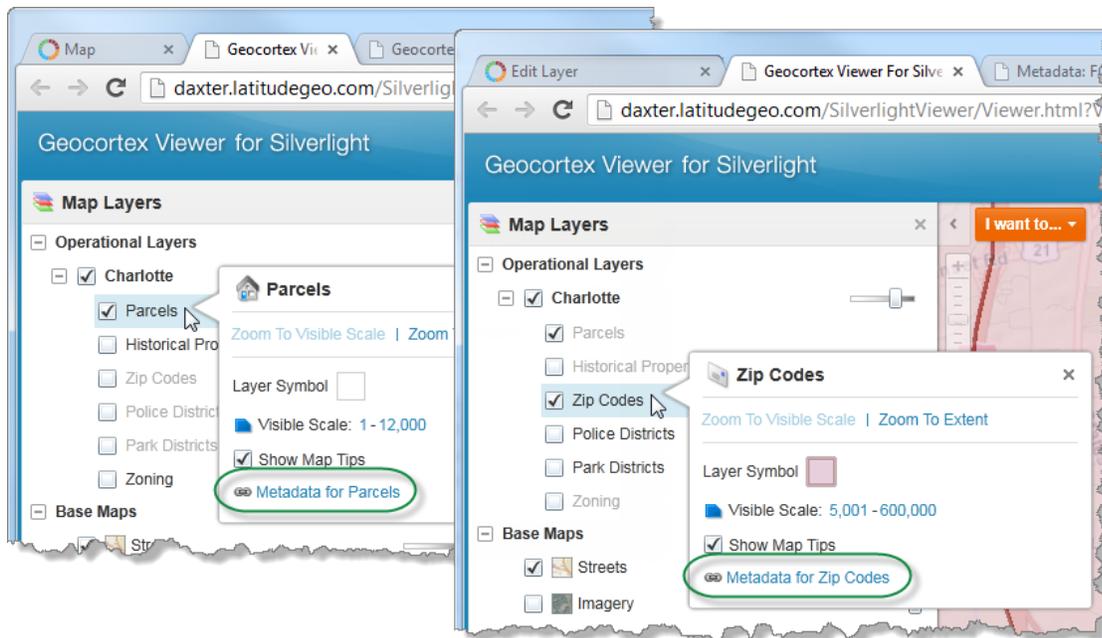
Layer hyperlink on two different layers, with the layer token replaced by the layer name

Settings

Layer hyperlinks have the following settings:

- **Hyperlink Text:** (optional) The text for the link. You can use layer tokens in the Hyperlink Text box. Click **Edit** to select from a list of available tokens.

  If you leave the Hyperlink Text box blank, the URI is used.

- **URI:** The URI to link to. You can use layer tokens in the URI box. Click **Edit** to select from a list of available tokens.

- **Encode Replacement Values:** Specify whether to URL encode the values used to replace layer tokens. URL encoding replaces characters that are not valid in URLs with valid characters.

  The default setting, Automatic, URL encodes tokens when they are combined with text. If the URI box contains only a token (no text), the viewer does not URL encode the value—it assumes the token defines a complete URI that is already URL encoded.

- **Tool Tip:** (optional) The text to display when the mouse hovers over the hyperlink. You can use layer tokens in the Tool Tip box. Click **Edit** to select from a list of available tokens.

- **Icon URI:** (optional) The URI of the icon to display beside the hyperlink. If you leave the Icon URI box blank, the default icon (🖼) appears beside the layer hyperlink.

- **Target:** The name of the browser window to open when the user clicks the hyperlink. To open the target in a new window, enter **_blank**.

See Also...

26.1 Add a Layer Hyperlink

▶ **To add a layer hyperlink:**

1. In Manager, edit the site that you want to configure, and then click **Map** in the side panel.

2. To add the hyperlink to all the layers in a map service, edit the map service.
   To add the hyperlink to a single layer, edit the layer.

3. Click the **Layer Hyperlinks** tab.

4. Click **Add Layer Hyperlink**.

5. Configure the settings.
   See **Settings** on page **210** for information about the settings.

6. Click **OK**.
   The layer hyperlink is created.

₂₇ Feature Hyperlinks

Feature hyperlinks are links to web pages that are relevant to the current feature. They give the end user easy access to information related to the feature. For example, if a layer has fields for latitude and longitude, you could create a feature hyperlink that links to the feature's Google Street View.

In the viewer, feature hyperlinks appear in the feature details. The Geocortex Viewer for HTML5 displays feature details stacked in the side panel—feature hyperlinks have their own section in the panel. The Geocortex Viewer for Silverlight displays feature details in a dialog box—feature hyperlinks have their own tab in the dialog box.

Feature hyperlinks can be static URIs, or they can be generated at run time in the viewer. Generating the URI at run time makes it possible to build values that are specific to the current feature into the URI. This is done by including field tokens or layer tokens in the configured URI. Field tokens are replaced at run time with the field's value for the selected layer. Field tokens can also be used in the hyperlink's text and tool tip.

Example: Feature Hyperlink that Contains a Field Token

In the screen capture below, the feature hyperlink links to census data for the selected zip code. It is configured on the Zip Codes layer. The configured URI, `http://www.city-data.com/zips/{ZIP}.html`, uses a field token, {ZIP}, that is replaced with the value of the selected feature's Zip Code field at run-time.

The feature hyperlink shown below is configured on the Zip Codes layer. It uses the {ZIP} feature token in the hyperlink text, URI, and tool tip. (The Icon URI also uses the {VirtualDirectoryUri} client token.)

Configuration of a feature hyperlink using field tokens

Suppose the user performs a search that returns the 28269 zip code. The user clicks the 28269 zip code to see its details. In the feature details the feature hyperlink's text is "28269 Census Data" (shown below). It points to `http://www.city-data.com/zips/28269.html`.

Note that the field label at top of the feature details also contains the current zip code. The configuration for the field label is `Zip Code: {ZIP}`.
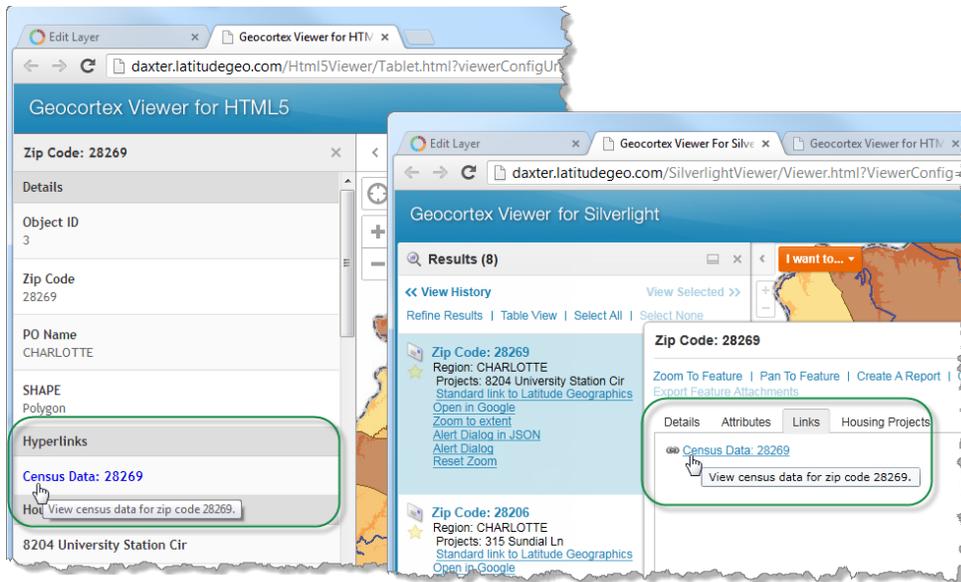
Feature hyperlink in the HTML5 Viewer (left) and the Silverlight Viewer

27.1 Settings that Apply to All Feature Hyperlinks

- **Invalid/Broken Links:** You can configure whether the viewer should display feature hyperlinks that are invalid or broken. The viewer tests each feature hyperlink before displaying it to determine whether the hyperlink works. There are three options:
  - **Show:** Always show the feature hyperlinks for this layer. This is the default value.
    This option is useful when the feature hyperlinks point to your own servers.
  - **Show Disabled:** If a feature hyperlink is invalid or broken, show the hyperlink as grayed out in the viewer.
    This option is useful when the layer's feature hyperlinks point to external resources that may be temporarily unavailable. The availability of the feature hyperlink depends on the availability of the resource when the user opens the feature details.
  - **Hide:** If a feature hyperlink is invalid or broken, do not show the hyperlink in the viewer.
    This option is useful when the layer's feature hyperlinks contain field tokens. If the field used in a feature hyperlink contains invalid data, or no data, the hyperlink will be invalid. The only way to fix the hyperlink for a feature with invalid or missing data is to fix the data.

27.2 Settings for Individual Hyperlinks

Individual feature hyperlinks have the following settings:

- **Hyperlink Text:** (optional) The text for the link. You can use field tokens and layer tokens in the Hyperlink Text box. Click **Edit** to select from a list of available tokens.
  If you leave the Hyperlink Text box blank, the URI is used.

- **URI:** The URI to link to. You can use field tokens and layer tokens in the URI box. Click **Edit** to select from a list of available tokens.

- **Encode Field Values:** Specify whether to URL encode the values that replace field tokens. URL encoding replaces non-ASCII characters and reserved ASCII characters with safe, equivalent ASCII characters.

  The default setting, **Automatic**, URL encodes tokens when they are combined with text. If the URI box contains only a token (no text), the viewer does not URL encode the value—it assumes the field contains a complete URI that is already URL encoded.

- **Tool Tip:** (optional) The text to display when the mouse hovers over the hyperlink. You can use field tokens in the Tool Tip box. Click **Edit** to select from a list of available tokens.

- **Icon URI:** (optional) The URI of the icon to display beside the hyperlink. If you leave the Icon URI box blank, the default icon ⬬ appears beside the feature hyperlink.

- **Target:** The browser window to open when the user clicks the hyperlink. If you leave the Target setting blank, the link opens in the current browser tab. To open the target in a new window, enter **_blank**.

See Also...

> **Field Tokens** on page **40**
>
> **Server Replacement Tokens** on page **35**

27.3   Add a Feature Hyperlink

▶ **To add a feature hyperlink:**

1. In Manager, edit the layer that you want to configure.

2. Click **Add Feature Hyperlink**.

3. Configure the settings.
   See **Settings for Individual Hyperlinks** on page **212** for information about the settings.

4. Configure the settings.

5. Click **OK**.
   The feature hyperlink is created.

6. Click **Save Site**.

28   Dynamic Layers-Enabled Map Services

ArcGIS Server 10.1 and newer has a Dynamic Layers feature that enables other applications to change the appearance and behavior of the layers in the map service. Geocortex Essentials supports the Dynamic Layers feature.

Having Dynamic Layers enabled in a map service provides the following additional functions in Essentials:

- **Dynamic Layers:** Add dynamic layers in Manager, and enable end users to add dynamic layers in the viewer.

- **Layer Drawing Order:** Change the drawing order of the map service's layers in Manager, and enable end users to change the drawing order of the layers in the viewer.

- **Symbolization:** Create layer styles that end users can select in a list. Enable end users to create new layer

symbolization and turn the symbolization on and off.

- **Labels:** Change the default visibility of a layer's labels in Manager, and enable end users to turn labels on and off in the viewer and modify the font.

The Geocortex Viewer for Silverlight supports all of the functions that are listed above. The HTML5 Viewer supports the server-side functions, but not the client-side functions. You can add dynamic layers, change the layer drawing order, and change the default visibility of labels in Manager and the HTML5 Viewer will represent your configuration correctly. However, end users cannot add dynamic layers, change the layer drawing order, select layer styles, create symbolization, or turn labels on and off in an HTML5 viewer.

28.1 Map Service Requirements for Dynamic Layers

To use ArcGIS Server's Dynamic Layers feature in Essentials, the map service must be published and configured in a particular way in ArcGIS Server:

Publish the Map Service

- You must publish the map service as a **Dynamic Map Service**.

- If you want to be able to change the default visibility of a layer's labels, or you want the end user to be able to turn the layer's labels on and off, the default visibility of the layer's labels must be turned on when you publish the map service. In addition, the layer must have label data.

Enable Dynamic Layers

When you enable Dynamic Layers:

- Select **Allow per request modification of layer order and symbology**.

- If you want to be able to add dynamic layers in Manager or in the viewer, you must configure a **Dynamic Workspace**.

For instructions on enabling Dynamic Layers, refer to Esri's Dynamic Layers documentation for ArcGIS 10.1 or newer.

28.2 Verify that the Dynamic Layers Feature is Enabled

▶ **To verify that an ArcGIS dynamic map service that you have added to a site supports dynamic layers:**

1. In Manager, edit the map service that you want to configure, and then click the **Details** tab.

2. Locate the **Supports Dynamic Layers** setting.
   If Supports Dynamic Layers is True, the map service supports the Dynamic Layers feature. You can use Dynamic Layers functions in Essentials.
   If Supports Dynamic Layers is False, the map service does not support the Dynamic Layers feature and you cannot use Dynamic Layers functions in Essentials.

You can also verify Dynamic Layers support by looking at the Supports Dynamic Layers property in the Geocortex Essentials REST API Sites Directory.

28.3 Verify that a Layer has Labels

> **To verify that a layer in an ArcGIS map service has labels:**

1. Open the ArcGIS REST Services Directory for the map service that the layer belongs to.
   You can do this from Geocortex Essentials Manager:

   a. Edit the map service.

   b. Click the **View REST Endpoint** icon .
      The Geocortex Essentials REST API Sites Directory opens.

   c. Click the **Connection String** hyperlink.
      The ArcGIS REST Services Directory opens.

2. Click the hyperlink for the desired layer.

3. Locate the **Has Labels** property.
   If Has Labels is True, the layer has labels.
   If Has Labels is False, the layer does not have labels and you cannot use the label visibility functions in Essentials.

28.4 Dynamic Layers

A dynamic layer is a layer that is configured outside of the map service's ArcGIS Server configuration. (The layers that are configured in ArcGIS Server are static.) There are two ways to add dynamic layers in Essentials:

- **Layer Catalog:** Build a layer catalog that defines the dynamic layers, and then point Manager to the layer catalog. This method allows you to add dynamic layers in Manager and in the viewer. If you want end users to be able to add dynamic layers in the viewer, you must use this method.

- **JSON:** Configure the JSON definition for the dynamic layers in Manager.

Both these methods require that the map service meet the requirements for Dynamic Layers.

Dynamic layers can be operated on in the viewer the same way as static layers—they can be searched, used in identify operations, printed, and so on.

28.4.1 About Layer Catalogs

A layer catalog is a catalog of layer definitions that can be used to add dynamic layers to a map service. Layer catalogs allow you to make a large number of layer definitions available, in one place, to add to a map service. To add layers, you select the layers from the catalog.
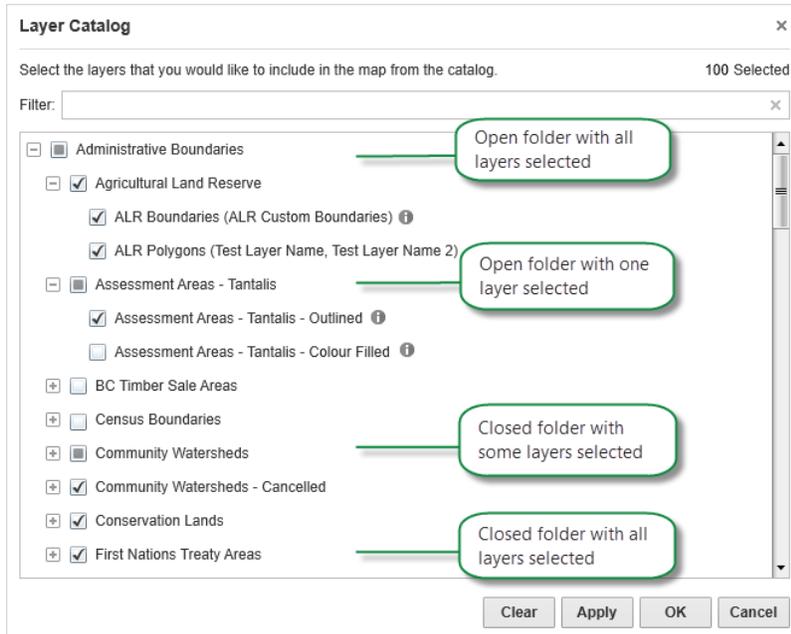
Example of a layer catalog

> Creating a layer catalog requires custom development. For information, contact your Geocortex Account Manager.

Once the layer catalog is built, its custom assemblies are integrated into the Essentials REST API and Manager. The layer catalog is then configured in Manager following the procedure below.

▶ **To add a layer catalog to a map service in Manager:**

1. In Manager, edit the map service that you want to configure, and then click the **Functional** tab.

2. In the **Layer Catalog Provider Name** drop-down list, select the layer catalog.

3. Click **Apply Settings**.

4. Click **Save Site**.
   You can now add layers from the catalog using Manager, and enable end users to add layers from the catalog.

28.4.2   Use a Layer Catalog to Add Dynamic Layers in Manager

▶ **To add dynamic layers from a layer catalog using Manager:**

1. In Manager, edit the map service that you want to configure.

2. Click the **Add/Remove Layers** tab.

3. Click the **Add Dynamic Layer** icon 🟢 at the top of the Included Layers list.
   If there is no Add Dynamic Layer icon, make sure the layer catalog has been added to the map service that you are editing. Follow the instructions to add the layer catalog.

4. Select **Select predefined layers from a catalog**, and then click **Next**.

5. Select the check box beside each layer that you want to add to the map service.

6. Click **OK**.

7. Click **Submit Layer Changes**.

8. Click **Save Site**.

28.4.3 Enable End Users to Add Dynamic Layers

To enable end users to add dynamic layers, you must provide a method of opening the Layer Catalog dialog box in the viewer. The Silverlight Viewer provides a Layer Catalog tool that the user can click to open the dialog box. Alternatively, you could add a menu item or hyperlink that opens the panel.

You can also configure various aspects of the Layer Catalog dialog box. For information, refer to the "Layer Catalog Module" section in the *Geocortex Viewer for Silverlight Administrator and Developer Guide*

To add dynamic layers, the user opens the Layer Catalog dialog box and selects the layers to add.

▶ **To add a tool to enable end users to add dynamic layers:**

1. In Manager, edit the viewer that you want to configure.

2. Click **Toolbar** in the side panel.

3. In the **Available Tools** column, locate the **Layer Catalog** tool.

4. Drag the tool to the desired position in the **Configured Toolbar** column.

5. Click **Apply Changes**.

6. Click **Save Site**.
   The Layer Catalog tool is added to the toolbar.

28.4.4 Add Dynamic Layers Using JSON

In this method, you add a dynamic layer to a map service by pasting the JSON definition for the layer into Manager. The JSON definition must comply with the ArcGIS Server specification for dynamic layers. For information, refer to ArcGIS REST API for 10.1, Dynamic Layer / Table. An example layer definition is given below.

▶ **To add a layer from a JSON definition:**

1. In Manager, edit the map service that you want to configure.

2. Click the **Add/Remove Layers** tab.

3. Click the **Add Dynamic Layer** icon ⊕ at the top of the Included Layers list.

If there is no Add Dynamic Layer icon, make sure the layer catalog has been added to the map service that you are editing. Follow the instructions to add the layer catalog.

4. Select **Create a new Layer from a JSON definition**, and then click **Next**.

5. In the **Layer Name** box, type the name that you want to display for this layer.

6. In the **Dynamic Definition** box, paste the JSON definition for the layer.

Add a dynamic layer to a map service using the layer's JSON definition

7. Click **Finish**.

8. Click **Submit Layer Changes**.

9. Click **Save Site**.

   The new layer is added to the map service. It appears at the top of the list on the Map Services tab.

   By default, the layer's visibility is turned off. To see the layer in the map preview, select the check box beside the layer on the Map Services tab.

Example JSON for a Dynamic Layer

```
{
 "id": 1234,
 "source": {
  "type": "dataLayer",
  "dataSource": {
   "type": "table",
   "workspaceId": "CharlotteFolder",
   "dataSourceName": "schools"
  }
 },
 "drawingInfo": {
  "renderer": {
   "type": "simple",
   "symbol": {
    "type": "esriSMS",
    "style": "esriSMSDiamond",
    "color": [255,255,0,255],
    "outline": {
     "color": [0,0,0,255],
     "width": 1
    }
   }
  }
 }
}
```

28.5 Layer Drawing Order

28.5.1 Change the Layer Drawing Order in Manager

You can change the order that a map service's layers are represented on the map. When a layer lies on top of another layer, the upper layer may obscure part or all of the layer underneath. By default, the layers are drawn in the order that they appear in the map service.

The map service must meet the map service requirements for Dynamic Layers.

▶ **To change the drawing order of layers in a Dynamic Layers-enabled map service:**

1. In Manager, edit the map service that you want to configure.

2. Click the **Drawing Order** tab.
   If there is no Drawing Order tab, the map service is not an ArcGIS Server dynamic map service with Dynamic Layers enabled.

3. Click and hold the ⬍ icon beside a layer you want to move, and then drag the layer to the new position in the list.

4. Continue dragging and dropping layers until the layers are sorted the way you want them.

5. Click **Submit Layer Changes**.

6. Click **Save Site**.

▶ **To reset the drawing order to the default order:**

The default order is the order that the layers appear in the map service.

1. In Manager, edit the map service that you want to configure.

2. Click the **Drawing Order** tab.
   If there is no Drawing Order tab, the map service is not an ArcGIS Server dynamic map service with Dynamic Layers enabled.

3. Click ↻ **Reset**.

4. Click **Submit Layer Changes**.

5. Click **Save Site**.

28.5.2 Enable End Users to Change the Layer Drawing Order

To enable end users to change the drawing order of a map service's layers, you must provide a method of opening the Layer Drawing Order panel in the viewer. The Silverlight Viewer provides a Re-Order Layers tool that the user can click to open the panel. Alternatively, you could add a menu item or hyperlink that opens the panel.

To change the drawing order of the layers, the user opens the Layer Drawing Order panel, clicks Edit beside the map service, and then drags and drops the layers into the desired order.

▶ **To add a tool to enable end users to reorder the layers in a Dynamic Layers-enabled map service:**

1. In Manager, edit the viewer that you want to configure.

2. Click **sToolbar** in the side panel.

3. In the **Available Tools** column, locate the **Re-Order Layers** tool.

4. Drag the tool to the desired position in the **Configured Toolbar** column.

5. Click **Apply Changes**.

6. Click **Save Site**.
   The Re-Order Layers tool is added to the toolbar.

_{28.6} Symbolization

There are two ways to give end users control of layer symbolization in a map service that has dynamic layers enabled:

- Create layer styles that end users can select in a list.
- Enable end users to create new layer symbolization and turn the symbolization on and off.

_{28.6.1} Create Layer Styles that End Users can Select

A **layer style** is layer symbolization that you define in Manager. In the viewer, end users can select a style from the list of styles that are defined for a layer. The selected style replaces the layer's default symbolization.

The Silverlight Viewer 2.4 supports layer styles. The HTML5 Viewer does not support layer styles.

▶ **To create a layer style:**

1. In Manager, edit the layer that you want to configure.

2. Click the **Styles** tab.

3. Click **Add Layer Style**.

4. In the **Display Name** box, type a name for the layer style.
   The display name can include spaces and special characters. The display name appears in the list of layer styles that end users select from.

5. In the **Definition** box, type or paste the JSON for an ArcGIS renderer.
   Essentials supports simple, unique value, and class breaks renderers. For information, refer to the ArcGIS documentation on renderers
   (`http://agsdemo.geocortex.com/arcgis/sdk/rest/index.html#/Renderer_`
   `objects/02ss0000002v000000/`).
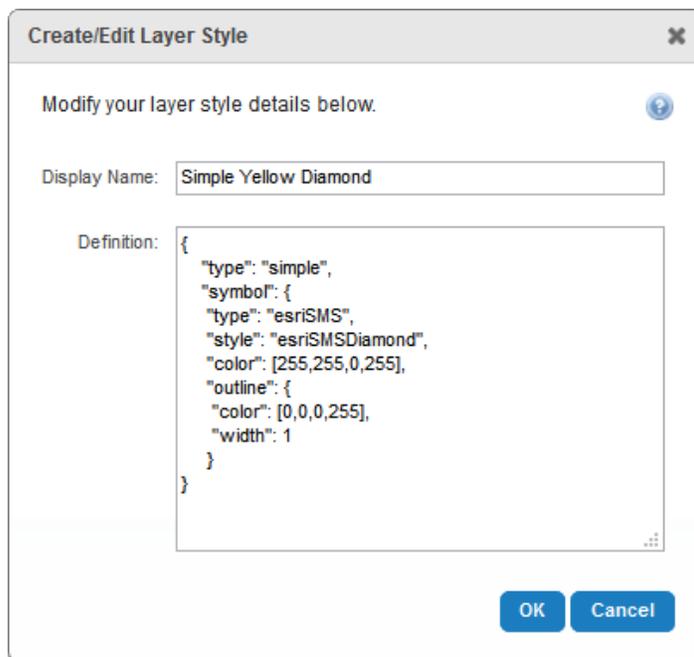
Example of a layer style definition

6. Click **Save Site**.

▶ **To re-order the list of layer styles:**

Layer styles appear in the viewer in the same order that they appear on the Styles tab in Manager.

1. In Manager, edit the layer that you want to configure.

2. Click the **Styles** tab.

3. In the list of layer styles, click and hold a layer style that you want to move to a different position in the list.

4. Drag and drop the layer style to its new position.

5. Continue to drag and drop layer styles until the list is ordered the way that you want it.

6. Click **Save Site**.

28.6.2 Enable End Users to Create New Layer Symbolization

To enable end users to create new symbolization for a layer and turn the symbolization on and off, you turn on the layer's Allow Symbolization setting in Manager. The layer must belong to a map service that meets the map service requirements for Dynamic Layers.

When a user configures symbolization for a layer, the new symbol replaces the layer icon that is configured for the layer in Manager. The user can turn the symbolization on and off. When symbolization is on, the user's symbol shows. When symbolization is off, the layer icon shows.

To create new symbolization for a layer, the user clicks the layer in the Map Layers panel, and then clicks the Symbolization hyperlink in the Layer Actions Menu. This opens the Symbolize Layers panel, which has settings for the symbolization type (simple, class breaks, unique values), symbol shape, size, border and fill color, and transparency. To turn symbolization on and off, the user clicks the layer in the Map Layers panel, and then toggles the Symbolization check box in the Layer Actions Menu.

▶ **To enable end users to change a layer's symbolization:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.

2. Click the ▶ icon beside the map service to show the map service's layers.

3. Click the 🔽 icon beside the layer and select the **Allow Symbolization** check box.

   If you clear the Allow Symbolization check box, end users will not be able to change the layer's symbolization.

4. Click **Apply Changes**.

5. Click **Save Site**.

▶ **To enable end users to change the symbolization for every layer in a map service:**

⚠️ Batch editing overwrites the existing configuration for every layer in the folder or service. The only way to restore the previous configuration after you click Apply Changes is to individually reconfigure each setting in each layer.

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.

2. Click the 🔽 icon beside the map service.

3. In the **Batch Edit** area, select the **Allow Symbolization** check box.

   If you clear the Allow Symbolization check box, end users will not be able to change the symbolization for any layer in the map service.

4. Click **Apply Changes**.

5. Click **Save Site**.

28.7 Labels

28.7.1 Set the Default Visibility of Labels

You can configure the default visibility of a layer's labels. The layer must belong to a map service that meets the map service requirements for Dynamic Layers.

If you turn on label visibility, by default users will see the labels when they zoom the map to show the layer's features. If you turn off the default visibility, the labels are initially hidden. Users can turn the labels on and off in the viewer, regardless of how the default visibility is configured.

▶ **To set the default visibility of a layer's labels:**

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.

2. Click the ▶ icon beside the map service to show the map service's layers.

3. Click the ⊙ icon beside the layer and do one of the following:

   - **Show Labels Initially:** Select the **Show Labels** check box.
   - **Hide Labels Initially:** Clear the **Show Labels** check box.

4. Click **Apply Changes**.

5. Click **Save Site**.

💡 You can also set the default visibility of a layer's labels using the Show Labels setting on the layer's Details tab.

▶ **To set the default visibility of the labels in every layer in a map service:**

⚠️ Batch editing overwrites the existing configuration for every layer in the folder or service. The only way to restore the previous configuration after you click Apply Changes is to individually reconfigure each setting in each layer.

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.

2. Click the ⊙ icon beside the map service.

3. In the **Batch Edit** area, do one of the following:

   - **Show Labels Initially:** Select the **Show Labels** check box.
   - **Hide Labels Initially:** Clear the **Show Labels** check box.

4. Click **Apply Changes**.

5. Click **Save Site**.

28.7.2 Enable End Users to Turn a Layer's Labels On and Off

You do not need to do any additional configuration to enable end users to turn a layer's labels on and off or change the font. If the layer belongs to a map service that meets the map service requirements for Dynamic Layers, then working with labels is automatically available in viewers.

To turn a layer's labels on or off, the user clicks the layer in the Map Layers panel, and then toggles the Show Labels check box in the Layer Actions Menu. To change attributes of the font, the user clicks the icon beside Show Labels.

You can configure additional font families for users to choose from when they change the font that is used for labels. For instructions, refer to "Layer Symbolization Module" in the *Geocortex Viewer for Silverlight Administrator and Developer Guide*.

₂₉ Time-Aware Map Services and Layers

Geocortex Essentials supports time-aware map services and layers.

Time-aware map services and layers have a time extent. The time of each data point lies within the layer's time extent.

Time Extent of a Map Service

The time extent of a map service with multiple time-aware layers spans the individual time extents of the layers. This is illustrated in the following figure. The top three horizontal lines represent the time extents of the map service's three time-aware layers. The bottom horizontal line is the time extent of the map service.
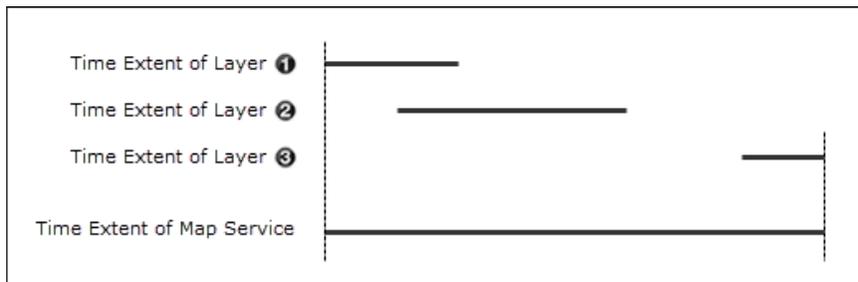
The time extent of a map service spans the time extents of its time-aware layers

For example, suppose your site has a map service with two time-aware layers:

- **Hurricanes Layer:** Has data on hurricanes from Mar. 12, 1950 to Sept. 22, 2005.
- **Tsunamis Layer:** Has data on tsunamis from Jul. 16, 1995 to Feb. 3, 2011.

The map service's time extent is Mar. 12, 1950 to Feb. 3, 2011.

You can override a time-aware map service's time extent in Essentials. For example, suppose a map service provides 100 years of data, from Jan. 1, 1900 to Jan. 1, 2000. You might want only the last twenty years of data to be available in the viewer. In this case, you would override the map service's time extent to start at Jan. 1, 1980. See **Configure a Time-Aware Map Service's Time Extent** on page **226** for instructions on configuring the time extent to use for a map service.

Time Extent of the Map

The time extent of a site's map is determined similarly to how the time extent of a map service is determined, except in this case, it is the time extents of map services that are combined, instead of layers. The time extent of a site's map spans the time extents of all its time-aware map services.
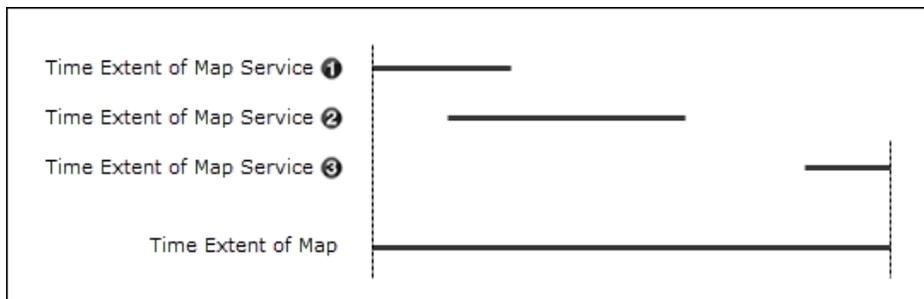
The time extent of a map spans the time extents of its time-aware map services

Viewer Support for Time-Aware Map Services and Layers

The Geocortex Viewer for Silverlight has a time slider map widget that enables end users to watch the time-sensitive data being added incrementally to the map, giving the effect of an animation of the events captured by the data. See **Configure a Silverlight Viewer's Map Widgets** on page **376** for information on configuring the time slider.

The Geocortex Viewer for HTML5 does not have any tools for viewing time-aware data.

See Also...

29.1 Configure a Time-Aware Map Service's Time Extent

▶ **To configure a time-aware map service's time extent:**

1. In Manager, edit the map service that you want to configure.

2. On the **Functional** tab, select the **Override Time Settings** check box.

   > **NOTE** If the Functional tab does not have settings for Override Time Settings, Start Time, and End Time, then the map service you are editing does not support time aware layers.

3. Click in the **Start Time** box to open a calendar, and then click the date you want to use as the beginning of the time slider's time extent.
   The date must be in UTC (Coordinated Universal Time).

4. Click in the **End Time** box to open a calendar, and then click the date you want to use as the end of the time slider's time extent.
   The date must be in UTC (Coordinated Universal Time).

5. Click **Apply Details**.

6. Click **Save Site**.

See also...

30 Data Linking

Data linking allows you to associate data in your layers with data from external sources, such as RDBM (relational database management) systems like SQL Server, Oracle Database, Microsoft Access, or even Microsoft Excel files.

Setting up data linking is a two-step process:

1. **Data Connection:** Add a data connection. The data connection defines the connection parameters that allow Essentials to connect to the external data source.

2. **Data Links:** Add data links that use the data connection. A data link specifies what external data will be retrieved (which columns from which tables) and defines how the data is linked to the attributes of a layer.

30.1 Data Connections

Before you can configure a data link or search table, you must configure the data connection. The data connection's configuration contains the information that Geocortex Essentials needs to connect to the data provider, execute commands, and retrieve data. Essentials uses ADO.NET providers to perform all linking operations.

Connection Strings

The key piece of information to configure is the connection string, which contains the information needed to create a connection to the data provider. The syntax of the connection string depends on which ADO.NET provider you use. Essentials attempts to connect using the connection string in the exact form that you configure it, without interpreting or parsing it. Therefore, it is important to consult the data provider's documentation to find out how to create the connection string. Another useful resource is The Connection String Reference at http://www.connectionstrings.com, which provides examples of the connection strings for numerous different providers.

To ensure you have entered the connection string correctly, use the Test Connection function provided by Geocortex Essentials Manager. When you click the Test button, Manager attempts to connect to the data provider using the connection string you have configured. If the connection is successfully established, Manager displays a Success message. If the connection fails, a Connection Failed message is displayed.

Impersonation

By default, Essentials accesses secured data sources using application credentials, which you configure in the connection string. Impersonation occurs when an application makes a request as a user instead of as the application—the application impersonates the user.

You can configure Essentials to impersonate the connected user when connecting to a data connection. For Essentials to use impersonation:

- The site must be secured using Integrated Windows Authentication.
  See **Integrated Windows Authentication** on page **402** for information.

- Windows impersonation must be enabled.
  See **Configure Global Security Settings** on page **418** for instructions.

- The external data source must be secured using Integrated Windows Authentication.

- The connection string defined in the data connection must indicate to connect using Integrated Windows Authentication.

- Impersonation must be enabled for the data connection.
  To enable impersonation, edit the data connection and set **Act Like** to **Connected Windows User**.

30.1.1 Supported Data Providers

Geocortex Essentials supports the following data providers for data linking:

- ODBC connections to the following types of file:
  - Microsoft Excel (.xls, .xlsx)
  - Comma-Separated Values (.csv)
  - Microsoft Access (.mdb)
  - dBase (.db)
  - OLE DB
- Oracle Client
- SQL Client
- SQL Server CE

30.1.2 Import a Data Connection

▶ **To import one or more data links from a site:**

1. In Manager, edit the site that you want to configure.
2. Click **Data Connections** in the side panel.
3. Click **Import Data Connection**.
   The Import Data Connection wizard opens.
4. Select the site in which the data connection is configured, and then click **Next**.
5. Select the data connections that you want to import. To select multiple data connections, hold the **Ctrl** key down while selecting.
6. Click **Finish**.
   The wizard closes and the data connection(s) appear on the Data Connections page.
7. Click **Save Site**.

30.1.3 Add an ODBC Connection

ODBC connections are used to connect to file-based data providers. Geocortex Essentials supports the following file-based providers:

- Microsoft Excel (.xls, .xlsx)
- Comma-Separated Values (.csv)
- Microsoft Access (.mdb)
- dBase (.db)

In order for Essentials to access an ODBC data file, the file must reside in your Sites folder or one of its subfolders. You can either copy the file to the Sites folder before you create the data connection, or you can use Manager's Upload function to copy the file over when you configure the connection.

When adding an ODBC connection, you are asked to choose between the Basic and Advanced methods of configuring the connection. If you choose the Basic option, Essentials creates the connection string for you. The Basic connection string uses the MS Access (*.mdb) driver; the DBQ is the path to the database file. When you use the Basic option, all you have to do is browse to the MDB file so Manager knows the path and file name to specify as the DBQ.

Choose the **Advanced** option if:

- The connection is specified in a system DSN or file DSN.

- You want to select a different ODBC driver.

- You want to specify connection options in the connection string.

You can edit the connection string at any time after the data connection is created.

> **To add an ODBC connection:**

1. In Manager, edit the site that you want to configure.

2. Click **Data Connections** in the side panel

3. Click **Add Data Connection**.
   The Create Data Connection wizard opens.

4. Type a display name for the data connection.

5. Select **ODBC** as the data provider.

6. If you want Essentials to test the connection whenever the site loads, select the **Verify on startup** check box.

7. Click **Next**.
   The **Basic** option creates the connection string for you. Select the **Advanced** option if you want to select a particular driver, specify a DSN, or specify options in the connection string.

   Basic
   a. With **Basic** selected, select **ODBC**.

   b. Click **Next.**

   c. If the database file is already in the Sites folder, browse to the file and select it.
      If the database file is located outside the Sites folder, **upload** the file.

   d. Click **Finish**.
      The wizard closes and the data connection appears on the Data Connections page.

   Advanced
   a. Select **Advanced** and follow the instructions that apply to you:

      DSN
         i. Select **Choose a DSN**, and then click **Next**.
         ii. Select the DSN from the list, and then click **Finish**.
            The wizard closes and the data connection appears on the Data Connections page.

ODBC Driver

i. Select **Choose an ODBC driver**, and then click **Next**.

ii. Select the driver from the list, and then click **Next**.

iii. If the database file is already in the Sites folder, browse to the file and select it.
If the database file is located outside the Sites folder, upload the file.

iv. Click **Finish**.
The wizard closes and the data connection appears on the Data Connections page.

Connection String

i. Select **Specify a connection string**, and then click **Next**.

ii. Type in the connections string.

iii. Test the connection.

iv. Click **Finish**.
The wizard closes and the data connection appears on the Data Connections page.

8. Click **Save Site**.

30.1.4   Add an OLE DB Connection

▶ **To add an OLE DB data connection:**

1. In Manager, edit the site that you want to configure.

2. Click **Data Connections** in the side panel

3. Click **Add Data Connection**.
The Create Data Connection wizard opens.

4. Type a display name for the data connection.

5. Select **OLE DB** as the data provider.

6. If you want Essentials to test the connection whenever the site loads, select the **Verify on startup** check box.

7. Click **Next**.

8. Type in the connection string.

9. Test the connection.

10. Click **Finish**.
The wizard closes and the data connection appears on the Data Connections page.

11. Click **Save Site**.

30.1.5 Add a SQL Client Connection

> **To add a SQL Client data connection:**

1. In Manager, edit the site that you want to configure.
2. Click **Data Connections** in the side panel
3. Click **Add Data Connection**.
   The Create Data Connection wizard opens.
4. Type a display name for the data connection.
5. Select **SQL Client** as the data provider.
6. If you want Essentials to test the connection whenever the site loads, select the **Verify on startup** check box.
7. Click **Next**.
8. Type the server name or click the **Refresh Servers** icon to select from a list of discovered servers.
9. Select the authentication method:
   - Integrated Windows Authentication
   - SQL Server Authentication.
     If you are using SQL Server Authentication, type the user name and password of a user configured in SQL Server.
10. Test the connection.
11. Click **Finish**.
    The wizard closes and the data connection appears on the Data Connections page.
12. Click **Save Site**.

30.1.6 Add a SQL Server CE Connection

> **To add a SQL Server CE data connection:**

1. In Manager, edit the site that you want to configure.
2. Click **Data Connections** in the side panel
3. Click **Add Data Connection**.
   The Create Data Connection wizard opens.
4. Type a display name for the data connection.
5. Select **SQL Server CE** as the data provider.
6. If you want Essentials to test the connection whenever the site loads, select the **Verify on startup** check box.
7. Click **Next**.
8. Type in the connections string.
9. Test the connection.

10. Click **Finish**.

    The wizard closes and the data connection appears on the Data Connections page.

11. Click **Save Site**.

30.1.7 Add an Oracle Client Connection

Before you can add an Oracle data connection, you must first have the Oracle Instant Client software installed on the server hosting Essentials.

▶ **To add an Oracle Client data connection:**

1. In Manager, edit the site that you want to configure.

2. Click **Data Connections** in the side panel.

3. Click **Add Data Connection**.

    The Create Data Connection wizard opens.

4. Type a display name for the data connection.

5. Select **Oracle Client** as the data provider.

6. If you want Essentials to test the connection whenever the site loads, select the **Verify on startup** check box.

7. Click **Next**.

    You can now choose to create the connection using either the **Basic** option or the **Advanced** option.

    The Basic option creates the connection string for you. Select the Advanced option if you want to manually specify a connection string.

    ### Basic

    a. Select **Basic**.

    b. Enter at least the following:

        - **Server name**: The name or IP address of the machine running the Oracle database that you wish to connect to.

        - **Instance**: The name of the Oracle database instance to connect to.

        - **User name**: The name of the user to connect as.

        - **Password**: The password for that user.
          You can also enter the port number that the Oracle server is listening on. If you do not specify a port, the **default port of 1521** is used.

    ### Advanced

    a. Select **Advanced**.

    b. Enter the full connection string to use for the connection. For example:

        ```
        Data Source=[YourDataSource];User Id=[UserName];Password=[Password];
        ```

8. For both the Basic and Advanced options, press **Test Connection** to test the connection.

9. Click **Finish**.

    The wizard closes and the data connection appears on the Data Connections page.

10. Click **Save Site**.

30.2 Search Tables

Search tables allow you to associate parameterized queries for data from external sources, such as RDBM (relational database management) systems like SQL Server, Oracle, Excel files, or Microsoft Access.

Search tables are often used by Data Link Searches but are themselves standalone entities.

Setting up search tables is a two-step process:

1. Define the connection parameters that allow Geocortex Essentials to connect to the external data source (the data connection).

2. Configure how to query the external data, and then specify what external data to retrieve.

30.2.1 Add a Search Table

▶ **To add a search table:**

1. In Manager, edit the site that you want to configure.

2. Click **Tables**

3. Click **Add Search Table**.
    The Create Search Table wizard opens.

4. Type a display name for the search table.

5. Select the data source that you want to use from the list.
    If the data source does not appear in the list, you must add the connection.

6. Click the **Add Data Connection** button and follow the instructions in **Data Connections** on page **227** to configure the connection.

7. Click **Next**.

8. Select the table that you want to search from the list.

9. Select the columns from that table that you want to retrieve data from. To select multiple columns, hold the **Ctrl** key down while selecting.

10. Click **Next**.

11. Enter the conditions to filter the data to retrieve.

12. Click **Finish**.
    The wizard closes and the search table appears on the Search Tables page.

30.3 Data Links

The second step in configuring data linking is to set up the actual link between your spatial layer attributes and the fields from the external data source. The data link submits your request to the data source and receives the results. The data link does not attempt to interpret the request.

You can either add and configure a new data link or you can import data links that are already configured in another site.

> **NOTE** The `DataLink` command is executed for each distinct set of parameters in your layer selection set. For example, if you have selected 500 features from the Zip Code layer and the Zip Code layer has a custom data link that retrieves sales information by zip codes, it will execute the command for each of the 500 zip codes.

30.3.1 Add a Data Link

▶ **To add a data link:**

1. In Manager, edit the layer that you want to configure.

2. Click the **Data Links** tab.

3. Click **Add Data Link**.
   The Create Data Link wizard opens.

4. Type a display name for the data link.

5. Select the data source that you want to link to from the list.
   If the data source does not appear in the list, you must add the connection.

6. Click the **Add Data Connection** button and follow the instructions in **Data Connections** on page **227** to configure the connection.

7. Click **Next**.

8. Select the table that you want to link to from the list.

9. Select the columns from that table that you want to retrieve data from.
   To select multiple columns, hold down the **Ctrl** key while selecting.

10. Click **Next**.

11. Enter the conditions to filter the data to retrieve.

12. Select the type of relationship that exists between the features in the layer and the records in the data source.

13. Click **Finish**.
    The wizard closes and the data link(s) appear on the Data Links tab.

30.3.2 Import A Data Link

▶ To import data links:

1. In Manager, edit the layer that you want to configure.

2. Click the **Data Links** tab.

3. Click **Import Data Link**.
   The Import Data Link wizard opens.

4. Select the site in which the data link is configured, and then click **Next**.

   > **NOTE** You can only import DataLinks from sites that contain the same map service that the current layer belongs to.

5. Select the data links that you want to import. To select multiple data links, hold the **Ctrl** key down while selecting.

6. Click **Finish**.
   The wizard closes and the data links appears on the Data Links tab.

7. Click **Save Site**.

30.3.3 About Data Link Search

Data link searches allow you to perform parameterized queries for data from external sources and relate the results to feature data from a layer.

▶ To set up a data link search:

1. Define the connection parameters that allow Geocortex Essentials to connect to the external data source (the data connection).

2. Configure a Search Table that defines how to query the external data and specifies what external data to retrieve.

3. Configure a relationship between the external data results and the feature data of the layer using key fields.

30.3.4 Add a Data Link Search

▶ To add a data link search:

1. In Manager, edit the layer that you want to configure.

2. Click the **Data Links** tab.

3. Click the **Advanced** edit button of the desired data link.
   The Edit Data Link page opens.

4. Click **Add Search**.

The Data Link Search dialog opens.

5. Type a display name for the data link search.

6. Select the search table that you want to use to perform searches into this data link from the list.

7. Type the name of a field from the search table that you want to use to link the search table result data to the feature result data from the layer.

8. Select the field from the layer from the list that relates to the Search Field of the Search Table.

9. Click **OK**.
   The dialog closes and the data link search appears on the Data Links tab.

31 Workflows

Workflows provide a quick and easy way to program complex, interactive, GIS and business processes. You create workflows in the Workflow Designer, which has a drag-and-drop interface, a library of activities, and a built-in simulator to accelerate development and free you from handling low-level details like client-server communications.

At its simplest, a workflow is a sequence of activities. However, there are several factors that affect the power of a workflow. A simple workflow takes some inputs and performs a particular type of operation on them, from which it produces the output. Many GIS workflows fit this pattern. The set of inputs is fed in at the beginning of the workflow, the GIS operations are performed, and the outputs are available at the very end.

The Geocortex Essentials model of workflows goes well beyond this simple model. Geocortex workflows extend the model to general business processes, so your workflows can be made up of a combination of business activities and GIS activities. Furthermore, Geocortex workflows are interactive. They can pause and wait for input as many times as needed and for as long as needed to model your processes.

31.1 Workflow Designer

Essentials comes with a powerful designer for creating workflows, **Geocortex Workflow Designer**. Workflow Designer has a built-in help system with instructions for creating workflows.

Workflow Designer has an extensive collection of activities, including both GIS activities and general activities. In addition to using the built-in activities, you can create custom activities. Custom activities appear in Workflow Designer alongside the built-in activities. You work with custom activities in exactly the same way as built-in activities—Workflow Designer treats them like any other activity.

31.2 Getting Help with Workflows

31.2.1 Workflow Designer Help System

Workflow Designer has a built-in help system with instructions for creating workflows. The help system includes an Activity Library that describes each workflow activity in detail.

To open the help system, launch Workflow Designer and click the help icon .

31.2.2 Sample Site

One way to learn about workflows is to experiment with the workflows in an existing site. The LA County sample site that ships with Essentials gives you a place to start. The LA County site has several workflows that you can run in the site's HTML5 viewer. You can also open the workflows in Workflow Designer and examine their configuration. For more information, see **Explore a Sample Site** on page **11**.

31.2.3 Workflow Activity Samples

Geocortex Essentials ships with a **Workflow Samples** site that provides samples of individual workflow activities. You can use the sample workflows to learn how individual activities work. Each sample workflow demonstrates one activity. The Workflow Samples site does not contains samples for all activities.

▶ **To use the Workflow Samples site:**

This procedure assumes that you are familiar with Geocortex Essentials Manager, the Geocortex Viewer for HTML5, and Workflow Designer.

1. Copy the `Workflow_Samples` folder from the `Sample Sites` folder to the `Sites` folder.
   This deploys the site.
   By default, the `Sample Sites` and `Sites` folders are here:

   ```
   C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST
   Elements\
   ```

2. Prepare to run the sample workflows:

   a. Launch the viewer for the Workflow Samples site.
      The viewer's Home Panel provides information and links to help you use the Workflow Samples site.

   b. Open the viewer's toolbar.
      The toolbar contains a tool for each sample workflow. You will use these tools to run the sample workflows.

   c. Open the viewer's Activity Glossary by clicking the link in the Home Panel.
      The Activity Glossary summarizes each activity that is available in Workflow Designer.

   d. Launch Workflow Designer.
      You are now ready to run the sample workflows to learn about the activities that they demonstrate.

3. Run a sample workflow:

   a. Choose an activity from the toolbar or the Activity Glossary.

   b. Open the sample workflow in Workflow Designer.
      By default, the sample workflows are here:

      ```
      C:\Program Files (x86)\Latitude Geographics\Geocortex
      Essentials\Default\REST Elements\Sites\Workflow_Samples\Resources
      ```

      Viewing an activity's configuration in Workflow Designer at the same time that you run the activity's sample workflow will help you to understand how the activity works.

   c. Select the activity on Workflow Designer's design surface.

This shows the activity's properties in the Properties panel, so you can see how the activity is configured.

d. Run the sample workflow by clicking the tool in the viewer's toolbar.
Follow the prompts that the workflow displays.

e. To open the help file for the activity, select the activity in Workflow Designer's toolbox and press F1.

4. Other things to try:

- Change the activity's configuration in Workflow Designer, save your changes, and then re-run the sample workflow to see the effect of your changes.

- Add a new instance of the activity to the sample workflow, configure it, save your changes, and then re-run the sample workflow.

31.2.4 Geocortex Support Center

The Geocortex Support Center has several resources to help you to learn about Workflow and share your ideas:

- **Community:** The Support Center has a Workflow Community where you can post questions about workflows.

- **Knowledge Base:** The Support Center's Knowledge Base has a Workflow and Workflow Designer area that contains articles about advanced Workflow topics.

- **Code Gallery:** The Support Center's Code Gallery has a Workflows and Workflow Designer area where you can download sample workflows that have been posted by Latitude Geographics or by Geocortex partners and customers.

- **Ideas:** The Support Center's Ideas area allows you to suggest improvements to Workflow and Forms.

- **Videos**: The Support Center's Videos area offers videos that show you how to use different activities and form elements.

31.3 Workflow Architecture

Geocortex Workflow is based on Microsoft Workflow Foundation 4.0, which is part of the .NET 4.0 stack. Being implemented in .NET on the server has many advantages. The main advantage is that it places the power of Windows Communication Foundation (WCF) and other .NET technologies at your command. Another advantage is having access to the libraries of the .NET Framework, which makes interaction with other systems straightforward. It also allows you to leverage existing knowledge in .NET programming for creating custom activities.

31.3.1 Workflow Files

Workflows are stored as `.xaml` files. When you create a workflow in Workflow Designer, you are actually creating a `.xaml` file. The `.xaml` file contains all the information needed to run the workflow.

Because they are based on XML, workflows are not compiled. This means that you can inspect and edit a workflow in a text editor or XML editor if you want to—there is no need to edit through the Workflow Designer, although the Designer does make it much easier to build and visualize the flow of activities.

31.3.2 Extensions to Microsoft Workflow Foundation

Geocortex Workflow extends Microsoft Workflow Foundation in several ways:

- **Interactivity**: Geocortex workflows are interactive. Because workflows are served through REST, which is stateless, the entire state of the workflow is packaged and sent to the client for execution of client-side activities. No server resources are tied up while the workflow is waiting for input or displaying alerts on the client.

- **Activities**: Many of the activities in the Workflow Designer's built-in library of activities complement out-of-the-box Microsoft Workflow. A minority are out-of-the-box Microsoft Workflow activities. The Workflow Designer's extended set of activities includes a wide variety of activities that work with ArcGIS Server and GIS objects and data types.

- **Simulation**: The Workflow Designer's built-in simulator enables you to run workflows in a simulated environment. Simulation saves you from having to deploy your workflow, which reduces the time and effort it takes to test your workflows.

To learn more about Microsoft Workflow Foundation, read **A Developer's Introduction to Windows Workflow Foundation (WF) in .NET 4** at http://msdn.microsoft.com/en-us/library/ee342461.aspx.

31.4 Getting Help with Workflow

31.4.0.1 Workflow Designer Help System

Workflow Designer has a built-in help system with instructions for creating workflows. The help system includes an Activity Library that describes each workflow activity in detail.

To open the help system, launch Workflow Designer and click the help icon 🕐.

31.4.0.2 Sample Site

One way to learn about workflows is to experiment with the workflows in an existing site. The LA County sample site that ships with Essentials gives you a place to start. The LA County site has several workflows that you can run in the site's HTML5 viewer. You can also open the workflows in Workflow Designer and examine their configuration. For more information, see **Explore a Sample Site** on page **11**.

31.4.0.3 Workflow Activity Samples

Geocortex Essentials ships with a **Workflow Samples** site that provides samples of individual workflow activities. You can use the sample workflows to learn how individual activities work. Each sample workflow demonstrates one activity. The Workflow Samples site does not contains samples for all activities.

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This procedure assumes that you are familiar with Geocortex Essentials Manager, the Geocortex Viewer for HTML5, and Workflow Designer.

1. Copy the `Workflow_Samples` folder from the `Sample Sites` folder to the `Sites` folder.
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   ```
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    b. Open the viewer's toolbar.
        The toolbar contains a tool for each sample workflow. You will use these tools to run the sample workflows.

    c. Open the viewer's Activity Glossary by clicking the link in the Home Panel.
        The Activity Glossary summarizes each activity that is available in Workflow Designer.

    d. Launch Workflow Designer.
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3. Run a sample workflow:

    a. Choose an activity from the toolbar or the Activity Glossary.

    b. Open the sample workflow in Workflow Designer.
        By default, the sample workflows are here:

        ```
        C:\Program Files (x86)\Latitude Geographics\Geocortex
        Essentials\Default\REST Elements\Sites\Workflow_Samples\Resources
        ```

        Viewing an activity's configuration in Workflow Designer at the same time that you run the activity's sample workflow will help you to understand how the activity works.

    c. Select the activity on Workflow Designer's design surface.
        This shows the activity's properties in the Properties panel, so you can see how the activity is configured.

    d. Run the sample workflow by clicking the tool in the viewer's toolbar.
        Follow the prompts that the workflow displays.

    e. To open the help file for the activity, select the activity in Workflow Designer's toolbox and press F1.

4. Other things to try:

    -   Change the activity's configuration in Workflow Designer, save your changes, and then re-run the sample workflow to see the effect of your changes.

    -   Add a new instance of the activity to the sample workflow, configure it, save your changes, and then re-run the sample workflow.

31.4.0.4   Geocortex Support Center

The Geocortex Support Center has several resources to help you to learn about Workflow and share your ideas:

-   **Community:** The Support Center has a Workflow Community where you can post questions about workflows.

-   **Knowledge Base:** The Support Center's Knowledge Base has a Workflow and Workflow Designer area that contains articles about advanced Workflow topics.

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- **Ideas:** The Support Center's Ideas area allows you to suggest improvements to Workflow and Forms.

- **Videos**: The Support Center's Videos area offers videos that show you how to use different activities and form elements.

31.5 Overview of Steps to Create and Use a Workflow

The main steps to create and use a workflow are:

1. **Create the workflow in Workflow Designer.**

    Refer to the Workflow Designer help system for help.

2. **Add the workflow to a site.**

    As with other components in a site, saving the site deploys the site's workflows to the REST API for consumption by the Essentials client APIs.
    See **Add a Workflow to a Site** on page **242**.

3. **Configure a method to run the workflow in a viewer.**

    There are several different ways to do this:

    - **Run on Startup:** Configure the workflow to run automatically whenever an end user launches one of the site's viewers.
      See **Configure a Workflow to Run on Startup** on page **243**.

    - **Toolbar Item:** Add a tool that runs the workflow to a viewer's toolbar.
      See **Viewers** on page **292**, or refer to the *Geocortex Viewer for HTML5 Administrator and Developer Guide* and *Geocortex Viewer for Silverlight Administrator and Developer Guide*.

    - **Menu Item:** Add an item that runs the workflow to a viewer's I Want To menu.
      See **Viewers** on page **292**, or refer to the *Geocortex Viewer for HTML5 Administrator and Developer Guide* and *Geocortex Viewer for Silverlight Administrator and Developer Guide*.

    - **Hyperlink:** Configure a hyperlink that end users can click to run the workflow.
      See **Hyperlinks in the Viewer** on page **44**.

    You can also run workflows from other workflows.

4. **Configure workflow containers.**

    If the workflow uses one or more **Display** activities, configure the workflow containers that control presentation of the workflow in the viewer:

    - **In Viewers:** In each viewer that will use the workflow, define the workflow containers that you want to use in the workflow.
      In the HTML5 Viewer, you define workflow containers in the configuration for the Workflow Module. See "Workflow Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.
      In the Silverlight Viewer, you can define workflow containers in Manager. See **Configure Workflow in a Silverlight Viewer** on page **386**. Alternatively, you can define workflow containers by manually editing the Workflow Module's configuration. See "Workflow Module" in the *Geocortex Viewer for Silverlight Administrator and Developer Guide*.

    - **In the Workflow:** In the workflow, set the **Workflow Container Name** property in **Display** and

ConfigureWorkflowContainer activities.

See "Configure Workflow Containers" in the Workflow Designer help system.

5. **Copy custom assemblies.**

If the workflow contains custom activities, you must copy the assemblies to the `<GE_INSTALL>\REST Elements\REST\bin` folder.

31.6 Add a Workflow to a Site

To add a workflow to your site, you must first create the workflow in [Workflow Designer](#).

▶ **To add a workflow to a site:**

1. In Manager, edit the site that you want to configure, and then click **Workflows** in the side panel.

2. Click **Add Workflow**.

3. Type a display name for the workflow.
   The display name can contain any characters, including spaces and special characters.

