Esri Maps for SharePoint

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What's new in Esri Maps for SharePoint

The Esri Maps for SharePoint 4.0 English release is now available. This topic provides information on the updates and enhancements for this release.

Note: Many aspects of installation and configuration have changed in Esri Maps for SharePoint 4.0. Read the System requirements and Configure topics carefully.

Esri Maps for SharePoint 4.0 includes the following new features:

- Support for SharePoint Online
- Allow guests to view the Esri Maps Web Part with limited functionality, without having to sign in
- Portal for ArcGIS10.3 and 10.3.1 support
- Work with common Portal for ArcGIS configurations (OAuth, SAML, IWA, PKI, LDAP)
- Work with Portal for ArcGIS in a disconnected environment
- Support for geographical data enrichment
- New tools added to the Esri Maps Web Part—print, measure, edit (add, modify & delete features), filter layer, and auto-refresh on SharePoint layers
- New Map Contents configuration options for the Esri Maps Web Part
- Esri Maps Location is now built with JavaScript (instead of Silverlight) and enables viewing on mobile devices
- Esri Maps Location field provides a search box to look up addresses, places, and coordinates
- Use the coordinate system of your choice with the Esri Maps Location and overlay other GIS datasets in your local coordinate system
- Extensibility—Create custom tools, behaviors, and custom symbol sets for the Esri Maps Web Part
- Better error handling and various bug fixes
- Various user interface improvements creating a new look and feel

Note: Because of web technology trends, the Silverlight-based ArcGIS Map Web Part will be deprecated after the Esri Maps for SharePoint v4.0 release. The JavaScript-based Esri Maps Web Partcontains many enhanced features not available in the ArcGIS Map Web Part. It is recommended that you use the Esri Maps Web Part in place of the ArcGIS Map Web Part— you will no longer be able to add a new ArcGIS Map Web Part to site pages. To continue using your existing ArcGIS Map Web Part, upgrade all sites containing the ArcGIS Map Web Part to Esri Maps for SharePoint 4.0 and save the pages. You'll then be able continue using the ArcGIS Map Web Part seamlessly.

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System requirements

Before deploying Esri Maps for SharePoint, the following prerequisites must be met:

- Microsoft SharePoint Server or Foundation 2010 or 2013
- An ArcGIS account (ArcGIS Online or Portal for ArcGIS)
- Esri Maps for SharePoint requires a set of MIME types to be present on the SharePoint server on which Esri Maps for SharePoint is installed. The required MIME types are listed below.
  - `.svg` image/svg+xml
  - The ArcGIS Map Web Part relies on the Microsoft Silverlight platform. Additional MIME types are also required if using this web part:
    - `.xaml` application/xaml+xml
    - `.xap` application/x-silverlight-app
    - `.xbap` application/x-ms-xbap

  See Configuring IIS for Silverlight applications for additional information.
- Secure store service—For SharePoint 2010 and 2013 (excluding Foundation), the OAuth app ID and secret are stored in the Secure Store Service. Ensure the Secure Store Service is started and an encryption key exists. For additional details, see Configure the Secure Store Service in SharePoint 2013 or Configure the Secure Store Service (SharePoint Server 2010). See the steps below to access the Secure Store Service and generate a new key.
  - On the **Central Administration** home page, in the **Application Management** section, click **Manage service applications**.
  - Click the **Secure Store Service** link.
  - Click **Generate New Key**. You can now exit **Central Administration**.
- Portal for ArcGIS—To successfully run the Esri Maps Locate workflow in Portal, configure the geocoder service according to If the service is not from a federated server and requires credentials section of Configure utility services in your Portal for ArcGIS documentation.
- SharePoint 2010—To successfully run the Esri Maps Locate workflow in SharePoint 2010, download and install the certificate from ArcGIS Online or your Portal for ArcGIS instance.
  Download the certificate.

  Note: Complete all steps in Internet Explorer. You may need elevated permissions (Run as Administrator) to copy the certificate.

  - Browse to `https://www.arcgis.com` (or the portal you are using). Be sure to use `https`.
  - Click the `Security Report` icon (padlock) in the URL address bar.
  - Click **View certificates** on the **Website Identification** dialog box that appears.
  - Click the **Certification Path** tab on the **Certificates** dialog box.
  - Select **DigiCert** and click **View certificate**.
  - Click the **Details** tab on the **Certificates** dialog box.
  - Click **Copy to File** to start the **Certificate Export Wizard**.
  - On the first page of the **Certificate Export Wizard**, click **Next**.
  - Select the Base-64 encoded X.509 (`.cer`) option and click **Next**.
  - Save the file to a known location on disk and click **Next** on the **Certificate Export Wizard**.
  - Click **Finish**.
    A message appears stating that the export was successful.

  Import the certificate to SharePoint SharePoint.

  - Open SharePoint Central Administration in a browser with elevated permissions (Run as Administrator).
  - Click **Security** and click **Manage Trust** under the **General Security** heading.
  - Click **New**, specify a name, and browse to the root certificate you saved in the previous steps.

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Note:

Do not delete the existing local certificate.

- Click **OK**. The certificate in now added to the SharePoint server instance.

Supported browsers:

- Chrome (latest)
- Firefox (latest)
- Internet Explorer (9, 10, 11)

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Supported environments

For Esri Maps for SharePoint to operate properly, Esri assumes an operational configuration of Microsoft SharePoint. Esri Maps for SharePoint is supported for use with SharePoint 2010 Server and Foundation and SharePoint2013 Server and Foundation.

Note: Esri Maps for SharePoint does not support SharePoint 2010 templates in SharePoint 2013.

System requirements

See the system requirements for Microsoft SharePoint for information:

- Hardware and software requirements (SharePoint Server 2010)
- Hardware and software requirements for SharePoint 2013

Operating systems

Esri Maps for SharePoint is supported for SharePoint 2010 and SharePoint 2013 on the following operating systems. See the Microsoft SharePoint supported environments information to determine which versions of these operating systems are actively supported:

- Windows Server 2012
- Windows Server 2008 R2 SP1
- Windows Server 2008 R2

Supported languages

Esri Maps for SharePoint is available in the following languages:

Arabic, Chinese (simplified), Czech, Danish, Dutch, English, Estonian, Finnish, French, German, Greek, Hebrew, Italian, Japanese, Korean, Latvian, Lithuanian, Norwegian, Polish, Portuguese (Brazil), Portuguese (Portugal), Romanian, Russian, Spanish, Swedish, Thai, Turkish, and Vietnamese.

The language used in the Windows version of the app is determined by your operating system's language setting. If you are using an unsupported language setting, the app uses English.

Web browsers

The following browsers are supported:

Browser name	SharePoint 2010	SharePoint 2013
Internet Explorer 11	Full	Full
Internet Explorer 10	Full	Full
Internet Explorer 9	Full	Full
Internet Explorer 8	Not supported	Not supported
Google Chrome*	Full	Full
Mozilla Firefox*	Full	Full

*Latest released version

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Install Esri Maps for SharePoint

The setup program setup program included with Esri Maps for SharePoint provides an easy way to deploy to your SharePoint installation.

Note: Installing Esri Maps for SharePoint requires administrative access to SharePoint. Run the installer with elevated permissions to avoid errors.

Note: Installing on a site that previously had a beta version of Esri Maps for SharePoint installed is not recommended. Before installing Esri Maps for SharePoint, disable and remove all components containing the beta software or create a new site.

Included files

The Esri Maps for SharePoint on-premises (SharePoint 2010 or 2013) installation includes the following files:

- Setup.exe—Installation program that allows you to deploy Esri Maps for SharePoint to web applications and site collections in your SharePoint farm.
- ESRI.ArcGIS.Mapping.SharePoint.wsp—SharePoint solution package that contains the Esri Maps for SharePoint features, resources, and configuration files.
- EnableAnonymousAccess.ps1—PowerShell script that enables anonymous access to SharePoint lists displayed within the Silverlight-based ArcGIS Map Web Part.
- WebContentInstaller.ps1—PowerShell script that lays down Web Contents to allow Esri Maps for SharePoint to work in a disconnected environment.

  Note: On sites that have anonymous access enabled, administrators also need to run this script to allow SharePoint lists to show on the ArcGIS Map Web Part when viewed by anonymous users.

- Documentation—Esri Maps for SharePoint includes a variety of documents to help you install, configure, and get started with the apps. It also includes a guide for installing language packs, and the license agreement.

Install and deploy Esri Maps for SharePoint on-premises

Follow these steps to deploy Esri Maps for SharePoint.

Steps:

1. Download and extract the contents of the Esri Maps for SharePoint installation ZIP file to a location on the system where SharePoint is installed.
2. Right-click the Setup.exe file and choose **Run as Administrator** to begin the installer. The installer performs a series of checks to ensure that the installation will be successful. If a check fails, the installer provides information about the failure.
3. Once the checks have completed successfully, click **Next**.
   If you receive a message that the Secure Store service has not started, start this service on your SharePoint server (not applicable for SharePoint Foundation). See System requirements for more information.
4. Read the End User License Agreement (EULA). If you agree to the terms of the EULA, check the check box and click **Next**.
5. Choose the web applications or site collections on which to enable Esri Maps for SharePoint. In the **Web Applications / Site Collections** tree, each top-level node represents a SharePoint web application, while each child node represents a site collection. In the following example, Esri Maps for SharePoint is targeted for deployment to the site collection located at http://7win/sites/demo. Once you have selected the target web applications and site collections, click **Next**.

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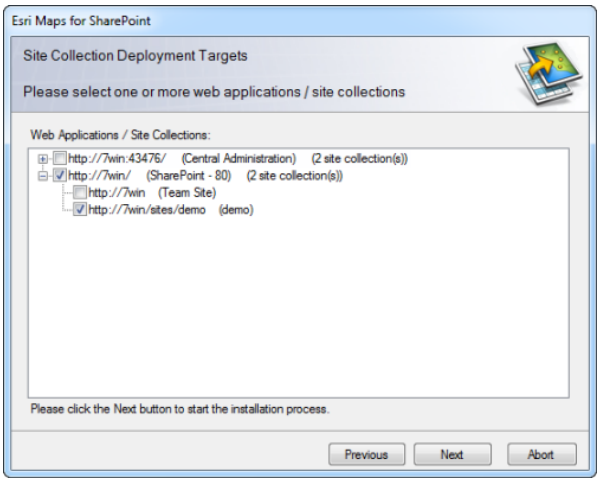

Note: If you target a web application, the Esri Maps for SharePoint feature is available to all site collections within that web application. Therefore, for site collections that are not checked on this installer page but are within web applications that are checked, the Esri Maps for SharePoint feature is available but not activated.

6. Once the operation completes, click **Next** to view a log of the operations or **Close** to close the setup program.

When the installation is complete, configure Esri Maps for SharePoint

Install using PowerShell

Use the following PowerShell commands to manually install Esri Maps for SharePoint. Be sure to replace the placeholders with the information from your system.

```
Add-SPSolution -LiteralPath C:\Software\ESRI.ArcGIS.Mapping.SharePoint.wsp
Install-SPSolution ESRI.ArcGIS.Mapping.SharePoint.wsp -WebApplication http://<web application name> -GACDeployment
Start-Sleep 15
Enable-SPFeature -identity "b432665a-07a6-4cc7-a687-3e1e03e92b9f" -URL http://<web application name>/sites/<MySiteCollectionName>
WebContentInstaller.psl -install
```

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Upgrade Esri Maps for SharePoint

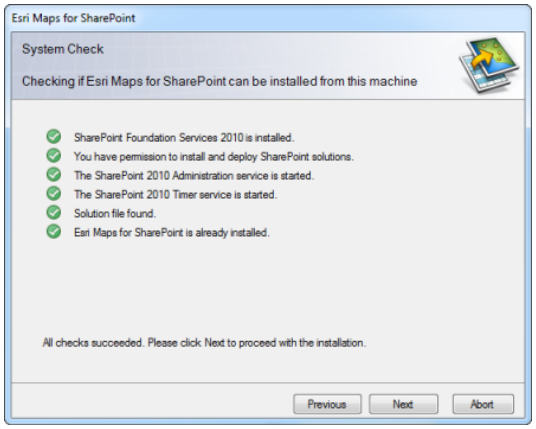
The Setup.exe program included with Esri Maps for SharePoint allows you to upgrade to the latest version. To upgrade, follow these steps.

Note:

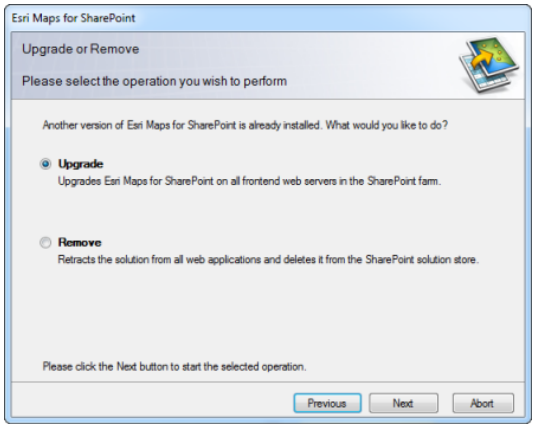
- You do not need to uninstall your previous version of Esri Maps for SharePoint to upgrade to a newer version.
- Maps created with the JavaScript-based Map Web Part in beta will need to be re-created once the final version is installed.

Upgrade

1. Double-click the Setup.exe file to open it. Click **Next** on the Esri Maps for SharePoint setup wizard dialog box.
2. The installer performs a series of checks to ensure that the installation will be successful. If a check fails, the installer provides information about the failure. Once the checks have completed successfully, click **Next**.



3. Choose the **Upgrade** option and click **Next**.



The installer deploys and activates Esri Maps for SharePoint to the selected site collections.

4. Once the operation is complete, click **Next** to view a log of the operations.

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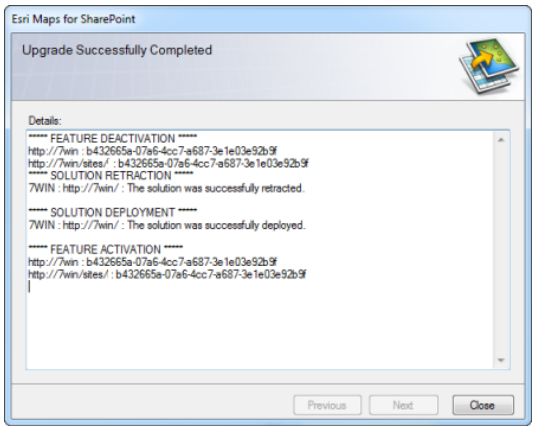

5. Click **Close** to close the setup program.

Upgrade using PowerShell

Use the following PowerShell commands to remove the previous version of Esri Maps for SharePoint and install the latest. Be sure to replace the placeholders with the information from your system.

```
Disable-SPFeature -identity "b432665a-07a6-4cc7-a687-3e1e03e92b9f" -URL http://<web application name>/sites/<MySiteCollectionName>
Uninstall-SPSolution -Identity ESRI.ArcGIS.Mapping.SharePoint.wsp -WebApplication http://<web application name>
Start-Sleep 15
Remove-SPSolution -Identity ESRI.ArcGIS.Mapping.SharePoint.wsp
WebContentInstaller.ps1 -uninstall
Add-SPSolution -LiteralPath C:\Software\ESRI.ArcGIS.Mapping.SharePoint.wsp
Net stop SPTimerV4
Net start SPTimerV4
Install-SPSolution ESRI.ArcGIS.Mapping.SharePoint.wsp -WebApplication http://<web application name> -GACDeployment
Start-Sleep 15
Enable-SPFeature -identity "b432665a-07a6-4cc7-a687-3e1e03e92b9f" -URL http://<web application name>/sites/<MySiteCollectionName>
WebContentInstaller.ps1 -install
```

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Configure Esri Maps for SharePoint

Esri Maps for SharePoint must be configured before it can be used for the first time. The configuration process generates an App ID for use with the Esri Maps Web Part, the Esri Maps Locate and Esri Maps Connect workflows, and the Esri Maps Location field. This App ID identifies your app to the platform based on OAuth 2.0. The App ID is also the foundation for distributing apps, accessing billable services, and getting usage reports. To learn more about authentication and OAuth 2.0, see ArcGIS for Developers. The App ID is created for you by Esri Maps for SharePoint.

Configuring Esri Maps for SharePoint requires the credentials of a single named user account from the organization. The credentials provided during the configuration process are used to charge credits consumed by the Locate and Connect Workflows, and by theEsri Maps Location field. The user account used for configuration requires the following:

- Permissions within the organization to geocode. By default, users, publishers, and administrators have permissions to geocode, but a user may belong to a custom role where this permission was removed. See ArcGIS roles for more information.
- Ownership of hosted services selected as a custom location type in the Esri Maps Locate workflow.
- The ability to use organization credits as needed for geocoding. See Service credits overview for more information.

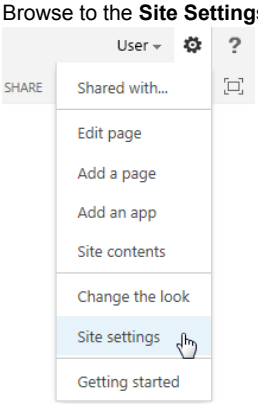
Note: If you installed both the Esri Maps and Esri Maps Locate workflow apps, you'll need to configure both apps separately.

Set the ArcGIS Connection URL

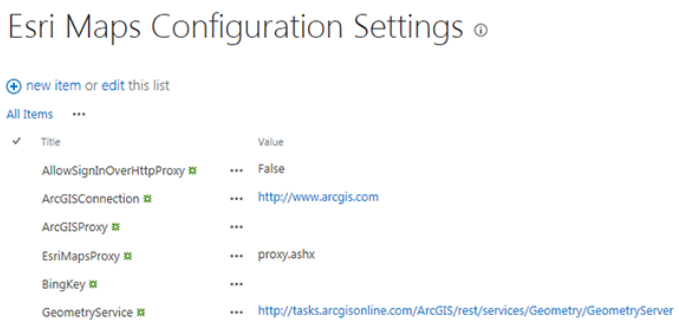
Prerequisite:
You must be a site collection administrator to access the Esri Maps for SharePoint administration menu.

Steps:

1. Browse to the **Site Settings** page of the site.



2. Under the **Esri Maps for SharePoint Administration** heading, click **Configuration Settings**.
3. Edit the value of the **ArcGISConnection** list item to point to your Portal for ArcGIS instance or ArcGIS Online organization. If you are connecting directly to ArcGIS Online (meaning your instance has no subdomain), leave the default setting of www.arcgis.com.



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Note: To configure Esri Maps for SharePoint to work with SSL-secured sites, change the ArcGISConnection URL from HTTP to HTTPS.

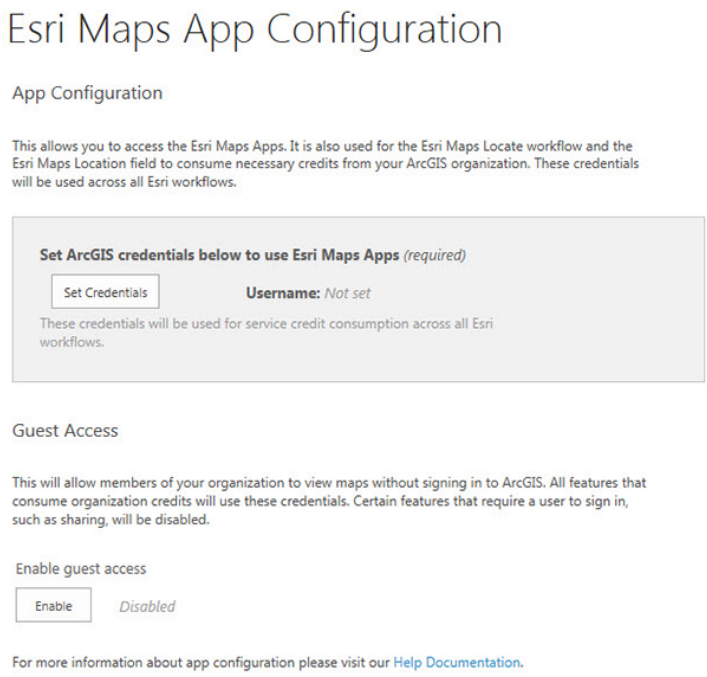
Set the App Configuration credentials

Prerequisite:
You must be a site collection administrator to access the Esri Maps for SharePoint administration menu.

The App Configuration credentials are used to charge credits consumed by the Esri Maps Locate and Esri Maps Connect workflows, and by the Esri Maps Location field.

Steps:

1. Browse to the **Site Settings** page of the site.
2. Under the **Esri Maps for SharePoint Administration** heading, click **App Configuration**.
   The Esri Maps App Configuration page opens.



Note: If you receive a **You do not have permissions to manage App Configuration** message when you open the App Configuration page, you need to ensure that the current web application pool account has Full Control administrative permissions to the SharePoint Secure Store Service. To determine the web application pool account, go to Central Administration > Security > Configure service accounts. From the drop-down menu, choose the web application you are trying to configure. The account name associated with that web application is listed under **Select an account for this account**. Refer to the frequently asked questions for detailed information about adding the account to the list of administrators for the Secure Store Service. Also note that any other application pool accounts that may be used by other SharePoint web applications must also be added to the members list of both Secure Store service applications. See the frequently asked questions for more information.

3. Under the **App Configuration** heading, click **Set Credentials**.

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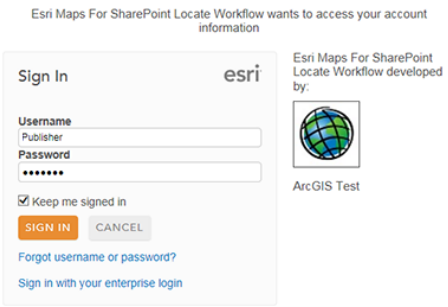

Note:

- If you're using Internet Explorer and the **Sign In** window appears but is blank, try the following:
  - On the Internet Explorer **Internet Options** dialog box, click the **Security** tab and choose **Trusted Sites**.
  - Check **Enable Protected Mode**.
  - Click the **Sites** button and add https://*.arcgis.com or your portal address.
  - Restart Internet Explorer.
- If you receive the following message: "Unable to obtain master key," follow the steps below to generate a key within the SharePoint Secure Store service:
  - On the **Central Administration** home page, in the **Application Management** section, click **Manage service applications**.
  - Click the **Secure Store Service** link.
  - Click **Generate New Key**.
- If you have a Portal for ArcGIS configured with SAML, you'll need to sign into App Configuration using a built-in user, change the credentials, and sign in using the SAML username and password.
- Use Firefox or Chrome when setting the App Configuration credentials on SharePoint 2010 for IWA, PKI, or LDAP portals. When using Firefox, first navigate to the portal itself and make sure to add the exception to trust the portal.

4. Provide the appropriate credentials and click **OK**.
   See the introduction for details about requirements for the named user account.

After entering these credentials, users are still prompted to provide their own credentials when using the Esri Maps Web Part. The credentials they enter on the web part persist for the current browser session; if the user closes the browser window and begins a new session, they must re-enter their credentials.

Set the Guest Access credentials (optional)

Sometimes you may want members of your organization to view the Esri Maps Web Part without needing to sign in to ArcGIS. To do so, you can set the Guest Access credentials. Keep in mind that this product is provided as an entitlement of your ArcGIS Online plan subscription or Portal for ArcGIS Named User License, and that all licensing requirements are in effect. All users are required to have a Named User license to access ArcGIS and interact with the map. Contact your local Esri representative for more information.

Guest users have limited access to the Esri Maps Web Part. In addition to viewing SharePoint content and shared ArcGIS content that has been added to the map, guest users can pan and zoom the map, turn layers on and off, and view pop-ups, but most functionality is restricted to viewing only. To fully interact with the map, users must sign in to ArcGIS using a named user account.

To configure Guest Access, do the following:

Steps:

1. Browse to the **Site Settings** page of the site.
2. Under the **Esri Maps for SharePoint Administration** heading, click **App Configuration**.
3. Under the **Guest Access** heading, click **Enable**.

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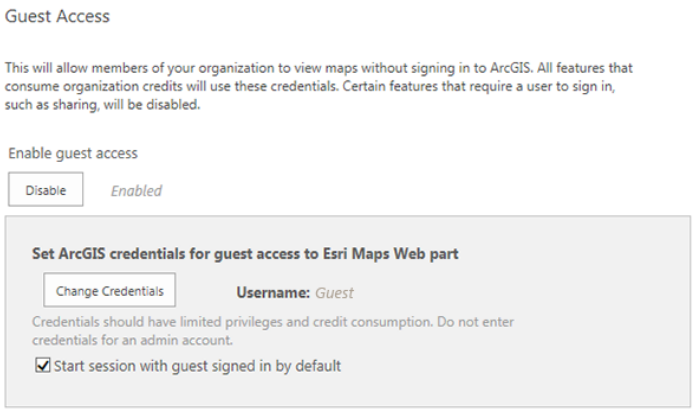
4. Click **Set Credentials**.



Note:

- If you're using Internet Explorer and the **Sign In** window appears but is blank, try the following:
  - On the Internet Explorer **Internet Options** dialog box, click the **Security** tab and choose **Trusted Sites**.
  - Check **Enable Protected Mode**.
  - Click the **Sites** button and add https://*.arcgis.com or your Portal for ArcGIS URL.
  - Restart Internet Explorer.
- If you receive the following message: "Unable to obtain master key," follow the steps below to generate a key within the SharePoint Secure Store service:
  - On the **Central Administration** home page, in the **Application Management** section, click **Manage service applications**.
  - Click the **Secure Store Service** link.
  - Click **Generate New Key**.
- If you have a Portal for ArcGIS configured with SAML, you'll need to sign in to App Configuration using a built-in user, change the credentials, and sign in using the SAML username and password.
- Use Firefox or Chrome when setting the App Configuration credentials on SharePoint 2010 for IWA, PKI, or LDAP portals.

5. Provide the appropriate credentials and click **OK**.
6. If you want the Esri Maps Web Part to automatically sign users in as guests, check the **Start session with guest signed in by default** check box.

Note: If you installed both the Esri Maps and Esri Maps Locate workflow apps, you'll need to configure Guest Access for both apps separately.

Configure enterprise login

You can specify your ArcGIS organization's subdomain to enable enterprise login across your site collection, allowing your users to login using their enterprise credentials

Prerequisite:
You must be a site collection administrator to access the Esri Maps for SharePoint administration menu.

To configure enterprise login, do the following:

Steps:

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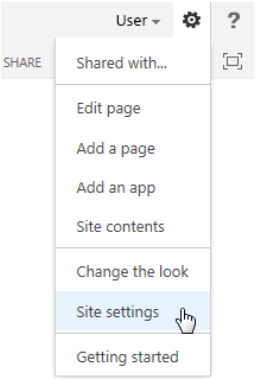
1. Navigate to the **Site Settings** page of the site.



2. Under the **Esri Maps for SharePoint Administration** heading, click **Configuration Settings**.
3. Edit the value of the **ArcGISConnection** list item to point to the subdomain of your Portal for ArcGIS instance or ArcGIS Online organization.
   For example: https://<mysubdomain>.maps.arcgis.com

   Enterprise login configuration is complete.
4. To disable enterprise login and revert to the default ArcGIS sign in method, reset the ArcGISConnection URL to https://www.arcgis.com.

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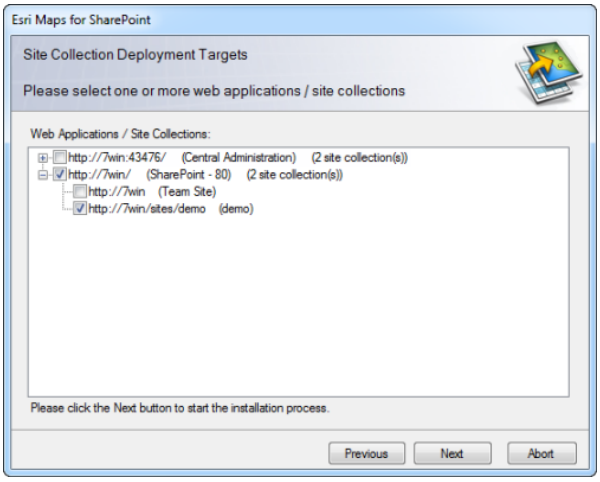
Modify or remove

Modify

The Setup.exe program included with Esri Maps for SharePoint allows you to easily modify which sites and web applications contain Esri Maps for SharePoint functionality. To modify your installation, complete the following steps:

Steps:

1. Right-click the Setup.exe file and click **Run as Administrator** to begin the installer. The installer performs a series of checks to see whether Esri Maps for SharePoint has been installed and to ensure the installer can perform its functions. If a check fails, the installer provides information about the failure.
2. Once the checks have completed successfully, click **Next**.
3. Select the **Modify** option and click **Next**.
4. Choose the web applications or site collections on which to enable or disable Esri Maps for SharePoint. In the Web Applications/Site Collections tree, each top-level node represents a SharePoint web application, while each child node represents a site collection. In the following screen capture, Esri Maps for SharePoint is being targeted for deployment to the site collection located at `http://7win/sites/demo`.



If you target a web application, Esri Maps for SharePoint is available to all site collections within that web application.

5. Once you have selected the target web applications and site collections, click **Next**. The installer deploys and activates Esri Maps for SharePoint to the selected site collections and deactivates Esri Maps for SharePoint on any unchecked site collections.
6. Once the operation completes, click **Next** to view a log of the operations or **Close** to close the setup program.

Remove

To remove Esri Maps for SharePoint from your SharePoint farm, use the Setup.exe program included with the product. Follow the steps below to uninstall Esri Maps for SharePoint.

Steps:

1. Right-click the Setup.exe file and click **Run as Administrator** to begin the installer. The installer performs a series of checks to see whether Esri Maps for SharePoint has been installed to ensure the installer can perform its functions. If a check fails, the installer provides information about the failure.
2. Once the checks have completed successfully, click **Next**. The **Modify or Remove** dialog box appears.
3. Choose the **Remove** option and click **Next**. The installer retracts Esri Maps for SharePoint from all site collections and removes it from the SharePoint farm.
4. Once the operation completes, click **Next** to view a log of the operations or **Close** to close the setup program.

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Uninstall using PowerShell

Use the following PowerShell commands to uninstall Esri Maps for SharePoint. Be sure to replace the placeholders with the information from your system.

```
Disable-SPFeature -identity "b432665a-07a6-4cc7-a687-3e1e03e92b9f" -URL http://<web application name>/sites/<MySiteCollectionName>
Uninstall-SPSolution -Identity ESRI.ArcGIS.Mapping.SharePoint.wsp -WebApplication http://<web application name>
Start-Sleep 15
Remove-SPSolution -Identity ESRI.ArcGIS.Mapping.SharePoint.wsp
WebContentInstaller.ps1 -uninstall
```

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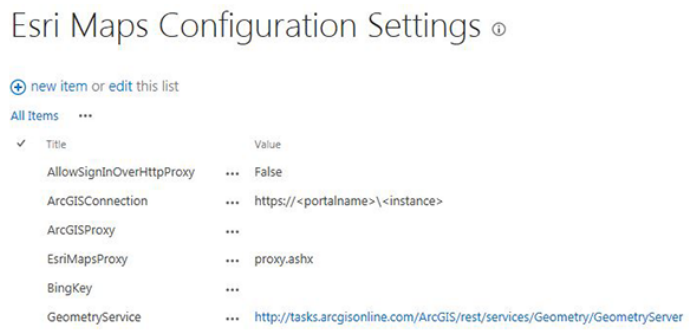
Disconnected environment

Esri Maps for SharePoint version 3.0 and later works with ArcGIS Online or Portal for ArcGIS. With the release of Esri Maps for SharePoint 4.0, support is included for connecting to Portal for ArcGIS in a disconnected setting such as when your internal network is behind a firewall. This functionality is not designed for, and does not support, working offline and reconnecting and syncing information.

In a disconnected scenario, set the ArcGISConnection (in the **Configuration Settings** list) to connect to Portal. For example:



Note: SharePoint administrator permissions are required to change **Configuration Settings**.

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Esri Maps for SharePoint and ArcGIS

With Esri Maps for SharePoint, you can easily create maps that combine your SharePoint data with published geographic content from ArcGIS. You can also share the maps you create in Esri Maps for SharePoint with others within and outside of your organization using ArcGIS. ArcGIS provides an online infrastructure for making maps and geographic information available throughout an organization, across a community, and openly on the web.

Esri Maps for SharePoint works directly with your organization's ArcGIS subscription to allow you to access geographic content to enhance your business data. You must be signed in to ArcGIS to use Esri Maps for SharePoint; depending how your administrator has configured the application, you may be prompted to enter your ArcGIS credentials. Your subscription includes a number of service credits, which are the currency of ArcGIS and are used in exchange for most of the ArcGIS services your organization uses. The number of service credits required depends on the type of service you are using. To help you estimate how many service credits you will need, see Service Credits Overview.

With Esri Maps for SharePoint, you can easily Add data from ArcGIS to your map to help you visualize your data in new ways. Once you have created the desired maps and layers in Esri Maps for SharePoint, you can publish them to ArcGIS for sharing with others.

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ArcGIS authentication modes

Esri Maps for SharePoint supports several authentication modes when connecting to ArcGIS Online or Portal for ArcGIS. The supported authentication mode differs based on how you have set up your ArcGIS Online organization or Portal for ArcGIS security. See the help documentation for ArcGIS Online or the Administrator Guide in the help system that is installed locally with Portal for ArcGIS for additional information and to ensure the security settings have been properly configured.

ArcGIS Online

Esri Maps for SharePoint supports the following authentication modes for connecting to ArcGIS Online:

- Built-in accounts—Users enter their ArcGIS Online credentials. This results in the use of token-based authentication via OAuth 2.0.
- Enterprise login—Enterprise logins are supported via Security Assertion Markup Language (SAML) 2.0. See Configure Maps for SharePoint for more information.

Portal for ArcGIS

For detailed information on Portal for ArcGIS authentication, see the Administrator Guide included with the Portal for ArcGIS installation.

For Portal for ArcGIS 10.3 and later, the default authentication is OAuth 2.0.

- Built-in accounts—Users enter their Portal for ArcGIS credentials. This results in the use of token-based authentication via OAuth 2.0.
- Enterprise login—Enterprise logins are supported via Security Assertion Markup Language 2.0 (SAML). The following Enterprise identity providers are supported: Integrated Windows Authentication (IWA), Public Key Infrastructure (PKI), Lightweight Directory Access Protocol (LDAP), and token-based authentication. See

  Note: If you use Portal for ArcGIS configured with SAML, you will need to sign in to the App Configuration using a built-in user, and then change the credentials to sign in using the SAML user name and password.

  Note: Esri Maps for SharePoint does not currently support IWA/PKI/LDAP authentication for workflows (Esri Maps Connect and Locate workflows) for Portal for ArcGIS.

Esri Maps for SharePoint requires no specific steps to implement the authentication methods supported by Portal for ArcGIS; the app configuration process outlined in the Esri Maps for SharePoint installation topic is all that is required. See About configuring portal authentication for more information.

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Sign in to ArcGIS

To use Esri Maps for SharePoint, you must be signed in to ArcGIS.

Sign in

User sign-in allows you to sign in to ArcGIS with your own credentials.

Steps:

1. Navigate to a map to configure or view it.
2. Click the link to Sign In.
   The **Sign In** window appears.

   Note: If you're using Internet Explorer and the **Sign In** window appears but is blank, try the following:

   a. On the Internet Explorer **Internet Options** dialog box, click the **Security** tab and choose **Trusted Sites**.
   b. Check **Enable Protected Mode**.
   c. Click the **Sites** button and add https://*.arcgis.com.
   d. Restart Internet Explorer.

3. In the **Sign In** window, provide your user name and password.
   If you do not know your user name or password, contact your administrator.

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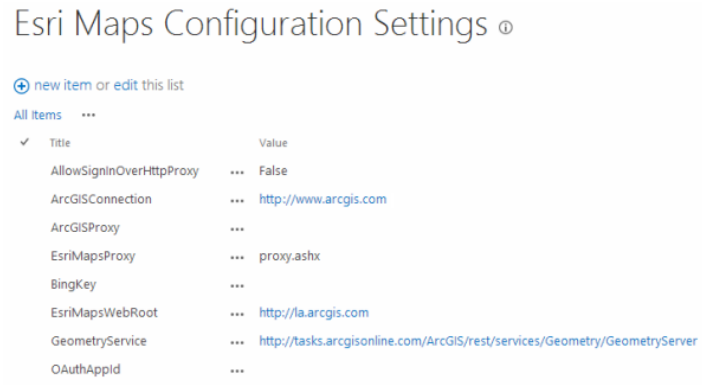
Esri Maps configuration settings

There are several properties for the JavaScript-based Esri Maps Web Part that can be configured using the **Esri Maps Configuration Settings** list installed with Esri Maps for SharePoint. For the Esri Maps Web Part, you can configure AllowSignInOverHttpProxy, ArcGISConnection, EsriMapsProxy, EsriMapsWebRoot, and OAuthAppId. You'll notice several additional properties, but those are for use with the Silverlight-based ArcGIS Map Web Part.

To open the **Esri Maps Configuration Settings** list, browse to the **Site Settings** page of your site collection. Under the **Esri Maps for SharePoint Administration** heading, click **Configuration Settings**.



Property	Description
AllowSignInOverHttpProxy	The AllowSignInOverHttpProxy property is a setting for use with SharePoint 2010 and Internet Explorer. By default, this value is False, but if you're using SharePoint 2010 and Internet Explorer as your web browser, set this value to True. If you try to sign in to ArcGIS with this setting set to False, you'll receive the following error message: Your browser configuration does not support sending secured content. Your sign-in was canceled to ensure password safety.
ArcGISConnection	The ArcGISConnection path property allows you to specify a path to Portal for ArcGIS or ArcGIS Online. These endpoints are used when adding data from ArcGIS or sharing your maps and layers to ArcGIS.
ArcGISProxy	The Silverlight-based ArcGIS Map Web Part does not require a proxy file unless connecting to secured services. This setting is blank by default and can be updated if necessary.
BingKey	This property is only for the Silverlight-based ArcGIS Map Web Part. For the JavaScript-based Esri Maps Web Part, this setting is controlled by the Organization administrator.
EsriMapsProxy	The JavaScript-based Esri Maps Web Part uses a proxy file, deployed to the server during theEsri Maps for SharePoint installation, to reach Portal for ArcGIS or ArcGIS Online from the SharePoint server. This proxy is generic and makes an HTTPRequest. You can make changes to the proxy or attempt to configure the proxy on other servers, but these are custom scenarios that may not be fully supported. If you expect your application to run on browsers that do not support cross-origin resource sharing (CORS), install a server-side proxy script to allow cross-domain requests. Currently, Internet Explorer 8 and 9 do not provide full support for CORS and require the server-side proxy script. See Can I use Cross-Origin Resource Sharing for more information on other browsers.
GeometryService	This geometry service contains utility methods that provide access to sophisticated and frequently used geometric operations.

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Esri Maps administration settings

Before Esri Maps for SharePoint 4.0, settings were contained in two different locations: the Esri Maps Configuration Files library and the Esri Maps for SharePoint Administration settings. All settings have now been moved to the Esri Maps for SharePoint Administration section on the **Site Settings** page of your SharePoint site. These settings require administrator permissions to access and modify. The following sections detail each of the settings contained in the Esri Maps for SharePoint Administration.

App configuration

The **App Configuration** setting is new with Esri Maps for SharePoint 4.0. It is divided into two settings: **App Configuration** and **Guest Access**. In both settings, you specify the credentials (user name and password) used to generate an OAuth app ID and secret. The app ID is used to identify Esri Maps apps and can be used for tracking.