4. If you do not want to use the default ID, type an ID for the workflow in the **ID** box.
   The ID can contain letters, numbers, and underscores.

5. In the **URI** box, enter the location of the workflow's `.xaml` file.

6. If you want the workflow to run automatically whenever an end user launches one of the site's viewers, select the **Run On Startup** check box.

7. Click **Next**

8. If you want to assign values to one or more of the workflow's input arguments, enter the values.
   To enter a string, you do not need to include the quotation marks.

9. Click **Next**.

10. Click **Finish**.
    The workflow is added to the site.

31.7 Import Workflows from Another Site

▶ **To import workflows from another site:**

1. In Manager, edit the site that you want to configure, and then click **Workflows** in the side panel.

2. Click **Import Workflow**.

3. Select the site where the workflows are configured, and then click **Next**.

4. Select the workflows that you want to import.
   To select multiple workflows, hold the Ctrl key down while selecting.

5. Click **Finish**.

    The workflows are added to the site.

6. If you want to change an imported workflow, click the **Edit** icon [icon] beside the workflow and follow the steps in the wizard.

    The wizard allows you to change the workflow's display name, ID, and URI; configure the workflow to run automatically when an end user launches one of the site's viewers; and assign values to one or more of the workflow's input arguments,

7. Click **Save Site**.

31.8 Configure a Workflow to Run on Startup

You can configure a workflow to run automatically whenever a user launches one of the site's viewers.

Essentials does not place a limit on the number of workflows that can run when a viewer launches. Follow the instructions below for each workflow that you want to run when a viewer launches.

▶ **To configure a workflow to run on startup:**

1. In Manager, edit the site that you want to configure, and then click **Workflows** in the side panel.

2. Click the **Edit** tool beside the workflow that you want to configure.

3. Select the **Run On Startup** check box.

4. Click **Next**

5. Click **Finish**.

32 Charts

The ability to represent feature layer data as charts and graphs was added in Geocortex Essentials 4.0, Geocortex Viewer for HTML5 2.3, and Geocortex Viewer for Silverlight 2.0.

Charts represent feature data on a single feature layer. For example, you could have a chart for a layer containing data about hurricanes, or a different chart for a layer containing census data.

32.1 Chart Types

Charts are divided into two high-level types:

-   **Pie charts** show the breakdown of data into divisions like slices of a pie. In Geocortex Essentials, you can configure pie charts to represent the data of multiple features on a map or to represent the data of a single feature.

Multiple-feature Pie Chart showing the distribution of different types of storms within a specific area

Single-feature Pie Chart showing population ages within a single Census Tract
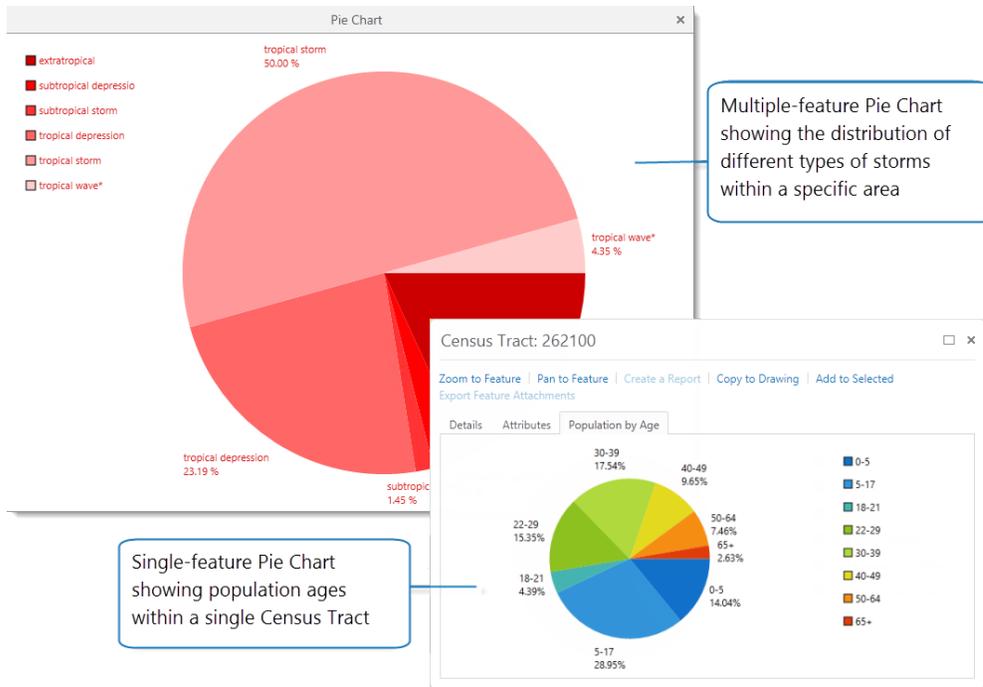
- **Linear charts** visualize data by plotting data points onto a chart containing an X- and Y-axis. A linear chart contains a single horizontal axis (X-axis) but may contain multiple vertical Y-axes that represent different data sets. The data sets shown on the Y-axis are called **series**. Each series can be represented as a different chart type, including bar, line, area, and scatter charts.

You can also configure and display separate chart types side-by-side to compare data.
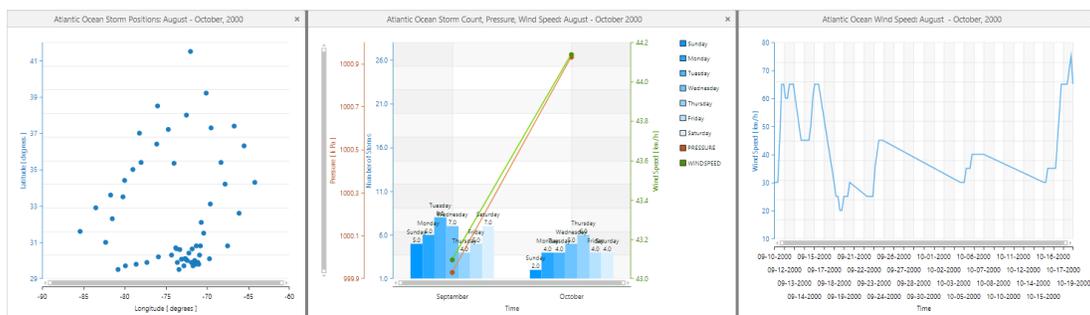
A scatter chart, multiple series chart (bar and two linear) and a line graph

32.2 Match the Chart Type to Your Data

To extract the most benefit from charting, you need to select the best chart type for your data. For example, bar charts are good for comparing data, line graphs are better for examining trends over time, but pie charts are useful for examining how different parts make up a whole.

Chart Types

If you want to... ▼	For example... ▼	Use this chart type... ▼
Compare data	Compare one or more categories of data, particularly if each category has sub-categories.	Bar chart
Show **trends** in data	Examine trends over a period of time, particularly if the number of data points is high - like population trends.	Line chart or Area chart
Show the **composition** of data	Indicate several types of data (nominal or ordinal) and the percentage of the whole each represents - like the ethnicity breakdown within a census tract.	Pie chart for static data, column or area charts for data that changes over time.
Show the **distribution** or **relationships** between data	See the relationship between two different attributes, particularly if there are many data points – like the correlation between crime incidents in a city and average income per person.	Scatter chart to show relationships with two or three attributes. Column or Bar charts for many data points.

32.3 About Series

A series in a chart is a way to represent a field or an attribute of one or more features on the map. In a pie chart, each series becomes another slice of the pie. In a linear chart, each series is added as a separate Y-axis and can be represented as a different chart type, for example, a bar or line graph. The X-axis represents the data set that is shared with the other features in the chart.

For example, the chart below contains three series that each use a different a chart type. The blue bar chart shows the Total Population of each city. The brown area chart shows the area of each city in square miles. The green line chart shows the average family size in each city. While the X-axis, City ID, remains constant, the three series—**Average Family Size**, **Total Population** and **Area**—represent how these attributes change for different cities. Using multiple series and different chart types makes it easier to visualize and analyze the relationship between the given attributes of each city.
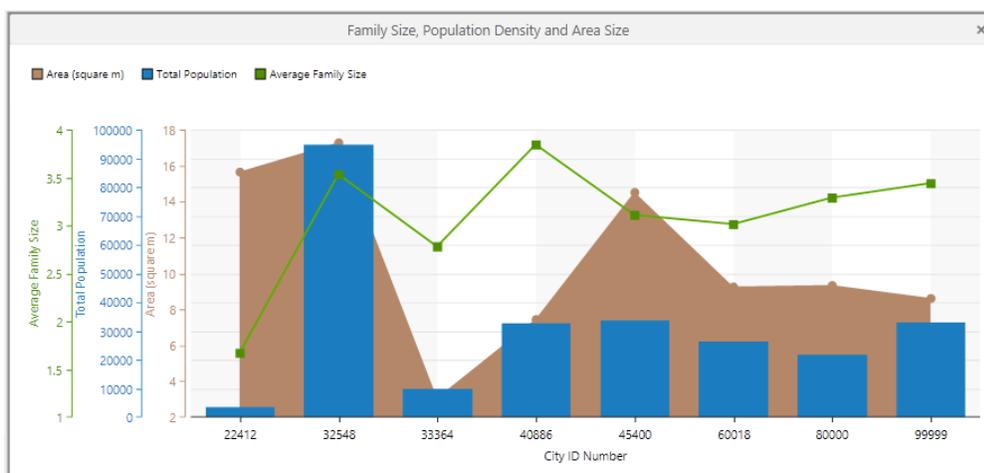
Chart with the X-axis Cities and a series of Y-axes for Family Size, Total Population and Area

You can also use multiple series in a single pie chart. For example, you could have a pie chart that contained a different series for each age group in the population. The chart would then display a slice for each age group, with the size of the slice indicating the relative number of individuals within the population for each given age. There is no limit to the number of series you can have in a pie chart, although too many might make the chart difficult to understand.
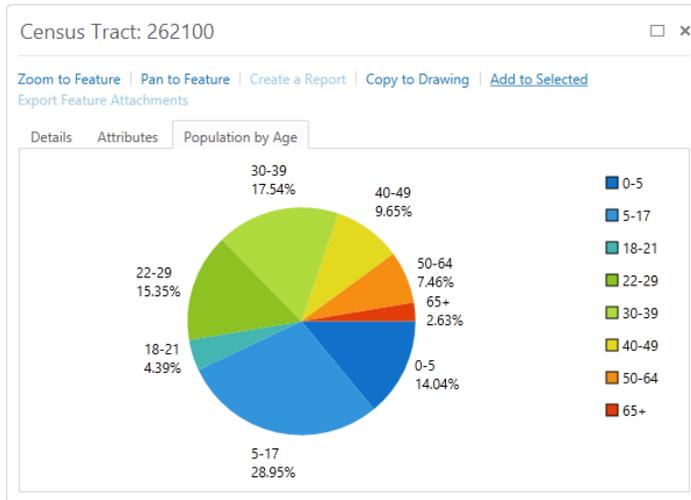
32.4 Data Sources for Charts

In Manager, you can use the fields in a layer or a datalink as source data for a chart.

32.4.1 Fields

The fields configured on a layer provide the data used to create charts. The charts you can make are therefore dependent on the field data for that layer, unless you configure data links to extend the layer data.

32.4.2 Datalinks

To use a datalink as a source for a chart, you would first need to set up the datalink for the layer. Once the data connection is set up and the data link is working, you can use these external data sources in charts. For example, you could incorporate data from a relational database into a chart.

See also...

32.5 Chart Settings

When you configure a chart, the following settings are available to you. Some settings only appear when you select a particular chart type as they apply only to that type of chart. For example, pie charts have fewer settings than linear charts and single-feature charts have fewer settings than multiple-feature charts.

32.5.1 Chart Setup

- **Chart Title:** The name of the chart. The Chart Title appears in drop-down lists, title bars, feature details, tabs, and dialogs to identify the chart.

- **Type:** Sets whether the chart is a Linear or Pie chart. When you select **Linear** in this field, it activates options that allow you to set up Bar, Line, Spline, Area, Spline Area and Scatter Point charts. You configure the settings for linear charts under More Options, Category Setup (Horizontal Axis), and Series Setup (Vertical Axis).

- **Charts:** Determines whether the chart displays information about a single feature or multiple features.
    - A single-feature chart displays information about only one feature. A single-feature chart opens in a tab in the Feature Details dialog box when you select one feature in the Results List or when you click **View Additional Details** in a map tip.
    - A multiple-feature chart displays information about any number of features in the Results List that you find using an Identify tool or Search. The chart region opens below the map when you click **Charting** at the top of the Results List. In the chart panel, you can use the **Chart Selector** to enable or disable the visibility of configured multiple-feature charts.

- **Visible:** Determines if the chart is visible in the viewer or not. The Visible setting makes it possible to disable a chart instead of deleting it permanently.

32.5.1.1 More Options

These option are available when you click .

When you select a pie chart, fewer options are available than when you select a linear chart.

- **Colors:** Determines the **Background** color of the chart and the **Foreground** color of text and lines in the chart.

- **Chart Area:**
    - **Show Tooltips**: Sets whether or not a tool tip appears when you hover over data points on the chart.
    - **Show Labels** (pie charts only): Sets whether or not a label appears beside each pie chart slice.
    In a pie chart, the label contains the name of the field by default and the percentage of the pie that the slice represents. You can edit the label.
    - **Show Trackball** (linear charts only): Displays a trackball for the data point closest to the current mouse position and follows the mouse left to right as it moves along the chart. The trackball shows the nearest data point even when the mouse isn't directly over it on the chart. You can use this option when there are too many data points to display individually.
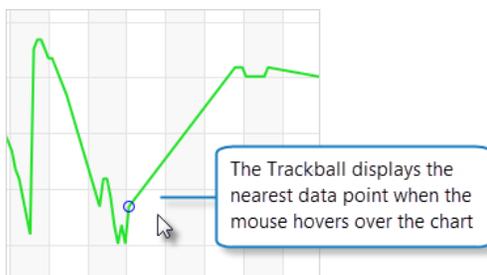
- **Common Series Range** (linear only): Sets all chart series to use the same range. You can use this option when you have multiple series that you want to display with a common scale. The common series range is determined based on the overall minimum and maximum value found in all chart series.

The effect on a chart of setting the Common Series Range unselected or selected

- **Gridlines** (linear only): Adds Horizontal and Vertical grid lines to the background of a Linear chart.

- **Shading Strips** (linear only): Adds translucent Horizontal and Vertical strips to the background of a Linear chart.

- **Horizontal Axis** (linear only):

  - **Visible**: Sets the visibility of the X-axis of the chart.

  - **Opposite Position**: Places the X-axis in the opposite position at the top of the chart rather than along the bottom.

  - **Sort Descending:** Sets whether to display data on the X-axis in ascending or descending order.

  - **Ticks:** Sets whether or not small lines appear on the X-axis to indicate key points along the axis.
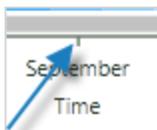
  - **Labels**: Sets whether or not the ticks should have labels to identify them on the X-axis. You can select either All Labels or Smart Labels. These settings are mutually exclusive—you can have one or the other.

    - **Smart Labels:** The number of labels adjusts intelligently to fit in the current view.

      If you have **Plot Numerical** selected in Chart Setup, then Smart Labels are used automatically.

    - **All Labels**: All of the axis labels are displayed and stacked on top of each other if they overlap.

  - **Maximum**: Specifies the maximum value to use for the chart's horizontal axis. You can only set a maximum value if the horizontal axis's Field is numeric. If you leave the Maximum box blank, the maximum is intelligently determined based on the data.

  - **Minimum:** Specifies the minimum value to use for the chart's horizontal axis. You can only set a minimum value if the horizontal axis's Field is numeric. If you leave the Minimum box blank, the minimum is intelligently determined based on the data.

- **Legend**: Defines whether or not the chart has a legend and where on the chart the legend is positioned.

- **Chart and Map Synchronization**: Defines interactions between the chart and the map. When you click a data point on the chart, it performs all of the actions you enable in this section.
  - **Select**: Sets whether or not those features are added to **Selected** in the Results List when you click on a data point in the chart. When you have selected several features, you can then click View Selected to display only those features in the Results List.
  - **Pan**: Pans the map to show all the features clicked on the chart.
  - **Zoom**: Zooms the map in or out to show all the features clicked on the chart.
  - **Feature Details**: Opens the Feature Details dialog box, which displays details about a feature when that feature is clicked on the chart. If more than one feature is selected, details about only the first one display.
  - **Run Command**: Runs a command with the specified command parameter. When you select the Run Command option, the **Command Name** and **Command Parameter** boxes open for you to enter the information.

- **Chart Zoom** (linear only): Defines if the chart can zoom or not and how the chart behaves when a user drags the mouse in the chart area. These settings affect the chart area only.
  - **Horizontal**: Sets whether or not the chart can be zoomed horizontally.
  - **Vertical**: Sets whether or not the chart can be zoomed vertically.
    - **No Drag Action**: When you drag on the chart, it has no effect.
    - **Zoom On Drag**: When you drag a rectangle on the chart, it sets the area to zoom to when you release the mouse.
    - **Pan On Drag**: When you drag on the chart, it pans the chart but does not zoom.
- **Chart Orientation** (linear only):
  - **Swap Axes**: Swaps the X-axis and the Y-axis so that the information from the Y-axis is horizontal and the information from the X-axis is vertical.
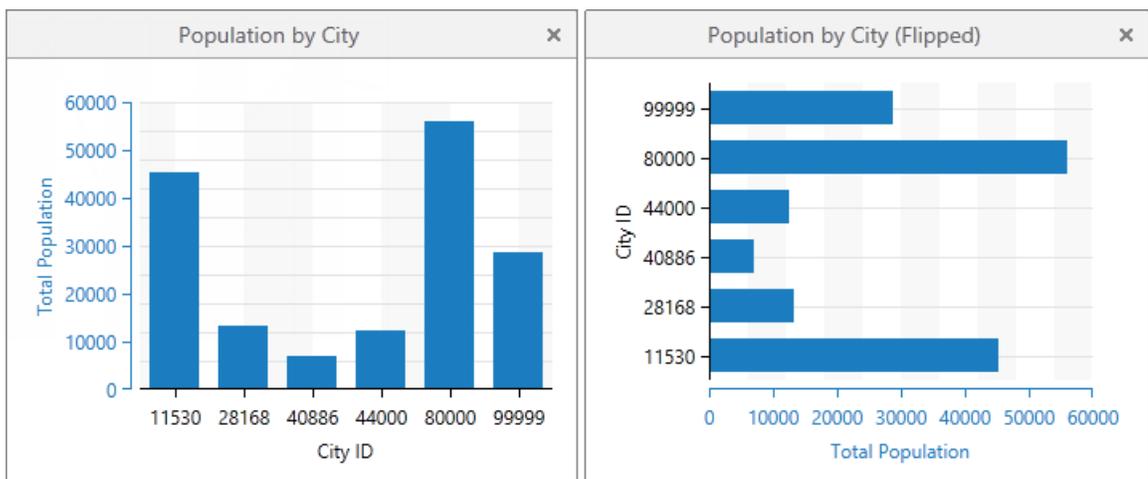
Charts showing the effect of swapping the axes in a linear chart

32.5.2   Category Setup (Horizontal Axis)

These settings appear when you select **Linear** in the **Type** field under Category Setup. The Horizontal Axis settings determine the appearance and data sources for the X-axis in linear charts.

- **Category Title**: Sets the label that appears under the X-axis in the chart.

- **Data Source**: Sets the source of the data for the X-axis to be either a field on the layer or a datalink. To use a datalink, you would first need to set up the link to the database or spreadsheet and link it to the layer. For more information, see **Data Linking** on page **226**.

- **Field**: Sets which field in the layer to use as the source of data for the X-axis. The data type of the field you select affects which options appear in other settings. For example, if you select a time-based type in Field, a **Plot Continuous** option appears. If you select a numerical type in Field, a **Plot Numerical** option appears.

- **Value Format**: Sets the format to use when interpreting DateTime or Numeric values on the selected field. The options in the Value Format drop-down list change depending on the field type. For example, if you select a DateTime field, the list shows options to read the field value as Day, Month, or Year. If you select a Numeric field, the list shows options to read the field value as a decimal value, currency, or a percentage. Specifically, if you select **Currency**, data points display in the chart with a currency sign in front of them. If you select **Percentage**, the value is multiplied by 100 and displays with a percentage sign.

- **Display Format**: Activates when you select either the **Custom Number Format** or the **Custom Date Format** option in the Value Format drop-down list. You can then specify a custom DateTime or Numeric format to sort and interpret the field data.
  Custom formats must comply with the MSDN Formatting Types standards:
  DateTime: Standard Date and Time Format Strings
  Numeric: Standard Numeric Format Strings

- **Decimal Places**: Activates when a numerical option is selected in the Value Format field. Decimal Places is where you would set how many places after the decimal point to allow for this data in the series.

- **Plot Continuous/Plot Numerical**: These options appear only if you select a particular type of data in the **Field** setting. For Example, for Plot Continuous to appear, you must select a time-based field type. For Plot Numerical to appear, you must select a numerical field type.

  - Select **Plot Continuous** if you want to plot the data to display chronologically and continuously over time.

  - Select **Plot Numerical** if you want to plot the data to display linearly and continuously.

> **NOTE** To create a Scatter Point chart, you must select a numerical field for the category and then enable Plot Numerical. This is because a Scatter Point chart can only represent numerical values.

32.5.3   Series Setup (Vertical Axis)

These settings appear when you click **Add Series**. Use the series settings to define the Y-axes in a linear chart or the segments of a pie chart. You can have multiple series in both linear and pie charts.

> **NOTE** When you select **Linear** in the **Type** field in Category Setup, many more options are available under Series Setup than when you select **Pie**. Other options may appear or disappear based on the type of data source selected.

- **Series Setup**: Settings that control the type and appearance of a series.

  - **Name**: Sets the name of the series as it appears on the legend and the label of a segment in a pie chart.

  - **Type** (linear only): Sets the type of series to display.
    Type choices include **Bar**, **Line**, **Spline**, **Area**, **Spline Area**, and **Scatter Point**.
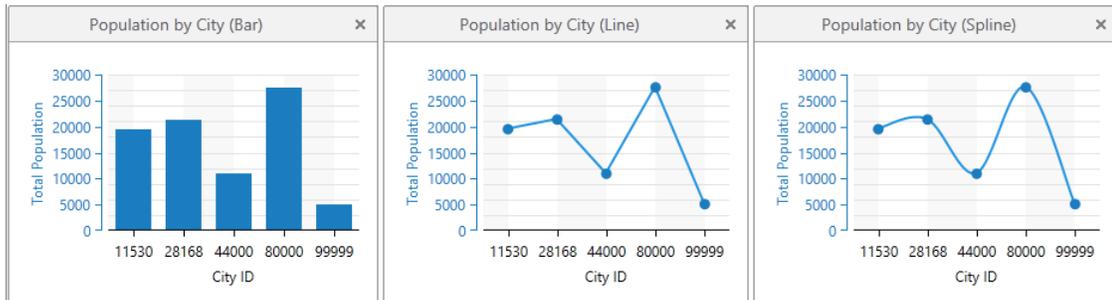
A Bar, Line, and Spline chart showing the same population data
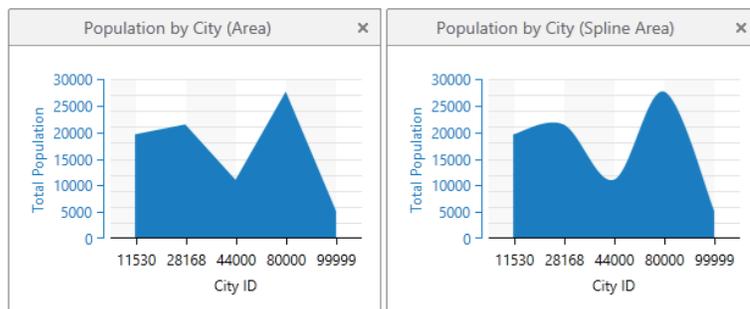
An Area and Spline Area chart showing the same population data
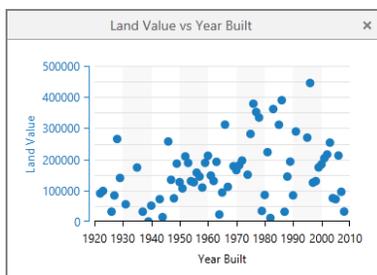
A Scatter Chart showing numerical data

- **Series Source**: Sets the source and format of the series data.

  - **Data Source**: Sets whether to use a **Field** on the layer or a **Datalink** as the data source for this series. If you want to use a datalink, you would need to set it up before it can be available for selection here.

  - **Field**: Sets which field to use as the source of data for this series.

  - **Value Format**: Sets the format to use based on the type of data you selected in the Field above. Use this setting to create a custom format for either Date/Time or Numeric values. For more information about Custom Formats, see the Value Format under Category Setup.

- **Series Format**: Defines how a series is formatted.

  - **Data Aggregator**: Determines the aggregation method to use on the values for this series. Choices include:

    - **Sum**: Calculates the total of all the values for the selected field. For example, the total population of the selected counties.

    - **Count**: Ignores the actual value of a field and simply counts the number of features. Use this aggregator when the field is a string and can take on multiple values. For example, the available census data of the selected counties.

    - **Min**: Finds the minimum value of all the selected features. For example, the lowest population of a single county within the selected counties.

    - **Max**: Finds the maximum value of all the selected features. For example, the highest population of a single county within the selected counties for a selected year.

    - **Average**: Calculates the average value of all the selected features. For example, the average population of the selected counties.

  - **Value Format**: Sets the format to use for the aggregated series based on the type of data you selected in the Field above. Use this setting to create a custom format for either Date/Time or Numeric values. For more information about Custom Formats, see *Value Format* under Category Setup.

  - **Sort Descending** (linear only): Sets whether to display data on the Y-axis in ascending or descending order.

- **Series Break** (linear only): Sets whether or not to break apart the aggregated series data by the specified method. If you select the Unique Value method, it separates the data into groups based on unique values for the selected field.

   Data broken apart by the unique value method is often best represented as a bar chart.

- **Series Style** (linear only): Controls the appearance of the series markers and labels.

  - **Point Marker**: Sets the shape of the points used to represent nodes in this series. You can select either: **None**, **Circle**, **Square**, **Triangle** or **Diamond**.

  - **Point Labels**: Sets whether or not to display text labels for the nodes in this series. You can select either: **None**, **Smart** or **Smart with Collectors**.
    If you use **Smart Labels**, the labels are placed next to each node in the series so that the labels do not overlap.
    If you use **Smart with Connectors**, the labels are arranged so they do not overlap but each label is connected to its corresponding chart node with a thin line.

     Smart Labels and **Smart with Connectors** for labelling the points in linear charts are only fully supported by the Silverlight Viewer. In the HTML5 Viewer, both **Smart Labels** and **Smart with Connectors** display point labels that may overlap, without connectors.

  - **Color**: Sets the color of the nodes and lines on the Y-axis.

- **Series Axis** (linear only):

  - **Axis Title**: Sets the title of this Y-axis.

  - **Maximum**: Manually sets the maximum value of the y-axis for this series. If you do not specify a Maximum, it is intelligently determined based on the data.

- **Minimum**: Manually sets the minimum value of the y-axis for this series. If you do not specify a Minimum, it is intelligently determined based on the data.

- **Ticks**: Sets whether or not to display ticks (small bars) to demarcate data points on the axis.

- **Labels**: Sets whether or not to display labels for each of the ticks, which are small bars that designate key points on the axis.
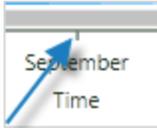
- **Opposite Position**: Places the series Y-axis in the opposite position on the right side of the chart rather than the left side.

- **Visible**: Sets the visibility of the Y-axis for this series.

See also...

32.6 Add or Copy a Chart

Before you add a chart, examine the options and select the chart type you plan to use to view and analyze your data.

The **Chart**s tab on the **Map > Layer** page in Manager is where you add and configure charts. Charts display the data of a single layer in the viewer. You add and configure a chart using the fields of a particular feature layer within a site.

If you have created a complex chart and want to add one that is similar, you may find it faster to copy an existing chart and then edit the settings rather that start from the beginning.

▶ **To add a chart to a layer in Manager:**

You can add charts to feature layers only.

1. In Manager, edit the layer that you want to configure.

2. Click the **Charts** tab.

3. Click .

4. In the Chart Wizard, type in a **Display Name** for this particular chart.
   The Display Name appears on this page in the list of charts, in the drop-down box in the viewer where end users select a chart to display and in the feature details dialog for single-feature charts. Choose a descriptive name that makes it clear what data the chart displays.
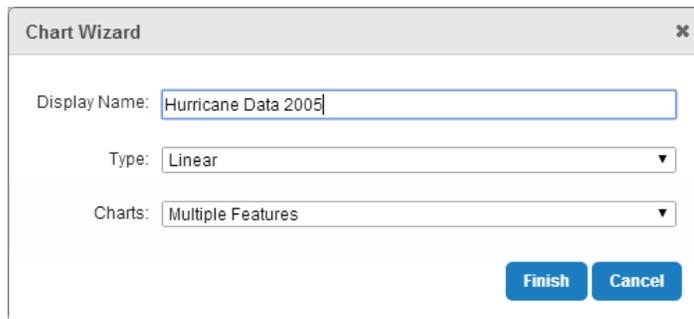
5. From the **Type** drop-down list select **Pie** or **Linear**.

6. From the **Charts** drop-down list select **Multiple Features** or **Single Feature**.

   A single-feature chart displays information about only one feature. A multiple-feature chart displays information about any number of features in the Results List.

7. Click **Finish** to create the new chart and add it to the list of charts.

   You now need to configure the chart.

8. Click **Apply Changes** and **Save Site**.

▶ **To copy a chart:**

1. In Manager, edit the layer that you want to configure.

2. Select the **Charts** tab.

3. Click the **Duplicate Chart** icon beside the chart that you want to copy.

   An exact copy of the chart appears at the bottom of the list of charts with the word **Copy** added to the Display Name.

   > You can only copy charts on the same layer. Currently, you cannot copy charts from a different layer or site.

4. To edit the copied chart, click **Edit** beside the copied chart and change the chart settings.

5. Click **Apply Changes** and **Save Site**.

32.7 Add or Copy a Series

You can add series to both pie and linear charts. In Pie charts, each series is represented as a slice of the pie. In pie charts, the slice indicates what percentage of the overall pie that slice represents. In linear charts, series are represented on the Y-axis and can be rendered as many different chart types, for example, bar, line, spline, etc.

To make it easier to create multiple series that are relatively similar, you can copy an existing series and edit it rather than create each one from the beginning. You can also select a palette of colors to use to ensure that the colors used in multiple series contrast both contrast and blend with each other.

▶ **To add a series:**

1. In Manager, edit the layer that you want to configure.

2. Click the **Charts** tab.

3. Click [icon] beside an existing chart.

4. If the chart does not contain an X-axis, define the X-axis in the Category Setup (Horizontal Axis) section.

5. In the **Series Setup (Vertical Axis)** section, click ⊕ **Add Series** .

6. In the Edit Series dialog box, do at least the following:

   - Type a **Name** for this series. The name appears in the Series list.

   - If this is a linear chart, select the chart **Type** from the drop-down list.

   - Select a **Data Source** that is either a **Field** or a **Datalink**.

   - Select the layer **Field** to use as the data set for this series.

   - Select a **Data Aggregator** to indicate the aggregation method to use on the data.

   - Ensure that the **Axis Title** is the exact wording you want to appear as the label on the Y-axis.
     For more information on these settings, see Series Setup (Vertical Axis) in Chart Settings.

7. Click **OK** to add the new series and add it to the Series list.

8. Click **Apply Changes** and **Save Site**.

▶ **To copy a series:**

1. In Manager, edit the layer that you want to configure.

2. Click the **Charts** tab.

3. Click [icon] beside the chart that contains the series you want to copy.

4. In the Series Setup section click the **Duplicate** icon [icon] beside the series.
   A exact copy of the series appears at the bottom of the list of series.

5. To edit the copied series, click **Edit** [icon] beside the copied series and change the Name and any other settings.

6. Click **Apply Changes** and **Save Site**.

See also...

Create a Single-Feature Chart on page **257**

Chart Settings on page **246**

32.8   Edit or Remove Charts

▶ **To edit a chart:**

1. In Manager, edit the layer that you want to configure.

2. Select the **Charts** tab.

3. To edit a chart, click the **Edit** icon beside the chart and change any of the Chart Settings.

4. Click **Apply Changes** and **Save Site**.

▶ **To remove a chart:**

1. In Manager, edit the layer that you want to configure.

2. Select the **Charts** tab.

3. Click the **Remove** icon beside the chart you want to delete.

4. When the Delete Chart dialog box opens, click **OK** to confirm the removal of the chart.
   The chart disappears from the list.

5. Click **Apply Changes** and **Save Site**.

32.8.1   Edit or Remove Series

▶ **To edit a series:**

1. In Manager, edit the layer that you want to configure.

2. Select the **Charts** tab, and then click beside the chart you want to edit.

3. In the Series Setup section, click beside the series you want to change.

4. Edit the series by changing any of the Edit Series settings.

5. Click **Apply Changes** and **Save Site**.

▶ **To remove a series:**

1. On the **Charts** tab, in the Series Setup section, click **Remove** beside the series you want to delete.
   The series disappears from the list.

2. Click **Apply Changes** and **Save Site**.

See also...

Chart Settings on page **246**

32.9 Create a Single-Feature Chart

You can configure pie charts or linear charts as a single-feature chart. A single-feature chart opens in the feature details when the user clicks on a single feature in the Results List, or when the user views additional details from a map tip.

Although it is possible to create single-feature charts that are linear, it is more likely that you will use a datalink configured on the layer in order to populate a linear single-feature chart with meaningful data.

To create a single-feature pie chart:

1. In Manager, edit the layer that you want to configure.

2. Click the **Charts** tab and click [Add Chart].

3. In the Chart Wizard, type in a **Display Name** for this particular chart.

4. In the **Type** drop-down list, select **Pie** chart and then **Finish**.
    The new chart appears in the chart list.

5. Click **Edit** to open the chart settings page.

6. In the **Charts** drop-down list, select **Single Feature**.

7. Click [More Options], select **Show Tooltips** and **Show Labels**, and then click **OK**.
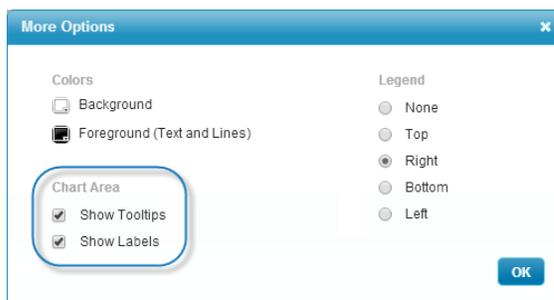
    You can also set the **Background** color, text and line color, as well as the position of the legend on the chart.

8. To choose a color palette for the chart series, click **Color Palette** in the Series Setup section, and then click **Enable Color Palette**.

9. Select a palette from the drop-down list, and then click **OK**.

10. Click **Add Series**.

11. To create a series, in the Edit Series window, set the following:

- **Name**: The label you want to use as the name of this series.

- **Data Source**: Whether the data source is a **Field** in the layer or a **Datalink**.

- **Field**: The field on the layer to use as the source data for this series.
    - **Value Format**: What formatting to use when this field is sorted.

- **Data Aggregator:** How to treat this data in the series.
    - **Value Format**: How to format each data point in this series.

For more information about these settings, please see **Series Setup (Vertical Axis)** on page **250**.

12. Create at least one more series.

13. Click **Apply Changes** and **Save Site**.

When you click on a single feature in the Results List, or **View Additional Details** in a map tip, the chart appears as a new tab in the Feature Details dialog box.
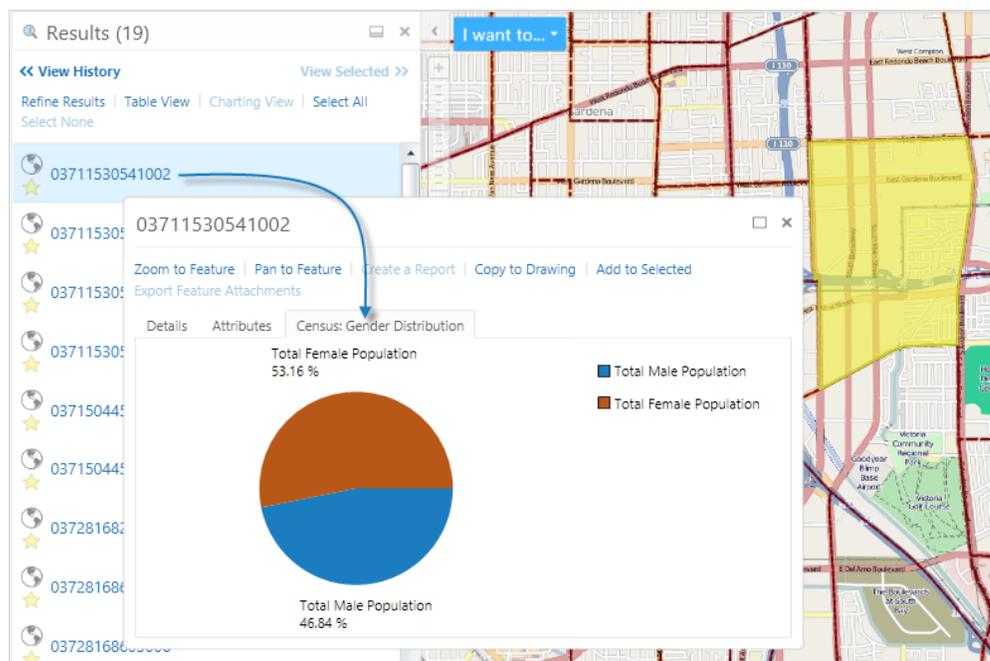
32.10 Create a Multiple-Feature Chart

Multiple-feature charts display data about all the features currently in the Results List. When a chart is open, the user can search for or identify other features and the chart updates to show the new data.

You can create both pie and linear multiple-feature charts and in each case, they can have multiple series. In a linear chart, the series on the Y-axis can include multiple series using different chart types, for example, a mix of line, spline or bar types.

If you have several charts set up for a layer, you can set which charts open by default when a user views charts.

To create a multiple-feature chart:

1. In Manager, edit the layer that you want to configure.

2. Click the **Charts** tab and click [Add Chart].

3. In the Chart Wizard, type in a **Display Name** for the chart.

   The Display Name appears on this page in the list of charts and in the drop-down list in the viewer where end users select a chart to display. Choose a descriptive name that makes it clear what data the chart displays.

4. In the **Type** drop-down list, select **Linear** or **Pie**, and then click **Finish**.

   The new chart appears in the chart list.
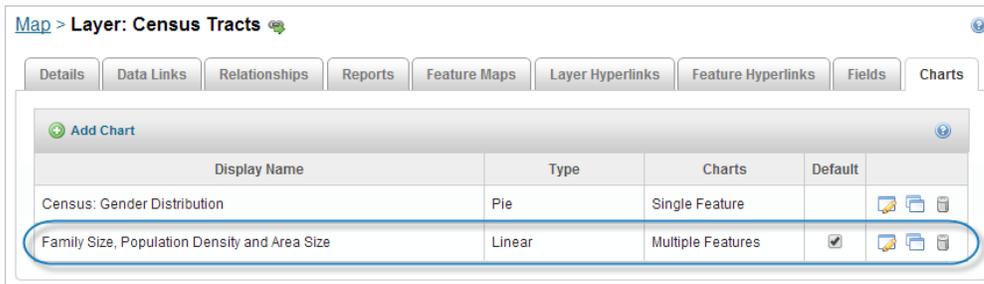
   The new chart is currently the only multiple-feature chart, so it is automatically set to be the default chart to open.

5. Click [icon] beside the new chart to open the chart settings.

6. Set up the data to display on the X-axis:

   In the **Category Setup** area:

   a. **Category Title**: Type in the label to appear under the X-axis on the chart.

   b. **Data Source**: Select whether to use a **Field** on the layer, or a **Data Link** as the source of data for this axis.

   c. **Field**: If you selected **Field** as the Data Source, select the layer field you want to use as the data for this axis, for example, **City ID**.

   In the **Chart Setup** area:

   a. Click **More Options**.

   b. In the **Legend** area, select **Top**.
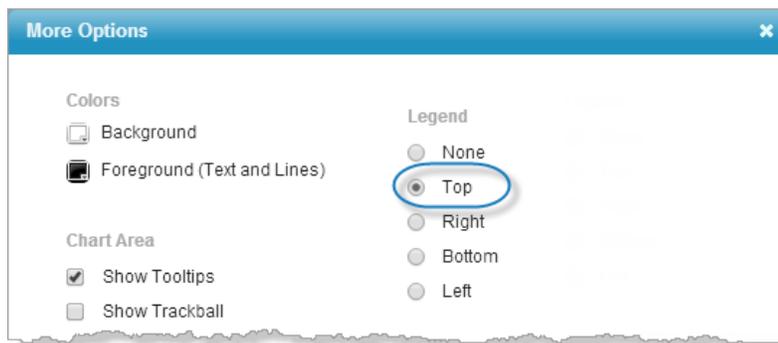
    c. Click **OK**.

7. To use a color theme, click **Color Palette** in the **Series Setup** area, select **Enable Color Palette**, select a palette and click **OK.**

8. To add three series that use different chart types, in the Series Setup area do the following:

    a. Click **Add Series** to add the first series as a bar type chart.

        1. In the **Name** field, type the label for this series, for example, **Total Population**.

        2. Set the **Type** to **Bar**.

        3. Set the **Data Source** to **Field**, and select the layer field, for example, **Total Population**.

        4. Set the **Data Aggregator** to **Sum**, so that all the values for the population fields are added together.
           Click **OK**.

        5. Set **None** for the Point Marker as it is not visible with the Bar chart type.

        6. Type in the **Axis Title**, for example, **Total Population**.

    b. Click **OK**.
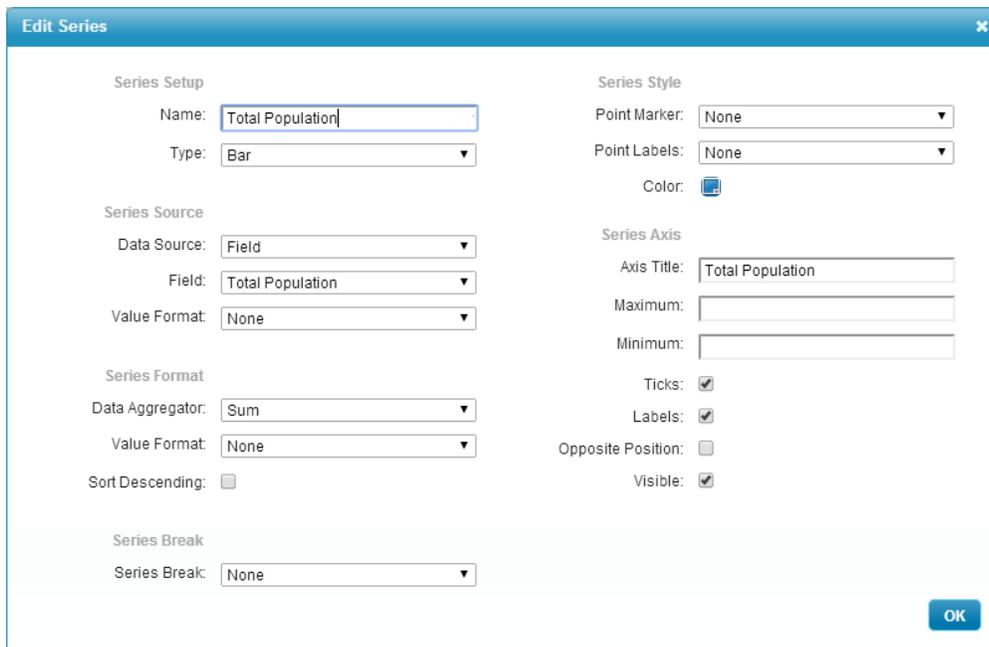
    c. Click **Add Series** to add the second series as an area chart type.

        1. In the **Name** field, type the label for this new series, for example, **Area Size**.

        2. Set the chart **Type** to **Area**.

        3. Set the **Data Source** to **Field**, and select the layer field, for example, **Area (square m)**.

        4. Leave **Data Aggregator** on **Sum**.

        5. Set **Point Marker** to **None**.

    d. Click **OK**.

e. Click **Add Series** to add the third series as a line chart type.

1. In the **Name** field, type the label for this new series, for example, **Average Family Size**.

2. Set the chart **Type** to **Line**.

3. Set the **Data Source** to **Field**, and select the layer field, for example, **Average Family Size**.

4. Set the aggregator to **Average,** so that the average value of all the selected features is calculated.

f. Click **OK**.

9. Click **Apply Changes** and **Save Site**.

   When the end user select a group of features and views charts, the chart displays.
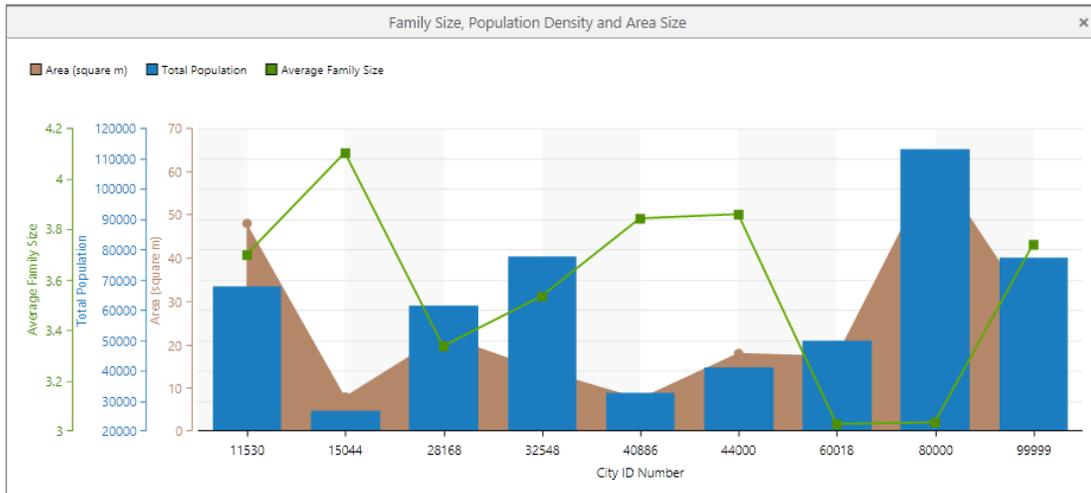
32.11 Set a Default Chart to Open

You can set one or more charts to open by default in the chart region of the map. In most cases, you would not set more than three charts to open by default.

▶ **To set the default charts to open in the chart region.**

1. In Manager, edit the layer that you want to configure.

2. Select the **Charts** tab.

3. In the **Default** column, select each chart that you want to open when the user views charts.

4. Click **Save Site**.

32.12 Use a Palette for Multiple Series

When you create charts, you can select the colors for each series individually. When you have multiple series within a chart, it can be difficult to ensure that the colors contrast well but also blend with each other. To make it easier to create series that contain multiple colors, you can enable palettes and then select one of the 8-color palettes to use in your series.

Once you have enabled palettes, the selection of individual series colors is disabled.
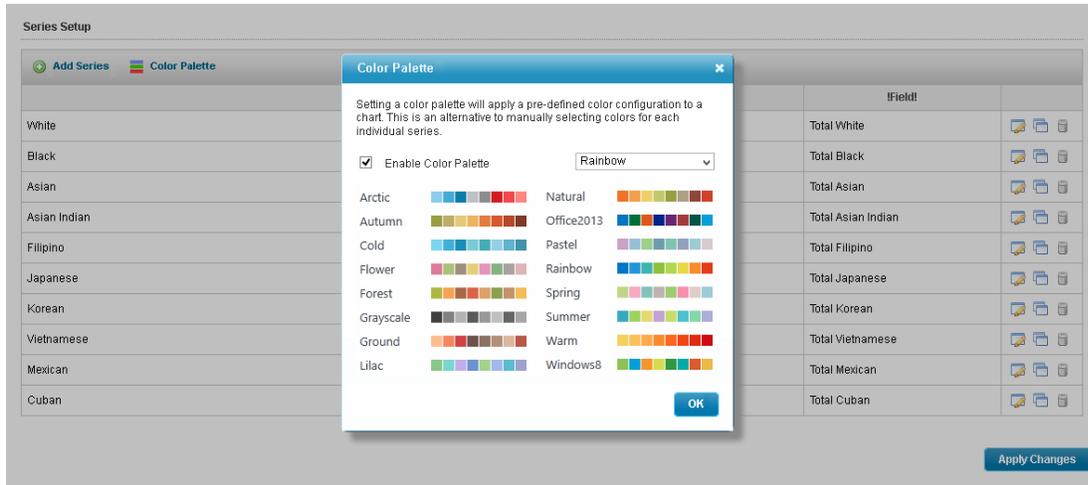
▶ **To use a color palette for multiple series:**

1. In Manager, edit the layer that you want to configure.
   The layer must be a feature layer.

2. Select the **Charts** tab.

3. Do one of the following:

   - Add a chart to the layer.

   - Edit the chart of a layer.

4. If the chart does not contain any series, add the series you want.
   As you add each series, they form a list in the Series Setup area.

List of series with individual colors selected.

5. To apply a color palette to all of the chart series, click in the Series Setup section.

6. Click the box to enable the Color Palette.

7. From the drop-down list, select the palette you want to use.
   The Color Palette dialog shows a preview of each palette. Colors are used in order from left to right.
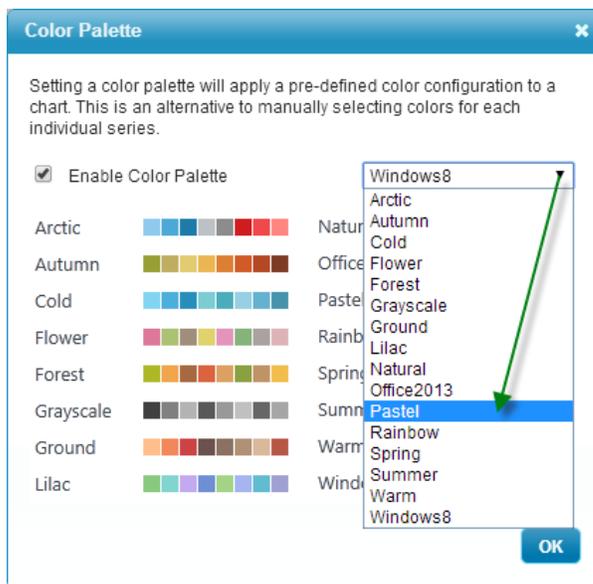
8. Click **OK**, **Apply Changes** and **Save Site**.

When you open the chart in a viewer, it displays the new set of colors from the selected palette.
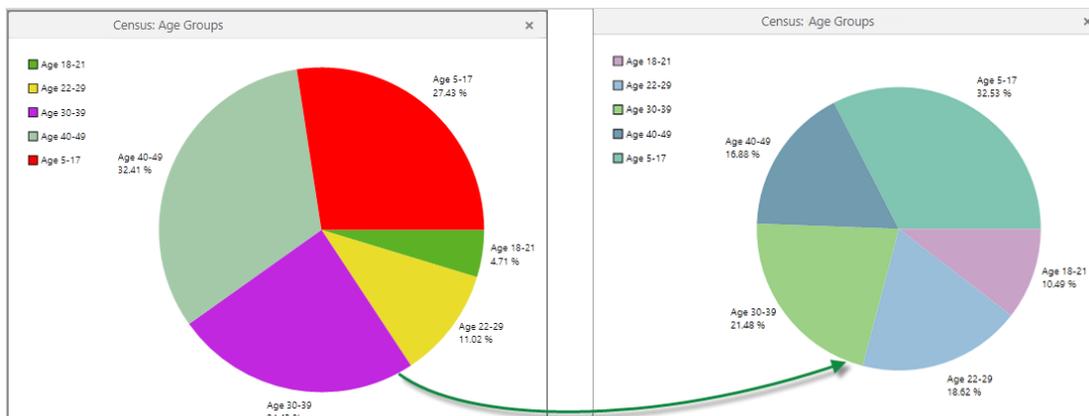
33 Reporting

Geocortex Essentials reports are used to publish information about the currently selected features in a particular layer. Reports can include attribute data, linked data, images, maps, charts, and more. The report shown below includes data related to the feature that the end user has identified (top), an aerial photo (bottom left), and a feature map (bottom right).

Example of a report that reports on a tax parcel

Reports are generated from templates (`.rpx` files) that you create in Geocortex Report Designer. Report Designer provides a design surface where you lay out the elements that you want in the report. In Manager, you must add the report template to the layer that you want the report to operate on. You can configure the output formats that users can select from, for example, PNG, PDF, or RTF. You must also provide a way for end users to run the report. To do this, you create a workflow that runs the report, and then you add a menu item, tool, or hyperlink that the user can click to run the workflow.

33.1 Main Configuration Steps

The main steps to create a report template and make it available in a viewer are:

1. In Geocortex Report Designer, design the report template.
   You may want to adapt one of the reports that ships with the LA County sample site. By default, the sample site's reports are here: `C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST Elements\Sample Sites\LA_County\Resources\TemplateReports`.

2. Save the report template to the `Sites` folder.

3. In Manager, add the report to the layer.

4. Edit the report and configure its settings.
   For example, you can configure the output formats that users can select from.

5. Provide a way for users to run the report:

- **HTML5 Viewer:**

  > 📌 As of HTML5 Viewer 2.5, users can now run reports from a link in a map tip, or an option from the Panel Actions menu of the results list or results table. For more information, see "Reporting Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

  1. In [Geocortex Workflow Designer](), create a workflow that runs the report.

     You may want to model your workflow after one of the `RunWorkflow` workflows that ship with the LA County sample site. By default, the sample site's workflows are here: `C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST Elements\Sample Sites\LA_County\Resources\Workflows`.

  2. In Manager, add an [I Want To menu item](), [tool](), or [hyperlink]() that users can click to run the workflow.

- **Silverlight Viewer:**

  1. In Manager, add the **Reports** tool to the toolbar.

  2. If you want to prevent the Reports tool from listing a particular report, edit the report and clear the **Visible** setting.

     The Reports tool allows users to choose from a list of all the site's reports that have the Visible setting selected. By default, a report's Visible setting is selected.

33.2 Report Settings

Reports have the following settings:

- **ID:** (information only) The ID that uniquely identifies this report.
  The ID is automatically generated.

- **Display Name:** The report's display name.
  The display name can contain spaces and special characters.

- **Description:** An optional description of the report.

- **Location:** The URI to the report template (`.rpx` file). Click **Browse** to browse the `Sites` folder for the template.

- **Order By:** Specifies how to order the features when the report includes more than one feature. The features are ordered by the value of the specified field, in either ascending or descending order.
  For example, to order tax parcels by decreasing value (field name: "VALUE"), enter **VALUE DESC** in the Order By box. To order tax parcels in A to Z order by the owner's last name (field name: "OWNERLAST"), enter **OWNERLAST ASC**.
  To find out the field names, open the REST API Sites Directory and navigate to the layer that the report belongs to.

- **Perform Data Linking:** If the report template contains references to one or more [data links](), select the **Perform Data Linking** check box. If the Perform Data Linking check box is cleared, external data will not appear in the report.

Do not select the Perform Data Linking check box if you do not need to, as it can affect performance.

- **Include Feature Maps:** If you have included one or more [feature maps](#) in the report template, select the **Include Feature Maps** check box. If the Include Feature Maps check box is cleared, the feature maps will not appear in the report.

Do not select the Include Feature Maps check box if you do not need to, as it can affect performance.

- **Output Formats:** The file formats that can be used for the report. Select the check box for each format that you want to be available to users. If you select more than one format, users must select which format they want to use before the report is created. Note that [print jobs](#) support PDF reports only.

- **Transform Workflow URI:** The URI of a Report DataSet Workflow that modifies the data set for the report before the report is created. If you have created a Report DataSet Transform workflow, enter the workflow's location. For more information, see "Create a Report DataSet Transform Workflow" in the Workflow Designer help system.

- **Visible:** Controls whether the report appears in the list of reports that the Silverlight Viewer's Reports tool presents to users. Users select the report that they want to run from the list. By default, a report's Visible check box is selected. Clearing a report's Visible check box allows you to hide a report from users in a Silverlight viewer.

- **Print Job Settings:** "Print jobs" allow background processing. When you enable print jobs for a report, the report is created in the background and the user is optionally notified of the job's status by email. If the report is large or contains a lot of data, enabling print jobs prevents report creation from timing out. Only PDF reports can be created in the background—the other output formats are not supported. See **Configure a Report to be Created in the Background** on page **269** for instructions.

33.3 Add a Report to a Layer

Before you can add a report to a layer, you must create the report template in [Geocortex Report Designer](#).

▶ **To add a report to a layer:**

1. In Manager, edit the layer that you want to configure.

2. Click the **Reports** tab.

3. Click **Add Report**.

4. **Display Name:** Type a display name for the report.
   The display name can contain spaces and special characters.

5. **Description:** Type a description for the report.

6. **Include Feature Maps:** If the report template includes one or more feature maps, select the **Include Feature Maps** check box.

7. **Perform Data Linking:** If the report template references one or more data links, select the **Perform Data Linking** check box.

8. Click **Next**.

9. If the report template (`.rpx` file) has not yet been placed somewhere within the `Sites` folder, upload it now:

    a. In the **Filename** list, open the folder that you want to upload the file to.

    b. Click ✚ **Upload**.

    c. Click **Select**.

    d. Browse to the file that you want to upload and select it.

    e. Click **Open**.

    f. Click **Upload**.

10. Browse to the report template and select it.

11. Click **Finish**.
The report is added to the list of reports on the Reports tab.

12. To configure additional settings, edit the report.
For example, you can configure the output formats that users can choose from.

13. Click **Save Site**.

33.4 Import Reports from Another Site

▶ **To import reports from another site:**

1. In Manager, edit the layer that you want to configure.

2. Click the **Reports** tab.

3. Click **Import Reports**.

4. Select the site where the reports are configured, and then click **Next**.

5. Select the map service that contains the layer where the reports are configured, and then click **Next**.

6. Select the layer where the report is configured, and then click **Next**.

7. Select the reports that you want to import.
To select multiple reports, hold the **Ctrl** key down while selecting.

8. Click **Finish**.
The reports are added to the list of reports on the Reports tab.

9. Click **Save Site**.

33.5 Configure a Report to be Created in the Background

Web servers and browsers place a time limit on web requests. Normally, reports run with a single request and complete within the time limit. However, reports that are particularly large or contain a lot of data can take much longer.

To ensure that a large or complex report does not time out, you can configure the report to be created in the background by clicking the **Edit Print Job Settings** button. When a report is configured for background creation, you can configure email settings to notify the user when report creation starts and ends.

> Only PDF reports can be created in the background—the other output formats are not supported for background creation.

▶ **To configure a report to be created in the background:**

1. In Manager, edit the layer that you want to configure.

2. Click the **Reports** tab.

3. Edit the report that you want to configure.

4. Click **Edit Print Job Settings**.

5. To turn on background report creation, select the **Enable Print Jobs** check box.

6. Select the **Email Settings** tab to manage email notifications and do any of the following:

   - To allow the user to be notified by email when report creation starts and ends, select the **Enable Email Notifications** check box.
   - **Sender Email Address** is the address that appears in the From field of notification emails to the user.
   - **Sender Name** is the name that appears in the From field of notification emails to the user.

7. Select Message Settings to modify the text of notification emails to the user:

   - **Printing Start Subject** is the text that appears in the subject field of notification emails to the user when report creation starts.
   - **Printing Start Message** is the text that appears as the message of notification emails to the user when report creation starts. A link to the status page is automatically appended to the message.
   - **Printing Success Subject** is the text that appears in the subject field of notification emails to the user if report creation succeeds.
   - **Printing Success Message** is the text that appears as the message of notification emails to the user if report creation succeeds. A link to the status page is automatically appended to the message.
   - **Printing Failure Subject** is the text that appears in the subject field of notification emails to the user if report creation fails.
   - **Printing Failure Message** is the text that appears as the message of notification emails to the user if report creation fails. A link to the status page is automatically appended to the message.

8. Select **SMTP Settings** to edit the SMTP server settings for sending status emails:

   - **SMTP Server Host** is the host name of the SMTP server.
   - **SMTP Server Port** is the port on the SMTP server. The default port is 25.
   - **SMTP Server Username** is the username used to access the SMTP server. If a username is not required, leave this setting blank.
   - **SMTP Server Password** is the password used to access the SMTP server. If a password is not required, leave this setting blank.

9. Click **OK**.

10. Click **Save Site**.

See also...

34 Printing

Print templates are used to generate maps in print-ready formats, such as PDF or JPG. Print templates are really a special type of report that has a map image as its content.

Like report templates, print templates are created in Geocortex Report Designer. In Report Designer, you can add elements like an overview map, title and description, north arrow, scale bar, legend, and charts to your print template. Report Designer has a built-in help system with instructions for creating templates.

See also...

34.1 Add or Import a Print Template

You can either add a print template by locating the template in the file system or you can import print templates that are already configured in another site. If your site has more than one print template, you can select which template you want to be the default in the viewer.

▶ **To add a print template:**

1. Launch Geocortex Report Designer and create the print template(s).
    For instructions on creating a print template, refer to Report Designer's built-in help.

2. In Manager, edit the site that you want to configure, and then click **Print Templates** in the side panel.

3. Click ⊕ **Add Print Template**.

4. Type a display name for the print template.

5. If you want, type a description for the print template.

6. Click **Next**.

7. If the print template (`.rpx` file) is not already somewhere in the `Sites` folder, upload it:

    a. In the **Filename** list, open the folder that you want to upload the file to.

    b. Click ➕ **Upload**.

    c. Click **Select**.

      d.   Browse to the file that you want to upload and select it.

      e.   Click **Open**.

      f.   Click **Upload**.

8. Select the print template.

9. Click **Finish**.

     The print template appears on the Print Templates page.

10. Click **Apply Changes**.

11. Click **Save Site**.

▶ To import print templates:

This procedure assumes that you have already created one or more print templates and added them to a site.

1. In Manager, edit the site that you want to configure, and then click **Print Templates** in the side panel.

2. Click   **Import Print Template**.

3. Select the site where the print templates are configured, and then click **Next**.

4. Select the print templates that you want to import.
     To select multiple templates, hold the Ctrl key down while selecting.

5. Click **Finish**.
     The print templates appear on the Print Templates page.

6. Click **Apply Changes**.

7. Click **Save Site**.

▶ To set the default print template:

The default print template is the print template that is initially selected in the drop-down list when the user makes a request to print the map.

1. In Manager, edit the site that you want to configure, and then click **Print Templates** in the side panel.

2. In the **Default Print Template** drop-down list, select the print template that you want to use as the default.

3. Click **Apply Changes**.

4. Click **Save Site**.

34.2 Create a Dedicated Site for Print Templates

One way to manage print templates is to configure them all in one site that you create especially for that purpose. This gives you a central location to manage your print templates. To use one or more of the print templates in another site, you can either import the templates, or create a reference and inherit them.

Importing vs. Inheriting Print Templates

Importing creates a copy of the print template component that you import. The copy's configuration is independent of the original's configuration—you can change the configuration of one without affecting the other.

> **NOTE** Importing does not create a copy of the print template (`.rpx`) file. The print template component in the dedicated Print Templates site and the copy both refer to the same `.rpx` file. If you modify the `.rpx` file, the changes appear in both the original and any imported copies.

Instead of importing print templates, you can create a reference to the Print Templates site. This creates a linked reference to each print template. You can change the inherited configuration without affecting the source configuration. This allows you to customize a print template for different sites.

However, if you change the configuration of the source site, the changes also appear in the site that references it, without overriding any changes you have made. For example, you could add a new print template to the Print Templates site and it would appear in the sites that reference Print Templates.

Example

Suppose you want users to be able to use the County Roads print template in several different sites. You create an empty site called Print Templates and add the County Roads print template to it. Then you edit each of the sites that you want to have the County Roads template and add a reference to the Print Templates site. Each site inherits the County Roads template.

Now suppose you add a second print template, County Waterways, to the Print Templates site. All the sites that reference the Print Templates site automatically inherit the new County Waterways template. Note that if you had originally added or imported the County Roads template, instead of referencing the Print Templates site, you would now have to add or import the County Waterways template to each site.

Similarly, if you modify one of the templates on the Print Templates site, all the other sites will automatically inherit the changes.

Overview of Steps to Create a Dedicated Site for Print Templates

> **To use a dedicated site for print templates:**

1. Create an empty site.
   See **Create a Site Using the Wizard** on page **54**.

2. Add your print templates to the new site.
   See **Add or Import a Print Template** on page **271**.

3. Save the site.

4. Edit a site that you want to inherit the print templates.

5. Add a reference to the site that contains the print templates.
   See **Add a Reference to a Site** on page **168**.

6. Click **Print Templates** in Manager's side panel to see the inherited print templates.

7. Modify or remove print templates as desired.
   This does not affect the print templates in the dedicated print templates site.

8. Save the site.

9. Continue adding references until you have added a reference to each site that you want to inherit print templates.

See also...

Inherit Components from Another Site on page **57**

34.3 Change the North Arrow

You can configure the style and color of the north arrow to use in printouts. In order for the north arrow to appear on a printout, the print template must have a placeholder for the north arrow. The placeholder is added in Report Designer.

▶ **To edit the North arrow:**

1. In Manager, edit the site that you want to configure, and then click **Print Templates** in the side panel.

2. Click ✛ **Edit North Arrow**.

3. To select a different image, click the image preview ◑, browse the thumbnail images, and then double-click the image that you want to use.
   The image preview shows the currently selected style and color of north arrow.

4. To change the color, enter the hexadecimal value in the **Select Color** box, or click the **Color** icon ◼ and select a new color.

5. Click **Apply Changes**.

6. Click **Save Site**.

34.4 Configure Map Scale Options for Printing

In the Geocortex Viewer for Silverlight, when you print a map, you can select from several options that determine the scale in which the map prints. You can configure the scale options that appear in the drop-down list within Print Templates in Manager. You can also configure which option appears in the Map Scale by default.
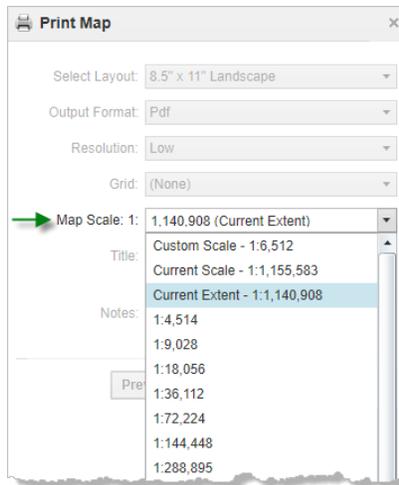
In the drop-down list in the Geocortex Viewer for Silverlight, you can select any of the following to print a map:

- **Custom Scale**: Prompts the user to enter the scale at which to print the map.

- **Current Scale**: Uses the current scale to print the map.

- **Current Extent**: Computes the scale so that the whole viewable extent fits within the printed map.

- **Specific defined map scales:** Uses the specific scale that you select from the list to print the map.

▶ **To configure the map scale options:**

1. In Manager, edit the site that you want to configure, and then click **Print Templates** in the side panel.

2. Click the **Edit** icon 🖉 beside the print template that you want to configure.

   Scale option settings are part of a particular print template, so you need to make the edits individually in all the print templates where you want them to appear.

3. On the **Edit Print Template** page, select the **Map Scales** tab.

4. Do any of the following:

   - To add a specific scale, click ⊕ **Add Map Scale**, enter the denominator of the scale and a display name for the scale, and then click **OK**.

   - To change a scale's display name, click the **Edit** icon 🖉 beside the scale, type in the new name, and then click **OK**.

   - To remove a specific scale, click the **Remove** icon 🗑 beside the scale, and then click **OK**.

   - To override the default selection behavior of the Map Scale box in Geocortex Viewer for Silverlight (Current Scale), select one of the following:

     - **None**: Sets no overridden default option for the Map Scale box and allows GVS to use the default, which is Current Scale.

     - **Current Scale**: The Current Scale option appears in the Map Scale box as the default.

- **Current Extent**: The Current Extent option appears in the Map Scale box as the default.
- **Custom Scale**: The Custom Scale option results in an empty Map Scale box prompting the user to enter a custom scale.

5. Click **Apply Changes** and then **Save Site**.

34.5 Configure Grids and Graticules

You can define grids that optionally print when the user makes a request to print the map. The grid coordinates print around the perimeter of the map image.

There are two types of grid:

- **Graticules:** Use latitude/longitude coordinates. You can specify the approximate number of intervals.
- **Measured Grids:** Use the map units of the base map by default. You can override the default by configuring the Well Known ID (WKID) or Well Known Text (WKT) of a different projection. As with graticules, you can specify the approximate number of intervals to use.
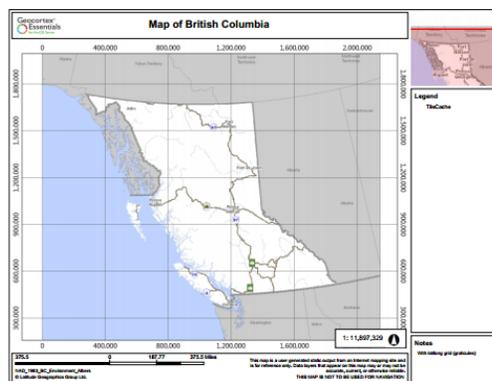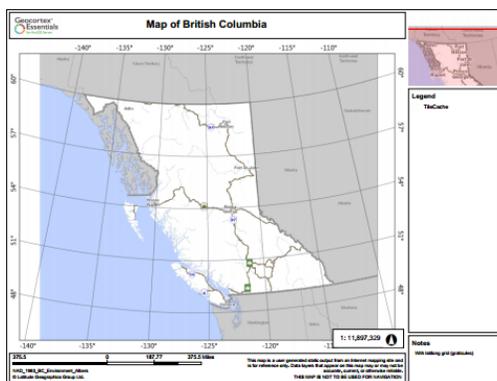
Printed map with graticules (left) and measured grid (right)

You can configure as many measured grid and graticule definitions as you want for a template. The user also has the option to exclude the grid.

> The Geocortex Viewer for Silverlight supports grids. The Geocortex Viewer for HTML5 does not support grids.

▶ **To add a grid to a print template:**

1. Launch Manager and edit the site that you want to configure.

2. Click **Print Templates** in the sidebar.
   The Print Templates page opens.

3. Click the **Edit** icon for the template you want to configure.
   The Edit Print Template page opens.

4. Select the **Grids** tab.

5. Follow the instructions that apply to you:

Graticules:

a. Click **Add Graticules**.

The Add Graticules dialog box opens.

Add graticules

b. Type a display name for the grid.
This is the name the end user will select to print this grid.

c. Enter the number of intervals you want in the grid.

d. If you do not want to use the default coordinate system, type the WKID or WKT of the coordinate system you want to use.

e. Click **OK**.
The dialog box closes. The graticules definition is listed on the Edit Print Template page.

f. Click **Save Site**.

> If you want to change a graticules definition into a measured grid, edit the graticules and enter the WKID or WKT for the projection you want to use.

Measured Grid:

a. Click **Add Measured Grid**.
The Add Measured Grid dialog box opens.

Add measured grid

    b. Type a display name for the grid.

        This is the name the end user will select to print this grid.

    c. Enter the number of intervals you want in the grid.

    d. If you want to use different units than the base map's units, type the WKID or WKT of the projection you want to use.

    e. Click **OK**.

        The dialog box closes. The measured grid definition is listed on the Edit Print Template page.

    f. Save the site.

> If you want to change a measured grid into graticules, edit the measured grid and enter 4326 in the WKID or WKT for the coordinate system you want to use.
> The default coordinate system for graticules is GCS WGS 4326.

▶ To set the default grid:

The default grid is the grid that is initially selected in the drop-down list when the user makes a request to print the map. The factory default is None (no grid).

1. In Manager, edit the site whose configuration you want to change.

2. Click **Print Templates** in the side panel.

    The Print Templates page opens.

3. Select the grid that you want to use as the default from the **Default Grid** drop-down list.

4. Save the site.

34.6 Large-Format Printing

The creation of printed output is memory intensive. To avoid performance issues, Essentials offers a large-format printing feature that stores the output on disk instead of in memory. Large-format printing enables you to create print templates for arbitrarily large output, including map images that are larger than the map service's maximum map image size. This means you can create high-resolution output that is as large as your printer or plotter supports, regardless of map service constraints.

By default, large-format printing is disabled. Each print template in a site has its own setting, so you can enable large-format printing for some print templates and leave it disabled for others. The end user cannot turn large-format printing on or off.

The following table compares the default handling of print templates (left column) to large-format printing (right column). Use the information in this table as your guide when deciding whether a template should be configured to use large-format printing or not.

LARGE-FORMAT PRINTING DISABLED	LARGE-FORMAT PRINTING ENABLED
Output is kept in memory as it is being created and after it is complete.	Output is written to disk as it is being created and after it is complete.
Output is available for download for a few minutes after the output is created. No housekeeping is required.	Output is available for download for up to three months, after which Essentials deletes the output. Status files are permanent. When the output is deleted, the status becomes "No longer available".
Large and concurrent print template requests can affect server performance due to memory shortage.	Large and concurrent print template requests have much less effect on server performance.
The size, resolution and number of print operations that can run concurrently are limited by RAM and CPU.	Size and resolution of print operations are limited only by available disk space on the server. Print operations are queued, so there is virtually no limit to the number of print operations that can be started concurrently.
Turnaround is quick, provided the size and resolution of the images are small.	Turnaround depends on the size of the job and the number of jobs in the queue.
The user is notified on screen when creation of the output has started and completed. Email notification is not supported.	The user is notified on screen and also optionally via email when creation of the output has started and completed. In addition, the user can check the progress of the print job at any time.
Multiple output formats are supported: PDF, RTF, TIFF, BMP, GIF, JPEG, and PNG.	One output format is supported: PDF.
If the paper size is smaller than the image size defined in the RPX file, the printed image automatically breaks at page boundaries.	The image size defined in the RPX file must be at most the paper size minus the margins. Page boundaries are not handled.

34.6.1 Configure a Print Template for Large-Format Printing

▶ **To configure a print template for large-format printing:**

1. In Manager, edit the site that you want to configure, and then click **Print Templates** in the side panel.

2. Edit the print template that you want to configure.

3. Click **Edit Print Job Settings**.

4. To turn on large-format printing, select the **Enable Print Jobs** check box.

5. Select the **Print Job Settings** tab to edit the parameters for rendering the map:

- **Tile Size** is the size (in pixels) of the square image tiles used to compose the map images. In most cases, a value between 512 and 2048 is ideal. Larger sizes consume more system memory.

- **Maximum Workers** is the number of threads that will be used to render the map. A larger number of threads will increase the speed of the print job, but will consume more system resources. Select value between 1 and 3 to start to be safe, more if the system can handle it.

- **Output File Time-to-Live** is the number of hours that the completed print job will persist on the server and be available for download.

6. Select the **Email Settings** tab to manage email notifications.

- To allow the user to be notified by email when the user's print jobs start and end, select the **Enable Email Notifications** check box.

- **Sender Email Address** is the address that appears in the From field of notification emails to the user.

- **Sender Name** is the name that appears in the From field of notification emails to the user.

7. Select Message Settings to modify the text of notification emails to the user.

- **Printing Start Subject** is the text that appears in the subject field of notification emails to the user when the print job starts.

- **Printing Start Message** is the text that appears as the message of notification emails to the user when the print job starts. A link to the status page will be automatically appended to the message.

- **Printing Success Subject** is the text that appears in the subject field of notification emails to the user if the print job succeeds.

- **Printing Success Message** is the text that appears as the message of notification emails to the user if the print job succeeds. A link to the status page will be automatically appended to the message.

- **Printing Failure Subject** is the text that appears in the subject field of notification emails to the user if the print job fails.

- **Printing Failure Message** is the text that appears as the message of notification emails to the user if the print job fails. A link to the status page will be automatically appended to the message.

8. Select **SMTP Settings** to edit the SMTP server settings for sending status emails.

- **Use SSL:** If you want emails related to print jobs to be sent using SSL (HTTPS), select the **Use SSL** check box. If the Use SSL check box is cleared, emails are sent using HTTP.

- **SMTP Server Host** is the host name of the SMTP server.

- **SMTP Server Port** is the port on the SMTP server. The standard port is 25.

- **SMTP Server Username** is the username used to access the SMTP server. If a username is not required, leave empty.

- **SMTP Server Password** is the password used to access the SMTP server. If a password is not required, leave empty.

9. Click **OK**.

35 Feature Maps

A feature map is an image that shows a particular feature on a feature layer. Feature maps are used in reports. When an end user runs the report, a feature map of the currently selected feature is included in the report.

The following screen capture shows a feature map in a report for a tax parcel. The feature map is circled. The parcel in the feature map is highlighted cyan.

Parcel report with a feature map showing the currently selected parcel

35.1 Main Configuration Steps

The main steps to create a feature map and use it in a report are:

> **NOTE** Additional steps are required to configure the report. See **Reporting** on page **265** for information.

1. In Manager, add a feature map to the layer that the report belongs to.

2. In Report Designer, add the feature map to the report template.

3. In Manager, make sure that the report's **Include Feature Maps** check box is selected.

35.2 Feature Map Settings

Feature maps have the following settings:

- **ID:** (information only) The ID that uniquely identifies this feature map.

  The ID is based on the display name that you enter when you create the feature map. Special characters are removed and spaces are converted to underscores.

- **Display Name:** The feature map's display name.

  The display name can contain spaces and special characters.

- **Buffer Distance:** Controls how much of the surrounding area around the feature to show in the feature map, in other words, how far to zoom out from the feature. If the buffer distance is 0 (zero), the feature extends to the edges of the feature map. The higher the buffer distance, the farther out the feature map is zoomed.

Feature maps with a buffer distance of 0 (left), 50 m. (center), and 100 m.

The default buffer distance is 0 (zero). Using a buffer distance helps readers to orient themselves within the feature's larger context.

 Click **Apply** to see a preview of the buffer distance that you have chosen. The preview also shows the highlight color and opacity.

- **Highlight Color:** The color to highlight the feature. Enter the highlight color using hexadecimal notation (for example, **#FFA500**) or the HTML color name (for example, **orange**). Alternatively, click the color picker to select the color from a color map. The **Highlight Color** setting has no effect if **Highlight Feature** is disabled.

- **Opacity:** The opacity of the highlighting, on a scale of 0 (transparent) to 255 (fully opaque). Drag the slider to change the opacity. The color picker's opacity changes to reflect the opacity that you have selected. The **Opacity** setting has no effect if **Highlight Feature** is disabled.

- **Highlight Feature:** Controls whether the feature is highlighted in the feature map. If you do not want the feature to be highlighted, clear the Highlight Feature check box.

- **Resolution:** The resolution to use for the feature map image, in pixels per inch. The default resolution, 96 ppi, is appropriate for viewing the report on a computer. If you want to print the report, you may want to increase the resolution.

35.3 Add a Feature Map to a Layer

▶ **To add a feature map to a layer:**

1. In Manager, edit the layer that you want to configure.

2. Click the **Feature Maps** tab.

3. Click **Add Feature Map**.

4. **Display Name:** Type a display name for the feature map.
   The display name can contain spaces and special characters.

5. Click **Apply**.
   This generates the feature map's ID.

6. Take note of the feature map's **ID**.
   You will need the ID when you add the feature map to the report template.

7. **Buffer Distance:** If you want to zoom the feature map out from the feature, enter a buffer distance and select the units.

8. **Highlight Color:** If you want to change the highlight color, enter the color's hexadecimal value (for example, **#EE82EE**) or HTML color name (for example, **violet**).

   Alternatively, click the color picker and select the new color from the color map.

9. **Opacity:** To adjust the opacity of the highlighting, drag the slider.

10. **Highlight Feature:** To turn off highlighting, clear the **Highlight Feature** check box.

11. **Resolution:** If you want, enter a new resolution for the feature map image, in pixels per inch.
    The default resolution is appropriate for viewing the report on screen.

12. To preview your settings, click **Apply**.
    The preview shows an example of a feature map that uses your configuration.

13. Click **OK**.
    The feature map is added to the list of feature maps on the Feature Maps tab.

14. Click **Save Site**.

35.4 Import Feature Maps from Another Site

▶ **To import feature maps from another site:**

1. In Manager, edit the layer that you want to configure.

2. Click the **Feature Maps** tab.

3. Click **Import Feature Map**.

4. Select the site where the feature maps are configured, and then click **Next**.

5. Select the feature maps that you want to import.

   To select multiple feature maps, hold the **Ctrl** key down while selecting.

6. Click **Finish**.

   The feature maps are added to the list of feature maps on the Feature Maps tab.

7. Edit each imported feature map and adjust the settings as needed to make the imported settings work in this layer.

   For example, the buffer distance could exceed the scale range of the layer that you imported the feature map into.

8. Take note of each feature map's ID.

   You will need the IDs when you add the feature maps to report templates.

9. Click **Save Site**.

35.5 Add a Feature Map to a Report Template

▶ **To add a feature map to a report template:**

1. Launch Report Designer.

2. Open the report that you want to add the feature map to:

   - **New Report:** If the report template does not exist yet, click **File | New**.

   - **Existing Report:** If the report template already exists, click **File | Open** and open the report template.
     Report templates are `.rpx` files. They are stored in the `Sites` folder.

3. Drag a **Picture** control from the left panel to the desired position on the design surface.

   If there is no Picture control, the Geocortex Essentials-specific controls may be open. Click **Controls** to open the standard controls.

4. Drag the Picture's handles to adjust its size to the size that you want the feature map.

5. Make sure that the Picture is selected on the drawing surface.

   This displays the Picture's properties in the right panel.

6. Configure the Picture's properties:

   a. In the **Data** area, set **DataField** to the feature map's **ID**.

      This puts the feature map into the Picture control. If you do not know the feature map's ID, edit the layer in Manager and click the **Feature Maps** tab to see the ID.

   b. In the **Behavior** area, make sure that **Visible** is set to **True**.

      If Visible is False, the feature map will not appear in the report.

   c. If you want the feature map to have a border, configure the **LineColor**, **LineStyle** and **LineWeight** properties in the **Appearance** area.

The Picture's properties will look something like this:
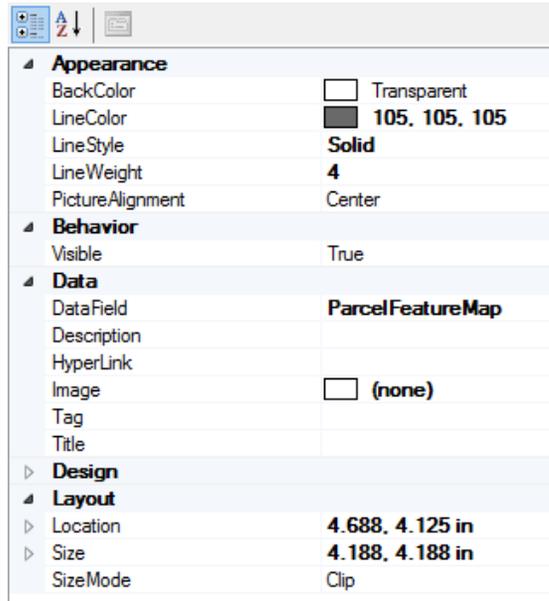
Example configuration for a Picture that contains a feature map

7. To add a caption to the feature map, drag a **TextBox** control below the Picture on the design surface and set the **Text** property in the **Data** area to the caption's text.

8. Save the report template.

See also...

36 Fields

Fields store feature attributes. For example, a Highways layer might have fields for the highway's name, shape, and ID attributes. This means that every feature in the Highways layer has a field for its name, a field for its shape, and a field for its ID.

Essentials allows you to configure settings for individual fields, including the field's visibility, whether the field can be searched by Global Search, and more. By default, all of a layer's fields are visible and searchable.

Settings

Fields have the following settings:

- **Display Name:** The name to use for the attribute in the viewer. The Display Name setting provides a way to define an alias that end users see. For example, a field named "ZIP" in the map service could appear as the "Zip or Postal Code" attribute in the viewer.

  If you leave the Display Name box blank, the name is inherited from the map service.

> You can also define display names for layers and map services. See **Layers** on page **170** and **Map Service Details Tab** on page **104** for information.

- **Visible:** When field visibility is turned on, the attribute is shown in the feature details. If you turn off visibility, the attribute is hidden from the end user, and queries performed by the Essentials Query Builder do not search the field. By default, fields are visible.

  In the following screen capture, three fields in the Crime layer are visible—Category, Stat_Desc, and City.
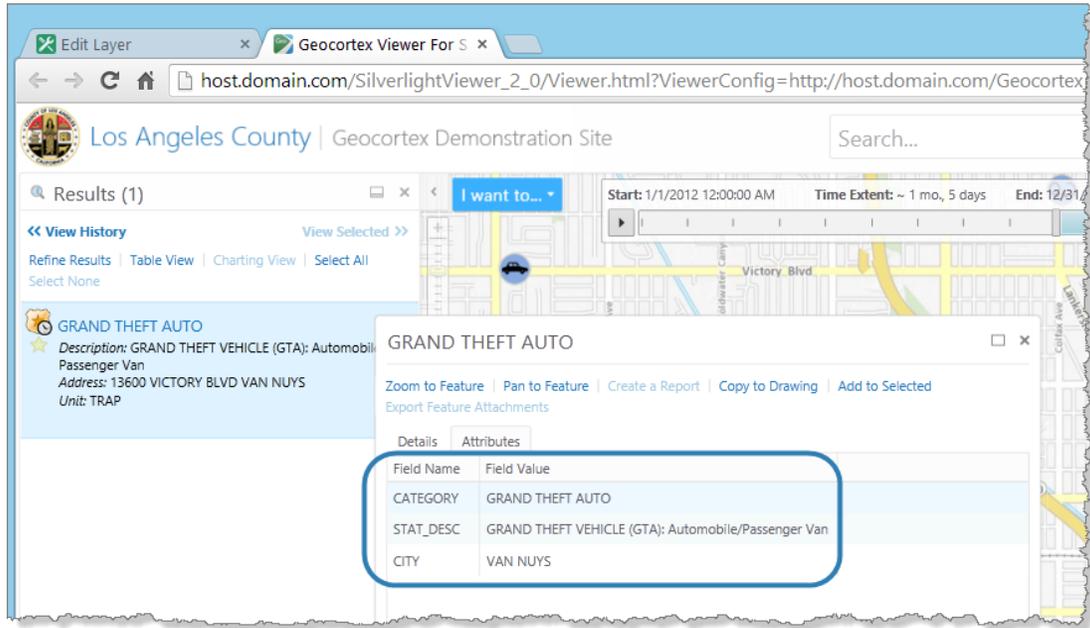
Visible fields listed in a feature's details, in a Silverlight viewer

> In addition to configuring which attributes are listed in the feature details, you can configure the attributes and other information that are used to describe features in search and identify results, map tips, and the Details tab of feature details. For information, see **About Feature Descriptions** on page **171**.

- **Include in Global Search:** If Include in Global Search is turned on, the field is searched when the user performs a global search. By default, fields are searchable. If you turn off this setting, global searches skip this field.

> Global Search is independent of field visibility. You can search for fields that are not visible, and fields that cannot be searched for appear in the feature details.

- **Can Symbolize Class Breaks:** (dynamic layers only) When this setting is enabled, the end user can symbolize attributes on the map based on numeric ranges. For example, the user could symbolize population ranges on a Population layer.

- **Can Symbolize Unique Values:** (dynamic layers only) When this setting is enabled, the end user can symbolize attributes that get their value from a set of predefined values. For example, the user could symbolize schools based on their level—elementary, middle, or high school.

- **Hyperlink Label:** If the field contains only a hyperlink (no text), viewers display the text specified in the Hyperlink Label box instead of the URL. This is particularly useful for long URLs. If you want viewers to display the URL, leave the box blank.

In order to configure the settings for a particular field, you must first add the field to the list of fields that you want to be able to configure individually. You can also bulk configure **<all other fields>**—the fields that you have not added. The other fields must all be configured the same.

36.1 Add or Remove Fields

Adding a field allows you to:

- Configure the field separately from other fields in the layer.
- Configure a display name for the field.
- Configure hyperlink text to use in place of the URL if the field contains a URL only.

The fields that you do not add can be configured in bulk. Because they are configured at one time, they must all have the same configuration.

▶ **To add or remove fields:**

1. In Manager, edit the layer that you want to configure.

2. Click the **Fields** tab.

3. Click **Add/Remove Fields**.

4. To add one or more fields, select the fields in the **Excluded Fields** column, and then click the **Include** button (») that is between the two columns.

   To select multiple fields, hold the Ctrl key down while you select the fields.

5. To remove fields that have been added, select the fields in the **Included Fields** column, and then click the **Exclude** button («) that is between the two columns.

   You can also exclude fields after you close the Add/Remove Fields dialog box by clicking the Remove icon beside the field that you want to exclude.

6. Click **OK**.
   The Fields tab lists the fields that you have added. The **<all other fields>** item is at the top of the list. The **<all other fields>** item enables you to change the settings for the fields that you have not added.

7. Click **Submit Field Changes**.
   You can now individually change the settings of any added field, and bulk change the settings of the excluded fields.

8. Click **Save Site**.

36.2 Configure an Individual Field's Settings

In order to configure an individual field's settings, you must first add the field.

The procedure below for configuring a field's settings gives you access to all of the field's settings. Several settings can also be modified by clicking the icon beside the field. When a setting is disabled, its icon either has a red X on it 🖼️ 👁️, or it is grayed out ▬ ▪️.
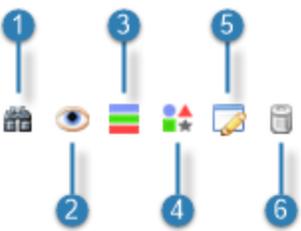
1	**Include in Global Search** - The field is searched when the user performs a global search.
2	**Visible** - The attribute is shown in the feature details.
3	**Can Symbolize Class Breaks** - (dynamic layers only) End users can symbolize attributes on the map based on numeric ranges.
4	**Can Symbolize Unique Values** - (dynamic layers only) End users can symbolize attributes on the map based on value from a set of predefined values.
5	**Edit -** Edit the field's settings. This gives you access to all the field's settings.
6	**Remove** - Remove the field from the list of added fields, in other words, exclude the field. You can add it back at any time using the Add/Remove Fields function.

Shortcut icons for configuring fields

▶ **To configure a field's settings:**

1. In Manager, edit the layer that you want to configure.

2. Click the **Fields** tab.

3. Use the shortcut icons to change settings, or click the **Edit** icon 📝 beside the field that you want to edit. Editing the field gives you access to additional settings.

4. Change settings as desired.
   The additional settings are:

   - **Display Name:** (optional) Type the field name to use in the viewer.
   - **Hyperlink Label:** (optional) If the field contains only hyperlinks (no text) and you want the viewer to display text instead of the URL, type the link's text.

5. Click **OK**.

6. Click **Submit Field Changes**.

7. Click **Save Site**.

36.3 Bulk Configure Excluded Fields

In addition to configuring individual fields that you have added, you can configure the remaining fields in bulk. The **<all other fields>** item at the top of the list on the layer's Fields tab is used for this purpose.

For example, in the screen capture below, the layer has four fields that are configured individually. The remaining fields are visible but not searchable, and they cannot be symbolized using class breaks or unique values.

Example of the list of fields on a layer's Fields tab

▶ **To change the settings of the fields that are not added:**

1. In Manager, edit the layer that you want to configure.

2. Click the **Fields** tab.

3. To prevent excluded fields from being searched as part of a global search, disable the **Include in Global Search** icon beside **<all other fields>**.

4. To prevent the excluded fields from showing in the viewer, disable the **Visible** icon beside **<all other fields>**.

5. To prevent the end user from symbolizing the excluded fields using class breaks, disable the **Can Symbolize Class Breaks** icon beside **<all other fields>**.

6. To prevent the end user from symbolizing the excluded fields using unique values, disable the **Can Symbolize Unique Values** icon beside **<all other fields>**.

7. Click **Submit Field Changes**.

8. Click **Save Site**.

36.4 Hide Coded Value Domain Codes

> This section applies only to Silverlight viewers from sites that have the Geocortex Services Enhancement Proxy configured.

By default, Silverlight viewers show both the codes and the values from fields with coded value domains, provided the Geocortex Services Enhancement Proxy is configured. As well, users can search on code fields by default.

You can hide domain codes from end users if you want. There are two ways to hide codes:

- **Individual Fields:** Use the **Add/Remove Fields** function to configure the visibility and searchability (and other settings) of individual fields.

- **All Other Fields:** Use the **Show Code Fields from Coded Domains** setting to hide the codes for the fields that you have not added.

  The fields that you have not added using the Add/Remove Fields function are represented as **<all other fields>** on Manager's Fields tab. The **<all other fields>** item enables you to change the settings for the fields that you have not added. The Show Code Fields from Coded Domains setting controls the visibility of <all other fields>. The setting has no effect on fields that you have added using the Add/Remove Fields function.

  > If you turn off the visibility for <all other fields>, the visibility setting (❌) takes precedence over the Show Code Fields from Coded Domains setting.

▶ To hide the codes for all of the fields in this layer that have coded value domains:

1. In Manager, edit the layer that you want to configure.

2. Click the **Fields** tab.

3. Clear the **Show Code Fields from Coded Domains** check box.

4. Click **Submit Field Changes**.

5. Click **Save Site**.

▶ To hide the codes for some fields and show the codes for other fields:

1. In Manager, edit the layer that you want to configure.

2. Click the **Fields** tab.

3. If the **Show Code Fields from Coded Domains** check box is cleared, select it.

4. Click **Add/Remove Fields**.

5. In the **Excluded Fields** column, select the fields that you want to hide, and then click the **Include** button (») that is between the two columns.

   For example, if you want to hide the codes for the **CallType** field, select the **CallType (Code)** field in the Excluded Fields column.

   > To select multiple fields, hold the Ctrl key down while you select the fields in the Excluded Fields column.

6. Click **OK**.

   The Fields tab lists the fields that you have added. Note that the fields do not have **(Code)** after their names on the Fields tab.

7. Configure the visibility and searchability for the fields that you added:

   a. To prevent a field's codes from showing in query results, click the **Visible** icon ⬤ beside the field.

   When a field's visibility is turned off, the icon has a red X on it: ✖.

   b. To prevent users from being able to search a field, click the **Include in global search** icon ⬛ beside the field.

   When a field's searchability is turned off, the icon has a red X on it: ✖.

8. Click **Submit Field Changes**.

9. Click **Save Site**.

37 Relationships

A relationship represents a link between features of a layer and features or records in another layer or table. ArcGIS Server services can expose the relationships defined by relationship classes in a geodatabase. Essentials is able to exercise these relationships and display the related data in a manner similar to `DataLinks`.

When you add a layer to your site, all of the layer's relationships (as defined by ArcGIS Server) are exposed through the Essentials REST API. If you wish to customize a given relationship (for example: you may want to change its visibility), you can add the relationship to your site configuration and edit the relationship's properties through Manager.

> **NOTE** All of the relationships of your layers are exposed through the REST API whether or not you add them to the site configuration through Manager.

Relationships have the following configurable properties:

- **Display Name**: is a user-friendly name for the relationship that can be used in an application's user interface. For example, a relationship with the name "**PARCEL_2_ZONE**" may have a display name of "**Zoning Data**".

- **Visible**: specifies whether or not a viewer should display related data for a feature. The default is False.

37.1 Add or Remove Relationships

▶ **To add or remove relationships:**

1. In Manager, edit the layer that you want to configure.

2. Click the **Relationships** tab, and then click **Add/Remove Relationships**.

3. To add a relationship to your site, select the relationship in the **Excluded Relationships** column, and then click the **«** button.

   💡 To select multiple relationships, hold the **Ctrl** key down while selecting relationships.

4. To remove a relationship from a site, select the relationship in the **Included Relationships** column, and then click the **»** button.

5. Click **OK**.

6. Click **Save Site**.

37.2 Edit Relationships

You can change the display name and visibility of a relationship.

▶ **To edit a relationship:**

1. In Manager, edit the layer that you want to configure.

2. Click the **Relationships** tab, and then click **Add/Remove Relationships**.

3. Click the **Edit Relationship** icon beside the relationship that you want to edit.

4. Modify the **Display Name** and **Visible** properties of the relationship as desired.

5. Click **OK**.

6. Click **Save Site**.

38 Viewers

A viewer is a web application that enables users to view and work with a map and its data. The viewer's configuration determines the user interface's appearance and behavior.

In Essentials, a viewer is associated with a site. The site provides the viewer with the configuration of map services, layers, reports, and other features—the map-related content—in a technology-neutral way.

You can configure as many viewers for a site as you want. For example, a site might have two viewers: one rich client application and the other a mobile application for viewing the site on a smart phone. Although the viewers are for the same site, they look different, have different purposes and capabilities, and may be built on different technologies.

38.1 Viewer Templates and Management Packs

A viewer template is a file that contains a viewer framework—generic viewer functionality that you configure to create a viewer for a particular application. A viewer Management Pack makes a particular viewer framework configurable in Manager. In order to be able to use Manager to add and configure a viewer, you must first install the template and Management Pack.

Manager enables you to configure common viewer settings. You can configure additional settings by editing the viewer's configuration file(s) in a text editor or Integrated Development Environment (IDE).

For information about the viewer frameworks and Management Packs, the features they offer, how to install them, and how to configure viewers manually, refer to the *Geocortex Viewer for HTML5 Administrator and Developer Guide* and the *Geocortex Viewer for Silverlight Administrator and Developer Guide*. These guides can be downloaded from the Geocortex Support Center.

38.2 Types of Viewer

Geocortex has two viewer frameworks:

- **Geocortex Viewer for HTML5:** Viewer framework implemented in HTML and JavaScript.
- **Geocortex Viewer for Silverlight:** Viewer framework implemented in Microsoft Silverlight.

The Geocortex Viewer for HTML5 is geared towards creating clean and effective mobile web applications for a wide variety of browsers and devices. The Geocortex Viewer for Silverlight is feature rich and suitable for rich client applications. A site can have multiple instances of both types of viewer.

38.3 Verify your Configuration

When configuring a viewer, it is recommended that you verify the configuration frequently. Before verifying, apply your changes and save the site.

▶ **To verify your configuration changes:**

1. If you have not yet launched the viewer, edit the viewer in Manager, click **Viewer Info** in the side panel, and then click a launch link.
   If you have already launched the viewer, refresh the page.

2. Navigate to the part of the viewer you want to verify.

3. Test any new tools or functions you have added.

See Also...

Viewer Commands in Hyperlinks on page **45**

38.4 Add a Viewer to a Site

In order to add a viewer using Manager, you must first install the viewer. For information on installing the HTML5 Viewer template, refer to the *Geocortex Viewer for HTML5 Administrator and Developer Guide*. For information on installing the Silverlight Viewer template, refer to the *Geocortex Viewer for Silverlight Administrator and Developer Guide*.

▶ **To add a viewer to your site:**

1. In Manager, edit the site that you want to configure, and then click **Viewers** in the side panel.

2. Click **Add Viewer**.
   The Create New Viewer dialog box opens.

   If the Add Viewer icon is not available, click **Save Site**.

3. In the **Display Name** text box, type a display name for the viewer.

> Try keep the viewer's display name reasonably short. The viewer's folder is named after the viewer's ID, which is based on the viewer's display name. Windows folder names must be less than 248 characters and Windows path names must be less than 260 characters.

4. In the **Template** drop-down list, select the template to base the viewer on.

   If there are no options in the Template drop-down list, there are no templates installed. For information, refer to the "Installation" section of the *Geocortex Viewer for Silverlight Administrator and Developer Guide* or the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

5. Click **OK**.

   The dialog box closes and the viewer is added to your site.

38.5 Edit a Viewer

▶ **To edit a viewer:**

1. Launch Manager. Follow the instructions that apply to you:

   - **Windows Server 2012 or Windows 8, and Newer Versions:**

     On the **Start** screen, type **Geocortex**, and then click **Geocortex Essentials Manager**.

   - **Windows Server 2008 or Windows 7, and Older Versions:**

     In the **Start** menu, select **All Programs** | **Latitude Geographics** | **Geocortex Essentials [Version] [Instance]** | **Geocortex Essentials Manager**.

     [Version] is the Essentials version number. [Instance] is the instance name, if Essentials is installed as a named instance. The default installation does not have an instance name.

2. Edit the site whose viewer you want to configure:

   a. Click the **Sites** tab.

   b. If a different site is open for editing, click **Save Site**, and then click **Close Site**.

   c. Follow the instructions for the view of the Site List that you are using:

      - **Tiled View:**

        World site in Tiled View

        - Click the thumbnail image of the site that you want to edit, or

        - Click the site's name, or

        - Position the pointer over the thumbnail image of the site that you want to edit, and then click the **Edit** icon .

      - **List View:**

        World site in List View

        - Click the site's name, or

        - Click the **Edit** icon .

3. Click **Viewers** in the side panel.

4. Click the **Edit** icon beside the viewer that you want to configure.

   The viewer opens for editing.

38.6 Change Viewer URLs in Manager

When you install a viewer template in the Post Installer, you are prompted to enter the location to deploy the template. By default, the template's URL is registered with Manager. This enables Manager to create launch links for viewers that are based on this template. Manager's home page, the Viewers page, and the Viewer Info pages have launch links.
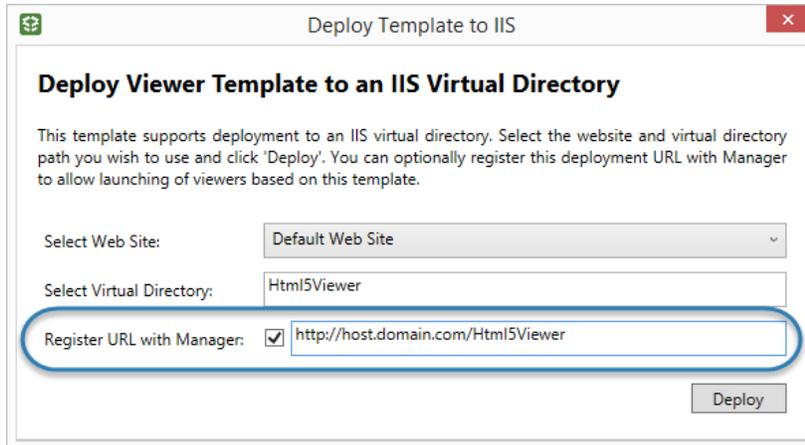
Post Installer dialog box to register a template's URL with Manager

If you move the IIS virtual directory where a viewer template is deployed, or you change the name of the viewer's host, the viewer's launch links in Manager will no longer work because the template's URL has changed. All the viewers that are based on that template are affected by a change in the virtual directory or host name. You can make the launch links work again by editing the template's URL in Manager. Updating a template's URL updates the launch links for every viewer that is based on that template.

In addition to modifying viewer URLs, you can add viewer URLs. For example, if you add a host name that you want Manager to use to create viewer launch links, you would add a viewer URL.

▶ **To update a viewer template's URL in Manager:**

⚠ Updating a template's URL overwrites the original URL.

1. In Manager, edit any site and click **Viewers** in the side panel.

2. Click **Edit Viewer URLs**.

3. Click the **Edit** tool 🖉 beside the URL that you want to update.

4. Update the URL to reflect the new virtual directory or host.

5. Click **OK**.

▶ **To add a viewer URL in Manager:**

1. In Manager, edit any site and click **Viewers** in the side panel.

2. Click **Add Viewer URL**.

3. Select the template that the new URL is for.

4. Type or paste the URL.

5. Click **OK**.

6. If you added a Silverlight Viewer URL, the Viewer Info page will have a launch link for each URL.

If you added an HTML5 Viewer URL, you can select which URL you want to use for the Online Launch Links on the Viewer Info page:

    a. Click **Viewers** in the side panel.

    b. Edit the HTML5 viewer that has multiple URLs.

    c. On the **Viewer Info** page, select the desired URL from the drop-down list.

    d. Click **Apply Changes**.

38.7 Configure an HTML5 Viewer

When configuring a viewer, it is recommended that you verify your configuration frequently. Before verifying, apply your changes and save the site.

▶ **To verify your configuration changes:**

1. If you have not yet launched the viewer, click **Viewer Info** in the side panel, and then click the launch link. If you have already launched the viewer, refresh the page.

2. Navigate to the part of the viewer you want to verify.

3. Test any new tools or functions you have added.

38.7.1 About Configuring Multiple Interfaces for HTML5 Viewers

The Geocortex Viewer for HTML5 is designed to work on different device types—desktop computers, tablets, and handheld devices like smartphones. The way the Viewer does this is by allowing you to configure multiple user interfaces, one for each device type.

The configurations for the different user interfaces are in separate files. When you configure a particular aspect of an HTML5 viewer in Manager, you can choose between configuring all three interfaces together, or configuring them separately. Configuring the interfaces separately allows you to make them different from each other—configuring them together makes their configurable settings identical.

In Manager, HTML5 viewer configuration is divided into pages of related settings—I Want To menu settings, look and feel settings, and so on. The decision to configure the user interfaces together or separately only affects the settings on the current page. This means you can configure the interfaces together on one page but individually on another page. For example, you might want to always use the same banner (configure the interfaces together on Manager's Look and Feel page), but have a different I Want To menu for handheld devices (configure the interfaces separately on Manager's I Want To Menu page).

⚠️ If you have configured the interfaces separately on a particular page in Manager, and then you change back to configuring the interfaces together, Manager prompts you to select which configuration you want to keep—you will lose any variations that exist in the other two interfaces.

💡 It is always safe to switch from configuring the user interfaces together to configuring them separately—you never lose any changes. If you are not sure whether you want the interfaces to be the same or different, keep them the same by configuring them together—you can always configure them separately later.

The issue of configuring the interfaces together or separately does not apply to the Viewer Info page—the Viewer Info page contains metadata about the viewer, not viewer settings.

Switch how you Configure the Interfaces

By default, the interfaces are configured together. In this case, there is only one tab, and its settings apply to all the interfaces.

▶ **To switch to configuring the interfaces separately:**

1. Click the **Configure Individually** hyperlink above the tab.

   A separate tab for each interface displays: Desktop, Tablet and Handheld. The hyperlink changes to say Configure Simultaneously.

   If you are configuring the user interfaces individually, remember to click Apply Changes or Save Site before leaving a tab—otherwise, you will lose your changes.

2. To return to configuring the interfaces together, click **Configure Simultaneously**.

   You are prompted to select the interface whose configuration you want to keep.

   Any changes that you made to the other two configurations will be lost.

3. Select the interface whose configuration you want to keep from the drop-down list.

4. Click **OK**.

   The tabs are combined into one tab, and the configurations for this page's settings are made the same.

38.7.2 About the Live Preview for HTML5 Viewers

The Live Preview runs your viewer within a simulated desktop, tablet, or handheld device. You must click Apply Changes to run the current configuration, but you do not need to save the site. This enables you to test your configuration before you save the site.

You can use the viewer the same way in the Live Preview as in a browser—navigate the map, use menus and tools, search, run workflows, and so on.

To open the Live Preview, click **Apply Changes**, and then click one of the **Preview** links at the bottom of any HTML5 Viewer page in Manager. Use the links at the top of the Live Preview to switch between device types.
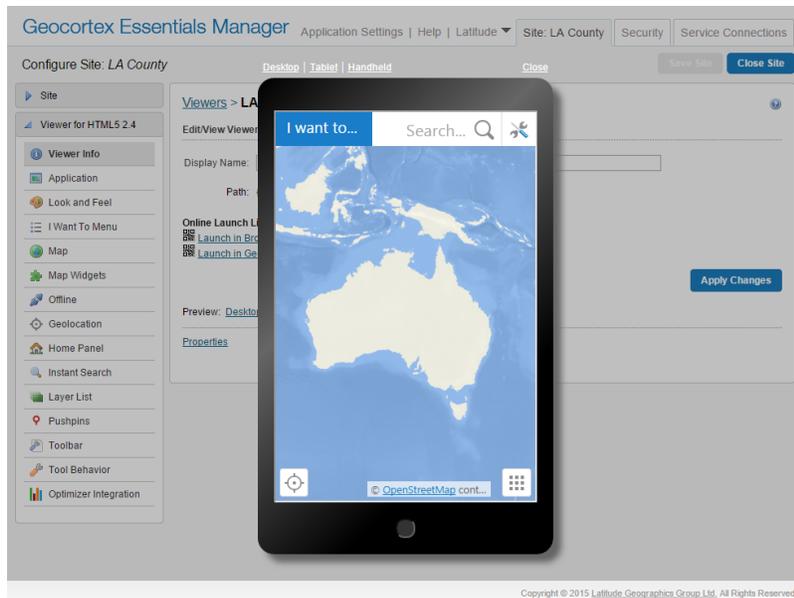
Live Preview for the Handheld interface

38.7.3 About User Interface Text in HTML5 Viewers

The HTML5 Viewer's user interface text is stored in two language files, one for each library. Each text item in a language file is assigned to a placeholder called a "key". The code for the HTML5 Viewer references the keys, not the text. When the viewer runs in a browser, the viewer looks up the key in the appropriate language file and displays the text assigned to that key.

When you configure user interface text in Essentials Manager, there are two ways you can specify the text. The method you use depends on how many languages the viewer will be available in.

- **Literal Text:** If your viewer is only going to be available in one language, type the text you want to use directly into Manager.

- **Text Key:** If you are going to make your viewer available in more than one language, type the key you want to use, or select it from the drop-down list that opens when you start typing. You must also create a language file for each language you are supporting.

    Type **@** to see the complete list of keys in the drop-down list—all text keys begin with @.

For more information on translating the HTML5 viewer, refer to the "Translation" section of the *Geocortex Viewer for HTML5 Administrator and Developer Guide.*

38.7.4 Change Viewer Information for an HTML5 Viewer

The Viewer Info page in Manager has high-level settings and meta-information about the viewer, such as the viewer's display name, the location of its configuration file, and a link to launch the viewer.

▶ **To open an HTML5 viewer's Viewer Info page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Viewer Info**.
   The Viewer Info page opens.

Settings

The Viewer Info page has the following settings and information:

- **Display Name:** Used to refer to the viewer in Manager and in the REST API Sites Directory. The display name is not visible to the end user, however, the viewer's ID can be—it can appear in the viewer's URL. The ID is based on the display name at the time the viewer is created. Changing the display name after the viewer has been created does not change the ID.

  > Try keep the viewer's display name reasonably short. The viewer's folder is named after the viewer's ID, which is based on the viewer's display name. Windows folder names must be less than 248 characters and Windows path names must be less than 260 characters.

- **Path:** The path to the viewer's configuration. {SitePath} represents the path to the folder containing the site's configuration file.

- **URL:** If you have deployed the viewer template to IIS multiple times, you can select which deployment you want the launch links and QR codes to use. This option is only visible if the template is deployed more than once.

- **Launch Links:** Hyperlinks and Quick Response (QR) codes ( ) that launch the viewer. Use the QR codes to launch the viewer in a device with a scanner, such as a smartphone. Hover the mouse pointer over a QR code to enlarge the code for scanning.
  - **Launch in Browser:** Launches the viewer in a browser. The Launch in Browser link uses the `configBase` URL parameter, which automatically detects the type of device that the viewer is running on—desktop computer, tablet, or handheld device—and uses the appropriate configuration for that device type. For more information on `configBase`, refer to "URL Parameters" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.
  - **Launch in Geocortex Mobile App Framework:** Launches the viewer in the Geocortex Mobile App Framework, provided you have purchased and installed the App.

  If you did not deploy the viewer to IIS when you installed the viewer's template, the launch links and QR codes will be missing. Refer to the "First-Time Installation" section of the *Geocortex Viewer for HTML5 Administrator and Developer Guide* for instructions on using the Post Installer to deploy the viewer to IIS.

  If the viewer is blank when you launch it, and the Live Previews are also blank, edit the URL in the address bar to make all the references to the server (including the port) identical. We recommend fully qualified URLs. To correct this permanently, upgrade to Geocortex Essentials 3.11.1 or newer and redeploy the viewer.

```
http://server.domain.com/Html5Viewer/Index.html?viewerConfigUri=http://server.domain.com/...
                                    ┌─────────┐
                                    │ Correct │
                                    └─────────┘
```
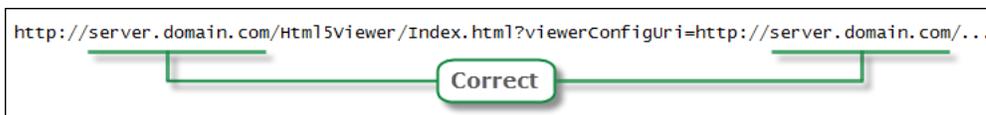
Recommended form for an HTML5 viewer URL

- **Preview:** (available on all HTML5 Viewer configuration pages in Manager) Hyperlinks that launch the viewer within an image of the specified device type, so you can see what the viewer looks like in its target device type. The previews are live—you can do everything in the previews that you can do if you launch the viewer in a browser.

  If the previews are blank, see the note under Online Launch Links, above.

- **Properties:** (available on all HTML5 Viewer configuration pages in Manager) Allows you to create a custom property for the viewer.

▶ **Before you leave the Viewer Info page:**

1. Click **Apply Changes**.

2. To save your changes, click **Save Site**.

38.7.5 Configure Application-Wide Settings for an HTML5 Viewer

The Application page in Manager has settings that apply to the viewer as a whole, such as the proxy page and geometry service to use.

You can configure additional application-wide settings in the configuration files. In particular, you can configure **datum transformations** to apply whenever the viewer performs an operation that requires projection, such as geocoding, measurement, or buffering. For information, see "Application-Wide Settings" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

▶ **To open an HTML5 viewer's Application page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Application**.
   The Application page opens.

▶ **Before you configure settings on the Application page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can always configure them separately later without losing any changes you have made.

- If you are sure you want the settings on the Application page to be different for one or more of the interfaces, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see **About Configuring Multiple Interfaces for HTML5 Viewers** on page **297**.

Settings

The Application page has the following settings:

- **Proxy URI:** The URI to the proxy page, if you are using one. By default, the proxy URI is set to the ASP.NET proxy page that ships with the HTML5 Viewer, `proxy.ashx?`. The default URI is terminated with a question mark because the viewer attaches parameters to the URI. The question mark is optional—the viewer will add the question mark if necessary.

  If you do not want to use a proxy page, remove `proxy.ashx?` from the **Proxy URI** box.

- **Allow Unsafe Content:** If this check box is selected, content from a KML or GeoRSS layer that contains HTML markup is interpreted by the viewer. If you want the viewer to display the actual markup rather than what it represents, clear the check box. By default, unsafe content is not allowed.

  If you have not added any KML or GeoRSS layers to your site, this setting has no effect.

- **Geometry Service URI:** The URI of the geometry service to use for projection and other geometry operations.

  > As of version 2.5, the Geometry Service URI property of the HTML5 Viewer has been deprecated. To configure a geometry service, edit the site instead. If configured, the geometry service in the site overrides the one configured here. For more information, see **Geometry Services** on page **154**.

▶ **Before you leave the Application page:**

1. Click **Apply Changes**.

2. To save your changes, click **Save Site**.

38.7.6 Change the Look and Feel of an HTML5 Viewer

The Look and Feel page in Manager has settings that control the appearance of various aspects of the viewer, specifically:

- Browser Title
- Banner
- Data Frame
- Results List
- Map Tips
- Feature Details

▶ **To open an HTML5 viewer's Look and Feel page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Look and Feel**.
   The Look and Feel page opens.

▶ **Before you configure settings on the Look and Feel page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can configure them separately later without losing any changes you have made.

- If you are sure you want the settings on the Look and Feel page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see **About Configuring Multiple Interfaces for HTML5 Viewers** on page **297**.

Settings

The Look and Feel page has the following settings:

Browser:

- **Title:** The title to display in the browser's title bar or tab.

  > If your viewer is going to be available in more than one language, enter the text key that the browser's title is assigned to. See **About User Interface Text in HTML5 Viewers** on page **299** for more information on using text keys.

  The default text key is `@language-browser-title`. The text key's current value is shown below the Title box.

Banner:

In the Desktop and Tablet interfaces, the banner is the area at the top of the viewer that optionally contains the title and logo. The Handheld interface does not have a banner.

- **Show Banner:** If this checkbox is selected, the banner shows in the viewer. If the checkbox is cleared, the viewer does not have a banner. By default, the viewer has a banner.

- **Title:** The text of the title to display in the banner. If you want control over the font and size, leave the Title box blank, create an image that contains the title, subtitle, and logo, and specify the image using one of the Image settings. You can use a text key or the literal text.

- **Title Color:** A valid HTML color to use for the title of the banner. For example, **red** or **#FF0000**.

- **Sub-Title:** The subtitle to display in the banner. The subtitle is the smaller text that appears under the title. The subtitle is optional. You can use a text key or the literal text.

  If you want control over the font and size, leave the Sub-Title box blank, create an image that contains the title, subtitle, and logo, and specify the image using one of the Image settings.

- **Sub-Title Color:** A valid HTML color to use for the subtitle of the banner. For example, **green** or **#00FF00**.

- **Background Color:** A valid HTML color to use for the background of the banner, for example, **blue** or **#0000FF**.

- **Background Image:** The URL to the banner's background image, if you want a background image. Use this setting to add texture to the background color. Click **Browse** to browse to the image file.

- **Left Image:** The URL to the image that forms the left side of the banner. This setting is often used for the image containing the logo, title, and sub-title. Click **Browse** to browse to the image file.

- **Left Image Description:** The alternative (**alt**) text for the Left Image. The alt text is used by screen readers. It is also used if the image cannot be displayed.

- **Right Image:** The URL to the image that forms the right side of the banner. Click **Browse** to browse to the image file.

- **Right Image Description:** The alternative (**alt**) text for the Right Image. The alt text is used by screen readers. It is

also used if the image cannot be displayed.

- **Height:** The height of the banner, in pixels. The default banner is 60 pixels high.

Data Frame:

Only the Desktop and Tablet interfaces have a Data Frame—the Handheld interface does not have a Data Frame.

- **Open By Default:** When this checkbox is selected, the Data Frame opens when the user launches the viewer. If you do not want the Data Frame to be open initially, clear the checkbox. By default, the Data Frame is closed. If you want the Home Panel to be visible when the user launches the viewer in the Desktop or Tablet interface, you must check the **Open By Default** checkbox.

- **Default Width:** The width of the Data Frame in pixels. The default width is **350** pixels. Alternatively, you can specify the amount as a percentage, for example, **25%**.

  Specifying the amount as a percentage string ensures the panel size remains in proportion to the browser window until the user resizes the panel.

- **Minimum Width:** The minimum width to which the Data Frame can be resized. The default width is **200** pixels. Alternatively, you can specify the amount as a percentage, for example, **10%**.