The **App Configuration** app ID and secret are used for the credits required by the Esri Maps Locate and Connect workflows and the Esri Maps Location field. This setting must be configured before using Esri Maps for SharePoint.

The **Guest access** app ID and secret are used to allow members to view maps without signing in to ArcGIS. Features, other than geocoding, that consume credits will be charged to this account. Geocoding credits are charged to the mandatory App Configuration account set above. Users signed in as guests have limited functionality available to them. Users will need to sign in to the map using their named user account to access more functionality such as sharing maps and layers. The **Guess access** setting is optional.

Configuration settings

These settings are for use with the Silverlight-based and JavaScript-based Web Parts. See Esri Maps Configuration Settings for more information.

Configuration files

The Configuration Files list contains two files used with the JavaScript-based Esri Maps Web Part: behaviors.json.txt and tool_collections.json.txt. These two files define the tools and behaviors available when creating new Web Parts. See the Extensibility overview for more information.

The remaining files in the Configuration Files list are used with the Silverlight-based ArcGIS Map Web Part. See Configure color ramps, Configure the default map, and Configure the default tools for more information.

Manage extensions

This setting is used with the JavaScript-based Esri Maps Web Part. See Add extensions for more information.

Legacy ArcGIS Mapping Settings

Configure the Silverlight-based ArcGIS Map Web Part using the settings lists below. These lists are used for configuring ArcGIS Map Web Parts that have been migrated from previous versions.

Note: It is recommended that you use the JavaScript-based Esri Maps Web Part as the ArcGIS Map Web Part, as these settings will no longer be available in future releases.

Basemaps

This file is for use with the Silverlight-based ArcGIS Map Web Part. See Configure basemaps for more information. For information on configuring basemaps for the JavaScript-based Esri Maps Web Part, see Change the basemap.

Connections

This file is for use with the Silverlight-based ArcGIS Map Web Part. See Configure connections for more information.

Locators

This file is for use with the Silverlight-based ArcGIS Map Web Part. See Configure locators for more information.

Symbols

This file is for use with the Silverlight-based ArcGIS Map Web Part. See Configure symbols for more information.

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ArcGIS Mapping extensions

This file is for use with the Silverlight-based ArcGIS Map Web Part. See Configure add-ins for more information.

Printing files

This file is for use with the Silverlight-based ArcGIS Map Web Part. See Print for more information.

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Prepare SharePoint data

Esri Maps for SharePoint allows you to add content to the Map web part from several sources, including SharePoint lists in your site collection, external SQL server tables, and ArcGIS Online or Portal for ArcGIS). Before data from SharePoint lists or external SQL server tables can be added to the map, the list items must be spatially enabled (geocoded) using the Esri Maps Locate workflow. See the table below for information on how to spatially enable and add the different types of data you have.

Data source	Process to add to a map
SharePoint list with address data	Run the Esri Maps Locate workflow. See Add lists containing address or place-name data.
SharePoint list with place names such as U.S. city, U.S. state, and World country.	Run the Esri Maps Locate workflow. See Add lists containing address or place-name data.
SharePoint list with coordinate data	Add the Esri Maps Location field to the existing list. See Add lists containing coordinate data.
External SQL Server tables	Run the Esri Maps Connect workflow to create a connection to the external content. The Esri Maps Connect workflow includes the Esri Maps Locate workflow. See Connect to external data.
ArcGIS (ArcGIS Online or Portal for ArcGIS)	No geocoding necessary. See Add data from ArcGIS.

Import Excel spreadsheet data

There are several best practices for importing Excel spreadsheets that will be used with Esri Maps for SharePoint:

- Ensure your spreadsheet contains no blank columns or rows.
- Ensure each column has a header (title).
- Be aware that SharePoint takes the first text column in your spreadsheet and sets that as the title field with a hyperlink to the original spreadsheet. See SharePoint lists III: Create a list based on a spreadsheet. The JavaScript-based Esri Maps Web Part does not include hyperlinked fields when adding data to the map (that is, content in the title field will not appear in pop-ups). This means that you may need to modify your default list view in SharePoint to include the appropriate fields for displaying information in pop-ups and for connecting web parts.
- Use Internet Explorer to import data from an Excel spreadsheet; Chome and Firefox browsers do not support importing Excel data into SharePoint.

Note: If you are new to creating and working with lists in SharePoint, see the following guides for more information:

- SharePoint lists I: An introduction
- SharePoint lists II: Create and work with different lists
- SharePoint lists III: Create a list based on a spreadsheet

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Esri Maps Locate workflow

Note:

- Before running the Esri Maps Locate workflow, ensure you have met all of the system requirements and completed the app configuration as outlined in the installation topic Install Esri Maps for SharePoint 2010 and 2013.
- ArcGIS service credits are only consumed when running the workflow on address data (geocoding). Spatially enabling lists with place name data does not consume credits. See Service credits overview for more information on the ArcGIS platform and credit usage.
- If you're using a list that was created by importing an Excel spreadsheet, be aware that SharePoint takes the first text column in your spreadsheet and sets that as the title field with a hyperlink to the original spreadsheet (see SharePoint lists III: Create a list based on a spreadsheet). The JavaScript-based Esri Maps Web Part does not include hyperlinked fields when adding data to the map. This means you may need to modify your default list view in SharePoint to include the appropriate fields for displaying information in pop-ups and for connecting web parts.

The Esri Maps Locate workflow can spatially enable SharePoint list items that contain the following location types:

- **Latitude and longitude**—Latitude and longitude values represent the position of a point on the earth's surface in an X, Y format. For SharePoint lists with coordinate data, run the Esri Maps Locate workflow only if the list will be used in the Silverlight-based ArcGIS Map Web Part.

  Note: The Esri Maps Locate workflow does not need to run on a SharePoint list with coordinate data if it is being used in the JavaScript-based Esri Maps Web Part. The Esri Maps Web Part automatically detects lists with coordinate columns labeled as X and Y; ShapeX and Shape Y; and Latitude and Longitude. These names are case sensitive.

- **Address**—In the United States, address data is comprised of street name, city, state, ZIP Code, and country. There are similar address elements in other countries. The more address elements your data contains, the more accurate your results will be. You can find a complete list of countries for which there is address coverage in the **supported countries** link on the World Geocoding Service overview page.
- **US city, State, ZIP code, World city, and Country**—Cities (US city and World city) are added to the map as points. States, ZIP codes, and Countries are added to the map as polygons, which represent both the shape and the location of the place. When entering World countries, you can use the Geonames country codes as a reference for accepted spelling variations.
- **Custom location types**—This feature allows you to use a hosted service from ArcGIS Online to specify a location type. For example, if your organization has its own boundaries (water districts, sales districts, zoning boundaries) shared on ArcGIS Online, you can map your spreadsheet data using those locations instead of the default location types.

The Esri Maps Locate workflow requires a connection to the ArcGIS platform, through ArcGIS Online or Portal for ArcGIS, to access the ArcGIS World geocoding service for geocoding addresses. By default, the Esri Maps Locate workflow connects to http://www.arcgis.com, but you can change this connection string to point to a Portal for ArcGIS instance by editing the ArcGISConnection item in the Esri Maps Configuration Settings list. If you're connecting to a Portal for ArcGIS instance, the default locator of your portal instance is available when running the Esri Maps Locate workflow.

Note: If you're connecting to a Portal for ArcGIS instance and do not see the fields populate on the **Choose the columns with location information** page of the Esri Maps Locate workflow, set the geocoding service to be available to Everyone.

When the Esri Maps Locate workflow executes on a list, it adds three new columns to the list: Esri Maps Location, ShapeX, and ShapeY. The ShapeX and ShapeY fields store the geographic coordinate data for the list item. The Esri Maps Location field stores the geometry for the list item in JSON format, which can be a point, line, or polygon, and embeds an interactive map in each item's form, which allows you to view and manipulate an item's location. See Fix a location for more information. These columns can be removed, if needed, using the **List Settings** page for the list.

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Column (click to edit)	Type
Store Number	Single line of text
Address	Multiple lines of text
City	Multiple lines of text
State	Single line of text
Zip Code	Single line of text
ShapeX	Number
ShapeY	Number
Esri Maps Location	Esri Maps Location
Created By	Person or Group
Modified By	Person or Group

For detailed steps on using the Esri Maps Locate workflow, see Add lists containing address or place name data.

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Spatially enable lists containing address or place name data

Add the Esri Maps Locate workflow to a list

Note:

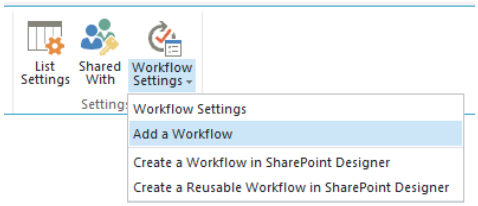
- Before running the Esri Maps Locate workflow, ensure you have met all of the system requirements and completed the app configuration as outlined in the installation topic, Install Esri Maps for Sharepoint 2010 and 2013.
- If you receive the following error: Access is denied to the Secure Store Service, see the Frequently Asked Questions.
- Custom geocoders must be proxied/federated and made public.

SharePoint lists containing address data need to be spatially enabled (geocoded) before they can be added to one of the Esri Maps Web Parts (both the ArcGIS Map Web Part and the Esri Maps Web Part). You can spatially enable lists containing Addresses, U.S. Cities, U.S States, U.S. ZIP codes, world cities, and countries using the Esri Maps Locate workflow. When spatially enabling a list containing addresses, ArcGIS geocoding credits are consumed. No credits are consumed for spatially enabling lists containing the other types of place name data listed.

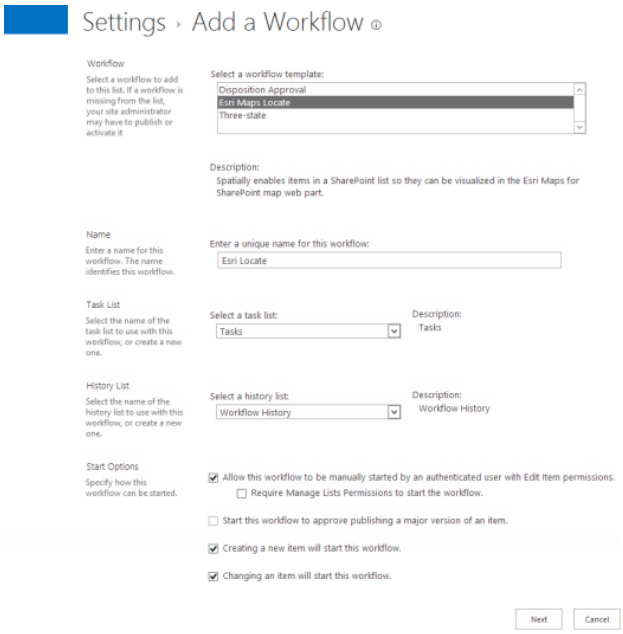
The Esri Maps Locate workflow requires a connection to the ArcGIS platform, either ArcGIS Online or Portal for ArcGIS. By default, the Esri Maps Locate workflow connects to http://www.arcgis.com but you can change the connection path by editing the ArcGISConnection list item in the Esri Maps Configuration Settings list.

Steps:

1. Browse to the applicable list in your SharePoint site.
2. On the **List** tab, click **Add a Workflow** from the **Workflow Settings** drop-down menu.



3. On the **Address Fields** page, choose **Esri Maps Locate** as the workflow template and type a name for the workflow. Optionally, you can configure the task list, history list, and start options, and then click **Next**.



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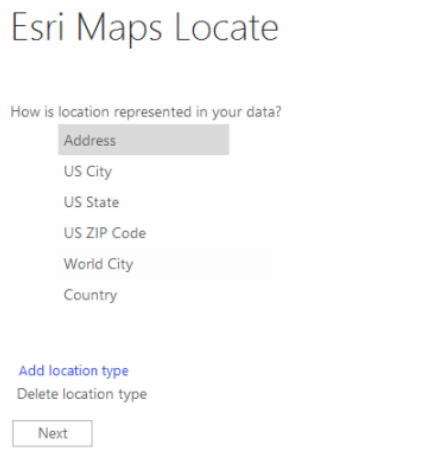
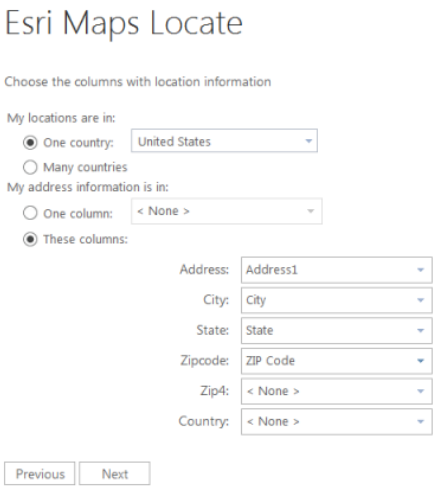
The two check boxes at the bottom of the page, **Start this workflow when a new item is created** and **Start this workflow when an item is changed**, allow you to have the location of items automatically updated when changes are made to existing items or new items are added to the list.

4. Choose the location type that you want to use and click **Next**. If you want to add a custom location type, click **Add location type**. See Add a location type for instructions.



If you are connected to a Portal for ArcGIS instance, the location choices you see may be different from those shown above. See Configure Portal to geocode addresses for information on configuring locators.

5. Choose the columns in the SharePoint list that correspond to the input parameters and click **Next**.



If you are connected to Portal for ArcGIS and do not see these columns appear, set the geocoding service on the portal to be accessible by everyone.

6. On the following page, you are prompted to choose the columns to add. The field selections on this page are only respected if you are using the custom location type. For standard location types, all fields are added.
7. You can optionally enrich your data with geographic data enrichment variables from ArcGIS. To do this, check the **Enrich data** check box and click **Next**. Otherwise, leave the box unchecked and click **Start Workflow** to finish.
8. If you chose to enrich your data, specify the applicable data collections and click **Next**.

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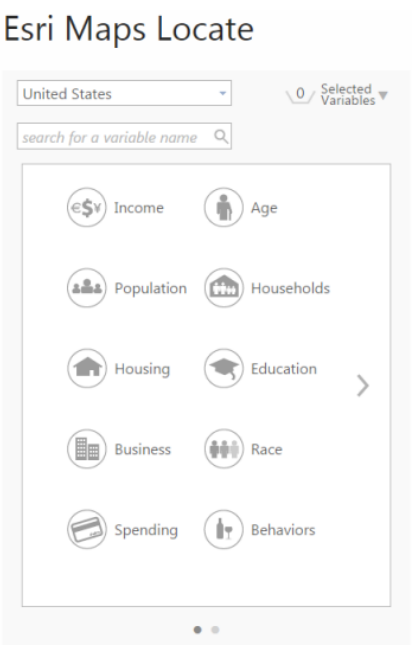
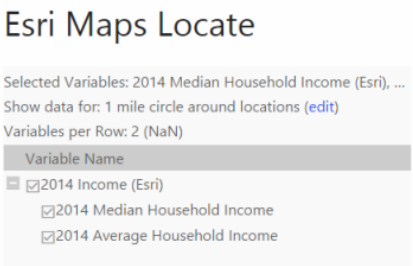


9. Review the data enrichment summary showing the distance parameters for retrieving data and the total number of ArcGIS credits that will be consumed. By default, data variables are retrieved for a 1-mile circle around each feature location. To change the radius to use a drive time or drive distance instead of a circle, click **edit**.



10. Click **Add data to system**. The data variables append to your existing SharePoint list and also display in feature pop-ups on the map.

If the Esri Maps Locate workflow does not complete successfully, you'll see Canceled in the workflow field in the list. Click **Canceled** for more information. Also, see Frequently asked questions for more information.

Once the Esri Maps Locate workflow successfully completes, the list is ready to be added to the map.

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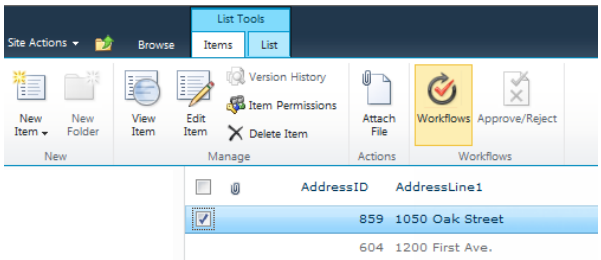
Spatially enable a single list item

Note: The ArcGIS Online (NA) and ArcGIS Online (EU) geocoders were retired on December 31, 2013. See Legacy geocoding and routing services at http://tasks.arcgisonline.com will be retired on December 31, 2013 for more information. Batch geocoding is now available through the World Geocoding Service included with an ArcGIS Online organizational subscription.

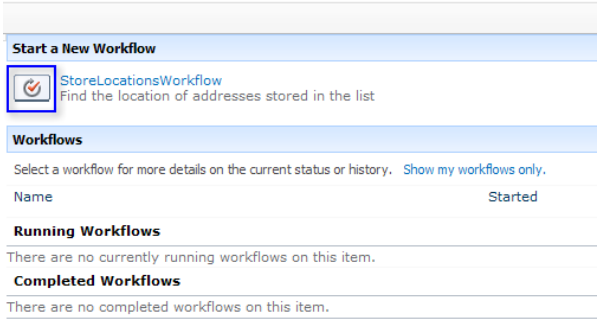
In addition to spatially enabling entire SharePoint lists, the Esri Maps Locate workflow allows you to spatially enable individual list items. To do so, associate the Esri Maps Locate workflow with a list. See Add lists containing address data for more information. You can then run the workflow on an individual list item as follows.

Steps:

1. Browse to the list in your browser and check the check box for the list item to geocode.
2. On the **Items** tab, click **Workflows**.



3. Under the **Start a New Workflow** section, click the button next to the name of the Esri Maps Locate workflow that has been associated with the list.
   In the following example, the workflow is named StoreLocationsWorkflow:



When the workflow starts, the list is once again shown in the browser. The list includes a column that shows the workflow's status.

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Spatially enable lists containing coordinate data

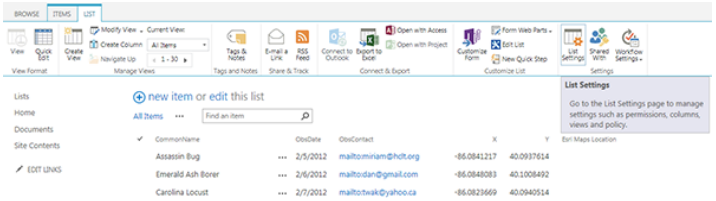
SharePoint lists can contain columns that store the geographic location of each item as latitude and longitude. Spatially enabling such lists so they can display on the Map Web Part requires adding and configuring a new Esri Maps Location type column in the list. Once the Esri Maps Location field has been added, the list can be added to the Map Web Part; you do not need to run the entire Esri Maps Locate workflow.

Adding an Esri Maps Location field to a list

To add an Esri Maps Location field to a list, complete the following steps:

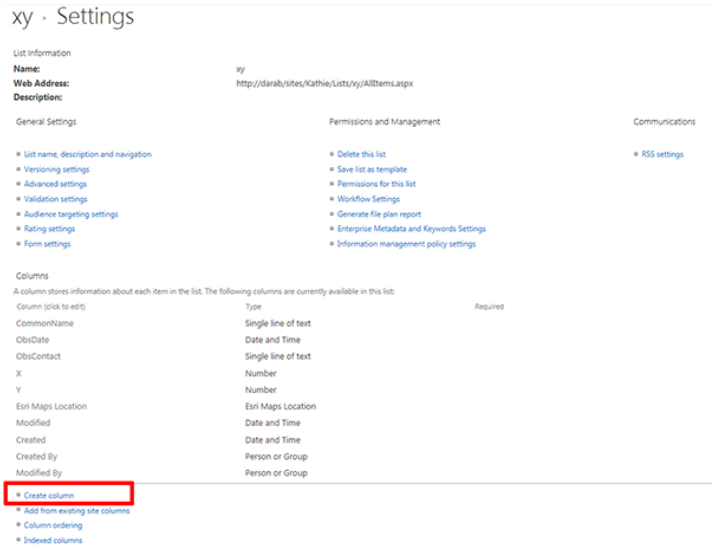
Steps:

1. Open the list. On the **List** tab, click **List Settings**.



   The **List Settings** page appears.

2. Click **Create column** located below the **Columns** section.



   The **Create Column** page appears.

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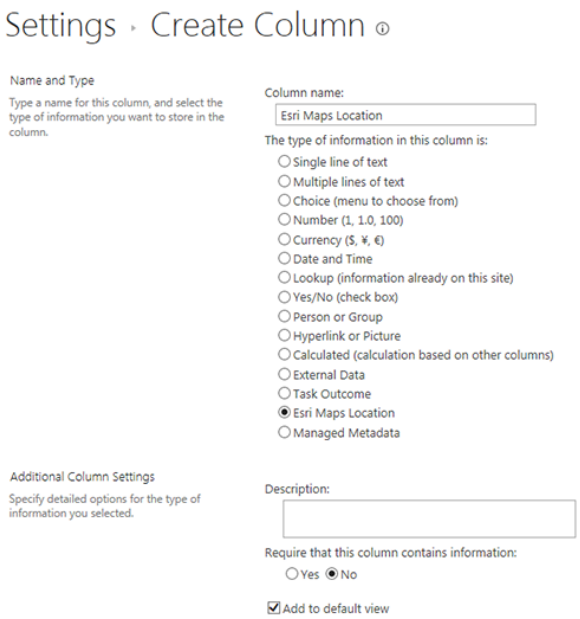
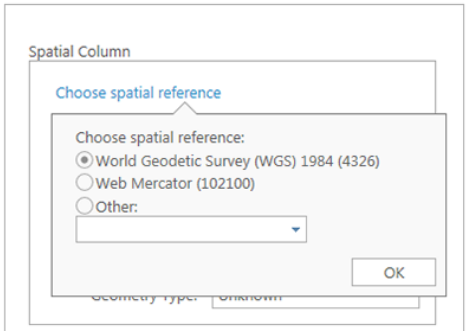
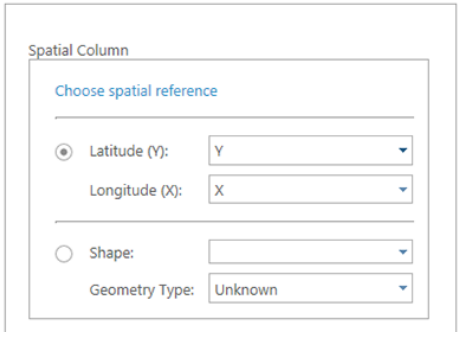


3. Specify a name for the column and click **Esri Maps Location**. A new section, specific to creating a location field, appears at the bottom of the page.
4. In this section, click the **Choose spatial reference** link if the spatial reference differs from World Geodetic Survey (WGS) 1984.



5. Choose the fields containing each item's latitude (y-coordinate) and longitude (x-coordinate) using the drop-down menus, and click **OK**.



Once the Esri Maps Location field has been added, the list is ready to be added to the map.

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Add a location type

You can use a map service or feature service from ArcGIS to specify a location type. For example, if your organization has its own boundaries (water districts, sales districts, or zoning boundaries), you can map your data using those locations instead of the default location types.

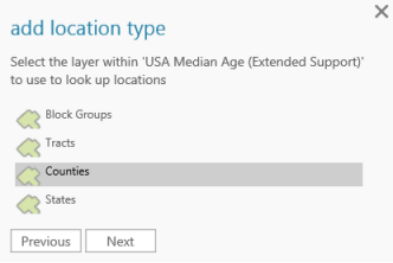
You can only add a custom location type in the Esri Maps Locate workflow. See Esri Maps Locate workflow and Add lists containing address data for more information.

Steps:

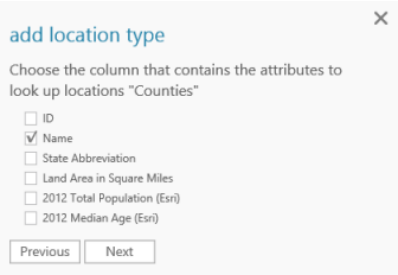
1. On the page of the Esri Maps Locate workflow where you are asked, How is location represented in your data?, click **Add location type**.
2. In the search box, type one or more keywords and press **Enter** to search for the service you want to use as a location type. Click **My organization** to narrow your results.

   Note: You can use advanced keyword searches to narrow your results by specifying how you want to search for an item. See Use search for more information.

3. Find the service you want and click **Select**.
4. Select the applicable layer from the service to use to look up locations and click **Next**.



5. Select the columns containing the attributes you want to use for looking up locations and click **Next**.



6. In the **Name** text box, type a name for your custom location type. Optionally type a description in the **Description** text box.
7. Click **Add**.
   Your location type is added to the list of locations.

   Note: If you made a mistake when adding your location type, delete it by selecting it in the list and clicking **Delete location type**.

8. Click your new location type in the list and click **Next**.
9. Select the columns containing the location information and click **Next**.
10. Select additional columns of data you would like to add.
11. Click **Start Workflow**.

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Fix a location

The Esri Maps Location field comes with several options for fixing and updating the location of an individual item. The Esri Maps Location field includes options for creating a new marker on the map, moving the existing marker, selecting from similar address matches, and typing an address in the search box.

Note:

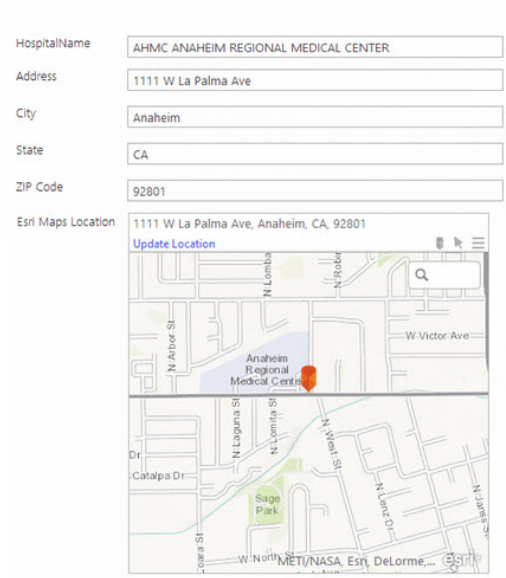
- If you are fixing a location that is part of a Microsoft SQL Server connected list (created by the Esri Maps Connect workflow), ensure that the users mapped to the NT AUTHORITY\ANONYMOUS LOGON or NT AUTHORITY\IUSR login accounts have at least update permission on the connected SQL Server table.
- If you are using SharePoint 2010 and Internet Explorer, set the Esri Maps Configuration Setting for AllowSignInOverHttpProxy to `True`. See Web part configuration options for more information.

The Esri Maps Location field shows the map location of the selected item and is automatically added to a list item when you run the Esri Maps Locate. You can also manually add the Esri Maps Location field to a list item and edit the geometry. Once the Esri Maps Location field has been added to a list item, you can fix or update the location of existing markers, or add a new marker if you are manually adding the Esri Maps Location field and have not run the Esri Maps Locate workflow.

Change a location using the map

Steps:

1. Browse to your list, select the applicable item, and click **Edit**.
   The item's fields display, including the Esri Maps Location field.



2. Click **Insert a pin** or **Move the point to the desired location** to place the marker in a new location.
3. Once you place the marker in the new location, you are prompted to update the address to the new location.
   If you click **Yes**, the map and location information in your item update with the new address information. If you click **No**, the marker stays in the location where placed, but the location information in your item is not changed. An example of where it may be useful to click **No** is if you want to leave the address as is but change the location of the marker to represent a specific location, such as a spot on a university campus or hospital.

   This step does not apply to items created with workflows that use place-name lookups (for example, World Cities) and custom location types. The pin will update, but a prompt will not appear to update the address information, and the information will remain unchanged.

Steps:

1. Click **Save** to save your changes and close the editing window, or click **Cancel** to close the window without saving changes.

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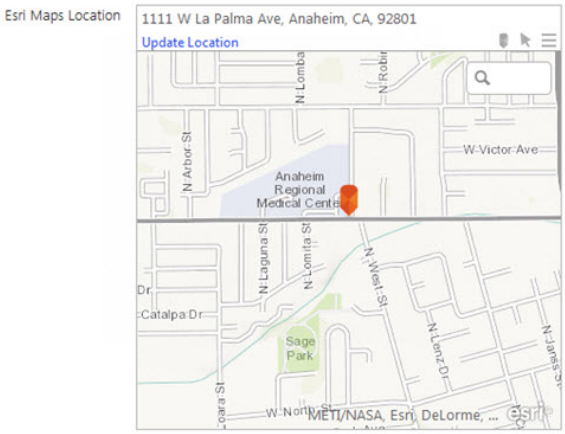
Change a location by editing address or coordinate data

Steps:

The following steps do not apply to items created with workflows that use place-name lookups (for example, World Cities) and custom location types.

1. Begin by editing the applicable list item.
2. Edit the values in one or more fields that contain information about an item's location. This can be the item's address information, coordinates, or other.
3. Click **Update Location** in the Esri Maps Location field.



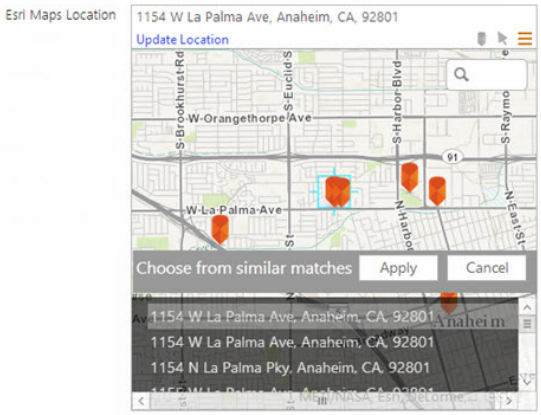
4. Click **Save** to save the new location.

View similar address matches

If the addresses found by the geocoding service are not correct, you can access similar matches and choose from any of those to update your item's location.

Steps:

1. Click **View similar address matches** on the Esri Maps Location field.



2. In the list of addresses that appears at the bottom of the map, select the appropriate address and click **Apply**. The Esri Maps Location field and the item's location data updates.

Add the Esri Maps Location field manually

You can manually add the Esri Maps Location field to a list item instead of running the Locate workflow. When manually adding the Esri Maps Location field, you are prompted to specify fields for the Esri Maps Location field to use, and these can be an X, Y coordinate pair

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or a Shape field. Both point and polygon shapes are currently supported in the Shape field, with support for lines coming at a later release.

Steps:

1. Begin with a list that has an X, Y coordinate pair or a Shape field (this can be a point or a polygon).
2. Add the Esri Maps Location field to the list.
3. Edit the applicable list item as in the previous steps.
4. Click **Insert a pin** or **Move the point to desired location** to place the marker in a new location. The values in the X, Y coordinate fields or Shape fields automatically update. Note that address fields other than the X, Y coordinate fields or Shape field are not updated.

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Connect to external data

Business data often resides in more than just one place. Esri Maps for SharePoint leverages SharePoint's Business Connectivity Services (BCS) to retrieve data that resides in Microsoft SQL Server (including SQL Server Express) and pull it in to SharePoint. BCS creates an external content type in SharePoint that allows for read and write access to the connected table. This means that not only can SQL Server external content be added to a connected list in SharePoint, changes made to the list by the Esri Maps Connect workflow, including location information and enriched attributes, can be written back to the original table.

The Esri Maps Connect workflow walks you through the process of connecting to your SQL Server database, selecting the applicable table, creating the connected list, spatially enabling the list, and enriching the list with demographic and other contextual data, all with no custom code or programming. Once the connected list has been created, the list data can be added to the ArcGIS Map Web Part and the Esri Maps Web Part.

The Esri Maps Connect workflow creates a SharePoint list that maintains a connection to the underlying SQL server database. The SharePoint Business Connectivity Service (BCS) uses SharePoint timer jobs to maintain and update the connection between the SQL Server database and the connected SharePoint list. By default, the timer job runs once every hour, but this setting can be changed in the SharePoint Central Administration.

Note: If you are using the Esri Maps Connect workflow as a Windows service, you must manually restart the SharePoint Timer Service after you install Esri Maps for SharePoint

When the Esri Maps Connect workflow completes, the result is a regular SharePoint list, not an external list. That said, the fields created from the SQL Server database are of an external type, and edits made to these fields in SharePoint cannot be passed back to the database. SharePoint can only pass back the fields it has created, such as for the Esri Maps Locate workflow and GeoEnrichment.

The Esri Maps Connect workflow supports external content from Microsoft SQL Server 2008 R2, 2012, and 2014, including the SQL Server Express editions. The external content must contain data that can be spatially enabled (geocoded), such as an address, U.S. city, U.S. state, ZIP code, or world city. Alternatively, the table can contain an existing SQL server spatial data type (geography or geometry) column that is then converted by the Esri Maps Connect workflow for use in Esri Maps for SharePoint. If the external table has an existing spatial column that contains no data, the Esri Maps Connect workflow populates the column based on other location information in the table (for example, address). If no spatial column exists, the Esri Maps Connect workflow creates a geography spatial type column named EsriShape with a Spatial Reference Identifier (SRID) of 4326 (WGS 84). The EsriShape field supports all geometries including points, lines, and polygons. In all scenarios, the external content can be geoenriched with additional geographic data variables from ArcGIS.

Note: If the Esri Maps Connect workflow fails, ensure the appropriate permissions for Microsoft SQL Server have been set. You can view the error messages in the SharePoint site workflow history to view exact details on the settings that need to be corrected.

The Esri Maps Connect workflow requires the following prerequisites:

- An ArcGIS organizational account
- Microsoft SQL Server 2008 R2 or Microsoft SQL Server 2012 or Microsoft SQL Server 2014 (including Microsoft SQL Server Express)
  - An NT AUTHORITY\ANONYMOUS LOGON or NT AUTHORITY\IUSR login. See Create a login for more information.
  - A database user for the applicable database with a minimum permission of db_datareader. The NT AUTHORITY\ANONYMOUS LOGON or NT AUTHORITY\IUSR login should be mapped to this login. See Create a database user for more information.
  - Update/insert/select permission on the custom schema to the database associated with the [NT AUTHORITY\NETWORK SERVICE] account.
  - Update/insert/select permission on the SQL Server table to the database user associated with the [NT AUTHORITY\NETWORK SERVICE] account.
  - The SharePoint server machine must be configured as follows:
    - If the SharePoint server machine is the same server machine that hosts the SQL server, the NT AUTHORITY\NETWORK SERVICE account should be granted at least db_datareader/db_datawriter/db_ddladmin permission.
    - If the SharePoint server machine is a different server machine than the one that hosts SQL server, the [domain name]\[SharePoint server machine name]$ (for example, DOMAIN\SPMACHINE$) account should be granted at least db_datareader/db_datawriter/db_ddladmin permission.

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Note: To enable SharePoint to write information back to the database, ensure the NT AUTHORITY\ANONYMOUS LOGON or NT AUTHORITY\IUSR login has update permissions on the connected table.

- SQL Server tables created with a DBO schema.
- A primary key or unique field in the external table—The Esri Maps Connect workflow requires that the external data source contains a unique field. Ideally, this is a field that is set as the primary key. It is often easiest to add an integer column to your existing table that autoincrements (that is, an Identity column). If a primary key is not or cannot be set, you can use any field that has unique values.

The following steps describe the first part of the Esri Maps Connect workflow and cover signing in to ArcGIS and creating a connection to your external content. You must complete these steps before you can spatially enable (geocode) and geoenrich your list items.

Steps:

1. Browse to the **Site Contents** page in your SharePoint site collection and click **Site Workflows**.
2. In the **Start a New Workflow** section, click **Esri Maps Connect** to start the workflow.
   The Esri Maps Connect workflow appears.
3. If this is the first time you are using the Esri Maps Connect workflow, choose **Create new** under **Specify the external content type**.
   When the workflow completes successfully, the external content type is saved to the site collection, allowing you to reuse the external content type, if necessary.

   External content types are a key feature of SharePoint's Business Connectivity Services that store descriptions of connectivity information and data definitions. For detailed information, see External content types in SharePoint 2013.

   a. Under **Connect to database**, specify whether to connect using a new database connection or an existing database connection (if you have previously completed the workflow). If you are creating a new connection, enter the database server and name and click **Connect**.
      For the database server, enter <server name>\<instance>. For the database name, enter the name of the applicable database. You will select a table from the database in the next step.
   b. Under **Select database table and columns**, use the drop-down menus to specify the database table, primary key column (or unique field), and optionally, spatial column. The spatial column drop-down menu automatically populates if the workflow detects an existing spatial data type (geography or geometry) column in your database.
   c. Specify a name for the external content type. The information you have completed in the previous steps are saved to an external content type in your site collection with the name you specify here.
4. Specify a name for displaying the connected list in SharePoint
5. Specify how to locate list items.
   - Use locations from the spatial column—This option is only available if your database table contains a spatial column.
   - Locate items based on information from other columns—Use this option to locate your list items based on an Address, U.S. City, U.S. State, ZIP Code, or World City.
6. Click **Next** to move to the next page of the Esri Maps Connect workflow.
   The next set of steps describe the second part of the Esri Maps Connect workflow and cover spatially enabling (geocoding) and optionally enriching your data with additional geographic variables. This part of the Esri Maps Connect workflow is identical to the Esri Maps Locate workflow used to spatially enable existing SharePoint lists.
7. Specify how location is represented in your data. The choices are Address, U.S. City, U.S. State, US ZIP Code, World City, and Country. Click **Next**.
8. **Choose the columns with the location information**—Specify the data in your table with the location information. Click **Next**.
9. **Choose the columns to add**—Specify which columns should be added to the SharePoint list that is created. Click **Next**.
10. You can optionally enrich your data with geographic data enrichment variables from ArcGIS. To do this, check the check box and click **Next**; otherwise, leave the box unchecked and skip to the final step. Note that GeoEnrichment capabilities are supported with ArcGIS Online only.
    a. Select the data collection or collections and click **Next**.
    b. Specify whether you want to see data available globally or for a specific country. Once you have selected a country, select the data variables and click **Next**.

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c. Review your selected variables and credits. Change the distance buffer to rings, drive times, or distances, if necessary. Click **Add data to system** to finish.

11. Click **Start workflow** to finish.

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Geographic data enrichment

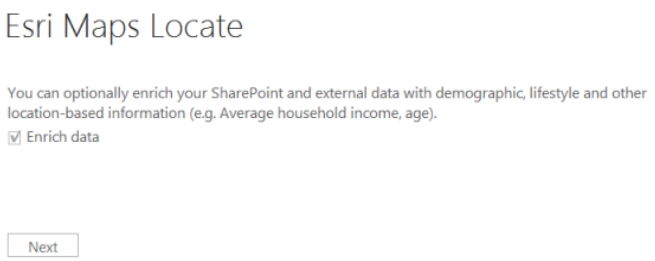
Mapping your data offers great insight into spatial patterns and allows for quick and easy visual analysis, but there may be times where you would like to obtain contextual information to provide deeper insights about the area surrounding that data. Esri's geographic data enrichment capabilities allow you to answer questions about locations that you can't answer with maps alone; for example, What kind of people live here? What do people like to do in this area? What are their habits and lifestyles? What kind of businesses are in this area?

In Esri Maps for SharePoint, you can append geographic data enrichment variables to your existing SharePoint lists when completing the Esri Maps Locate or Esri Maps Connect Workflows. Data enrichment variables are contextual variables available for locations throughout the U.S., Canada, and some countries in Western Europe. Available variables include demographic and socioeconomic factors, age distributions, landscape data, and area wealth information.

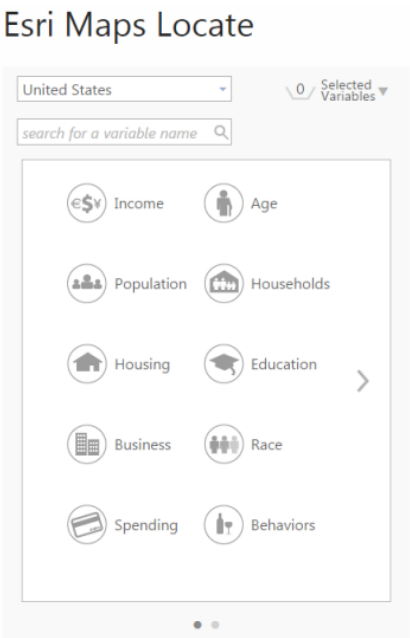
As part of the Esri Maps Locate and Esri Maps Connect workflows, you can optionally choose to add these data variables while completing the workflow.

Steps:

1. Check the **Enrich data** check box and click **Next**.



2. Click the applicable data collection to move to the variables panel.



3. Check the check box beside the applicable variables for the data collection and click **Next**.
4. Review the data enrichment summary showing the distance parameters for retrieving data and the total number of ArcGIS credits consumed. By default, data variables are retrieved for a one-mile circle around each feature location. To change the radius to use a drive time or drive distance instead of a circle, click the `edit` link.

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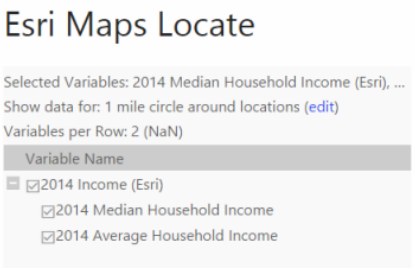

5. Click **Add data to system**. The data variables are appended to your existing SharePoint list and also display in feature pop-ups on the map.

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Essential vocabulary

ArcGIS

ArcGIS provides an online infrastructure for making maps and geographic information available throughout an organization, across a community, and openly on the web. By signing in to your ArcGIS organization, you can access ready-to-use maps and apps, or create new maps that help you tell a story. With Esri Maps for SharePoint, you can combine your business data with data from ArcGIS to create rich maps that help you analyze your data visually and make better decisions. ArcGIS also makes it easy to share your maps and map layers within your organization or with colleagues in the field.

For more information, see Esri Maps for SharePoint and ArcGIS.

Basemap

A basemap provides a geographical context, or background, for the content you want to display in a map. With Esri Maps for SharePoint, you can choose from several Esri basemaps hosted on ArcGIS. These basemaps include many options that combine road, aerial, and topographic data with a variety of symbology. If your organization makes them available, you can also access basemaps in your ArcGIS Organization.

Clustering

Clustering in Esri Maps for SharePoint refers to grouping point features within a certain distance of each other into one symbol. This is different from grouping in Esri Maps for SharePoint where features are grouped by a user-specified category and styled accordingly. For more information, see Configure clustering.

Contents pane

The **Contents** pane is a central component of Esri Maps for SharePoint. The **Contents** pane displays the list of layers contained in the map, provides the ability to toggle layer visibility, and provides a starting point for setting layer properties such as styling, heat maps, transparency, visible range, clustering, and pop-ups.

Coordinate system

Coordinate systems provide a framework for defining real-world locations.

In Esri Maps for SharePoint, there are two supported coordinate systems: World Geodetic Survey 1984 (WGS84) and Web Mercator.

WGS84 is a geographic coordinate system in which every location on the earth is specified by a set of numbers (coordinates). Coordinates are often expressed as latitude and longitude values. Web Mercator is a projected coordinate system in which locations are identified by x,y coordinates on a grid, with the origin at the center of the grid. Coordinate values in the Web Mercator system generally have 6, 7, or 8 digits to the left of the decimal, and the units are meters. If you are unsure as to which coordinate system you should use, please contact the originator of your data or the person who collected it.

Coordinates

A set of values represented by the letters x and y that define a position within a spatial reference. Coordinates are used to represent locations in space relative to other locations. Coordinates are often shown in latitude-longitude pairs, where x coordinates range from -180 to 180 and y coordinates range from -90 to 90, or as values with 6, 7, or 8 digits to the left of the decimal point. When using Esri Maps for SharePoint, these value pairs are often composed of the values from two columns in your data.

Feature

Geographic features are representations of things located on or near the surface of the earth. Geographic features can occur naturally (such as rivers and vegetation), can be constructions (such as roads, pipelines, wells, and buildings), and can be subdivisions of land (such as counties, political divisions, and land parcels). Geographic features are most commonly represented as points, lines, or polygons. In Esri Maps for SharePoint, data you have added is often referred to as features on the map.

Feature service

A feature service is a collection of geographic features. Each feature in the collection has a location, set of properties, map symbology, and pop-up. In Esri Maps for SharePoint, you can search for feature services on ArcGIS and add them to your map. When you add a feature service to your map, it becomes one or more layers in the map.

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Grouping

Grouping in Esri Maps for SharePoint is the process of placing features in user-specified categories and styling them accordingly. See Feature display and style for more information.

Heat map

A heat map represents the geographic density of point features on a map by using colored areas to represent those points. The areas are largest where the most points are concentrated together. See Add a heat map for more information.

Layer

A layer is the way in which Esri Maps for SharePoint visually represents geographic datasets. A layer can be thought of as similar to a legend item on a paper map. On a road map, for example, roads, national parks, political boundaries, and rivers might be considered different layers. When you add SharePoint business data to a map, Esri Maps for SharePoint creates a layer and displays it on the **Contents** pane. Once the layer is created, functionality such as determining visibility, configuring style, and setting transparency are all enabled.

Lines

Lines represent the shape and location of geographic objects too narrow to depict as areas (such as street centerlines and streams).

Map

A map displays geographic data and allows you to explore and interact with that data. In Esri Maps for SharePoint, you can add SharePoint data directly to the map and combine it with additional content from ArcGIS Online.

Map service

A map service is a pre-styled collection of map cartography organized by location and scale. In Esri Maps for SharePoint, you can search for map services on ArcGIS and add them to your map. When you add a map service to your map, it becomes one or more layers in the map.

Pan (the map display)

Shift a map image relative to the display window without changing the viewing scale. Panning a map can also be thought of as moving the map image in the display window so that you can see different parts of the map.

Points

Points represent discrete locations of geographic features too small to be depicted as lines or areas, such as well locations, telephone poles, and stream gauges. Points can also represent address locations, Global Positioning System (GPS) coordinates, or mountain peaks.

Polygons/Areas

Polygons are enclosed areas (many-sided figures) that represent the shape and location of homogeneous features such as states, counties, parcels, and land-use zones. Polygons are often called areas.

Web map

An ArcGIS web map is an interactive display of geographic information that you can use to tell a story and answer questions. For example, you can create a map that addresses the question, 'How many people in the United States live within a reasonable walk or drive to a supermarket?' The map could contain layers showing neighborhoods within a 10-minute drive or 1-mile walk to a supermarket, and for context, a topographic basemap that includes cities, roads, and buildings overlaid on land cover and shaded-relief imagery. In Esri Maps for SharePoint, you can search for web maps on ArcGIS and add them to your map. When the web map is added to your map, the individual layers in the web map become layers in your map.

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Frequently asked questions

- What are the licensing requirements for Esri Maps for SharePoint?
- You receive an Access Denied message when trying to access the Esri Maps for SharePoint App Configuration page.
- You see a blank page when you try to configure the Esri Maps App Configuration settings, or you receive a PS1 file is not digitally signed error.
- You receive an Unable to obtain master key message when trying to access the Esri Maps for SharePoint App Configuration page.
- You receive an Access is denied to the Secure Store Service message when running theEsri Maps Locate workflow.
- When running the Esri Maps Locate workflow, the fields do not appear on the Choose the columns with location information page.
- The Esri Maps Locate workflow does not complete successfully when using a custom geocoder and Portal for ArcGIS.
- How can I use Esri GeoEnrichment services?
- How do I connect to services in a firewalled environment?
- Why does Esri Maps for SharePoint store properties in configuration lists?
- I created a new site collection within a web application that has Esri Maps for SharePoint, but the components and configuration lists are not available.
- Do I have to use the Esri Maps Locate workflow or can I use existing lists with latitude-longitude data?
- How do I import Excel spreadsheets for use with Esri Maps for SharePoint?
- Error message: Your browser configuration does not support sending secured content. Your sign-in was canceled to ensure password safety.
- In SharePoint 2010, you receive one of the following error messages: An invalid ArcGIS Portal URL was entered. Please verify the URL.Unable to access the authentication service.Your Workflow failed: The underlying connection was closed: Could not establish trust relationship for the SSL/TLS secure channel.Your Workflow failed: Generating request token failed. System.Exception: Generating token request failed.
- Error message: Could not load file or assembly, Microsoft.SqlServer.Types, Version=11.0.0.0, Culture=neutral, PublicKeyToken=89845dcd8080cc91, or one of its dependencies.

What are the licensing requirements for Esri Maps for SharePoint?

Esri Maps for SharePoint requires an ArcGIS Online organization plan or Portal for ArcGIS. All users are required to have a Named User license to access ArcGIS and interact with the map.

You receive an **Access Denied** message when trying to access the Esri Maps for SharePoint App Configuration page.

The user performing the app configuration must have administrative access to the SharePoint server's Secure Store Service.

1. On the **Central Administration** home page, in the **Application Management** section, click **Manage service applications**.
2. Select (do not click the link) the line for **Secure Store Service**.
3. Click **Administrators**.
4. Add the applicable account and check the check boxes to Create, Delete, and Manage the Target Application.

Note: You do not need to create the target application in the Secure Store Service; Esri Maps for SharePoint creates this for you.

You see a blank page when you try to configure the Esri Maps App Configuration settings, or you receive a **PS1 file is not digitally signed** error.

This question is specific only to users running PowerShell to install Esri Maps for SharePoint version 4.0 or earlier.

By default, the PowerShell execution policy—the setting that defines which types of scripts can be run—is set to **Restricted**, meaning no scripts are allowed to run on the system. This policy is not meant as security control, however, and can be changed to allow specific types of scripts or to bypass the policy to execute a script from a local file.

From within the Esri Maps setup folder, manually execute the following PowerShell script:

```
-ExecutionPolicy Bypass -File./WebContentInstaller.ps1 -install
```

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In your browser, reload the App Configuration page. The page should load successfully.

For more information, see Using the Set-ExecutionPolicy cmdlet and Use the Bypass Execution Policy flag.

You receive an Unable to obtain master key message when trying to access the Esri Maps for SharePoint App Configuration page.

Esri Maps for SharePoint requires that the SharePoint Secure Store Service is started and a key is generated. This message occurs when the key has not been generated.

1. On the **Central Administration** home page, in the **Application Management** section, click **Manage service applications**.
2. Click the **Secure Store Service** link.
3. Click **Generate New Key**.

Note: You do not need to create the target application in the SharePoint Secure Store Service; Esri Maps for SharePoint creates this for you.

You receive an Access is denied to the Secure Store Service message when running theEsri Maps Locate workflow.

Esri Maps for SharePoint creates a target application in the SharePoint Secure Store Service. Users who create new workflows must have permissions to this target application. Users who only run existing workflows do not need permissions to the target application.

1. On the **Central Administration** home page, in the **Application Management** section, click **Manage service applications**.
2. Click the **Secure Store Service** link.
3. Click the EsriMapsforSharePointLocateWorkflow application to edit it.
4. Click **Next** and click **Next** again until you reach the page to set the target application administrators and members.
5. Add the applicable users to the Members list and click **OK**.

When running the Esri Maps Locate workflow, the fields do not appear on the **Choose the columns with location information** page.

This issue can occur with Portal for ArcGIS10.2.1 and later on Linux servers. If this occurs, ensure that the geocoding service used is shared with everyone.

The Esri Maps Locate workflow does not complete successfully when using a custom geocoder and Portal for ArcGIS.

To successfully run the Esri Maps Locate workflow in Portal for ArcGIS 10.3, configure the geocoder service according to the If the service is not from a federated server and requires credentials section in the Configure utility services topic in your Portal for ArcGIS documentation.

How can I use Esri GeoEnrichment services?

Esri GeoEnrichment services provide demographic and contextual data for features in your map. GeoEnrichment requires a subscription to ArcGIS Online or configuration of GeoEnrichment on your installation of Portal for ArcGIS.

How do I connect to services in a firewalled environment?

See the Disconnected environment topic.

Why does Esri Maps for SharePoint store properties in configuration lists?

Some shared properties used across Esri Maps for SharePoint components are stored in lists at the site collection and site level to provide flexibility and ease of use in configuration. Exposing the properties in lists accommodates scenarios where it is appropriate to allow nonadministrative users to configure these properties and scenarios where these should only be editable by administrators. Users of Esri Maps for SharePoint components do not need edit rights to the configuration lists. Additionally, using lists for configuration provides an intuitive, easy-to-use user interface (UI) that will be familiar to most SharePoint users.

I created a new site collection within a web application that has Esri Maps for SharePoint, but the components and configuration lists are not available.

Esri Maps for SharePoint is not automatically activated when you create a new site collection. For new site collections, browse to the **Site Settings** page, click **Site Collection Features**, and activate the Esri Maps for SharePoint feature. This makes all the functionality included with Esri Maps for SharePoint available on the site collection.

Do I have to use the Esri Maps Locate workflow or can I use existing lists with latitude-longitude data?

If you have existing lists with latitude-longitude or x,y data, Esri Maps for SharePoint can work with the list directly. To do this, add the Esri Maps Location field to the list and specify the latitude-longitude fields when setting the location field's properties.

How do I import Excel spreadsheets for use with Esri Maps for SharePoint?

See Prepare SharePoint data for information on importing Excel spreadsheets to SharePoint.

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Error message: Your browser configuration does not support sending secured content. Your sign-in was canceled to ensure password safety.

This happens when using Internet Explorer that uses a proxy page hosted through http (as is done with Esri Maps for SharePoint). Esri Maps for SharePoint provides a configuration setting, **AllowSignInOverHttpProxy**, which is set to **False** by default. This setting prevents the user's password from being transmitted over http, which is not secure, instead of https. This setting can be changed to **True** if it is acceptable to send a password over http instead of https. See Configuration settings for details.

In SharePoint 2010, you receive one of the following error messages:

- An invalid ArcGIS Portal URL was entered. Please verify the URL.
- Unable to access the authentication service.
- Your Workflow failed: The underlying connection was closed: Could not establish trust relationship for the SSL/TLS secure channel.
- Your Workflow failed: Generating request token failed. System.Exception: Generating token request failed.

This error message is specific to SharePoint 2010 and is the result of a certificate error in SharePoint. To resolve this error message, download the certificate from https://www.arcgis.com or your portal, and add it to the SharePoint server using the steps below:

Download the certificate

Note: Complete all steps in Internet Explorer. You may need elevated permissions (Run As Administrator) to copy the certificate.

1. Browse to https://www.arcgis.com (or the portal you are using). Ensure you use https.
2. Click the **Security Report** icon (padlock) in the URL address bar.
3. Click **View certificates** on the **Website Identification** dialog box that appears.
4. Click the **Certification Path** tab on the **Certificates** dialog box.
5. Select DigiCert and click **View certificate**.
6. Click the **Details** tab on the newly opened **Certificates** dialog box.
7. Click **Copy to File** to start the **Certificate Export Wizard**.
8. On the first page of the **Certificate Export Wizard**, click **Next**.
9. Select the Base-64 encoded X.509 (.CER) option and click **Next**.
10. Save the file to a known location on disk and click **Next** on the **Certificate Export Wizard**.
11. Click **Finish**. A message appears stating that the export was successful.

Import the certificate to SharePoint

1. Open SharePoint Central Administration in a browser with elevated permissions (Run As Administrator).
2. Click **Security** and click **Manage Trust** under the **General Security** heading.
3. Click **New**, specify a name, and browse to the root certificate you saved in the previous steps.

   Note:

   Do not delete the existing local certificate.

4. Click **OK**. The certificate in now added to the SharePoint server instance.

Error message: Could not load file or assembly, Microsoft.SqlServer.Types, Version=11.0.0.0, Culture=neutral, PublicKeyToken=89845dcd8080cc91, or one of its dependencies.

When running the workflow to connect to external data, you may encounter the error message, Could not load file or assembly Microsoft.SqlServer.Types, Version=11.0.0.0, Culture=neutral, PublicKeyToken=89845dcd8080cc91, or one of its dependencies. This error message occurs on systems with SQL Server 2008, which does not always provide version 11 of the Microsoft.SqlServer.Types assembly. This error message should only occur with SharePoint 2010. Follow the steps below to install version 11 of the Microsoft.SqlServer.Types assembly to the Global Assembly Cache (GAC) of the SharePoint server machine.

1. Download the Microsoft SQL Server 2012 SP1 Feature Pack from http://www.microsoft.com/en-us/download/details.aspx?id=35580.
2. When prompted to choose the download, select ENU\x86\SQLSysClrTypes.msi or ENU\x64\SQLSysClrTypes.msi, depending on whether the server is 32 bit (x86) or 64 bit (x64).

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3. Save the file to the server machine and run it.
4. Restart IIS.

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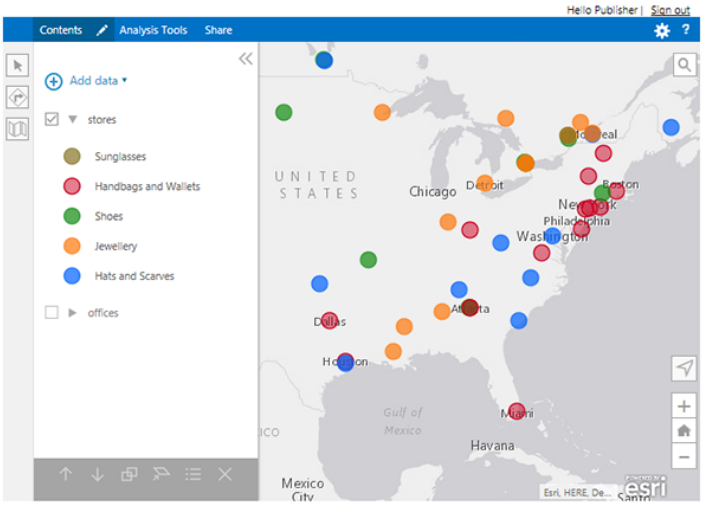
About the Esri Maps Web Part

The Esri Maps Web Part is the JavaScript-based Web Part for Esri Maps for SharePoint. Similar to the Silverlight-based ArcGIS Map Web Part, the Esri Maps Web Part enables a rich display of SharePoint lists, ArcGIS-hosted feature services, and ArcGIS web maps on an interactive map.



With the Esri Maps Web Part, you can do the following:

- Add web maps and services from ArcGIS, either ArcGIS Online or Portal for ArcGIS.
- Share maps and layers on ArcGIS for the public or your organization.
- Display SharePoint lists and connect to external data sources via Business Connectivity Services (BCS).
- Connect to List and Chart web parts via Web Part-to-Web Part connections.
- Spatially enable (geocode) items in a SharePoint list.
- Interactively configure the map appearance, layers, and other settings.
- Choose from background maps populated by the basemap gallery of your ArcGIS organization.
- Define the appearance of datasets (symbolize) using basic, class breaks, or unique value symbols.
- Display point features using clustering or heat maps.
- Configure the appearance of pop-up windows. Specify the pop-up window style and fields to display when the user hovers over map features.
- View infographics in pop-up windows that provide rich contextual information about the areas surrounding the features in your map.
- Perform route-based analysis of your data.
- Interactively select and filter data within ring-based or drive-time distances.
- Interactively retrieve additional demographic and contextual information associated with mapped locations.

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Esri Maps for SharePoint and ArcGIS

With Esri Maps for SharePoint, you can easily create maps that combine your SharePoint data with published geographic content from ArcGIS. You can also share the maps you create in Esri Maps for SharePoint with others within and outside of your organization using ArcGIS. ArcGIS provides an online infrastructure for making maps and geographic information available throughout an organization, across a community, and openly on the web.

Esri Maps for SharePoint works directly with your organization's ArcGIS subscription to allow you to access geographic content to enhance your business data. You must be signed in to ArcGIS to use Esri Maps for SharePoint; depending how your administrator has configured the application, you may be prompted to enter your ArcGIS credentials. Your subscription includes a number of service credits, which are the currency of ArcGIS and are used in exchange for most of the ArcGIS services your organization uses. The number of service credits required depends on the type of service you are using. To help you estimate how many service credits you will need, see Service Credits Overview.

With Esri Maps for SharePoint, you can easily Add data from ArcGIS to your map to help you visualize your data in new ways. Once you have created the desired maps and layers in Esri Maps for SharePoint, you can publish them to ArcGIS for sharing with others.

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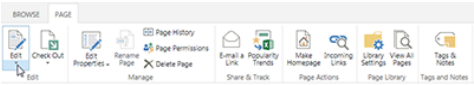
Add an Esri Maps Web Part to a page

The Esri Maps Web Part enables a rich display of SharePoint lists, ArcGIS hosted feature services, and ArcGIS web maps on an interactive map.

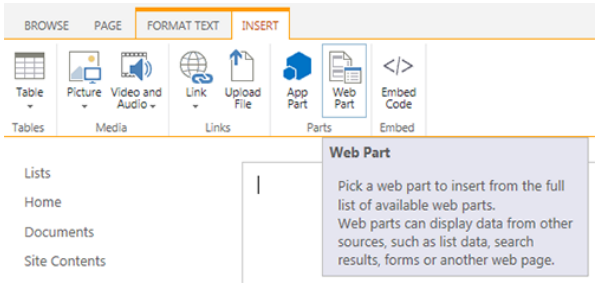
To insert an Esri Maps Web Part on your page, do the following:

Steps:

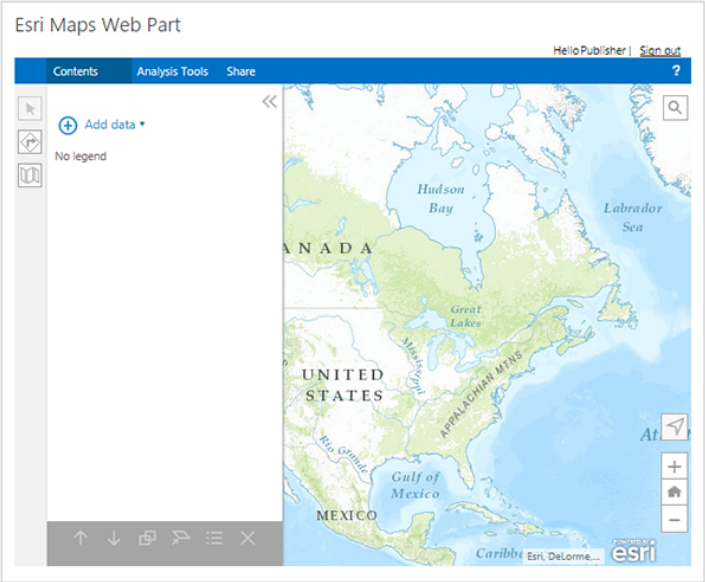
1. Browse to the page on which you want to insert the Esri Maps Web Part.
2. On the SharePoint ribbon, click **Page** and click **Edit**.



3. Click the location on the page where you want to insert the Esri Maps Web Part.
4. Click the **Insert** tab and click **Web Part**.



5. Under **Categories**, click **Esri Maps**.
   The **Parts** pane shows the available web parts in the Esri Maps category.
6. Click Esri Maps Web Part and click **Add**.
   The Esri Maps Web Part appears on the page, using the default basemap and map settings.



Note: If a message is displayed saying the app is not configured, your administrator needs to set the credentials to enable the app for use. See Configure Esri Maps for SharePoint for more information.

7. From the **Page** tab, click **Save** to save the Web Part on the page.

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Edit mode and run mode

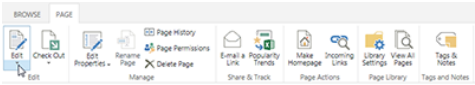
Microsoft SharePoint uses Web Parts to display specific content types on a page of a SharePoint site. Like other Web Parts within SharePoint, the Esri Maps Web Part has an edit mode and a run mode. SharePoint users with permissions to edit the page containing the Map Web Part can put the Web Part in edit mode, while users with read-only permissions can only interact with the Web Part in run mode. Users with contribute permissions in SharePoint can edit an existing Web Part, but users must have design permissions to insert a Web Part onto a page. See User permissions and permission levels in SharePoint 2013 for more information on SharePoint permission levels.

The Esri Maps Web Part can only persist changes when it is in edit mode. This includes signing in, adding and removing layers, and so forth. Credentials are persisted during the current browser session only.

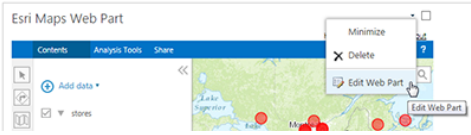
Edit mode

Caution: Page refreshes occur often during SharePoint web part communication! For example, a page refresh will occur when selecting a feature in one web part and sending that information to another web part. Be aware that a page refresh may cause you to lose changes you've made to the Esri Maps Web Part. To avoid losing changes, click **Apply** on the **Properties** pane frequently while you're configuring the Esri Maps Web Part.

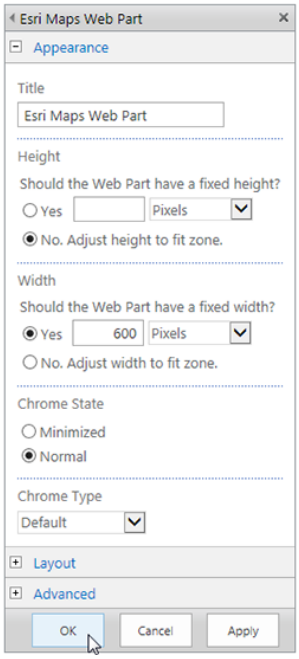
To put the Maps Web Part in edit mode, start by placing the page that contains the map in edit mode; this applies to SharePoint 2013 only. On the SharePoint ribbon, click **Page**, and click **Edit**.



Next, click the arrow above the upper right corner of the Web Part to display the drop-down menu, and choose **Edit Web Part**.



The Esri Maps Web Part properties pane appears beside the map.



Edit mode allows you to make changes to the Web Part's configuration and save the changes as part of the Web Part. Configurable portions of the Web Part include the following:

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- Layers, including order and appearance
- Basemap
- Map extent
- Appearance of pop-up windows

To save the Web Part's configuration, click the **OK** or **Apply** button in the properties pane to the right of the Web Part.

Note: Your login information will not persist unless the Maps Web Part is in Edit mode. Credentials persist during the current browser session only. In addition, any changes you make to the map will not persist unless you place the Web Part in edit mode and save your changes.

Run mode

Users that have read access to the page hosting the Esri Maps Web Part can use the Web Part in run mode. In run mode, users can do the following:

- Add or remove layers
- Pan and zoom the map
- Select features
- Share the map

Any changes made in run mode, including adding or removing layers, do not persist in the map.

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Change the basemap

A basemap provides a background, or visual context, for the data in a map. For example, a basemap showing streets can provide context for your address data. ArcGIS includes several different types of basemaps for you to use in Esri Maps for SharePoint, including aerial imagery, terrain, streets, and topographic data. The default basemap displayed on the map is determined by your administrator. You can change the basemap at any time to one of the other maps provided.

Steps:

1. Click the **Basemap** button from the **Map tools** toolbar to display the basemap gallery.
2. In the gallery, click the desired basemap to select it.
   The map automatically displays the new basemap.

   Note: The basemaps gallery is populated by the basemap settings of your ArcGIS organization.

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Navigate the map

There are several options for navigating the map.

Navigate with the mouse

To begin exploring with your mouse, move the mouse pointer so it is in the middle of the map display. Use the following table as a guide for completing navigation actions with the mouse.

Using the mouse to navigate offers the most flexibility. You can zoom to a specific area by pressing the Shift key and holding the mouse button while dragging a rectangle on the map. There is no equivalent to this using the zoom tools.

Action	Mouse button	Mouse function
Move or pan the map		Click the left mouse button and drag the map in the direction you want it to move.
Zoom in to a specific area on the map		Hold down the Shift key, and click and drag a rectangle with the left mouse button that designates the area of interest. **Note:** You can also use the mouse scroll wheel to zoom in and out. Rotate the wheel up to zoom in and rotate down to zoom out.
Zoom out to a specific area on the map		Hold down the Shift and Ctrl keys, and click and drag a rectangle with the left mouse button that designates the area of interest.
Zoom in on the map at the location of the mouse pointer		Double-click the left mouse button on the point of interest.

Zoom in and out using the zoom tools

The zoom in (**+**), zoom out (**-**), default extent, and find my location tools are shown at the lower right corner of the map and allows you to easily zoom in and out.

To use the zoom tools, do the following:

- Click the **+** (plus sign) button to zoom in.
- Click the **-** (minus sign) button to zoom out.
- Click the **Default extent** button to zoom to the default extent of the map.
- Click the **Find my location** button to detect your physical location and zoom the map to it.

Find address or place

The find address or place tool is shown at the upper right corner of the map and allows you to zoom to a location based on typing a place-name or location into the text box.

To use the tool, do the following:

- Click on the **Find address or place** button.
- Type in a place-name, address, or coorodinates. For example, type `Esri`.
- A list of potential candidate matches appears. Select the one that is the closest match.
- The map zooms to the location that was selected.

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Web part communication

The Esri Maps Web Part allows for connections between the Map Web Part and a List Web Part if both are contained on the same page. This functionality is available in SharePoint 2010 and 2013. In SharePoint Server 2010, you can also connect to a Chart Web Part, but due to a change in SharePoint 2013, the Chart Web Part connection is not available.

Web part communication works by associating a primary key as a connection between a layer in the map and a field in the list. One web part must be the provider and the other web part is the consumer. This means, for example, that in your map you could have a States layer and connect that to a list of cities. By setting the States layer as the provider, when you select a state on the map, the list filters to show the cities located in that state. Alternatively, you can set the Cities list as the provider, in which case you select a city or cities in the list, and the states on the map in which those cities are located are selected.

Connections are one to one; therefore, you can only have a single feature selected on the map to display the corresponding items in the list. If you select multiple features in the map, the attribute table displays and you must select a specific feature. See the steps below for detailed information on configuring the Map Web Part, lists, and connections.

The Esri Maps Web Part supports connections to a List Web Part. You can then select features on the map to filter items in the list, and select features in the list and have them selected on the map. The Esri Maps Web Part does not provide direct support for filtering a list and having the respective features filtered on the map.

Initial setup of web part communication

Caution: Page refreshes occur often during SharePoint Web Part communication. For example, a page refresh occurs when selecting a feature in one Web Part and sending that information to another Web Part. Be aware that a page refresh may cause you to lose changes you have made to the Esri Maps Web Part. To avoid losing changes, click **Apply** on the **Properties** pane frequently while you are configuring the Map Web Part.

Note: If you are using a list that was created by importing an Excel spreadsheet, be aware that SharePoint takes the first text column in your spreadsheet and sets that as the title field with a hyperlink to the original spreadsheet (see SharePoint lists III: Create a list based on a spreadsheet). The JavaScript-based Esri Maps Web Part does not include hyperlinked fields when adding data to the map or in web part communication. This means that you may need to modify your default list view in SharePoint to include the appropriate fields for displaying information in pop-ups and for connecting web parts.

The following steps are common to all workflows in which you are connecting the Esri Maps Web Part to a List Web Part or Chart Web Part.

Steps:

1. Add the Esri Maps Web Part to the page.
   Web part communication is only available for the JavaScript-based Esri Maps Web Part.
2. Insert the applicable List or Chart Web Part on the same page as the Esri Maps Web Part.
   The Chart Web Part is only available in SharePoint Server 2010.
3. Place the Esri Maps Web Part into Edit mode.
4. Click the **Configure** button to display the configuration options.
5. From the list of configuration options, click **Behaviors** and choose **Web Part Connectivity Behavior**.
6. Click the **Settings** button at the top of the panel.
7. Select the applicable layer from the drop-down menu on the **Web Part Connectivity Connection** panel and click **OK** on each of the panels to close the configuration panel.
8. Click **Apply** on the Esri Maps Web Part properties to apply the changes.
   You must click **Apply** on the Esri Maps Web Part properties pane to persist the selected layer for web part communication.

Connections > Send Row To

Prerequisite:
Ensure pop-ups are allowed on your site; otherwise, the SharePoint **Choose Connections** dialog box will not appear.

In web part communication, setting the Map Web Part to **Send Row To** the List Web Part enables you to select a feature on the map and have the List filtered to show only the selected items. In the workflow below, the map layer, States, is set as the provider. When a state (feature) is selected on the map, the Cities list filters to show only those cities located in the selected state.

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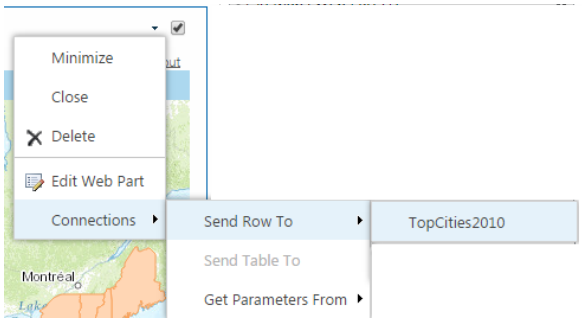
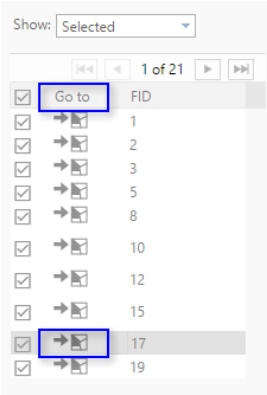
Steps:

1. With the Esri Maps Web Part in Edit mode, click **Connections** > **Send Row To** > **<List>**.



2. On the **Choose Connections** dialog box, you are asked to **Select the connection type for <list>**. Choose **Get Filter Values from** in the drop-down list.
3. Next, specify the **Provider** and **Consumer** field names. In this case, the map is the provider, and the list is the consumer. For example, with a Cities list and States layer, you are connecting the Map Web Part and the List Web Part using the State field (both the Cities list and States layer have this field).
4. Click **OK** on the Esri Maps Web Part properties pane to apply changes and stop editing.
5. Click **Save** on the SharePoint page to save the page.
   If the page is still editable, selecting features can cause a refresh to occur and currently selected features will be unselected.
6. Use the Select tool in the Esri Maps Web Part to select features on the map. Connections are one to one; therefore, you can only have a single feature selected on the map to display the corresponding items in the list. If you select multiple features in the map, the attribute table displays and you must select a specific feature.
   - One feature selected—List Web Part filters to the corresponding items.
   - Multiple features selected—Attribute table displays and you must click the **Go to** icon to select a single feature to filter the List Web Part.



Connections > Get Parameters From

Prerequisite:
Ensure pop-ups are allowed on your site; otherwise, the SharePoint **Choose Connections** dialog box will not appear.

In web part communication, setting the Map Web Part to **Get Parameters From** the List Web Part enables you to select an item in the list and have the corresponding item selected on the map. In this workflow, the List Web Part containing the cities is set as the provider.

Steps:

1. With the Esri Maps Web Part in Edit mode, click **Connections** > **Get Parameters From** > **<List>**.

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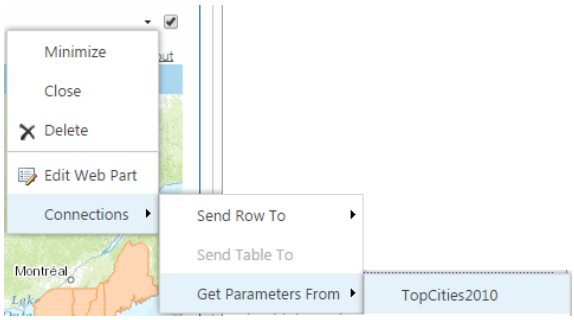
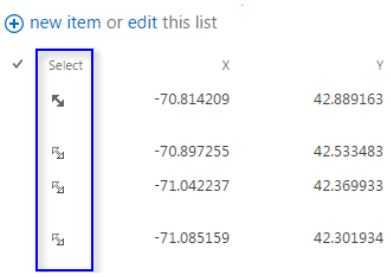


2. On the **Choose Connections** dialog box, specify the **Provider** and **Consumer** field names. In this scenario, the list is the provider and the map is the consumer. For example, with a Cities list and States layer, you connect the Map Web Part and the List Web Part using the State field (both the Cities list and States layer have this field).
3. Click **OK** on the Esri Maps Web Part properties pane to save your changes and stop editing.
4. Select the applicable item in the List Web Part to filter the items displayed in the Esri Maps Web Part. Only one item can be selected at a time. Select the row by clicking in the **Select** column as shown below.



5. Click **OK** on the Map Web Part properties to apply the changes and exit Edit mode.

Connect to a Chart Web Part

Connections from the Esri Maps Web Part to a Chart Web Part are only supported in SharePoint 2010 Server.

Steps:

1. On the Chart Web Part, click **Data and Appearance** and click **Connect Chart to Data**.
   The **Connect Chart to Data** wizard opens.
2. Click **Connect to another Web Part** and click **Next**.
3. Choose the Esri Maps Web Part and click **Next**.
4. Choose **Table** as the Data Format and click **Next**.
5. Specify the property of the series and the X and Y fields, and click **Finish**.
   The chart is now configured to display data from the Esri Maps Web Part.
6. Select features in the Esri Maps Web Part to display them on the chart. Only selected features display.

Remove the connection

Steps:

1. To remove a web part connection, place the Esri Maps Web Part in Edit mode.
2. On the Esri Maps Web Part menu, click **Connections** > **Get Parameters From** > **<List>** or **Connections** > **Send Rows To** > **<List>**, depending on the type of connection you have created.
   The **Configure Connection** dialog box appears.
3. On the **Configure Connection** dialog box, click **Remove Connection**.

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Add data from ArcGIS

Esri Maps for SharePoint works directly with your organization's ArcGIS subscription, allowing you to search for content within your organization and, if enabled by your administrator, search for public content published by the GIS community, including Esri, and local governments and agencies around the world. Adding data from ArcGIS is a quick and easy way to add content to your map to complement your existing SharePoint data. For example, you may have SharePoint data showing proposed store locations and want to add household income census data from ArcGIS for those areas to visually analyze trends.

With Esri Maps for SharePoint, you can search ArcGIS for map services, feature services, and web maps to add to your map. Once added, they become layers in your map.

Only layers that are added while the Esri Maps Web Part is in Edit mode are persisted in the map.

Steps:

1. Sign in to ArcGIS if you are not already signed in.
2. From the **Add data** menu, choose **from ArcGIS**.
3. Search for a layer to add to the map in any of the following ways:
   - Enter one or more keywords and click the **Search** button to search all of ArcGIS. If desired, click **My organization** to narrow your results.
   - Click one of the popular search categories to browse available maps and services from Esri within that category.
   - Enter one or more keywords and click a category to search within that category.

     Note: The **Show available data in** drop-down menu allows you to show available data for the United States, Canada, and global regions. The option selected by default is the region of the user who is currently logged in. You can select another option from the menu to filter results for both full content and category searches. If you change the region, a new search is performed and the results are displayed immediately.

   - Use advanced keyword searches to narrow your results by specifying how you want to search for an item. To learn how, see Using search.

   If your organization's administrator has restricted the ability to search for content outside of your organization, the search only returns results from your organization and the **All results** and **My organization** options will not be visible.
4. Check the **Zoom to data** check box if you want the map to zoom to the full extent of the data you add.
5. Find the service you want and click **Add**.

   Note: Depending on the data you add, you may consume ArcGIS service credits. To help you estimate how many service credits you will use, see Service Credits Overview.

   A layer containing the data is added to the map and is listed in the **Contents** pane.

   Note: If you want more information about the data, click **Details**.

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Add data from SharePoint

Note: To addSharePoint lists to your map, the lists must first be spatially enabled (geocoded). To spatially enable lists, see Add lists containing address data and Add lists containing coordinate data.