- **Maximum Width:** The maximum width to which the Data Frame can be resized. The default width is **500** pixels. Alternatively, you can specify the amount as a percentage, for example, **50%**.

Bottom Panel:

- **Default Height:** (Desktop and Tablet interfaces only) The default height of the Bottom Panel. The default height is **400** pixels. Alternatively, you can specify the amount as a percentage, for example, **25%**.

  Specifying the amount as a percentage string ensures the panel size remains in proportion to the browser window until the user resizes the panel.

  To specify the percentage height of the Bottom Panel in the Handheld interface, manually edit the `bottomPanelHeightPercent` property in the Handheld configuration file. For more information, see "Shells Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

Results List:

- **Content Field:** Specifies which setting to display for each feature in the Results List—the **Feature Description** or the **Feature Long Description**. The default is **Feature Long Description**.

Map Tips:

- **Content Field:** Specifies which setting to display as the main content of map tips—the **Feature Description** or the **Feature Long Description**. The default is **Feature Long Description**.

Feature Details:

- **Show Description:** The kind of description to display when viewing feature details, if any. Possible values include: **No Feature Description**, **Feature Description** and **Feature Long Description**. The default is **No Feature Description**.

▶ **Before you leave the Look and Feel page:**

1. Click **Apply Changes**.

2. Use the Preview hyperlinks to see your configuration.
   See **About the Live Preview for HTML5 Viewers** on page **298** for instructions.

3. To save your changes, click **Save Site**.

See Also...

About User Interface Text in HTML5 Viewers on page **299**

Configure the Home Panel for an HTML5 Viewer on page **317**

38.7.7 Configure the I Want To Menu for an HTML5 Viewer

The HTML5 Viewer's default configuration has a menu for common tasks, such as opening the list of map layers and returning to the initial extent. The menu is called the I Want To menu because the default text on the button that opens the menu is **I want to...**. In the Desktop and Tablet interfaces, the I Want To button is in the top left corner of the map. In the Handheld interface, the button is at the top left of the screen.
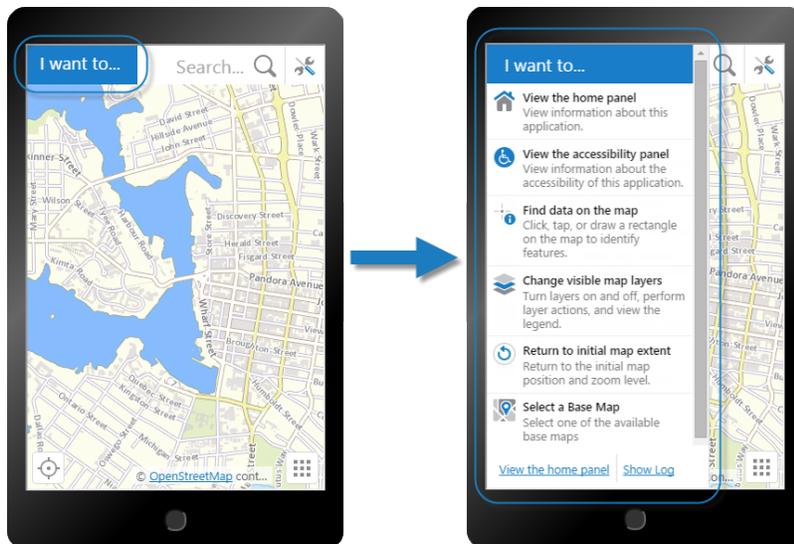
I Want To menu shown in the Handheld preview

Each menu item is represented by some text and optionally a description and small image. You can modify or remove these items, create new items, and change the order that the items appear in the menu. A menu item can run any Geocortex Viewer for HTML5 command. For a list of commands, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

▶ **To open an HTML5 viewer's I Want To Menu page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **I Want To Menu**.

The I Want To Menu page opens.

▶ **Before you configure settings on the I Want To Menu page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can always configure them separately later without losing any changes you have made.

- If you are sure you want the settings on the I Want To Menu page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see **About Configuring Multiple Interfaces for HTML5 Viewers** on page **297**.

Settings

The I Want To Menu page has the following settings:

- **Show Menu:** If this check box is selected, the I Want To menu appears in the viewer. If the check box is cleared, the viewer does not have an I Want To menu.

- **Title:** If your viewer is going to be available in one language only, type the menu title.

    If your viewer is going to be available in more than one language, enter the text key that the menu title is assigned to. See **About User Interface Text in HTML5 Viewers** on page **299** for more information on using text keys.
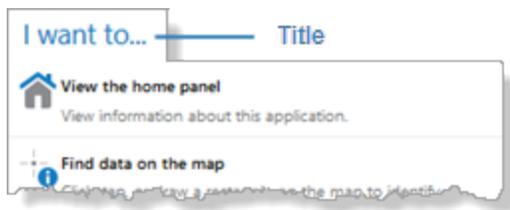
Title for the I Want To menu

▶ **To add an item to the I Want To menu:**

1. Click **Add Menu Item**.
   The Add Menu Item dialog box opens.

2. **Appearance:** Configure the menu item's appearance:
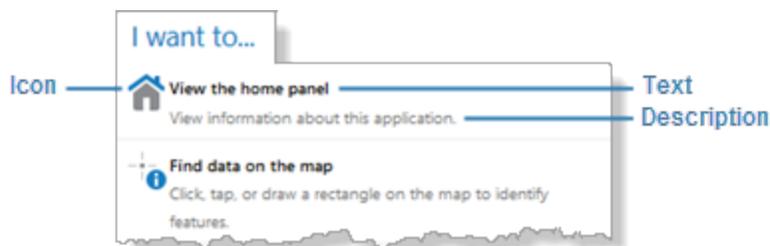
Parts of I Want To menu items

- **Text:** The menu item's text.

- **Description:** (optional) A short description of what the menu item does.

- **Icon URI:** (optional) The URI of the image to display next to the menu item. The image should be the size that you want it in the viewer. Valid file formats are PNG, BMP, JPG, and JPEG.
  To browse to the image file:

  a. Click **Browse**.
     The Select File dialog box opens.

  b. Expand the **Resources** | **Images** branch of the **VirtualDirectory** tree in the side panel.

  c. Select the **Images** folder.

  d. Click **Upload**.
     The Upload dialog box opens.

  e. Click **Select**.

  f. Browse to and select the image file you want to use for the menu item.

  g. Click **Open**.

  h. Click **Upload**.
     The file appears in the Filename list.

  i. With the file selected, click **OK**.

3. **Command:** Configure the command that the menu item runs:

   - **Command:** The name of the command to run when the user selects the menu item. Click in the **Command** box to open a drop-down list of commands.

   - **Command Parameter:** The parameter value to pass to the command when it runs. Parameters may either be simple strings or complex objects containing any number of parameters.

   For more information on the HTML5 Viewer's commands and their parameters, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

4. Click **OK**.

▶ **To edit an I Want To menu item's appearance or command:**

1. Click the **Edit** icon next to the item you want to modify.
   The Edit Menu Item dialog box opens.

2. Edit the details as desired.

3. Click **OK**.

To remove an item from the I Want To menu:

⚠️ Removing menu items is permanent. If you remove a menu item, you cannot get it back after you have applied your changes.

1. Click the **Remove** icon 🗑 beside the item you want to remove.

   You are prompted to confirm.

2. Click **OK**.

   The item is removed from the list of menu items.

To change the order of items in the I Want To menu:

The menu items are listed in Manager in the same order that they appear in the viewer.

1. Click and hold the ⬍ icon for the menu item whose position in the menu you want to change.

2. Drag the item to its new position.

3. Repeat these steps until the menu is ordered the way you want it.

Before you leave the I Want To Menu page:

1. Click **Apply Changes**.

2. Use the Preview hyperlinks to see your configuration.
   See **About the Live Preview for HTML5 Viewers** on page **298** for instructions.

3. To save your changes, click **Save Site**.

See Also...

About User Interface Text in HTML5 Viewers on page **299**

38.7.8 Configure the Map

The Map page in Manager has settings that enable you to extend or restrict the scale range of the map.

To open an HTML5 viewer's Map page in Manager:

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Map**.
   The Map page opens.

Before you configure settings on the Map page:

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can configure them separately later without losing any changes you have made.

- If you are sure you want the settings on the Map page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see **About Configuring Multiple Interfaces for HTML5 Viewers** on page **297**.

Settings

The Map page has the following settings:

- **Override Scale:** The Override Scale settings enable you to override the default scale range of the map.

  By default, the primary map service determines the scale range of the map. The map's Zoom control has the same range as the map's primary map service. Each level of detail in the primary map service is one zoom level in the Zoom control. Users cannot zoom in closer than the primary map service's minimum scale, or zoom out farther than the primary map service's maximum scale.

  A site may contain a service, often a dynamic service, with a larger scale range than the primary map service. In this case, users will not be able to see the entire map service—they can only see the part that lies within the primary map service's scale range. The Override Scale settings enable you to extend the map's scale range so users can see the parts of the map service that lie outside the primary map service's scale range.

  You can also use the Override Scale settings to restrict the map's scale range.

  - **Override Minimum Scale:** The minimum scale at which the map is visible in viewers. For example, if the map's minimum scale is 1:5,000,000, you could extend the minimum scale to 1:10,000,000 in Essentials.

    To configure the minimum scale, enter the scale's denominator, without commas or other punctuation. For example, to set the minimum scale to 1:10,000,000, enter **10000000** in the **Override Minimum Scale** box.

  - **Override Maximum Scale:** The maximum scale at which the map is visible in viewers. For example, if the map's maximum scale is 1:2,000, you could extend the maximum scale to 1:500 in Essentials.

    To configure the maximum scale, enter the scale's denominator, without commas or other punctuation. For example, to set the maximum scale to 1:500, enter **500** in the **Override Maximum Scale** box.

▶ **Before you leave the Map page:**

1. Click **Apply Changes**.

2. Use the Preview hyperlinks to see your configuration.
   See **About the Live Preview for HTML5 Viewers** on page **298** for instructions.

3. To save your changes, click **Save Site**.

38.7.9 Configure Map Widgets for an HTML5 Viewer

The Map Widgets page in Manager has settings for:

- Bookmarks
- Scale Bar
- Overview Map
- Map Coordinates

▶ **To open an HTML5 viewer's Map Widgets page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Map Widgets**.
   The Map Widgets page opens.

▶ **Before you configure settings on the Map Widgets page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can configure them separately later without losing any changes you have made.

- If you are sure you want the settings on the Map Widgets page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see **About Configuring Multiple Interfaces for HTML5 Viewers** on page **297**.

Settings

The Map Widgets page has the following settings:

Bookmarks:

- **Enabled:** When this checkbox is selected, the Bookmarks feature is enabled—you can add the Bookmarks map widget or Bookmarks tool, so users can open the Bookmarked Locations menu. The Bookmarked Locations menu allows users to jump to existing bookmarks and create new bookmarks to add to the menu.
  To show the Bookmarks map widget, select the **Show Bookmarks Button** checkbox. When the widget is clicked, the Bookmarked Locations menu opens beside the widget.
  To add the Bookmarks tool to the toolbar, follow the instructions to add a button in **Configure the Toolbar for an HTML5 Viewer** on page **325**. When the Bookmarks tool is clicked, the Bookmarked Locations menu opens next to the Bookmarks map widget if the widget shows on the map. If the widget does not show on the map, the Bookmarked Locations menu opens in a modal window.
  By default, the Enabled checkbox is selected.

- **Show Bookmarks Button:** When this checkbox is selected, the Bookmarks map widget appears on the map, provided at least one bookmark is defined. When the widget is clicked, the Bookmarked Locations menu opens beside the widget.
  When Show Bookmarks Button is selected, the viewer hides the Bookmarks map widget if there are no bookmarks defined. In this case, users can use the **Bookmark current map extent** I Want To menu item to create bookmarks. As soon as a user has created one bookmark, the Bookmarks widget shows on the map.
  By default, the Show Bookmarks Button checkbox is cleared.

  > To select the **Show Bookmarks Button** checkbox, the **Enabled** checkbox must be selected.

Scale Bar:

The scale bar appears at the bottom left of the map.

- **Show Scale Bar:** To display the scale bar, select this checkbox; otherwise, clear this checkbox. It is selected by default.

- **Scale Bar Style:** Select a style for the scale bar from this drop-down menu. The possible choices are **Ruler** or **Line**. The default is **Ruler**.

- **Scale Bar Unit:** Select the units of measurement for the scale bar from this drop-down menu. The possible choices are **US Customary**, **Metric** or **Both (US Customary and Metric)**. The **Both (US Customary and Metric)** option can only be used with the **Line** scale bar style. The default is **Metric**.
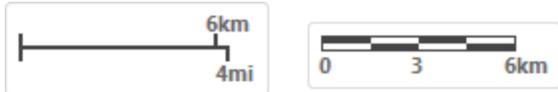
Dual-unit Line scale bar (left) and metric Ruler scale bar (right)

- **Show Background:** To display a rectangular background for the scale bar, select the Show Background checkbox. The background prevents other widgets from overlapping the scale bar. In the screen capture above, both scale bars have a background. If you do not want the scale bar to have a background, clear the checkbox. It is selected by default.

Overview Map:

The overview map appears at the bottom right of the map.
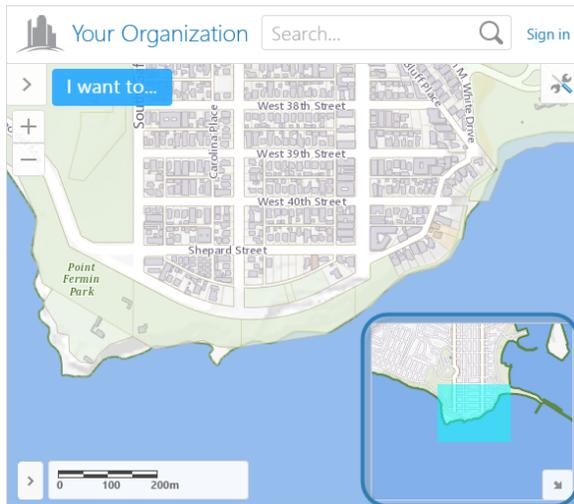
Example of an overview map

- **Show Overview Map:** To enable the overview map, select this checkbox; otherwise, clear this checkbox. It is selected by default.

- **Open By Default:** To open the overview map when the viewer starts, select this checkbox; otherwise, clear this checkbox. It is cleared by default.

- **Extent Scale Factor:** The scale factor to use for the overview map in relation to the current map extent. The default is **2**.

- **Color of Visible Extent:** A valid HTML color to use for the rectangle that represents the current map extent. The default is **#00FFFF**.

Map Coordinates:

The map coordinates show the position of the mouse pointer. By default, the coordinates appear at the bottom left of the map, beside the scale bar:
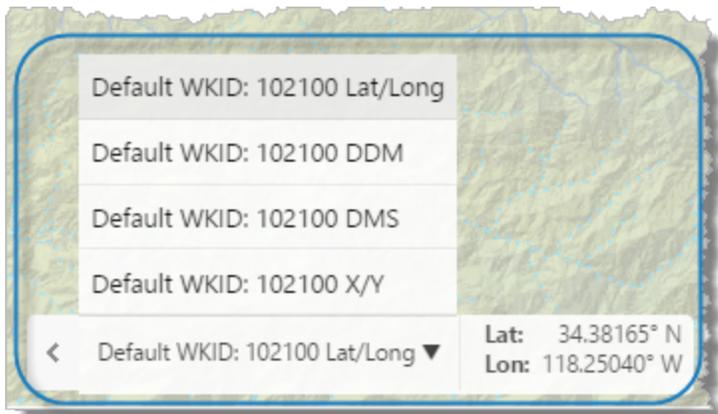
Map coordinates with the coordinate system menu open

- **Show Map Coordinates:** To show the map coordinates widget on the map, select this checkbox. For the widget to display, at least one coordinate system must be specified—either Display Basemap's Coordinate System is enabled or at least one Alternate Coordinate System is configured, or both.

  If you do not want the coordinates widget to show, clear the Show Map Coordinates checkbox. The checkbox is selected by default.

- **Open By Default:** To open the map coordinates widget when the viewer starts, select this checkbox; otherwise, clear this checkbox. It is cleared by default.

- **Display Basemap's Coordinate Systems:** To include the base map's coordinate system in the coordinates widget, select this checkbox. This creates four options that the user can select from—display lat/lon, DDM, DMS, or X/Y coordinates. The Display Basemap's Coordinate Systems checkbox is selected by default.

  If you do not want to the coordinates widget to show the coordinates in the base map's coordinate system, clear the Display Basemap's Coordinate Systems checkbox and configure at least one Alternate Coordinate System.

- **Coordinate Decimal Precision:** The number of decimal places to use for coordinates. The default is **5**.

- **Alternate Coordinate Systems:** A list of coordinate systems to make available as options in the coordinates widget. To add a coordinate systems, click **Add** and configure the settings:

  - **Display Name:** The name to display in the coordinates widget.

  - **WKID:** The well-known ID of the coordinate system. Cannot be set if **WKT** is already specified.

    For a list of WKIDs, see Esri's Geographic Coordinate Systems or Projected Coordinate Systems documentation.

  - **WKT:** The well-known text of the coordinate system. Cannot be set if **WKID** is already specified.

For a list of WKTs, see Esri's Geographic Coordinate Systems or Projected Coordinate Systems documentation.

- **Output Labels:** The units to use for the coordinates. Possible values include:
  - **DDM:** Degrees, Decimal Minutes
  - **DMS:** Degrees, Minutes, Seconds
  - **Lat/Long:** Latitude, Longitude
  - **X/Y:** X, Y (in the units of the coordinate system)

The Map Coordinates widget is only available for the Desktop interface.

Before you leave the Map Widgets page:

1. Click **Apply Changes**.

2. Use the Preview hyperlinks to see your configuration.
   See **About the Live Preview for HTML5 Viewers** on page **298** for instructions.

3. To save your changes, click **Save Site**.

38.7.10 Configure an HTML5 Viewer for Offline Use

Through the Geocortex Mobile App Framework, the HTML5 viewer supports access to feature layers and base maps when there is no network connection. In offline mode, users can navigate the feature layers, perform searches and identify operations, and if the layers are editable, create, modify, and remove features. When the viewer is connected again, they can upload the changes to the server.

As of Geocortex Viewer for HTML5 2.0, launching a viewer in offline mode requires the Geocortex Mobile App Framework. For more information, see **Offline Mode** in the *Geocortex Mobile App Framework Administrator Guide*.

To open an HTML5 viewer's Offline page in Manager:

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Offline**.
   The Offline page opens.

Before you configure settings on the Offline page:

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can always configure them separately later without losing any changes you have made.

- If you are sure you want the settings on the Offline page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see **About Configuring Multiple Interfaces for HTML5 Viewers** on page **297**.

Settings

The Offline page has the following settings:

- **URL:** If you have deployed the viewer template to IIS multiple times, you can select which deployment you want the launch link and QR code to use. This option only appears if the template is deployed more than once.

- **Advertise viewer in Geocortex Mobile App Framework:** Whether this viewer should be offered to be added in the Geocortex Mobile App Framework.

- **Automatically download in Geocortex Mobile App Framework:** Whether this viewer should be automatically downloaded in the Geocortex Mobile App Framework.

- **Select Base Maps:** The HTML5 Viewer supports the offline use of base maps when the Viewer is running in the Geocortex Mobile App Framework. If you are going to run the Viewer in a browser, or if your site does not have any base maps, this setting does not apply to you.

▶ **To configure an HTML5 viewer for offline use:**

1. If you have multiple deployments of the HTML5 viewer in IIS, select the deployment that you want the launch link and QR code to use.

2. To offer this viewer to be added in the Geocortex Mobile App Framework, select the **Advertise viewer in Geocortex Mobile App Framework** checkbox.

3. To automatically download this viewer in the Geocortex Mobile App Framework, select the **Automatically download in Geocortex Mobile App Framework** checkbox.

4. In the **Base Map** table, select the checkbox beside each base map that you want to be available offline.

5. For each base map you select, type the TPK's file name in the **Base Map Filename (.tpk)** column.

    > You must enter the full file name, including the **.tpk** file extension. For example, **imagery.tpk**.

	Base Map	Base Map Filename (.tpk)
☑	World_Shaded_Relief	World_Shaded_Relief.tpk
☑	World_Street_Map	World_Street_Map.tpk
☐	World_Imagery	

Two base maps configured for offline use

6. Follow the instructions in the *Geocortex Mobile App Framework Administrator Guide* to distribute Tile Packages (TPK files) to end users to load on their devices.

7. Click **Apply Changes**.

    The end user can now set up offline use of the viewer.

▶ **Before you leave the Offline page:**

1. Click **Save Site**.

38.7.11 Configure Geolocation in an HTML5 Viewer

Geolocation locates the user on the map. The HTML5 Viewer supports the following geolocation options:

- **Find Me:** Pans the map to the user's location and marks the location with an indicator.

- **Track Me:** Tracks the user's location with an indicator, without panning the map.

- **Follow Me:** Follows the user's location with an indicator and pans the map as the user's location changes.
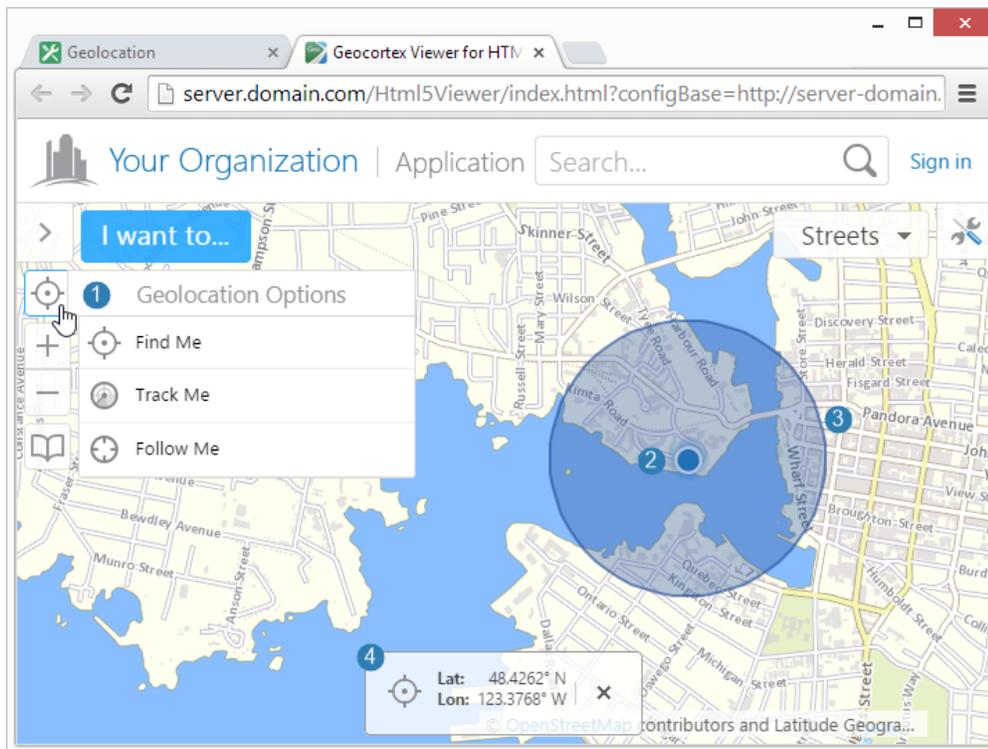
Geolocation menu (❶), location indicator (❷), accuracy circle (❸), and geolocation coordinates (❹)

Web browsers return geolocation results in WGS 84. If your map is not in Web Mercator or WGS 84, you must configure an ArcGIS geometry service so the geolocation widget can project from latitude/longitude to the map's coordinates. For instructions on configuring a geometry service, see **Configure Application-Wide Settings for an HTML5 Viewer on page 301**.

> **NOTE** Internet Explorer 8 does not support geolocation.

In order for an HTML5 viewer to perform geolocation operations, the user's device must have a built-in GPS (Global Positioning System), a Wi-Fi connection, or a wired connection. GPS provides the most accurate geolocation results. Wi-Fi is less accurate than GPS, and geolocation using a wired connection is less accurate than Wi-Fi.

Some devices use a mix of GPS and Wi-Fi to obtain a location. This can result in unpredictable readings. Accuracy is improved by setting the device to GPS-only mode, however, this drains the battery more quickly in some devices.

Geolocation is configured on the viewer's Geolocation page in Manager. You can configure additional geolocation settings in the viewer's configuration files. For information, see the "Geolocate Module" section in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

▶ **To open an HTML5 viewer's Geolocation page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Geolocation**.
   The Geolocation page opens.

Settings

> By default, the Geolocation page is set to configure the Desktop, Tablet, and Handheld interfaces separately. For more information, see **About Configuring Multiple Interfaces for HTML5 Viewers** on page **297**.

The Geolocation page has the following settings:

Geolocation:

- **Enable Single-Reading Geolocation:** Select this checkbox if you want to make single-reading geolocation (**Find Me**) available in the Geolocation Options menu; otherwise, clear this checkbox. The Find Me feature pans the map to the user's current location and marks the location with an indicator.
  By default, this setting is enabled for the Tablet and Handheld interfaces, and disabled for the Desktop interface.

- **Enable Geolocation Tracking:** Select this checkbox if you want to make tracking (**Track Me**) available in the Geolocation Options menu; otherwise, clear this checkbox. The Track me feature tracks the user's location with an indicator, without panning the map.
  By default, this setting is enabled for the Tablet and Handheld interfaces, and disabled for the Desktop interface.

- **Enable Geolocation Following:** Select this checkbox if you want to make following (**Follow Me**) available in the Geolocation Options menu; otherwise, clear this checkbox. The Follow Me feature follows the user's location with an indicator and pans the map as the user's location changes.
  By default, this setting is enabled for the Tablet and Handheld interfaces, and disabled for the Desktop interface.

- **Display Geolocation Accuracy Circle:** Select this checkbox if you want to display the geolocation accuracy circle; otherwise, clear this checkbox. It is checked by default. When checked, the indicator for the user's position includes a surrounding circle that indicates the margin of error of the user's position; the user's actual position should lie somewhere within this circle.

- **Geolocation Indicator Image:** The URL to the image that represents the geolocation indicator. Type the URL in the text box. Alternatively, click **Browse** to use an image on the server; if necessary, upload an image to the server by clicking **Upload** and selecting an image file to upload. The default is an image of a blue dot located at **Resources/Images/Icons/geolocate-position-32.png**.

- **Zoom Upon Geolocation:** Select this checkbox if you want to zoom to the user's location upon single-reading geolocation (**Find Me**) or following (**Follow Me**); otherwise, clear this checkbox. It is checked by default.

- **Zoom Value:** The scale to which to zoom when **Zoom Upon Geolocation** is selected. The default is **50000** (to 1).

Geolocation Coordinates:

- **Display Coordinates for Single-Reading Geolocation:** Select this checkbox to display the coordinates of the user's location, in addition to showing the geolocation indicator, when the user performs a **Find Me** operation.

If you do not want to show the coordinates for Find Me operations, clear the checkbox.

- **Display Coordinates for Geolocation Tracking:** Select this checkbox to display the coordinates of the user's location, in addition to showing the geolocation indicator, when the user performs a **Track Me** operation.
  If you do not want to show the coordinates for Track Me operations, clear the checkbox.

- **Display Coordinates for Geolocation Following:** Select this checkbox to display the coordinates of the user's location, in addition to showing the geolocation indicator, when the user performs a **Follow Me** operation.
  If you do not want to show the coordinates for Follow Me operations, clear the checkbox.

- **Coordinate Format:** Select the units to use for displaying the coordinates. The options are:

  - **DDM:** Degrees, Decimal Minutes

  - **DMS:** Degrees, Minutes, Seconds

  - **Lat/Long:** Latitude, Longitude

  - **X/Y:** X, Y (in the units of the coordinate system)

    By default, X/Y coordinates are shown in the map's spatial reference. To change the spatial reference that is used for the coordinates, use the **WKID** setting to specify the well-known ID of the coordinate system that you want to use.

- **Coordinate Decimal Precision:** The number of decimal digits to show in the coordinates.

▶ **Before you leave the Geolocation page:**

1. Click **Apply Changes**.

2. Use the Preview hyperlinks to see your configuration.
   See **About the Live Preview for HTML5 Viewers** on page **298** for instructions.

3. To save your changes, click **Save Site**.

38.7.12 Configure the Home Panel for an HTML5 Viewer

The Home Panel is a multipurpose panel with a variety of possible uses. You could use it to:

- Identify your organization.

- Publish a disclaimer.

- Introduce the application.

- Provide instructions for working with the application.

- Provide hyperlinks that run viewer commands or workflows.

You can configure the viewer to show the Home Panel when the user launches the viewer. In this case, the Panel serves as a welcome page.

The contents of the Home Panel are defined using HTML markup. The contents can include text, images, and UI elements like buttons and links that launch web pages, invoke commands, and run workflows. Initially, the Home Panel contains placeholder text to help give you ideas for how you might use the Panel.
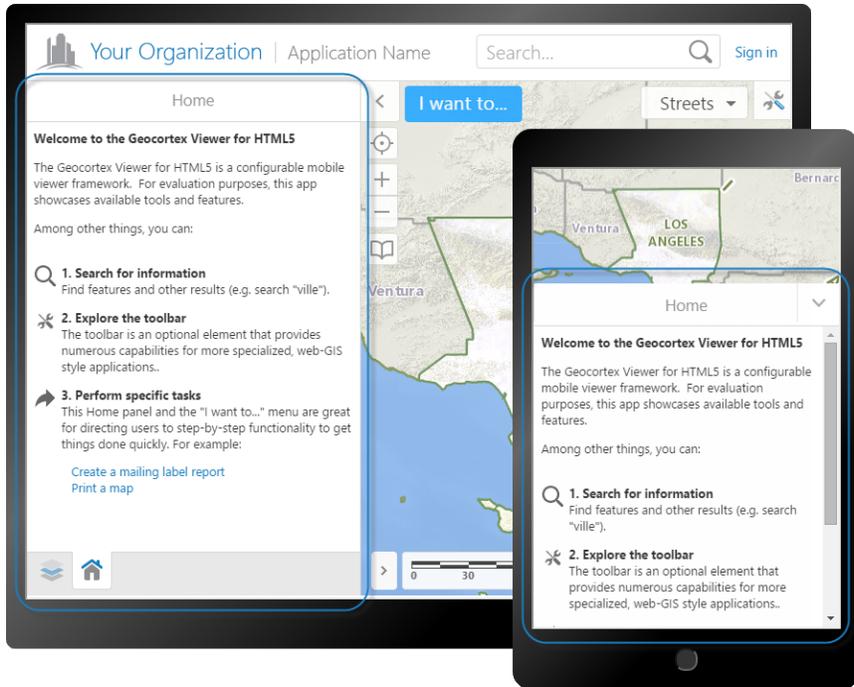
Home Panel in the Desktop interface (rear), and in the Handheld interface

The Home Panel was introduced in version 1.3 of the HTML5 Viewer.

▶ **To open an HTML5 Viewer's Home Panel page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Home Panel**.
   The Home Panel page opens.

▶ **Before you configure settings on the Home Panel page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can always configure them separately later without losing any changes you have made.

- If you are sure you want the settings on the Home Panel page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see **About Configuring Multiple Interfaces for HTML5 Viewers** on page **297**.

Settings

The Home Panel page has the following settings:

- **Include Home Panel:** When this checkbox is selected, the Home Panel is available in the viewer. If you do not want the viewer to have a Home Panel, clear the checkbox. By default, the viewer has a Home Panel.

- **Open Home Panel by Default:** When this checkbox is selected:

- In the Handheld interface, the Home Panel displays instead of the map when the viewer launches.

- In the Desktop and Tablet interfaces, the Data Frame has a tab for the Home Panel when the viewer launches. The user can click ❯ to see the Home Panel if the Data Frame is closed. Alternatively, the user can click the Home button 🏠 in the toolbar to see the Home Panel.

    You can configure the Data Frame to open when the viewer launches by selecting the Open By Default checkbox on the Look and Feel page in Manager.

By default, the Open Home Panel by Default checkbox is not selected.

If you clear the Open Home Panel by Default checkbox but leave the Include Home Panel checkbox selected, the user can click the Home button 🏠 in the toolbar to open the Home Panel.

- **Title:** The title that appears at the top of the Home Panel.

    If your viewer is going to be available in more than one language, enter the text key that the Home Panel title is assigned to. See **About User Interface Text in HTML5 Viewers** on page **299** for more information on using text keys.

    The default title is `@language-common-welcome`.

- **Content:** The HTML markup that defines the contents of the Home Panel. The Content box provides a Rich Text Editor with a toolbar at the top. By default, the Rich Text Editor is open in the Content box.

    If the Rich Text Editor does not have a particular tool that you want, or you prefer to work directly in the HTML markup, click the Show Source icon 〈〉 at the end of the toolbar. This displays the HTML markup in the Content box, so you can edit the HTML markup directly.

    To return to the Rich Text Editor, click the 〈〉 icon again. You can switch between the Rich Text Editor and the HTML markup as many times as you want.

▶ **To configure the Home Panel:**

1. On the **Home Panel** page, select the **Include Home Panel** checkbox.

2. If you want the Data Frame to have a tab for the Home Panel when the user launches the viewer, select the **Show Home Panel** checkbox.

3. In the **Title** box, type the title that you want to appear at the top of the Home Panel. You can use a text key or the literal text.

4. In the **Content** box, create the contents of the Home Panel.

    Use the Rich Text Editor that displays by default, or click the Show Source icon 〈〉 to work in the HTML markup.

5. Click **Apply Changes**.

6. If you want the user to see the Home Panel when the Desktop or Tablet interface launches, you must configure the Data Frame to open:

    > **NOTE** The Handheld interface does not have a Data Frame; if you want the Home Panel to be the first thing the user sees when the viewer launches, all you have to do is select Include Home Panel and Show Home Panel.

    a. Click **Look and Feel** in the side panel.
        The Look and Feel page opens.

    b. In the **Data Frame** area, select the **Open By Default** checkbox.

    c. Click **Apply Changes**.

7. Click **Save Site**.

See Also...

> **About User Interface Text in HTML5 Viewers** on page **299**

38.7.13 Configure Instant Search in the HTML5 Viewer

Before you configure Instant Search settings in a viewer, you should configure Instant Search in the site. For information, see About Instant Search.

The Instant Search page allows you to configure Instant Search settings for a viewer. In general, you should not need to change these settings—the default values have been adjusted to work for the speed people usually type, the amount of information people can realistically work with, and so on. The only setting you might want to change is Maximum Results, which limits the number of search results that are shown.

> You can navigate between search hints by pressing the **up arrow** (↑) or **down arrow** (↓) keys.

▶ **To open an HTML5 Viewer's Instant Search page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Instant Search**.
    The Instant Search page opens.

▶ **Before you configure settings on the Instant Search page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can always configure them separately later without losing any changes you have made.

- If you are sure you want the settings on the Instant Search page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see **About Configuring Multiple Interfaces for HTML5 Viewers** on page **297**.

Settings

The Instant Search page has the following settings:

- **Search Hints:** When this check box is selected, the viewer suggests search terms to the user. The user can click a hint to search for the term given in that hint. By default, the Search Hints check box is selected.
  When the Search Hints check box is cleared, the viewer does not display search hints.

- **Give Precedence to Nearby Results:** To rank search results by how close they are to the center of the current map and relevance to search terms, check this check box. To rank search results only by relevance to search terms, uncheck this check box. By default, this check box is checked.

- **Autocomplete Delay (ms):** The number of milliseconds to wait after the user stops typing before search hints are displayed.

- **Minimum Prefix length:** The number of characters the user must type before search hints are displayed.

- **Maximum Search Hints:** The maximum number of search hints to display.

- **Maximum Results:** The maximum number of search results to show.

▶ **Before you leave the Instant Search page:**

1. Click **Apply Changes**.

2. Use the Preview hyperlinks to see your configuration.
   See **About the Live Preview for HTML5 Viewers** on page **298** for instructions.

3. To save your changes, click **Save Site**.

38.7.14 Configure the Layer List for an HTML5 Viewer

The Layer List page in Manager has settings that control the appearance and behavior of the Map Layers panel that is displayed on the left side of the viewer. The Map Layers panel contains the configurable directory of folders, map services, layers and base maps that are available in the viewer. It also contains a menu to select a layer theme.

You can use Manager to control which folders, map services and layers are initially turned on in the Map Layers panel when a user launches the map. For more information, see **The Layer List** on page **184**.
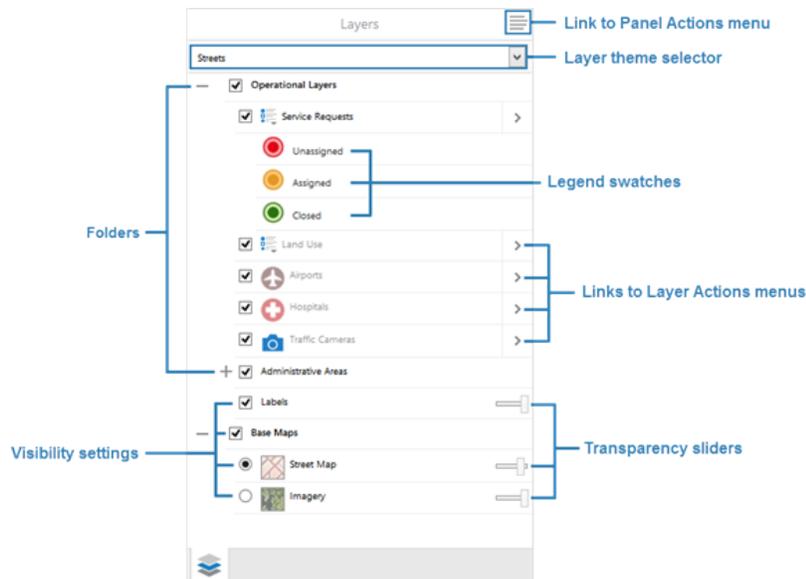
Layer List showing map services and layers

▶ **To open an HTML5 viewer's Layer List page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Layer List**.
   The Layer List page opens.

▶ **Before you configure settings on the Layer List page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can configure them separately later without losing any changes you have made.

- If you are sure you want the settings on the Geolocation page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see **About Configuring Multiple Interfaces for HTML5 Viewers** on page **297**.

Settings

The Layer List page has the following settings:

- **Show Transparency Slider:** Select this checkbox if you want to display transparency sliders for each map service; otherwise, clear this checkbox. It is checked by default.

- **Include Legend Swatches:** Select this checkbox if you want to enable the ability to display legend swatches within the layer list; otherwise, clear this checkbox. It is checked by default.

- **Auto Expand Swatches:** Select this checkbox if you want to automatically display all legend swatches for each layer within the layer list; otherwise, clear this checkbox. It is unchecked by default.

- **Show Swatches For Visible Layers Only:** Select this checkbox if you want to only display legend swatches for layers that are visible; otherwise, clear this checkbox. It is unchecked by default.

▶ **Before you leave the Layer List page:**

1. Click **Apply Changes**.

2. Use the Preview hyperlinks to see your configuration.
   See **About the Live Preview for HTML5 Viewers** on page **298** for instructions.

3. To save your changes, click **Save Site**.

38.7.15 Configure Pushpins for an HTML5 Viewer

The Pushpins page in Manager has settings that control the appearance of pushpins that appear for each feature on the current page of the search results. The pushpin is placed in the center of each feature, with a specified offset. Clicking the pushpin displays a map tip, if configured.
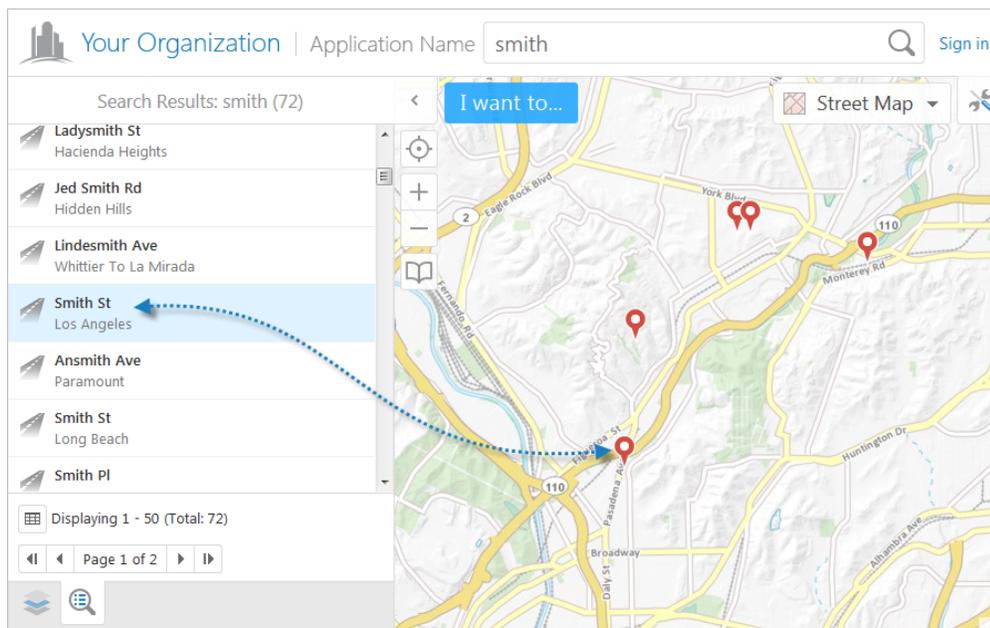
NOTE If you add markup to a map that has pushpins displayed, the markup appears behind the pushpins by design.

NOTE Pushpins are supported with geocoders and workflows.

▶ **To open an HTML5 viewer's Pushpins page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Pushpins**.
   The Pushpins page opens.

▶ **Before you configure settings on the Pushpins page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can configure them separately later without losing any changes you have made.

- If you are sure you want the settings on the Pushpins page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

Although it is possible to configure pushpins for the Handheld interface, doing so will have no effect since pushpins are not currently supported by the Handheld interface.

For more information, see **About Configuring Multiple Interfaces for HTML5 Viewers** on page **297**.

Settings

The Pushpins page has the following settings:

- **Enabled:** Check this check box if you want pushpins to appear for each feature of the search results; otherwise, uncheck it. It is checked by default.

- **Pushpin Image:** The URL to the image that represents the pushpin. Type the URL in the text box. Alternatively, click **Browse** to use an image on the server; if necessary, upload an image to the server by clicking **Upload** and selecting an image file to upload. The default is a red pushpin image located at **Resources/Images/Pushpins/map-marker-red-32.png**. Other colors available out-of-the-box include blue, green, purple and yellow.

- **Pushpin Marker Width:** The width of the pushpin in pixels. This is typically set to the width of the pushpin image, otherwise the image will be scaled. The default is **32**.

- **Pushpin Marker Height:** The height of the pushpin in pixels. This is typically set to the height of the pushpin image, otherwise the image will be scaled. The default is **32**.

- **Offset X:** The number of pixels to horizontally offset the pushpin image. In other words, the distance along the X-axis between the center of the feature and the center of the pushpin image. Use a negative integer to place the pushpin to the left of the feature's center. The default is **0**.

- **Offset Y:** The number of pixels to vertically offset the pushpin image. In other words, the distance along the Y-axis between the center of the feature and the center of the pushpin image. Use a negative integer to place the pushpin below the feature's center. The default is **16**, because the pointer is at the bottom of the default image, which is 32 pixels high.
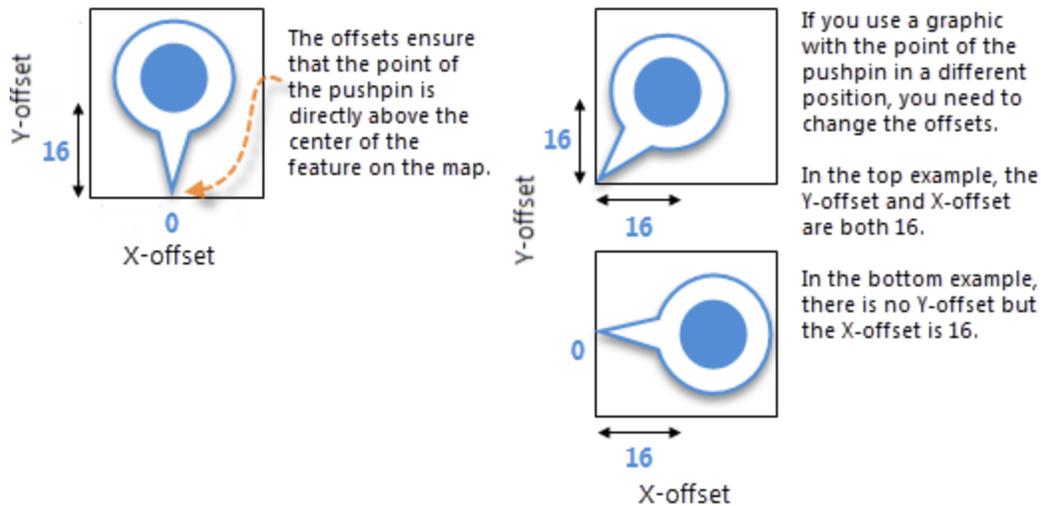

Before you leave the Pushpins page:

1. Click **Apply Changes**.

2. Use the Preview hyperlinks to see your configuration.
   See **About the Live Preview for HTML5 Viewers** on page **298** for instructions.

3. To save your changes, click **Save Site**.

38.7.16 Configure the Toolbar for an HTML5 Viewer

By default, a toolbar has a few basic tools in it to navigate the map, identify features, and print the map. As of version 2.4, there are two types of toolbars available:

- **Tabbed Toolbar:** Includes tabs and groups to organize tools in a particular order. This is the default toolbar for the Desktop and Tablet interfaces, and appears below the banner when activated. It may also be used in the Handheld interface.

- **Compact Toolbar:** Does not include tabs or groups and is designed to be simple and compact. This is the default toolbar for the Handheld interface, and appears at the top of the screen when activated. It may also be used in the Desktop and Tablet interfaces, where it appears below the banner.
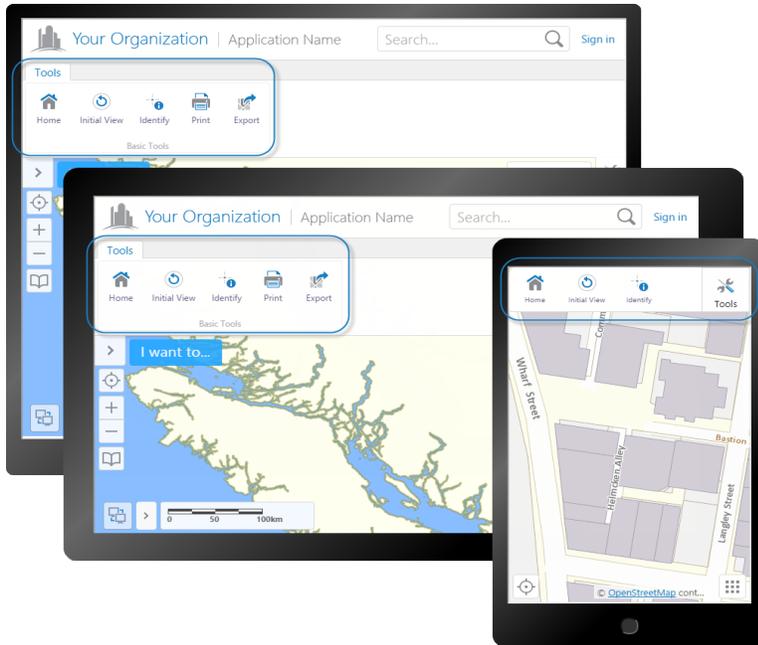
The Tabbed Toolbar in the Desktop (back) and Tablet (middle) interfaces; and the Compact Toolbar in the Handheld interface

When the user launches the viewer, the toolbar is initially closed by default. To open the toolbar, the user clicks the icon in the upper right corner of the map. In the Handheld interface, if the map is not open, the user must open the map to see the toolbar icon. In the Desktop and Tablet interfaces, the user can also double-click the banner.

Most tools in the HTML5 viewer are sticky by default—they remain active (selected) until deselected by the user. This allows the user to use a tool repeatedly without having to reselect it each time. You can turn off stickiness in the configuration. Each tool has a setting for stickiness, so you can make some tools sticky, and others not sticky.

You can use the toolbar in its default configuration, or customize it by adding, modifying, and removing tools. For the Tabbed Toolbar, you can also reorganize the toolbar by adding, modifying, and deleting groups and tabs, and by moving tools to different groups or tabs.

To configure the toolbar, edit the viewer in Manager and click Toolbar in the side panel. The Toolbar page has two lists—a list of Available Tools on the left, and a list of tools in the Configured Toolbar on the right. To add a tool to the toolbar, drag the tool from the Available Tools list and drop it where you want it on the Configured Toolbar. To remove a tool from the toolbar, click the Remove icon .
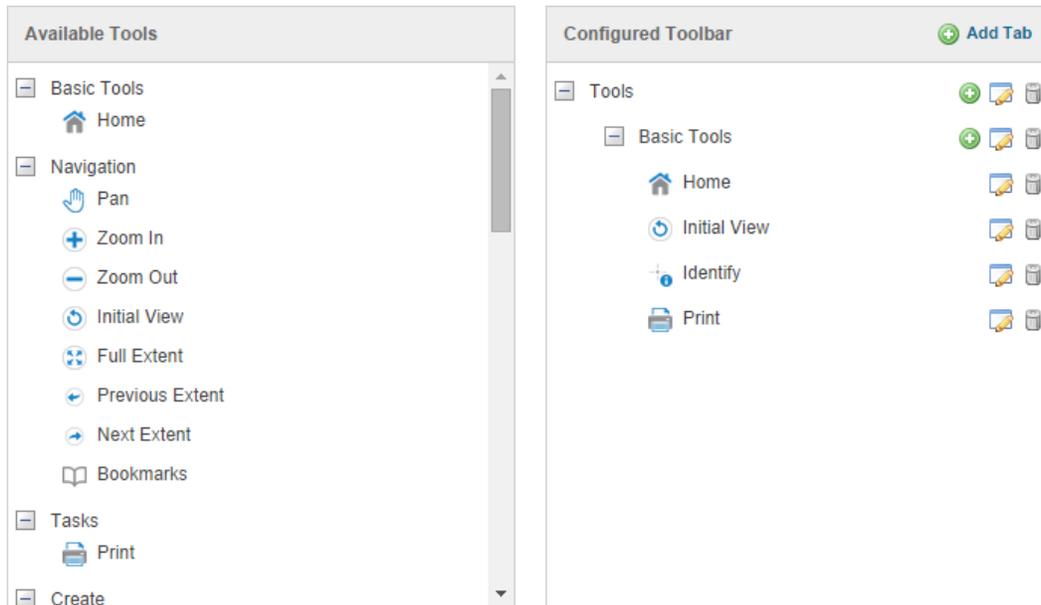
Drag and drop tools to customize the toolbar

You can add the following types of item to the toolbar:

- **Buttons:** When clicked, a button immediately runs its command using the parameter that is configured for it, if it has one. For a list of HTML5 Viewer commands, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

- **Toggle Buttons:** When clicked, a toggle button either turns on or off. Because of this, a toggle button can run two commands immediately when clicked: one when it is turned on, and another when it is turned off. When a toggle button is turned on, a selected checkbox will appear on the button. The commands may be different, or the commands may be identical but have different parameters. For a list of HTML5 Viewer commands, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center. A toggle button may optionally be associated with a toggle state.

- **Tools:** When clicked, a tool waits for the user to draw a shape on the map, and then runs its command using the geometry created by the user as its parameter. For a list of HTML5 Viewer commands, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

- **Multitools:** A multitool offers the user a menu of various related tools or buttons to use.

- **Regions:** A region is an area in the toolbar that contains custom content. For information on adding custom content to a toolbar region, contact Geocortex Support (https://support.geocortex.com/).

The toolbar is optional. You can turn it off using the Remove Toolbar function.

▶ **To open a viewer's Toolbar page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Toolbar**.
   The Toolbar page opens.

> **Before you configure settings on the Toolbar page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can always configure them separately later without losing any changes you have made.

- If you are sure you want the settings on the Toolbar page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

> By default, the Toolbar is configured individually because the Tabbed Toolbar is the default for the Desktop and Tablet interfaces, while the Compact Toolbar is the default for the Handheld interface.

For more information, see **About Configuring Multiple Interfaces for HTML5 Viewers** on page **297**.

> **To configure the type of toolbar to use:**

1. Beside **Active Toolbar**, select either **Tabbed Toolbar** or **Compact Toolbar**.

   > To specify the number of tools to display at once in the Compact Toolbar, type a number in **# of Tools to Display**.

> **To open the toolbar when the viewer starts:**

1. Check the **Open Toolbar by Default** checkbox.

> **To use a preset Tabbed Toolbar:**

1. Click **Load Preset Toolbar**.

2. To use the default Tabbed Toolbar, click **Standard (Default)**. To use a comprehensive Tabbed Toolbar with nearly all tools, click **Web GIS (Full)**.

   > The **Web GIS (Full)** toolbar does not include Offline Management tools, as these tools require the Geocortex Mobile App Framework.

> **To limit the number of tools displayed at once in the Compact Toolbar:**

1. Type a number in **# of Tools to Display**. The minimum is **3** and the maximum is **9**. The default is **4**.

   > This only applies to the Desktop and Tablet interfaces; it does not apply to the Handheld interface.

> **To disable or re-enable tool stickiness:**

1. Click the **Edit** icon beside the tool.

2. To disable stickiness, clear the **Is Sticky** checkbox.

3. To re-enable stickiness, select the **Is Sticky** checkbox.

▶ **To add a tab to the toolbar:**

1. In the **Configured Toolbar** area, click ⊕ **Add Tab**.
    The Add Tab dialog box opens.

2. In the **Display Name** box, type the text to appear on the tab.

    💡 If your viewer is going to be available in more than one language, instead of typing the literal text, type the text key that the tab display name is assigned to. See **About User Interface Text in HTML5 Viewers on page 299** for more information on using text keys.

3. Click **OK**.
    The tab is added to the bottom of the Configured Toolbar area.

4. To move the tab to a different location in the toolbar, click the tab in the **Configured Toolbar** area and drag it to its new location.

▶ **To add a group to a tab:**

1. In the **Configured Toolbar** area, click the ⊕ icon beside the tab to which you want to add the group.
    The Add Group dialog box opens.

2. In the **Display Name** box, type the name for the group. You can use a text key or the literal text.
    In the Desktop and Tablet interfaces, the name appears at the bottom of the group, under the group's buttons and tools. In the Handheld interface, the name appears at the top of the group.

3. In the **Layout** drop-down list, select the layout size for the group: either **Small** or **Large**.
    In the Desktop and Tablet interfaces, the **Small** Layout causes items in the group to have smaller icons, stacked in pairs. In the Handheld interface, the icons are always large, regardless of the Layout setting.

4. Leave the **Multitool** checkbox cleared.

5. Click **OK**.
    The group is added as the last group in the tab.

6. To move the group to a different location in the toolbar, click the group in the **Configured Toolbar** area and drag it to its new location.

To add a multitool to a tab:

A multitool acts as a menu of various related tools or buttons.

1. Use one of the following methods to add the multitool:

   - **Drag and Drop:**

     a. Click the multitool 🛠 in the **Available Tools** panel, and then drag it to the **Configured Toolbar** panel. For example, the 🛠 **Draw** multitool.

     b. Click the **Edit** button 📝 beside the multitool in the **Configured Toolbar** panel.
     The Edit Multitool dialog box opens.

   - **Menu Option:**

     a. In the **Configured Toolbar** area, click the ⊕ icon beside the tab to which you want to add the multitool.
     The Add Group dialog box opens.

2. In the **Display Name** box, type the name for the multitool. You can use a text key or the literal text.

3. Select the **Multitool** checkbox.

   💡 It is possible to convert the multitool into a group by unchecking the **Multitool** checkbox. While it is possible to include a multitool within a group, it is not possible to include a group within a group. A group can only be within a tab.

4. Click **OK**.
   The multitool is added as the last item in the tab.

5. To move the multitool to a different location in the toolbar, click the multitool in the **Configured Toolbar** area and drag it to its new location.

   📝 To view and edit the items within a multitool, click the multitool icon 🛠.

   💡 A multitool cannot contain other multitools.

To add a button to a group:

A button runs its command immediately when the user clicks the button. If the user needs to draw a geometry for the command to operate on, you must add a tool instead of a button.

1. Use one of the following methods to add the button:

   - **Drag and Drop:**

a. Click the button in the **Available Tools** panel, and then drag it to the **Configured Toolbar** panel.

b. Click the **Edit** button beside the button in the **Configured Toolbar** panel.
The Edit Button dialog box opens.

- **Menu Option:**

    a. In the **Configured Toolbar** area, click the icon beside the group that you want to add the button to.

    b. Click **Add Button**.
    The Add Button dialog box opens.

2. Configure the button's settings:

- **Name:** The name that you want to appear on the button. You can use a text key or the literal text.
For example, **@language-toolbar-markup-clear** or **Clear Markup**.

- **Tooltip:** The text for the tooltip that opens when the user positions the pointer over the button. You can use a text key or the literal text.
For example, **@language-toolbar-markup-clear-tooltip** or **Clear all drawings from the map**.

- **Hide on Disable:** When this checkbox is selected and the button's command cannot run under the current configuration or run-time conditions, the button does not show in the toolbar.
For example, if the Include Home Panel checkbox is cleared, a command to show the Home Panel cannot run because the viewer does not have a Home Panel. In this case, selecting the Hide on Disable checkbox for the Home Panel button hides the button.
If the checkbox is cleared and the button's command cannot run, the button shows in the toolbar, but it is grayed out.

- **Image URI:** The URI for the icon that you want to appear on the button. The image must be an appropriate size to fit on the button; for example, 24 x 24 pixels. Valid file formats are PNG, BMP, JPG, and JPEG.
To browse to the image file:

    a. Click **Browse**.
    The Select File dialog box opens.

    b. Expand the hierarchy in the left panel. When you can see the folder where you keep images for this viewer, open the folder.

    c. If the file has not yet been uploaded to the folder, click **Upload** and upload the file.

    d. Select the file.

    e. Click **OK**.

- **Command:** The command that the button runs when the user clicks the button. Click in the **Command** box to open a drop-down list of commands, and then select a command from the list.
For more information, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

- **Command Parameter:** The value for the command to use as its parameter, if it has a parameter. Parameters may either be simple strings or complex objects containing any number of parameters.

For more information, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

3. Click **OK**.

   The button is added as the last button in the group.

4. To move the button to a different location in the toolbar, click the button in the **Configured Toolbar** area and drag it to its new location.

▶ **To add a toggle button to a group:**

A toggle button runs a command immediately when the user clicks it to turn it on, and a different command when the user clicks it to turn it off.

1. Use one of the following methods to add the button:

   - **Drag and Drop:**

     a. Click the button in the **Available Tools** panel, and then drag it to the **Configured Toolbar** panel.

     b. Click the **Edit** button 📝 beside the button in the **Configured Toolbar** panel.
        The Edit Button dialog box opens.

   - **Menu Option:**

     a. In the **Configured Toolbar** area, click the 🟢 icon beside the group that you want to add the button to.

     b. Click **Add Button**.
        The Add Button dialog box opens.

2. Configure the button's settings:

   - **Toggle On Configuration:** Configures the toggle-on button, which turns the toggle button on.

     - **Name:** The name that you want to appear on the toggle-on button. You can use a text key or the literal text.
       For example, **@language-toolbar-home-sub** or **Home**.

     - **Tooltip:** The text for the tooltip that opens when the user positions the pointer over the toggle-on button. You can use a text key or the literal text.
       For example, **@language-toolbar-navigation-home-tooltip** or **Returns to introductory page**.

     - **Hide on Disable:** When this checkbox is selected and the toggle-on button's command cannot run under the current configuration or run-time conditions, the toggle-on button does not show in the toolbar.
       For example, if the Include Home Panel checkbox is cleared, a command to show the Home Panel cannot run because the viewer does not have a Home Panel. In this case, selecting the Hide on Disable checkbox for the toggle-on button hides the toggle-on button.
       If the checkbox is cleared and the toggle-on button's command cannot run, the toggle-on button shows in the toolbar, but it is grayed out.

- **Image URI:** The URI for the icon that you want to appear on the toggle-on button. The image must be an appropriate size to fit on the toggle-on button; for example, 24 x 24 pixels. Valid file formats are PNG, BMP, JPG, and JPEG.

  To browse to the image file:

     a. Click **Browse**.

        The Select File dialog box opens.

     b. Expand the hierarchy in the left panel. When you can see the folder where you keep images for this viewer, open the folder.

     c. If the file has not yet been uploaded to the folder, click **Upload** and upload the file.

     d. Select the file.

     e. Click **OK**.

- **Command:** The command that the toggle-on button runs when the user clicks the toggle button to turn it on. Click in the **Command** box to open a drop-down list of commands, and then select a command from the list.

  For more information, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

- **Command Parameter:** The value for the command to use as its parameter, if it has a parameter. Parameters may either be simple strings or complex objects containing any number of parameters.

  For more information, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

- **Toggle Off Configuration:** Configures the toggle-off button, which turns the toggle button off.

  - **Name:** The name that you want to appear on the toggle-off button. You can use a text key or the literal text.

    For example, **@language-toolbar-markup-clear** or **Clear Markup**.

  - **Tooltip:** The text for the tooltip that opens when the user positions the pointer over the toggle-off button. You can use a text key or the literal text.

    For example, **@language-toolbar-markup-clear-tooltip** or **Clear all drawings from the map**.

  - **Hide on Disable:** When this checkbox is selected and the toggle-off button's command cannot run under the current configuration or run-time conditions, the toggle-off button does not show in the toolbar.

    For example, if the user hasn't drawn any markup, a command to clear the markup cannot run because no markup exists. In this case, selecting the Hide on Disable checkbox for the toggle-off button hides the toggle-off button.

    If the checkbox is cleared and the toggle-off button's command cannot run, the toggle-off button shows in the toolbar, but it is grayed out.

- **Image URI:** The URI for the icon that you want to appear on the toggle-off button. The image must be an appropriate size to fit on the toggle-off button; for example, 24 x 24 pixels. Valid file formats are PNG, BMP, JPG, and JPEG.

  To browse to the image file:

  a. Click **Browse**.

  The Select File dialog box opens.

  b. Expand the hierarchy in the left panel. When you can see the folder where you keep images for this viewer, open the folder.

  c. If the file has not yet been uploaded to the folder, click **Upload** and upload the file.

  d. Select the file.

  e. Click **OK**.

- **Command:** The command that the toggle-off button runs when the user clicks the toggle button to turn it off. Click in the **Command** box to open a drop-down list of commands, and then select a command from the list.

  For more information, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

- **Command Parameter:** The value for the command to use as its parameter, if it has a parameter. Parameters may either be simple strings or complex objects containing any number of parameters.

  For more information, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

- **Associated State (Optional):**

  - **Toggle State:** A optional toggle state to associate with the toggle button.

    > For a complete list of states, see "State Reference" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

3. Click **OK**.

   The toggle button is added as the last button in the group.

4. To move the toggle button to a different location in the toolbar, click the toggle button in the **Configured Toolbar** area and drag it to its new location.

▶ To add a tool to a group:

A tool prompts the user to draw a geometry for the tool's command to operate on. If you want the command to run immediately when the user clicks it, you must add a button instead of a tool.

1. Use one of the following methods to add the tool:

   - **Drag and Drop:**

    a. Click the tool in the **Available Tools** panel, and then drag it to the **Configured Toolbar** panel.

    b. Click the **Edit** button ![edit icon] beside the tool in the **Configured Toolbar** panel.

       The Edit Button dialog box opens.

- **Menu Option:**

    a. In the **Configured Toolbar** area, click the ![plus icon] icon beside the group that you want to add the tool to.

    b. Click **Add Tool**.

       The Add Tool dialog box opens.

2. Configure the tool's settings:

- **Name:** The name that you want to appear on the tool. You can use a text key or the literal text.

   For example, **@language-toolbar-markup-rectangle** or **Draw Rectangle**.

- **Tooltip:** The text for the tooltip that opens when the user positions the pointer over the tool. You can use a text key or the literal text.

   For example, **@language-toolbar-markup-rectangle-tooltip** or **Draw a rectangle on the map**.

- **Hide on Disable:** When this checkbox is selected and the tool's command cannot run, the tool does not show in the toolbar.

   If the checkbox is cleared and the tool's command cannot run, the tool shows in the toolbar, but it is grayed out.

- **Image URI:** The URI for the icon that you want to appear on the tool. The icon should be sized to fit on the tool. The image must be an appropriate size to fit on the button. Valid file formats are PNG, BMP, JPG, and JPEG.

   To browse to the image file:

    a. Click **Browse**.

       The Select File dialog box opens.

    b. Expand the hierarchy in the left panel. When you can see the folder where you keep images for this viewer, open the folder.

    c. If the file has not yet been uploaded to the folder, click **Upload** and upload the file.

    d. Select the file.

    e. Click **OK**.

- **Command:** The command that the tool runs after the user has drawn the geometry for the command to operate on. Click in the **Command** box to open a drop-down list of commands, and then select a command from the list.

   For more information, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

- **Draw Mode:** The type of geometry that the user will draw.

- **Status Text:** Optional text to display on the map to provide guidance to the user. You can use a text key or the literal text.

For example, **@language-toolbar-markup-rectangle-desc** or **Click and drag on the map to draw a rectangle on the map**.

- **Is Sticky:** When this checkbox is selected, tools remain active (selected) until deselected by the user—the tools are "sticky". This allows the user to use a tool repeatedly without having to reselect it each time.
  If you do not want a tool to remain selected after it is used, clear the Is Sticky checkbox.

3. Click **OK**.
   The tool is added as the last tool in the group.

4. To move the tool to a different location in the toolbar, click the tool in the **Configured Toolbar** area and drag it to its new location.

▶ **To add a region to the toolbar:**

> **NOTE** To add content to a region that you created in Manager, you must edit the viewer's configuration file. Refer to the *Geocortex Viewer for HTML5 Administrator and Developer Guide* for instructions.

1. In the **Configured Toolbar** area, click the **Add Toolbar Item** icon ⊕ beside the group that you want to add the region to.
   A drop-down list opens.

2. Click **Add Region**.
   The Add Region dialog box opens.

3. **Region Name:** Type a name for the region.
   The name is visible in Manager only—it is not visible in the viewer.

4. Click **OK**.
   The region appears at the bottom of the group.

5. To move the region to a different location in the toolbar, click and drag it.

▶ **To edit a tab, group, or toolbar item:**

1. Click the **Edit** icon 🖉 next to the item you want to modify.
   The Edit dialog box opens.

2. Edit the item as desired.

3. Click **OK.**

▶ **To change the order of items in the toolbar:**

You can move tabs, groups, buttons, tools and regions within the toolbar.

1. Click and hold the item you want to move.

2. Drag the item to its new location in the toolbar.

▶ **To revert to the default toolbar:**

⚠️ Reverting to the default toolbar permanently deletes your custom toolbar.

Follow the instructions that apply to your type of toolbar:
- **Tabbed Toolbar:**
    1. Click **Load Preset Toolbar**.

    2. Click **Standard (Default)**.

- **Compact Toolbar:**
    1. Click the **Revert to Default Toolbar** button.

The configuration for the default toolbar appears in the Configured Toolbar area.

▶ **To remove the toolbar:**

If you do not want the viewer to have a toolbar, you can remove the toolbar.

⚠️ Removing the toolbar permanently deletes any customizations you have made to the toolbar.

1. Click the **Remove Toolbar** button.
   You are prompted to confirm.

2. Click **OK**.

▶ **To add back the toolbar if you have removed it:**

Follow the instructions that apply to your type of toolbar:
- **Tabbed Toolbar:**
    1. Click **Load Preset Toolbar**.

    2. Click **Standard (Default)**.

- **Compact Toolbar:**
    1. Click the **Revert to Default Toolbar** button.

The configuration for the default toolbar appears in the Configured Toolbar area.

▶ **Before you leave the Toolbar page:**

1. Click **Apply Changes**.

2. Use the Preview hyperlinks to see your configuration.
   See **About the Live Preview for HTML5 Viewers** on page **298** for instructions.

3. To save your changes, click **Save Site**.

See Also...

About User Interface Text in HTML5 Viewers on page **299**

38.7.17 Configure Tool Behavior in an HTML5 Viewer

The Tool Behavior page in Manager contains settings that define how the Identify, Buffer and Measurement Tools operate in each shells of the HTML5 Viewer. In addition to controlling which layers are affected by the Identify tool, you can set the projection ID and default units to use for buffering and measuring distances and areas. It is also possible to set the type of calculation to use for measurement, and select whether or not to add the markup to the map automatically, or to enable prediction.

▶ **To open the Tool Behavior page for the HTML5 viewer in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Tool Behavior**.
   The Tool Behavior page opens.

▶ **Before you configure settings on the Tool Behavior page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can always configure them separately later without losing any changes you have made.

- If you are sure you want the settings on the Tool Behavior page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see **About Configuring Multiple Interfaces for HTML5 Viewers** on page **297**.

Settings

The Tool Behavior page has the following settings:

Identify Tools:

- **Pixel Tolerance:** The maximum number of pixels away from a feature the user can click with a point-based Identify tool in order to identify the feature. The default is **5**.

  > NOTE: This does not apply to polygon-based identify operations, which can be manually modified via the `polygonPixelTolerance` property in the configuration file.

- **Visible Layers Only:** To only include layers marked as visible in identify operations, select this checkbox; otherwise, clear this checkbox. By default, this checkbox is selected.

- **Layers in Visible Scale Range Only:** To only include layers within the visible scale range in identify operations, select this checkbox; otherwise, clear this checkbox. By default, this checkbox is selected.

Buffer: The buffering tool performs geodesic buffering.

> **NOTE** Buffering requires an ArcGIS Server 10.1 or newer geometry service.

- **Projection WKID:** Add the well-known ID (WKID) of the projection to use, or leave the field blank to disable projection. By default, projection is disabled.

- **Buffer Units:** Select the distance units to be available for buffering. Possible values include: **Feet (ft)**, **Yards (yd)**, **Meters (m)**, **Kilometers (km)**, **Miles (mi),** and **Nautical Miles (NM)**. By default, all units are selected except for **Yards (yd)**.

- **Default Unit:** Select the default unit of distance to use for buffering. The default is **Kilometers (km)**.

Measurement:

- **Projection WKID:** Add the WKID of projection for the Measurement module to use, or leave the field blank to disable projection. By default, projection is disabled. This setting only applies if the Calculation Type is set to Planar.

- **Default Length Unit:** Select the default unit of measurement to use for length. Possible values include **Feet (ft)**, **Yards (yd)**, **Meters (m)**, **Kilometers (km)**, **Miles (mi),** and **Nautical Miles (NM)**.

- **Default Area Unit:** Select the default unit of measurement to use for area. Possible values include **Feet^2 (ft^2)**, **Yard^2 (yd^2)**, **Meter^2 (m^2)**, **Kilometer^2 (km^2)**, **Mile^2 (mi^2)**, **Nautical Mile^2 (NM^2)**, **Acres (ac)**, and **Hectares (ha)**.

- **Calculation Type:** Select the calculation type to use when calculating measurements.

  > **NOTE** Geodesic measurement requires an ArcGIS Server 10.1 or newer geometry service.

  - **Planar:** Use Planar if you want to specify a particular WKID and you want to ensure that this projection is used no matter where in the world the measurements are taken. Planar strictly enforces a particular WKID. If you enter the incorrect WKID for a particular area, you can get inaccurate measurements. Planar measurements use 2D Cartesian mathematics to calculate area and length.

    > **NOTE** If you select the Planar calculation type and do not specify a Projection WKID, no projection takes place and measurements are computed in the default spatial reference of the site.

    > **NOTE** Essentials only allows a Projection WKID to be selected for the Planar calculation type. A Projection WKID is not required for the Geodesic or Preserve Shape calculation types.

  - **Geodesic:** Use Geodesic if you intend to measure very long distances that require accounting for the curvature of the earth. The Geodesic calculation type computes distances, areas and perimeters using only the vertices of the polygon to define the lines connecting the vertices as geodesic segments, independently of the actual shape of the polygon. A geodesic segment is the shortest path between two points on an ellipsoid. The results, when you use a geodesic calculation type, are independent of the input spatial reference.

  - **Preserve Shape:** Use Preserve Shape if you are unsure about which calculation type to use, as it will provide the most accurate results for most users. This calculation type computes distances, areas and perimeters on the surface of the Earth ellipsoid, while preserving the shape of the geometry in its

coordinate system. This means that the true area and length will be calculated for the geometry that is displayed on the map. This is the default calculation type.

- **Add as Drawing:** Defines whether or not markup is added to the map by default. The default is `true`.

- **Prediction Enabled:** Defines whether or not the current segment length, total segment length, perimeter, and area are predicted when the cursor hovers over the map for one second. When set to `false`, it disables predictive measurements. The default value is `true`. Prediction makes it possible to see approximately what measurements you would get if you clicked to plot a vertex at a given point.

▶ **Before you leave the Tool Behavior page:**

1. Click **Apply Changes**.

2. Use the Preview hyperlinks to see your configuration.
   See **About the Live Preview for HTML5 Viewers** on page **298** for instructions.

3. To save your changes, click **Save Site**.

See Also...

Configure the Toolbar for an HTML5 Viewer on page **325**

38.7.18 Configure Insight Integration

Geocortex Insight collects data about and reports on GIS infrastructure. If you do not use Geocortex Insight, skip this page.

If you are running Geocortex Insight, you must configure your Viewer applications to send data to the Client Relay Collector in Insight so it can report on viewer activity. The `InsightIntegration` module in Geocortex Viewer for HTML5 collects and sends usage and other data about the viewer to the Client Relay Collector at configurable intervals. The Insight Integration page in Manager enables you to configure the settings required to send this data to Insight.

▶ **To open an HTML5 viewer's Insight Integration page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Insight Integration**.
   The Insight Integration page opens.

▶ **Before you configure settings on the Insight Integration page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can configure them separately later without losing any changes you have made.

- If you are sure you want the settings on the Insight Integration page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see **About Configuring Multiple Interfaces for HTML5 Viewers** on page **297**.

Settings

The Insight Integration page has the following settings:

- **Enabled**: When this checkbox is selected, the Viewer sends data to Insight. If you do not use Insight, clear this checkbox. By default, this checkbox is cleared.

- **Data Relay URI**: The URI to the Insight Client Relay Collector responsible for collecting data.

▶ **Before you leave the Insight Integration page:**

1. Click **Apply Changes**.

2. Use the Preview hyperlinks to see your configuration.
   See **About the Live Preview for HTML5 Viewers** on page **298** for instructions.

3. To save your changes, click **Save Site**.

38.7.19 Configure Optimizer Integration in an HTML5 Viewer

Geocortex Optimizer captures and organizes information about your ArcGIS Server sites and infrastructure. If you have purchased a Geocortex Optimizer license, you can integrate your Geocortex viewers with Optimizer. When a viewer is integrated with Optimizer, the viewer sends usage data to Optimizer's Client API Relay collector. The data is then written to the Optimizer database so you can run reports against it. The data includes information about the viewer's users, the layers and regions that they look at, and the tools that they use.

The Optimizer Integration page in Manager enables you to configure the settings required to send data to Optimizer. If you have not purchased Geocortex Optimizer or you are not using the Client API Relay collector, skip this page. To find out more about Geocortex Optimizer, see the Geocortex website or contact your Geocortex Account Manager.

▶ **To open an HTML5 viewer's Optimizer Integration page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Optimizer Integration**.
   The Optimizer Integration page opens.

▶ **Before you configure settings on the Optimizer Integration page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can configure them separately later without losing any changes you have made.

- If you are sure you want the settings on the Optimizer Integration page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see **About Configuring Multiple Interfaces for HTML5 Viewers** on page **297**.

Settings

The Optimizer Integration page has the following settings:

- **Enabled**: When this check box is selected, the Viewer sends data to Optimizer. If you do not use Optimizer, clear this check box. By default, this check box is cleared.

- **Username**: A phrase indicating that the real username is not available because the user is not signed in. The default is **DefaultUser**.

- **Data Relay URI**: The URI to the Optimizer endpoint responsible for collecting data. If the endpoint is not specified, the Viewer attempts to log back to the same host that the Viewer application is launched from.

▶ **Before you leave the Optimizer Integration page:**

1. Click **Apply Changes**.

2. Use the Preview hyperlinks to see your configuration.
   See **About the Live Preview for HTML5 Viewers** on page **298** for instructions.

3. To save your changes, click **Save Site**.

38.8 Configure a Silverlight Viewer

When configuring a viewer, it is recommended that you verify your configuration frequently. Before verifying, apply your changes and save the site.

▶ **To verify your configuration changes:**

1. If you have not yet launched the viewer, click **Viewer Info** in the side panel, and then click the launch link.
   If you have already launched the viewer, refresh the page.

2. Navigate to the part of the viewer you want to verify.

3. Test any new tools or functions you have added.

38.8.1 Change Viewer Information for a Silverlight Viewer

The Viewer Info page in Manager has meta information and high-level settings such as the Viewer's display name, the location of its configuration file, and a link to launch the Viewer. The launch link provides a quick way to view the changes you make to the Viewer's configuration.

▶ **To open a viewer's Viewer Info page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. Click **Viewer Info** in the side panel.
   The Viewer Info page opens.

Settings

The Viewer Info page has the following settings and information:

- **Display Name:** Used to refer to the Viewer in Manager. It also appears in the Sites Directory (the directory of REST endpoints).

  The display name is not visible to the end user, however, the Viewer's ID is—it appears in the Viewer's URL. The ID is based on the display name at the time the Viewer is created, with spaces converted to underscores. Changing the display name after the Viewer has been created does not change the ID.

- **Path:** The path to the Viewer's configuration. {SitePath} represents the fully qualified path to the folder containing the Site's configuration file.

- **Hidden:** Determines whether the Viewer is listed in the default splash page's drop-down list.

  > **NOTE** In order for this setting to work, you must configure the `RemoteSettings` element in the `Viewer.Settings.xml` file. By default, this file is located in `inetpub\wwwroot\SilverlightViewer_1_7\config`. Follow the instructions in the file.

- **Launch Links:** A hyperlink that launches the Viewer in the current browser.

- **Properties:** Allows you to Create Custom Properties for the Viewer.

▶ **Before you leave the Viewer Info page:**

1. Click **Apply Changes** or **Save Site**.

38.8.2 Change the Look and Feel of a Silverlight Viewer

You can configure many aspects of a viewer's appearance, including the layout, colors, and images used in the viewer's user interface.

In Manager, the Look and Feel page provides settings that control the viewer's appearance. The Look and Feel page has several tabs:

- **Banner tab:** Provides settings that control the banner's images and text.
- **Layout tab:** Provides settings that control the viewer's layout, including the Data frame, Results Frame, and Home Panel.
- **Theme tab**: Provides settings that control the color scheme used throughout the viewer.

▶ **To open a viewer's Look and Feel page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Look and Feel**.
   The Look and Feel page opens.

Configure the Banner

The banner is the area at the top of the viewer that optionally contains the title and logo.

Settings

The Banner tab on Manager's Look and Feel page has the following settings:

- **Browser Title:** The title to display in the browser's title bar or tab.

- **Application Title:** The title to display in the banner. If you want control over the font and size, leave the Application Title box blank, embed the title in an image with the logo, and specify the image using one of the Image URL settings.

- **Left Image URL:** The URL to the image that forms the left side of the banner. This setting is often used for the image containing the logo and title.

- **Background Image URL:** The URL to the banner's background image. Use this setting to add texture to the background color.

- **Right Image URL:** The URL to the image that forms the right side of the banner. This setting is often used for the image containing the logo and title.

- **Show Banner:** If this check box is selected, the banner shows in the viewer. If the check box is cleared, the viewer does not have a banner.

▶ **Before you leave the Banner tab:**

1. Click **Apply Changes** or **Save Site**.

Configure the Layout

The layout settings control what regions the viewer has, their size and position, and whether they are open when the user launches the viewer.
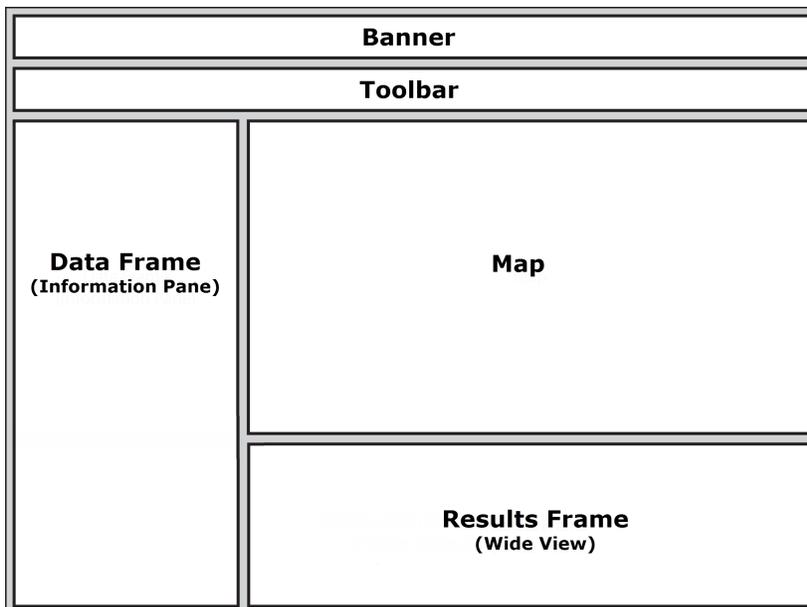
Main areas in a Silverlight viewer

The Layout tab on Manager's Look and Feel page has the following settings:

Toolbar
- **Open by Default:** If this check box is selected, the advanced toolbar is visible when the user launches the viewer. If the check box is cleared, the advanced toolbar is initially collapsed.

General
- **Flow Direction:** The direction of wording and information in the viewer—left to right, or right to left. The default is left to right. Change this setting if your viewer's text is written in a right-to-left language, such as Arabic.

Data Frame (Information Pane)
The data frame is a panel that is pinned to the left or right edge of the viewer. The data frame can be used to display map layers, search results (in list or table format), workflow steps, and more.
- **Open by Default:** If this check box is selected, the side panel is open when the user launches the viewer. If the checkbox is cleared, the side panel is initially closed—it opens automatically when the user performs some action that uses it.
- **Resizable:** If this check box is selected, the user can resize the panel by dragging its edge. If the check box is cleared, the side panel is Default Width wide.
- **Position:** The side of the viewer that the panel is pinned to—left or right. The position of the data frame is not affected by the flow direction.
- **Min Width:** The minimum width that the user can make the panel if it is resizable. If the Resizable check box is cleared, the Min Width setting has no effect.
- **Max Width:** The maximum width that the user can make the panel if it is resizable. If the Resizable check box is cleared, the Max Width setting has no effect.
- **Default Width:** The width of the panel the first time when it opens. If the user resizes the frame, Essentials remembers its new width.

Results Frame (Wide View)
The results frame is a panel that is pinned at the bottom of the viewer. The results frame can be used to display search results (in list or table format), map layers, workflow steps, and more.
- **Results View Region:** The region of the viewer where results, such as search and identify results, are displayed. If you select DataRegion, results display in the side panel. If you select ResultsRegion, results display in the bottom panel.
- **Results View Mode:** The format to display results—list or table. Usually list format is better for the side panel (the data frame) and table format is better for the bottom panel (the results frame).

▶ **Before you leave the Layout tab:**

1. Click **Apply Changes** or **Save Site**.

Configure Fonts and Colors Using Themes

Themes control the fonts and colors that are used in the Viewer. You can independently control colors and fonts for many different aspects of a Viewer, including its panels, buttons, icons, hyperlinks, pop-up menus, and more.

On Manager's Look and Feel page, you can select a factory theme or create a new theme based on an existing theme. Themes are XAML files. XAML is the type of XML that Silverlight uses. Modifying a theme requires editing the markup.

> **To use a factory theme:**

1. On the Look and Feel page, click the **Theme** tab.

2. Select a theme from the **Theme** drop-down list.

3. Click **Apply Changes**.

> **To customize a theme:**

1. Select a theme from the **Theme** drop-down list.

2. Click **Save Copy**.

3. Enter a name for your custom theme.
   The name is visible in Manager only—it is not visible in the viewer.

4. Click **OK**.
   The theme file becomes editable.

5. Edit the markup as desired.

6. Click **Apply Changes**.

7. Click **Save Site**.

> **To define the appearance of the banner:**

Text for the banner must be defined in the Viewer settings in the Banner Module. See the Banner Module in the Geocortex Viewer for Silverlight Administrator and Developer Guide. The global for the banner text is `ApplicationTitle` and its default value is **""** (empty string). This is because the default title of the Geocortex Viewer for Silverlight is actually an image. To customize the banner, you change this image for another or define a title in the Banner Module, and then define the styles in the theme file.

1. Select a customized theme from the **Theme** drop-down list.

2. Scroll down to the section that contains the following code:

```
<!-- BEGIN: Banner -->
  <SolidColorBrush x:Key="AppBackground">#FFFFFFFF</SolidColorBrush>
  <SolidColorBrush x:Key="AppBorderBrush">#FFE6E6E6</SolidColorBrush>
  <System:Double x:Key="AppHeaderFontSize">14</System:Double>
  <Color x:Key="AppHeaderForeground">#FF656169</Color>
  <Thickness x:Key="ApplicationTitleMargin">10,0</Thickness>
<!-- END: Banner -->
```

3. Edit any of the following:

   - **AppBackground**: Defines the background color behind the image using the hex value of the color.

   - **AppBorderBrush**: Defines the color of the border that surrounds the application using the hex value of the number.

   - **AppHeaderFontSize**: Defines the size of the Banner Title font. The default is **14**.

- **AppHeaderForeground**: Defines the color of the Banner Title using the hex value of the color.

- **ApplicationTitleMargin**: Defines the thickness of the margin that surrounds the Banner Title. The default is **10,0**.

▶ **To configure highlight colors:**

You can configure the color to use for highlighting features added to your selection, or the highlight color used globally when a user hovers over an item in the Results List or in Map Tips.

Edit any of the following:

- **HighlightFillColor** and **HighlightBorderColor**: Set the Map Tip highlight color and the hover-over-a-Result highlight color.

- **SelectionFillColor** and **SelectionBorderColor**: Set the color of feature highlights when they are added to your selection.

The highlight settings are applied in the in the Theme.xaml file. The settings are global in scope—they apply to all the layers in the map that do not have Feature Fill Color and Feature Border Color properties configured.

> If you have set the highlight colors in the Feature Border Color and Feature Fill Color fields of the Details tab in Geocortex Essentials, they take precedence over the settings in the Theme.xml file.

1. Select a customized theme from the **Theme** drop-down list.

2. To set the colors for highlights using Map Tips or in the Results List, in the code, scroll down to `<!--BEGIN: Map Highlight Colors -->`.

3. Type in the hex number of the color you want to use for the **HighlightFillColor** and the **HighlightBorderColor**, for example:

```
<!-- BEGIN: Map Highlight Colors -->
<Color x:Key="HighlightFillColor">#99ECEC3A</Color>
<Color x:Key="HighlightBorderColor">#FFCCCC33</Color>
<!-- END: Map Highlight Colors -->
```

4. To set the colors for highlights in your selection, scroll down to `<!-- BEGIN: Selection -->`.

5. Type in the hex number of the color you want to use for the **HighlightFillColor** and the **HighlightBorderColor**, for example:

```
<!-- BEGIN: Selection -->
<Color x:Key="SelectionFillColor">#99ECEC3A</Color>
<Color x:Key="SelectionBorderColor">#FFCCCC33</Color>
```

▶ **To change the appearance of the progress bar:**

To change the appearance of the progress bar that appears when you re-size the map, you configure the Progress Indicator code in the theme.

1. Select a customized theme from the **Theme** drop-down list.

2. Scroll down to the section that contains the following code:

```
<!-- BEGIN: Progress Indicator -->
 <System:Double x:Key="ProgressIndicatorHeight">10</System:Double>
 <System:Double x:Key="ProgressIndicatorWidth">100</System:Double>
 <Color x:Key="ProgressIndicatorColor">#FFFFFBA3</Color>
 <Color x:Key="ProgressIndicatorBackgroundColor">#FF808080</Color>
<!-- END: Progress Indicator -->
```

3. Edit any of the following:

- **ProgressIndicatorHeight**: Increases or decreases the height of the progress indicator. The default is 10.

- **ProgressIndicatorWidth**: Defines the width of the progress indicator. The default is 100.

- **ProgressIndicatorColor**: Defines the color of the progress bar that sweeps over the background. Type in the hex value of the color. The default is a pale yellow.

- **ProgressIndicatorBackgroundColor**: Defines the background color using the hex value of the color. The default is a pale gray.

▶ **To change the default colors and fonts of drawing tools:**

You can change the default styles of the Drawing tools on the toolbar by editing the Symbol Colors section of the Theme .

1. Select a customized theme from the **Theme** drop-down list.

2. Scroll down to the section that contains the following code:

```
<!-- BEGIN: Symbol Colors -->
<!-- MarkerSymbolStyle can be any of the following: Circle, Square, Cross, Diamond,
or Triangle. -->
  <System:String x:Key="MarkerSymbolStyle">Circle</System:String>
  <Color x:Key="MarkerSymbolColor">#FFCC3333</Color>
  <System:Double x:Key="MarkerSymbolOpacity">1</System:Double>
  <System:Double x:Key="MarkerSymbolSize">14</System:Double>
  <!-- LineSymbolStyle can be any of the following: Dash, DashDot, DashDotDot, Dot,
Null, or Solid. -->
  <System:String x:Key="LineSymbolStyle">Solid</System:String>
  <Color x:Key="LineSymbolColor">#FFCC3333</Color>
  <System:Double x:Key="LineSymbolOpacity">0.8</System:Double>
  <System:Double x:Key="LineSymbolWidth">2</System:Double>
  <Color x:Key="FillSymbolFillColor">#FFCC3333</Color>
  <System:Double x:Key="FillSymbolFillOpacity">0.5</System:Double>
  <Color x:Key="FillSymbolBorderColor">#FFCC3333</Color>
  <System:Double x:Key="FillSymbolBorderOpacity">0.8</System:Double>
  <System:Double x:Key="FillSymbolBorderThickness">2</System:Double>
<!-- TextSymbolFontFamily can be any of the following: Arial, Arial Black, Comic
Sans MS, Courier New,Georgia, Lucida Grande Unicode, Trebuchet MS, Segoe UI, or
Webdings. -->
  <FontFamily x:Key="TextSymbolFontFamily">Arial</FontFamily>
```

```
  <Color x:Key="TextSymbolColor">#FF000000</Color>
  <System:Double x:Key="TextSymbolOpacity">1</System:Double>
  <System:Double x:Key="TextSymbolFontSize">14</System:Double>
<!-- END: Symbol Colors -->
```

3. Edit any of the following:

- **MarkerSymbolStyle**: Defines the default marker to use for markup. Options include a Circle, a Square, Cross, Diamond, or Triangle. The default is **Circle**.

- **MarkerSymbolColor**: Defines the default color of the markers, for example, the circle, using the hex value of the color.

- **MarkerSymbolOpacity**: Defines the default transparency of the marker. An opacity value of 1 is completely opaque. A value of 0 is completely transparent. The default is **1**.

- **MarkerSymbolSize**: Defines the default diameter of the marker. The greater the number, the bigger the marker. The default is **14**.

- **LineSymbolStyle**: Defines the default appearance of straight and freehand lines. Options include Dash, DashDot, DashDotDot, Dot, Null, or Solid. The default is **Solid**.

- **LineSymbolColor**: Defines the default color of the lines using the hex value of the color.

- **LineSymbolOpacity**: Defines the default transparency setting for lines. An opacity value of 1 is completely opaque. A value of 0 is completely transparent. The default is **1**.

- **LineSymbolWidth**: Defines the width of all lines in pixels. The greater the number, the wider the lines. The default is **2**.

- **FillSymbolFillColor**: Defines the fill color for polygons, rectangles, arrows, circles, ellipses, and triangles using the hex value of the color.

- **FillSymbolFillOpacity**: Defines the transparency of the fill for polygons, rectangles, arrows, circles, ellipses, and triangles. An opacity value of 1 is completely opaque. A value of 0 is completely transparent. The default is **0.5**.

- **FillSymbolBorderColor**: Defines the color of the border of polygons, rectangles, arrows, circles, ellipses, and triangles by the hex value of the color.

- **FillSymbolBorderOpacity**: Defines the transparency of the fill for polygons, rectangles, arrows, circles, ellipses, and triangles. An opacity value of 1 is completely opaque. A value of 0 is completely transparent. The default is **0.8**.

- **FillSymbolBorderThickness**: Defines the width of the border of all polygons, rectangles, arrows, circles, ellipses, and triangles in pixels. The greater the number, the wider the border. The default is **2**.

- **TextSymbolFontFamily**: Defines the font family to use for text. The default is **Arial**.

- **TextSymbolColor**: Defines the color for text using the hex value of the color.

- **TextSymbolOpacity**: Defines the transparency of the text. An opacity value of 1 is completely opaque. A value of 0 is completely transparent. The default is **1**.

- **TextSymbolFontSize**: Defines the size of the font. The default is **14**.

▶ **To define the appearance of Measure Distance and Area tools:**

You can configure the default style of the tools used to Measure Distance and Measure Area on the toolbar.

1. Select a customized theme from the **Theme** drop-down list.

2. Scroll down to the section that contains the following code:

```
<!-- BEGIN: Measurement -->
  <SolidColorBrush x:Key="MeasurementLabelBackground">#FF000000</SolidColorBrush>
  <SolidColorBrush x:Key="MeasurementLabelFontColor">#FFFFFFFF</SolidColorBrush>
  <SolidColorBrush
x:Key="MeasurementLengthLabelBackground">#00000000</SolidColorBrush>
  <SolidColorBrush
x:Key="MeasurementLengthLabelFontColor">#FF000000</SolidColorBrush>
  <System:Double x:Key="MeasurementLabelFontSize">10</System:Double>
  <SolidColorBrush x:Key="MeasurementLineColor">#FF000000</SolidColorBrush>
  <System:Double x:Key="MeasurementLineWidth">2.0</System:Double>
  <Color x:Key="MeasurementAreaBorderColor">#FF000000</Color>
  <System:Double x:Key="MeasurementAreaBorderWidth">2.0</System:Double>
  <System:Double x:Key="MeasurementAreaBorderOpacity">1.0</System:Double>
  <Color x:Key="MeasurementAreaFillColor">#FF000000</Color>
  <System:Double x:Key="MeasurementAreaFillOpacity">0.25</System:Double>
<!-- END: Measurement -->
```

3. Edit any of the following:

- **MeasurementLabelBackground**: Defines the default background color of labels added when you use the Measurement tools. Use the hex value of the color.

- **MeasurementLabelFontColor**: Defines the default font color of labels added when you use the Measurement tools. Use the hex value of the color.

- **MeasurementLengthLabelBackground:** Defines the default background color of length labels when you use the Measurement tools. Use the hex value of the color. The default is set to fully transparent: #00000000.

- **MeasurementLengthLabelFontColor**: Defines the default font color of length labels added when you use the Measurement tools. Use the hex value of the color. The default is black: #FF000000.

- **MeasurementLabelFontSize**: Defines the default font size on labels added when you use the Measurement tools. The Default is **10**.

- **MeasurementLineColor**: Defines the default color of the drawing added to the map when you use the Measure Distance tool. Use the hex value of the color.

- **MeasurementLineWidth**: Defines the default line width of the drawing in pixels when you use Measure Distance tool. The default is **2.0**.

- **MeasurementAreaBorderColor**: Defines the default border color of polygons when you use the Measure Area tool. Use the hex value of the color.

- **MeasurementAreaBorderWidth**: Defines the width of the border of polygons in pixels when you use the Measure Area tool. The default is **2.0**.

- **MeasurementAreaBorderOpacity**: Defines the opacity of the border of the polygon when you use the Measure Area tool. An opacity value of 1 is completely opaque. A value of 0 is completely transparent. The default is **1.0**.

- **MeasurementAreaFillColor**: Defines the default fill color of polygons when you use the Measure Area tool. Use the hex value of the color.

- **MeasurementAreaFillOpacity**: Defines the default opacity of the fill of polygons when you use the Measure Area tool. An opacity value of 1 is completely opaque. A value of 0 is completely transparent. The default is **0.25**.

▶ **Before you leave the Theme tab:**

1. Click **Apply Changes** or **Save Site**.

38.8.3 ## Configure the Home Panel for a Silverlight Viewer

The Home Panel was added in version 1.9 of the Geocortex Viewer for Silverlight to provide an easy entry point for end users when they first open the Viewer. It is easiest to configure the Home Panel in Manager but you can configure the panel by adding code to the `Viewer.xml` file of a particular Viewer.

Using settings in Manager, you can configure the Home Panel to:

- Be visible when the user first opens the Viewer.

- Close for the rest of the session if the user clicks ⊠.

- Show or hide when the user clicks a tool in the toolbar.

▶ **To configure the Home Panel in Essentials:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Look and Feel**.
   The Look and Feel page opens.

3. Click the **Layout** tab.

4. In the **Home Panel** section, do any of the following:

   - To make the Home panel available in the viewer, select the **Show Home Panel** check box.
     The user will be able to open the Home panel.

   - To turn off the ability of end users to close the Home panel for the duration of the session, clear the **Can Close** check box.
     The Close icon ⊠ will not appear in the corner of the Home panel.

   - To change the image used in the title bar and on the tab of the Home panel, enter the image's URI in the **Icon URI** box, or click **Browse** to load a new icon.

   - To change the title text of the Home panel, type the new text into the **Title** box.

   - To configure the content of the Home panel, use the Rich Text Editor to add text, images, and links to the panel.

> **NOTE** You can add images to the Home panel by entering an absolute or a relative URL. If you use an absolute URL, the image appears in the Rich Text Editor so you can preview it, although this is not recommended. If you use a relative URL, you see only a placeholder icon, for example, . The actual image only appears in the viewer.

- To toggle between the Rich Text mode and HTML mode in the Rich Text Editor, click the **Show Source** icon.

> **NOTE** You can copy and paste HTML or XHTML code into the content box if you are in HTML mode, which allows you to create the content outside of Manager.

> **NOTE** You can add images to the Home Panel by entering an absolute or a relative URL. If you use an absolute URL, the image appears in the Rich Text Editor so you can preview it, although this is not recommended. If you use a relative URL, you see only a placeholder icon, for example, . The actual image only appears in the viewer.

To toggle between the Rich Text mode and HTML mode in the Rich Text Editor, click the **Show Source** icon.

5. If you want the user to be able to see the Home Panel when the Viewer launches, select **Open By Default** in the **Data Frame** area.

   The Home Panel is displayed in the Data Frame. Selecting Open By Default ensures that the Data Frame opens when the Viewer launches.
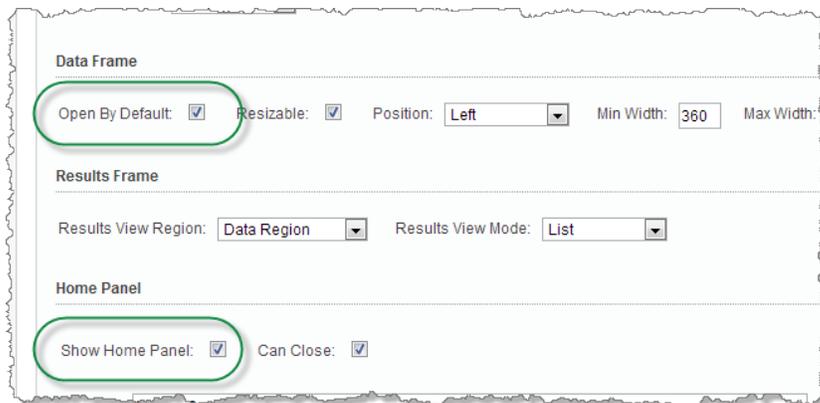
Configuration that ensures the user can see the Home Panel when the Viewer launches

6. Click **Apply Changes**.
7. Click **Save Site**.

▶ To add a tool to open the Home Panel from the Toolbar:

The Standard (Default) toolbar ships with a Home Panel and the Home panel tool already in place. The following procedure is only necessary if your toolbar does not already contain these items.

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Toolbar**.
   The Toolbar page opens.

3. Click **Copy Defaults** to populate the boxes with the default tools available for the Toolbar.

4. In the Configured Toolbar box, beside the Getting Around group, click the **Add Group** icon.

5. In the Add Group dialog, type **Home**, and then click **OK**.

6. From the Available Tools box, under the Getting Around section, drag the **Home** tool into position on the Toolbar.
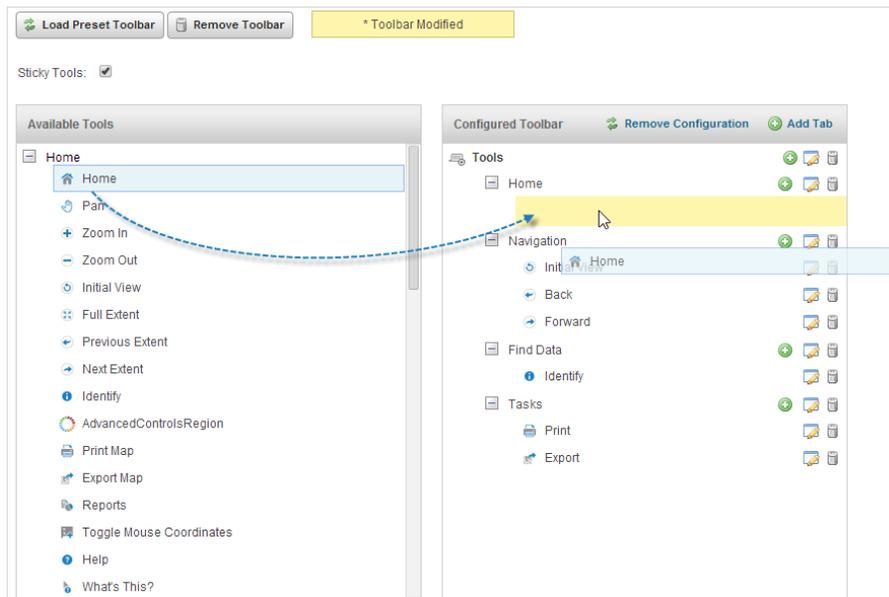
7. Click **Apply Changes**.
8. Click **Save Site**.

38.8.4   Configure the I Want To Menu for a Silverlight Viewer

The default I Want To menu in the Silverlight Viewer contains a number of menu items. You can modify or remove these items, create new ones, and change the order that they appear in the menu.

Each item is represented in the menu by some text and optionally a small image, both of which are customizable. Items also have a description that is used within Manager.

A menu item can execute any Geocortex Viewer for Silverlight command. Refer to the *Geocortex Viewer for Silverlight Administrator and Developer Guide* to see the complete list of Viewer commands.

In addition to the main command that a menu item executes, there are usually preparatory ("batch") commands that you want executed before the main command is executed. For example, a menu item to create freehand markup might first execute the commands to show the Advanced Toolbar, show the Toolbar's tab that contains the markup tools, and activate the freehand markup tool in the Toolbar, in that order.

To open a Viewer's I Want To Menu page in Manager:

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **I Want To Menu**.
   The I Want To Menu page opens.

To create a custom I Want To menu:

1. Click **Copy Defaults**.
   The list of menu items becomes available for editing.

2. Modify the menu as desired.
   Follow the instructions to add, edit, and remove menu items.

To configure the I Want To menu title:
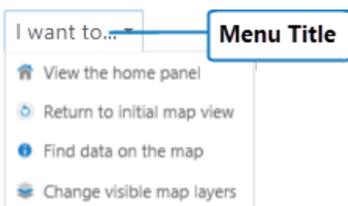
1. In the **Title** box, type the title that you want to appear in the menu's banner.

To add an item to the I Want To menu:

1. Click **Add Menu Item**.
   The Add New Menu Item dialog box opens.

2. **Appearance:** Configure the menu item's appearance:
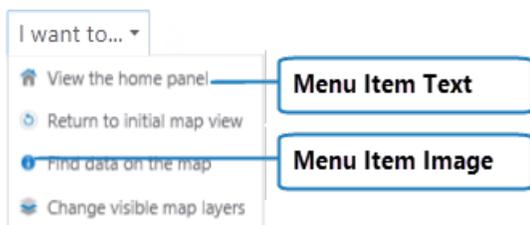
Settings that control the menu item's appearance in the Viewer

- **Text:** Type the text to appear on the I Want To menu item.

- **Description:** Type a short description of what the menu item does. The description is visible in Manager only—it is not visible in the viewer.

- **Image URI:** The URI of the image to display next to the menu item. The image can be any size—it is automatically sized to fit beside the menu item. Valid file formats are PNG, BMP, JPG, and JPEG. The image is optional.
   To browse to the image file:

      a. Click **Browse**.

         The Select File dialog box opens.

      b. Expand the **Resources** | **Images** branch of the **VirtualDirectory** tree in the side panel.

      c. Select the **Images** folder.

      d. Click **Upload**.

         The Upload dialog box opens.

      e. Click **Select**.

      f. Browse to and select the image file you want to use for the menu item.

      g. Click **Open**.

      h. Click **Upload**.

         The file appears in the Filename list.

      i. With the file selected, click **OK**.

3. **Command:** Configure the main command that the menu item executes:

- **Command:** The name of the command to execute when the user selects the menu item. Click in the **Command** box to open a drop-down list of commands.

- **Description:** Type a short description of what the menu item does. The description is visible in Manager only—it is not visible in the Viewer.

    Click ⊕ **Upload**.

Refer to the *Geocortex Viewer for Silverlight Administrator and Developer Guide* to see the complete list of viewer commands and their parameters.

4. Click **OK**.

▶ **To edit the appearance or command of a menu item:**

1. Click the **Edit** icon ✎ next to the item you want to modify.
   The menu item's Details tab displays.

2. Edit the details as desired.

3. Click **Apply Changes**.

4. Click **I Want To Menu** in the side panel to return to the list of I Want To menu items.

▶ **To configure commands to execute when a menu item is clicked:**

1. Click the **Edit** icon ✎ next to the item you want to modify.
   The menu item's Details tab displays.

2. Click the **Batch Commands** tab.

3. Click **Add Batch Command**.
   The Add New Batch Command dialog box opens.

4. To add a command, do the following:

- **Command:** Select the name of the command to execute. Click in the **Command** box to open a drop-down list of commands.

- **Command Parameter:** Add the parameter values to pass to the command when it executes.

Refer to the *Geocortex Viewer for Silverlight Administrator and Developer Guide* to see the complete list of viewer commands and their parameters.

Refer to the *Geocortex Viewer for Silverlight Administrator and Developer Guide* to see the complete list of Viewer commands and their parameters.

5. Click the **Edit** icon next to the item you want to modify.

Click the **Edit** icon next to the item you want to modify.

Refer to the *Geocortex Viewer for Silverlight Administrator and Developer Guide* to see the complete list of Viewer commands and their parameters.
Click **OK**.
The command is added to the list of batch commands.

6. If the command is in the wrong position in the list, click and hold the command's icon and drag the item to its new position.
The batch commands are executed in the same order that they appear in the Manager.

7. To modify a batch command you have already added, click the **Edit** icon next to the command you want to modify.

8. To remove a batch command, click the **Remove** icon beside the command you want to remove and click **OK** when prompted to confirm.

9. When you have added all the batch commands you want and they are in the correct order, click **Apply Batch Order**.

10. Click **I Want To Menu** in the side panel to return to the list of I Want To menu items.

To remove an item from the I Want To menu:

If you remove any of the Silverlight Viewer's out-of-the-box menu items, you can add them back at any time using the Import Items from Default function.

1. Click the **Remove** icon beside the item you want to remove.
You are prompted to confirm.

2. Click **OK**.
The item is removed from the list of menu items.

To add factory items to the I Want To menu:

1. Click **Import Items from Default**.
The Import Menu Items from Default dialog box opens.

2. Select the check box for each factory menu item you want to add to the I Want To menu.

3. Click **OK**.

The items you selected appear at the bottom of the list of menu items.

▶ **To change the order of items in the I Want To menu:**

The menu items are listed in Manager in the same order that they appear in the Viewer.

1. Click and hold the ⬍ icon for the menu item whose position in the menu you want to change.

2. Drag the item to its new position.

3. Repeat these steps until the menu is ordered the way you want it.

▶ **To revert to the default I Want To menu:**

⚠️ Reverting to the default I Want To menu permanently deletes your custom menu.

1. Click the **Revert to Default** button.
   You are prompted to confirm.

2. Click **OK**.

▶ **To remove the I Want To menu:**

If you do not want the Viewer to have an I Want To menu, you can remove the menu.

1. Click the **Remove Menu** button.
   You are prompted to confirm.

2. Click **OK**.

▶ **To add back the I Want To menu if you have removed it:**

1. Click the **Create Menu** button.
   A copy of the default I Want To menu becomes available for editing.

2. Customize the copy of the default menu, or click **Revert to Default** to go back to the default I Want To menu.

▶ **Before you leave the I Want To Menu page:**

1. Click **Apply Changes** and **Save Site**.

38.8.5 Configure the Toolbar for a Silverlight Viewer

The Standard toolbar in the default Silverlight Viewer contains an a small, essential selection of tools. You can add tools and tabs to the default toolbar. There are also several Preset toolbars that you can use as they are, or customize by adding or deleting tools, groups, or tabs.

38.8.5.1 Toolbar Items

You can add the following types of item to the toolbar:

- **Buttons:** When clicked, a button immediately executes its command using the parameter that is configured for it. Refer to the *Geocortex Viewer for Silverlight Administrator and Developer Guide* to see the complete list of Viewer commands.

- **Tools:** When clicked, a tool waits for the user to draw a shape on the map, and then executes its command using the geometry created by the user as its parameter.

- **Regions:** A region is an area in the Toolbar that contains custom content. To add content to a region created in Manager, you must edit the Viewer's configuration file. Refer to the *Geocortex Viewer for Silverlight Administrator and Developer Guide* for instructions.

- **Splitters:** Splitters add space to the Toolbar. You can add as many splitters as you want, anywhere in the Toolbar—between two tools or at the beginning or end of a group.

- **Groups**: Groups are added to a toolbar as an area to hold tools and buttons that have a similar function.
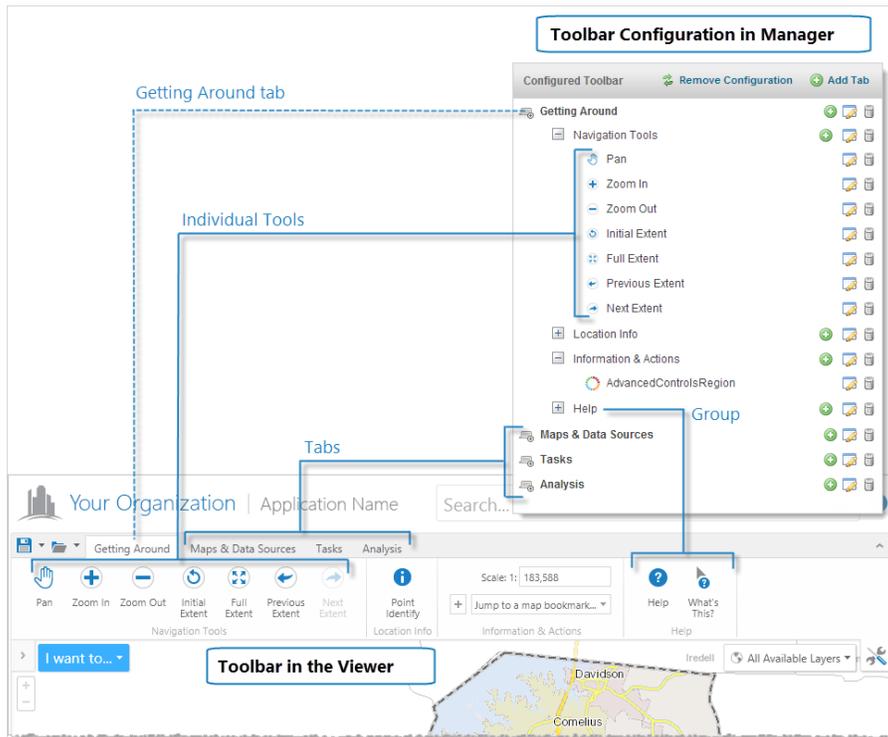
Tabs, groups, and tools in Manager and in the Viewer toolbar

38.8.5.2   Preset Toolbars

From version 2.0 of the Geocortex Viewer for Silverlight, the viewer ships with the **Standard (Default)** toolbar. The Standard Toolbar is a very simple toolbar that contains a small set of essential tools.
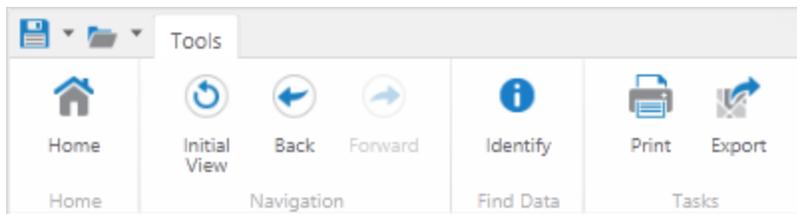
Standard (Default) toolbar

To make it easier to set up more complex toolbars quickly, two other preset toolbars are available when you configure Toolbars:

- **Web GIS (Full)**: The Web GIS toolbar contains a full set of tools grouped onto tabs that are designed for GIS implementations. The Editing tab only activates if the map contains editable layers. Similarly, some tools like Batch Geocode, only activate when a geocoding service is configured.
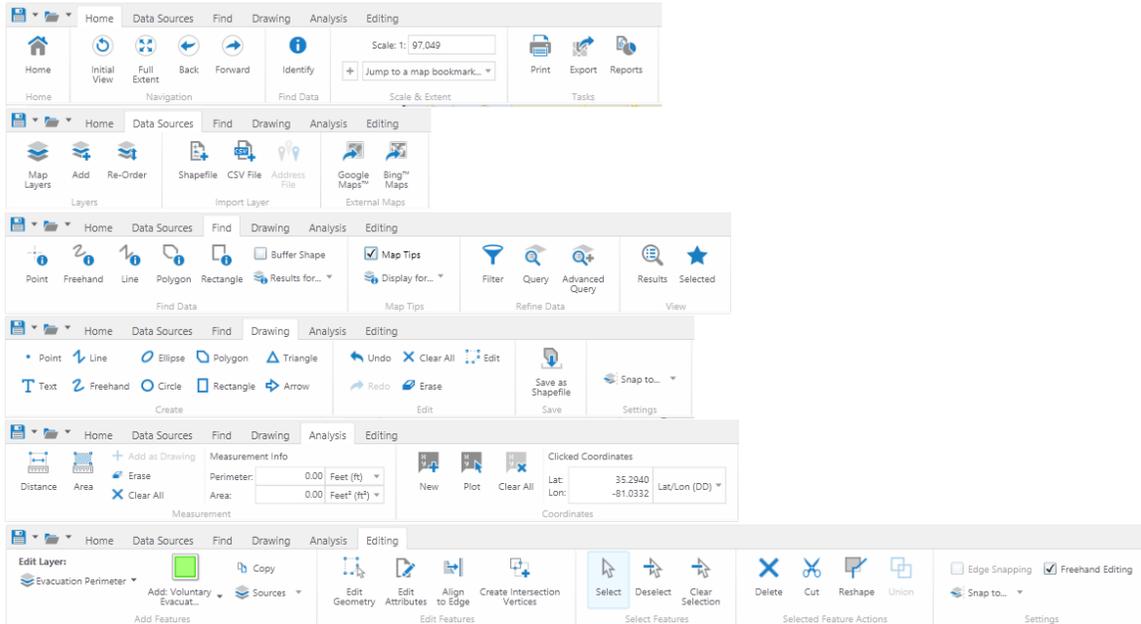
The Web GIS (Full) toolbar with its tabs

- **Pre 2.0**: The Pre 2.0 toolbar used to ship with the viewer prior to the 2.0 release. It contains groups of tools arranged onto four tabs; Getting Around, Maps & Data Sources, Tasks, and Analysis.
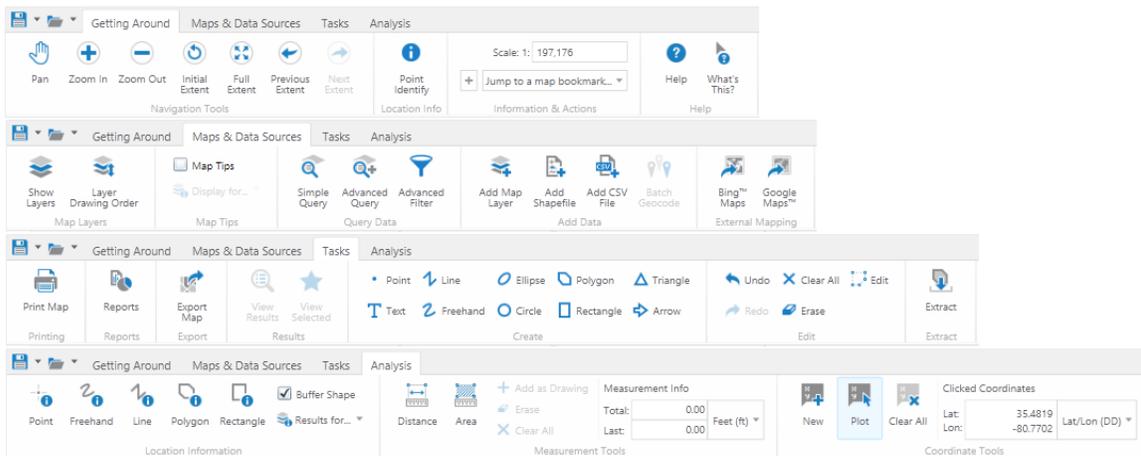
The Pre 2.0 toolbar with its tabs

38.8.5.3   Sticky Tools

By default, tools in the Silverlight Viewer are sticky—they remain active (selected) until deselected by the user. This allows the user to use a tool repeatedly without having to reselect it each time. You can disable stickiness in the configuration. When stickiness is disabled tools are automatically deselected after a single use.

If stickiness is disabled in the configuration, you can temporarily make a tool sticky by double-clicking it. You click the tool again to the stickiness off.

38.8.5.4   Create a Toolbar

The Toolbar is optional. You can turn it off completely using the **Remove Toolbar** function. You can use a preset toolbar and adapt it or create a completely custom toolbar.

▶ **To open a Viewer's Toolbar page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Toolbar**.
   The Toolbar page opens.

▶ **To use a Preset toolbar:**

1. Click **Load Preset Toolbar**.
   The Load Preset dialog box opens.

2. Click the button to select either the **Standard (Default)**, **Web GIS (Full)** or **Pre 2.0 toolbar**.
   The tabs, tools, buttons and groups for that tool bar are loaded into the **Configured Toolbar** box. You can now customize the toolbar by deleting or adding other tools, tabs, regions, or groups.