Esri Maps for SharePoint works directly with your organization's SharePoint data, allowing you to use spatially enabled content within your SharePoint site and add it to the Esri Maps Web Part. Adding data from SharePoint is a quick and easy way to add content to your map to complement your existing SharePoint data. For example, you may have SharePoint data showing proposed store locations to add to your map of household income census data to visually analyze trends.

With Esri Maps for SharePoint, you can add spatially enabled lists containing addresses or place-names, or lists containing coordinate data, to your map. Once added, they become layers in your map.

Only layers that are added while the Esri Maps Web Part is in Edit mode are persisted in the map.

Steps:

1. Sign in to ArcGIS if you are not already signed in.
2. From the **Add data** menu, select **from SharePoint**.
   A list of spatially enabled SharePoint lists displays.
3. Select a list to add to the map.
4. Click the **All Items** entry for that list.
5. Click **Add**.
   A layer containing the data is added to the map and is listed in the **Contents** pane.

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Feature display and style

With Esri Maps for SharePoint, you can style your data on the map using different symbols, colors, and sizes to appropriately represent the features. For example, you may want to use different public safety symbols to denote locations of police and fire stations, or use different colors or sizes of a symbol to show locations of major cities according to the population.

When you add data from your business system to the map, Esri Maps for SharePoint creates a layer that appears on the **Contents** pane and draws the data on the map using a default style. The style can be changed using the options on the **Style** pane.

How layers are drawn

The **Style** pane allows you to draw a layer as follows:

- With a single symbol or color—Draw the features in a layer using the same symbol or color.
- With different colors—Divide your data into groups and show each with a different color.
- With different-sized symbols—Divide your data into groups and show each with a different size.

For layers containing point features, there are two different types of symbols you can use to style your data: icons and shapes.

- **Icons**—Standard, Business and Facilities, Public Safety, Transportation, People and Places, Public Safety and Health, and Outdoor Recreation
- **Shapes**—Circles, Crosses, Diamonds, Squares, and Xs

For layers containing polygon features, you can style your data using different colors.

If you Add data from ArcGIS that contains line features, you can change the style of the line features by choosing from different line types and colors and changing the line thickness.

For more information, see Style points, Style lines, and Style polygons.

Grouping methods

If you decide to style a layer using either different colors or different-sized symbols (for point features only), you will be asked how you want to group your data and what field (or attribute) to use to group it. If you choose to group your data by categories, your data will be grouped and styled based on a common value for the field (or attribute) you chose for grouping (for example, business types such as retail or wholesale).

If your layer has numeric fields, you can choose to group your data by number ranges. For this grouping option, you must choose a classification method. Each classification method takes your data and divides it into classes (groups). Classification method options include Equal Interval, Natural Breaks, and Quantile. The value at which a feature is placed into a different class is often referred to as a class break. The way in which class breaks are determined by each grouping method is discussed below.

Equal Interval

With the Equal Interval classification method, the range of all of your data values are divided into equal-sized subranges. With Equal Interval classification, you specify the number of intervals (or subranges), and Esri Maps for SharePoint automatically determines how to divide the data. For example, if you specify three classes for a field whose values range from 0 to 300, Esri Maps for SharePoint creates three classes with ranges of 0–100, 101–200, and 201–300. Equal Interval is best applied to familiar data ranges, such as percentages and temperature. This method emphasizes the amount of an attribute value relative to other values. For example, it shows that a store is part of the group of stores that make up the top one-third of all sales.

Natural Breaks

Natural Breaks classes are based on natural groupings inherent in the data. Class breaks that best group similar values and maximize the differences between classes are identified. The features are divided into classes whose boundaries are set where there are relatively big differences in the data values. Natural Breaks classification is good for mapping data values that are not evenly distributed as it places clustered values in the same class.

Quantile

In Quantile classification, each class contains an equal number of features (for example, 10 per class or 20 per class). A quantile classification is well suited to linearly distributed data. It is useful when you want to emphasize the relative position of a feature among other featuresfor example, to show that a store is in the top quarter of all stores by sales. Quantile classification assigns the same

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number of data values to each class. There are no empty classes or classes with too few or too many values. Because features are grouped in equal numbers in each class using quantile classification, the resulting map can often be misleading. Similar features can be placed in adjacent classes, or features with widely different values can be put in the same class. You can minimize this distortion by increasing the number of classes.

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Change a layer's style

In Esri Maps for SharePoint, layers are drawn on the map using a default style. You can change a layer's style to any of the styles shown in the **Style** pane. The style currently applied to a layer is shown in the **Contents** pane when you expand the layer by clicking the arrow ▸. For more information, see Feature display and style.

Steps:

1. On the **Contents** pane, click the **Settings** button to the right of the layer for which you want to change the style.
2. Click **Style**.
3. To configure style properties, do one of the following:
   - To style a point layer, see Style points.
   - To style a line layer, see Style lines.
   - To style a polygon layer, see Style polygons.

   The map automatically updates to reflect the style changes you made.
4. Click **OK**.

Note: You can quickly change the basic style of an individual layer directly from the **Contents** pane. Click the arrow (▸) to expand the layer contents, and click the symbol you want to modify. Depending on the layer type, different options are available. For lines and polygons, choose a new color for the shape. For point features, choose a different icon from the drop-down menu, or, if the layer was styled using shapes, choose a new color.

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Style points

When you add data from SharePoint to a map, Esri Maps for SharePoint creates a layer and displays the data using a default style (symbol). These layers, and certain layers added from ArcGIS, can be styled using different icons or shapes, colors, and grouping.

One way to style a point layer is using a single symbol to represent all of the features in the layer. Another way is to divide the point features into groups and style each group with a different color. Alternatively, if your data has numeric fields, you may choose to style each group with a different-sized symbol. For example, you may want to use different point colors or sizes to show retailers classified by profit.

As you modify the style options for your layer, the map automatically updates to reflect your settings.

For more information on styling layers, see Feature display and style.

Use a single symbol

Steps:

1. On the **Contents** pane, click the **Settings** button to the right of the layer whose style you want to configure.
2. Click **Style**. Specify **No** for **Style by column**.
3. You can use an icon or a shape to style a point layer. Do one of the following:
   - To style the layer with an icon, choose the icon you want to use. To see additional icons, click the drop-down arrow, click a desired category, and choose the icon you want.
   - To style the layer with a shape, click the **Shapes** arrow. Choose the shape and color you want.
4. Use the **Size** slider to specify the desired size for the icon or shape.
   The map automatically updates to reflect the style options you specified.
5. Click **OK**.

Note: When printing point symbols using a native Internet Explorer 9 browser, only points with a Shapes style will appear.

Use different colors

Steps:

1. On the **Contents** pane, click the **Settings** button to the right of the layer whose style you want to configure.
2. Click **Style**. Specify **Yes** for **Style by column**.
3. If the column you chose does not contain numeric data, do the following:
   a. Click the **Symbol** drop-down arrow, click **Shapes**, and choose the shape you want.
   b. From the **Color scheme** drop-down menu, choose the desired colors.
   c. Optionally, change the color for any of the individual categories as needed.
   d. Skip to step 9.
4. If the column you chose contains numeric data, click the **Group column values by** drop-down arrow and do one of the following:
   - Choose **Number ranges** to classify values into groups by numeric order and assign a group style.
   - Choose **Categories** to assign a style to each unique value.

   Tip: If your data contains a column that has a URL to a specific icon you want to use to style your point layer, choose **Categories** from the **Group column values by** drop-down menu, and then choose the appropriate column from the **Choose column with icon Url** drop-down menu.
5. If you chose **Number ranges** from the **Group column values by** drop-down menu, do the following:
   a. Click the **Symbol** drop-down arrow, click **Shapes**, and choose the shape you want.
   b. Under **Style using**, click **Colors** and choose the color you want.
   c. Click the **Classification method** drop-down arrow and choose the desired grouping method.
   For additional information on each of these methods, see Feature display and style.

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   d. Using the **Number of groups** slider, specify the number of groups to use for the data. You can have between two and seven groups.
   e. Choose the desired colors from the **Color ramp** drop-down menu. Check the **Reverse colors** check box to reverse the colors in the selected color ramp. The default color ramps cannot be changed or edited.

6. If you chose **Categories** from the **Group column values by** drop-down menu, do the following:
   a. Click the **Symbol** drop-down arrow, click **Shapes**, and choose the shape you want.
   b. Choose the desired colors from the **Color scheme** drop-down menu.
   c. Optionally, change the color for any of the individual categories as needed.

Note: If you turn on the **Clustering** option for a layer styled using shapes grouped by category, clusters will display as pie charts at the appropriate zoom level. Pie chart clustering is available only for shapes; clusters for layers styled using symbols will display as a solid circle. For more information, see Configure clustering.

7. Use the **Size** slider to specify the desired size for the shape.
8. Click **OK** when finished.
   Your style settings are displayed on the map. For point layers, you may have to turn off clustering to see individual point symbols.

Use different-sized symbols

Steps:

1. On the **Contents** pane, click the settings icon to the right of the layer whose style you want to configure.
2. Click **Style**. Specify **Yes** for **Style by column**.
3. Click the **Choose column to group** drop-down arrow and choose a column containing numeric data.
4. Click the **Group column values by** drop-down arrow and choose **Number ranges**.
   This classifies values into groups by numeric order and assigns a group style.
5. Click the **Symbol** drop-down arrow and do one of the following:
   - To style your data with an icon, choose a category and choose the icon you want.
   - To style your data with a shape, click the **Shapes** arrow and choose the shape you want to use.
6. You will have a **Style using** choice if you are styling a shape. Click **Sizes**. If you are styling an icon, you will not see this option.
7. Click the **Classification method** drop-down arrow and choose the desired grouping method.
   For additional information on each of these methods, see Feature display and style.
8. Using the **Number of groups** slider, specify the number of groups to use for the data. You can have between two and seven groups.
9. Use the **Minimum and Maximum Sizes** slider to specify the start and end (minimum and maximum) sizes for the symbols.
10. Click **OK** when finished.
    Your style settings are displayed on the map. You may have to turn off clustering to see individual point symbols. See Configure clustering.

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Style lines

When you add data from SharePoint to a map, Esri Maps for SharePoint creates a layer and displays the data using a default style. These layers, and certain layers added from ArcGIS, can be styled using different symbols, colors, and grouping.

One way to style a line layer is using a single line symbol to represent all of the features in the layer. Another way is to divide the line features into groups and style each group with a different color. Alternatively, if your data has numeric fields, you may choose to style each group with a different-sized line. For example, you could use different line colors or sizes to show roads classified by traffic volume.

As you modify the style options for your layer, the map automatically updates to reflect your settings.

For more information on styling layers, see Feature display and style.

Use a single line symbol

Steps:

1. On the **Contents** pane, click the settings icon to the right of the layer whose style you want to configure.
2. Click **Style**. Specify **No** for **Style by column?**
3. From the **Line** drop-down menu and select the type of line you want.
4. Select a color for the lines.
5. Move the **Thickness** slider as desired to set the thickness of the lines.
6. Click **OK**.

Use different colors

Steps:

1. On the **Contents** pane, click the settings icon to the right of the layer whose style you want to configure.
2. Click **Style**. Specify **Yes** for **Style by column?**
3. If the column you chose does not contain numeric data, do the following:
   a. From the **Line** drop-down menu, select a line type.
   b. From the **Color scheme** drop-down menu, select the desired colors.
   c. Optionally change the color for any of the individual categories as needed.
   d. Skip to step 9.
4. If the column you chose contains numeric data, click the **Group column values by** drop-down arrow and do one of the following:
   - Select **Number ranges** to classify values into groups by numeric order and assign a group style.
   - Select **Categories** to assign a style to each unique value.
5. If you chose **Number ranges** from the **Group column values by** drop-down menu, do the following:
   a. From the **Line** drop-down menu, select a line type.
   b. Click the **Classification method** drop-down arrow and select the desired grouping method.
   For additional information on each of these methods, see Feature display and style.
   c. Using the **Number of groups** slider, specify the number of groups to use for the data. You may have between two and seven groups.
   d. Choose the desired colors from the **Color ramp** drop-down menu. Check the **Reverse colors** check box to reverse the colors in the selected color ramp. The default color ramps cannot be changed or edited.
6. If you chose **Categories** from the **Group column values by** drop-down menu, do the following:
   a. From the **Line** drop-down menu, select a line type.
   b. Select the desired colors from the **Color scheme** drop-down menu.
   c. Optionally change the color for any of the individual categories as needed.
7. Move the **Thickness** slider as desired to set the thickness of the lines.
8. Click **OK** when finished.

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Use different-sized lines

Steps:

1. On the **Contents** pane, click the settings icon to the right of the layer whose style you want to configure.
2. Click **Style**. Specify **Yes** for **Style by column?**
3. Click the **Choose column to group** drop-down arrow and select a column containing numeric data.
4. Click the **Group column values by** drop-down arrow and select **Number ranges**.
   This classifies values into groups by numeric order and assigns a group style.
5. From the **Line** drop-down menu, select a line type. From the color selector, choose a color for the lines.
6. Under **Style using**, click **Sizes**.
7. Click the **Classification method** drop-down arrow and select the desired grouping method.
   For additional information on each of these methods, see Feature display and style.
8. Using the **Number of groups** slider, specify the number of groups to use for the data. You may have between two and seven groups.
9. Use the **Minimum and Maximum Sizes** slider to specify the start and end (minimum and maximum) sizes for the symbols.
10. Click **OK** when finished.

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Style polygons

When you add SharePoint data to a map, Esri Maps for SharePoint creates a layer and displays the data using a default style. These layers, and certain layers added from ArcGIS, can be styled using different symbols, colors, and grouping.

One way to style a polygon layer is using a single color to represent all of the features in the layer. Another way is to divide the polygon features into groups and style each group with a different color. For example, you might want to use different colors to denote sales territories classified by revenue range.

As you modify the style options for your layer, the map automatically updates to reflect your settings.

For more information on styling layers, see Feature display and style.

Use a single color

Steps:

1. On the **Contents** pane, click the settings icon to the right of the layer whose style you want to configure.
2. Click **Style**. Specify **No** for **Style by column?**
3. Select a color for the polygon features.
4. Click **OK**.

Use different colors

Steps:

1. On the **Contents** pane, click the settings icon to the right of the layer whose style you want to configure.
2. Click **Style**. Specify **Yes** for **Style by column?**
3. If the column you chose does not contain numeric data, do the following:
   a. Select the desired colors from the **Color scheme** drop-down menu.
   b. From the **Color scheme** drop-down menu, select the desired colors.
   c. Optionally change the color for any of the individual categories as needed.
   d. Skip to step 9.
4. If the column you chose contains numeric data, click the **Group column values by** drop-down arrow and do one of the following:
   - Select **Number ranges** to classify values into groups by numeric order and assign a group style.
   - Select **Categories** to assign a style to each unique value.
5. If you chose **Number ranges** from the **Group column values by** drop-down menu, do the following:
   a. Click the **Classification method** drop-down arrow and select the desired grouping method.
   For additional information on each of these methods, see Feature display and style.
   b. Using the **Number of groups** slider, specify the number of groups to use for the data. You may have between two and seven groups.
   c. Choose the desired colors from the **Color ramp** drop-down menu. Check the **Reverse colors** check box to reverse the colors in the selected color ramp. The default color ramps cannot be changed or edited.
6. If you chose **Categories** from the **Group column values by** drop-down menu, do the following:
   a. Select the desired colors from the **Color scheme** drop-down menu.
   b. Optionally change the color for any of the individual categories as needed.
7. Click **OK** when finished.

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Customize the map contents

Show and hide the Contents pane

When you add data to your map, the data appears as one or more layers listed in the **Contents** pane. When you want to work with the layers in your map—for example, toggle layer visibility, style your data, configure clustering, and so on—you can display the **Contents** pane and access your layers of data. You can hide the **Contents** pane at any time when you want a full view of the map.

Steps:

1. To show the **Contents** pane, click the **Contents** tab.
2. To hide the **Contents** pane, click the **Hide map contents** icon.

Depending on the size of the map, the **Contents** pane and controls may be displayed slightly differently.

Toggle a layer's visibility

The **Contents** pane lists all layers available to display in the map. By default, Esri Maps for SharePoint displays all available layers. Using the check box beside each layer name, you can specify which layers to display and which ones to hide from view, making it easier for you to work with features on the map. For grouped styles, you can also hide individual groups as desired.

Steps:

1. In the **Contents** pane, do one of the following to define a layer's visibility:
   - To show the layer on the map, check the check box beside the layer name.
     By default, all available layers are visible (selected).
   - To hide the layer from the map, uncheck the check box.
     Items on the specified layer are no longer displayed on the map.
2. You can also toggle the visibility of individual groups:
   a. Click the plus sign (**+**) beside the layer name to expand the layer contents.
      The **Contents** pane displays the styling applied to the selected layer. If the features in the layer are styled by group, the **Contents** pane shows the styling of all the groups.
   b. Click in the center of the row for the group you want to hide.
      Text identifying the group turns light gray, and the specified group is hidden in the map.
   c. Click on the group again to restore its visibility.

Rename a layer

Layers that you add to the map can be renamed in the **Contents** pane. When you first add a layer, the layer name is determined by the layer's data source. When you change the layer name in the **Contents** pane, only the display name of the layer is changed; the name in the underlying data is not affected.

Steps:

1. In the **Contents** pane, click the layer name to highlight it.
2. While the layer name is highlighted, type the new layer name.
3. Click outside the text area to finish.

Change the order of layers

The order in which layers are listed in the **Contents** pane represents how layers are drawn on the map. Within the map, the layers listed at the top draw over those listed below them, and so on, down the list. You can easily move layers in the **Contents** pane to adjust their drawing order.

Note: The order of heat map layers and map service layers added from ArcGIS cannot be changed.

Steps:

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1. In the **Contents** pane, click the desired layer in the **Contents** pane to highlight it.
2. Use the **Move layer down** and **Move layer up** icons at the bottom of the **Contents** pane to move the selected layer to the desired order.

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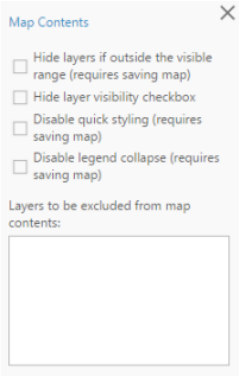
Configure the Map Contents pane

The **Map Contents** pane is a central component of the Esri Maps Web Part. The **Map Contents** pane displays the list of layers contained in the map, and you can use it to toggle layer visibility on and off. By default, the pane also shows the symbols used for each layer.

Note: The Map Contents **Edit** feature is available only when the Esri Maps Web Part is in Edit mode.

Map Contents configuration options include specifying which layers to include in the Map Contents, whether to allow end users to change layer visibility, and the ability to show only the layers visible at the current scale.



- The **Map Contents** pane displays the list of layers contained in the map, and you can use it to toggle layer visibility on and off.
- To configure the **Map Contents** pane, place the Esri Maps Web Part in Edit mode.
- Click the **Edit** icon at the top of the Contents pane.
- Enable an option by checking the option's check box. Clear the check box to disable the option.
- Click **Save.**

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Duplicate a layer

Sometimes, you may want to use the same data in your map but style it differently. You can make a copy of any layer in the map and style it as desired.

Steps:

1. In the **Contents** pane, click the layer you want to copy to highlight it.
2. Click the **Duplicate layer** button to create a copy of the selected layer.

   The new layer appears at the top of the layer list in the **Contents** pane. The new layer is named using the same name as that of the original layer, with the word `Copy` appended to it.

   You can rename the new layer and style it as desired.

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Remove a layer

Any layer that you add to the map can be removed.

Steps:

1. On the **Contents** pane, select the layer you want to remove.
2. Click the **Remove layer** icon at the bottom of the **Contents** pane.

3. When a confirmation message appears, click **Yes**.
The layer is removed from the map and is no longer listed in the **Contents** pane.

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View layer details

For layers you have added from ArcGIS or layers you have shared on ArcGIS, you can access information about the item on ArcGIS. The information associated with the layer may include a description, access use and constraints, tags, credits, size, and extent.

Steps:

1. On the **Contents** pane, select the desired layer.
2. Click the **Layer details** button at the bottom of the **Contents** pane.

   If the **Layer details** icon isn't enabled, the selected layer does not have information accessible from ArcGIS

   The ArcGIS details page for the layer opens in your default web browser. If you are viewing the details for a layer that is not shared publically, you are prompted to log in to ArcGIS

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Zoom to a feature

You can get detailed geographic information about a feature layer in your map by viewing the layer's attribute table. An attribute table includes information about each geographic feature in the layer. You can zoom to a feature in your map by clicking the corresponding record in the attribute table.

Note: Zooming to features is only available for feature service layers.

Steps:

1. Select a feature on the map. See Select features on the map.
2. Under **What do you want to do with your selection?**, click **View selected records**.
   Attribute information for the selected features appears in an attribute table.
3. In the attribute table, find the record corresponding to the feature to which you want the map to zoom.
4. Click the icon in the **Go to** column for the record.
   The map zooms to the feature and the feature flashes briefly.

   Tip: If pop-ups are turned on for a layer, you can zoom to a feature in the layer by clicking the feature on the map and click the **Zoom to** icon on the pop-up. To learn how to configure pop-ups, see Configure and display pop-ups.

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Zoom to the full extent of a layer

You can zoom the map to display all the features of a layer.

Steps:

1. Select the layer in the **Contents** pane.
2. Click the **Go to layer** button at the bottom of the **Contents** pane.
   The map automatically zooms to display all the features in the layer.

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Zoom to the combined area of layers

You might want your map to automatically zoom to display the combined area of specific layers each time it's loaded in a SharePoint site. You can turn on this behavior using the **Zoom on load** setting on each of the layers you want to include in the combined zoom area.

Steps:

1. Click the **Contents** tab to display the **Contents** pane.
2. In the **Contents** pane, click the settings icon to the right of one of the layers you want to include in the combined zoom area.
3. Click **Zoom on load** to turn on this setting for the layer.
4. Repeat these steps for any other layers you want to include in the combined zoom area.
   Each time the SharePoint site opens, the map will automatically zoom to show the combined area of all the layers for which the **Zoom on load** setting was turned on.

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Change layer display

Set the visible range of a layer

As you configure or view your map, you may find it appropriate to limit the levels at which layers display. These levels, or thresholds, allow you to specify that, for example, certain layers should only display when you zoom to the level of a neighborhood or city, or that a layer only displays when you zoom to the level of an entire region or country.

Setting the visible range of a layer can be particularly useful for ensuring that only the relevant data is displayed when zooming in and out to different levels on the map. For example, you may have a layer showing the locations of parks throughout a city. It would be appropriate to display the layer at a city level but not at a continent level. In this scenario, you would set the city level to be the maximum threshold at which the layer displays. As you zoom out past the city level, the parks layer no longer displays. Alternatively, your map may have state boundaries that only need to be shown at the country level but not when you have zoomed in closer to the city or neighborhood levels. In this scenario, you would set the minimum threshold of the state boundaries layer to country so that as soon as you zoom in past that level, the layer no longer displays. In other words, with a minimum threshold of country, the state boundaries layer only displays when you have zoomed out to the country level.

Steps:

1. Click the **Contents** tab to display the **Contents** pane.
2. On the **Contents** pane, click the settings button to the right of the layer for which you want to set the visible range.
3. Click **Visible range** to display the visible range settings.
4. Move the Minimum and Maximum sliders as desired.
5. Click **OK**.
   As you zoom in and out on the map, the layer displays only within the visible range you specified.

Set layer transparency

You can configure the transparency of layers in the map. This allows you to see more or less of certain layers so you can emphasize specific data.

Steps:

1. Click the **Contents** tab to display the **Contents** pane.
2. On the **Contents** pane, click the settings button to the right of the layer whose transparency you want to set.
3. Use the **Transparency** slider to specify the desired setting. A layer with 0 percent transparency has no transparency applied. A layer with 100 percent transparency is not visible in the map.

   Tip: You can also set the transparency by entering a value in the box beside the slider.

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Filter a layer

Filtering a layer provides a means of asking questions about the features of a feature service you have added to the map. When filtering a layer, only the features that meet the criteria specified by the filter are shown on the map. For example, you may want to specify a filter on a layer to display graffiti complaints within a specified district or city. In the Esri Maps Web Part, you can filter a feature service so that only the features that meet the filter criteria are shown. To filter a layer, see the following steps:

Steps:

1. Click the **Contents** tab to open the **Contents** pane.
2. Select the feature service to be filtered.
3. Click the **Settings** button to the right of the layer name to open the layer menu.
4. Click the **Filter layer** button to bring up the **Filter layer** pane.
5. Create an expression under **Match the following expression** by changing the drop-down boxes and radio buttons to create your query. For more information on filter expressions, see Building a query expression.
   - Click **Add another expression** to add additional expressions on which to filter.
   - Click **Add a set** to create a query containing AND or OR in the expression.
6. Click **Apply** to update the layer.
   The map is updated with the data matching the query set in the **Filter layer** pane.
7. Alternatively click the **Clear** button to reset the expression back to the default.
8. Click **Close** to exit from the **Filter layer** pane.

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Auto refresh a layer

Layers on your map can be configured to update based on a certain time interval. Auto refresh requeries the data underlying a layer and allows you to automatically see changes when layer or table contents have changed. You can enable updates based on a specified time interval. Auto refresh can be enabled on feature layers, web maps, and SharePoint list layers.

To turn on auto refresh, complete the following steps:

Steps:

1. Click the **Contents** tab to open the **Contents** pane.
2. Choose the layer to auto refresh.
3. Click the **Settings** (gear icon) button beside the layer name to open the **Layer options** pane.
4. Click **Auto refresh** to display the **Auto refresh** pane.
5. Click the **On/Off** selector under the **Layer** drop-down box to turn on auto refresh.
   The **Interval in minutes** section appears under the **On/Off** selector.
6. Type a time interval in minutes or use the arrows to increase or decrease the time interval.
7. Click **OK** to exit the **Auto refresh** pane.

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Configure and display pop-ups

Configure pop-ups

Pop-ups contain descriptive information about the features in each layer in the map. A pop-up displays a header (title) and attribute information based on the columns and rows in your data. Pop-ups display when you click a feature on the map. You can change the way information is presented in the pop-up by changing the header and specifying the fields to display.

Some layers from ArcGIS do not support configuring pop-ups. In these instances, the pop-up option will not be available on the layer's context menu.

To configure a pop-up, complete the following steps:

Steps:

1. In the **Contents** pane, click the settings button to the right of the layer for which you want to configure pop-ups.
2. Click **Pop-ups** to display the Pop-ups pane.
3. Click the **On/Off** selector below the **Layer** drop-down box to turn on pop-up display.
   The **Configure pop-ups** section appears below the **On/Off** selector.
4. From the **Header** menu, select the field you want to display as the header (title) of the pop-up.
5. Below the **Header** menu, each field in your data is listed. Check or uncheck the check box beside each field to specify the information you want to display in the pop-up.
6. Click **OK** when finished.
   When you click a feature on the map, the newly configured pop-up displays. click the **Zoom to** icon on the pop-up to zoom to the selected feature.

   If you're displaying the pop-up on a SharePoint list layer, click the **Go to item** icon on the pop-up to open a new tab in your browser displaying the SharePoint List item attributes for the current feature item.

   Note: The **Attributes** and **Infographics** options on pop-ups are persistent, meaning that the last selected button determines what is displayed in subsequent pop-ups. For example, if you view infographics in a pop-up and close the pop-up, all other pop-ups will automatically display infographics for selected features. Because viewing infographics consumes ArcGIS service credits, it is good practice to revert to the **Attributes** display before closing the pop-up.

   You can generate a report containing demographic data surrounding the selected feature on the map. Click the **Report** icon at the lower right of the pop-up to open the report window. For details, see Create reports.

Set up attachments

If you're displaying a SharePoint list layer, click the **Show item attachment** icon on the pop-up to open a list of hyperlinks to the available attachments for the item. Click the hyperlink to open the attached item.

To set up attachments in your SharePoint list, complete the following steps:

Steps:

1. Browse to and click the desired list.
2. Highlight the item you which you want to add an attachment.
3. Right-click the item and click **Edit Item**.
4. Click **Attach File** on the ribbon.
5. Click **Browse** and browse to the file you want to attach.
6. Click **Open** and click **OK** to exit the attachments page.
7. Click **Save** to save your changes and exit the **Edit Item** page.
8. Click the**List** tab on the SharePoint List ribbon.
9. Click **Modify View** to modify the list's view.
10. Check attachments.
    This will allow the **Show item** attachment icon to display on the pop-up by default.

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11. Click **OK** to exit the **Modify View** page.

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Select features on the map

Selecting features on a map provides a way to identify, locate, and visually analyze a set or subset of data on the map. Once you have made a selection on the map, you can find features that are near your selection, view detailed information about the selected features in an attribute table, deselect certain features, or clear all selections.

Steps:

1. From the **Map tools** toolbar, choose **Select**.
2. From the **Choose a layer** drop-down menu, select the layer containing the features you want to select.
3. Do any of the following to make selections:

   Note: For point features, only features that are completely within the selection area are included in the selection.

   Note: To pan the map while making selections, use the **Pan** tool.

   - Click the **Rectangle** selection tool and drag on the map to draw a rectangle to select the features you want.
   - Click the **Free-hand** selection tool and drag on the map to draw a freehand shape to select the features you want.
   - To select a single feature, click the feature on the map while either of the selection tools are enabled.

   Continue to draw shapes or click individual features to select more features as needed.

   Note: If your map has point features that have been clustered, you will not be able to select the clustered features on the map. You can turn off clustering to select the individual point features. See Configure clustering.

4. To clear all selections or remove part of your selection, do one of the following:
   - Click the **Remove from selection** tool and drag on the map to draw a rectangle around the features you want to remove from the selection.
   - Click the **Clear selection** tool to clear all selections in the layer.
5. Specify whether to use the selected features to View selected records, Find Nearby, or Get Route.
6. To find features in other layers in your map that are near your selection, click **Find nearby** and do the following:
   a. Click the **What do you want to find** drop-down arrow and select a layer.
   b. Click **Ring** to search within a specified distance around the selection, or click **Drive time** to search within a specified drive time of the selection.
   c. If you chose **Ring**, specify a radius in either miles or kilometers. If you chose **Drive time**, specify the maximum drive time from the selection in minutes or hours.
   d. Click **Find**.
   If you chose **Ring**, Esri Maps for SharePoint generates a new temporary layer containing the circles that define the search radius. The features encompassed within that radius are selected on the specified layer.

   If you chose **Drive time**, Esri Maps for SharePoint generates a new temporary layer containing the polygons that define the search area. The features encompassed within those polygons are selected on the specified layer.

   The search area for each **Find nearby** action is generated as a temporary layer in the **Contents** pane, using the name of the original layer with a prefix indicating the name of the related action, for example, **Find nearby buffer - LayerName**. You can use these layers as reference for future select actions.

   Note: These layers are temporary and are not saved with the map.

7. To view detailed attribute information about the features you selected, click **View selected records** on the **Select** pane. Attribute information for the selected features appears in an attribute table.

   Tip: You can select additional features from this table to add to your selection. click the **View** drop-down arrow and select **All**. Check the boxes for the records corresponding to the additional features you want to add to the selection. The features are selected on the map.

   Tip: You can use the attribute table to zoom to a specific feature in the map. See Zoom to a feature.

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8. Click **Get route** if your selected point features are destinations and you want to find the best driving route to reach them. See Find a driving route for more information.

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Edit features

Editing in Esri Maps for SharePoint includes the ability to add and delete features, change feature geometries and attributes, and add attachments. Editing is available for feature layers that have been made editable by the original author. If a feature layer is editable, it is automatically enabled for editing in Esri Maps for SharePoint.

In addition to editing features, you can also edit Map Notes if they were included in the original web map. Edits to map notes are not pushed back to the original web map; they are saved in the Esri Maps for SharePoint map only.

Caution: There is a known issue with Microsoft SharePoint where hovering over the Format Text and Insert tabs on the ribbon causes a refresh of the page. Editing while the Map Web Part is in edit mode can cause this issue to occur more frequently. Therefore, it is recommended that you perform all edit tasks while the Map Web Part is in run mode.

Configure editing

Editing can only be configured if there are editable feature layers or map notes (from a web map) in the map.

Editing is available in both run mode and edit mode.

Note: Add Features must be explicitly added to the Esri Map Web Part in order to enable all the editing capabilities described in this document.

Steps:

1. Edit the page and place the Esri Maps Web Part in edit mode.
2. From the Esri Maps Web Part menu, click the **Configure** button to display the Configuration pane.
3. From the list of configuration options, click **Tools**, and click **Map tools**.
4. Click the **Add** icon (+) at the top of the pane.
5. Expand the **esriMapsSharePointX** category to display available tools.
6. Check the **Add features** check box and click **Add**.
   The **Add features** tool appears in the list of **Map tools**.
7. Highlight the **Add features** tool and click the **Settings** button at the top of the pane.
8. In the **Configuration** pane, select the layers to edit. Only layers that support editing are shown here. If you select the option to edit all feature layers, editing will automatically be enabled on any layers added to the map that support editing. By default, **Edit all editable feature layers** is enabled.
9. Check the box beside any of the editing options you want to enable and click **OK**.
   The **Advanced Editing Tools** section contains tools intended for users with advanced editing scenarios. The **Advanced Editing Tools** items appear on the **Edit toolbar**.
10. Click **OK** to exit the **Configuration** pane.
11. Click **OK** on the Esri Maps Web Part properties to save your changes and exit edit mode.
12. **Save** your page.

Add features

Steps:

1. Open the **Add features** pane from the **Map Tools** toolbar.
2. Choose an icon in the **Add features** pane and click on the map to add the feature.
3. Update the appropriate attributes in the **Add features** pane and click **Apply**.
4. Alternatively, you can delete features when the attributes are displayed by clicking the **Delete** button.

Delete features

Steps:

1. Ensure pop-ups are enabled for the desired feature layer.
2. Click a feature to display its pop-up.

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3. Click the **Edit attributes** icon in the pop-up's toolbar.
4. Click the **Delete** button.
5. Click **Yes** to confirm you want to delete the feature.
   The feature is now permanently deleted from the feature layer.

Edit features

Editing of feature geometry and attributes is available on the feature's pop-up menu.

Steps:

1. Ensure pop-ups are enabled for the desired feature layer.
2. Click a feature to display its pop-up. The edit geometry and edit attributes icons display in the pop-up's toolbar.

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Find a driving route

About finding a route

It is often necessary to analyze your data to answer questions such as the following:

- What is the quickest way to get from point A to point B?
- How can a fleet of delivery or service vehicles improve customer service and minimize transportation costs?
- Which branch of a store should a potential customer visit to minimize travel time?

Esri Maps for SharePoint can help you find the best way to get from one location to another or visit multiple locations. The best route is the shortest route that minimizes travel time. If you have more than two stops to visit, Esri Maps for SharePoint can determine the best sequence in which to visit the locations. This is called route optimization.

Esri Maps for SharePoint uses specialized services from ArcGIS—the route service and the World Geocoding Service—to find an optimal driving route. Your data can come from ArcGIS or from SharePoint.

Note: The route service and the World Geocoding Service work in all supported countries. One or more countries are grouped together to form a region. The route service does not support requests that span more than one region. Consequently, a route will be found only between those stops that are in the same region as the first stop.
You can easily find a driving route by specifying two or more destinations in your point layer. Once Esri Maps for SharePoint finds the best route using the destinations you specified, you can zoom to the full route or print out driving directions.

Note: Using this functionality consumes ArcGIS service credits. To help you estimate how many service credits you will use, see Service Credits Overview.

Find a route

You can easily find a driving route by specifying two or more destinations in your point layer using any of the following methods:

- Selecting destinations on your map using a selection tool
- Specifying a destination by adding a pin
- Manually entering addresses

When Esri Maps for SharePoint finds the best route using the destinations you specified, you can zoom to the full route or print out driving directions.

To find a route:

Steps:

1. From the **Map tools** menu, click **Get route**.
   The **Get Route** pane appears.
2. Specify the destinations you want to include in your route using any of the following methods:
   - Click the **Select** tool and click and drag a rectangle on the map to select the points you want to use as destinations. Your map must contain points to select.
   - Click the **Drop pin** tool and click a point on the map to add it as a destination. The destination is added as the first stop.
   - Click the **Enter an address** tool and type an address in the empty destination box.

   You can repeat any of these methods until all destinations have been specified.
3. Do any of the following to make changes to your destinations:
   - To remove a destination from the route, click the small **x** beside the destination.
     The **x** icon appears only when your route contains more than two destination points . When the route consists of only two points, the **Reverse directions** icon appears beside the addresses.
   - To switch the start and end destinations, click the **Reverse directions** icon to the right of the destination list.
   - To rearrange three or more destinations, hover over the letter icon (A, B, C) until the icon changes to a four-directional arrow. Click and drag the destination field to the desired location in the list of destinations.

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- To change the location of a stop on the map, click the icon on the map and drag it to a new destination; the new address is updated in the address field.

  Note: You can move destination points on the map after generating the original route; click **Get route** again to update the driving route after you move a destination point.

- If you want Esri Maps for SharePoint to determine the best sequence in which to visit four or more specified destinations, check the **Optimize order** check box. When optimizing a route, the first and last stops are fixed, and the intermediate stops are optimized.

4. When you're finished specifying destinations for your route, click **Get route**.

   Note: Using this functionality consumes ArcGIS service credits. To help you estimate how many service credits you will use, see Service Credits Overview.

   The route is displayed on the map. Information about the route, including route length (miles or kilometers) and estimated driving time, appears under the list of destinations.

   Tip: To see the entire route displayed on the map, click **Zoom to full route**.

5. To view and print driving directions for the route, click the **Print** icon, and click **Print** on the directions page that appears. Modify the print settings as needed and click **Print**.
   The resulting printout consists of a map that contains the route and the stops.

6. To clear the route, close the **Get route** pane.

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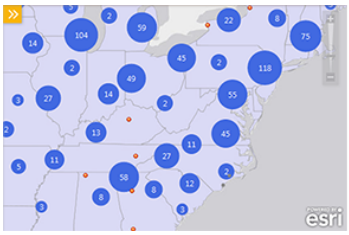
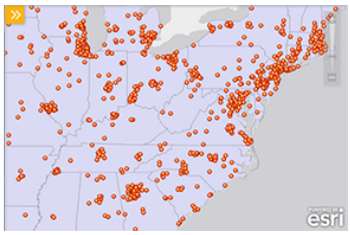
Configure clustering

When a layer contains a large number of point features, showing each feature individually on the map is often not useful. In this scenario, point features often overlap, making it difficult to distinguish between features. Even when they do not overlap, it is usually difficult or impossible to visually extract meaningful information when hundreds or thousands of points are shown all at once.

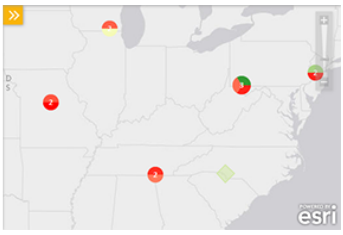
One approach to resolving this issue is to group point features within a certain distance of one another on-screen into one symbol. This is known as clustering. Since the clustering is dependent on screen distance, more points are aggregated into fewer groups as you zoom out. Conversely, points are divided into more and more groups as you zoom in. When you zoom to a level where the clustering area around one point feature no longer contains any other features, that feature will not be clustered but rather will be shown in its location with the styling specified by the layer.

Clusters are interactive; when you click on a cluster, each individual point feature in the cluster appears on the map. The cluster's pop-up contains a separate page for each feature; use the forward and back arrows in the pop-up's title bar to scroll through pop-ups for each feature. Although you cannot change the default style of a single cluster, you can change the basic color that applies to all clusters and the color of the text that appears within a cluster. In the screen captures below, the image on the left displays the points with clustering enabled, and the image on the right does not have clustering enabled.





If you styled a point layer using shapes grouped by category, the clusters will display a pie chart showing the ratio of different categories within that cluster. As you zoom in, the cluster is divided into smaller groups and the pie chart changes to reflect the information in the new cluster.



Steps:

1. On the **Contents** pane, click the settings icon to the right of the point layer for which you want to configure clustering.
2. Click **Cluster points**.
3. Click the **On/Off** selector under the layer to turn on clustering for the layer.
   The map automatically displays the default properties for clustering symbols for the layer.

   Note: To turn off clustering, click the **On/Off** selector again.

4. Do any of the following to configure clustering for the layer:
   - To change the distance at which points will be grouped together in a cluster, use the **-** or **+** buttons or enter a new pixel value between 0 and 50 in the **Cluster radius** box.
   - To change the color of the text on the cluster symbols, click the **Cluster number color** drop-down menu and select a new color.
   - To change the color of the cluster symbol, click the **Cluster color** drop-down menu and select a new color.

   The map automatically updates to reflect the new cluster settings.
5. Click **OK** when you are finished.

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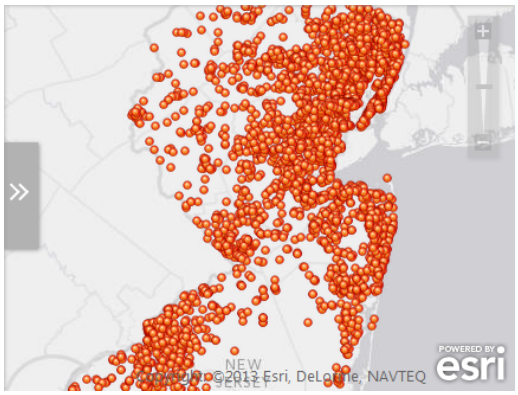
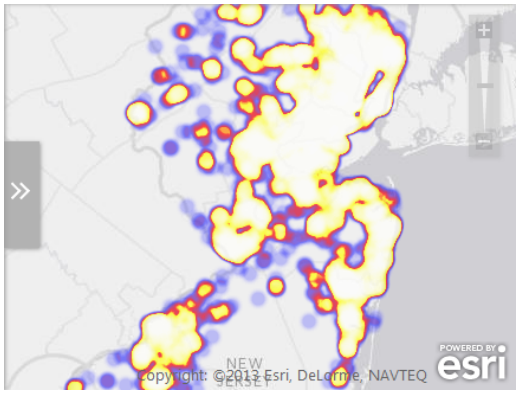
Add a heat map

When a layer contains a large number of point features, showing each feature individually on the map is often not useful. In this scenario, point features often overlap, making it difficult to distinguish between features. Even when they do not overlap, it is usually difficult or impossible to visually extract meaningful information when hundreds or thousands of points are shown all at once.



One approach to resolving this issue is to create a heat map. A heat map represents the geographic density of point features on a map by using colored areas to represent those points. The areas will be largest where the most points are concentrated.



Note: Heat map layers and layers that are clustered cannot be shared to ArcGIS as a layer, but they can be shared as part of a map. In the map viewer on ArcGIS.com, the heat map layer displays as a point layer instead of rendering as a heat map.

Steps:

1. Click the **Contents** tab to display the **Contents** pane.
2. On the **Contents** pane, click the **settings** icon to the right of the point layer for which you want to configure a heat map.
3. Click **Heat map**.

   Note: The **Heat map** item will be disabled if **Clustering** is turned on. You must first turn off clustering before applying and configuring a heat map.

4. Click the **On/Off** selector under the layer to turn on the heat map for the layer.

   Note: To turn off clustering, click the **On/Off** selector again.

5. Click **Heat map**.
6. To change the way the heat map appears on the map, from the **Contents** pane, click the arrow to the right of the heat map layer and click **Configure heat map**.
7. To change the way the heat map appears on the map, do any of the following to configure it:
   - Choose a color scheme from the **Color scheme** menu.

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- Adjust the intensity of the heat map using the **Radius** slider or by typing a number between 10 and 100 in the text box beside the radius slider.

8. Click **OK** when you are finished.
   A new heat map layer appears in the **Contents** pane. The map automatically displays the heat map under the original points layer.

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Find hot spots

Even random spatial patterns exhibit some degree of clustering. In addition, our eyes and brains naturally try to find patterns even when none exist. Consequently, it can be difficult to know if the patterns in your data are the result of real spatial processes at work or just the result of random chance. This is why researchers and analysts use statistical methods like Find Hot Spots (Getis-Ord Gi*) to quantify spatial patterns. When you do find statistically significant clustering in your data, you have valuable information. Knowing where and when clustering occurs can provide important clues about the processes promoting the patterns you're seeing. Knowing that residential burglaries, for example, are consistently higher in particular neighborhoods is vital information if you need to design effective prevention strategies, allocate scarce police resources, initiate neighborhood watch programs, authorize in-depth criminal investigations, or identify potential suspects.

Note: Hot spot analysis is currently only available with connections to ArcGIS Online organizations. Hot spot analysis with Portal for ArcGIS is coming at a future release.

Steps:

1. Click the **Contents** tab to display the **Contents** pane.
2. On the **Contents** pane, click the point layer you want to analyze.
3. Click **Analysis Tools** > **Find hot spots**.
4. In the **Hot spot analysis** pane, select the layer in the drop-down list.
5. Under **Find hot and cold spots**, choose how you want the analysis to be performed.
   - Choose by point densities to perform the analysis based on the points in the layer.
   - Choose by attribute values to perform based on an attribute value of the layer.
     Use the drop down to select the attribute value you want to use
6. To restrict the analysis to the map area displayed in the viewer, check the **Restrict analysis to the map's current map extents** check box. To apply the analysis to the entire map, uncheck the check box.
7. In the **Result layer name** field, type a name to assign to the new layer.
8. Check the **Save the results** check box if you want the results to be saved.
9. Click **Run analysis**.
   When the analysis is complete, a new layer is created and appears in the **Contents** pane. For the points or the areas in this result layer, the darker the red or blue colors appear, the more confident you can be that clustering is not the result of random chance. Points or areas displayed in beige, on the other hand, are not part of any statistically significant cluster; the spatial pattern associated with these features could very likely be the result of random chance. Sometimes the results of your analysis will indicate that there aren't any statistically significant clusters at all. This is important information to have. When a spatial pattern is random, there are no clues about underlying causes. In these cases, all of the features in the results layer will be beige. When you do find statistically significant clustering, however, the locations where clustering occurs are important clues about what might be creating the clustering. Finding statistically significant spatial clustering of cancer associated with certain environmental toxins, for example, can lead to policies and actions designed to protect people. Similarly, finding cold spots of childhood obesity associated with schools promoting after-school sports programs can provide strong justification for encouraging these types of programs more broadly.

   For technical details on how the Hot Spot tool works, see How Hot Spot Analysis works.

   For more information about spatial statistics, see How Hot Spot Analysis (Getis-Ord Gi*) works.

   Note: You cannot change the styling properties of a hot spot layer.

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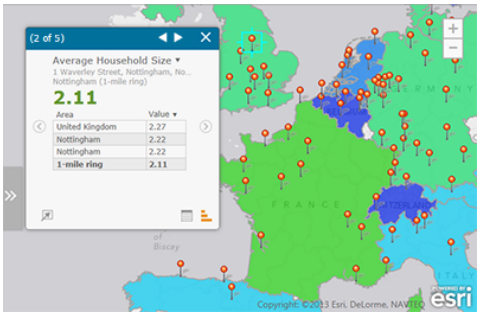
Infographics

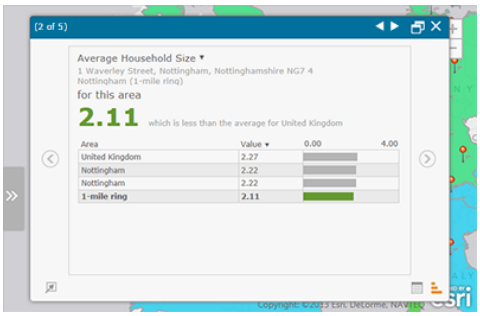
Infographics are visualizations that provide rich contextual information about the areas surrounding the features in your map. When you press the **Infographics** button in a pop-up, ArcGIS aggregates the demographics around that feature on your map and delivers them using easy-to-understand Infographics that contain information such as age distribution and income for a set distance around the selected location. The information contained in Infographics is available while the pop-up is open and is not saved to your business system.

Note: Using this functionality consumes ArcGIS service credits. To help you estimate how many service credits you will use, see Service Credits Overview.

In the image below, an Infographic shows the average household size within a one-mile radius of the selected city. Many Infographics are interactive; hover over elements in the Infographics or use the **Forward** and **Back** arrows to display additional information.



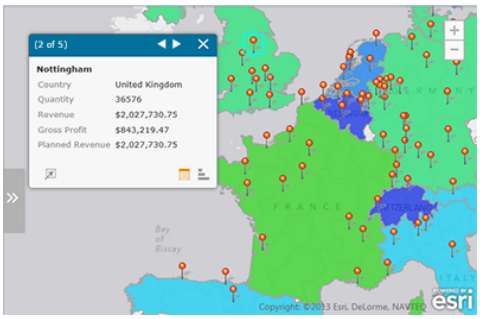
To view a more detailed Infographic, click the **Maximize** button in the pop-up's title bar. Click **Restore** to return the window to its original size.



Click the **Previous** and **Next** arrows on the **Infographics** window to scroll through available feature visualizations.

Click the **Zoom to** button to zoom in to the selected feature.

Click the **Attributes** button to display the feature's attributes list.



Note: The **Attributes** and **Infographics** options on pop-ups are persistent, meaning that the last selected button determines what is displayed in subsequent pop-ups. For example, if you view Infographics in a pop-up and then close the pop-up, all other pop-ups will automatically display infographics for selected features. Because viewing infographics consumes ArcGIS service credits, it is good practice to revert to the **Attributes** display before closing the pop-up.

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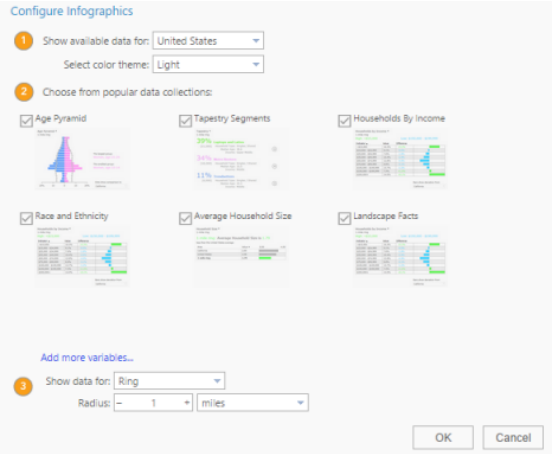
Configure infographics

How to configure infographics

Information is displayed in a carousel of configurable infographics. Each infographic shows the distribution of one variable around the chosen location. A few infographics are turned on by default and can be scrolled through by clicking the arrows beside the infographic. Infographics can be configured to display specific data collections and for specific distances.

Steps:

1. Edit the page and place the map in Edit mode.
2. From the Esri Maps Web Part menu, click the **Configure** button to display the **Configuration** pane.
3. From the list of configuration options, click **Tools**, then click **Popup tools** and choose **Infographics**.
4. Click the **Configure** button (gear icon).
   The **Configure Infographics** pane opens.
5. Click the **Show available data for** drop-down list, and choose the country for which you want to view infographics variables.



6. Choose whether you prefer to use the **Light** or **Dark** theme by clicking the **Select color theme** drop-down list.
7. Choose which data collections should appear in the carousel.
   - Check the boxes beside the infographics you want to see. Uncheck the boxes for the infographics you don't want to see.
   - Click **Add more variables** to explore the data collections available from the ArcGIS platform.
   - Choose a data collection to see which variables are contained within it.
   - Check the variables you want to see in your infographics carousel.
   - Click **Back** to return to the **Configure Infographics** window.
8. Define the area for which you want information.
   - Choose either **Ring** or **Drive Times** to define the type of area around the selected feature. A ring will return information from a circle around the selected feature. Selecting **Drive Times** will return information from an area within a driving distance from the selected feature.
   - Choose the distance from the selected feature for which you want demographic information. By default, demographic information will be gathered for an area 1-mile in all directions from the selected object. This ring can be changed to different linear distances. If **Drive Times** was chosen in the previous step, you have the option of choosing distance in units of linear measurement (miles or kilometers) or time (minutes).
9. Click **OK** to save your changes.

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Create reports

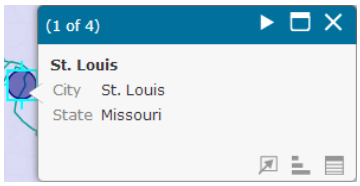
Reports can be created for a location or point on the map and saved in PDF or Excel formats. Reports can be generated to include values for a distance of rings or drive distance or within a drive time. There are 20 different reports that provide information about the area of your choice. Reports include Demographic and Income Profile, Executive Summary and Retail Goods, and Services Expenditures. These reports can be used to describe and gain a better understanding about the market, customers and clients, and competition associated with your area of interest. Once created, reports can be shared and sent to others.

Note: Using this functionality consumes ArcGIS service credits. To help you estimate how many service credits you will use, see Service Credits Overview.

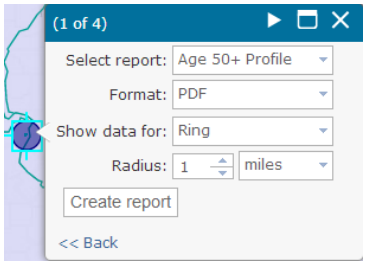
You can create reports for a feature on the map. Features can be rivers, roads, pipelines, buildings, counties, and political subdivisions, as well as points, lines, and polygons. Any data that you add is also added as a feature on the map.

Steps:

1. Click a feature on the map to display the pop-up to access reports.



2. Click the **Create report** icon.
   The dialog box appears where you can set the parameters for the report you want to create.



3. Click the **Select report** drop-down arrow to select the report you want to run.
4. Click the **Format**drop-down arrow to select the format for your report. You can choose from PDF or Excel.
5. Click the **Show data for** drop-down arrow for rings, drive times, and drive distance.
6. Select the radius and units for your report.
7. Click **Create report**.
   The report icon appears at the bottom of the page. Click to open the report.

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Measure distances and areas

You can easily measure distances and areas on your map using the **Measure** tool. The **Measure** tool allows you to draw a single-segment or multisegment line to measure a linear path, or a shape to measure a specific area. You can also use the **Measure** tool to find the coordinates of any point on the map. You can also change the default units of measurement while you use the tool.

Add the Measure tool to the Esri Maps Web Part

You must add the **Measure** tool to the Esri Maps Web Part before you can use it.

Steps:

1. Edit the page and place the Esri Maps Web Part into Edit mode.
2. Click the **Configure** button to display the configuration options.
3. From the list of configuration options, click **Tools** and choose **Map tools**.
4. Click the **Add** button (+) from the top of the panel.
5. Expand the **esriMapsSharePointX** category to display available tools.
6. Check the **Measure** check box and click **Add**.
   The **Measure** tool appears in the list of Map tools.
7. Click **OK** to exit the configuration options.
8. Click **OK** on the Esri Maps Web Part properties to save your changes and exit edit mode.
9. **Save** your page.

Measure a distance

Measure distances on the map by drawing a line to specify a linear path.

Steps:

1. On the **Map tools** toolbar, click the **Measure** tool.
2. Click **Distance**.
3. Click two or more points on the map to draw a line. When you are finished drawing, double-click to complete the line.
   The result of your distance measurement appears at the bottom of the **Measure** tool.

   Note: Depending on the distance and location of your measurement, the line you drew may be curved. This is because the **Measure** tool must take into account the natural curvature of the earth to calculate the shortest path between two points. The curve you see is called a geodesic curve. Lines and shapes drawn using geodesic curves more accurately represent length, direction, and position everywhere on the surface of the earth.

4. To change the distance units, choose a new unit of measurement from the drop-down menu.
   The measurement result updates to reflect the new units.
5. To measure another distance, click on the map and draw a new line.
   The new line replaces the previous measurement line on the map, and the measurement result updates to reflect the new distance.

Measure an area

Measure areas on the map by drawing a shape to specify an area.

Steps:

1. On the **Map tools** toolbar, click the **Measure** tool.
2. Click **Area**.
3. Click three or more points on the map to draw a shape. Double-click to complete the shape.
   The result of your area measurement appears at the bottom of the **Measure** tool.

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Note: Depending on the distance and location of your measurement, the line you drew may be curved. This is because the **Measure** tool must take into account the natural curvature of the earth to calculate the shortest path between two points. The curve you see is called a geodesic curve. Lines and shapes drawn using geodesic curves more accurately represent length, direction, and position everywhere on the surface of the earth.

4. To change the area units, choose a new unit of measurement from the drop-down menu.
   The measurement result updates to reflect the new units.
5. To measure another area, click on the map and draw a new shape.
   The new shape replaces the previous measurement shape on the map, and the measurement result updates to reflect the new area.

Display coordinates for a point

Display longitude and latitude coordinates for a point on the map by clicking a specific location.

Steps:

1. On the **Map tools** toolbar, click the **Location** tool.
2. Click the map at the location for which you want to get coordinates.
   The coordinates of the point appear at the bottom of the **Measure** tool.
3. To change the units, choose a new unit of measurement from the drop-down menu. Choose from Decimal Degrees or Degrees, Minutes, Seconds (DMS).
   The result updates to reflect the new units.
4. To view coordinates for another location, click a different point on the map.
   The result updates to reflect the new location.

Pan the map while measuring

You may find that what you want to measure is not completely contained within the current extent of the map; for example, a street or parcel may extend beyond what is visible.

To move the map as you're measuring, while still maintaining the cumulative total distance or area, hold down the left mouse button (or the equivalent navigation) and drag to pan the map in the direction you want. Resume measuring by clicking the map with the left mouse button.

Close the Measure tool

Close the **Measure** tool by clicking the **Close** (X) button on the tool.

When you close the tool, all measurement graphics are cleared from the map.

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Share a layer on ArcGIS

Sharing your Esri Maps for SharePoint layers to ArcGIS is a quick and easy way to share information with others in your organization or in the ArcGIS public community. You can share individual layers or the entire map.

When you share a layer, a hosted feature service is created on ArcGIS, where you can do more work on it.

Note: You can only share layers to ArcGIS if you are signed in with an organizational account that has publisher permissions. If you are unsure of your account permissions, contact your ArcGIS subscription administrator.
Only layers that have been created with Esri Maps for SharePoint can be shared. You cannot share layers to ArcGIS that you've added using the Search function.

Steps:

1. Sign in to ArcGIS if you are not already signed in. For more information, see Sign in to ArcGIS.
2. Click the **Contents** tab to display the **Contents** pane.
3. In the **Contents** pane, click the **Settings** icon to the right of the layer you want to share.

   Note: Heat map layers cannot be shared to ArcGIS as layers but can be shared as part of a map. In the map viewer on ArcGIS.com and ArcGIS Explorer Online, the heat map layer displays as a point layer instead of rendering as a heat map.
   If you want to share a layer with clustering applied, the layer is shared as a point layer without clustering.

4. Click **Share layer**. Note that publishing may take several minutes depending on the amount of data in your layer.
   Share layer will only be visible if you've selected a layer that can be shared on ArcGIS. Layers you create with data from your business system can be shared on ArcGIS. Layers you've added using the **Search** cannot be shared.

   Once the map has published successfully, a message appears telling you it has successfully published. Click **OK** to close the message.

   Note: You can update the layer and republish it on ArcGIS by clicking **Update shared map** under the settings icon next to the shared layer and modify the information you entered as needed.

5. Specify a title, tags, and a description for the layer and choose whether to share it with everyone (public), your organization, or any groups to which you belong.
6. Click **Share**.

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Share a map to ArcGIS

Sharing a map created in Esri Maps for SharePoint to ArcGIS is a quick and easy way to share information with others in or outside of your organization. When you share a map, a web map is created on ArcGIS, where you can do more work on it.

If the map you're sharing contains layers created from SharePoint data, these layers will represent a snapshot of the current SharePoint data in the shared map.

Note: You can only share a map to ArcGIS if you are signed in with an organizational account that has publisher permissions and if sharing has been enabled by your organization's administrator. If you're unsure of your account permissions, contact your ArcGIS subscription administrator.

Steps:

1. Sign in to ArcGIS if you are not already signed in. For more information, see Sign in to ArcGIS.
2. Click the **Share** menu and click **Share map**.
3. Specify a title, tags, and description for the map and choose whether to share it with everyone (public), your organization, or any groups to which you belong. These fields are used to display information about the map on ArcGIS and are also used for searching.
4. Click **Share** to share the map to ArcGIS as a web map. Note that publishing may take several minutes depending on the amount of data in your map.
   Once the map has published successfully, a message appears at the bottom of the **Contents** pane along with a link to view the shared map on ArcGIS.

   Note: You can update the map and republish it to ArcGIS by clicking **Update shared map** under the **Share** menu and modifying the information you provided as needed.

5. Click the link at the bottom of the **Contents** pane to view the published map. The web map details page opens in ArcGIS. The details page displays the title, tags, and description that you provided.
6. Click **Open** to open the map in the ArcGIS.com map viewer, ArcGIS Explorer Online, or, if installed, ArcGIS for Desktop.

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Print a map

The Esri Maps Web Part provides printing capabilities for your application. The **Print Map** tool prints exactly what is displayed in the map. You must configure your map before clicking Print Map, as there are no configuration options (such as zooming or panning) on the print screen.

The print layout includes the following:

- The map's current visible extent
- All copyright and attribution information, shown below the map

The print layout does not include the following:

- An overview map
- Scalebar
- Description

Esri Maps for SharePoint supplies the text's font and the printed map's layout. The map is drawn using the same resolution as shown on the screen and therefore may not display properly if scaled to a larger map display. The location and scaling of the map cannot be adjusted.

Using the standard Windows **Print** dialog box, you can choose the following:

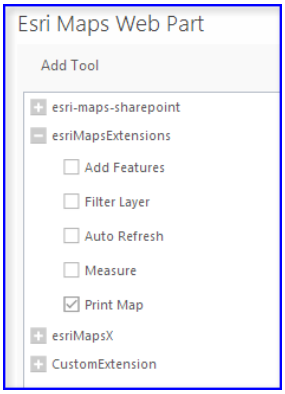
- The printer to use
- The paper size
- Whether to print in landscape or portrait layout

Add the Print Map tool to the Esri Maps Web Part

To add the Print Map tool to your application, follow these steps.

Steps:

1. Edit the page that contains the map and place the Esri Maps Web Part in Edit mode.
2. From the Esri Maps Web Part menu, click **Configure** to display the **Configuration** pane.
3. Select the area in which you want to place the tool. For example, choose **Map tools**.
4. Click the **Add** button (+), expand **esriMapsSharePointX**, and check the **Print Map** check box. Click **Add**.



   The **Print Map** tool appears in the list of map tools.
5. Click **OK** to close the **Configuration** pane.
6. Click **OK** on the Esri Maps Web Part properties pane to save your changes and exit Edit mode.
7. Click **Save** to save your page.

Print a map

The **Print Map** tool prints exactly what is displayed in the map on your screen. Configure your map before clicking **Print Map**.

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Steps:

1. Set your map to display as you want it to look in your printout. This includes zooming to the appropriate level and panning the map to display the features you want to see in the printed map.
2. From the **Map Tools** toolbar (or the toolbar you specified for the **Print Map** tool), click **Print Map**.
   The **Print Map** pane opens, displaying the map at its current extent and zoom level.
3. Click **Print**.
   A second browser window opens, showing a preview of your printed map. The standard Microsoft Windows **Print** dialog box also opens.
4. Choose the desired print options and click **Print**.

Note:

- When using Internet Explorer, the **Print Map** tool is disabled if the browser is using Document Mode IE 8 standards.
- For IE 9, make sure your browser is set to use Document Mode IE 9 standards or higher. For example, SharePoint 2010 renders in IE 8 by default and the **Print Map** tool will be disabled. Switch the browser to use Document Mode IE 9 standards or higher to enable the tool.
- When printing custom symbol sets, custom symbols must specify symbols that are publicly and anonymously accessible. If the symbol images are hosted under a custom site, the site must be anonymously authenticated. No extra authentication is supported. For example, if you use a symbol URL that requires a user name and password, printing layers containing these symbols will fail.

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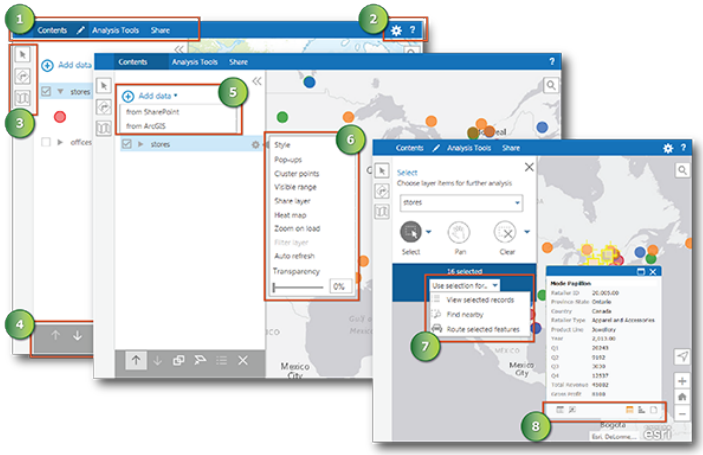
Change the default tools and behaviors

Esri Maps for SharePoint includes a standard set of tools and functionality, such as panning, zooming, selecting features, and routing. While the default tools cover a large range of functionality, you may want to add or remove tools to fulfill your users' needs.

You must be an administrator on the SharePoint site to access the Esri Maps for SharePoint configuration options.

Tool containers

Tools are displayed in the Esri Maps Web Part's tool containers. Customizable tool containers are as follows:



1. Main application menu
2. Right banner tools
3. Map contents toolbar
4. Map tools toolbar
5. Add data tools menu
6. Layer options pane
7. Selection tools menu
8. Toolbar on pop-ups

Built-in tools

Esri Maps for SharePoint comes with a variety of built-in tools that provide the basic functionality for the application. These include menus, buttons on toolbars, and tools selected through a menu.

You can add or remove these tools using the Esri Maps Web Part **Configuration** pane. The following images show the out-of-the-box tools included with Esri Maps for SharePoint and their location in the user interface.

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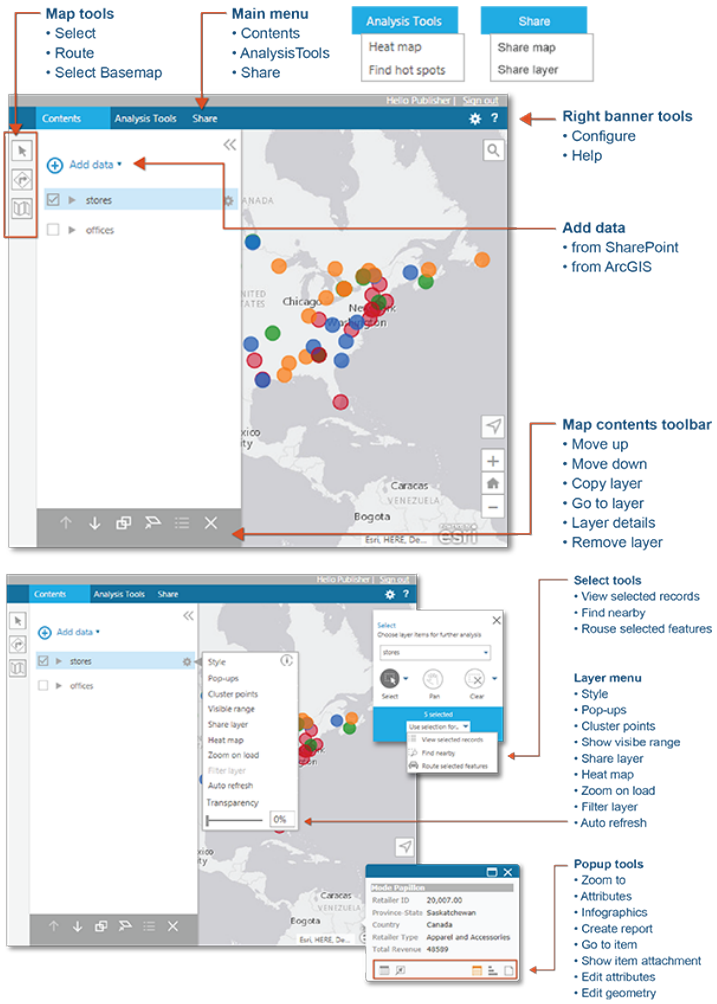

Add a tool

Prerequisite:
You must be an administrator on the SharePoint site to access the Esri Maps for SharePoint Administration menu.

Steps:

1. Edit your page and place the Esri Maps Web Part in Edit mode.
2. Click **Configure** to open the **Configuration** pane.
3. Under **Configure**, click **Tools**.
4. Click the tool container to which you want to add the tool.

   Note: When adding tools to the **Main** menu, tools must be placed under **Analysis Tools** or **Share**. Tools added to the root level will not appear in the Web Part.

5. Click **Add** (plus sign), expand the categories, and check the check box beside each desired tool.

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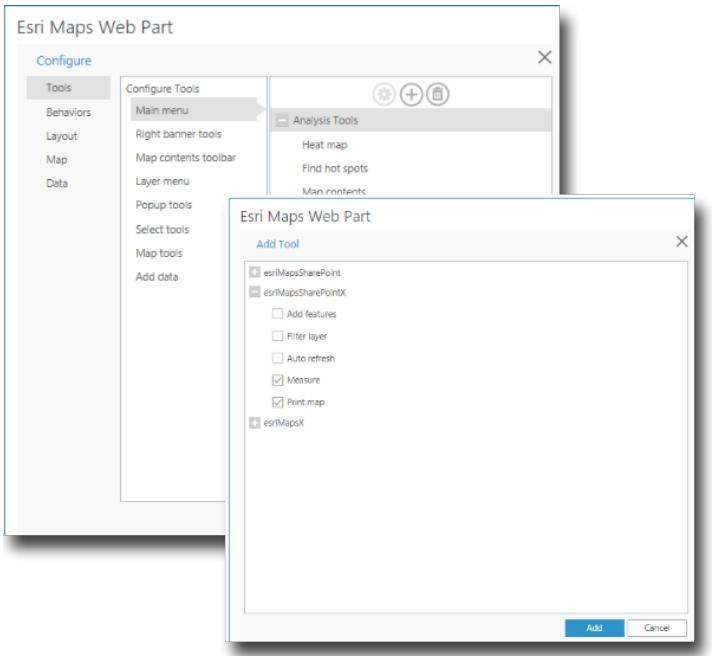
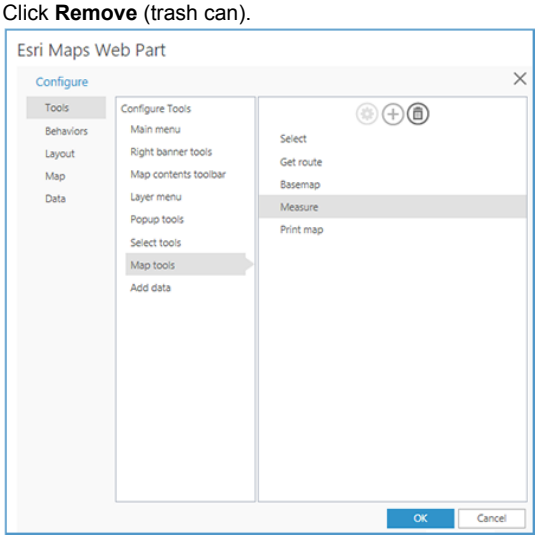


6. Click **Add** and click **OK** to close the **Configuration** pane.
7. Click **Apply** or **OK** on the Esri Maps Web Part properties pane to save changes to the map.
8. Click **Save** to save your page.

Remove a tool

Steps:

1. Edit your page and place the Esri Maps Web Part in Edit mode.
2. Click **Configure** to open the **Configuration** pane.
3. Under **Configure**, click **Tools**.
4. Click the tool container that contains the tools you want to remove.
5. Highlight the tool you want to remove.
6. Click **Remove** (trash can).



7. Click **OK** to close the **Configuration** pane.

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8. Click **Apply** or **OK** on the Esri Maps Web Part properties pane to save changes to the map.
9. Click **Save** to save your page.

Built-in behaviors

Behaviors execute functionality, but not in response to a particular user interaction (a mouse click, for example). Rather, behaviors are executed in response to some other mechanism; for example, behaviors can be created to respond to events fired by the map, a layer, other tools in the application, or even the hosting system itself.

One such behavior that can be configured for the Esri Maps Web Part is **Web Part Connectivity**. To configure this behavior, refer to Web part communication.

Custom tools

Esri Maps for SharePoint allows you to create your own custom tools and behaviors. For more information on creating custom tools, see the documentation section on extensibility.

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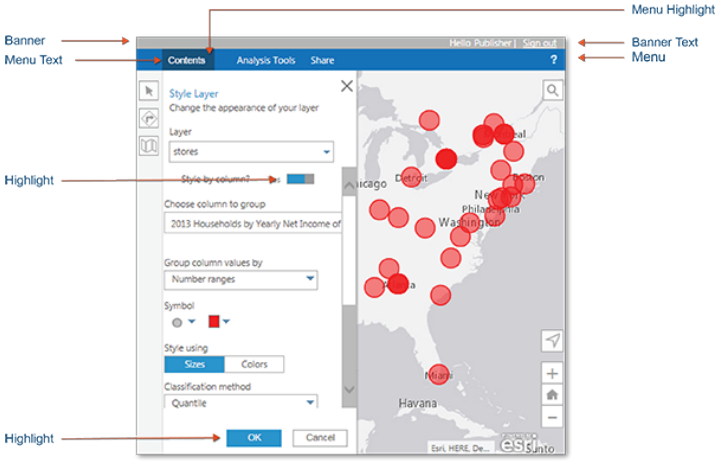
Change the layout colors

You can customize the look of the Esri Maps Web Part by changing the user interface (UI) layout colors and fonts.

You can customize the following areas of the layout:

- Banner
- Banner text
- Menu
- Menu text
- Menu highlight
- Highlight



To change the Web Part layout, do the following:

Steps:

1. Edit your page and place the Esri Maps Web Part into Edit mode.
2. Click **Configure** to open the **Configuration** pane.
3. Under **Configure**, click **Layout**.
4. To change the colors, use the color pickers or type the numeric RGB or HSV values.
5. To change the font, choose a font set from the **Default text** drop-down menu.
6. Click **OK**.
7. Click **Apply** or **OK** on the Esri Maps Web Part properties pane to save your changes.

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Change the map selection colors

You can customize the Esri Maps Web Part by changing the color of the selection tool. The color is applied when you select items on the map using the selection tool.

To change the Web Part selection color, do the following:

Steps:

1. Edit your page and place the Esri Maps Web Part into Edit mode.
2. Click **Configure** to open the **Configuration** pane.
3. Under **Configure**, click **Map**.
4. To change the selection color, use the color pickers or type the numeric RGB or HSV values.
5. Click **OK**.
6. Click **Apply** or **OK** on the Esri Maps Web Part properties pane to save your changes.

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Change the map data formats

You can customize the Esri Maps Web Part by changing the data formats displayed in the layout. The data format changes apply to percentage, currency, number, and date formats.

To change the Web Part layout, do the following:

Steps:

1. Edit your page and place the Esri Maps Web Part into Edit mode.
2. Click **Configure** to open the **Configuration** pane.
3. Under **Configure**, click **Data**.
4. Use the drop-down menus to choose data formats.
5. Click **OK**.
6. Click **Apply** or **OK** on the Esri Maps Web Part properties pane to save your changes.

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Overview

Esri Maps for SharePoint allows you to add functionality to your application by adding tools, behaviors, and custom picture marker sets using extension packs.

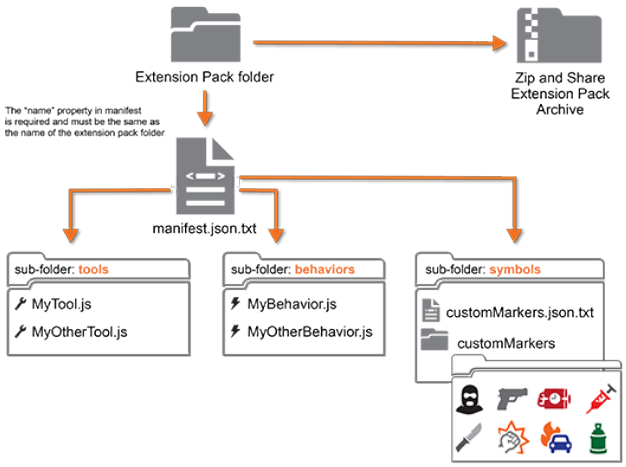
Extension packs

Central to extensibility in Esri Maps for SharePoint is the **extension pack**. An extension pack is a container for all tools, behaviors, and custom picture marker sets that can be loaded into the application.

An extension pack typically consists of a uniquely named folder that contains the required manifest file; the JavaScript files that describe the tool, behavior, or picture marker sets; and any required supporting files. Extension packs can contain more than one tool, behavior, or picture marker set.

The manifest is provided to Esri Maps for SharePoint in the form of a JSON file and must be named `manifest.json.txt`.

Although it is not required, it is generally a best practice to package tools, behaviors, and picture marker sets in separate, dedicated folders, as shown below.



Esri Maps for SharePoint can have multiple extension packs. The functionality available in Esri Maps for SharePoint on application startup is defined in the `tool_collections.json.txt` and `behaviors.json.txt` files in the Esri Maps for SharePoint Administration **Configuration Files** list. Site collection administrators can edit these files to modify the default tools and behaviors.

Extension pack names

Dojo keeps an internal list of namespaces and package names, and does not allow different packages to have the same name. If your extension pack contains a module that you reference using its absolute path (for example, `acme/stuff/SomeModule`), you must name the extension pack in the same manner as you would name the package in a regular Dojo application (for example, `acme`).

For example, the following references a module in a package named `acme`; in this case, the extension pack must be named `acme`:

```
define(["dojo/_base/declare", "esriMaps/extensions/tools/_Tool", "acme/stuff/SomeModule"], function(declare, _Tool, SomeModule) {
   return declare(_Tool, {
      constructor: function() {
         var myModule = new SomeModule();
      }
   });
});
```

If your code does not reference a module in the package using its absolute path, as shown in the code sample below, you can name your extension pack using any name that does not include special characters or spaces. You must ensure, however, that your tool or template code does not reference a specific module.

```
define(["dojo/_base/declare", "esriMaps/extensions/tools/_Tool", "./stuff/SomeModule"], function(declare, _Tool, SomeModule) {
   return declare(_Tool, {
      constructor: function() {
         var myModule = new SomeModule();
      }
   });
});
```

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Manifest file

The manifest included in an extension pack contains descriptions of the extensions contained within that extension pack; these include tools, behaviors, and picture marker sets. These descriptions, written in JSON format, outline the properties of each extension; for example, a tool's description must include name, location, and label properties, but may also optionally include other initial properties. The path defined in the location property is relative to the location of the manifest file.

The basic structure of an extension pack manifest, in JSON format, is as follows:

Caution:

Do not include comments in your JSON file.

```
{
    "name" : "myExtensions",
    "description" : "",
    "tools" : [],
    "behaviors" : [],
    "pictureMarkerSets": []
}
```

Where:

- name— Required. Name of the extension pack. Must be the same as the name of the extension pack folder, for example, **myExtensions**. See Extension pack names.
- description—Optional. Brief description of the extension pack.
- tools—Array of JSON objects, each describing an individual tool. See Tool description.
- behaviors—Array of JSON objects, each describing an individual behavior. See Behavior description.
- pictureMarkerSets—Array of JSON objects, each describing a custom picture marker set. See Picture Marker Set description.