▶ **To disable or re-enable tool stickiness:**

1. To disable stickiness, clear the **Sticky Tools** check box.

2. To re-enable stickiness, select the **Sticky Tools** check box.

▶ **To create a custom Toolbar:**

1. Click **Copy Defaults**.
   The Available Tools and Configured Toolbar areas become available for editing.

2. Modify the Toolbar as desired.
   Follow the instructions to add, edit, and remove tabs, groups, and tools.

▶ **To add a tab to the Toolbar:**

1. In the **Configured Toolbar** area, click .
   The Add Tab dialog box opens.

2. In the **Display Name** box, type the text to appear on the tab.

3. Click **OK**.

4. To move the tab to a different location in the Toolbar, click and drag it.

▶ **To add a group to a tab:**

1. In the **Configured Toolbar** area, click the **Add Group** icon ⊕ beside the tab that you want to add the group to.
The Add Group dialog box opens.

2. In the **Display Name** box, type the text to appear at the bottom of the group.
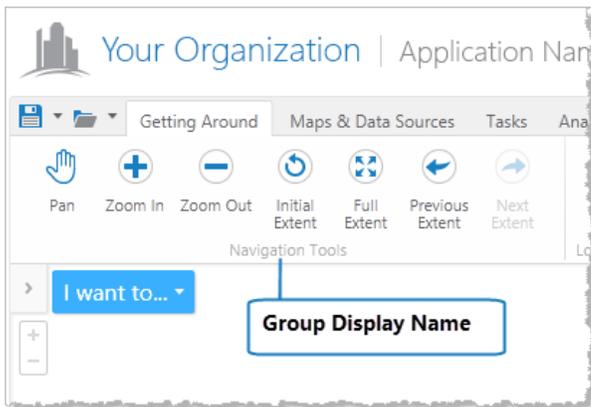
Group's display name in the Viewer

3. Click **OK**.

4. To move the group to a different location in the Toolbar, click and drag it.

▶ **To add a button to a group:**

1. In the **Configured Toolbar** area, click the **Add Toolbar Item** icon ⊕ beside the group that you want to add the button to.
A drop-down list opens.

2. Select **Add Button**.
The Add Button dialog box opens.

3. **Name:** Type a name for the button.
The name is visible in Manager only—it is not visible in the Viewer.

4. **Appearance:** Configure the button's appearance:
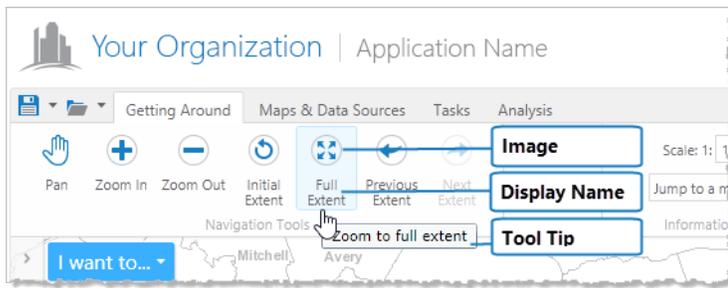
Settings that control a button's appearance in the Viewer

Click ⊕ Upload.

- **Display Name:** Type the text to appear on the button.

- **Image URI:** The URI of the image to display on the button. The image can be any size—it is automatically sized to fit on the button. Valid file formats are PNG, BMP, JPG, and JPEG.
  To browse to the image file:

  a. Click **Browse**.
  The Select File dialog box opens.

  b. Expand the **Resources | Images** branch of the **VirtualDirectory** tree in the side panel.

  c. Select the **Images** folder.

  d. Click **Upload**.
  The Upload dialog box opens.

  e. Click **Select**.

  f. Browse to and select the image file you want to use for the button.

  g. Click **Open**.

  h. Click **Upload**.
  The file appears in the Filename list.

  i. With the file selected, click **OK**.

- **Tool Tip:** Type the text for the tool tip that opens when the user hovers the pointer over the button.

5. **Command:** Configure the command that the button executes:

   - **Command:** The name of the command to execute when the user clicks the button. Click in the **Command** box to open a drop-down list of commands.

   - **Command Parameter:** The parameter value to pass to the command when it executes.

   Refer to the *Geocortex Viewer for Silverlight Administrator and Developer Guide* to see the complete list of Viewer commands and their parameters.

6. Click **OK**.

7. To move the button to a different location in the Toolbar, click and drag it.

▶ **To add a tool to a group:**

1. In the **Configured Toolbar** area, click the **Add Toolbar Item** icon ⊕ beside the group that you want to add the tool to.
   A drop-down list opens.

2. Select **Add Tool**.
   The Add Tool dialog box opens.

3. **Name:** Type a name for the tool.
   The name is visible in Manager only—it is not visible in the Viewer.

4. **Appearance:** Configure the tool's appearance:
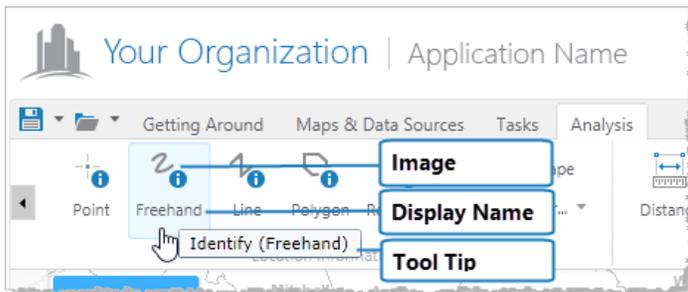
Settings that control a tool's appearance in the Viewer

Click ⊕ Upload.

- **Display Name:** Type the text to appear on the tool.

- **Image URI:** The URI of the image to display on the tool. The image can be any size—it is automatically sized to fit on the tool. Valid file formats are PNG, BMP, JPG, and JPEG.
   To browse to the image file:

   a. Click **Browse**.
      The Select File dialog box opens.

   b. Expand the **Resources | Images** branch of the **VirtualDirectory** tree in the side panel.

   c. Select the **Images** folder.

   d. Click **Upload**.
      The Upload dialog box opens.

   e. Click **Select**.

   f. Browse to and select the image file you want to use for the tool.

   g. Click **Open**.

   h. Click **Upload**.
      The file appears in the Filename list.

   i. With the file selected, click **OK**.

- **Tool Tip:** Type the text for the tool tip that opens when the user hovers the pointer over the tool.

5. **Command:** Configure the command that the tool executes:

   - **Command:** The name of the command to execute after the user has drawn the shape on the map. Click in the **Command** box to open a drop-down list of commands.

   - **Draw Mode:** The type of shape for the user to draw on the map. The geometry that the user draws is passed to the command when it executes.

   Refer to the *Geocortex Viewer for Silverlight Administrator and Developer Guide* to see the complete list of Viewer commands and their parameters.

6. Click **OK**.

7. To move the tool to a different location in the Toolbar, click and drag it.

To add a region to the Toolbar:

> To add content to a region created in Manager, you must edit the Viewer's configuration file.

1. In the **Configured Toolbar** area, click the **Add Toolbar Item** icon ⊕ beside the group that you want to add the region to.
   A drop-down list opens.

2. Select **Add Region**.
   The Add Tool dialog box opens.

3. **Name:** Type a name for the region.
   The name is visible in Manager only—it is not visible in the Viewer.

4. Click **OK**.

5. To move the region to a different location in the Toolbar, click and drag it.

To add a splitter to the Toolbar:

1. In the **Configured Toolbar** area, click the **Add Toolbar Item** icon ⊕ beside the group that you want to add the splitter to.
   A drop-down list opens.

2. Select **Add Splitter**.
   A horizontal line representing a splitter appears in the group.

3. To move the splitter to a different location in the Toolbar, click and drag it.

To edit a tab, group, or Toolbar item:

1. Click the **Edit** icon 🖉 next to the item you want to modify.
   The Edit dialog box opens.

2. Edit the item as desired.

3. Click **OK.**

▶ **To change the order of items in the Toolbar:**

You can move tabs, groups, buttons, tools, regions and splitters within the Toolbar.

1. Click and hold the item you want to move.

2. Drag the item to its new location in the Toolbar.

▶ **To revert to the default Toolbar:**

⚠ Reverting to the default Toolbar permanently deletes your custom Toolbar.

1. Click the **Revert to Default** button.
   You are prompted to confirm.

2. Click **OK**.

▶ **To remove the Toolbar:**

If you do not want the Viewer to have a Toolbar, you can remove the Toolbar.

1. Click the **Remove Toolbar** button.
   You are prompted to confirm.

2. Click **OK**.

▶ **To add back the Toolbar if you have removed it:**

1. Click the **Create Toolbar** button.
   A copy of the default Toolbar becomes available for editing.

2. Customize the copy of the default Toolbar, or click **Revert to Default** to go back to the default Toolbar.

▶ **Before you leave the Toolbar page:**

1. Click **Apply Changes** and **Save Site**.

38.8.6 Change the Behavior of Tools in a Silverlight Viewer

The Tools page in Manager has settings to configure buffering, units of measurement, CSV imports and other aspects of tool behavior.

▶ **To open a Viewer's Tools page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Tool Behavior**.
   The Tools page opens.

Buffering

By default, buffering is done in the spatial reference of the Universal Transverse Mercator (UTM) zone that the buffer geometry center falls into. This generally yields accurate results. However, if you need to create very large buffers, you should configure a specific coordinate system using one of the following settings:

- **WKID:** The Well-Known ID of a coordinate system to perform buffering in.

- **WKT:** The Well-Known Text of a coordinate system to perform buffering in. If both the WKID and WKT are configured, the WKID overrides the WKT.

Identify

- **Pixel Tolerance:** The number of pixels away from a feature the user's geometry can be to successfully identify the feature. This setting applies to Point, Line, and Freehand Identify.

- **Visible Layers Only:** When this check box is selected, Identify operations return features only from layers that are turned on—features on layers that are turned off are not identified.

- **Visible at Current Scale Only:** When this check box is selected, Identify operations return features only from layers that are turned on and visible at the current scale—features on layers that are not currently visible are not identified.

Measurement

The settings in the Measurement area of the Tool Behavior page apply to every measurement tool in the Toolbar.

- **Distance Units:** The units to use for measuring distance. The user can change the units in the Viewer.

- **Area Units**: The units to use for measuring area. The user can change the units in the Viewer.

- **Prediction Enabled:** When this check box is selected, the measurement tools preview the length of line segments before vertices are added. The preview displays beside the pointer while the user draws the measurement markup.

- **Projection WKID:** The Well-Known ID of the map projection suitable to project measurements into. If you configure a projection WKID, you must set the Projection Units setting to the native units for the WKID projection. If you leave the Projection WKID box blank, measurements are done in the coordinate system of the map.

- **Projection Units:** If you configured a projection WKID, set the projection units to the native units for the configured projection.

- **CalculationType**: Determines which calculation type to use when taking measurements.
  Calculation options include:

  - **Planar**: Planar measurements use two dimensional Cartesian mathematics to calculate length. Use this type only if the length needs to be calculated in the given spatial reference, otherwise use `preserveShape`.

  - **Geodesic**: A geodesic segment is the shortest path between two points on an ellipsoid. Use this calculation type if you want to calculate the length using only the vertices of the polyline and define the lines between the points as geodesic segments independent of the actual shape of the polyline.

  - **Preserve Shape**: Calculates the length of the geometry on the surface of the Earth ellipsoid, for a geometry defined in projected or geographic coordinate system. This method preserves the shape of the geometry in its coordinate system. When you use `preserveShape`, the true length is calculated for the geometry you see in the map and is very accurate. For this reason, it is recommended that you use this calculation type.

> **NOTE** ArcGIS Server v10.0+ is required to use **Geodesic** a calculation type.
> ArcGIS Server v10.1+ is required to use **Preserve Shape** as a calculation type.

Editing

- **In-Place Attribute Editing:** When this check box is selected, the user can edit feature attributes directly in the results table by clicking the attribute to edit. The feature attribute must belong to a feature layer that has editing enabled. In-place editing is independent of having an Edit tool in the Viewer—you can have both or neither or just one type of editing.

Advanced Map Controls

- **Include Map Scale**: When this check box is selected, the Map Scale control is visible in the Viewer.

- **Include Bookmarks**: When this check box is selected, the Bookmarks control is visible in the Viewer.

  The AdvancedMapControlsView contains the Map Scale control and the Bookmarks control. If you want both the Map Scale and Bookmarks controls to be visible, select the **Include Map Scale** and the **Include Bookmarks** check box. To remove either control, deselect that particular check box, for example, the Bookmarks control.
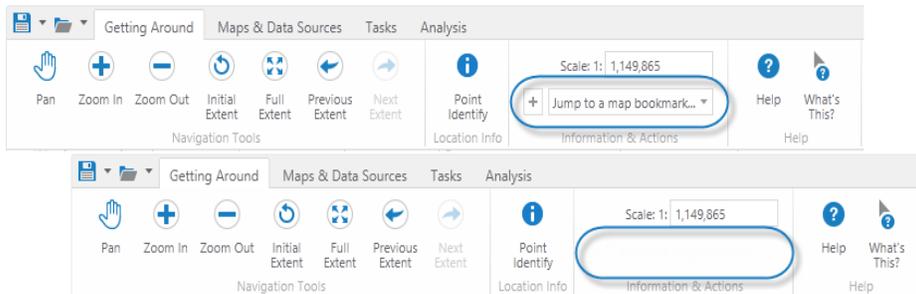
Fragment of the Toolbar with the Bookmarks control visible (top) and hidden (bottom)

> **NOTE** The check boxes remove only each individual control. To completely remove this section of the Toolbar, you need to configure the Toolbar. For more information, see **Configure the Toolbar for a Silverlight Viewer** on page 357.

Save/Open Project

The Projects feature enables the user to save snapshots of Viewer sessions and reopen them later or send them to colleagues to open locally. Saving a project saves the extent, markup, bookmarks, and other changes the user made during the session.

The project category controls which projects can be opened in a Viewer. If two Viewers have the same project category, users in both Viewers have access to all the projects in that category that were saved to the server, no matter which Viewer the projects were saved on. If two Viewers have different project categories, users do not have access to projects saved in the other Viewer.

- **Project Category:** A name for the category that this Viewer's projects belong to. The name itself is arbitrary, but if you want multiple Viewers to share saved projects, you must set each Viewer's Project Category setting to the same name and select the Can Save Project to Server setting.

- **Can Save Project to Server:** When this check box is selected, the user can save Viewer sessions on the server. Projects are saved in the Projects subfolder of the Sites folder.

- **Can Save Project as File:** When this check box is selected, the user can save Viewer sessions to the local hard drive.

Export

The Export feature allows the user to export the current map image to a file.

- **Allow Including Georeference Data:** When this check box is selected, the user has the option to include georeference data with the exported map image. Exporting georeference data allows the exported image to be accurately positioned in GIS applications.

  If you do not want the user to be able to export georeference data with the map image, clear the Allow Including Georeference Data check box.

  > **NOTE** iOS does not support ZIP files. To use Export features that produce ZIP files in iOS, you must install third-party software to handle ZIP files, such as iZip.

- **Default Map Output Format:** The file format that is initially selected when the user requests a map export. Users can change the file format. After a user has changed the output file format once, the viewer remembers the user's preference.

Map export settings in Manager (back) and in the Silverlight Viewer (front)

38.8.6.1   Open CSV

The Open CSV feature makes it possible to set the spatial reference used for CSV data that you add to a map. Before Geocortex Viewer for Silverlight 2.4, the spatial reference of the map was autodetected and applied to imported CSV files. Administrators can now do the following:

- Activate the ability for end users to select a spatial reference to apply to a CSV file as it is added to the map.

- Add a set of spatial references that end users can select from a drop-down list in the Select Coordinate Fields dialog in the viewer.

- Set a default spatial reference that appears in the drop-down list.

- Add a box to the Select Coordinate Fields dialog so that end users can add a spatial reference using a WKID or

WKT while adding a CSV file.

These Open CSV settings make it possible for the end user to specify which spatial reference to use when they add a CSV file to a map. If the Include Custom WKID/WKT is enabled, end users can also paste in a WKID or WKT to set the spatial reference at the time they import a CSV file.

- **Include Map Spatial Reference:** When this box is selected, a Spatial Reference drop-down list is added to the Select Coordinate Fields dialog box in the viewer. The **Spatial Reference** drop-down list presents options to the end user to select in order to set the spatial reference for incoming CSV data. The administrator can name the reference or use the default name, which is Map Spatial Reference. If the administrator adds other spatial references, they appear in this drop-down list for end users to select.

- **Include Custom WKID/WKT Option:** When this check box is selected, a **Custom WKID/WKT** box is added to the Select Coordinate Files dialog box in the viewer. End users can then paste in a WKID or WKT to apply when the CSV data is added to the map.

- **Map Spatial Reference Name:** When the Include Map Spatial Reference box is selected, you can type a name for the spatial reference in this box. The name then appears in the Spatial Reference drop-down list in the Select Coordinate Fields drop-down list for end users to select.

- **Default Spatial Reference**: Sets which spatial reference in the Spatial Reference drop-down list is selected by default.

- **Add Spatial Reference**: Adds a series of spatial references using WKIDs or WKTs to the Spatial Reference drop-down list in the viewer for end users to select. The spatial references appear in the order that they were added but you can drag them up or down in the list to re-order their appearance as well as edit or remove each reference.

▶ **To add a spatial reference:**

1. Click the **Add Spatial Reference** button.

2. In the Add Spatial Reference dialog box, enter the **Name** of the reference and the WKID number or paste in the WKT text.

3. Click **OK**.

The new spatial reference appears in the list.

To reorder spatial references:

1. Add more than one spatial reference to the list.

2. To change the order of the options in the drop-down list in the viewer, click and drag the reorder icon beside the spatial reference to the position you want it to be in the list.

To edit or remove a spatial reference:

1. To remove a spatial reference from the list, click the Remove icon.

2. To edit the spatial reference, click the Edit icon, change the name or the WKID/WKT, and then click **OK**.

Before you leave the Tools page:

1. Click **Apply Changes** and **Save Site**.

38.8.7 Configure the Map Module in a Silverlight Viewer

The Map Module page in Manager allows you to configure:

- **Context Menu tab:** The context menu that opens when the user right-clicks the map.
- **Settings tab:** Map settings such as minimum and maximum resolution, pan and zoom durations, and snapping.

▶ To open a viewer's Map Module page in Manager:

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Map Module**.
    The Map Module page opens.

Configure the Map's Context Menu

The default context menu in the Silverlight viewer contains a number of menu items. You can modify or remove these items, create new ones, and change the order that they appear in the menu.

Each item is represented in the menu by some text and optionally a small image, both of which are customizable. Items also have a description that is used within Manager.

A menu item can execute any Geocortex Viewer for Silverlight command. Refer to the *Geocortex Viewer for Silverlight Administrator and Developer Guide* to see the complete list of viewer commands.

In addition to the main command that a menu item executes, there are usually preparatory ("batch") commands that you want executed before the main command is executed. For example, a menu item to create freehand markup might first execute the commands to show the advanced toolbar, show the toolbar's tab that contains the markup tools, and activate the freehand markup tool in the toolbar, in that order.

Example context menu, with no images configured for the menu items

▶ To create a custom context menu:

1. Click **Copy Defaults**.
    The list of menu items becomes available for editing.

2. Modify the menu as desired.
    Follow the instructions to add, edit, and remove menu items.

▶ **To add an item to the context menu:**

1. Click Add Menu Item .

   The Add New Menu Item dialog box opens.

2. **Appearance:** Configure the menu item's appearance:

   - **Text:** Type the text to appear in the context menu.

   - **Description:** Type a short description of what the menu item does. The description is visible in Manager only—it is not visible in the viewer.

   - **Image URI:** The URI of the image to display next to the menu item. The image can be any size—it is automatically sized to fit beside the menu item. Valid file formats are PNG, BMP, JPG, and JPEG. The image is optional.

     To browse to the image file:

     a. Click **Browse**.

        The Select File dialog box opens.

     b. Expand the **Resources | Images** branch of the **VirtualDirectory** tree in the side panel.

     c. Select the **Images** folder.

     d. Click Upload.

        The Upload dialog box opens.

     e. Click **Select**.

     f. Browse to and select the image file you want to use for the menu item.

     g. Click **Open**.

     h. Click **Upload**.

        The file appears in the Filename list.

     i. With the file selected, click **OK**.

3. **Command:** Configure the command that the menu item executes:

   - **Command:** The name of the command to execute when the user selects the menu item. Click in the **Command** box to open a drop-down list of commands.

   - **Command Parameter:** The parameter value to pass to the command when it executes.

   Refer to the *Geocortex Viewer for Silverlight Administrator and Developer Guide* to see the complete list of viewer commands and their parameters.

4. Click **OK**.

5. To move the item to a different location in the context menu, click and drag the item's icon.

▶ **To edit a menu item:**

1. Click the **Edit** icon next to the item you want to modify.

   The menu item's Details tab displays.

2. Edit the details as desired.

3. Click **Apply Changes**.

4. Click **Map Module** in the side panel to return to the list of context menu items.

▶ **To configure preparatory commands to execute when the user clicks a context menu item:**

1. Click the **Edit** icon 🖊 next to the item you want to modify.

   The menu item's Details tab displays.

2. Click the **Batch Commands** tab.

3. Click **Add Batch Command**.

   The Add New Batch Command dialog box opens.

4. Configure the command:

   - **Command:** The name of the command to execute. Click in the **Command** box to open a drop-down list of commands.

   - **Command Parameter:** The parameter values that are passed to the command when it executes.

   Refer to the *Geocortex Viewer for Silverlight Administrator and Developer Guide* to see the complete list of viewer commands and their parameters.

5. Click **OK**.

   The command is added to the list of batch commands.

6. If the command is in the wrong position in the list, click and hold the command's ⬍ icon and drag the item to its new position.

   The batch commands are executed in the same order that they appear in the Manager.

7. To modify a batch command you have already added, click the **Edit** icon 🖊 next to the command you want to modify.

8. To remove a batch command, click the **Remove** icon 🗑 beside the command you want to remove and click **OK** when prompted to confirm.

9. When you have added all the batch commands you want and they are in the correct order, click **Apply Batch Order**.

10. Click **Map Module** in the side panel to return to the list of context menu items.

▶ **To remove an item from the context menu:**

💡 If you remove any of the Silverlight Viewer's out-of-the-box menu items, you can add them back at any time using the Import Items from Default function.

1. Click the **Remove** icon 🗑 beside the item you want to remove.

   You are prompted to confirm.

2. Click **OK**.

   The item is removed from the list of menu items.

▶ **To add factory items to the context menu:**

1. Click **Import Items from Default**.
   The Import Menu Items from Default dialog box opens.

2. Select the check box for each factory menu item you want to add to the context menu.

3. Click **OK**.
   The items you selected appear at the bottom of the list of menu items.

4. To move an item to a different location in the context menu, click and drag the item's ⬍ icon.

▶ **To change the order of items in the context menu:**

The menu items are listed in Manager in the same order that they appear in the viewer.

1. Click and hold the ⬍ icon for the menu item whose position in the menu you want to change.

2. Drag the item to its new position.

3. Repeat these steps until the menu is ordered the way you want it.

▶ **To revert to the default context menu:**

> ⚠ Reverting to the default context menu permanently deletes your custom menu.

1. Click the **Revert to Default** button.
   You are prompted to confirm.

2. Click **OK**.

▶ **To save your changes:**

1. Click **Apply Changes**.
2. Click **Save Site**.

Configure Map Module Settings

The following settings are on the Map Module page's Settings tab:

- **Snap to Levels:** When this check box is selected, zooming snaps to scale levels if the map contains cached layers. Clear the check box if you want the user to be able to zoom to scales that are in between cached scale levels.

- **Pan Duration:** The speed of the pan animation. Smaller values are faster and larger values are slower. We recommend that you do not set this value to more than 2. A value of 0 disables the animation completely.

- **Zoom Duration:** The speed of the zoom animation. Smaller values are faster and larger values are slower. We recommend that you do not set this value to more than 2. A value of 0 disables the animation completely.

- **Minimum Resolution:** The minimum resolution (map units per pixel) the user can zoom in to. For dynamic map services, the map scale is unconstrained by default. This setting allows you to constrain how far in to the map the user can zoom.

For cached map services, the map scale is constrained to scales between the smallest and largest tile level by default. This setting enables zooming beyond the scale levels.

If you leave the Minimum Resolution box blank, then the default behavior for that type of map service applies.

- **Maximum Resolution:** The maximum resolution (map units per pixel) the user can zoom out to. For dynamic map services, the map scale is unconstrained by default. This setting allows you to constrain how far out from the map the user can zoom.

  For cached map services, the map scale is constrained to scales between the smallest and largest tile level by default. This setting enables zooming beyond the scale levels.

  If you leave the Maximum Resolution box blank, then the default behavior for that type of map service applies.

> **Before you leave the Map Module page:**

1. Click **Apply Changes** or **Save Site**.

38.8.8 Configure the Scale Range of Base Maps in a Silverlight Viewer

In version 1.9 of the Geocortex Viewer for Silverlight and version 3.14 of Manager, the ability to set the scale range to display a particular base map was added. This feature makes it possible to set minimum and maximum scale ranges where a base map is no longer visible. This can be used to show only the most appropriate base map at any given scale range. For example, you may elect to set up a streets and highways base map to disappear when it becomes too cluttered to decipher and then have it appear again when zoomed in close enough.

The ability to control the base map at a particular scale range means that the:

- Performance of the map improves because the amount of data loaded at a given scale is minimized because there is less data to process. This results in faster response times.

- Appearance and usefulness of the map improves as unnecessary clutter is removed but detail is present when it is needed.

The scale range of a base map is controlled by setting the minimum and maximum scale at which the map service displays.

> **NOTE** Although the settings are entered in Manager, the interpretation of the scale ranges is done by Geocortex Viewer for Silverlight.

> **To set the minimum and maximum scale of a base map:**

1. Launch Manager.

2. Edit the site whose map you want to change.

3. In the side panel, click **Map**.

4. Click the **Edit Map Service** icon beside the map service you want to change.

5. Select the **Display Settings** tab.

6. If you want to restrict the base map from displaying when zoomed **out** beyond a specific scale range, enter it into the **Override Minimum Scale** box.

   This field sets the smallest scale that the base map becomes visible.

   For example, **2400000** (2.4 mil).

> **NOTE** Scales are fractions; 1:25,000 means 1/25,000th. Larger numbers typically refer to smaller map scales.

7. If you want to restrict the base map from displaying when zoomed **in** beyond a specific scale range, enter it into the **Override Maximum Scale** box.
   For example, **20000** (20k).
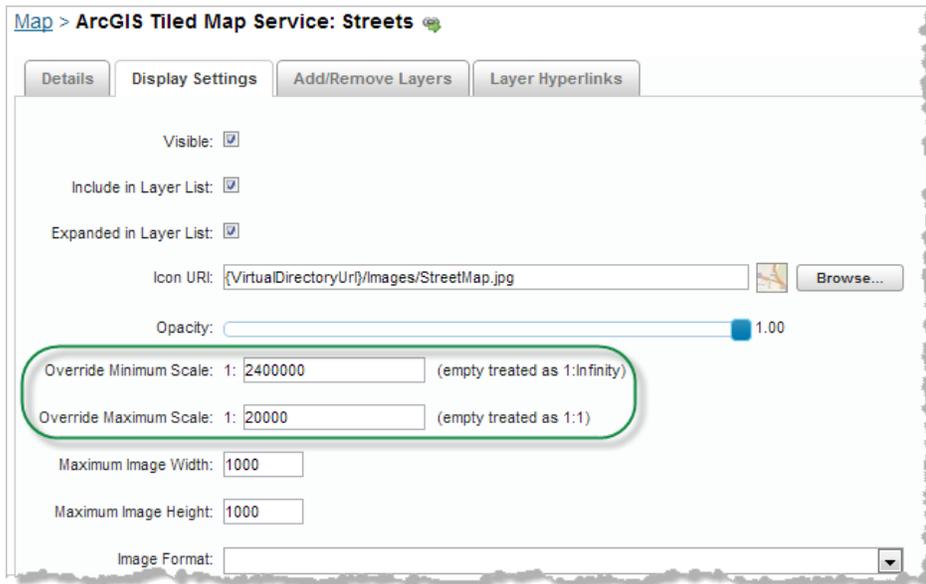
8. Click **Apply Changes** and **Save Site**.

38.8.9 Configure a Silverlight Viewer's Map Widgets

The Map Widgets page in Manager provides settings for the Overview Map, Map Tips, Pushpins, the Scale Bar and Scale Slider, and a variety of other map elements.
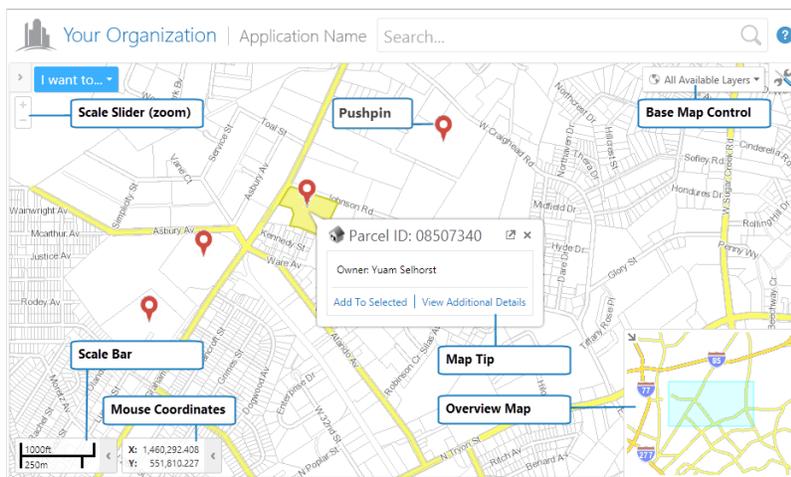
Map widgets in the Viewer

▶ **To open the Map Widgets page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Map Widgets**.
   The Map Widgets page opens.

Overview Map

The Overview Map settings control the visibility and behavior of the Site's Overview Map in the Viewer. A Site can only have one Overview Map, so all of the site's Viewers use the same Overview Map.

Settings

- **Show Overview Map:** When this check box is selected, the Overview Map is available in the Viewer. If you do not want the Viewer to have an Overview Map, clear the check box.

- **Open by Default:** When this check box is selected, the Overview Map is open when the user launches the Viewer. The user can close and reopen the Overview Map by clicking the icon in the corner of the Overview Map. If you want the Overview Map to be closed initially, clear the check box.

- **Mode:** Controls whether the Overview Map's extent changes whenever the main map's extent changes. Set the mode to Dynamic if you want the Overview Map's extent to change with the main map's extent. Set the mode to Static if you want the Overview Map's extent to remain fixed.

- **Extent Scale Factor:** The factor by which the extent of the Overview Map is scaled in relation to the scale of the Viewer's map.

See Also...

Map Tips

Map Tips are pop-ups that open when the user hovers over or clicks a feature. For performance reasons, Map Tips are disabled by default.

Settings

- **Map Tips Enabled:** When this check box is selected, features in the Viewer are capable of displaying Map Tips. By default, Map Tips are not displayed when the mouse hovers over a feature on the map. If you want the Viewer to have map tips, select the check box.

  💡 The default Toolbar has an Enable Map tips check box in it so the user can turn off Map Tips.

- **Display on Click:** When this check box is selected, Map Tips display when the user clicks a feature on the map or in search results, instead of when the pointer hovers over the feature. If you want Map Tips to display when the pointer hovers over the feature, clear the check box.

- **Ignore Pixel Tolerance for Polygons:** The number of pixels away from a feature the user's geometry can be to successfully identify the feature. The default pixel tolerance is 2 pixels. When this check box is selected, the Viewer treats the pixel tolerance as zero for Polygon Identify operations. If you want the pixel tolerance used for Polygon Identify operations, clear the check box.

- **Default Feature Details Tab:** Map tips contain a link that the user can click to see additional details about the feature. The dialog box that opens when the link is clicked has tabs for the feature's details (description), attributes, feature hyperlinks (if configured), and data links (if configured). Select the tab that you want to open by default when the user views additional details for a feature.

Pushpins

When enabled, pushpins appear on the map when the results of a search are listed in the Results List. A pushpin appears over the center of each feature listed in the search results. When you click on a feature in the Results List, the map zooms to that feature, highlights it, and displays the map tip.

If you configure a contrasting color for pushpins, they changes color when:

- You hover over a feature in the Results List.

- You add a feature to your selection.

NOTE If you add markup to a map that has pushpins displayed, the markup appears behind the pushpins by design.

NOTE Pushpins are supported for use with geocoders and workflows.

Settings

- **Pushpins Enabled:** When this check box is selected, features that are listed after a search, display a pushpin at the center of each feature on the map. If you click on the feature in the Results List, it zooms in to that feature, highlights it, and displays the Map Tip. You can also configure a contrasting color for a pushpin to indicate when a user hovers over that feature in the Results List.

- **Pushpin Marker Image URL**: The URL to the image used for the pushpin.

- **Pushpin Marker Highlight Image URL**: The URL to the image to use as a contrasting color that indicates when a pushpin is selected.

- **X Offset**: Defines the distance in pixels to offset the X-axis of a graphic to ensure that the point of the pushpin is directly over the feature. The default value is 16 pixels.

- **Y Offset**: Defines the distance in pixels to offset the Y-axis of a graphic to ensure that the point of the pushpin is directly over the feature. The default value is 32 pixels.
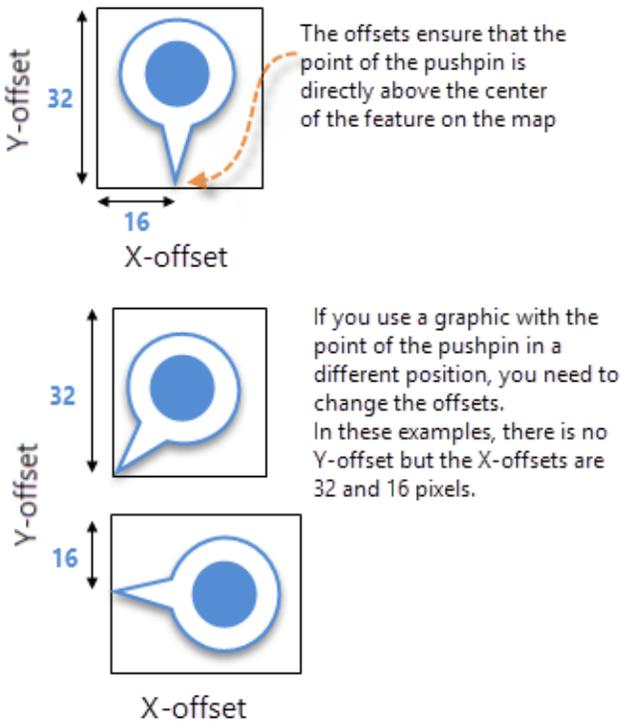
Watermark

A watermark is an image that overlays the map in the Viewer. Usually a watermark identifies the owner or copyright holder.

You can adjust the opacity of the watermark image to ensure it does not interfere with the map image. The watermark appears below any markup or measurements made by the user so it does not interfere with the markings.

Settings

- **Show Watermark Image:** When this check box is selected, the watermark is visible on the map. If you do not want the Viewer to use a watermark, clear the check box.

- **Image URL:** The URL to the image to use as the watermark. Click **Browse** to select a file from the Site's virtual directory.

- **Image Mode:** Scaled mode scales the watermark up or down when the user resizes the window. Fixed mode displays the watermark at its original size and does not scale it when the user resizes the window. Tiled mode repeats the (unscaled) watermark image in a tiled pattern.

- **Opacity:** The opacity of the watermark image. Drag the slider to the left to make the image more transparent.

Time Aware Slider

The time-aware slider provides the ability to visualize data contained in time-aware layers. The end user can click the Play button to see time-sensitive data added incrementally to the map, which gives the effect of watching an animation of the event.

The primary time-aware map service is the time-aware map service whose data shows on the map, in other words, the active map service. If you choose not to use a primary map service, the map shows the data for all the time-aware map services whose visibility is turned on in the Layer List.

The default primary time-aware map service is the time-aware map service that is listed closest to the top of the Layer List. If the user turns off the primary map service in the Layer List, the next highest time-aware map service becomes the primary map service.
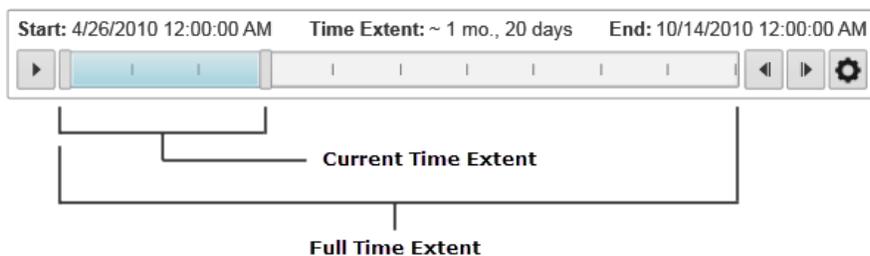
Time slider in the Silverlight Viewer

The primary map service also determines the extent of the time slider. If you have not overridden the primary map service's time extent, the time slider uses the primary map service's time extent as its full extent. If you have overridden the map service's time extent, then your override is used as the time slider's full time extent. See **Configure a Time-Aware Map Service's Time Extent** on page **226** for instructions.

If there is no primary map service, the time slider's full extent spans the time extents of all the time-aware map services that are turned on in the Layer List. The slider's full extent adjusts dynamically when the user turns time-aware map services on and off in the Layer List.

If you allow the user to configure the time slider's settings, the user will be able to select the primary map service.

The current time extent is the time extent of the data that is currently shown on the map—data points outside the current time extent are not visible on the map. The current time extent is the time extent between the two bars on the time slider. You can configure the initial positions of the two bars.

See Also...

Time-Aware Map Services and Layers on page **225**

Configure a Time-Aware Map Service's Time Extent on page **226**

Settings

- **Show Time-Aware Slider:** When this check box is selected, the time-aware slider shows in the Viewer whenever one or more time-aware map services are selected in the Layer List. If you do not want the Viewer to have a time-aware slider, clear the check box.

- **Is User Configurable:** When this check box is selected, the end user can change the time slider's settings, provided Show Time-Aware Slider is also selected.
Specifically, the user can set:
Use Primary Time-Aware Map Service: If you want to have a primary time-aware map service, select the Use Primary Time-Aware Map Service check box. This sets the time slider's default full extent to the time extent of the time-aware map service that is listed highest in the Layer List.

  If you clear the check box, the time slider's default full extent will span the time extents of all the time-aware map services that are turned on in the Layer List. Clearing the Use Primary Time-Aware Map Service check box is equivalent to setting the primary map service to None—in fact, the Primary Time-Aware Map Service setting in the Viewer will initially be set to None, if you configured the time slider to be user configurable.

- **Playback Speed:** The speed at which the animation occurs. The default playback speed is **1** second. This means the data displayed on the map updates every second. You can enter fractions of seconds.

Frequent updating of time-aware data can place a strain on your ArcGIS Server. Do not use a very low playback speed unless absolutely necessary.

- **Number of Intervals:** The number of intervals that the time slider is divided into.

- **Loop Playback:** When this check box is selected, the animation automatically cycles back to the beginning and replays until the user stops it. If you want the animation to play only once, clear the check box—in this case, the user can replay it manually.

- **Mode:** The mode controls what subset of the primary time-aware layer's data is displayed on the map.

  - **Time Extent:** The slider shows a time extent (time range) that moves back and forth on the slider. As the user drags the time extent back and forth, the data displayed on the map changes to show events within the current extent. The user can change the start and end of the time extent, making the extent longer or shorter. During playback, the entire time extent advances one interval every Playback Speed seconds.

  - **Cumulative From Start:** The slider shows a time extent whose start time is fixed at the beginning of the primary time-aware layer's time span. The user can drag a bar to change the end of the time extent. There is no bar to change the start of the time extent. During playback, the end of the time extent advances one time interval every Playback Speed seconds and the start remains fixed—the time extent gets one interval longer every Playback Speed seconds. The data that displays on the map is aggregated.

  - **Time Instant:** The slider shows a time instant that coincides with one of the slider's interval divisions. During playback, the data for the current instant is displayed on the map.

    The map displays the data for the exact instant that is selected. If there is no data for that instant, nothing will display on the map.

- **Initial Time Extent Options:** The Dates and Ratios settings allow you to set the initial positions of the bars that define the current time extent on the time slider.

  Because the bars must coincide with interval boundaries, the time slider may have to approximate the dates or ratios you enter.

  If you leave both the Dates and Ratios settings blank, the bars will be positioned at (approximately) the first 10% of the full time extent.
 If you define both Dates and Ratios, the time slider uses the Ratios.

Other Settings

- **Show Scale Bar:** When this check box is selected, the Scale Bar is visible on the map. If you do not want the Viewer to have a Scale Bar, clear the check box.

- **Show Scale Slider:** When this check box is selected, the Scale Slider is visible on the map. If you do not want the Viewer to have a Scale Slider, clear the check box.

- **Show Base Map Control:** When this check box is selected, the base map control is visible on the map. If you do not want the Viewer to have a base map control, clear the check box.

- **Show Progress Indicator:** When this check box is selected, a progress indicator displays whenever the Viewer is busy processing a request. If you do not want the Viewer to use progress indicators, clear the check box.

- **Show Mouse Coordinates**: When this check box is selected, the mouse coordinates display on the map. The user can close the coordinates and reopen them by clicking the icon at the edge of the coordinates display area. If you do not want the Viewer to show mouse coordinates, clear the check box.

▶ **Before you leave the Map Widgets page:**

1. Click **Apply Changes** or **Save Site**.

38.8.10 Configure Instant Search in the Silverlight Viewer

The Instant Search page allows you to configure Instant Search settings for a viewer. In general, you should not need to change these settings—the default values have been adjusted to work for the speed people usually type, the amount of information people can realistically work with, and so on. The only setting you might want to change is Maximum Results, which limits the number of search results that are shown.

Before you configure Instant Search settings in a viewer, you should configure Instant Search in the site. For information, see About Instant Search.

▶ **To open a Silverlight viewer's Instant Search page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Instant Search**.
   The Instant Search page opens.

Settings

The Instant Search page has the following settings:

- **Search Hints:** When this check box is selected, the viewer suggests search terms to the user. The user can click a hint to search for the term given in that hint. By default, the Search Hints check box is selected.
  When the Search Hints check box is cleared, the viewer does not display search hints.

- **Autocomplete delay (milliseconds):** The number of milliseconds to wait after the user stops typing before search hints are displayed.

- **Minimum Prefix length:** The number of characters the user must type before search hints are displayed.

- **Maximum Search Hints:** The maximum number of search hints to display.

- **Maximum Results:** The maximum number of search results to show.

▶ **Before you leave the Instant Search page:**

1. Click **Apply Changes**.

2. Click **Save Site**.

38.8.11 Configure the Layer List for a Silverlight Viewer

The Layer List lists the layers, map services, base maps, and graphics layers in the map.

The Layer List page in Manager allows you to configure the visibility and behavior of the Layer List elements such as the legend and transparency slider.

▶ **To open a Viewer's Layer List page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Layer List**.
   The Layer List page opens.

▶ **To create a custom Layer List:**

1. Click **Copy Defaults**.
   The settings become available for editing.

2. Modify the Layer List as desired.

Layer List

- **Show Transparency Slider:** When this check box is selected, a slider that controls the map's transparency is included in the Layer List. If you do not want the user to be able to control map transparency, clear the check box.

- **Include Legend Swatches:** When this check box is selected, legend swatches are embedded in the Layer List under the layers they represent. The user can expand and collapse the legend for individual layers by clicking the legend icon beside the layer's name. If you want the legend to show as a separate list instead of being embedded in the Layer List, clear the check box.
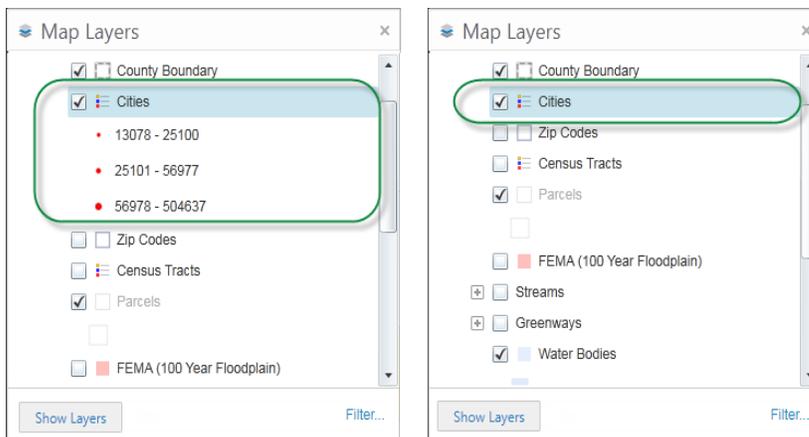
Legend in the Layer List showing the Cities legend expanded and collapsed

- **Auto Expand Swatches:** When this check box is selected, embedded legend swatches are expanded when the user first opens the Layer List. If you want the legends to initially be collapsed, clear the check box.

- **Expand Folders:** When this check box is selected, folders in the Layer List are expanded the first time the user opens the Layer List. If you want folders to be collapsed initially, clear the check box.

- **Expand Group Layers:** This setting applies only to Essentials versions older than 3.7. When this check box is selected, group layers are expanded the first time the user opens the Layer List. If you want group layers to be collapsed initially, clear the check box.

- **Expand Map Services:** This setting applies only to Essentials versions older than 3.7. When this check box is selected, map services in the Layer List are expanded the first time the user opens the Layer List. If you want map services to be collapsed initially, clear the check box.

Legend

The following settings enable you to control which layers legend swatches are shown for:

- **Toggled Visible:** When this check box is selected, legend swatches are shown only for layers that are turned on. If you want the legend to show for layers that are turned off, clear the check box.

- **Available at Current Scale:** When this check box is selected, legend swatches are shown only for layers that are visible at the current map scale. If you want the legend to show for layers that are not currently visible, clear the check box.

- **Layer Extent Intersects Current Map Extent:** When this check box is selected, legend swatches are shown only for layers that extend into the current map extent—layers that lie entirely outside the current map extent are not shown in the legend. If you want the legend to show for layers that lie outside the current map extent, clear the check box.

Filter

- **Filter:** The location of the Filter control—at the top or bottom of the Layer List

▶ **To revert to the default Layer List:**

> Reverting to the default Layer List permanently deletes your custom Layer List.

1. Click the **Revert to Default** button.
   You are prompted to confirm.

2. Click **OK**.

▶ **To remove the Layer List:**

If you do not want the Viewer to have a Layer List, you can remove it.

1. Click the **Remove layer List** button.
   You are prompted to confirm.

2. Click **OK**.

▶ **To add back the Layer List if you have removed it:**

1. Click the **Create Layer List** button.
   A copy of the default Layer List becomes available for editing.

2. Customize the copy of the default Layer List, or click **Revert to Default** to go back to the default Layer List.

▶ **Before you leave the Layer List page:**

1. Click **Apply Changes** or **Save Site**.

38.8.12 Configure User Layer Addition in a Silverlight Viewer

The User Layer Addition feature enables end users working in the viewer to add layers to the map. The user can add:

- ArcGIS Server map services, feature services, and image services
- WMS and WMTS map services
- Web tiled layers
- Bing Maps layers
- GeoRSS layers
- Shapefiles

To add a layer, the user opens the Add Layer wizard, and then searches for one or more map services. The user has two options:

- **Enter a URL:** The user can enter the URL for the service to add.
- **Search by Keyword:** If one or more service connections are configured to allow being searched from viewers, the user can enter a search term, and then select the service from the search results. To configure a service connection to allow being searched from viewers, see **Enable Searching a Service Connection from Viewers** on page **125**.

To complete the wizard, the user selects the layer to add and specifies a name to use for the layer in the viewer.

If you want to allow User Layer Addition, the user must have a way to open the Add Layer wizard. The toolbar has an Add Map Layer tool 🍭 that the user can click to open the Add Layer wizard. See **Configure the Toolbar for a Silverlight Viewer** on page **357** for instructions on adding tools to the toolbar.

If you do not want users to be able to add layers, you can remove the User Layer Addition feature. Alternatively, you can prevent the user from opening the Add Layer wizard by not providing a way to open the wizard. In particular, you can exclude the Add Map Layer tool from the toolbar.

Settings

User layer addition has the following settings:

- **Start searching when Add Layer wizard opens:** When this check box is selected, the search starts right away when the user opens the Add Layer wizard. Search results display as soon as they are found.

  If the user lets the search complete, the search results will include all the services in all the services connections that are configured to allow being searched in viewers. The user can override a search that is in progress by entering a new keyword or URL and clicking Search.

  If you do not want the search to start automatically when the wizard opens, clear the check box. By default, the check box is cleared.

- **Zoom to extent of newly added layer:** When this check box is selected, the map automatically zooms to the full extent of the layer as soon as the user adds the layer. The check box is selected by default.

  If you want the map to remain at the same extent when a layer is added, clear the check box.

Configuration

User layer addition is configured on the User Layer Addition page in Manager.

To open a Viewer's User Layer Addition page in Manager:

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **User Layer Addition**.
   The User Layer Addition page opens.

To modify the configuration:

1. Click **Copy Defaults**.
   The settings become available for editing.

2. Modify the settings as desired.

To revert to the default configuration:

1. Click the **Revert to Default** button.
   You are prompted to confirm.

2. Click **OK**.
   The User Layer Addition settings are reset to their default values. The settings can no longer be edited.

To remove the ability for users to add layers:

1. Click the **Remove Module** button.
   You are prompted to confirm.

2. Click **OK**.
   The configuration settings disappear from the page and an Enable Layer Addition button displays. The UserLayerAddition module is disabled on the All Modules page.

To re-enable user layer addition:

1. Click the **Enable Layer Addition** button.
   A copy of the default configuration becomes available for editing.

2. Modify the settings as desired, or click **Revert to Default** to go back to the default configuration.

Before you leave the User Layer Addition page:

1. Click **Apply Changes** and then **Save Site**.

38.8.13 Configure Workflow in a Silverlight Viewer

A Silverlight viewer's Workflow page in Manager allows you to configure the viewer's workflow containers, and disable the Workflow feature.

> **NOTE** Before version 2.4 of the Silverlight Viewer, you could configure startup workflows in viewers. Starting in version 2.4, startup workflows are configured in the site instead of the viewer. For information, see **Configure a Workflow to Run on Startup** on page **243**. Startup workflows that were configured using the old method will continue to work in version 2.4 and higher.

For information about workflow containers, see "Configure Workflows" in the *Geocortex Viewer for Silverlight Administrator and Developer Guide*.

▶ **To open a viewer's Workflow page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Workflow**.
   The Workflow page opens.

▶ **To modify the default configuration:**

1. Click **Copy Defaults**.
   The workflow settings become available for editing.

2. Modify the settings as desired.
   Follow the instructions to add, edit, and remove workflow containers.

▶ **To add a workflow container:**

1. Click **Add Workflow Container**.
   The Add Workflow Container dialog box opens.

2. **Name:** A name for the container.
   The name is not visible in the viewer.

3. **Title:** The title to appear in the title bar of the region where the workflow displays.
   If you do not specify a title, the default title, "Workflow", is used.

4. **Region Name:** The region in the viewer where the workflow displays.
   The most common regions for workflows are:

   - **DataRegion:** Opens the workflow in the data frame (information pane) at the side of the viewer.

   - **ModalWindowRegion**: Opens the workflow opens in a modal dialog.

   For information about additional regions, see "Predefined Viewer Regions" in the *Geocortex Viewer for Silverlight Administrator and Developer Guide*.

5. **Icon URI:** (optional) The URI for the icon that the user can click to return to the workflow if it is interrupted by another activity.
   The icon displays at the bottom of the frame where the workflow is displayed.

6. Click **OK**.
   The container is added to the list.

To edit a workflow container:

1. In the list of containers, click the **Edit** icon next to the container you want to modify.

   The Edit Workflow Container dialog box opens.

2. Edit the container settings.

3. Click **OK**.

To remove a workflow container:

1. In the list of containers, click the **Remove** icon beside the container you want to remove.

   You are prompted to confirm.

2. Click **OK**.

   The container is removed from the list.

To revert to the default configuration:

> ⚠ Reverting to the default configuration permanently deletes your custom workflow configuration.

1. Click the **Revert to Default** button.

   You are prompted to confirm.

2. Click **OK**.

To remove the ability for users to run workflows:

If you do not want the viewer to allow users to run workflows, you can remove the module.

1. Click the **Remove Workflow** button.

   You are prompted to confirm.

2. Click **OK**.

   The Workflow module is disabled on the All Modules page.

To re-enable workflow:

1. Click the **Enable Workflows** button.

   A copy of the default configuration becomes available for editing.

2. Customize the copy of the default configuration, or click **Revert to Default** to go back to the default configuration.

Before you leave the Workflow page:

1. Click **Apply Changes** or **Save Site**.

38.8.14 Integrate Insight

From version 2.5, the Geocortex Viewer for Silverlight contains the Insight Integration Module that collects and sends viewer usage and other data to the Client Relay Collector in Insight. You enable Insight integration on the Insight Integration page for each viewer in Manager and then set the URL to the Client Relay Collector.

You can also configure the file size that is sent to the Client Relay Collector in the `Viewer.Defaults.xml` file.

▶ **To enable Insight in Manager:**

1. Log in to Manager and navigate to the site that contains the viewer you want to enable.

2. Expand the side panel of the viewer you want to activate.

3. On side panel, click **Insight Integration**.
   The Insight Integration page opens.
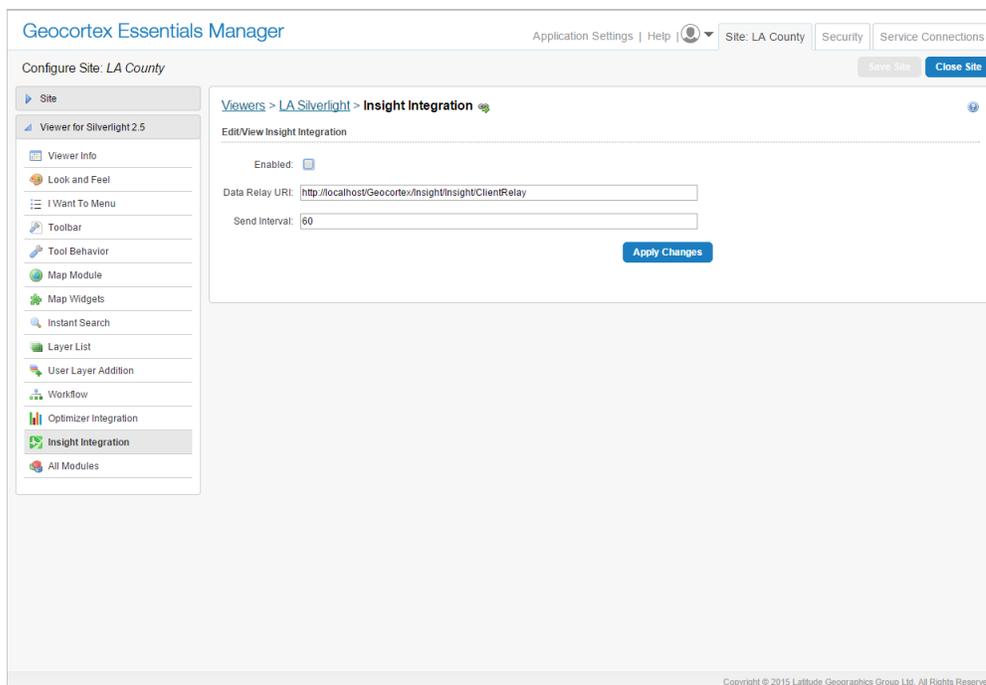
4. On the Insight Integration page, select the **Enabled** checkbox to activate Insight..

5. In the **Data Relay URI** box, paste the URI to the Client Relay Collector.

6. In the Send Interval box, type in the time, in seconds, between attempts to send the data file to the Client Relay Collector in Insight.

7. Click **Apply Changes**, and then **Save Site**.

38.8.15 Integrate Optimizer into a Silverlight Viewer

Geocortex Optimizer captures and organizes information about your ArcGIS Server sites and infrastructure. If you have purchased a Geocortex Optimizer license, you can integrate your Geocortex viewers with Optimizer. When a viewer is

integrated with Optimizer, the viewer sends usage data to Optimizer's Client API Relay collector. The data is then written to the Optimizer database so you can run reports against it. The data includes information about the viewer's users, the layers and regions that they look at, and the tools that they use.

The Optimizer Integration page in Manager enables you to configure the settings required to send data to Optimizer. If you have not purchased Geocortex Optimizer or you are not using the Client API Relay collector, skip this page. To find out more about Geocortex Optimizer, see the Geocortex website or contact your Geocortex Account Manager.

▶ **To open a Viewer's Optimizer Integration page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Optimizer Integration**.
   The Optimizer Integration page opens.

Settings

The Optimizer Integration page has the following settings:

- **Enabled**: When this checkbox is selected, the Viewer sends data to Optimizer. If you do not use Optimizer, clear this checkbox. By default, this checkbox is cleared.
- **User Name**: A phrase indicating that the real user name is not available because the user is not signed in. The default is **DefaultUser**.
- **Data Relay URI**: The URI to the Optimizer endpoint responsible for collecting data. If the endpoint is not specified, the Viewer attempts to log back to the same host that the Viewer application is launched from.

▶ **Before you leave the Optimizer Integration page:**

1. Click **Apply Changes** or **Save Site**.

38.8.16 Enable or Disable Modules in a Silverlight Viewer

The All Modules page in Manager allows you to enable and disable individual Modules in the Viewer. By default, all Modules are enabled.

This page also provides the following information about each Module, as well as a link to the page in Manager where the Module is configured:

- **ID:** The ID that uniquely identifies the Module.
- **Name:** The Module's name.
- **Library URI:** The URI to the Assembly that the Module is packaged in.

▶ **To open a viewer's All Modules page in Manager:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **All Modules**.
   The All Modules page opens.

▶ **To disable or enable a Module:**

1. To disable a Module, clear the **Included** check box beside the Module.

2. To enable a Module, select the **Included** check box beside the Module.

▶ **Before you leave the All Modules page:**

1. Click **Apply Changes** or **Save Site**.

38.8.17 Configure Editing in a Silverlight Viewer

About Editing

The table below lists the details of which editing functions come with Essentials-out-of-the-box.

> **NOTE** As of Geocortex Viewer for Silverlight 2.0, the Editing Module contains all of the functionality that was previously in the Advanced Editing Module, which is now a part of the product.

Feature	Available in Essentials Out of the Box
Add features to a map.	✔
Add features using feature templates.	✔
Edit attributes and feature geometry.	✔
Use freehand editing.	✔
Cut, Reshape, Union, and Delete features.	✔
Copy features from other layers.	✔
Align edges along a complex path.	✔
Create vertices where features intersect.	✔
Use the Edge Snapping tool to snap precisely to edges from dynamic services, WMS layers, tiled layers etc.	✔
Snap precisely to vertices and edges on any type of layer.	✔

Configure Editing

Manual Configuration

To manually configure Editing, see "Editing Module" in the Geocortex Viewer for Silverlight Administrator and Developer Guide.

It is much easier to add the Editing Module automatically using Manager, however, customizing the configuration must be done manually.