Tool description

```
{
    "name" : "myTool",
    "location" : "./tools/MyTool.js",
    "label" : "My Tool",
    "description" : "This does something",
    "iconClass" : "logToolIcon",
    "showTooltip" : true,
    "tooltip" : "tooltip message"
}
```

Where:

- name—Tool name; must be unique within the manifest.
- location—Path to the tool's JS file, relative to `manifest.json.txt`.
- label—Label displayed in the application's user interface.
- description—Optional. Brief description of the tool.
- iconClass—Optional. Name of the CSS class used to style the tool's icon.
- showTooltip—Optional. If true, displays the tooltip defined in the tooltip property.
- tooltip—Optional. Defines the content of the tooltip.

The `name`, `location`, and `label` properties are required; other properties are optional.

Behavior description

```
{
    "name" : "myBehavior",
    "location" : "./behaviors/MyBehavior.js",
    "label" : "My Behavior"
}
```

Where:

- name—Behavior name; must be unique within the manifest.
- location—Path to the behavior's JS file, relative to `manifest.json.txt`.
- label—Label displayed in the application's user interface.

Picture marker set description

```
{
    "label" : "My Picture Marker Set",
    "description" : "This is my Picture Marker Set",
    "location" : "./symbols/MyPictureMarkerSet.json.txt"
}
```

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Where:

- label—Label displayed in the application's user interface.
- description—Optional. Brief description of the picture marker set.
- location—Path of the picture marker set's JSON.txt file, relative to `manifest.json.txt`.

Example

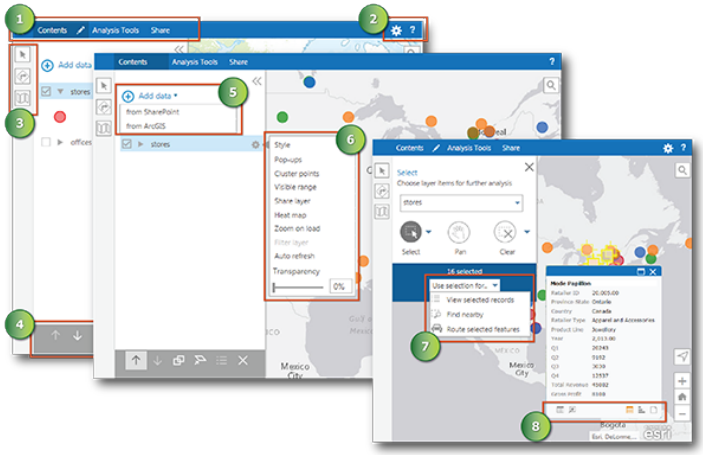
The following code shows an example of a populated manifest.json.txt file. It contains the definition for two tools, one behavior, and one picture marker set.

```
{
    "name" : "myExtensions",
    "description" : "",
    "tools" : [
        {
            "name" : "MyTool",
            "location" : "./tools/MyTool.js",
            "label": "My Tool"
        },
        {
            "name" : "MyOtherTool",
            "location" : "./tools/MyOtherTool.js",
            "label" : "My Other Tool"
        }
    ],

    "behaviors" : [
        {
            "name" : "MyBehavior",
            "location" : "./behaviors/MyBehavior.js",
            "label" : "My Behavior"
        }
    ],

    "pictureMarkerSets": [
        {
            "label": "My Picture Marker Set",
                   "description" : "My Picture Marker Set",
            "location": "./symbols/MyPictureMarkerSet.json.txt"
        }
    ]
}
```

Tool collections

Tool collections are named sets of tools; they determine which tools are displayed and made available to the user. The Esri Maps for SharePoint layout is composed of tool containers, a series of widgets that can be configured to display different sets of tools and behaviors. Each tool container is responsible for displaying a specific set of named tool collections.

The following images show the default tool collections:



1. **main**—Menu items that appear on the main menu, for example, Analysis Tools and Share.
2. **rightBanner**—Tools on the application's main right banner tools toolbar, for example, Configure and Help.
3. **mapTools**—Tools on the Map tools toolbar, for example, Select, Route, and Basemap.
4. **layerPrimary**—Tools on the application's Map contents toolbar, for example, Move up, Move down, Duplicate layer, Zoom to, Layer details, and Remove layer.
5. **addData**—Tools on the Add data drop-down menu, for example, from SharePoint and from ArcGIS.
6. **layerSecondary**—Tools or widgets related to a selected layer, for example, Style, Pop-ups, Cluster points, and Filter layer.

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7. **select**—Tools available from the Select Tools drop-down menu, for example, View selected records, Find nearby, and Route selected features.
8. **popup**—Tools on the pop-up toolbar, for example, Zoom to, Open Item, and Infographics.

The tool collection has a configuration file in JSON format, named tool_collections.json.txt. The file lists the IDs of tool collections, relative to the layout's tool containers. Each tool collection can contain individual tools, or tools assembled into tool groups. For each tool, the file lists the unique ID and name of the tool, along with the path of the extension pack that contains it.

For example:

Caution: Comments are included here for documentation purposes only. Do not include comments in your JSON files.

```
[{
  "id": "main",                                 // ToolCollection ID
  "tools": [{                                   // first ToolGroup in ToolCollection
    "label": "First Menu",                      // label of ToolGroup
    "tools": [{                                 // tools included in this ToolGroup
        "name": "Menu1",                        // tool name
        "extensionPackName": "myExtensions"     // extension pack that contains the tool
    }, {
        "name": "Menu2",                        // tool name
        "extensionPackName": "myExtensions"     // extension pack that contains the tool
    }]
  }, {                                          // second ToolGroup in ToolCollection
    "label": "Second Menu",                     // label of ToolGroup
    "tools": [{                                 // tools included in this ToolGroup
        "name": "Tool1",                        // name of tool
        "extensionPackName": "myExtensions"     // extension pack that contains the tool
    }, {
        "name": "Tool2",
        "extensionPackName": "myExtensions"
    }, {
        "name": "Tool3",
        "extensionPackName": "myExtensions"
    }, {
        "name": "Tool4",
        "extensionPackName": "myExtensions"
    }]
  }]
}]
```

Note: When you define a tool, the tool's name attribute must match the tool name specified in the tool's extension pack manifest (`manifest.json.txt`).
To see the default Tool Collection definition, see `tool_collection.json.txt` listed under **Configuration Files** in the Esri Maps for SharePoint **Site settings**. This file determines the tools that are loaded when creating a new Esri Maps Web Part. You can modify the tool definitions to overwrite properties defined in the extension pack's manifest or other properties. For example, to change a tool's label at run time, edit the value in the tool collection.

For example:

```
. . .
"name" : "MyTool",
"extensionPackName" : "MyExtensions",
"label" : "Display a different label",
"newProperty" : "new value"
```

Behavior definition

You can define one or more behaviors in Esri Maps for SharePoint. Behaviors are defined in a configuration file in JSON format, named `behaviors.json.txt`. This file is in the **Configuration Files** list of the Esri Maps for SharePoint **Site settings**. You can modify the behavior definitions to overwrite properties defined in the extension pack's manifest or other properties.

For example:

```
[{
    "name": "MyCustomBehavior",
    "extensionPackName": "MyExtensions"
}]
```

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Requirements

Web server

Developing with the Esri Maps extensibility framework requires a web server.

For additional information on options for configuring a development environment, see Set up a development environment.

Supported browsers

The Esri Maps for SharePoint extensibility is built on the ArcGIS API for JavaScript and supports the same browsers. See Supported browsers for details.

JavaScript and Dojo

The Esri Maps for SharePoint extensibility is built on the ArcGIS API for JavaScript, so a familiarity with both the JavaScript programming language and Esri's JavaScript API is essential. See ArcGIS API for JavaScript Overview to get started. Additionally, Esri uses Dojo, an open source toolkit, to simplify the development process and to ensure that its applications behave the same in different browsers. For more information, see Working with dojo or the Dojo Toolkit Reference Guide. The Esri Maps for SharePoint extensibility supports only Asynchronous Module Definition (AMD) style code.

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Naming conventions

The Esri Maps for SharePoint extensibility follows the Dojo coding style outline on the Dojo Toolkit website.

Additionally, the Esri Maps for SharePoint extensibility uses the following conventions:

- **_ClassName**—An abstract base class, for example **_Adapter**. These names are nouns written in UpperCamelCase, preceded by an underscore character. Abstract base classes should never be instantiated.
- **_NameMixin**—A mixin class, for example, **_SelectedLayerMixin**. These names are nouns written in UpperCamelCase, preceded by an underscore character and always include the term Mixin.
- **__VirtualClassName**—Denotes a class that exists for documentation purposes only; it cannot be instantiated.

  A virtual class describes either of the following:
  - the type of object that should be passed as a parameter to a method; for example, a keyword argument
  - the return value of a method

  These names are written in UpperCamelCase and are preceded by a double underscore.

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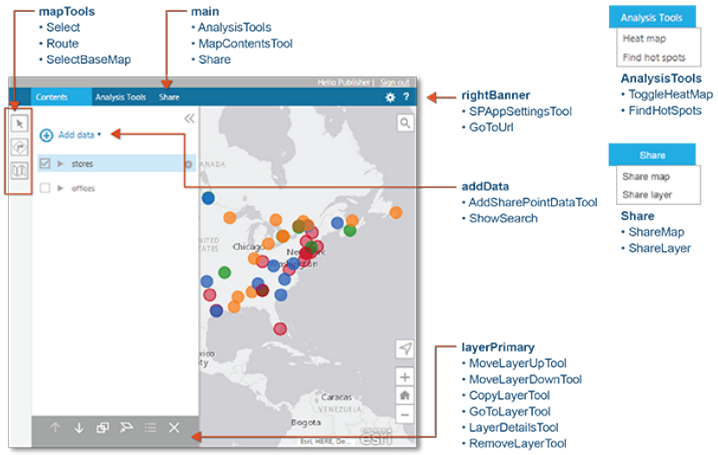
Create a tool

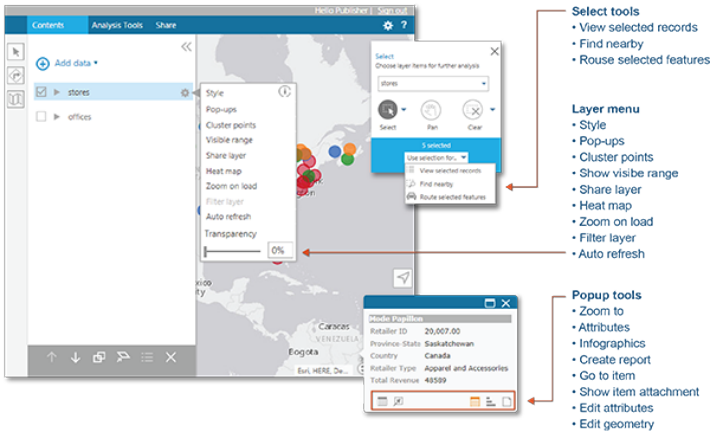
As a developer, you may want to add functionality to Esri Maps for SharePoint by creating custom tools. Tools are executed through user interaction. They can be added as buttons, tools, or menu items to tool containers in the map.

Built-in tools

Esri Maps for SharePoint comes with a variety of built-in tools that provide the basic functionality for the application. These include menus, buttons on toolbars, and tools selected through a menu.

The following image shows the built-in tools included with Esri Maps for SharePoint. These are defined in `tool_collection.json.txt`, listed under **Configuration Files** in the Esri Maps for SharePoint **Site settings**.





Create a new tool

The following example illustrates the implementation of a tool that displays an alert message when clicked. For more information, see the Tool class documentation in the API reference section.

```
define([
        "dojo/_base/declare",
        "esriMaps/extensions/tools/_Tool"
        ], function (declare, _Tool) {

return declare([_Tool], {
        message: "Welcome!",
        label: "My Tool",
        description: "This is my custom tool",
        execute:function(){     // Function called when tool is clicked in the app
                alert(this.message);
        },
        ...
});
```

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Tools that show widgets

Some tools need to show widgets as part of their functionality. When implementing a tool that shows a widget, it is recommended that you implement the following logic to check for the existence of the widget.

Additionally, when uploading extensions with widgets with templates (.html files) from a URL, there is the potential for a cross-domain error if the extension pack location is on a different domain than the SharePoint server. To resolve this, there are two options:

- Embed the HTML content into the widget's JavaScript file. This makes for a longer file but resolves the issue.
- Use the Dojo build process to bundle multiple resources into a single resource.

Here are the solutions:

- The tool.execute method is called for the first time.
- The tool creates an instance of the widget and stores a reference to it on the tool.
  For example:
  ```
  this._myWidget = new MyWidget({
      layer:this.selectedLayer
      });
  ```
- The tool shows the widget by calling the following:
  ```
  layout.showWidget(this._myWidget)
  ```
- The tool creates a listener for an event to destroy the widget and delete the reference to the widget.
  For example:
  ```
  widget.on('ok', function(){
      widget.destroy();
      tool._myWidget = null;
      }
  );
  ```
- Check to see if the reference to the widget still exists; if it does, it means the user didn't close the tool.
  If the reference still exists, set the properties on the existing widget (`this._myWidget.set('layer', this.selectedLayer)`) to update the state of the widget and call `layout.showWidget(this._myWidget)` again. The layout should bring the widget forward if it was hidden by another widget.

Set a tool's icon

Some tools display an icon, while others only display text. To set the icon for a tool, you must first create an icon, and then create a style sheet and assign the style rule to the tool.

- Create an icon that measures 24x24 pixels to best fit into the layout. Use an existing icon as a guideline for colors and positioning.
- Create a CSS style sheet with a class rule that contains the icon as a background image.
  For example:
  ```
  .myToolIcon {
          background-image:url(./umbrella.png);
      }
  ```
- Assign the class rule to the iconClass property of the tool, either in the tool module or in the tool's manifest.
  To load the class rule, you must inject the CSS style sheet into the page. You can use the xstyle package for this purpose.

  Your tool module would then resemble the following:
  ```
  define([
      "dojo/_base/declare",
      "esriMaps/extensions/tools/_Tool",
      "xstyle!./stylesheet.css"
      ], function(declare, _Tool) {
      return declare([_Tool], {
          message:"My tool",
          isDisabled:false,

          execute:function() {
              console.log(this.message);
              }
      });
  });
  ```

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If you added the iconClass to the tool's manifest, the code would resemble the following:

```
{
    "tools": [{
        "name": "MyTool",
        "location": "./tools/MyTool.js",
        "label": "This is my tool",
        "iconClass": "myToolIcon"
    }]
}
```

Add a tool to Esri Maps for SharePoint

Tools, behaviors, and picture marker sets are packaged in collections named extension packs, which consist of the code files for each extension, any supporting files, and a manifest file that describes the extensions contained within that extension pack. These descriptions, written in JSON format, outline the properties of each extension; for example, a tool's description must include name, location, and label properties, but it may also include other optional properties.

See Add extensions for more information.

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Create a behavior

As a developer, you may want to add functionality to Esri Maps for SharePoint by creating custom behaviors. Behaviors are extensions that execute functionality, but not in response to a particular user interaction (a mouse click, for example). Rather, behaviors are executed in response to some other mechanism; for example, behaviors can be created to respond to events fired by the map, a layer, other tools in the application, or even the hosting system itself.

All behaviors extend the `esriMaps/extensions/behaviors/_Behavior` base class. Behaviors triggered by events on a specific layer extend the `esriMaps/extensions/behaviors/_LayerBehavior` class; those triggered by events on the map itself extend the `esriMaps/extensions/behaviors/_MapBehavior` class. Behaviors triggered by an event on a specific target extend the `esriMaps/behaviors/_EventBehavior` class.

Create a new behavior

The following example shows the implementation of a behavior that uses a browser's window.console to log the extent of the current map whenever the extent changes. For more information, see the Behavior class documentation in the API reference section.

```
require(["dojo/_base/declare", "esriMaps/extensions/behavior/_MapBehavior"], function(declare, _MapBehavior) {
    return declare(_MapBehavior, {
        eventName: "extent-change",

        execute: function(delta, extent, levelChange, lod) {
            console.log("Extent changed", this.map, extent);
        }
    });
});
```

Add a behavior to Esri Maps for SharePoint

Tools, behaviors, and picture marker sets are packaged in collections named extension packs, which consist of the code files for each extension, any supporting files, and a manifest file that describes the extensions contained within that extension pack. These descriptions, written in JSON format, outline the properties of each extension; for example, a behavior's description must include name and location properties, but it may also include other optional properties.

See Add extensions for more information.

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Create picture marker sets

As a developer, you may want to customize the symbols within Esri Maps for SharePoint by creating custom picture marker sets. Picture marker sets are extensions that add custom symbols to symbolize your data. Custom symbols can consist of images such as PNGs and JPGs, or URLs to an image.

pictureMarkerSet.json.txt file

When you create a custom picture marker set, you place an array of picture marker set definitions in a JSON configuration file named <picturemarkersetname>.json.txt, and place the file in the same folder as the custom symbols in the extension pack. This file determines the picture marker sets that are loaded symbolizing data.

Create a new picture marker set

The following example shows the implementation of a picture marker set that uses two images: one packaged with the extension pack and the second one as a URL pointing to an image.

```
[
    {
        "type": "esriPMS",
        "url": "extensionPackName/symbols/image1.png",
        "width": "20",
        "height": "20",
        "xoffset": "0",
        "yoffset": "10"
    },
    {
        "type": "esriPMS",
        "url": "http://mypicturemarkerset.com/somepicture",
        "width": "20",
        "height": "20",
        "xoffset": "0",
        "yoffset": "10"
    }
]
```

Note: Some restrictions apply when naming your extension pack. If your picture marker set references a module by its absolute path (for example, `acme/stuff/SomeModule`), you must name the extension pack in the same manner as you name the package in a regular Dojo application (for example, acme). For more information, see Extension pack names.

Add a picture marker set to Esri Maps for SharePoint

Tools, behaviors, and picture marker sets are packaged in collections named extension packs, which consists of the code files for each extension, any supporting files, and a manifest file that describes the extensions contained within that extension pack. These descriptions, written in JSON format, outline the properties of each extension; for example, a picture marker set's description must include label and location properties but may also include other optional properties.

See Add extensions for more information.

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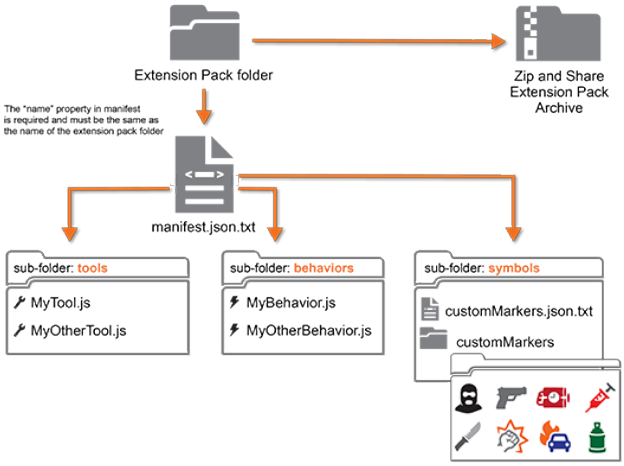
Add extensions

Esri Maps for SharePoint comes with a standard set of tools and functionality, such as panning, zooming, selecting features, and routing. While the default tools cover a large range of functionality, you may want to develop custom functionality to fulfill your users' needs. Esri Maps for SharePoint provides an extensibility framework that allows you to develop tools and behaviors.

After you create your extensions, you add them to an extension pack. An extension pack consists of the tool or behavior code, custom picture marker sets, any supporting files, and a manifest file that lists the name and path to those modules, along with other optional properties. The extension pack format allows you to bundle multiple extension types into a single package that can easily be shared.

Although it is not required, it is generally a best practice to package tools, behaviors, and picture marker sets in separate, dedicated folders, as shown below.



Create an extension pack

Tools, behaviors, and custom picture marker sets must be packaged in collections named extension packs. These extension packs allow for easy deployment and sharing of tool or behavior collections.

To create an extension pack, do the following.

Steps:

1. Create your custom tool, behavior, or picture marker set. See Create a tool, Create a behavior, or Create a picture marker set.
2. Create a manifest file named `manifest.json.txt`.
   The manifest included in an extension pack contains descriptions of the extensions within that extension pack; these include tools, behaviors, and picture marker sets. These descriptions, written in JSON format, outline the properties of each extension; for example, a tool's description must include `name` and `location` properties (and a `label` property for tools), but may also optionally include other initial properties. The path defined in the `location` property is relative to the location of the manifest file. The extension pack's `name` property is required.

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The following code illustrates a manifest file that lists a custom tool, a custom behavior, and a custom picture marker set. The `name` properties for tools and behaviors must match the name attributes specified in the tool collections and behaviors configuration files, respectively. The tool includes the required `label` property, which will appear in the application's UI, and an optional `tooltip` property, which defines the message that appears when a user hovers over the tool.

```
{ "name": "extensionPack",
  "description": "Basic tool, behavior, and picture marker set examples",
    "tools": [{
        "name": "myTool",
        "location" : "./tools/myTool.js",
        "label" : "My Tool",
        "tooltip" : "An example of a custom tool"
    }],
    "behaviors": [{
        "name": "myBehavior",
        "location" : "./behaviors/myBehavior.js"
    }],
    "pictureMarkerSets": [{
        "label": "Display Label",
        "description" : "My custom markers",
        "location": "./symbols/myPictureMarkers.json.txt"
    }]
}
```

3. Place the manifest file in a folder named according to the `name` property in the manifest.

   Note: Some restrictions apply when naming your extension pack. If your tool or behavior references a module by its absolute path (for example, 'acme/stuff/SomeModule'), you must name the extension pack in the same manner as you name the package in a regular Dojo application (for example, 'acme'). For more information, see Extension pack names.

4. In the extension pack folder, create separate subfolders for tools, behaviors, and symbols, and place all related behavior, tool, and picture marker files in the appropriate folders.
   Although this is not required, it is considered a best practice.
   - For tools and behaviors, the subfolders (tools | behaviors) should include the tool or behavior's JavaScript file and any related resources files. (See Create a tool or Create a behavior.)
   - For picture marker sets, the subfolder (symbols) should include the picture marker set definition file and all related resource files, such as images. (See Create picture marker sets.)
5. Zip the extension pack folder and place the zipped package in a location that can be accessed by Esri Maps for SharePoint.
6. The extensions folder and its contents constitute your extension pack.

Add to SharePoint 2010 or 2013

To add an extension pack to SharePoint 2010 or 2013, do the following:

- Add the extension pack to the Extensions list.
- Add the extension pack to the Esri Maps Web Part.

Add to Extensions list

Prerequisite:
You must be an administrator on the SharePoint site to access the Esri Maps for SharePoint Administration menu.

Steps:

1. Browse to the site's **Site Settings**.
2. Under **Esri Maps for SharePoint Administration**, click **Manage Extensions**.
3. Click the **Add extension packs** drop-down arrow and choose one of the following:
   - Upload—Add an extension pack from your computer or other location. The extension pack must be compressed with a .zip file extension.
   - Link from SharePoint—Add an extension pack that already exists in the SharePoint site. The extension pack must reside in a document library on an accessible SharePoint site. The extension pack must not be compressed into a ZIP file; the entire extension pack including all folders and files must be uploaded to the document library. The manifest.json.txt file must be accessible at the root.
   - Link from Address—Add an extension pack from any website as long as it allows anonymous access for downloading. The extension pack must not be compressed into a ZIP file; the entire extension pack including all folders and files must be uploaded. The manifest.json.txt file must be accessible at the root.

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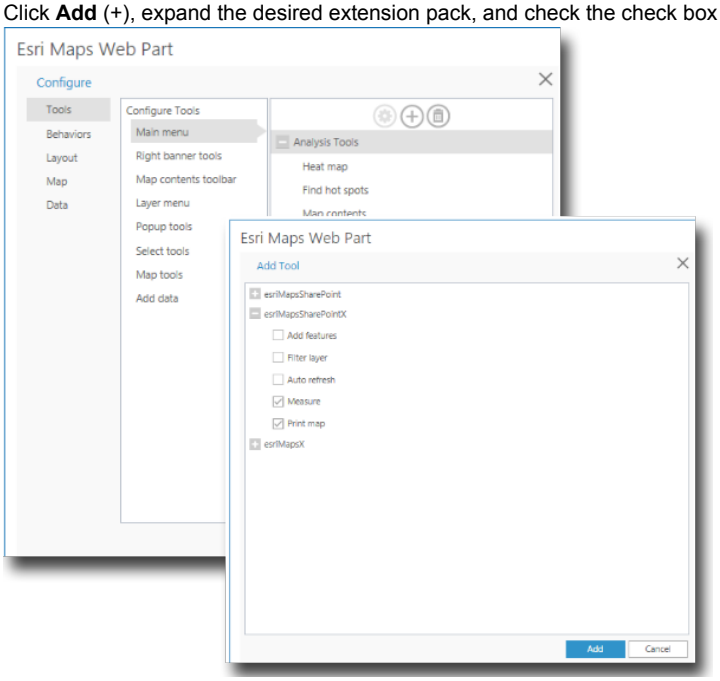
Add to Esri Maps Web Part

Steps:

1. Edit the page and place the Esri Maps Web Part in Edit mode.
2. Click **Configure** to open the **Configuration** pane.
3. Under **Configure**, click **Tools** or **Behaviors**, depending on which type of extension you want to add.
   When adding tools to the Main menu, tools must be placed under **Analysis Tools** or **Share**. Tools added to the root level will not appear in the Web Part.
4. Click **Add** (+), expand the desired extension pack, and check the check box beside the extension you want to add.



5. Click **Add** and click **OK**.
6. Click **Apply** or **OK** on the Esri Maps Web Part properties to save changes.
7. Click **Save** to save the page.

Share an extension pack

You can share extension packs by packaging the extensions folder into an archive (ZIP file) and distributing the archive to your colleagues. Ensure that the folder contains all the custom tool and behavior JavaScript files, picture marker definitions, and the manifest.json.txt file, along with any other supporting files.

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Samples

The samples listed below demonstrate basic extensibility functionality available with Esri Maps for SharePoint. Each sample is already in the required extension pack format; download the ZIP file and add it according to the instructions in Add extensions.

Basic Extension Pack	This sample demonstrates configuring an extension pack with a custom tool and a behavior. • A custom tool that displays a message in the alert dialog box when the tool is clicked • A custom behavior that displays a message in the alert dialog box on a map click event
Measure widget	This sample demonstrates configuring widgets from the ArcGIS API for JavaScript. The measurement widget is displayed in the Map Contents pane. Esri Maps for SharePoint already contains a Measure tool by default; therefore, this sample demonstrates how to include a premade widget in the app.
Constrain extent	This sample demonstrates a behavior that constrains the map extent to a certain geographic location.
Redfin Search	This sample demonstrates integration with the Redfin real estate listing search. This tool is designed to reside on the pop-up toolbar. This tool works with point layers in the map.
SharePoint communication via the JavaScript Client Object Model	This sample contains a Hello World sample to demonstrate communication with SharePoint via the JavaScript Client Object Model. See the JavaScript API reference for SharePoint 2013 or the JavaScript Class Library (SharePoint 2010) for more information. This sample applies to SharePoint on-premises only.

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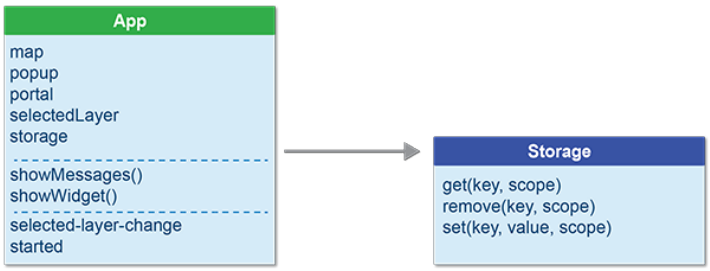
email: contracts@esri.com

App

App is the main class that instantiates the application. It defines the mapping application and exposes map functionality. Storage provides an interface for storing and retrieving information for the application.



App

Properties

Name	Type	Summary
map	esri/Map	Returns the instance of the Map in the App.
popup	esri/dijit/Popup	The Popup.
portal	esri/arcgis/Portal	An instance of a Portal for ArcGIS object.
selectedLayer	esri/layers/Layer	The currently selected layer in the **Contents** pane.
storage	Object	Provides functions to store and retrieve information.

Methods

Name	Return Type	Summary
showMessage(title, message, confirm)	Nothing	Used to display a message.
Method details:		
· title		Title text displayed at the top of the message.
· message		Message text to display under the title.
· confirm		Boolean value indicating if the message has an **OK** button when confirm = false or **Yes** and **No** buttons when confirm = true.
showWidget(widget, options)	Dialog	Used to show a widget.
Method details:		
· widget		The dojo widget to display.
· options		Options to display. JSON format indicating the title of the widget container, subtitle of the widget container, and whether the widget is modal or non-modal. By default, the widget will be nonmodal (showModal = false).

Events

On Event	Event Properties	Description
selected-layer-change	esri/layers/Layer	Fires when the selected layer changes.
started		Fires when the app loading sequence has completed and the App has started.

Storage

Methods

Name	Return Type	Summary
get(key, scope)	Any	Returns the value associated with the specified key. If scope is specified, then the key-value map will only be retrieved from the respective storage; otherwise, this function will check all storage methods.
Method details:		
· key		The key to use to retrieve the value.
· scope		The scope of the value to retrieve.

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remove(key, scope)	Nothing	Removes the key-value pairs associated with the specific key from storage.
Method details:		
· key		The key to be removed from storage.
· scope		The scope of the value to be removed.
set(key, value, scope)	Nothing	Stores a key-value map. If scope is specified, then the key-value map will be stored with the respective storage method.
Method details:		
· key		A key with which to store the value.
· value		The value to store.
· scope		The scope of the value to be set.

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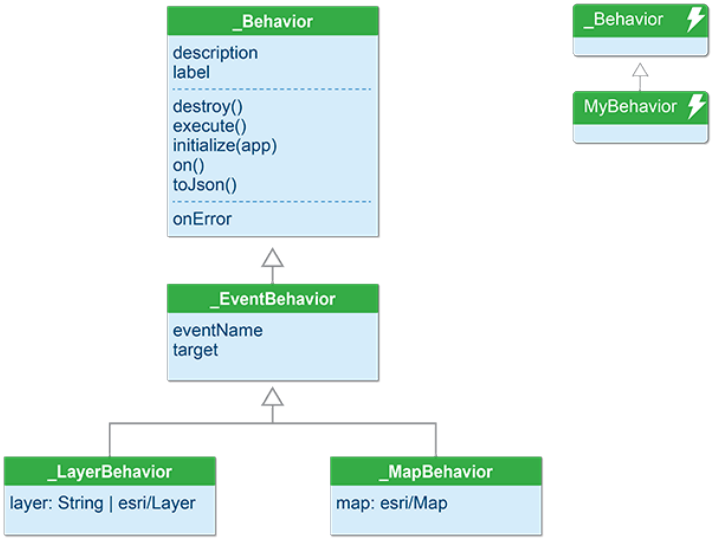
Behavior

As a developer, you may want to add functionality to Esri Maps for SharePoint by creating custom behaviors. Behaviors are extensions that execute functionality, but not in response to a particular user interaction (a mouse click, for example). Rather, behaviors are executed in response to some other mechanism; for example, behaviors can be created to respond to events fired by the map, a layer, other tools in the application, or even the hosting system itself.



_Behavior

The base class for all behaviors.

```
define([
   "dojo/_base/declare",
   "dojo/_base/lang",
   "esriMaps/extensions/behaviors/_Behavior"
], function(declare, lang, Behavior) {

   // Create a custom behavior by inheriting _Behavior class
   return declare([Behavior], {
       label: "Time Refresh Behavior",
       description: "Time Refresh Behavior",
       initialize: function(app) {
           // Set a timer to call execute every 10 seconds.
          window.setInterval(lang.hitch(this, this.execute), 10000);
       },
       execute: function() {
           // When execute is called, log the current Date and Time to console.
           console.log (new Date());
       }
   });
});
```

_Behavior implements the following three dojo mixins:

- dojo/Stateful
- dojo/Evented
- dojo/Deferred

Properties

Name	Type	Summary
description	String	Description of the behavior.
label	String	Label for the behavior.

Methods

Name	Return type	Summary
destroy()	Nothing	Destroys the instance of the extension.
execute()	Nothing	Called in response to an event or an action. This function is called in response to an event. Use this function to write any actions that should be performed in response to the occurring event.
initialize(app)	Nothing	Initializes the extension.

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toJson	Object	Returns the properties of the Behavior as a JSON string. If there are properties or settings that need to be saved, return them as a JSON. When the App is saved, the App calls each of the object's toJson method to get the properties that need to be saved.

Events

On Event	Event Properties	Description
onError		Use to report and log errors encountered in an extension.

_EventBehavior

The following code sample illustrates the implementation of a behavior that shows the mouse pointer when a user clicks on the app window.

```
require([
   "dojo/_base_declare",
   "esriMaps/extensions/behaviors/_EventBehavior"
], function(_EventBehavior) {
   return declare(_EventBehavior, {
       target: window,
       eventName: 'click',

       execute: function(e) {
           console.log({
               x: e.clientX,
               y: e.clientY
           });
       }
   });
});
```

Properties

Name	Type	Summary
eventName	String	Defines the event that triggers the execution of the behavior.
target	Object	Specifies the object on which to listen for events.

_LayerBehavior

A LayerBehavior executes a function when an event on a specified layer is fired.

The following code illustrates a sample LayerBehavior that logs a message when the opacity of a specific layer changes.

```
require([
   "dojo/_base/declare",
   "esriMaps/extensions/behaviors/_LayerBehavior"
], function(declare, _LayerBehavior) {
    return declare(_LayerBehavior, {
        layer: "myLayer",
        eventName: "opacity-change",

        execute: function(opacity) {
            console.log("Layer opacity changed", this.layer, opacity);
        }
    });
});
```

Properties

Name	Type	Summary
eventName	String	Defines the event to listen for on the layer and which triggers the execution of the behavior.
layer	String | esri/Layer	The Layer in the Map, which is the source of the specified event. The layer may be specified as an ID or as an instance of a layer. If an ID is specified, this property will be replaced by an instance when the behavior is initialized. For more information, refer to the ArcGIS API for JavaScript help for Layer.

_MapBehavior

A MapBehavior executes a function when an event on the Map is fired.

The following code illustrates a sample MapBehavior that logs a message when the extent of the map changes.

```
require([
   "dojo/_base/declare",
   "esriMaps/extensions/behavior/_MapBehavior"
], function(declare, _MapBehavior) {
   return declare(_MapBehavior, {
       eventName: "extent-change",

       execute: function(delta, extent, levelChange, lod) {
           console.log("Extent changed", this.map, extent);
       }
   });
});
```

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Properties

Name	Type	Summary
eventName	String	Defines the event to listen for on the map and triggers the execution of the behavior.
map	String | esri/Map	The Map object that is the source of the specified event. For more information, refer to the ArcGIS API for JavaScript API help for Map.

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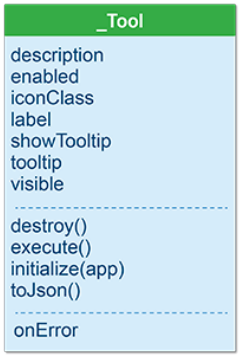
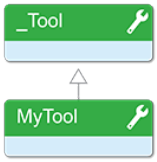
Tool

As a developer, you may want to add functionality to Esri Maps for SharePoint by creating custom tools. Tools are executed through user interaction. They can be added as buttons, tools, or menu items to tool containers in the map.





_Tool

This is the base class for all tools. Extend this class to create a custom tool.

Description

Tools are extensions that are executed through user interaction; they provide a way to expose logic in the map that should be initiated by the user, as opposed to behaviors, which react to events. Tools can be added as buttons or tools on toolbars and menus in the Esri Map app. The following code sample illustrates a custom tool that records the extents of the map.

```
define([
    "dojo/_base/declare",
    "esriMaps/extensions/tools/_Tool",
], function(declare, _Tool) {

return declare(_Tool, {

    label: "My Custom Tool",
    description: "A Tool that logs the Map extent",
    execute: function() {
        window.console.log (this.app.mapManager.map.extent);
   },

   ...

 });
});
```

_Tool implements the following three dojo mixins:

- dojo/Stateful
- dojo/Evented
- dojo/Deferred

Properties

Name	Type	Summary
description	String	Description of the tool.
enabled	Boolean	Indicates whether the tool is enabled. Use this property to define the availability of the tool. If the tool relies on the presence of a particular layer or particular state of the map, then use this property to disable the tool until the conditions are met. The default value is `true`.
iconClass	String	CSS class name. Specifies the CSS class name to use when the tool is placed in a tool container that shows icons.
label	String	Label for the tool.
showTooltip	Boolean	Defines the visibility of the ToolTip. Specifies whether the tool should display the ToolTip. The default value is `true`.
tooltip	String	The message displayed in the ToolTip. Specifies the message displayed as a ToolTip when the user hovers over the tool. If no ToolTip is set, accessing the ToolTip via `tool.get('tooltip')` defaults to the tool's description, or to the label if no description is set.
visible	Boolean	Defines the tool's visibility. Specifies whether a tool is visible. The default value is `true`.

Methods

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Name	Return type	Summary
destroy()	Nothing	Destroys the instance of the extension.
execute()	Nothing	Called when the tool is clicked. If the intended result of clicking the tool is to display a widget or a custom UI, call the code to show the widget in this function to implement the desired functionality.
initialize(app)	Nothing	Initializes the extension.
toJson	Object	Returns the properties of the tool as a JSON string. If there are properties or settings that need to be saved, return them as a JSON. When the app is saved, the app calls each of the object's toJson method to get the properties that need to be saved.

Events

On Event	Event Properties	Description
onError		Use to report and log errors encountered in an extension.

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Essential vocabulary

ArcGIS

ArcGIS provides an online infrastructure for making maps and geographic information available throughout an organization, across a community, and openly on the web. By signing in to your ArcGIS organization, you can access ready-to-use maps and apps, or create new maps that help you tell a story. With Esri Maps for SharePoint, you can combine your business data with data from ArcGIS to create rich maps that help you analyze your data visually and make better decisions. ArcGIS also makes it easy to share your maps and map layers within your organization or with colleagues in the field.

For more information, see Esri Maps for SharePoint and ArcGIS.

Basemap

A basemap provides a geographical context, or background, for the content you want to display in a map. With Esri Maps for SharePoint, you can choose from several Esri basemaps hosted on ArcGIS. These basemaps include many options that combine road, aerial, and topographic data with a variety of symbology. If your organization makes them available, you can also access basemaps in your ArcGIS Organization.

Clustering

Clustering in Esri Maps for SharePoint refers to grouping point features within a certain distance of each other into one symbol. This is different from grouping in Esri Maps for SharePoint where features are grouped by a user-specified category and styled accordingly. For more information, see Configure clustering.

Contents pane

The **Contents** pane is a central component of Esri Maps for SharePoint. The **Contents** pane displays the list of layers contained in the map, provides the ability to toggle layer visibility, and provides a starting point for setting layer properties such as styling, heat maps, transparency, visible range, clustering, and pop-ups.

Coordinate system

Coordinate systems provide a framework for defining real-world locations.

In Esri Maps for SharePoint, there are two supported coordinate systems: World Geodetic Survey 1984 (WGS84) and Web Mercator.

WGS84 is a geographic coordinate system in which every location on the earth is specified by a set of numbers (coordinates). Coordinates are often expressed as latitude and longitude values. Web Mercator is a projected coordinate system in which locations are identified by x,y coordinates on a grid, with the origin at the center of the grid. Coordinate values in the Web Mercator system generally have 6, 7, or 8 digits to the left of the decimal, and the units are meters. If you are unsure as to which coordinate system you should use, please contact the originator of your data or the person who collected it.

Coordinates

A set of values represented by the letters x and y that define a position within a spatial reference. Coordinates are used to represent locations in space relative to other locations. Coordinates are often shown in latitude-longitude pairs, where x coordinates range from -180 to 180 and y coordinates range from -90 to 90, or as values with 6, 7, or 8 digits to the left of the decimal point. When using Esri Maps for SharePoint, these value pairs are often composed of the values from two columns in your data.

Feature

Geographic features are representations of things located on or near the surface of the earth. Geographic features can occur naturally (such as rivers and vegetation), can be constructions (such as roads, pipelines, wells, and buildings), and can be subdivisions of land (such as counties, political divisions, and land parcels). Geographic features are most commonly represented as points, lines, or polygons. In Esri Maps for SharePoint, data you have added is often referred to as features on the map.

Feature service

A feature service is a collection of geographic features. Each feature in the collection has a location, set of properties, map symbology, and pop-up. In Esri Maps for SharePoint, you can search for feature services on ArcGIS and add them to your map. When you add a feature service to your map, it becomes one or more layers in the map.

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Grouping

Grouping in Esri Maps for SharePoint is the process of placing features in user-specified categories and styling them accordingly. See Feature display and style for more information.

Heat map

A heat map represents the geographic density of point features on a map by using colored areas to represent those points. The areas are largest where the most points are concentrated together. See Add a heat map for more information.

Layer

A layer is the way in which Esri Maps for SharePoint visually represents geographic datasets. A layer can be thought of as similar to a legend item on a paper map. On a road map, for example, roads, national parks, political boundaries, and rivers might be considered different layers. When you add SharePoint business data to a map, Esri Maps for SharePoint creates a layer and displays it on the **Contents** pane. Once the layer is created, functionality such as determining visibility, configuring style, and setting transparency are all enabled.

Lines

Lines represent the shape and location of geographic objects too narrow to depict as areas (such as street centerlines and streams).

Map

A map displays geographic data and allows you to explore and interact with that data. In Esri Maps for SharePoint, you can add SharePoint data directly to the map and combine it with additional content from ArcGIS Online.

Map service

A map service is a pre-styled collection of map cartography organized by location and scale. In Esri Maps for SharePoint, you can search for map services on ArcGIS and add them to your map. When you add a map service to your map, it becomes one or more layers in the map.

Pan (the map display)

Shift a map image relative to the display window without changing the viewing scale. Panning a map can also be thought of as moving the map image in the display window so that you can see different parts of the map.

Points

Points represent discrete locations of geographic features too small to be depicted as lines or areas, such as well locations, telephone poles, and stream gauges. Points can also represent address locations, Global Positioning System (GPS) coordinates, or mountain peaks.

Polygons/Areas

Polygons are enclosed areas (many-sided figures) that represent the shape and location of homogeneous features such as states, counties, parcels, and land-use zones. Polygons are often called areas.

Web map

An ArcGIS web map is an interactive display of geographic information that you can use to tell a story and answer questions. For example, you can create a map that addresses the question, 'How many people in the United States live within a reasonable walk or drive to a supermarket?' The map could contain layers showing neighborhoods within a 10-minute drive or 1-mile walk to a supermarket, and for context, a topographic basemap that includes cities, roads, and buildings overlaid on land cover and shaded-relief imagery. In Esri Maps for SharePoint, you can search for web maps on ArcGIS and add them to your map. When the web map is added to your map, the individual layers in the web map become layers in your map.

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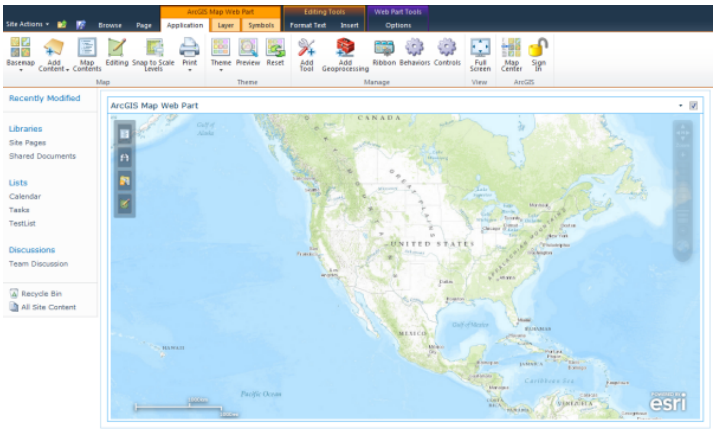
About the ArcGIS Map Web Part

Note: It is recommended that you use the JavaScript-based Esri Maps Web Part, as the ArcGIS Map Web Part, its configuration settings, and configuration files will no longer be available in future releases. The ArcGIS Map Web Part applies only for sites that have been migrated from previous versions.

The ArcGIS Map Web Part enables a rich display of SharePoint lists and ArcGIS Server services on an interactive map. The ArcGIS Map Web Part is the Silverlight-based web part and is available in both SharePoint 2010 and SharePoint 2013 on-premises.



With the ArcGIS Map Web Part, you can do the following:

- Use ArcGIS Online, Bing Maps, or ArcGIS for Server map services as basemaps.
- Add data from SharePoint lists, ArcGIS for Server, and GeoRSS feeds on top of your basemap.
- Open web maps from ArcGIS Online.
- Define the appearance of datasets (symbolize) using single, class breaks, or unique value symbols.
- Configure the functionality that is available in run mode.
- Display point features using clustering or heat maps.
- Configure the appearance of pop-up windows. Specify the pop-up window style and fields to display when you hover over map features.
- View tabular data for datasets within the map.
- Select records in the map and see them highlighted in the table and vice versa.
- Zoom to layers and selected features.
- Find items within a specified distance of point features.
- Export the tabular data from selected items to a CSV or TXT file.
- Print maps.
- Extend the web part with custom tools and behaviors based on the ArcGIS API for Silverlight and the ArcGIS Extensibility SDK for Silverlight.

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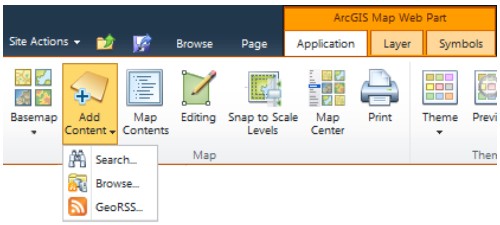
Add content to the map

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

The ArcGIS Map Web Part provides the ability to add layers to the map by browsing to or searching for SharePoint lists, ArcGIS Server services, and services from ArcGIS.com. Use **Browse** to view the data provided by a SharePoint site or an ArcGIS Server instance you already know about. Use **Search** to find places or discover layers to add.

Note: Open the **Browse** or **Search** panel by clicking **Add Content** on the **Application** tab of the ribbon and making a selection from the drop-down menu.



Browsing for content

Browsing to a SharePoint list

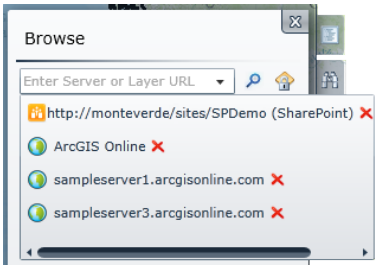
Prerequisite:
The ArcGIS Map Web Part only makes a SharePoint list available for adding to a map if the list has been spatially enabled. You can spatially enable a list of addresses using the Esri Maps Locate workflow, and spatially enable a list of coordinates by adding an Esri Maps Location field to the list.

SharePoint lists are tables of data made available through a SharePoint site. The ArcGIS Map Web Part can display SharePoint lists stored within any site in any SharePoint farm. A SharePoint farm can consist of one or more SharePoint servers that host one or more web applications, each of which can contain one or more site collections. Each site collection contains one or more sites, which is where lists are stored.

Note: The site's contents only display in the **Browse** panel if the site contains at least one spatially enabled list. If it does not, a message displays indicating that this is the case.

Steps:

1. Click the **Browse** drop-down arrow to choose a data source or enter the URL to any site within a SharePoint farm, and click the **Load Data Source** button (magnifying glass icon). You may notice that the current SharePoint site is included as a data source by default. After selecting a site, the spatially enabled lists contained within that site show on the **Browse** panel.



While SharePoint lists represent a dataset within SharePoint, SharePoint users always interact with lists through views. In the ArcGIS Map Web Part, this means that lists cannot be added directly. Rather, list views are what you actually add to the map. On the **Browse** pane, you can see the available views for a list by expanding the list's node.

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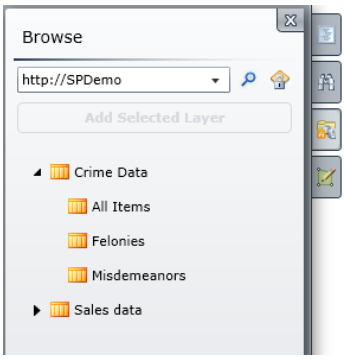


The Crime Data list contains three views—All Items, Felonies, and Misdemeanors.

2. Select the applicable view and click **Add Selected Layer**.

Browsing to ArcGIS Server services

The ArcGIS Map Web Part browse functionality allows you to add an ArcGIS Server service to the Map web part. The services made available by any ArcGIS Server REST endpoint can be viewed by selecting an endpoint from the **Browse** drop-down list or typing all, or part of a REST endpoint's uniform resource locator (URL) into the text box.

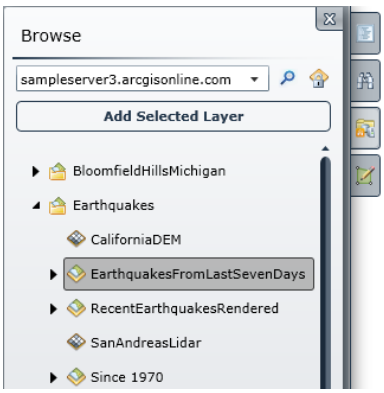
Note: When content is added while the ArcGIS Map Web Part is in edit mode, it persists with the map when the Web Part is saved. When the Map web part is not in edit mode, content can be added for the current session only.

Steps:

1. In the **Browse** panel, expand the drop-down list and choose the appropriate ArcGIS Server endpoint. ArcGIS Server endpoints show with a globe icon. Several ArcGIS Server endpoints are included by default. Alternatively, you can type the URL to an ArcGIS Server endpoint and click the **Load Data Source** button (magnifying glass icon). The services and folders provided by that endpoint display in the panel.

   Note: The data sources that appear by default in the drop-down list can be modified by editing the Esri Maps Connections list.

2. Select the applicable service and click **Add Selected Layer**. Several different layer types can be added. See Layer types for more information about the different types. The available ArcGIS Server layer types are as follows:
   - Cached and dynamic map services—These show with the same icon in the **Browse** panel:



   - Image services:

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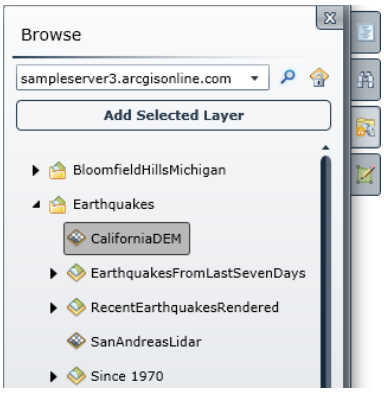
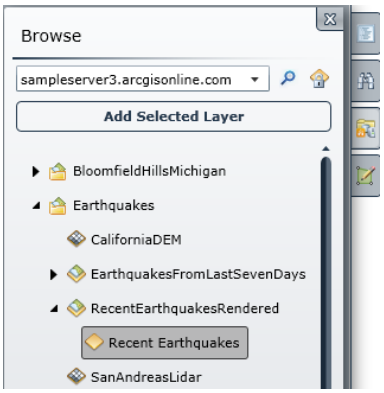
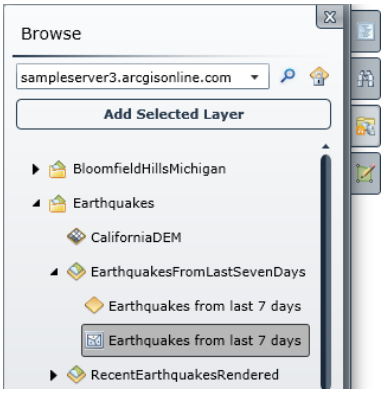


- Layers within map services—Since this layer type renders on the client, it offers additional functionality such as pop-up windows and symbology configuration:



- Feature service layers—As with layers within map services, this layer type renders on the client:



Note: All or part of the ArcGIS Server endpoint URL can be specified. When the full REST endpoint URL is specified, it must be in the format <scheme>://<host>:<port>/<instance>/rest/services. The host must always be specified, but the other parts of the URL will be filled in automatically with default values if they are not specified. A description of each part, as well as the default value for each, is provided in the following table:

Parameter	Description	Default value
scheme	Protocol of the URL—http or https.	http
host	Domain (for example, serverapps.esri.com) or machine name (for example, serverapps).	N/A

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Searching for content

The search functionality allows you to search for places using the World Geocoder service; search ArcGIS.com to find map, feature, and image services; and search the web for the ArcGIS Server services containing the specified keyword.

Searching places

With the search functionality provided by the ArcGIS Map Web Part, you can find addresses, monuments, geographic entities (for example, cities or states), intersections, landmarks, or other points of interest.

Steps:

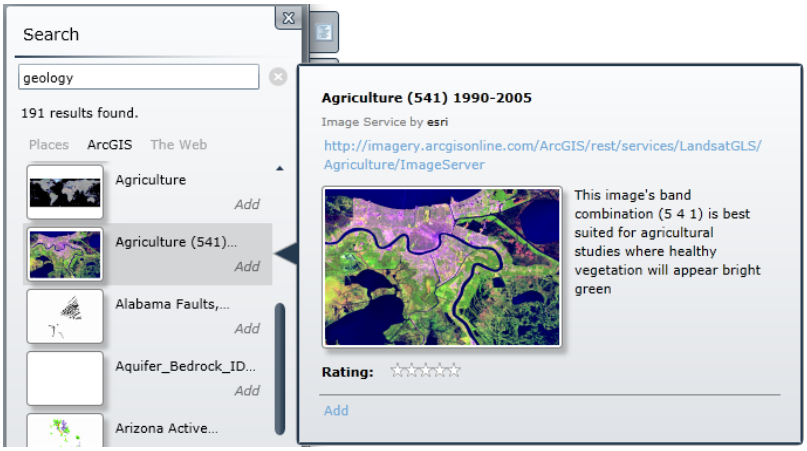
1. Click **Places** (if necessary) on the **Search** pane.
2. Type your search criteria and click the magnifying glass icon or press **Enter** to execute the search. The search results are shown in the **Search** pane below the search text box.
   In general, the more specific you are in your search, the greater the likelihood you will find what you're searching for; therefore, provide as much detail as you can. For example, compare the results of a search for `San Carlos` with a search for `San Carlos, CA`.
3. To add a place to the map, click **Add** next to the place.

Searching ArcGIS

Searching ArcGIS provides access to content such as a map service, feature service, or image service shared by Esri and GIS users around the world.

Steps:

1. Click **ArcGIS** on the **Search** pane.
2. Type your search criteria and click the magnifying glass icon or press **Enter**. All map, feature, and image services that match your criteria show in the **Search** panel
3. Hover over a result to get more information about it. The result's title, owner, URL, thumbnail, description, and rating show.



4. Click **Add** to add the result to the map.

Searching the web

The ArcGIS Map Web Part search functionality allows you to search for map, feature, and image services that are publicly available on the Internet.

Steps:

1. Click **The Web** on the **Search** pane.
2. Type your search criteria and click the magnifying glass icon or press Enter to execute the search. The results are listed on the **Search** pane below the search text box.
3. Hover over a result to see more information about it. A pop-up window appears containing the service's URL, description, and copyright information.

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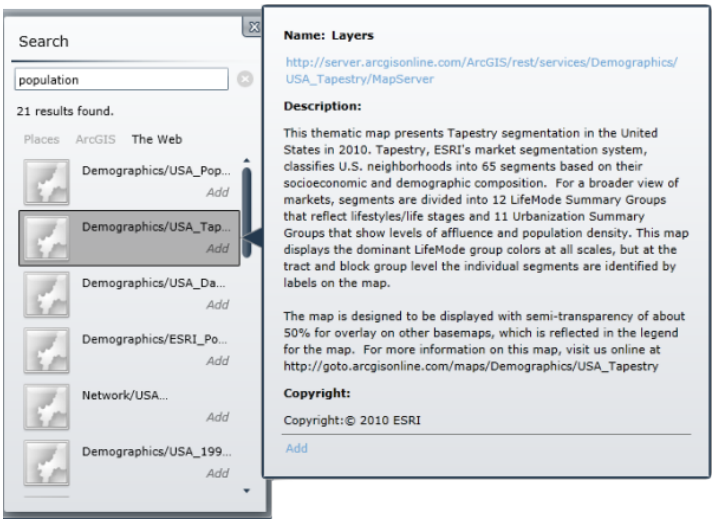

4. To add a result to the map, click **Add** for that result.

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Configure basemaps

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part. The Basemap gallery of the JavaScript web part is populated by the basemap settings for your ArcGIS Online organization.

Esri Maps for SharePoint comes with a list called Esri Maps Base Maps that is used to configure the Basemap gallery for the Silverlight-based Map Web Part. SharePoint users with read/write permissions on this list can add, remove, and edit the basemaps in the Basemap gallery by manipulating the items in this list.

The following table describes the columns in the list:

Column	Description
Title	Identifier of the basemap list item.
Display Name	Determines the label that appears in the Basemap gallery.
Thumbnail Image	Uniform resource locator (URL) for the thumbnail image. The default thumbnails are 85x60 pixels. For the best results, use basemap thumbnails that are the same size.
Base Map Type	Type of basemap. Available types are ArcGIS Server, Bing Maps, and OpenStreetMap.
Map Service URL	URL for the map service endpoint.

Note: See Configure Bing Maps for information on adding a Bing Maps Key to Esri Maps for SharePoint.

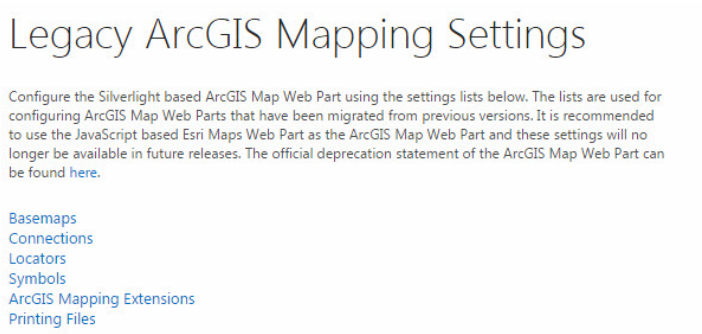
Browsing to the Esri Maps Basemaps list

Note: Administrative rights are required to edit this list.

As with other Esri Maps for SharePoint configuration lists and libraries, you can browse to the Esri Maps Base Maps list using the Esri Maps for SharePoint Administration links on the Site Settings page as shown in the following steps:

Steps:

1. Browse to the **Site Settings** page of your site collection.
2. Under the **Esri Maps for SharePoint** heading, click **Legacy ArcGIS Mapping Settings** and click the **Basemaps** link.



Editing a basemap item

Steps:

1. Open the item to edit by clicking the hyperlink in the **Title** field.
2. On the **View** tab, click **Edit Item**.
3. Make your changes and click **Save**.

Adding a basemap

Steps:

1. Click the **Add new item** hyperlink located at the end of the Esri Maps Base Maps list.

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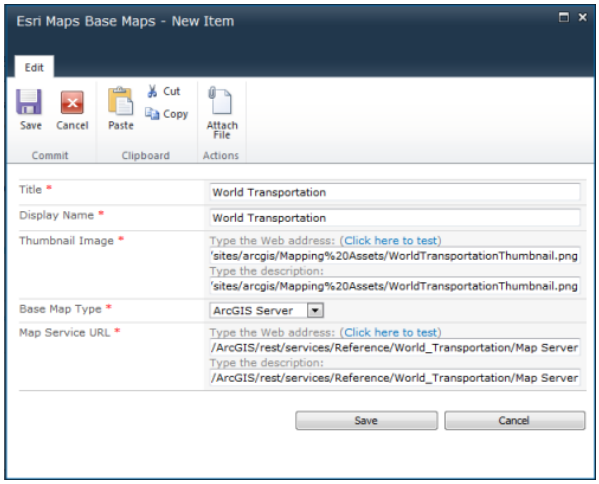
2. Provide the information for the new basemap and click **Save**.



Once it has been saved, the new basemap is available in the Basemap gallery for you to use.

Removing a basemap

Steps:

1. In the standard view of the list, choose the item to remove by checking the check box next to it.
2. Click **Delete Item** on the **Items** tab of the ribbon.
3. Click **OK** when prompted.
   The basemap is removed from the list and is no longer available in the Basemap gallery.

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Configure connections

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Esri Maps for SharePoint comes with a list, Esri Maps Connections, that is used to specify the items that appear in the **Browse** panel drop-down menu by default. SharePoint users with read/write permissions on this list can add, remove, and edit the connections in the menu by manipulating the items in the list.

The following table describes the columns in the list:

Column	Description
Title	The display name of the connection as it appears in the connections list.
Url	The uniform resource locator (URL) to the SharePoint site or ArcGIS Server endpoint.
Server	The data source type for the connection. Supported types are SharePoint and ArcGIS Server.

Note: Configuring the Esri Maps Connections list defines the default settings for new Map Web Parts. It does not change the behavior of existing Map Web Parts.

Browsing to the Esri Maps Connections list

Note: Administrative rights are required to edit this list.

Like the other Esri Maps for SharePoint configuration lists and libraries, you can browse to the Esri Maps Connections list using the Esri Maps for SharePoint Administration links on the **Site Settings** page by completing the following steps.

Steps:

1. Browse to the **Site Settings** page of your site collection.
2. Under the **Esri Maps for SharePoint Administration** heading, click the Legacy ArcGIS Mapping Settings link and click **Connections**.

Editing a connection

Steps:

1. Open the item to edit by clicking the hyperlink in the **Title** field.
2. Click **Edit Item**.
3. Make your changes and click **Save**.

Adding a connection

Steps:

1. Click the **Add new item** hyperlink at the bottom of the Esri Maps Connections list.
   The **New Item** form appears.
2. Enter the new connection's information and click **Save**.

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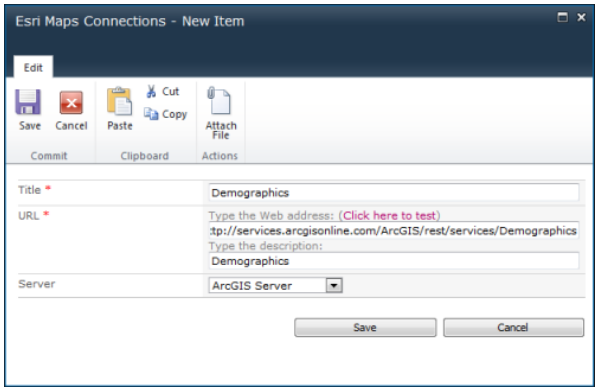
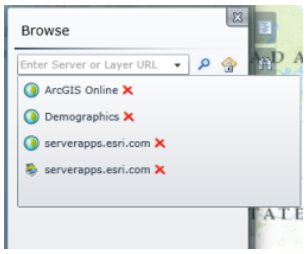


The new connection will be available in the drop-down menu on the **Browse** panel.



Removing a connection

Steps:

1. In the standard view of the list, choose the item to be removed by checking the check box next to it.
2. Click **Delete Item** on the **Items** tab of the ribbon.
   The connection will no longer be available in the **Browse** drop-down menu.

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Configure geometry services

The Geometry Services list determines the geometry service endpoint used by Esri Maps for SharePoint to perform geometric operations. This is used, for instance, by the Find Nearby tool and the ArcGIS Map Web Part to project list items to spatial references other than WGS84 (WKID 4326) and Web Mercator (WKID 102100).

The number of geometry services included in the list is static. You should not add or remove items to or from this list. However, you can edit the existing item to specify any ArcGIS Server geometry service. The following table describes the columns in the list:

Column	Description
Title	The identifier for the geometry service list item.
Url	The URL to the ArcGIS Server geometry service. If Esri Maps for SharePoint is unable to connect to the specified endpoint, it will attempt to use the ArcGIS Online geometry service.

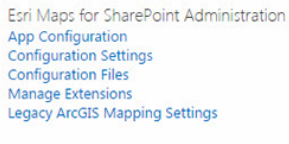
Browsing to the Esri Maps Geometry Services

Note: Administrative rights are required to edit this list item.

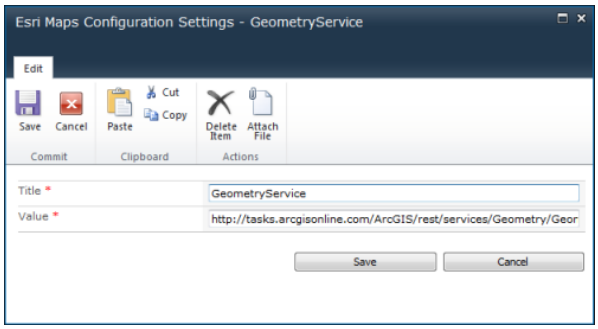
Like the other Esri Maps for SharePoint configuration lists and libraries, you can browse to the Geometry Services list in the Esri Maps Configuration Settings using the Esri Maps for SharePoint Administration links on the Site Settings page, as shown in the following steps:

Steps:

1. Browse to the **Site Settings** page of your site collection.
2. Under the **Esri Maps for SharePoint Administration** heading, click **Configuration Settings**.



3. In the Configuration Settings list, click the hyperlink for the GeometryService item.
4. Click **Edit Item** on the dialog box that appears.
5. Make your changes and click **Save**.



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Configure locators

Note: ArcGIS Online (NA) and ArcGIS Online (EU) have been retired and are no longer actively maintained. See Legacy geocoding and routing services at http://tasks.arcgisonline.com will be retired on December 31, 2013 for more information. Batch geocoding is now available through the World Geocoder Service included with an ArcGIS Online organization subscription.

The columns in the list are described in the following table:

Column	Description
Title	The identifier for the locator service list item.
Display Name	Determines the display name of the service when shown while configuring the Esri Maps Locate workflow or Esri Maps Location field.
Locator Type	The type of the locator service. Supported locator types are those from ArcGIS for Server.
URL	URL to the REST endpoint for the locator service.
Is Default	Determines if the item is the default locator when configuring the Esri Maps Locate workflow (only one can be true).

Browsing to the Esri Maps Locators list

Like the other Esri Maps for SharePoint configuration lists and libraries, you can browse to the Esri Maps Locators list using the Esri Maps for SharePoint Administration links on the **Site Settings** page as shown in the following steps:

Steps:

1. Browse to the **Site Settings** page of your site collection.
2. Under the **Esri Maps for SharePoint Administration** heading, click the **Legacy ArcGIS Mapping Settings** link and click the **Locators** link:

Editing a locator

Steps:

1. Open the item to edit by clicking the link in the **Title** field.
2. On the form that appears, click **Edit Item**.
3. Make your changes and click **Save**.

Adding a locator

Steps:

1. Click the **Add new item** link located at the bottom of the **Esri Maps Locators** list.
   The **New Item** dialog box appears.
2. Enter the new locator's information and click **Save**:

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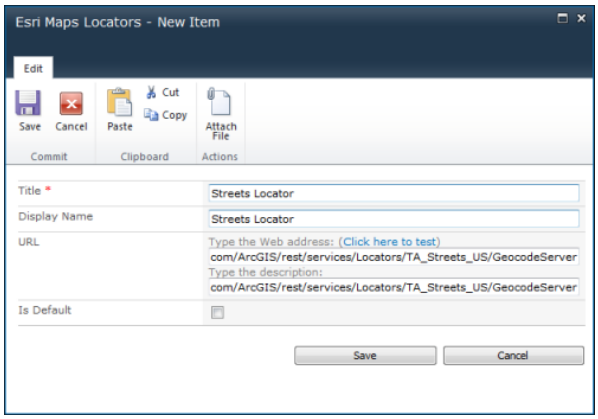

Once the item has been saved, the locator is available on the Esri Maps Locate workflow configuration wizard's **Locator** page, as well as when editing an Esri Maps Location field's properties.

Removing a locator

Steps:

1. In the default view of the **Esri Maps Locators** list, choose the item to be removed by checking the check box beside it.
2. Click **Delete Items** on the **Items** tab of the ribbon.
3. Click **OK** when prompted.
   The locator will be removed from the list and will no longer be available when configuring the Esri Maps Locate workflow or Esri Maps Location field.

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Configure symbols

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Esri Maps for SharePoint comes with a document library, named Esri Maps Symbols, that uses ArcGIS JavaScript Object Notation (JSON) to define symbol sets that are used to populate the Map Web Part symbol gallery. You can edit, add, and remove documents in this library.

The Esri Maps Symbols library supports the following two content types:

- Symbols Document—This content type is for files stored within the document library that contain JSON symbols.
- Link to Symbols Document—This content type is for linking to JSON files that are hosted outside the document library. This type is convenient for sharing one symbols file across multiple site collections.

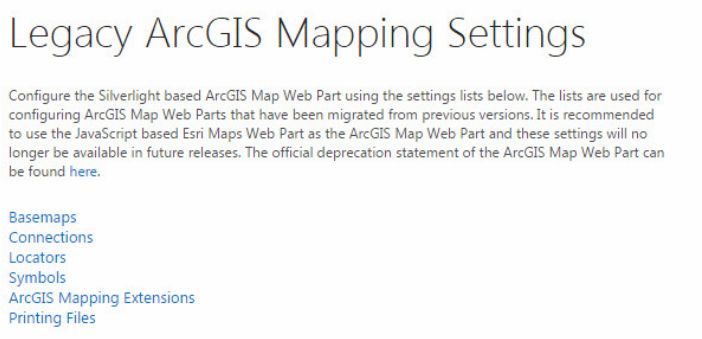
Browsing to the Esri Maps Symbols document library

Note: Administrative rights are required to edit these items.

As with other Esri Maps for SharePoint configuration lists and libraries, you can easily browse to the Esri Maps Symbols library using the Esri Maps for SharePoint Administration links on the Site Settings page as shown in the following steps:

Steps:

1. Browse to the **Site Settings** page of your site collection.
2. Under the **Esri Maps for SharePoint Administration** heading, click the Legacy ArcGIS Mapping Settings link and click the Symbols link.



Adding a symbols document

To add a symbol, complete the following steps:

Steps:

1. Using the text editor of your choice, create a JSON symbol set.
2. In the Esri Maps Symbols document library, click **Add document**.
   The **Upload Document** dialog box appears.
3. Click **Browse** to select the new symbol set and click **OK**.
4. On the properties dialog box, choose the content type, type the display name, choose the desired geometry type, and click **Save** when you're finished.

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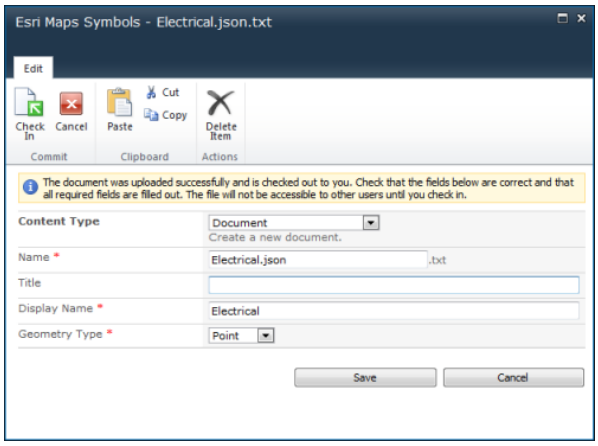
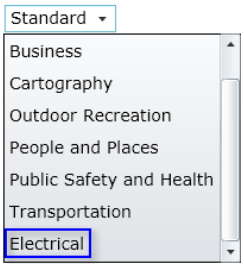


The new document is added to the Esri Maps Symbols library. Now, when using ArcGIS Map Web Parts that are within the same site collection, the new symbol gallery is available to use for symbolizing layers.

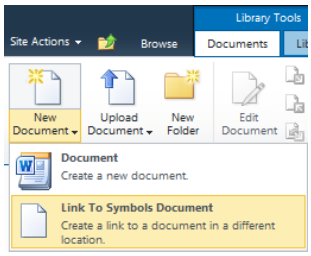


Adding a link to a symbols document

To add a link to a symbols document, complete the following steps:

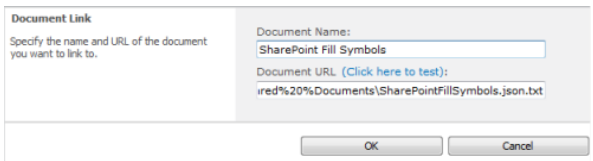
Steps:

1. Browse to the Esri Maps Symbols library and click the **Documents** tab.
2. Click the **New Document** button and choose **Link To Symbols Document**.



The **Document Link** page appears.

3. Specify a name and the uniform resource locator (URL) to the symbols document and click **OK**.



The **Edit** form dialog box appears.

4. Specify the display name, choose the correct geometry type, and click **Save**.

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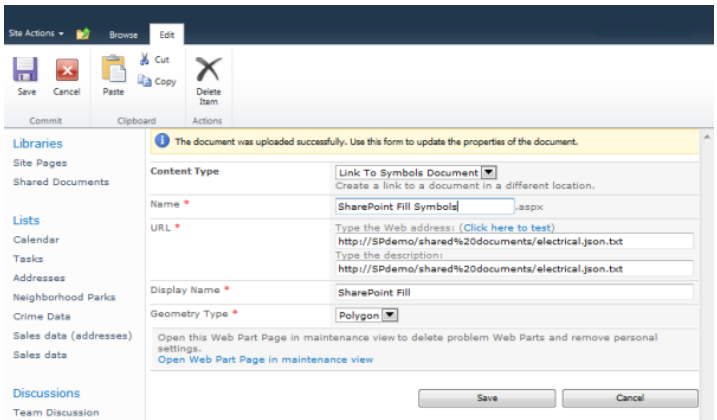
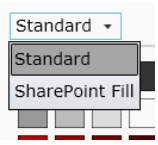


The link is added to the Esri Maps Symbols library. Now, when using ArcGIS Map Web Parts that are within the same site collection, the linked symbols document is available to use for symbolizing layers.



Removing a symbols document

To remove a symbols document, complete the following steps:

Steps:

1. Browse to the Esri Maps Symbols library and choose the document to be removed by checking the check box next to its name.
2. Click **Delete Document** on the **Documents** tab of the ribbon. A confirmation message appears.
3. Click **OK**. The file or link is removed from the document library. This removes the symbols document from the symbol gallery in ArcGIS Map Web Parts that are within the same site collection.
   If you used symbols from the deleted symbol gallery for layers in saved Map Web Parts, the web parts will continue to use those symbols. Different symbols can be specified for these layers by editing the Map Web Part.

Creating a symbol set

All the files used by the ArcGIS Map Web Part symbol gallery are JSON files containing sets of symbols. When you create a JSON symbol set for use in the symbol gallery, it is important to keep in mind that each JSON file can only contain symbology for one type of symbol: marker symbols, fill symbols, or line symbols. A description of each type of symbol follows:

- Marker symbol—Used to draw points and multipoints on the graphics layer. Use the Simple Marker Symbol or Picture Marker Symbol type to create marker symbols.
- Fill symbol—Used to draw polygon features on the graphics layer. Fills can be specified as solid, hatched, or pictures. In addition, the symbol can have an optional outline, which is defined by a line symbol. Use the Simple Fill Symbol or Picture Fill Symbol type to create fill symbols.
- Line symbol—Used to draw linear features on the graphics layer. Use the Simple Line Symbol type to create line symbols.

For additional information on JSON symbols, see the ArcGIS Server REST API and the symbol section of the ArcGIS API for JavaScript.

The simplest way to get started is to use one of the out-of-the-box symbol sets as a template.

Marker symbols

Marker symbols are used to draw point features on the map. Marker symbols can be specified using the following samples as guidelines. For more information on Marker symbols, see the ArcGIS Server REST API documentation.

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- Simple Marker Symbol—Simple Marker Symbols are used to display points as a simple shape, for example, a circle. In addition, the symbol can have an optional outline, which is defined by a line symbol. To create a Simple Marker Symbol, set the type to esriSMS and specify the ID, style, color, and size properties. The style property constants for a Simple Marker Symbol include esriSMSCircle, esriSMSCross, esriSMSDiamond, esriSMSSquare, and esriSMSX (diagonal cross).

```
{
 "id":"Square","symbol":
  {
   "type": "esriSMS",
   "style": "esriSMSSquare",
   "color": [76,115,0,255],
   "size": 8,
   "angle": 0,
   "xoffset": 0,
   "yoffset": 0,
   "outline":
    {
     "color": [152,230,0,255], "width": 1
    }
  }
}
```

- Picture Marker Symbol—Picture Marker Symbols can be used to symbolize point features using an image. For a Picture Marker Symbol, set the type to esriPMS and specify the ID, URL, width, and height properties.

```
{
 "id":"Hiking","symbol":
  {
         "type" : "esriPMS",
   "url" : "/_layouts/ESRI.ArcGIS.Mapping.SharePoint/Images/MarkerSymbols/OutdoorRecreation/Hiking.png",
   "contentType" : "image/png",
   "color" : null,
   "width" : 19.5,
   "height" : 19.5,
   "angle" : 0,
   "xoffset" : 0,
   "yoffset" : 0
  }
}
```

Fill symbols

Fill symbols are used to draw polygon features on the map. Fills can be specified as solid, hatched, or pictures. In addition, the symbol can have an optional outline, which is defined by a line symbol. Fill symbols can be specified using the following samples as guidelines. For more information on Fill symbols, see the ArcGIS Server REST API documentation.

- Simple Fill Symbol—The Simple Fill Symbol can be used to display polygons as solid, transparent, or with one of several crosshatch patterns. In addition, the symbol can have an outline, which is defined by a line symbol. For a Simple Fill Symbol, set the type to esriSFS and specify the ID, style, and color properties.

```
{
 "id":"SolidFill","symbol":
  {
   "type": "esriSFS",
   "style": "esriSFSSolid",
   "color": [115,76,0,255],
   "outline":
    {
     "type": "esriSLS",
     "style": "esriSLSSolid",
     "color": [110,110,110,255],
     "width": 1
    }
  }
}
```

- Picture Fill Symbol—The Picture Fill Symbol can be used to display polygon features filled with an image in a repeating pattern. In addition, the symbol can have an outline, which is defined by a line symbol. For a Picture Fill Symbol, set the type to esriPFS and specify the ID, URL, outline, width, and height properties.

```
{
 "id":"PictureFill","symbol":
  {
   "type" : "esriPFS",
   "url" : "images/sand.png",
   "contentType" : "image/png",
   "color" : null,
   "outline" :
    {
     "type" : "esriSLS",
     "style" : "esriSLSSolid",
     "color" : [110,110,110,255],
     "width" : 1
    },
   "width" : 63,
   "height" : 63,
   "angle" : 0,
   "xoffset" : 0,
   "yoffset" : 0,
   "xscale" : 1,
   "yscale" : 1
  }
}
```

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Line symbols

Line symbols can be used to display line features on the map or to specify outlines for polygon symbols. Line symbols can be specified using the following sample as a guideline. For more information on Line symbols, see the ArcGIS Server REST API documentation.