Automatic Configuration

Manager can automatically add the Editing Module. If the Viewer does not have an editing tab, create a tab and a group to hold the editing tools, and add **EditToolsRegion** to the group.

> If you want to customize the configuration of the Editing Module, you must configure the module manually.

▶ To add a new Editing tab to the toolbar:

1. In Manager, edit the viewer that you want to configure.

2. Click **Toolbar** in the side panel.

3. Click **Copy Defaults** to add all the default tools to the Viewer.

4. In the Configured Toolbar section, click **Add Tab**.

5. In the **Display Name** box, type in the name you want to give the Toolbar tab, for example, **Editing**, and then click **OK**.
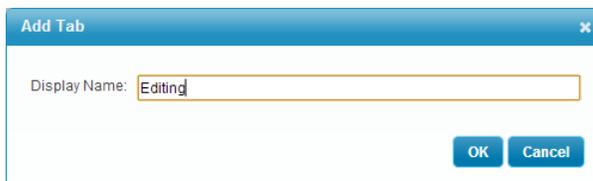
6. Position the new tab in relation to the current Configured Toolbar tabs.
   If you want it to appear at the end of the Toolbar, drag it to the bottom.
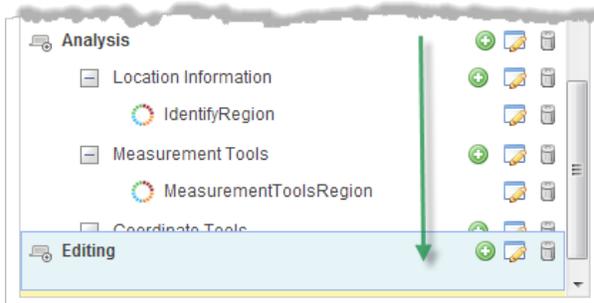
7. Click **Apply Changes**.

▶ **To create a new group for the editing tools:**

1. Beside the new tab, click **Add Group** ⊕.

2. In the **Display Name** box, type a name for the group, for example, **Editing**.

3. Click **Apply Changes**.

▶ **To add the Edit Tools Region to the new Toolbar tab:**

1. In the **Available Tools** section, scroll down to the **Tasks** section.

2. Drag the **EditToolsRegion** into the position below the new group.
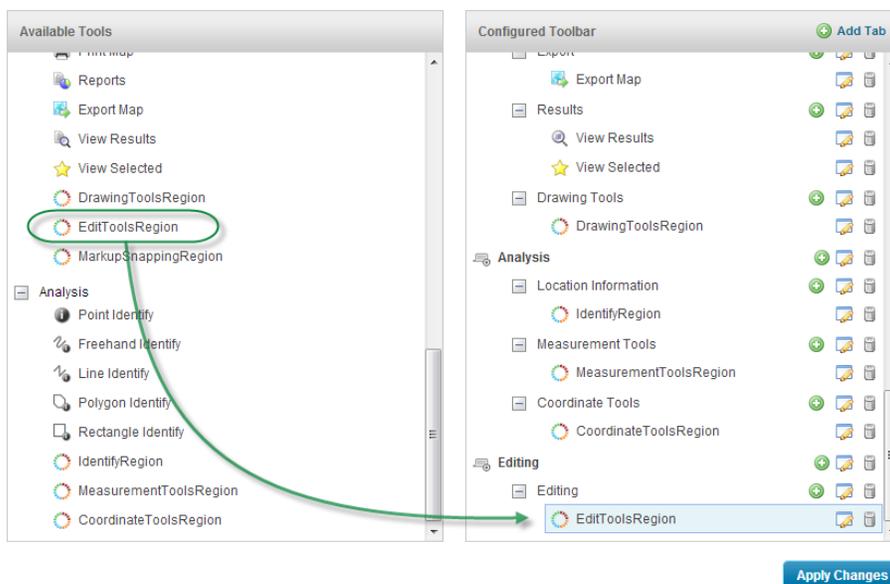
3. Click **Apply Changes**.

4. Click **Save Site**.

Configure Layers for Editing

There are layer settings that you can configure in Geocortex Essentials Manager to facilitate editing. These settings are applied to each layer in the map separately. The editing settings are on the Details page of each Layer and include:

- **Features can be Copied to Edit Laye**r: When selected, features from this layer can be copied to the edit layer you are working on.
- **Allow Snapping**: When selected, this layer appears in the Layers for Snapping list so that it can be downloaded to the client and its graphics used to snap to.
- **Snapping Enabled**: When selected, this layer will be enabled for snapping by default.

Configure a Layer for Copying

In order for a layer to appear in the **Layers for Copying** list so that its features can be copied to the edit layer, you need to configure them in Geocortex Essentials Manager.
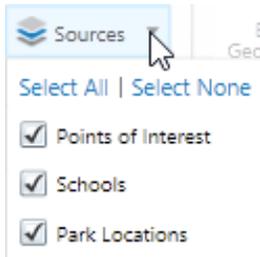
▶ **To enable a Layer for Copying:**

1. In Manager, edit the site.
2. Click **Map** in the side panel.
3. Expand the map service to list the layers.
4. Click **Edit** 🖉 beside the layer you want to enable for copying.
5. On the **Details** tab, scroll to the **Editing** section at the bottom of the page.
6. Select **Features be Copied to Edit Layer**.
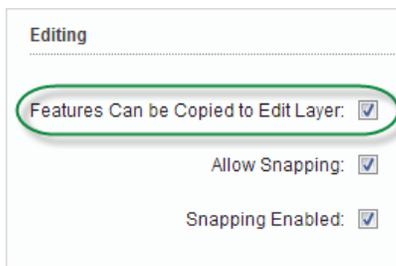
7. Click **Apply Changes** or **Save Site**.

Configure a Layer for Snapping

Before a layer can appear in the **Snap to** list and its features snapped to using the snapping tool, you need to configure them in Geocortex Essentials Manager.
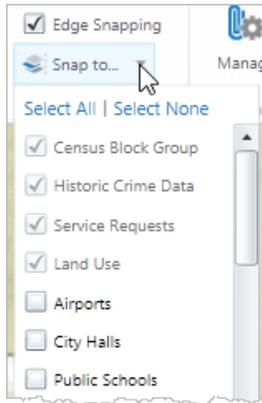
> **To enable a Layer for Snapping:**

1. In Manager, edit the site.

2. Click **Map** in the side panel.

3. Expand the map service to list the layers.

4. Click **Edit** ✎ beside the layer you want to enable for snapping.

5. On the **Details** tab, scroll to the **Editing** section at the bottom of the page.

6. Do one of the following:

   - If you want the layer to appear in the Layers for Snapping drop-down list, select **Allow Snapping**.

   - If you want the layer to appear selected in the list by default, select **Snapping Enabled**.
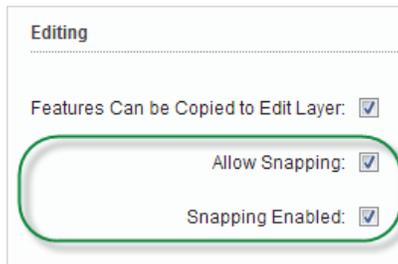
7. Click **Save Site**.

38.8.18 Export Georeference Data in a Silverlight Viewer

The Silverlight Viewer's Export Map function can export the map image alone, or export the map image with its georeference data. Including the georeference data makes it possible for the user to open the exported map in GIS applications like ArcMap, and have the application position the map image correctly.

There are two ways for a user to include the georeference data when exporting the map image:

- **GeoTIFF Format:** By exporting the map in GeoTIFF format.
  Exporting the map as a GeoTIFF creates a `.tif` file that has the georeference information embedded in the file.

- **Non-Spatial Format:** By exporting the map in a standard image format, such as BMP or PNG, and selecting the option to include the georeference data.
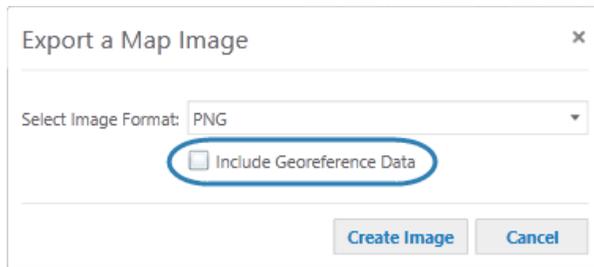
Include Georeference Data option in the Silverlight Viewer

This method creates a ZIP file that contains:

- The map image in the image format selected by the user.

- The map projection in PRJ format at the current extent and with any added markup.

- A world file containing the georeference information.

If your Silverlight viewer includes a tool or menu option to export the map (`ShowExportMapDialog` command), by default the Include Georeference Data check box appears in the viewer. If you do not want the Include Georeference Data option to appear in the viewer, you can hide it.

▶ **To hide the Include Georeference Data check box:**

1. In Manager, edit the viewer that you want to configure.

2. In the side panel, click **Tool Behavior**, and scroll down to the **Export** area.

3. Clear the **Allow Including Georeference Data** check box.

4. Click **Apply Changes**.

5. Click **Save Site**.
   The Include Georeference Data check box will not be visible in the viewer.

39 Essentials Security

The Security feature enables you to control access to your sites and protect your ArcGIS Server map services. You can control access to entire sites, and to individual parts of a site (map services, layers, workflows, reports, and more).

Security is implemented using **users**, **roles**, and **permissions**. To view a secured site, a user must present valid credentials (**authenticate**) and the user must have permission to access the site (**authorize**). When a user launches a viewer, the user may have to sign in if the site or any of its sub components are secured.

Security providers store and manage the users and roles that are used for security. **Membership providers** are security providers that store users. **Role providers** are security providers that store roles. There are also two special, predefined **Global roles**.

A **secured site** has at least one permission configured for at least one enabled security provider. It does not matter what the configuration is—the fact that at least one component has a permission set for it means that security is in force.

If you already have users and roles set up for some other purpose besides Essentials, you can configure Essentials to use these existing users and roles. This allows users to authenticate using the same credentials that they already use in some other context. For example, you could configure Essentials to use Windows users and groups.

You can configure more than one security provider. If you apply permissions to a site using more than one security provider, users choose which security provider to sign in with. Signing in with one security provider can give access to different parts of the site than signing in with a different security provider. Viewers have **Sign in and Sign out** hyperlinks that allow users to sign out of one security provider and sign in using a different security provider.

Security providers are configured globally—all the sites in an instance of Essentials have access to the same security providers. Enforcement of **SSL encryption** (HTTPS) is also set globally. (Before version 4.0 of Essentials, security providers and SSL were configured within each individual site.)

Manager has a **Security Health** function that evaluates your security configuration for potential weaknesses. Use the Security Health function to close gaps in your security configuration.

> **NOTE** The Geocortex Viewer for HTML5 and Geocortex Viewer for Silverlight both support Essentials Security. Note that you cannot take secured sites offline in the HTML5 Viewer.

See also...

> **Overview of Security** on page **25**

39.1 Functions of Security

The purpose of Essentials Security is to control which users can access your data. Essentials Security has two effects:

- **Filtering:** Essentials Security filters which parts of the site users can see. You can prevent users from seeing an entire site, particular map services and layers, or other configured components like charts, reports, and workflows.

- **Layer Security (Proxy):** Essentials Security secures communications between the site's ArcGIS Server services and Geocortex viewers. This is done by proxying service requests through Essentials. Instead of seeing the service's URL in the browser's address bar, the user sees the URL of an Essentials endpoint.

39.1.1 Filtering

Filtering allows you to control which parts of a site users see in the viewer. The Filtering function of Essentials Security is useful for hiding parts of a site that are not relevant to the user.

When a user is denied permission to a particular component in a site, that component is not visible in the viewer, it cannot be queried, and it does not appear in map exports, reports, or printouts. For more information about the visibility of secured components, see **Permissions** on page **421**.

> **NOTE** The Filtering function does not **secure** components—it does not hide the service's URL from the user. Filtering simply prevents components from appearing in the viewer.

Filtering also prevents unauthorized access to the site's REST API—an unauthorized user cannot view the site's REST endpoints in the REST API Sites Directory, and an unauthorized application cannot access the site programmatically.

Unlike the Layer Security function, filtering works for all the types of service that you can add to the map.

💡 You can exclude layers that you do not want anyone to see. For information, see **Exclude Layers from a Dynamic Map Service** on page **113**. If you want some users or applications to be able to access a layer, use the Security feature's filtering capability instead of excluding layers.

Layer Security (Proxy)

The Layer Security function of Essentials Security prevents a malicious user from using Essentials to access your ArcGIS Server services. It does this by proxying requests through Essentials.

As soon as you apply a permission to one layer in the service or you configure a layer filter workflow for one layer, all viewer requests that would previously have gone directly to ArcGIS Server now go through Essentials's built-in Layer Security proxy—the viewer no longer communicates directly with the service, and the user sees the URL of an Essentials REST endpoint instead of the URL of the service. This is illustrated below.

The Layer Security proxy is specific to a map service. If your site has more than one ArcGIS Server map service, each map service with at least one secured layer or layer filter workflow has its own Layer Security proxy.

📌 NOTE The Layer Security function works for ArcGIS Server map services, feature services, and image services only. Requests to other types of service, such as WMS services and geocoding services, are not proxied.

📌 NOTE If you secure ArcGIS Server using a proxy page and you apply permissions to one or more layers, the Layer Security proxy takes precedence over your proxy page.
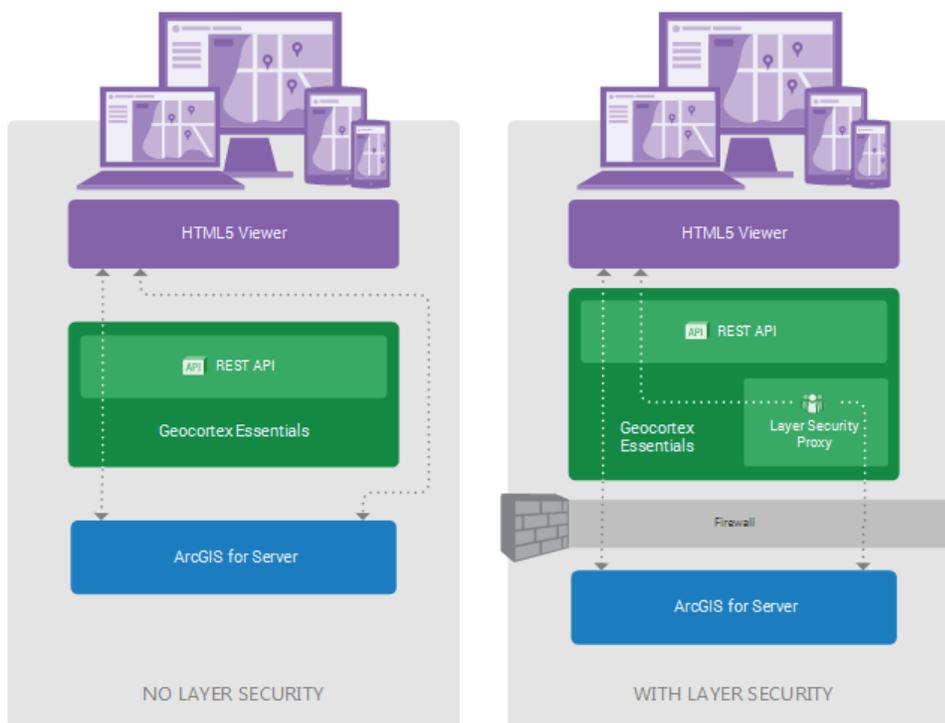
System without Layer Security (left) and with Layer Security (Right)

In the diagram on the left, labelled **No Layer Security**, viewers request map images and data directly from ArcGIS Server. This is represented by the right-hand arrow bypassing Geocortex Essentials.

The left-hand arrow represents Essentials REST API operations. Certain REST API operations, such as printing, require Essentials to make a request to ArcGIS Server. This is represented by the arrow continuing through Essentials to ArcGIS Server. Essentials can freely make requests to ArcGIS Server as needed, regardless of whether Layer Security is in force. This is why the left-hand arrow is the same in both diagrams.

In the diagram on the right, labelled **With Layer Security**, viewer requests for map images and data go to the Essentials Layer Security proxy before being forwarded to ArcGIS Server. Responses go back through the proxy.

> ⚠️ The ArcGIS Server services must be behind a firewall or otherwise secured. Otherwise, a malicious user could access the services directly, bypassing the Essentials Layer Security proxy.

The diagram has been simplified to show a single Layer Security proxy. This implies a single secured ArcGIS Server map service, because each secured ArcGIS Server map service has its own proxy. In the more general situation, there may be many ArcGIS Server map services, some of which are secured and others not. In this case, there would be many proxies—one for each secured service—and the unsecured services would communicate directly with the viewers.

39.2 SSL Encryption

Essentials Security does not protect a site's information while it is being transmitted across a network. In particular:

- When a user signs in, the user name and password are not encrypted.
- Feature data is not encrypted between the viewer and server.
- The authentication token that a viewer presents to gain access to a site is not encrypted between the viewer and server.

For this reason, we recommend that you enforce the use of Secure Socket Layer (SSL) for communications with Essentials. When the Security feature's Enforce SSL setting is turned on, viewers must use the HTTPS protocol to access sites. By default, SSL is enforced for all secured operations and requests.

> 📝 The Identity Server security provider has a Require SSL setting in the Post Installer. The Require SSL setting enforces the use of SSL for communications with Identity Server. Refer to the *Geocortex Essentials Installation Guide* for information.

Turn SSL Enforcement Off or On

By default, SSL is enforced. This means that sites can only be accessed using HTTPS. When the Security feature's Enforce SSL setting is turned off, sites can be accessed using HTTP.

> 📝 Turning off SSL enforcement is not recommended.

▶ **To change SSL enforcement:**

1. In Manager, click the **Security** tab, and then click **Settings** in the side panel.

2. To enforce SSL encryption between the viewer and server, select the **Enforce SSL** check box.
   To allow unencrypted communications between the viewer and server, clear the **Enforce SSL** check box.

3. Click **Apply Details**.

39.3 Overview of Steps to Set Up Essentials Security

The procedure below outlines the main steps to secure Essentials.

▶ **To set up Essentials security:**

1. **SSL:** If you do not have a working SSL certificate, get one and install it.
   By default, the SSL is enforced in Essentials.

   > Turning off SSL enforcement is not recommended—SSL encryption is a critical part of the complete security picture.

   See **SSL Encryption** on page **399**.

2. **Security Settings:** Configure the security settings.
   See **Configure Global Security Settings** on page **418**.

3. **Security Providers:** Configure the security provider(s) that you want to use:

   - **Integrated Windows Authentication** on page **402**
   - **Anonymous Access** on page **404**
   - **Geocortex Identity Server** on page **405**
   - **The ArcGIS Security Provider** on page **415**

4. **Sign-In Settings:** For each site, configure the settings that control sign-in and sign-out behavior.
   See **Configure Sign-In Settings** on page **420**.

5. **Permissions:** For each site and each security provider, apply permissions to users and roles.
   See **Configure Permissions** on page **423**.

6. **Security Health Check:** Check for and correct potential weaknesses in your security configuration.
   See **Perform a Security Health Check** on page **427**.

7. **Filter Features:** If you want to restrict the particular features that different users see, configure feature filtering.
   See **Filter a Layer's Features** on page **428**.

See also...

Common Problems on page **428**

39.4 Example: Windows Authentication and Identity Server

This example uses two security providers: the Windows Integrated security provider and Geocortex Identity Server.

Your company has Essentials sites that employees use regularly. In addition, the company sometimes hires outside contractors who need to access one or more of the sites. Essentials is secured. You use Integrated Windows Authentication to authenticate employees, and Geocortex Identity Server to authenticate contractors. Windows Authentication and Geocortex Identity Server are the only security providers that you use.

When a contractor is hired, you create a Geocortex Identity Server user for the contractor and apply permissions to the user. You change the security provider's name to **Contractors**, and then give the credentials to the contractor with instructions to sign in using Geocortex Identity Server.

When the contractor launches the viewer, the contractor is presented with a list of the enabled security providers, in this case, **Geocortex Identity Server** and **Windows Integrated** (shown below). The contractor selects Geocortex Identity Server. This opens the Identity Server sign-in dialog box and performs the authentication using Identity Server.

When employees launch the viewer, they select Windows Integrated. This authenticates them using Windows users and roles.
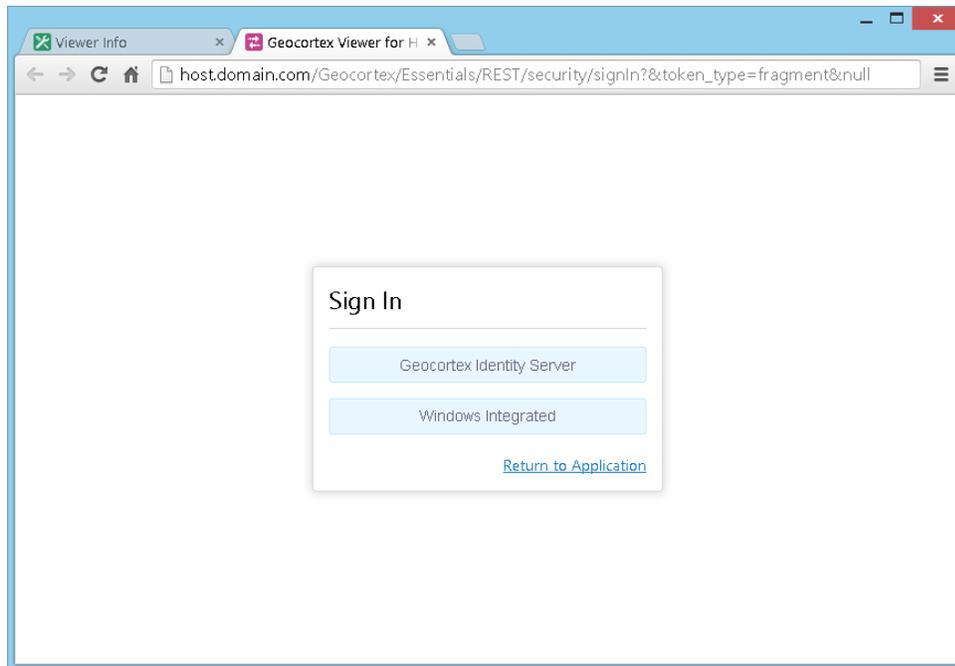
Sign-in page where the end user selects the security provider to sign in with

39.5 Security Providers

Security providers store and manage the users and roles that are used for security. Security providers may also provide the web page where users sign in.

The security providers that you use depend on your IT infrastructure and business needs. Different security providers are appropriate in different circumstances.

Essentials supports the following security providers:

- **Windows Integrated (Integrated Windows Authentication):** Integrated Windows Authentication (IWA) uses Windows users and roles. If you use Active Directory with IWA, Essentials automatically uses the Active Directory users and roles.

- **Anonymous Access:** Anonymous access gives users access to the site without being authenticated.

- **Geocortex Identity Server:** Geocortex Identity Server uses dedicated security software that is installed with Essentials. By default, Identity Server uses the membership and role providers that ship with Essentials. You can adapt Identity Server to use any ASP.NET-compatible membership and role providers. You can also adapt Identity Server to use legacy (Essentials 3.x) XML providers.

- **ArcGIS:** The ArcGIS security provider uses Portal for ArcGIS or ArcGIS Online to perform authentication.

You can use multiple security providers. You can also create custom security providers.

See also...

> [**The Global Roles** on page **418**](#)

39.5.1 Integrated Windows Authentication

Integrated Windows Authentication (IWA) uses Windows users and roles. IWA is appropriate for securing sites that will be used by members of your organization.

Windows Users and Roles

The Windows Integrated security provider allows you to apply permissions to the following types of users and roles:

- **Windows Integrated - All Users:** Permissions that you set for All Users apply to all users who authenticate using their Windows credentials when they launch the viewer.

- **Windows Integrated - Windows Account:** Permissions that you set for a particular Windows account only apply to that user account.

- **Windows Integrated - Windows Group:** Permissions that you set for a particular Windows group apply to users that belong to that group.

39.5.1.1 Enable Windows Authentication

To use Integrated Windows Authentication for Essentials Security, Windows Authentication must be enabled. You can use the Post Installer to enable Windows Authentication. Turning on Windows Authentication in the Post Installer is equivalent to installing Windows Authentication in Internet Information Services (IIS) and enabling the **Windows Authentication** Windows feature.

> **To enable Windows Authentication using the Post Installer:**

1. In the Post Installer, click **Configure Windows Features** in the side panel.

2. Select the **Windows Authentication** check box.
   If the check box is selected and grayed out, Windows Authentication is already installed and enabled.

3. Click **Finish**.
   You have now enabled Windows Authentication.

39.5.1.2 Windows Authentication with Active Directory

If you use Active Directory with Integrated Windows Authentication, Essentials automatically uses the Active Directory users and groups. To find a user or group, start to type in the name, and then select the user or group from the drop-down list.
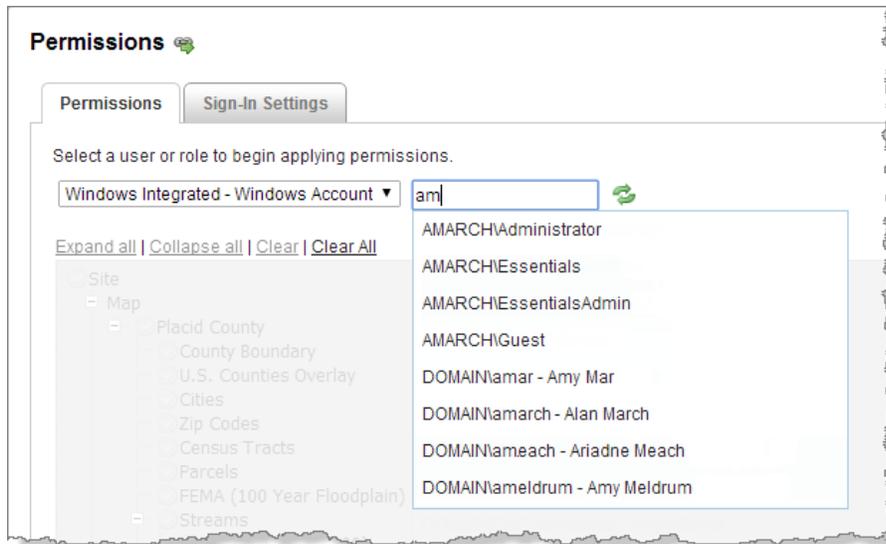
Example of accessing a Windows account from Active Directory

> **NOTE**
> In addition to using Active Directory with Windows Authentication, you can use standalone Active Directory membership and role providers with Geocortex Identity Server. For information, see **Geocortex Identity Server on page 405**.

39.5.1.3 Single Sign-On

Integrated Windows Authentication supports single sign-on, which automatically signs in users using their Windows credentials.

In order for single sign-on to work, the user must already be signed in to Windows. In addition, the client browser's security settings must have automatic authentication enabled under the current user name and password, for the appropriate zone. If one or more of these conditions is not met, the user has to sign in.

For complete steps to set up single sign-on, refer to the Geocortex Knowledge Base article "Configure single sign-on with Essentials Manager and viewers".

If Windows Integrated is the only service provider that you are using, you may want to configure a landing page so the user's browser is directed to a different page after the user signs out. Otherwise, single sign-on will immediately sign the user back in. Alternatively, you can disable sign-out.

39.5.1.4 Windows Impersonation

Impersonation occurs when an application makes a request as a user instead of as the application—the application impersonates the user. Impersonation ensures that the resource receiving the request knows the identity of the user that originated the request.

For example, in Essentials, when a user prints the map, the viewer sends the print request to Essentials, and Essentials sends a map image request to the map service. Normally, the map image request is made as Essentials. When impersonation is enabled, the map image request is made as the user—Essentials impersonates the user.

To use Windows impersonation:

- The service must be an ArcGIS Server map service.

- Both the service and the Essentials site or component must be secured using Integrated Windows Authentication.

- The end user must be on the domain—impersonation does not work when the user connects over the Internet.

- The Essentials server must be on the domain.

Allowing Windows impersonation ensures that ArcGIS Server knows the identity of the user that made the request.

For instructions on enabling Windows impersonation, see **Configure Global Security Settings** on page **418**.

In addition to impersonating users when connecting to services, Essentials can impersonate users when connecting to data links. If you are using Windows impersonation and your sites use data links, see **Data Connections** on page **227** for information.

39.5.1.5 Configuration Checklist for Windows Authentication

The complete list of steps to configure security is given in **Overview of Steps to Set Up Essentials Security** on page **400**. Use this checklist in conjunction with the complete list of steps.

To use Integrated Windows Authentication for Essentials Security:

- Windows Authentication must be enabled.

- The Windows Integrated security provider must be enabled. By default, it is enabled.

- You must configure permissions using one or more of the Windows users and roles, in each site that you want to secure using Windows Authentication.

- If Windows Integrated is the only security provider you are using to secure a site, you might want to configure the site's sign-in settings. To prevent single sign-on from immediately signing a user back in after signing out, you can either configure a landing page or disable sign-out.

- If you want, change the name of the security provider to something that is more meaningful to end users.

- If both ArcGIS Server and Essentials are secured using Windows Authentication and ArcGIS Server needs to know user identities, enable Windows impersonation.

- If you are using Windows impersonation and you also want to use impersonation when connecting to data links, enable impersonation on the data connections.

See also...

> **The Global Roles** on page **418**

39.5.2 Anonymous Access

Anonymous access gives users immediate access to a site without being authenticated. Anonymous access is also called guest access.

Anonymous Access is often used in conjunction with one or more other security providers. Typically, Anonymous Access gives access to a subset of the site, and the other security providers give access to additional parts of the site or to the entire site. When a user launches the viewer, the site loads immediately with Anonymous Access - Guest permissions. To see additional parts of the site, the user must sign in to one of the other security providers. When the user signs out, either the site reloads with Anonymous Access - Guest permissions, or the browser redirects to the landing page if you have configured one.

Another use for Anonymous Access is to filter out components that are irrelevant to users.

The Anonymous Access security provider has a single role that you can apply permissions to, called **Anonymous Access - Guest**.

39.5.2.1   Configuration Checklist for Anonymous Access

The complete list of steps to configure security is given in **Overview of Steps to Set Up Essentials Security** on page **400**. Use this checklist in conjunction with the complete list of steps.

To use Anonymous Access for Essentials Security:

- The Anonymous Access security provider must be enabled. It is enabled by default.

- You must configure permissions using the **Anonymous Access - Guest** role in each site that uses Anonymous Access.

See also...

   Configure Permissions on page **423**

39.5.3   Geocortex Identity Server

Geocortex Identity Server uses dedicated security software that is installed with Essentials. To authenticate with Identity Server, users must enter their credentials.

Identity Server is based on membership and role providers that are defined in the following two files:

- `membership.config`
- `roleManager.config`

By default, the membership and role provider files are located in the following folder:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Identity
Server\Web\Configuration
```

Essentials ships with membership and role providers that you can use to perform authentication and authorization. Alternatively, you can change the membership and role providers that Identity Server uses.

Identity Server can use any ASP.NET-compatible membership and role providers that point to an existing database. Depending on the membership provider that you use, you may be able to configure password strength restrictions, the maximum number of sign-in attempts a user can have, lock-out procedures, and so on.

You can also adapt Identity Server to use legacy (Essentials 3.x) XML providers. See **Configure Identity Server to Use Legacy XML Providers** on page **412**.

NOTE   Geocortex Identity Server requires SSL. By default, Identity Server's Require SSL setting in the Post Installer is enabled.

Default Membership and Role Providers

In the default setup, authentication and authorization are against the membership and role providers that ship with Essentials. The default setup is appropriate when you do not have an existing database of users, or you want an easy way to create accounts for temporary users and you do not want to add them to your corporate database.

NOTE   The default Identity Server membership and role providers must be used together. You cannot use the default membership provider with a custom role provider. Likewise, you cannot use the default role provider with a custom membership provider.

Custom Membership and Role Providers

You can configure Geocortex Identity Server to use any ASP.NET-compatible membership and role providers that point to an existing database, such as SQL Server or Active Directory (when Active Directory is not being used with Integrated Windows Authentication). Using Identity Server with an existing database is appropriate when you already have a database of users who will be accessing Essentials.

> Geocortex Identity Server can work with security providers like Google, Yahoo, or Facebook. Setting this up is an advanced scenario. Contact Geocortex Support for help.

Geocortex Identity Server Users and Roles

The Geocortex Identity Server security provider allows you to apply permissions to the following types of users and roles:

- **Geocortex Identity Server - All Users:** Permissions that you set for All Users apply to all users who authenticate using credentials that are defined in the membership provider.

- **Geocortex Identity Server - Role:** Permissions that you set for a particular role apply to all the users with that role. The role is defined in the role provider that you are using.

- **Geocortex Identity Server - User:** Permissions that you set for a particular user only apply to that user. The user account is defined in the membership provider that you are using.

39.5.3.1 Configuration Checklist for Geocortex Identity Server

The complete list of steps to configure security is given in **Overview of Steps to Set Up Essentials Security** on page **400**. Use this checklist in conjunction with the complete list of steps.

To use Geocortex Identity Server for Essentials Security:

- The Geocortex Identity Server security provider must be enabled. By default, it is disabled.

- If you want, change the name of the security provider to something that is more meaningful to end users.

- You must configure permissions using one or more of the Identity Server users and roles, in each site that is secured using Geocortex Identity Server.

- If you want to use Geocortex Identity Server with the default membership and role providers, you must create the users and roles. See **Configure Users and Roles for the Default Setup** on page **406**.

- If you want to use Geocortex Identity Server with alternate membership and role providers, you must configure Identity Server to point to the providers. Follow the instructions that apply to you:

  - **Configure Identity Server to Use SQL Server** on page **408**
  - **Configure Identity Server to Use Active Directory** on page **409**
  - **Configure Identity Server to Use Active Directory Federation Services** on page **411**
  - **Configure Identity Server to Use Legacy XML Providers** on page **412**

39.5.3.2 Configure Users and Roles for the Default Setup

When you use Geocortex Identity Server with the default membership and role providers, users and roles are created and managed in Manager.

You can create users and roles in any order. If you create the roles first, you can assign roles to users at the same time you create the users. On the other hand, if you create the users first, you can assign users to the roles at the same time that you create the roles. Adding a role to a user is equivalent to adding a user to a role—you only need to define the relationship in one direction. Similarly, removing a user from a role is equivalent to removing a role from a user.

To configure users and roles to use with Geocortex Identity Server's default setup:

1. In Manager, click the **Security** tab, and then click **Providers** in the side panel.

2. Click the **Users and Roles** icon beside the **Geocortex Identity Server** security provider.
   The Users and Roles dialog box opens.

   > If Identity Server's SSL setting is enabled in the Post Installer and you do not have a valid SSL certificate installed, Essentials will not be able to connect to Identity Server and you will get an error message. SSL is enabled by default. You must correct this before you can add users and roles.

3. Create users and roles, and add users to roles.

   - **Add a User:** On the **Users** tab, click **New User**, and enter the user name and password.

   - **Add a Role:** On the **Roles** tab, click **New Role**, and enter the name for the role.

   - **Add a User to a Role:** On the **Roles** tab, click the **Edit** icon beside the role, click **Add User**, and then enter the user name.

   - **Add a Role to a User:** On the **Users** tab, click the **Edit** icon beside the user, click **Add Role**, and then enter the role name.

   - **Filter Users:** Filtering users is useful if the list of users is long. On the **Users** tab, enter the text that you want to match, and then click **Filter**. For example, **col** matches **coldenburg** and **jcollins**. To return to the full list of users, click **Clear**.

   - **Filter Roles:** Filtering roles is useful if the list of roles is long. On the **Roles** tab, enter the string that you want to match and click **Filter**. For example, **con** matches **Contractors** and **Quality Control**. To return to the full list of roles, click **Clear**.

   - **Remove a User from a Role:** On the **Roles** tab, click the **Edit** icon beside the role that you want to remove the user from. Click the **Remove User** icon beside the user that you want to remove.

   - **Remove a Role from a User:** On the **Users** tab, click the **Edit** icon beside the user that you want to remove the role from. Click the **Remove Role** icon beside the role that you want to remove.

   - **Delete a User:** On the **Users** tab, click the **Delete User** icon beside the user that you want to delete.

   - **Delete a Role:** On the **Roles** tab, click the **Delete Role** icon beside the role that you want to delete.

4. When you have finished configuring users and roles, click **Close**.
   The Users and Roles dialog box closes.

5. Click **Apply Details**.

39.5.3.3   Configure Identity Server to Use SQL Server

> **NOTE:** This section assumes that you already have a working SQL Server database that you want to use. For information, refer to Creating the Membership Schema in SQL Server (`http://www.asp.net/web-forms/tutorials/security/membership/creating-the-membership-schema-in-sql-server-cs`).

When you use SQL Server with Geocortex Identity Server, you can create, modify and delete SQL Server users and roles in Manager. Alternatively, you can use the utilities provided by SQL Server to manage users and roles.

To use SQL Server membership and role providers with Identity Server, you must add the providers to the Identity Server configuration files and point Identity Server at the SQL Server providers. Follow the instructions below to configure Identity Server to use SQL Server providers.

▶ **To set up Identity Server to work with SQL Server:**

There are three files you must modify:

- `connectionStrings.config`
- `membership.config`
- `roleManager.config`

By default, these files are in the following folder:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Identity
Server\Web\Configuration
```

Configure connectionStrings.config

1. Open **`connectionStrings.config`** in a text editor.

2. In the `connectionStrings` element, add the following markup as a sub element:

```
<add name="SqlConnString"
    connectionString="MY_CONNECTION_STRING">
```

3. Replace **`MY_CONNECTION_STRING`** with the connection string for your SQL Server.

4. Save **`connectionStrings.config`**.

5. Close the file.

Configure membership.config

1. Open **`membership.config`** in a text editor.

2. In the **`membership`** element, set **`defaultProvider`** to **`SqlMembershipProvider`**.
   The first line of the file should look like this:

```
<membership defaultProvider="SqlMembershipProvider">
```

3. In the **`providers`** element, add the following markup as a sub element:

```
<add name="SqlMembershipProvider"
     type="System.Web.Security.SqlMembershipProvider, System.Web, Version=4.0.0.0,
Culture=neutral, PublicKeyToken=b03f5f7f11d50a3a"
     connectionStringName="SqlConnString"
     enablePasswordRetrieval="false"
     enablePasswordReset="true"
     requiresQuestionAndAnswer="true"
     applicationName="/"
     requiresUniqueEmail="false"
     passwordFormat="Hashed"
     maxInvalidPasswordAttempts="5"
     minRequiredPasswordLength="7"
     minRequiredNonalphanumericCharacters="1"
     passwordAttemptWindow="10"
     passwordStrengthRegularExpression=""/>
```

4. Save **`membership.config`**.

5. Close the file.

Configure roleManager.config

1. Open **`roleManager.config`** in a text editor.

2. In the **`roleManager`** element, set **`defaultProvider`** to **`SqlRoleProvider`**.
   The first line of the file should look like this:

```
<roleManager enabled="true" defaultProvider="SqlRoleProvider">
```

3. In the **`providers`** element, add the following markup as a sub element:

```
<add name="SqlRoleProvider"
     connectionStringName="SqlConnString"
     applicationName="/"
   type="System.Web.Security.SqlRoleProvider, System.Web, Version=4.0.0.0,
Culture=neutral, PublicKeyToken=b03f5f7f11d50a3a"/>
```

4. Save **`roleManager.config`**.

5. Close the file.

39.5.3.4 Configure Identity Server to Use Active Directory

If your organization uses Active Directory to store its domain users, normally you would use Integrated Windows Authentication to secure Essentials. When you secure Essentials using Windows Authentication, Essentials automatically uses your Active Directory users and groups for authentication.

If Windows Authentication will not work for you, you can set up Geocortex Identity Server to connect to Active Directory. This creates an LDAP connection to Active Directory that you can customize to your needs.

> **NOTE** This method does not support single sign-on. For single sign-on to work, you must use Integrated Windows Authentication.

This section shows how to set up Geocortex Identity Server to connect to Active Directory. It assumes that you already have a working Active Directory database that you want to use.

▶ **To set up Identity Server to work with Active Directory:**

There are three files you must modify:

- `connectionStrings.config`
- `membership.config`
- `roleManager.config`

By default, these files are in the following folder:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Identity
Server\Web\Configuration
```

Configure connectionStrings.config

1. Open **`connectionStrings.config`** in a text editor.

2. In the `connectionStrings` element, remove `<!--` and `-->` surrounding each of the following sub elements:

```
<!--
   <add name="ADConnString"
connectionString="LDAP://server.domain.com/cn=Users,dc=domain,dc=com"/>
   -->
<!--
   <add name="ADRolesConnString"
connectionString="LDAP://server.domain.com/cn=Users,dc=domain,dc=com"/>
   -->
```

3. In the **`ADConnString`** sub element, replace the value of the **`connectionString`** attribute with the connection string for your Active Directory membership provider.

4. In the **`ADRolesConnString`** sub element, replace the value of the **`connectionString`** attribute with the connection string for your Active Directory role provider.

5. Save **`connectionStrings.config`**.

6. Close the file.

Configure membership.config

1. Open **`membership.config`** in a text editor.

2. In the **`membership`** element, set **`defaultProvider`** to **`ActiveDirectoryMembershipProvider`**.
   The first line of the file should look like this:

```
<membership defaultProvider="ActiveDirectoryMembershipProvider">
```

3. In the `providers` element, remove `<!--` and `-->` surrounding the following sub element:

```
<!--
<add name="ActiveDirectory"
  type="System.Web.Security.ActiveDirectoryMembershipProvider"
  connectionStringName="ADConnString"
  connectionUsername="username"
  connectionPassword="********"
  attributeMapUsername="sAMAccountName"
  enableSearchMethods="true" />
-->
```

4. Configure the `connectionUsername` and `connectionPassword`, and other attributes as required for your Active Directory.

5. Save `membership.config`.

6. Close the file.

Configure roleManager.config

1. Open `roleManager.config` in a text editor.

2. In the `roleManager` element, set `defaultProvider` to `ActiveDirectoryRoleProvider`.
   The first line of the file should look like this:

```
<roleManager enabled="true" defaultProvider="ActiveDirectoryRoleProvider">
```

3. In the `providers` element, remove `<!--` and `-->` surrounding the following sub element:

```
<!--
<add name="ActiveDirectoryRoleProvider"

type="Geocortex.ApplicationServices.Security.Membership.ActiveDirectoryRoleProvider
,Geocortex.ApplicationServices.Security"
    activeDirectoryUsersConnectionString="ADConnString"
    activeDirectoryGroupsConnectionString="ADRolesConnString"
    securityGroupsOnly="false"
    groupsToUse="*team;Ad*"/>
-->
```

4. Save `roleManager.config`.

5. Close the file.

39.5.3.5   Configure Identity Server to Use Active Directory Federation Services

Geocortex Identity Server supports Active Directory Federation Services (ADFS). Configuring Identity Server to use ADFS is an advanced scenario. Contact your Geocortex Account Manager to discuss Professional Service options.

39.5.3.6   Configure Identity Server to Use Legacy XML Providers

This section describes how to configure Identity Server to use the XML-based membership and role providers that were available in Geocortex Essentials 3.x.

> **NOTE:** You should only use the legacy XML providers if you are upgrading from a 3.x version of Essentials and you have an existing Security Provider XML file that you wish to continue using.

When you use legacy XML providers with Geocortex Identity Server, you can create, modify and delete users and roles in Manager. Legacy users and roles are managed the same way as users and roles in the default Identity Server setup. See **Configure Users and Roles for the Default Setup** on page **406** for instructions.

To use legacy XML membership and role providers with Identity Server, you must enable the providers in the Identity Server configuration files. Follow the instructions below to configure Identity Server to use legacy XML providers.

▶ **To set up Identity Server to work with the legacy XML providers:**

There are three files that you must modify:

- `App_Data\GlobalSecurityProvider.xml`
- `Configuration\membership.config`
- `Configuration\roleManager.config`

By default, these files are in the following folder:

`C:\Program Files (x86)\Latitude Geographics\Geocortex Identity Server\Web`

Configure GlobalSecurityProvider.xml

1. Open `GlobalSecurityProvider.xml` in a text editor.

2. Replace the content of `GlobalSecurityProvider.xml` with the content of your existing Security Provider XML file:

   - **Global Provider:** If you were using the global Geocortex security providers in Essentials 3.x, the default location of the legacy Security Provider XML file is:

     `C:\Program Files (x86)\Latitude Geographics\Geocortex Application Services\App_Data`

   - **Site-Specific Provider:** If you were using site-specific Geocortex security providers in Essentials 3.x, the default location of the legacy Security Provider XML file is:

     `C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Sites`

3. Save `GlobalSecurityProvider.xml`.

4. Close the file.

Configure membership.config

1. Open `membership.config` in a text editor.

2. In the `membership` element, set `defaultProvider` to `XmlMembershipProvider`.

The first line of the file should look like this:

```
<membership defaultProvider="XmlMembershipProvider">
```

3. Save `membership.config`.

4. Close the file.

Configure roleManager.config

1. Open `roleManager.config` in a text editor.

2. In the `roleManager` element, set `defaultProvider` to `XmlRoleProvider`.
   The first line of the file should look like this:

```
<roleManager enabled="true" defaultProvider="XmlRoleProvider">
```

3. Save `roleManager.config`.

4. Close the file.

39.5.3.7 Edit an Identity Server Security Provider

There are circumstances when you may need to change Identity Server's URL, for example, to update the host name when you change to a production server. You can also change the security provider's display name.

▶ **To edit a Geocortex Identity Server security provider:**

1. In Manager, click the **Security** tab, and then click **Providers** in the side panel.

2. Click the **Edit** icon [icon] beside the security provider that you want to configure.

3. Edit the settings as desired:

   - **Display Name:** The name that is used to refer to this security provider in Manager and on the Sign In page, where the user selects the security provider to sign in with.

   - **URL:** Identity Server's URL. Type or paste the URL in the box.

4. Click **OK**.

5. If Manager displays a message that you need to enter Identity Server's secret:

   1. In the file system where Identity Server is installed, navigate to Identity Server's setup application.
      In the default installation, the setup application is here:

      ```
      C:\Program Files (x86)\Latitude Geographics\Geocortex Identity
      Server\Web\bin\Geocortex.IdentityServer.Setup.exe
      ```

   2. Run the Identity Server setup application as an administrator.
      The results display in a Windows command window.

   3. Find `ServiceSecret` and copy the value.
      The value of `ServiceSecret` is Identity Server's secret.

   4. Close the command window.

5. In Manager, paste the secret into the **Secret** box.

6. Click **OK**.

6. Click **Apply Details**.

Add an Identity Server Security Provider

Essentials ships with one Geocortex Identity Server security provider already configured. You can add Identity Server security providers in Manager. This is useful if you deleted the security provider and you want to add it back.

▶ **To add a Geocortex Identity Server security provider:**

1. In Manager, click the **Security** tab, and then click **Providers** in the side panel.

2. Click ⊕ **Add Identity Server**.

3. In the **Display Name** box, type a name for the security provider.
    The display name appears in the list of security providers that the end user selects from, if you configure multiple security providers.

4. In the **URL** box, type or paste Identity Server's URL.

5. Get Identity Server's secret:

    1. In the file system where Identity Server is installed, navigate to Identity Server's setup application.
        In the default installation, the setup application is here:

        ```
        C:\Program Files (x86)\Latitude Geographics\Geocortex Identity
        Server\Web\bin\Geocortex.IdentityServer.Setup.exe
        ```

    2. Run the Identity Server setup application as an administrator.
        The results display in a Windows command window.

    3. Find `ServiceSecret` and copy the value.
        The value of `ServiceSecret` is Identity Server's secret.

    4. Close the command window.

6. In Manager, paste the secret into the **Secret** box.

7. If you want, enter an issuer seed in the **Issuer Seed** box.
    If you do not enter an issuer seed, Manager will create a seed for you.

    💡 Unless you have a specific reason to enter a seed, such as re-accessing a previously configured Identity Server that you deleted, we recommend that you let Manager create the seed.

8. Click **OK**.

Find Identity Server's Secret

In Manager, you may need to enter the unique secret for your instance of Geocortex Identity Server, for example, some changes to Identity Server's URL may require the secret. Follow the instructions below to get Identity Server's secret.

▶ **To find Identity Server's secret:**

1. In the file system where Identity Server is installed, navigate to Identity Server's setup application.

   In the default installation, the setup application is here:

   ```
   C:\Program Files (x86)\Latitude Geographics\Geocortex Identity
   Server\Web\bin\Geocortex.IdentityServer.Setup.exe
   ```

2. Run the Identity Server setup application as an administrator.

   The results display in a Windows command window.

3. Find `ServiceSecret` and copy the value.

   The value of `ServiceSecret` is Identity Server's secret.

4. Close the command window.

5. Paste the secret where it is needed.

39.5.4 The ArcGIS Security Provider

When you register Essentials with Portal for ArcGIS or ArcGIS Online in the Post Installer, the Post Installer creates an **ArcGIS**-type security provider that you can use to secure your sites. If Essentials is registered with Portal for ArcGIS, end users can sign in using the credentials that they use to sign in to Portal for ArcGIS. Portal for ArcGIS performs the authentication. If Essentials is registered with ArcGIS Online, end users can sign in using the credentials that they use to sign in to ArcGIS Online. ArcGIS Online performs the authentication.

💡 If you carried forward an existing **ArcGIS Online** security provider when you upgraded to Essentials 4.2 or newer, an **ArcGIS** security provider appears in place of the ArcGIS Online security provider in Manager. The ArcGIS security provider will use the permissions that you configured before 4.2. For more information, see "Upgrading Essentials" in the *Geocortex Essentials Installation Guide*.

You cannot create additional ArcGIS security providers—there is at most one. If the Windows sign-in method is configured in the Post Installer, then Manager does not have an ArcGIS security provider.

For information about registering Essentials, see "Choose a Method to Sign In to Manager" in the *Geocortex Essentials Installation Guide*.

ArcGIS Users and Roles

The ArcGIS security provider allows you to apply permissions to the following types of users and roles:

- **User**: Permissions that you set for a particular Portal for ArcGIS or ArcGIS Online user only apply to that user.
- **All Users:** Permissions that you set for all Portal for ArcGIS or ArcGIS Online users apply to all users who authenticate using their Portal for ArcGIS credentials.
- **ArcGIS Group:** Permissions that you set for a particular Portal for ArcGIS or ArcGIS Online group apply to all the users in that group.
- **ArcGIS Organization:** Permissions that you set for a particular Portal for ArcGIS or ArcGIS Online organization apply to all the users that belong to that organization.
- **ArcGIS Organization Role:** Permissions that you set for a particular Portal for ArcGIS or ArcGIS Online organization role apply to all the users with that role.

Security Provider and Permission Names

The security provider's default name, and the user and role names that appear on Manager's Permissions page, depend on whether Essentials is registered with Portal for ArcGIS or with ArcGIS Online:

- **Portal for ArcGIS:** The security provider is named after your portal by default. The user and role names start with the name of your portal.

  For example, if the portal name configured in Portal for ArcGIS is **My Portal**, the security provider is called **My Portal**, and the users and roles are **My Portal- ArcGIS Group**, **My Portal- All Users**, and so on.

- **ArcGIS Online:** The names depend on the URL that is configured for the sign-in method in the Post Installer:

  - **Main ArcGIS Online URL:** If the main ArcGIS Online URL (`www.arcgis.com`) is configured, the security provider's default name is **ArcGIS Online**. The user and role names start with **ArcGIS Online**, for example, **ArcGIS Online - ArcGIS Group**, **ArcGIS Online - All Users**, and so on.

  - **Organization URL:** If the URL for your organization's ArcGIS Online portal is configured, the security provider is named after your organization's ArcGIS Online portal by default. The user and role names start with the name of the portal.

    For example, if the portal is named **My Portal** in ArcGIS Online, the security provider is called **My Portal**, and the users and roles are **My Portal- ArcGIS Group**, **My Portal- All Users**, and so on.

39.5.4.1   Configuration Checklist for the ArcGIS Security Provider

The complete list of steps to configure security is given in **Overview of Steps to Set Up Essentials Security** on page **400**. Use this checklist in conjunction with the complete list of steps.

To use the ArcGIS security provider for Essentials Security:

- The ArcGIS security provider must be enabled. By default, it is enabled.

- If you want, change the name of the security provider to something that is more meaningful to end users.

- You must configure permissions using one or more ArcGIS users and roles, in each site that is secured using the ArcGIS security provider.

39.5.5   Enable and Disable Security Providers

You must enable each security provider that you want to use to secure sites. Disable the providers that you do not use. The Windows Integrated and Anonymous Access security providers are enabled by default.

Having one or more security providers enabled does not secure your sites. You must also configure permissions.

To enable or disable a security provider:

1. In Manager, click the **Security** tab, and then click **Providers** in the side panel.

2. To enable a security provider, select the **Allow** check box beside the security provider.
   To disable a security provider, clear the **Allow** check box beside the security provider.
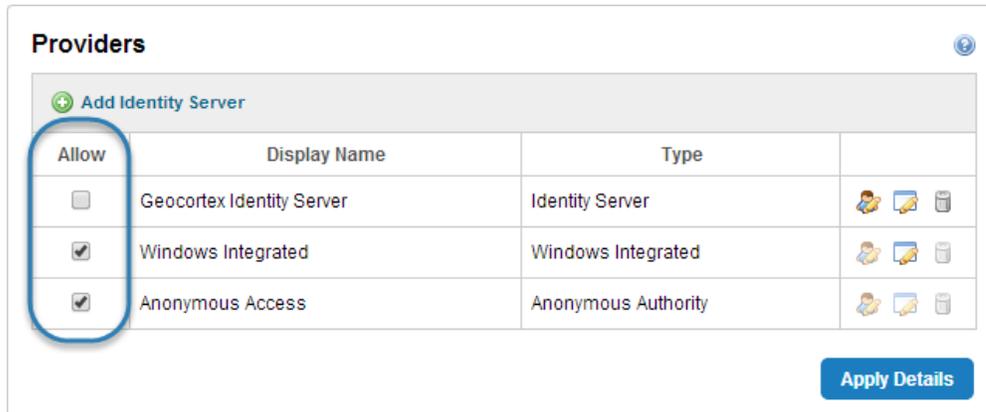
Check boxes to enable and disable security providers

3. Click **Apply Details**.

39.5.6 Edit a Security Provider

If you use more than one security provider, end users select which security provider to sign in with. Editing a security provider enables you to change the security provider's name to something that is meaningful to end users. Note that you cannot change the name of the Anonymous Access security provider. End users never see this name, so there is no reason to change it.

> **NOTE** Security providers have settings for the duration of security tokens, **Access Token Duration** and **Refresh Token Duration**. The default values for these settings are appropriate for most circumstances. Do not change these settings without first contacting Geocortex Support to discuss your needs. Make sure that you have adequate Support hours available.

To change a security provider's name:

1. In Manager, click the **Security** tab, and then click **Providers** in the side panel.

2. Click the **Edit** icon ![edit icon] beside the security provider that you want to configure.

3. In the **Display Name** box, enter a name that is meaningful to end users.

4. Click **OK**.

5. Click **Apply Details**.

39.6 The Global Roles

The Global roles are special roles that would otherwise be difficult or impossible to define. There are two Global roles:

- **Global - All Users:** This role is similar to the Windows **Authenticated Users** identity. Any user who is signed in through one of the enabled security providers belongs to the Global - All Users role.

  For example, suppose you have secured a site using ArcGIS Online. If you apply Allow permission to the World map service using the Global - All Users role, any user who is signed in to ArcGIS Online has access to the World map service.

- **Global - Everyone:** This role is similar to the Windows **Everyone** identity. Everyone belongs to the Global - Everyone role, whether they are signed in or not.

To use a Global role, select the role from the drop-down list when you are applying permissions, the same way that you would select any other role.
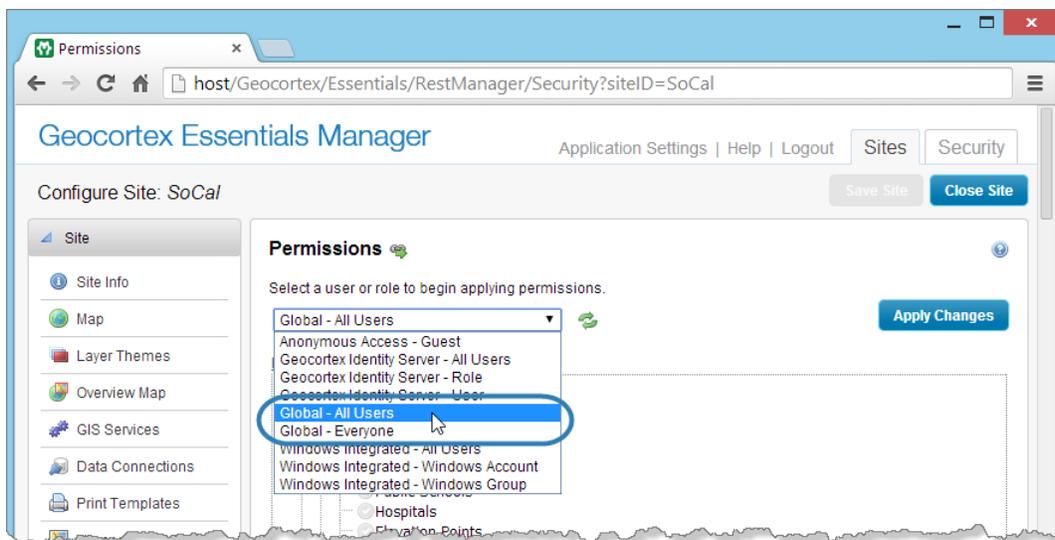
Global - All Users and Global - Everyone roles on Manager's Permissions page

See also...

[Configure Permissions](#) on page **423**

39.7 Configure Global Security Settings

The global security settings include settings for SSL encryption, Windows impersonation, and URLs that Essentials requires to manage the user sign-in process. Configuration of the URLs is required as a security measure.

> If the URLs are incorrectly configured, the user's browser will not be able to redirect back to the viewer after the user has signed in and the user's session will fail.

▶ **To configure the global security settings:**

1. In Manager, click the **Security** tab, and then click **Settings** in the side panel.

2. Configure the security settings:

   - **Enforce SSL:** When this check box is selected, communications between Essentials and viewers use SSL encryption (HTTPS).

     > Turning off SSL enforcement is not recommended.

   - **Windows Impersonation:** If you want requests to ArcGIS Server to be made as the user instead of as Essentials, select the check box. This ensures that ArcGIS Server knows the identity of the user that originated the request. For more information, see **Windows Impersonation** on page **403**.

     > In order to use Windows impersonation, both ArcGIS Server and the Essentials site must be secured using Integrated Windows Authentication.

     > Most deployments do not require Windows impersonation. We recommend that you leave the Windows Impersonation setting disabled, unless you need it for some specific purpose.

   - **Allowable Redirect URLs:** After the user has signed in Essentials redirects the browser to a redirect URL, which returns the user to the viewer.

     If your viewers are deployed on the same server as Essentials and the server uses the same host name internally and externally, you do not need to configure any redirect URLs—simply make sure the **Allow All Redirects** check box is selected.

     If you have viewers deployed to other servers or the servers have different internal and external host names, add a redirect URL for each server that hosts viewers.

     - To add a redirect URL, type or paste the server's URL in the **Allowable Redirect URLs** box, and then click **Add**.

     - To remove a redirect URL, click the **Remove** icon 🗑 beside the URL.

3. Click **Apply Details**.

39.8 Sign-In Settings

Sign-in settings control the appearance of sign-in and sign-out hyperlinks in viewers, and specify the page that the user's browser goes to after the user signs out (the landing page). Every site has its own sign-in settings, so different sites can have different sign-in behavior.

Clicking the icon ▾ beside the sign-out hyperlink shows the identity of the user that is signed in.
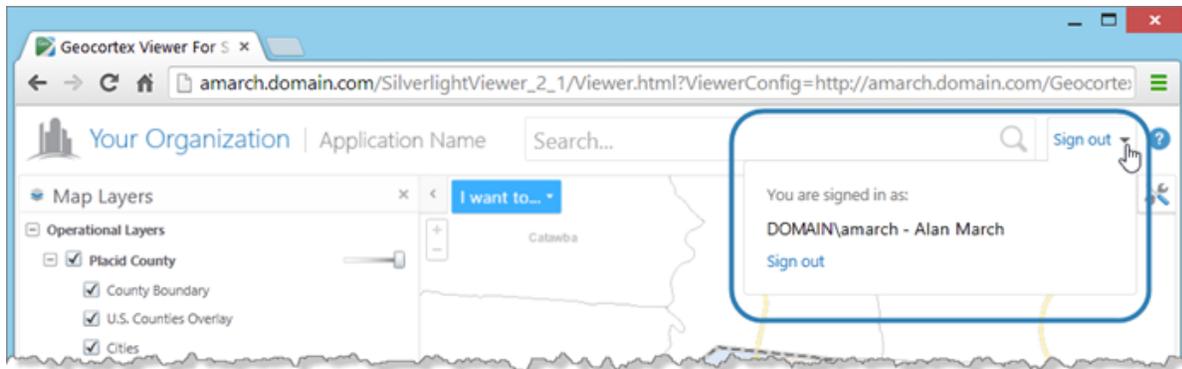
Identity of the current user shown in a Silverlight viewer

The sign-in and sign-out hyperlinks are useful for sites that are secured using multiple security providers. If you are using Anonymous Access and at least one other security provider, you should use both hyperlinks. When a user launches the viewer, the site loads with Anonymous Access - Guest permissions. The sign-in hyperlink allows the user to sign in to a security provider with access to additional parts of the site. The sign-out hyperlink allows the user to sign back out to Anonymous Access, or to the landing page if you have configured one.

If you are using multiple security providers, but not Anonymous Access, you only need the sign-out hyperlink. The only time the viewer is displayed in the browser is when the user is signed in. If the sign-in hyperlink is enabled, the user will never see it.

If you are using a single security provider, you might want to enable the sign-out hyperlink and configure a landing page. For example, if users launch the viewer by clicking a hyperlink in your company website, you might want to return users to the company website when they sign out.

See also...

> **Configure Sign-In Settings** on page **420**
>
> **Anonymous Access** on page **404**

39.8.1 Configure Sign-In Settings

Each site has its own sign-in settings.

> ▶ **To configure a site's sign-in settings:**

1. In Manager, edit the site that you want to configure, and then click **Permissions** in the side panel.

2. Click the **Sign-In Settings** tab.

3. Configure the settings as desired:
   - **Enable Sign-In:** When this check box is selected, the site's viewers have a sign-in hyperlink that shows when the user is not signed in. This is useful for sites that are secured using Anonymous Access and at least one other security provider—it allows the user to sign in from Anonymous Access to a security provider that gives access to additional parts of the site. The Enable Sign-In setting is turned on by default.
   If you clear the Enable Sign-In check box, the sign-in hyperlink does not appear in the site's viewers.
   - **Enable Sign-Out:** When this check box is selected, the site's viewers have a sign-out hyperlink that shows when the user is signed in. Sign-out behavior depends on the landing page and security providers you are

using. The Enable Sign-Out setting is turned on by default.

If you clear the Enable Sign-Out check box, the sign-out hyperlink does not appear in the site's viewers.

- **Sign-Out Landing Page URL:** The URL of the web page that loads after the user signs out. You can only configure a sign-out landing page when the Enable Sign-Out setting is turned on. For the landing page to work, the landing page URL must be configured as an allowable redirect URL on the Security tab.

  If you leave the landing page URL blank, the sign-out behavior depends on which security providers you are using:

  - **Multiple Security Providers, Including Anonymous Access:** The site reloads using the Anonymous Access - Guest permissions.

  - **Multiple Security Providers, Without Anonymous Access:** The list of security providers displays, so the user can choose the security provider to log in with.

  - **Single Security Provider:** The sign-in dialog box displays.

  > To use the landing page with Geocortex Identity Server, you must enforce SSL.

4. Click **Apply Changes**.

5. Click **Save Site**.

39.9 Permissions

Permissions are used to authorize or deny access to a site or part of a site. Every securable component in a site has a permission setting.

Possible permissions are:

- **Allow:** The Allow value allows access to the component.

- **Deny:** The Deny value prevents access to the component. When a user is denied permission to a particular component in a site, that component is not visible in the viewer; it cannot be searched for, identified, or queried; and it does not appear in map exports, reports, or printouts.

- **Inherit:** Permission is not set for this component. The component inherits its value from the next higher component in the Permissions hierarchy that has Allow or Deny permission configured.

  > Whenever you configure permissions for a user or role, set the permission on the Site component. Do not leave the Site component's permission as Inherit.

By default, permissions are inherited.

The following fragment of the Permissions hierarchy illustrates how permissions are inherited.
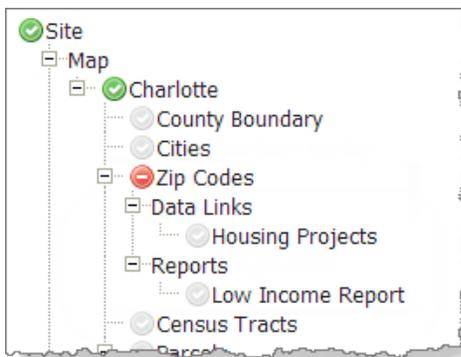
Access to the Charlotte map service is allowed. The County Boundary, Cities, and Census Tracts layers inherit Allow permission from the Charlotte service. The end user will be able to see and interact with these layers in the viewer.

Access to the Zip Codes layer is denied. The Housing Projects data link and Low Income Report inherit Deny permission from the Zip Codes layer. The end user will not see the Zip Codes layer, Housing Projects data link, or Low Income Report in the viewer.

Inheritance of permissions

Normally, when a component is assigned or inherits Deny permission, the component does not appear in the viewer. There are particular situations in which a component appears in the viewer even though it has Deny permission:

- **Services:** If you configure Deny permission for a service in the map, but you allow at least one of the service's layers, the service appears in the Layer List as a container for its allowed layers. For example, in the screen capture below, the Placid County service has Deny permission in Manager (rear), but it appears in the viewer's Map Layers list (front) as the container for the layers that have Allow permission.
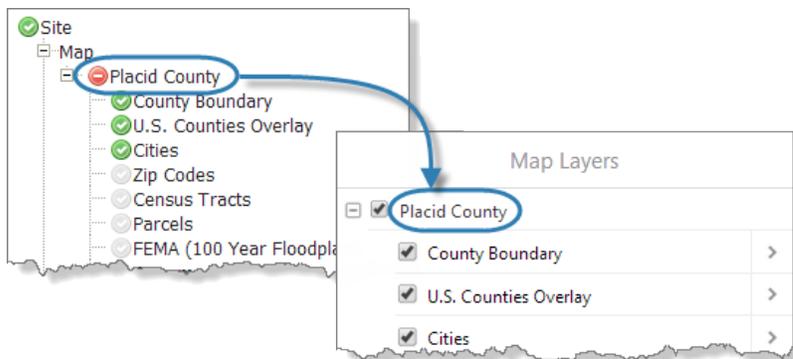
Service denied in Manager (rear) shows in the viewer (front)

- **Group Layers**: If you assign Deny permission to a group layer, but you allow at least one of the sublayers, the group layer appears in the Layer List as a container for its allowed sublayers.

> In tiled map services, it is not possible to prevent users from seeing secured layers, because the map images are pregenerated. However, layer operations and layer data in tiled map services are secured. For example, users cannot query a layer that they do not have permission to access.

It is possible for a user to have more than one permission for a particular component or site. For example, a user could belong to more than one group. If the permissions for a particular component are in conflict with each other, the user is denied access to the component—a single Deny permission always overrides any number of Allow permissions.

Permissions are configured separately for each site. There is no way to simultaneously configure permissions for two or more sites.

Configure Permissions

To secure a site, you apply permissions to the site's securable components for the users and roles in each security provider that you want to use for the site. The security providers must be enabled. For example, if you have enabled Geocortex Identity Server and Anonymous Access, you would set permissions for Identity Server users and roles, and for the Anonymous Access - Guest role.
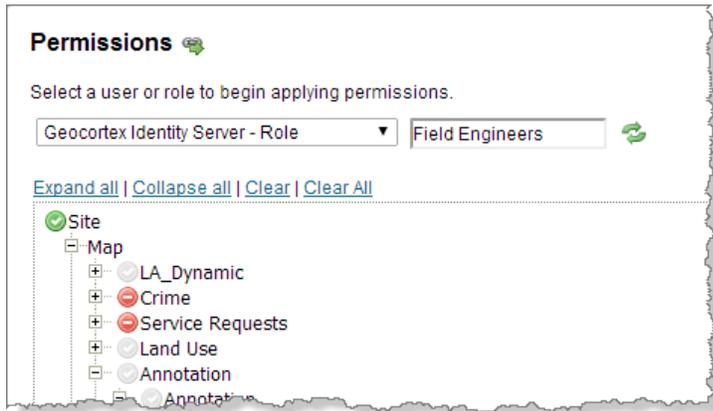
Permissions set for the Field Engineers role in the Geocortex Identity Server security provider

Configuration Tips

- To locate components more easily in the Permissions hierarchy, use the **Expand All** and **Collapse All** hyperlinks immediately above the Permissions hierarchy.

- If you have already configured permissions for a particular user or role, click **Show Permission Entries** and click the **Edit** tool to load the permissions that are configured for that user or role. This is often quicker than using the drop-down list.

- To remove all of the permissions for the currently selected user or role in this site, click the **Clear** hyperlink.

- To remove all of the permissions for a particular type of user or role, click **Show Permission Entries**, and then click the **Clear All** hyperlink beside the type or user or role.

- To remove all of the permissions for all users and roles in this site, click the **Clear All** hyperlink.

- If the hierarchy does not refresh when you select a new user or role, click the **Update Permissions** tool .

- You do not need to click **Apply Changes** for every user and role that you configure permissions for. For example, you could change the permissions for Role1, then for User1, then for Role1 again, and then click Apply Changes.

▶ **To configure permissions:**

You must configure permissions for each site that you want to secure.

1. In Manager, edit the site that you want to configure, and then click **Permissions** in the side panel.

2. On the **Permissions** tab, select the type of user or role that you want to configure permissions for.
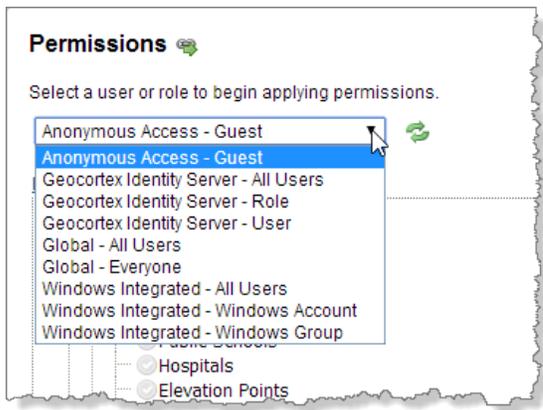
Drop-down list of types of users and roles

3. If an additional box appears, type in the user name or role.

   - If you are using Integrated Windows Authentication, start to type the user or group name, and then select the user or group from the drop-down list that appears.

   - For Geocortex Identity Server's default setup, click in the box to open a drop-down list of users or roles.

   - If you have configured custom membership and role providers for Geocortex Identity Server, you may have to type in the user name or role in full. For some providers, like SQL Server, a drop-down list of user names and roles appears when you start typing. Select the user or role from the drop-down list.

4. Press **Enter**, or click the **Update Permissions** tool .

5. Click the permission setting beside each item in the hierarchy that you want to change.

   Clicking the setting cycles the value from Inherit , to Deny , to Allow , and then back to Inherit again. In the screen capture below, the pointer is positioned to change the permission setting for the Crime service.
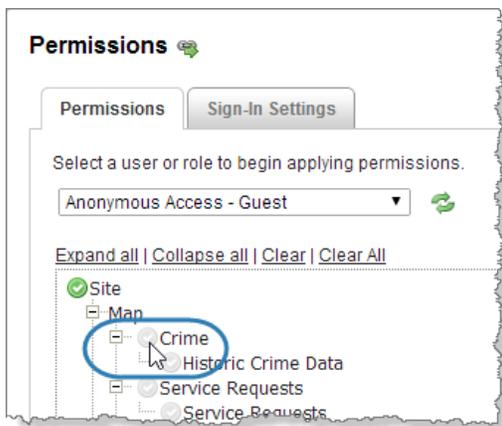
Click the permission setting to change the value

> Make sure you set the permission for the Site component—do not leave it as Inherit.

6. Repeat these steps for each user and role that you want to set permissions for.

---

7. Click **Apply Changes**.

8. Click **Save Site**.

39.9.1.1 View a Summary of Permissions

The permissions summary lists all of the permissions that are currently configured for the site. The summary provides a quick way to load or remove the permissions that are configured for a user or role.
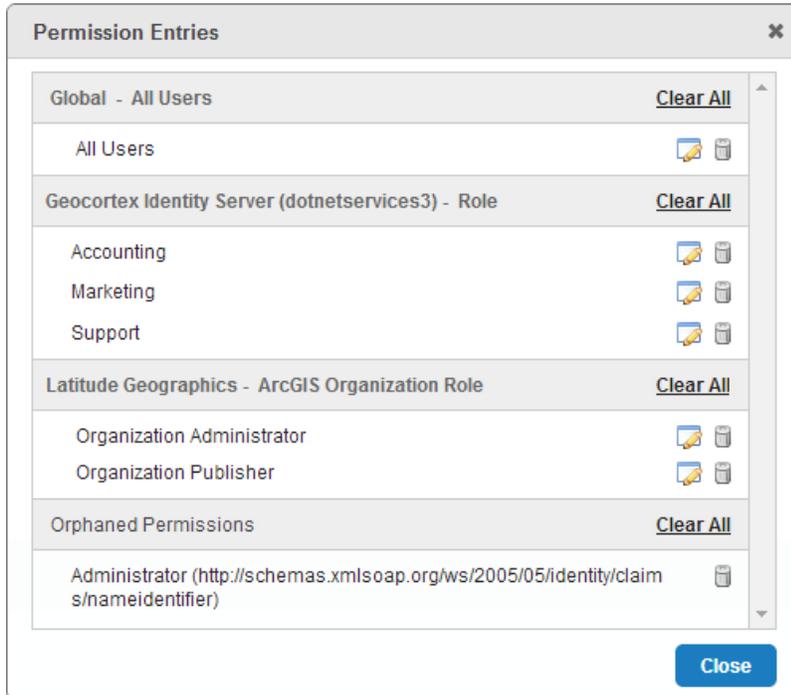
Summary of all the permissions that are configured

The permissions summary provides many of the same tools as the Permissions page, such as loading permissions into the Permissions hierarchy, and removing (clearing) permissions.

▶ **To load or remove permissions using the permissions summary:**

⚠ Removing permissions is permanent. You cannot undo the deletion after you click Apply Changes.

1. In Manager, edit the site that you want to configure, and then click **Permissions** in the side panel.

2. Click **Show Permission Entries**.

3. Load or remove permissions:

   - **Load Permissions:** To load the permissions that are configured for a particular user or role into the Permissions hierarchy, click the **Edit** tool 🖉.

   - **Remove Permissions:** To remove the configured permissions for a particular user or role, click the **Remove Permission** tool 🗑 beside the user or role. Click **OK** to confirm.

- **Remove All Permissions:** To remove all of the configured permissions for a particular type of user or role, click the **Clear All** hyperlink beside the type of user or role. Click **OK** to confirm.

> **NOTE** The Clear All function in the permissions summary is different than the Clear All function on the Permissions page. In the permissions summary, Clear All clears all the permissions for one type of user or role. On the Permissions page, Clear All clears all the permissions in the entire site.

4. Click **Apply Changes**.

39.9.1.2 Remove Orphaned Permissions

Orphaned permissions are permissions that are configured for a user or role that Essentials cannot locate in the security provider. There are two ways that permissions can become orphaned:

- The user or role was deleted in the security provider.
- The security provider was moved or deleted.

When a user or role is intentionally deleted in the security provider, you can use the permissions summary to remove the permissions that were configured for that user or role. Although the orphaned permissions do not do any harm, it is a good practice to remove orphaned permissions so they do not accumulate.

When a security provider is moved or deleted, Essentials cannot find any of the users and roles in the security provider. Depending on how many different users and roles had permissions configured, you may see a long list of orphaned permissions in the permissions summary. If moving or deleting the security provider was not intentional, this alerts you to the fact that there is a problem. When you restore the security provider, Essentials will again be able to locate the users and roles in the security provider and the permissions will no longer be orphaned.

▶ **To remove permissions for a user or role that Essentials cannot locate:**

> ⚠ Removing orphaned permissions is permanent. You cannot undo the deletion after you click Apply Changes.

1. In Manager, edit the site that you want to configure, and then click **Permissions** in the side panel.

2. Click **Show Permission Entries**.

3. In the **Orphaned Permissions** area:

   - **Remove Permissions:** To remove the orphaned permissions for a particular user or role, click the **Remove Permission** tool 🗑 beside the user or role.

   - **Remove All Permissions:** To remove all of the orphaned permissions in the site, click the **Clear All** hyperlink beside **Orphaned Permissions**.

4. Click **OK** to confirm.

5. Click **Apply Changes**.

39.10 Perform a Security Health Check

Manager has a **Security Health** function that evaluates your security configuration for potential weaknesses. To strengthen your security setup, follow the recommendations in the Security Health panel.

▶ **To use the Security Health function:**

1. In Manager, click the **Security** tab.

   It does not matter which Security page is open—Providers or Settings.

2. Click the **Security Health** icon ⚠.
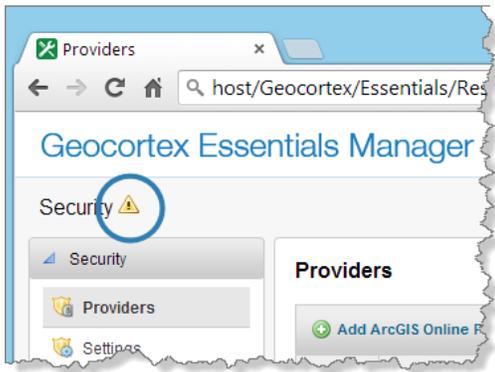
Location of the Security Health icon

The Security Health panel opens. The Security Health panel lists recommendations for changes that you can make to your Essentials configuration to strengthen security.

3. To make a recommended change, click the hyperlink beside the setting that you want to change.
   This opens the page in Manager where the setting is configured.
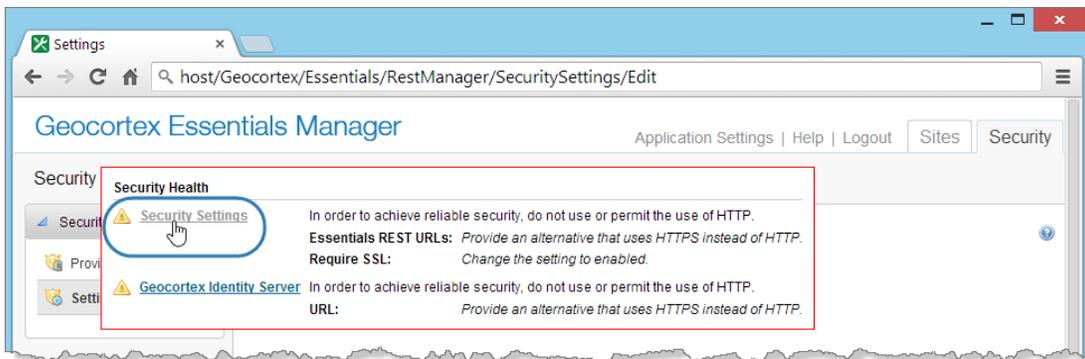
Security Health panel, with hyperlinks to the pages where the settings are configured

4. Change the setting as recommended.

5. Continue making the recommended changes until you have dome them all.
   You have now closed the gaps in your security configuration.

39.11 Common Problems

The following table lists some common errors related to Essentials security.

Error	Cause	Resolution
Secret Required	As a security measure, Identity Server requires you to enter its unique secret when you make some types of changes to its configuration.	Get the secret and enter it where required. See **Find Identity Server's Secret** on page **414** for instructions.
Invalid Redirect URL	The security provider completed the sign-in and redirected back to Essentials, but Essentials could not redirect back to the viewer because the viewer is on a different server whose URL is not registered.	Add the URL of the server that the viewer is hosted on to the list of **Allowable Redirect URLs** in the security settings. See **Configure Global Security Settings** on page **418** for instructions.
Digest Verification Error	Identity Server completed the sign-in, but Essentials will not accept the security token because it has been modified. Sometimes a reverse proxy or network appliance rewrites responses, which marks the token as modified.	Reconfigure your reverse proxy or network appliance so it does not rewrite or modify Identity Server's responses.

39.12 Filter a Layer's Features

You can restrict the features that different users see by filtering the features. Filtering is based on the values of feature attributes. For example, you might want county inspectors to see only the parcels in the city where they work. In this case, filtering is based on the City attribute of the Parcels layer.

> **NOTE** Feature filtering can be used for ArcGIS Server map services and feature services only.

> **NOTE** ArcGIS Server should be behind a firewall. If ArcGIS Server is not behind a firewall, a user could bypass feature filtering by making requests directly to ArcGIS Server.

Essentials implements filtering by attaching a "where" clause to requests made to ArcGIS Server. Where clauses are used in queries and map image requests to filter the data returned by the query.

Each where clause is built by a workflow that is associated with a particular layer. Whenever a request is made to access a layer, Essentials runs the workflow for that layer, if there is one, and then attaches the where clause to the request. A workflow that filters features in a layer is called a **layer filter workflow**.

In order for a feature to be included in the response, it must satisfy the condition in the where clause. For example, a Parcels layer request with the where condition `"City='Paris'"` returns only parcels that have **Paris** as the value of the City attribute.

> **NOTE** In tiled map services, it is not possible to prevent users from seeing filtered features in the map image, because the tiles are pre generated. However, filtering applies to operations that access feature data, such as query and identify operations.

Role of Essentials Security in Feature Filtering

When a site has a layer filter configured for at least one layer in an ArcGIS Server map service, requests to that map service get proxied through the Layer Security proxy. The proxying of requests enables Essentials to intercept requests to ArcGIS Server so it can attach the where clause. This means that in order to filter one or more layers in a site, the site must have security enabled.

Overview of Steps

▶ **To set up filtering for a layer:**

1. Configure Essentials Security.
   See **Essentials Security** on page **396** for information.

2. Launch Workflow Designer and create a workflow that builds the where clause.
   For information, refer to "Create a Layer Filter Workflow" in Workflow Designer's help system.

3. Add the workflow to the layer.
   Follow the instructions below.

Add a Layer Filter Workflow to a Layer

▶ **To add a layer filter workflow to a layer:**

Do this after you have created the workflow.

1. In Manager, edit the site that you want to configure, and then click **Map** in the side panel.

2. Follow the instruction that applies to you:

   - **Feature Layer:** If the layer that you want to filter is from a feature service, edit the layer.

   - **Map Service Static Layer:** If the layer that you want to filter is a static layer from a map service, edit the layer.

   - **Map Service Dynamic Layer:** If the layer that you want to filter is a dynamic layer form a map service, edit the map service.

   Because dynamic layers are created at run time, the layer filter workflow is configured at the map service level instead of the layer level. Note that you do not have to add the workflow to Manager's Workflows page.

3. On the **Details** tab, click the **Browse** button beside the **Filter Workflow URI** box.

4. Locate the workflow (`.xaml`) file, select the file, and then click **OK**.

5. Click **Apply Changes**.

6. Click **Save Site**.

40 Extend Essentials with Custom Functionality

A site configuration file contains the configuration of a site. At run time, Essentials parses (deserializes) the site configuration into business objects. Business objects can be accessed (consumed) by client-side applications (applications written with the JavaScript or Silverlight API) or they can be accessed from the server.

Essentials provides a number of classes of business object out of the box, for example, layers, reports, print templates, and data links. Essentials also allows you to create custom functionality that extends your site, specifically, custom properties and custom site extensions. As well, you can create custom REST endpoints, which are independent of sites but can work with sites.

Custom properties are simple name/value pairs and as such, do not have any logic associated with them. Custom properties are configured using Manager. Custom site extensions and custom REST endpoints, on the other hand, do have logic associated with them.

> **NOTE** Creating custom site extensions and custom REST endpoints requires both development work and configuration. If you are not comfortable programming, you will need to enlist the help of a developer.

Your Essentials installation can use any combination of custom properties, custom site extensions, and custom REST endpoints that you and your developer think is called for.

Often a custom function can be implemented using either a custom site extension or a custom REST endpoint. From the administrator's point of view, there are two important differences between the two:

- Custom site extensions and custom properties are configured in the site configuration file, which gives the administrator direct control over how they are used, unlike custom REST endpoints,.

- Custom REST endpoints can have parameters, whereas custom site extensions cannot. In other words, custom REST endpoints can dynamically accept inputs that determine what business object to operate on or otherwise alter the behavior of business logic. Depending on the situation, these inputs can come from an application or from the end user as parts of the request URL path or the query string. Furthermore, parameterization provides a means for the administrator to restrict the objects that a custom function is permitted to operate on. For example, you might want to restrict a custom REST endpoint to operate only on the layer with ID 7.

If there is no administrative reason to choose one approach over the other when creating a particular function, it is often the application developer who makes the decision about which method to use. There may be software design reasons for selecting one approach over the other.

40.1 Visual Studio

We recommend using Visual Studio to customize the code, since it offers excellent support for editing XML documents, including IntelliSense. For example, when you begin to define a new element and the XSD is properly referenced, a list of possible child elements will display for you to select from, as illustrated in the following figure. Here, we see that the site.xsd file allows the `DataConnections` and `Map` child elements of the `Site` element.

Intellisense in Visual Studio

40.2 Custom Properties

Custom properties are arbitrary name/value pairs that provide a means to pass values from the server to the client application. For example, you might define a property for the site administrator's email address so the web application can display the address to the end user. Or you might define a property for the base URI of stored images so the client application can construct the full URIs for images on the fly.

One use of custom properties is to provide metadata about server-side objects. For example, if you configure a Boolean `CanSelect` property for a layer, the developer can use the property in an application to determine whether or not the layer should be selectable by the user using a custom selection tool.

Because custom properties do not have any logic associated with them, no development work is required to create custom properties. They are configured in Manager.

Custom properties apply to a site's extensible objects. Any extensible object can have any number of custom properties configured for it.

To create a custom property, click the **Properties** hyperlink for the desired object. For example, to create a custom property for a map service, edit the map service—the Properties hyperlink is at the bottom of the Details tab.

40.2.1 Create Custom Properties

▶ **To create a custom property:**

1. In Manager, edit the site that you want to configure and navigate to the object you want to define a custom property for.

2. Click the **Properties** hyperlink.

   The Custom Properties dialog box opens.

3. Click **Add Property**.

4. Type a name for the new property.

   > **NOTE** If the property name begins with "_" the property will not be published by the REST API. It will only be accessible to server-side components.

5. Type the property's value.

6. Click **OK**.

7. Click **Save Site**.

40.3 Custom Site Extensions

Custom site extensions extend a site with custom logic that applies to an extensible object. The extensible objects include:

- Sites
- Map services, including the map service component of feature layers
- Layers
- Print templates

Example

Suppose you want to configure the visibility of the fields in a layer and an alias for each field. This can be done using a custom site extension as follows:

```
<Layer Name="Zip Codes">
   <Extensions>
      <Extension Assembly="Extensions" ClassName="Extensions.FieldsCollection">
         <FieldsCollection>
            <Field Name="PO_Name" Alias="PO Name" Visible="true" />
            <Field Name="ZIPCODE" Alias="Zip Code" Visible="true" />
         </FieldsCollection>
      </Extension>
   </Extensions>
</Layer>
```

40.3.1 Create a Custom Site Extension

Because creating a custom site extension involves both configuration and programming, each step in the procedure below is labeled either Administrator or Developer, to indicate who is responsible for performing that step. If you are filling both roles, ignore the labels.

Instructions are provided here for the administrative steps. The Geocortex Resource Center (http://resources.geocortex.com/) provides instructions for both the administrative steps and development steps.

▶ **To create custom a site extension:**

1. **Administrator**: It is recommended that you create and verify the core part of your site before deploying the extended portion.

2. **Developer**: In your development environment:

a. Create a class for each extension.

b. Implement the extension's logic.

c. Compile the assembly or assemblies.

d. Provide the administrator with the following:

- A copy of each assembly.

- The name of each class.

3. **Administrator**: The developer will provide you with one or more assemblies (DLL files) and the class name for each extension.

> It is important to perform these steps in the order given. Site validation will fail if you deploy a site containing references to assemblies that do not exist.

a. Copy the assemblies to anywhere within the `Sites` directory.

> Deploying or redeploying a custom assembly causes all your sites to reload. The site is unavailable to users while Essentials loads the site.

> Place assemblies that will be used by only one site in the site's directory. Create an `Extensions` directory up one level to deploy assemblies that will be used by more than one site.

b. Open your `Site.xml` file for editing.

c. Add an `Extensions` element immediately after the extensible element that the property applies to.

d. Add an `Extension` element beneath the `Extensions` element.

  i. Give the **Extension** element an **Assembly** attribute and assign it the name of the assembly provided by the developer for this extension.

  ii. Give the **Extension** element a `ClassName` attribute and assign it the value of the class name provided by the developer for this extension.

e. If you are configuring more than one extension, add a collection element beneath the **Extension** element. The collection element must be named after the class.
For example, if the class name provided by the developer is `AssemblyName.SomeCollection`, then the collection element must be named `SomeCollection`. Now add each element in the collection and give it a `Name` attribute, plus whatever other attributes you want it to have.
If you are configuring a single element, you do not need a collection element.

f. Repeat these steps d - e for each extension the developer has created for this extensible element.

g. Repeat steps c - f for each extension class the developer has created.

h. Confirm your configuration by comparing it to the following example:

Example Code

```xml
<Extensions>
   <Extension Assembly="Extensions" ClassName="Extensions.FieldsCollection">
      <FieldsCollection>
         <Field Name="PO_Name" Alias="PO Name" Visible="true" />
         <Field Name="ZIPCODE" Alias="Zip Code" Visible="true" />
      </FieldsCollection>
   </Extension>
</Extensions>
```

i. Save the `Site.xml` file and browse the `Sites` directory to confirm the extensions.

j. Inform the developer of the purposes of the extensions you have configured so the developer can use the extensions in applications.

40.4 Custom REST Endpoints

Implementing a custom REST endpoint involves both programming and configuration. A developer creates the custom REST endpoint and an administrator configures the endpoint.

Custom REST endpoints are configured through their own configuration file, `RestResources.xml`, that can be deployed anywhere in the Sites directory. As the administrator, you will create the `RestResources.xml` file and use it to configure references to the REST endpoints created by the developer.

Essentials automatically detects new `RestResources.xml` files and updates to existing `RestResources.xml` files. This means you do not need to restart the Geocortex Essentials REST API web application to deploy or redeploy your custom REST endpoints, and you can update properties and parameters on the fly without interrupting service.

You can deploy multiple `RestResources.xml` files. As well, a single `RestResources.xml` file can be used to register and configure multiple endpoints.

For detailed information about the elements and attributes that can appear in a `RestResources.xml` file, refer to the *REST Resources XML Reference*. The *REST Resources XML Reference* is installed with Essentials, in the `Docs` folder. In the default installation, the `Docs` folder is here:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\Docs
```

You can also configure custom properties for custom REST endpoints and you can place constraints on the objects that a parameterized REST endpoint is permitted to operate on. To configure constraints on a parameter, you will add a `Parameter` element to the `RestResources.xml` file and specify the constraints in the `Parameter` element's `Constraint` and `UseRegularExpression` attributes.

You can define complex constraints using the .NET Framework Regular Expression Syntax. Details on the .NET regular expression language are available at:

http://msdn.microsoft.com/en-us/library/hs600312(VS.71).aspx

For example, to allow an operation to be performed on the layer with ID 7 only:

```xml
<Parameter Name="LayerID" Constraint="7" UseRegularExpression="false" />
```

To allow an operation to be performed on layer 12 or layer 3 only:

```xml
<Parameter Name="LayerID" Constraint="^(12|3)$" UseRegularExpression="true" />
```

To allow an operation to be performed on any layer except layer 5, layer 9 or layer 23:

```
<Parameter Name="LayerID" Constraint="^(?!(\b5\b|\b9\b|\b23\b)).*$"
UseRegularExpression="true" />
```

40.4.1   Create a Custom REST Endpoint

Because creating a custom REST endpoint involves both configuration and programming, each step in the procedure below is labeled either Administrator or Developer, to indicate who is responsible for performing that step. If you are filling both roles, ignore the labels.

The following instructions provide an overview of the steps to create and deploy a custom REST endpoint. The Geocortex Resource Center (http://resources.geocortex.com/) provides instructions for both the administrative and development steps.

▶ To create a custom REST endpoint:

1. **Administrator**: It is recommended that you deploy and verify the core part of your site before deploying the extended portion

2. **Developer**: In your development environment:

    a.   Create a class library for your custom REST endpoints.

    b.   Implement the logic.

    c.   Compile the assembly or assemblies.

    d.   Provide the administrator with the following:

      - A copy of each assembly

      - The name of each class

      - A list of the parameters and a description of what they represent

3. **Administrator**: The developer will provide you with one or more assemblies (DLL files) and the class name for each extension.

    a.   Copy the assemblies to anywhere within the Sites folder.

      > Deploying or redeploying a custom assembly causes all your sites to reload. The site is unavailable to users while Essentials loads the site.

      > Place assemblies that will be used by only one site in the site's directory. Create an Extensions subdirectory up one level to store assemblies that will be used by more than one site.

    b.   Create a new XML file. Save the file as `RestResources.xml` anywhere within the `Sites` directory.

    c.   Add the following content to the file. Change the value given to `noNamespaceSchemaLocation` to reflect the physical location of your `RestResources.xsd` file.

```
<?xml version="1.0" encoding="utf-8" ?>
  <RestResources
          xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
```

```
        xsi:noNamespaceSchemaLocation="RestResources.xsd">


</RestResources>
```

d. Add a `Resource` element after the `RestResources` element.

    i. Give the `Resource` element an `Assembly` attribute and assign it the name of the assembly provided by the developer for this extension.

    ii. Give the `Resource` element a `ClassName` attribute and assign it the value of the class name provided by the developer for this extension.

    iii. If you want, add custom properties to the custom REST endpoint. Custom properties for REST endpoints are configured exactly like other custom properties. The only difference is that they are configured in the `RestResources.xml file` instead of the Site.xml file. See **Create Custom Properties** on page **431** for instructions.

    iv. If the custom REST endpoint has parameters, add constraints to the parameters if you want:

        i. Add a `ParameterConstraints` element within the Resource element.

        ii. Add a `Parameter` element within the `ParameterConstraints` element.

        iii. Assign the name of the parameter you want to constrain to the `Name` attribute.

        iv. Assign values to the `Constraint` and `UseRegularExpression` attributes as needed to specify the desired constraint. See the discussion in **Custom REST Endpoints** on page **434** for examples of constraint definitions.

        v. Repeat steps ii. to iv. for each parameter you want to constrain.

    v. Repeat step 4. for each custom REST endpoint the developer has created.

    vi. Confirm your configuration by comparing it to the following example:

```
<Resource Assembly="Extensions"
    ClassName="Extensions.ExtractFeatureMapOperation">
        <ParameterConstraints>
            <Parameter Name="SiteID" Constraint="Charlotte"/>
             <Parameter Name="LayerID" Constraint="^(0|7)$"
UseRegularExpression="true" />
        </ParameterConstraints>
</Resource>
```

    vii. Save the `RestResources.xml` file.

    viii. Browse the REST API Sites directory to ensure the deployment of the custom REST endpoints did not cause any problems.

    ix. Inform the developer of any custom properties you have defined for the REST endpoints.

4. **Developer**: The administrator will inform you when the custom REST endpoints are ready to be consumed.

```
<Resource Assembly="Extensions"
  ClassName="Extensions.ExtractFeatureMapOperation">
      <ParameterConstraints>
           <Parameter Name="SiteID" Constraint="Charlotte"/>
            <Parameter Name="LayerID" Constraint="^(0|7)$"
              UseRegularExpression="true" />
      </ParameterConstraints>
</Resource>
```

Appendix A: Glossary

API (Application Programming Interface). An interface to an application which allows other applications to communicate with it. Essentials creates an API out of your site configuration so the site's viewers can interact with the configuration. See also. REST API.

Authentication. When Essentials is secured and a user launches a viewer, the user must sign in. Essentials uses the credentials the user enters to ensure they are a recognized user (the authentication step), and that they have permission to use the site (the authorization step).

Authorization. When a user launches a viewer and Essentials is secured, the user must sign in. Essentials uses the credentials the user enters to ensure they are a recognized user (the authentication step), and that they have permission to use the site (the authorization step).

ArcGIS Server. Software that makes it possible to create GIS services over the web for web mapping applications.

Base 64. A way of encoding binary data as text so that it can be transmitted over a network. If you do not encode binary data, the network protocol might misinterpret the data. The World Wide Web has many free base 64 converters.

Base map. A group of map services that supplies background and contextual information. Base maps usually contain information about features or structures that do not change often, like highways, rivers, or borders.

Base map service. A map service that is included in at least one base map.

Cluster. A group of computers that work together to behave like a single system. An Essentials deployment with multiple Essentials servers is a cluster. Each server in a cluster uses the same server-side configuration (sites) and client-side web applications (viewers).

Endpoint. See REST Endpoint.

Epoch Time. See Unix Time.

Feature Service. Feature services serve feature attributes, geometry, and symbology over a network. Map images are rendered on the client, not the server. Feature services support client-side editing that can be applied back to the server.

Firewall. A network security system that controls incoming and outgoing network traffic.

Framework. Software that provides generic functionality, which you can customize for different applications. For example, the HTML5 Viewer framework enables you to add HTML5 viewers that are customizable.

GeoRSS Service. RSS is a technology for delivering text, audio, and media over the Internet. GeoRSS services provide geographic data in RSS feeds, so the data can be plotted by web mapping applications.

GIS (Geographic Information System). A system that captures, analyzes, or manages data that is linked to a location on a map.

GML (Geography Markup Language). An XML format for geographical information, developed by the OGC.

Host Name. A human-readable name that stands for an IP address. For example, `www.geocortex.com` and `support.geocortex.com` are host names.

Image Service. Image services serve raster images that can be displayed by mapping applications.

IP Address (Internet Protocol Address). A numeric label that uniquely identifies a computer or other device connected to a network that uses Internet Protocol. For example, 192.168.1.1 is an IP address. See also: Host Name.

KML (Keyhole Markup Language). An XML-based schema for rendering geographic markup on web maps, developed by the OGC.

Layer. The data in web maps is usually represented in layers, for example roads would be on a separate layer from rivers and waterways and political boundaries would be on a separate layer from national parks. A **Group Layer** is group of several layers that look and behave like a single layer.

Map. In the context of Geocortex Essentials, maps are web-based. Web-based maps are fundamentally different from paper-based maps in that they are both interactive and searchable. Web-based maps contain data in many forms, which can be searched and annotated.

Map Service. Map services render maps that can be displayed and queried by mapping applications. Map images are rendered on the server and served to the client. **Dynamic** map services render map images on demand. **Tiled** (cached) map services pre-render map images at specific scales and cache the images ("tiles").Essentials supports both dynamic and tiled map services.

OGC. The Open Geospatial Consortium is an international organization that sets standards for geospatial services and content, data sharing and GIS data processing. They have issued over 30 standards including GML, KML, WFS, WMS, and WMTS.

Origin. The protocol, host, and port that defines how a web resource is accessed. For example, if you have a viewer that is deployed to `mymaps.mydomain.com/Html5Viewer` and you use SSL and the default port, then the viewer's origin is `https://mymaps.mydomain.com`.

Primary Service. The bottom-most service listed on the Map page's Map Services tab in Manager. The primary service determines the map's spatial reference. The primary service also determines the map's default initial and full extent.

QR Code (Quick Response Code). A square bar code used to encode web addresses. Mobile devices with an integrated camera app or scanner can read a QR code and open the web page whose address is encoded, so the user does not have to type the address.

Regions. Areas within a viewer's UI (in the shell or within views) in which views are displayed. Regions allow the layout of the application's UI to be updated without requiring changes to the application logic. Many common controls can be used as a region, allowing views to be automatically displayed within controls, such as a `ContentControl`, `ItemsControl`, `ListBox`, or `TabControl`. Views can be displayed within a region programmatically or automatically. Regions can be located by other components through the `RegionManager` component.

Registration. The act of setting up access. For example, in order for Essentials to be able to access your private ArcGIS Online content, you must register Essentials with ArcGIS Online. Minimally, registration information includes the URL to access. It may also include security information such as a user name and password.

REST (Representational State Transfer). An architectural style used for network applications. Communication between the Essentials server, viewers, and ArcGIS Server is done using REST.

REST API. A web-based, REST-compatible representation of the configuration of one or more web mapping applications. The REST API is organized as a hierarchy (a tree). Each site in an Essentials installation has a branch in the hierarchy that represents the configuration of that site. Viewers obtain configuration information by making HTTP requests to the REST API.

REST Endpoint. The items in a REST API's hierarchy are called "endpoints". Each endpoint represents the configuration of a particular resource or operation in the site. Each endpoint has a unique URL, which enables viewers to identify individual endpoints.

Service. In the context of web mapping, services are GIS resources that are located on a server and accessed over a network. Types of service include map services, feature services, and geocoding services.

Site. A technology-neutral configuration of a GIS application. A site's configuration is stored in XML format. Each site has its own configuration file called `Site.xml`.

Symbology. Conventions or rules that define how symbols represent geographic features on a map. In some applications, the size, color, or shape of a symbol is influenced by characteristics of the feature it represents. For example, symbols that represent the epicenter of an earthquake could be larger or more intensely colored the larger the magnitude of the earthquake.

Symbolization. The assignment of symbols to map features.

Tree. A hierarchy, called a "tree" because it looks like an upside-down tree when represented graphically. The items in a tree are called "nodes". In a REST API, the nodes are called "endpoints". See also: REST Endpoint.

Example of a tree structure in Manager

Unix Time. The number of milliseconds since the "epoch"—Jan. 1, 1970 at midnight (UTC). Unix time is a common way for software to store times internally. To convert between human-readable times and Unix time, use a converter like http://www.epochconverter.com/.

URI (Uniform Resource Identifier). A string of characters used to identify a resource on a computer or computer network. URIs enable interactions over the Internet using protocols.

URL (Uniform Resource Locator). A type of URI. Commonly known as a **web address**.

UTC (Coordinated Universal Time). Closely related to Greenwich Mean Time, UTC is the primary time standard by which clocks and time are regulated. Viewed as a time zone, the United Kingdom is UTC+0, New York is UTC-05:00 (subtract 5 hours from UTC time), and the Netherlands is UTC+01:00 (add one hour to UTC time).

UTM (Universal Transverse Mercator). A geographic coordinate system which orients the equator north-south through the poles, providing a north-south swath with little distortion.

Viewer. In the context of Geocortex Essentials, viewers are the web applications that end users run to interact with a site and its map.

WFS (Web Feature Service). A standard for the discovery, querying of, and operations for the transformation of data, developed by the OGC.

Widget. An interactive element that is created and controlled through scripting. Any controls that is not native to HTML, or that is greatly enhanced by scripting, is a widget. For example, sliders, fly-out menus, tree systems, and drag-and-drop controls are widgets.

WMS (Web Map Service). A standard for web-based maps, developed by the OGC.

WMTS (Web Map Tile Service). A standard for implementing servers to deliver tiled maps, developed by the OGC.

Appendix B: Locations of Essentials Files and Folders

All the files and folders listed in this table are created automatically by Essentials, either when Essentials is installed, or when you configure something that requires that file or folder.

Curly brackets represent a file path. For example, `{GE_INSTALL}` is the path of the Essentials installation folder.

Square brackets represent the name of the particular item. For example, in `{GE_HOME}\Sites\[site]`, `[site]` stands for the name of a particular site.

Default File and Folder Locations

File or Folder	Shorthand	Default Location
Geocortex Essentials installation folder	`{GE_INSTALL}`	`C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials`
Geocortex Essentials REST	`{GE_HOME}`	Unnamed instance of Essentials: `{GE_INSTALL}\Default\REST Elements` Named instances of Essentials: `{GE_INSTALL}\[instance]\REST Elements`
Sites folder	`{GE_SITES}`	`{GE_HOME}\Sites`
Folder for a particular site		`{GE_SITES}\[site]`
Site configuration file		`{GE_SITES}\[site]\Site.xml`
Essentials `Web.config` file		`{GE_HOME}\REST\Web.config`
Manager `Web.config` file		`{GE_HOME}\Manager\Web.config`
Geocortex Core	`{CORE}`	`C:\Program Files\Latitude Geographics\Geocortex Core`
Instant Search index		`{CORE}\Data`
Geocortex Identity Server	`{IdServer}`	`C:\Program Files (x86)\Latitude Geographics\Geocortex Identity Server`
Identity Server connections file		`{IdServer}\Web\Configuration\Settings\connectionStrings.config`

File or Folder	Shorthand	Default Location
Identity Server membership provider		`{IdServer}\Web\Configuration\Settings\membership.config`
Identity Server role provider		`{IdServer}\Web\Configuration\Settings\roleManager.config`
Site cache		`{GE_HOME}\REST\App_Data\SiteCache\SiteCache.xml`
Global virtual directory		`{GE_HOME}\Sites\VirtualDirectory`
Virtual directory for a site*		`{GE_SITES}\[site]\[virtual directory]`
Geocortex viewers	`{G_VIEWERS}`	`{GE_SITES}\[site]\Viewers`
HTML5 viewers		`{G_VIEWERS}\[viewer]`
HTML5 viewer virtual directory		`{G_VIEWERS}\[viewer]\VirtualDirectory`
HTML5 viewer configuration files		`{G_VIEWERS}\[viewer]\VirtualDirectory\Resources\Config\Default`
HTML5 viewer offline bundle files		`{G_VIEWERS}\[viewer]\VirtualDirectory\Resources\Bundled`
HTML5 viewer custom images		`{G_VIEWERS}\[viewer]\VirtualDirectory\Resources\Images\Custom`
HTML5 viewer styles		`{G_VIEWERS}\[viewer]\VirtualDirectory\Resources\Styles\Custom`
HTML5 viewer language files		`C:\inetpub\wwwroot\[viewer]\Resources\Locales`
Silverlight viewers		`{G_VIEWERS}\[viewer]`
Silverlight viewer virtual directory		`{G_VIEWERS}\[viewer]\VirtualDirectory`
Silverlight viewer configuration file		`{G_VIEWERS}\[viewer]\VirtualDirectory\Config\Viewer.xml`
Viewer backups created by the upgrader		Unnamed instance of Essentials: `{GE_INSTALL}\Default\Backups` Named instances of Essentials: `{GE_INSTALL}\[instance]\Backups`
Resources directory		`{GE_HOME}\Sites\Resources`

File or Folder	Shorthand	Default Location
Print templates		`{GE_HOME}\Sites\Resources\PrintTemplates`
Large-format print jobs (during creation)		`{GE_HOME}\Print Jobs`
Workflows		`{GE_HOME}\Sites\Resources\Workflows`
REST settings		`{GE_HOME}\Sites\RestAppSettings.xml`
Documentation		`{GE_HOME}\Docs`
Essentials assemblies (DLL files)		`{GE_HOME}\REST\bin`
Manager assemblies (DLL files)		`{GE_HOME}\Manager\bin`
Essentials log files		`{GE_HOME}\REST\App_Data\Logs`
Manager log files		`{GE_HOME}\Manager\App_Data\Logs`

* A site's virtual directory can be anywhere in the site's folder. Usually, it is a subfolder of the site's folder, as shown in the table, but it can also be more deeply nested.

Appendix C: Logging and Log Levels

Geocortex Essentials creates two types of log: system logs and access logs. Log levels control how much information is recorded in the log files. Essentials logs the events and activities for the level configured at the application level and all the less verbose levels.

Essentials supports the following log levels:

Off > **Error** > **Warn** > **Info** > **Debug**

The farther to the right a level is, the more information is logged.

Log levels are configured in Manager. There are separate settings for the system and access log levels.

▶ **To change the log levels:**

1. In Manager, click the **Application Settings** hyperlink in the banner area.

2. Select a system log level, if desired.

3. Select an access log level, if desired.

4. Click **OK**.

5. Click **Save Site**.
   The new log levels take effect immediately.

Appendix D: Geocortex Core

Geocortex Core provides software services that Geocortex applications like Essentials use. For example, Geocortex Core has a distributed database that Essentials Security uses for the security store.

The services provided by Geocortex Core make it possible to build scalable components for Geocortex software. Instant Search is one such component.

D.1 Ports for Geocortex Core

By default, Geocortex Core's services use the TCP network ports listed in the table below. These ports must not be used by any other application on the server, or restricted in any way.

You do not need to expose these ports to the Internet—they are only used internally. If you need to change the ports, contact Geocortex Support for help.

Default TCP Network Ports to Reserve for Geocortex Core

Service	Ports
Blob Store	7000, 7198, 9042, 17000, 17199, and 19042
BootStrapper	7278
Cache	6379
Data Store	9200 and 9300
Message Queue 1	4369, 5672, and 15672
Printing	4731
Web Service Proxy	10080

D.2 Firewall Access for Geocortex Core

Geocortex Core requires access through the firewall. By default, Geocortex Core uses Windows Firewall with the inbound rules shown in the screen capture below. The rules that Geocortex Core needs are created automatically during installation—you do not need to do any firewall configuration if you use the default setup.

Inbound Rules

Name	Program
Geocortex Core Instant Search Scanner	...NSRoot\Geocortex\Core\Roles\InstantSearch\Scanner\2.3.0\Bin\Geocortex.Platform.Roles.InstantSearch.Scanner.exe
Geocortex Core Sentinal	...NSRoot\Geocortex\Core\Roles\Sentinel\2.3.0\Redis-64.2.8.17\redis-server.exe
Geocortex Core Blob Store	...NSRoot\Geocortex\Core\Roles\BlobStore\2.3.0\Bin\Geocortex.Platform.Roles.BlobStore.exe
Geocortex Core Bootstrapper	...NSRoot\Geocortex\Core\Roles\BootStrapper\2.3.0\bin\Geocortex.Platform.Roles.BootStrapper.exe
Geocortex Core Cache	...NSRoot\Geocortex\Core\Roles\Redis\2.3.0\Redis-64.2.8.17\redis-server.exe
Geocortex Core Deployment Server	...NSRoot\Geocortex\Core\Roles\DeploymentServer\2.3.0\Klondike 2.0.0 Beta\bin\Klondike.SelfHost.exe
Geocortex Core EPMD	...Runtime\Erlang\erl5.10.4\erts-5.10.4\bin\epmd.exe
Geocortex Core Erlang Runtime	...Runtime\Erlang\erl5.10.4\bin\erl.exe
Geocortex Core HTML Reporting	...NSRoot\Geocortex\Core\Roles\HtmlReporting\2.3.0\Bin\Geocortex.Platform.Roles.HtmlReporting.exe
Geocortex Core Instant Search Index Service	...NSRoot\Geocortex\Core\Roles\InstantSearch\IndexService\2.3.0\Bin\Geocortex.Platform.Roles.InstantSearch.IndexService.exe
Geocortex Core Instant Search Indexer	...NSRoot\Geocortex\Core\Roles\InstantSearch\Indexer\2.3.0\Bin\Geocortex.Platform.Roles.InstantSearch.Indexer.exe
Geocortex Core Instant Search Manager	...NSRoot\Geocortex\Core\Roles\InstantSearch\ScannerManager\2.3.0\Bin\Geocortex.Platform.Roles.InstantSearch.ScannerManager.exe
Geocortex Core Instant Search Migrator	...NSRoot\Geocortex\Core\Roles\InstantSearch\Migrator\2.3.0\Bin\Geocortex.Platform.Roles.InstantSearch.Migrator.exe
Geocortex Core Instant Search Scheduler	...NSRoot\Geocortex\Core\Roles\InstantSearch\IndexScheduler\2.3.0\Bin\Geocortex.Platform.Roles.InstantSearch.IndexScheduler.exe
Geocortex Core Instant Search Service	...NSRoot\Geocortex\Core\Roles\InstantSearch\SearchService\2.3.0\Bin\Geocortex.Platform.Roles.InstantSearch.SearchService.exe
Geocortex Core Java Runtime	...Runtime\Java\jre1.8.0_45\bin\java.exe
Geocortex Core NodeJS	...Runtime\node\node.exe
Geocortex Core PhantomJS	...NSRoot\Geocortex\Core\Roles\HtmlReporting\2.3.0\PhantomJS\phantomjs.exe
Geocortex Core Security Store	...NSRoot\Geocortex\Core\Roles\SecurityStore\2.3.0\Bin\Geocortex.Platform.Roles.SecurityStore.exe
Geocortex Core Web Service Proxy	...NSRoot\Geocortex\Core\Roles\WebServiceProxy\2.3.0\Bin\Geocortex.Platform.Roles.WebServiceProxy.exe

Inbound firewall rules required by Geocortex Core 2.3.0 programs

If you use some other firewall besides Windows Firewall, you must configure the firewall with inbound rules similar to the ones shown in the screen capture. Each rule allows access to one program that Geocortex Core uses.

The programs that Geocortex Core uses are in the `Geocortex Core` folder. To save space, the path to the `Geocortex Core` folder is omitted from the screen capture. If Geocortex Core is installed in the default location, the folder is here:

    C:\Program Files\Latitude Geographics\Geocortex Core\

Additional settings for the rules are:

- **Profile**: Domain, Private
- **Enabled:** Yes
- **Action:** Allow
- **Override:** No
- **All Other Settings**: Any

To see the entire rules, view them in Windows Firewall.

▶ **To view Windows Firewall's inbound rules:**

1. Open Windows Control Panel.
2. Click **Windows Firewall**.
3. In the side panel, click **Advanced settings**.
4. In the side panel, click **Inbound Rules**.

Appendix E: Run Essentials Behind a Reverse Proxy

One way to make an Essentials deployment publicly available is to use a reverse proxy. In this deployment scenario, incoming requests from the Internet go to the reverse proxy. The reverse proxy forwards the request to the server that hosts Essentials. Responses from Essentials go back through the reverse proxy.

Microsoft Application Request Routing (ARR) works well with Geocortex Essentials.

There are two main steps to configure Essentials to run behind a reverse proxy:

1. Register the reverse proxy's URL with Essentials.
   This tells Essentials to accept requests that come from the reverse proxy.

2. Configure the REST API's external URL. (optional)
   You only need to do this if you use different internal and external URLs for your servers.

The external URL that you configure in Step 2 is used for operations that return a URL, such as reporting and printing. For example, when an end user runs a report, Essentials returns the URL to the report. The viewer displays a hyperlink to the URL, which the user clicks to download the report.

Suppose your Essentials server is `essentialsserver.internal.com` and your reverse proxy is `myreverseproxy.public.com`. The URL that Essentials creates is based on `internal.com`, which the end user is not allowed to access. Configuring the external URL enables Essentials to convert the URL to the external form, `public.com`, which the user can access.

▶ **To configure Essentials to run behind a reverse proxy:**

Step 1: Register the Reverse Proxy with Essentials

1. In the Post Installer, click **Configure Geocortex Essentials REST API** in the side panel.

2. Click **Hosts**.

3. In the blank box at the bottom of the list, type the fully qualified host name for the reverse proxy, for example, `myreverseproxy.domain.com`.
   If you are not using the default port (port 80 for HTTP, port 443 for HTTPS), make sure to include the port, for example, `myreverseproxy.domain.com:7630`.

4. If the reverse proxy uses SSL, make sure that **https://** is selected in the **Type** box.
   If the reverse proxy does not use SSL, click the down arrow ⌄ in the **Type** box and select **http://**.

   If you want the reverse proxy to accept both HTTP and HTTPS, without upgrading HTTP to HTTPS, register both versions of the URL and make sure that the HTTP version is higher in the list than the HTTPS version. Click ≡ to drag an entry up or down in the list.
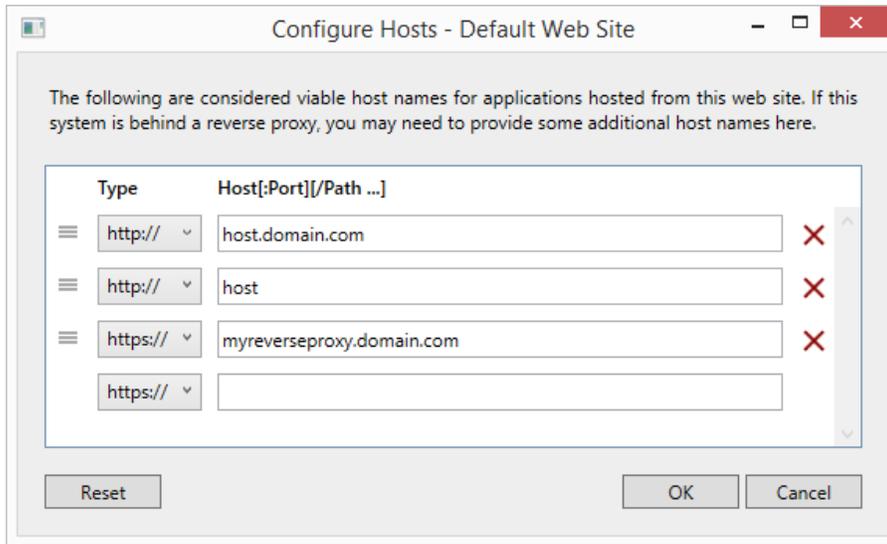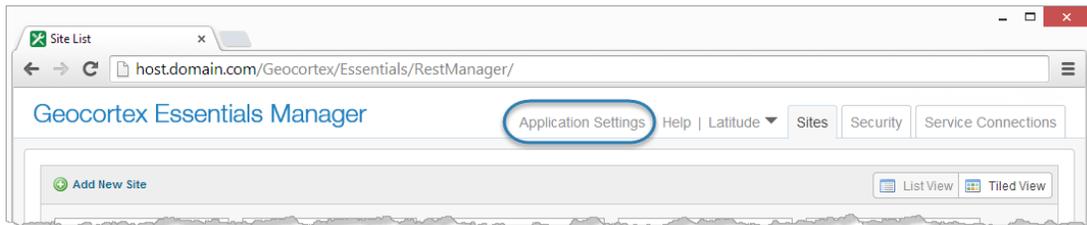
Example of a reverse proxy host name configured in the Post Installer

5. Click **OK**.

6. Click **Finish**.

Step 2: Configure the REST API's External URL (optional)

Do this step if you use different internal and external URLs for your servers.

1. In Manager, click the **Application Settings** hyperlink at the top of the page.

Location of Application Settings hyperlink

2. In the **External REST URL** box, enter the URL to the REST API's root, for example:

   `https://myreverseproxy.public.com/Geocortex/Essentials/REST`

3. Click **OK**.
   The setting takes effect immediately.