- Simple Line Symbol—A Simple Line Symbol can specify either a solid line or a predefined pattern of dashes and dots. For a Simple Line Symbol, set the type to esriSLS and specify the ID, style, color, and width properties. The style property constants for a Simple Line Symbol include esriSLSDash, esriSLSDashDotDot, esriSLSDot, esriSLSNull, and esriSLSSolid.

```
{
 "id" : "BasicLineSymbol_Green_5", "symbol" :
  {
   "type" : "esriSLS",
   "style" : "esriSLSSolid",
   "color" : [0,128,0,255],
   "width": 5
  }
}
```

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Configure color ramps

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Esri Maps for SharePoint contains two configuration files that allow you to customize the color ramps displayed in the **Color Scheme** drop-down menu and **Scheme Options** dialog box.

The first configuration file is DefaultLinearGradientBrushes.xaml. The color ramps in this file populate the **Color Scheme** drop-down menu and **Color Scheme** selector in the **Scheme Options** dialog box when a layer that supports configuring symbology is selected in the Map Contents pane. See Layer types for information on layers that support symbology configuration.

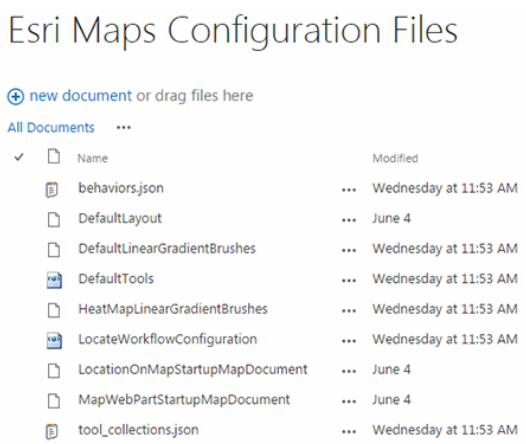
The second configuration file is HeatMapLinearGradientBrushes.xaml. The color ramps in this file populate the Color Scheme drop-down menu when a heat map is selected in the Map Contents pane. See Heat maps for more information.

Editing the linear gradient brushes files

Note: Administrative rights are required to edit this file.

Steps:

1. Browse to the library containing the configuration file using the **Quick Launch** links or the **Site Actions** menu and click **View All Site Content**.
2. Under the **Document Libraries** heading, click **Esri Maps Configuration Files**.



   The document library opens.
3. Check the **DefaultLinearGradientBrushes.xaml** or **HeatMapLinearGradientBrushes.xaml** item.
4. Click the **Documents** tab on the ribbon and click **Edit Document** (check out the document if necessary).
   The file opens in your default XML editor
5. Make the desired changes and save the file.
6. Check the file back in to the Esri Maps Configuration Files library.

DefaultLinearGradientBrushes.xaml

The DefaultLinearGradientBrush.xaml file is a Resource Dictionary containing the collection of color ramps displayed in the **Color Scheme** drop-down menu and **Scheme Options** dialog box. Each color ramp is represented in XAML as a Silverlight LinearGradientBrush. See LinearGradientBrush Class for more information.

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Only two GradientStops are allowed in the GradientStopCollection for each brush. These two GradientStops correspond to the beginning and end of the color ramp and must contain Offset attribute values of 0 and 1. The following XAML sample shows an example of one linear gradient brush. The DefaultLinearGradientBrush.xaml Resource Dictionary contains this brush and several others.

```
<ResourceDictionary
    xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
    xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml">

    <LinearGradientBrush x:Key="Red_Brush">
        <LinearGradientBrush.GradientStops>
            <GradientStopCollection>
                <GradientStop Color="#FFFF0000" Offset="0"/>
                <GradientStop Color="#FFFF8888" Offset="1" />
            </GradientStopCollection>
        </LinearGradientBrush.GradientStops>
    </LinearGradientBrush>

...

</ResourceDictionary>
```

HeatMapLinearGradientBrushes.xaml

The HeatMapLinearGradientBrushes.xaml file is a Resource Dictionary containing the collection of brushes used for drawing heat maps in the Map Web Part. See Heat maps for more information. The following XAML sample shows an example of one heat map brush. The HeatMapLinearGradientBrushes.xaml Resource Dictionary contains this brush and several others.

```
<ResourceDictionary
    xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
    xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml">

    <LinearGradientBrush x:Key="HeatMapBrush_1">
        <LinearGradientBrush.GradientStops>
            <GradientStopCollection>
                <GradientStop Color="#00FFFFFF" Offset="0.0"/>
                <GradientStop Color="#FF0000FF" Offset="0.5" />
                <GradientStop Color="#FFFF0000" Offset="0.75" />
                <GradientStop Color="#FFFFFF00" Offset="0.8" />
                <GradientStop Color="#FFFFFFFF" Offset="1" />
            </GradientStopCollection>
        </LinearGradientBrush.GradientStops>
    </LinearGradientBrush>

...

</ResourceDictionary>
```

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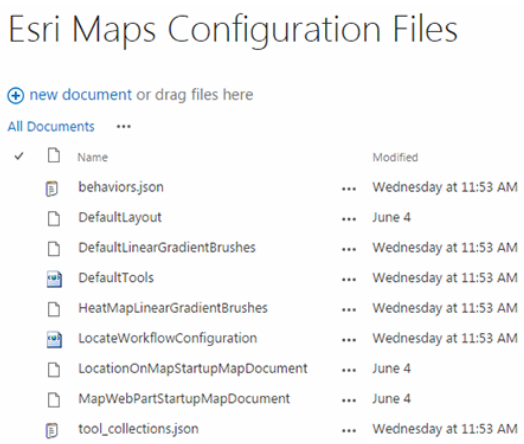
Configure the default map

Esri Maps for SharePoint includes two XML files used to initialize the default map for the ArcGIS Map Web Part and the Esri Maps Location Field. These files, named MapWebPartStartupMapDocument.xaml and LocationOnMapStartupMapDocument.xaml, are deployed to the Esri Maps Configuration Files document library within each site collection on which Esri Maps for SharePoint is activated. The default map can be modified by editing these XML files.

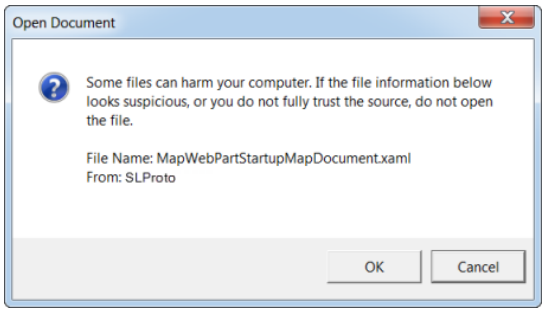
Note: Administrative rights are required to edit these files.

Steps:

1. Browse to the library containing the configuration file using the **Quick Launch** links or the **Site Actions** menu, and click **View All Site Content**.
2. Under the **Document Libraries** heading, click **Esri Maps Configuration Files**.



3. Check the **MapWebPartStartupMapDocument.xaml** or **LocationOnMapStartupMapDocument.xaml** item.
4. Click the **Documents** tab on the ribbon and click **Edit Document** (check out the document if necessary).
5. Click **OK** if the following warning displays:



The MapWebPartStartupMapDocument.xaml file opens in your default XML editor.

```
<?xml version="1.0" encoding="utf-8"?>
<e:Map xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
   xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
   xmlns:e="http://schemas.esri.com/arcgis/client/2009"
   xmlns:esriMapping="http://schemas.esri.com/arcgis/mapping/2009"
   xmlns:esriExtensibility="http://schemas.esri.com/arcgis/client/extensibility/2010">
  <esriMapping:ScaleBarExtensions.ScaleBarMapUnit>Meters</esriMapping:ScaleBarExtensions.ScaleBarMapUnit>
  <e:Map.IsLogoVisible>False</e:Map.IsLogoVisible>
  <e:Map.Extent>
    <e:Envelope XMin="-16334576.8010418" YMin="699595.291282528" XMax="-6812752.83654833" YMax="7913098.29468664">
      <e:Envelope.SpatialReference>
        <e:SpatialReference WKID="102100" />
      </e:Envelope.SpatialReference>
    </e:Envelope>
  </e:Map.Extent>
  <e:ArcGISTiledMapServiceLayer Url="http://services.arcgisonline.com/ArcGIS/rest/services/World_Topo_Map/MapServer" esriExtensibility:Document.IsBas
</e:Map>
```

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6. Make the necessary changes and save the file; for example, the element defining the basemap could be updated to define a different map service.
   Changes made to the MapWebPartStartupMapDocument.xaml file are only reflected in newly-added Map Web Parts. Existing Map Web Parts are not updated.
7. Check the file back in to the Esri Maps Configuration Files library.

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Configure the default tools

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Esri Maps for SharePoint contains a configuration file, DefaultTools.xml, that is used to define the default tools contained in the attribute table and pop-ups within the Map Web Part. By editing this file, new Map Web Parts can be configured to display any of the available Esri Maps for SharePoint tools or a custom tool (add-in). Changes made in this file will apply to new Map Web Parts within the same site collection as the file being edited. Map Web Parts in other site collections or that have been created previously will be unaffected.

Note: Administrative rights are required to edit this file.

Steps:

1. Browse to the **Site Settings** page of your site collection.
2. Under the **Esri Maps for Sharepoint Administration** heading, click **Configuration Files**.
3. Check the **DefaultTools.xml** item.
4. Click the **Files** tab on the ribbon and click **Edit Document** (check out the document if necessary). The DefaultTools.xml file opens in your default XML editor.
   The following code is from the DefaultTools.xml file. Note that each tool resides in a <Tools> element within a <ToolPanel>. The Esri tools can be placed on any of the existing toolbars. To include a custom tool in the DefaultTools.xml file, you must first upload your add-in to the **ArcGIS Mapping Extensions** library.

```
<ToolPanels xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml" xmlns:esri="http://schemas.esri.com/arcgis/mapping/2009">
  <ToolPanel Name="Attribute Table Toolbar" ContainerName="FeatureDataGridToolbarContainer" Orientation="Horizontal">
    <Tools>
      <Tool Icon="/_layouts/ESRI.ArcGIS.Mapping.SharePoint/Images/toolbar/SelectAllCommand16.png">
        <Tool.Class>
          <esri:SelectAllCommand />
        </Tool.Class>
      </Tool>
      <Tool Icon="/_layouts/ESRI.ArcGIS.Mapping.SharePoint/Images/toolbar/ZoomToSelectionCommand16.png">
        <Tool.Class>
          <esri:ZoomToSelectionCommand />
        </Tool.Class>
      </Tool>
      <Tool Icon="/_layouts/ESRI.ArcGIS.Mapping.SharePoint/Images/toolbar/ExportSelectionCommand16.png">
        <Tool.Class>
          <esri:ExportSelectionCommand />
        </Tool.Class>
      </Tool>
      <Tool Icon="/_layouts/ESRI.ArcGIS.Mapping.SharePoint/Images/toolbar/ClearSelectionCommand16.png">
        <Tool.Class>
          <esri:ClearSelectionCommand />
        </Tool.Class>
      </Tool>
      <Tool Icon="/_layouts/ESRI.ArcGIS.Mapping.SharePoint/Images/toolbar/ToggleFilterFeaturesByMapExtentCommand16.png">
        <Tool.Class>
          <esri:ToggleFilterFeaturesByMapExtentCommand />
        </Tool.Class>
      </Tool>
    </Tools>
  </ToolPanel>
  <ToolPanel Name="Popup Toolbar" ContainerName="PopupToolbarContainer" Orientation="Horizontal">
    <Tools>
      <Tool Icon="/_layouts/ESRI.ArcGIS.Mapping.SharePoint/Images/toolbar/DeleteGraphicCommand16.png">
        <Tool.Class>
          <esri:DeleteGraphicCommand />
        </Tool.Class>
      </Tool>
      <Tool Icon="/_layouts/ESRI.ArcGIS.Mapping.SharePoint/Images/toolbar/EditShapeCommand16.png">
        <Tool.Class>
          <esri:EditShapeCommand />
        </Tool.Class>
      </Tool>
      <Tool Icon="/_layouts/ESRI.ArcGIS.Mapping.SharePoint/Images/toolbar/EditValuesCommand16.png">
        <Tool.Class>
          <esri:EditValuesCommand />
        </Tool.Class>
      </Tool>
      <Tool Icon="/_layouts/ESRI.ArcGIS.Mapping.SharePoint/Images/toolbar/AddAttachmentsCommand16.png">
        <Tool.Class>
          <esri:AddAttachmentsCommand />
        </Tool.Class>
      </Tool>
    </Tools>
  </ToolPanel>
</ToolPanels>
```

5. Make the desired changes and save the file.
6. Check the file back in to the Esri Maps Configuration Files library.

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Configure ArcGIS Online

Esri Maps for SharePoint can be configured to point to Portal for ArcGIS or ArcGIS Online. Portal for ArcGIS provides you with the same collaboration and sharing tools as ArcGIS Online but differs in where it's hosted and what content is available to users. Portal for ArcGIS can be deployed behind your organization's firewall, or a private instance can be hosted and managed by Esri for your organization.

Esri Maps for SharePoint uses the endpoint specified (either Portal for ArcGIS or ArcGIS Online) to populate the Map Center and determine the appropriate location for the search functionality. If you specify a Portal for ArcGIS endpoint in the configuration file, the Map Center populates with maps contained in the portal, and the search functionality searches the portal endpoint instead of searching ArcGIS Online.

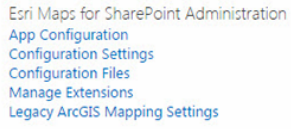
Editing the endpoint

Note: Administrative rights are required to edit this list item.

The ArcGIS Online or Portal for ArcGIS endpoint used by Esri Maps for SharePoint is specified by the ArcGISConnection item in the Esri Maps Configuration settings. The configuration setting points to ArcGIS Online by default. To edit the endpoint used by Esri Maps for SharePoint, complete the following steps. When you edit the endpoint, this change applies to all Map Web Parts within the site collection containing the file you're editing.

Steps:

1. Browse to the **Site Settings** page of your site collection.
2. Under the **Esri Maps for SharePoint** heading, click Configuration Settings.

   The document library opens and displays the available configuration items.
3. Click **ArcGISConnection** to open the item.
4. On the form that appears, click **Edit Item**.
5. Enter the appropriate information and click **Save**.

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Configure Bing Maps

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Caution: Complimentary use of Microsoft's Bing Maps with ArcGIS software will be phased out by December 31, 2013. To continue using Bing Maps with ArcGIS after December 31, 2013, you will need to obtain your own Bing Maps key directly from Microsoft, and input the key into your ArcGIS products. It is recommended that you start this process as soon as possible to avoid any service disruption. See Reminder: Bing Maps Use in ArcGIS Has Changed for more information.

Esri Maps for SharePoint supports access to the Bing Maps Road, Aerial, and Hybrid maps if you have a Bing Maps Key. In the Silverlight-based ArcGIS Map Web Part, the Bing key can be configured as detailed in this topic. In the JavaScript-based Esri Maps Web Part, the Bing key is set by the administrator of your ArcGIS Online organization.

Access to the Bing services platform requires explicit registration with Microsoft. Once you've obtained a Bing Maps Key, add it to the BingKey.xml configuration file in the Esri Maps Configuration Settings document library as described below. Once the configuration file has been updated, the Bing Maps Road, Aerial, and Hybrid maps display in the Basemap gallery drop-down menu. You can then add any of these maps to the Map Web Part as a basemap.

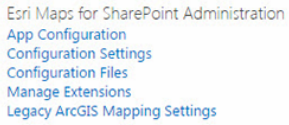
Browse to the Configuration Settings list

Note: Administrative rights are required to edit this list item.

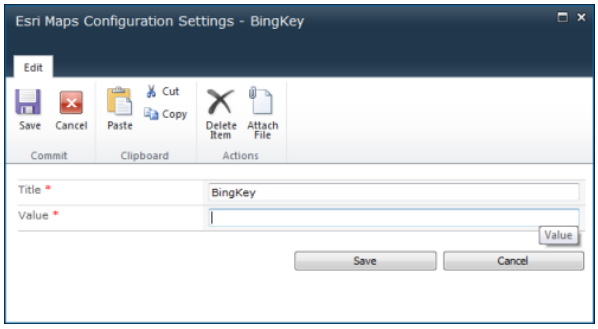
As with other Esri Maps for SharePoint configuration lists and libraries, you can browse to the Configuration Settings list using the Esri Maps for SharePoint Administration links on the Site Settings page as shown in the following steps:

Steps:

1. Browse to the **Site Settings** page of your site collection.
2. Under the **Esri Maps for SharePoint** heading, click the Configuration Settings link.



3. Click the **BingKey** hyperlink to open the item.
4. On the form that appears, click **Edit Item**.
5. Add the Bing Maps key to the **Value** box and click **Save**.



Once a Bing Maps key has been specified, Bing Maps basemaps will be shown in the Basemap galleries of all ArcGIS Map Web Parts within the site collection containing the BingKey.xml file that was edited, provided that the Bing Maps basemaps are included in the Esri Maps Base Maps list. These basemaps are included in the list by default.

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Configure SharePoint to work with SSL-secured sites

Note: This topic applies to the use of the Silverlight-based ArcGIS Map Web Part, as cross-scheme restrictions are specific to Silverlight.

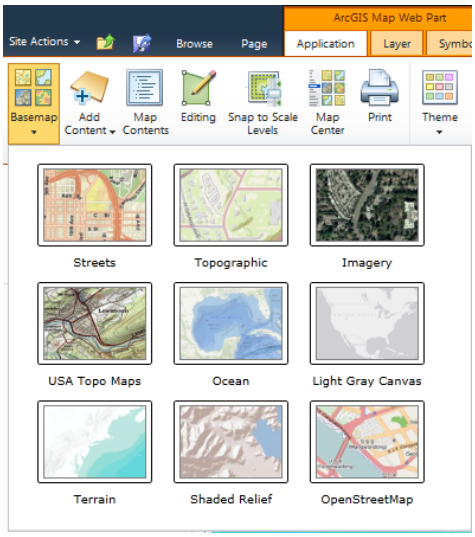
The components included in Esri Maps for SharePoint—the Silverlight-based ArcGIS Map Web Part, Esri Maps Locate workflow, Esri Maps Connect workflow, and Esri Maps Location field—each reference services from ArcGIS Online out of the box. By default, they access these services over HTTP. Due to the cross-scheme restrictions of Silverlight, the default use of HTTP introduces problems when Esri Maps for SharePoint is used within a SharePoint site that employs Secure Sockets Layer (SSL or HTTPS) protection. Since Esri Maps for SharePoint is highly configurable, all of the service endpoints used by the product can be updated to use HTTPS endpoints instead of HTTP. This topic explains how to use HTTPS instead of HTTP.

Updating configuration lists to use SSL

Much of the Esri Maps for SharePoint configuration is stored in lists, where each list item corresponds to a web service used by the product. The lists containing items you'll need to update include Basemaps, Connections, Locators, and the ArcGIS Online URL in the **Configuration Settings** list. Updating these to use HTTPS instead of HTTP is a matter of updating each list item to specify an equivalent HTTPS endpoint or deleting those items for which SSL equivalents do not exist. The specific steps to update each configuration list are as follows:

Updating the basemaps

Update the map services used as basemaps to point to HTTPS endpoints. These are the set of basemaps available in the ArcGIS Map Web Part basemap gallery.



Note: The Basemap configuration settings apply only to the Silverlight-basedArcGIS Map Web Part. All basemaps for the JavaScript-based Esri Maps Web Part are configured as part of the ArcGIS organization.

Steps:

1. Within the SSL-secured site collection, browse to the settings page by selecting **Site Settings** from the **Site Actions** menu.
2. Under Esri Maps for SharePoint Administration, click the **Legacy ArcGIS Mapping Settings** link and click **Basemaps**
3. For each list item with a basemap type of ArcGIS Server, change the **Map Service URL** to point to an HTTPS equivalent. If no HTTPS equivalent exists, delete it. By default, the first eight basemaps should be changed to HTTPS.

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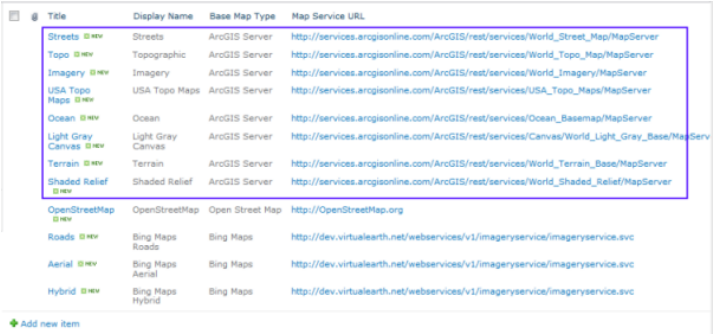
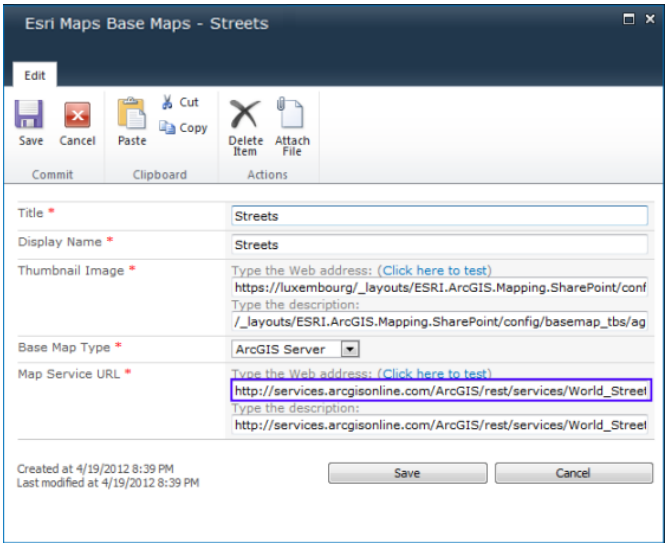


Title	Display Name	Base Map Type	Map Service URL
Streets	Streets	ArcGIS Server	http://services.arcgisonline.com/ArcGIS/rest/services/World_Street_Map/MapServer
Topo	Topographic	ArcGIS Server	http://services.arcgisonline.com/ArcGIS/rest/services/World_Topo_Map/MapServer
Imagery	Imagery	ArcGIS Server	http://services.arcgisonline.com/ArcGIS/rest/services/World_Imagery/MapServer
USA Topo Maps	USA Topo Maps	ArcGIS Server	http://services.arcgisonline.com/ArcGIS/rest/services/USA_Topo_Maps/MapServer
Ocean	Ocean	ArcGIS Server	http://services.arcgisonline.com/ArcGIS/rest/services/Ocean_Basemap/MapServer
Light Gray Canvas	Light Gray Canvas	ArcGIS Server	http://services.arcgisonline.com/ArcGIS/rest/services/Canvas/World_Light_Gray_Base/MapServ
Terrain	Terrain	ArcGIS Server	http://services.arcgisonline.com/ArcGIS/rest/services/World_Terrain_Base/MapServer
Shaded Relief	Shaded Relief	ArcGIS Server	http://services.arcgisonline.com/ArcGIS/rest/services/World_Shaded_Relief/MapServer
OpenStreetMap	OpenStreetMap	Open Street Map	http://OpenStreetMap.org
Roads	Bing Maps Roads	Bing Maps	http://dev.virtualearth.net/webservices/v1/imageryservice/imageryservice.svc
Aerial	Bing Maps Aerial	Bing Maps	http://dev.virtualearth.net/webservices/v1/imageryservice/imageryservice.svc
Hybrid	Bing Maps Hybrid	Bing Maps	http://dev.virtualearth.net/webservices/v1/imageryservice/imageryservice.svc

Add new item

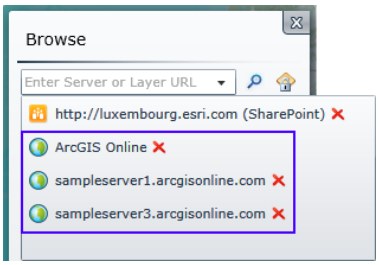
These eight map services are hosted on ArcGIS Online, and each have SSL equivalents. When editing each item, make sure to update the web address.



While it's recommended to update the description as well, that's only used for display within the list. The web address is the uniform resource locator (URL) that's used by Esri Maps for SharePoint. This applies to the service endpoints in this list as well as the others that need to be updated (described below).

Update the ArcGIS Server connections

Update the default set of ArcGIS Server connections. These are the ArcGIS Server instances that appear by default in the ArcGIS Map Web Part **Browse** pane.



Note: ArcGIS Server connections can only be configured for the Silverlight-based ArcGIS Map Web Part. ArcGIS Server connections are not available in the JavaScript-based Esri Maps Web Part.

Steps:

1. Return to the **Site Settings** page.

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2. Under Esri Maps for SharePoint Administration, click **Connections**.
3. Edit the URL of any HTTPS entries to point to SSL equivalents. By default, the ArcGIS Online list item should be updated. As with the basemap URLs, make sure to update the web address.

4. Delete any items for which HTTPS equivalents do not exist. If the sampleserver1 and sampleserver3 endpoints are included in the list, delete them.

Update the geometry service

Update the geometry service endpoint. This endpoint is used by the ArcGIS Map Web Part for geometric operations, such as reprojecting graphics when switching between basemaps with different spatial references.

Steps:

1. Return to the **Site Settings** page.
2. Under Esri Maps for SharePoint Administration, click **Esri Maps Configuration Settings**.
3. Edit the URL of the geometry service list item to specify an HTTPS endpoint. If the default ArcGIS Online geometry service is listed here, it can be changed to `https`.

Update the ArcGIS configuration settings

Update the ArcGIS configuration settings. These settings define the endpoints used by the Map Web Part for retrieving the web maps and groups provided by the Map Center. This file can be edited to specify use of an organization's Portal for ArcGIS instance instead of ArcGIS Online.

Steps:

1. Return to the **Site Settings** page.
2. Under Esri Maps for SharePoint Administration, click **Esri Maps Configuration Settings**.
3. For the **ArcGISConnection** list item, change the URL from HTTP to HTTPS.

Updating configuration files to use SSL

Some of the Esri Maps for SharePoint configuration is stored in configuration files. Unlike the configuration lists, which define the configuration of sets of equivalent items, the configuration files specify relatively complex configurations, such as the default map definition and default layout of the Map Web Part. Two of these files contain references to HTTP service endpoints. These can be changed to HTTPS as follows:

Steps:

1. From the **Site Actions** menu, choose **View All Site Content**.
2. Under **Document Libraries**, choose **Esri Maps Configuration Files**.

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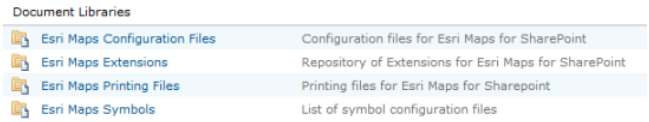
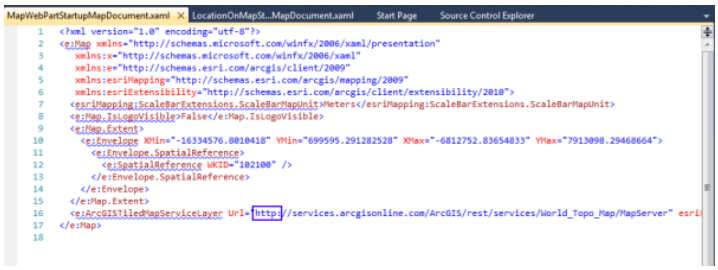


Document Libraries

Esri Maps Configuration Files	Configuration files for Esri Maps for SharePoint
Esri Maps Extensions	Repository of Extensions for Esri Maps for SharePoint
Esri Maps Printing Files	Printing files for Esri Maps for Sharepoint
Esri Maps Symbols	List of symbol configuration files

3. Open the MapWebPartStartupMapDocument.xaml document for editing. This document specifies the map definition for new Map web parts. One convenient way to open it for editing is to click **Open with Explorer** from the **List** tab on the SharePoint ribbon. From there, files can be opened for editing with text editors such as Notepad or integrated development environments (IDEs) such as Visual Studio. Alternatively, the file can be downloaded, edited locally, and uploaded to the document library once editing is complete.
4. In the markup, change any layers that reference an HTTP service endpoint to HTTPS. By default, only the URL for the ArcGISTiledMapServiceLayer needs to be updated.



```
MapWebPartStartupMapDocument.xaml   LocationOnMapSt...MapDocument.xaml   Start Page   Source Control Explorer
1  <?xml version="1.0" encoding="utf-8"?>
2  <e:Map xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
3    xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
4    xmlns:e="http://schemas.esri.com/arcgis/client/2009"
5    xmlns:esriMapping="http://schemas.esri.com/arcgis/mapping/2009"
6    xmlns:esriExtensibility="http://schemas.esri.com/arcgis/client/extensibility/2010">
7    <esriMapping:ScaleBarExtensions.ScaleBarMapUnit>Meters</esriMapping:ScaleBarExtensions.ScaleBarMapUnit>
8    <e:Map.IsLogoVisible>False</e:Map.IsLogoVisible>
9    <e:Map.Extent>
10     <e:Envelope XMin="-16334576.8010418" YMin="699595.291282528" XMax="-6812752.83654833" YMax="7913098.29468664">
11       <e:Envelope.SpatialReference>
12         <e:SpatialReference WKID="102100" />
13       </e:Envelope.SpatialReference>
14     </e:Envelope>
15   </e:Map.Extent>
16   <e:ArcGISTiledMapServiceLayer Url="http://services.arcgisonline.com/ArcGIS/rest/services/World_Topo_Map/MapServer" esri
17 </e:Map>
18
```

5. Open the LocationOnMapStartupMapDocument.xaml document for editing. This document specifies the map definition for all ArcGIS Location Fields within the site collection.
6. As with the previous document, change any HTTP service endpoints to HTTPS. By default, the LocationOnMapStartupMapDocument.xaml document is exactly the same as MapWebPartStartupMapDocument.xaml, so with a default installation, the change specified in step 4 can be applied here as well.

Once these steps have been completed, Esri Maps for SharePoint components will all work within the SSL site just as they do by default within any non-SSL site. New ArcGIS Map Web Part, Esri Maps Locate workflows, and Esri Maps Location fields will all retrieve the updated configuration, using only HTTPS service endpoints and working within Silverlight's URL access restrictions.

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Configure add-ins

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Esri Maps for SharePoint allows you to develop functionality for the ArcGIS Map Web Part. To learn more about this capability, see Extend the Map Web Part. Custom functionality, referred to as add-ins, is packaged in a compiled Silverlight application or .xap file. To make add-ins available to the Map Web Part, Esri Maps for SharePoint provides a document library, named Esri Maps Extensions, where Map Web Part add-in packages are stored.

The Map Web Part provides two techniques for add-ins to expose functionality: commands and behaviors. Commands offer a way to plug logic into the ArcGIS Map Web Part that should be initiated by the user. Behaviors provide a way to surface logic that should be initiated as soon as the web part is loaded.

To get started with add-ins, the first step is to write and compile a command or behavior into a xap file. For information on creating a command, see Write commands. For information on creating a behavior, see Write map behaviors.

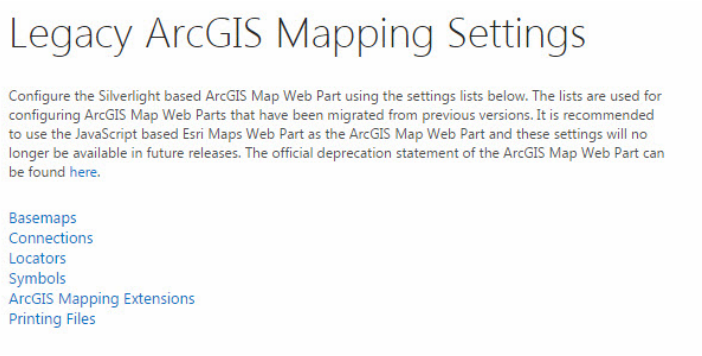
Making add-ins available to the ArcGIS Map Web Part

Note: Administrative rights are required to edit the Extensions library.

Making add-ins available to the ArcGIS Map Web Part requires adding the compiled Silverlight application that contains the add-in code to the Esri Maps Extensions document library as shown in the following steps:

Steps:

1. Browse to the **Site Settings** page of your site collection.
2. Under the **Esri Maps for SharePoint Administration** heading, click the Legacy ArcGIS Mapping Settings link and click **ArcGIS Mapping Extensions**.



3. Click **Add Document**.
   The **Upload Document** form appears.
4. Click **Browse** to open the **Choose file to Upload** form.
5. Locate and select the .xap file containing the extension and click **Open**.

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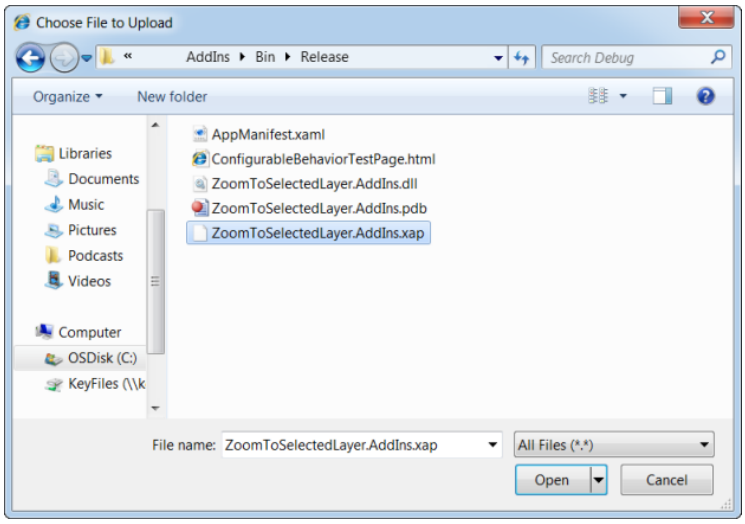

The .xap file will be uploaded to the library. Once this is done, the commands and behaviors within the add-in package will be available when adding tools to ArcGIS Map Web Parts within the same site collection.

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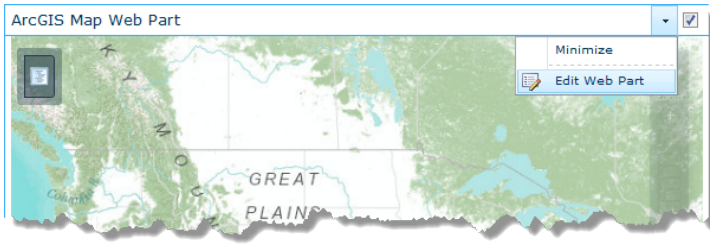
Edit mode and run mode

Like other web parts within SharePoint, the ArcGIS Map Web Part has an edit mode and a run mode. SharePoint users with permissions to edit the page containing the Map Web Part can put the Web Part in edit mode, while users with read-only permissions can only interact with the Web Part in run mode. Although users with contribute permissions in SharePoint can edit an existing web part, users must have design permissions to insert a web part onto a page. See User permissions and permission levels in SharePoint 2013 for more information on SharePoint permission levels.

Note: Edit mode allows you to configure the ArcGIS Map Web Part as described in this topic. If you want to edit the features in a layer, enable the editing capabilities for that layer. See Edit features for more information.

Edit mode

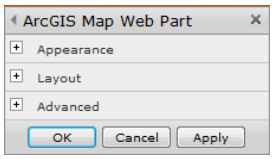
To put the Map Web Part in edit mode, choose **Edit Web Part** from the menu in the upper right corner of the Web Part.



Edit mode allows you to make changes to the Web Part's configuration and save the changes as part of the Web Part. Configurable portions of the Web Part include the following:

- Layers, including order and appearance
- Basemap
- Map extent
- Map rotation
- Appearance of pop-up windows
- Fields included in the attribute table
- Ribbon configuration

To save the Web Part's configuration, click **OK** or **Apply** in the properties pane to the right of the Web Part.



Run mode

Users with read access to the page hosting the Map Web Part can use the Web Part in run mode. In run mode, users can pan and zoom the map and interact with the layers the map contains. The ribbon controls that are available in run mode are determined by the controls included in edit mode. While all the ribbon controls are available in edit mode, only the controls included by the designer are available in run mode.

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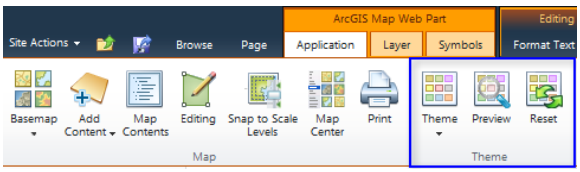
Specify theme colors

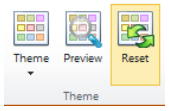
Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

The ArcGIS Map Web Part allows specifying its theme colors. The theme colors are applied to dialog boxes, panels, the Map Center, the Navigation control, and other parts of the user interface (UI). The Map Web Part's theming functionality also integrates with SharePoint site themes. The colors available for selection on the color palette include the theme colors of the current SharePoint site. To change the web part's theme, click the **Theme** drop-down menu in the Theme group on the **Application** tab. In the drop-down menu, specify colors for the background, accents, and selections. Any changes are immediately reflected in the Map Web Part.



Specifying theme colors

You have two approaches to use when changing theme colors. The first is to use the **Theme** button alone and see the changes in the web part as you make them. The second approach is to use the **Theme** button with the **Preview** button. The **Preview** button opens a dialog box with a UI that incorporates all of the different theme colors. To reset the Map Web Part's theme to the default colors, click the **Reset** button.

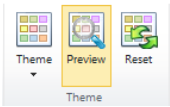


Displaying the Preview Theme dialog box

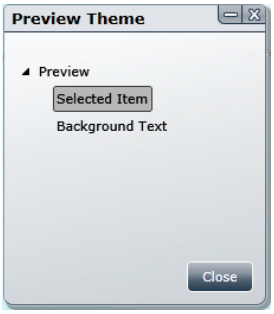
Steps to configure themes while making use of the preview functionality are as follows:

Steps:

1. Click the **Preview** button.



The **Preview Theme** dialog box appears.



Setting a solid background color

Steps:

1. Click the **Theme** button to open the **Theme** drop-down menu.

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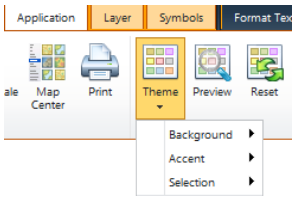
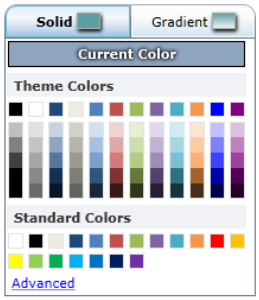
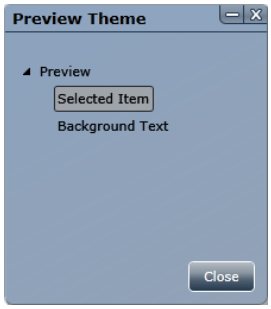


2. To change the background fill, click **Background** > **Fill** on the **Theme** drop-down menu.
3. To specify a solid (single color) background, click the **Solid** tab and select the applicable color.



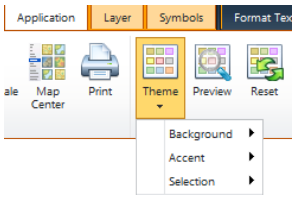
The web part and the **Preview Theme** dialog box update to display the new background.



Setting a gradient background color

Steps:

1. Click the **Theme** button to open the **Theme** drop-down menu.



2. To change the background fill, select **Background** > **Fill** from the **Theme** drop-down menu.
3. To specify a gradient background, click the **Gradient** tab.

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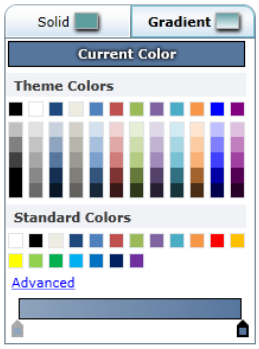
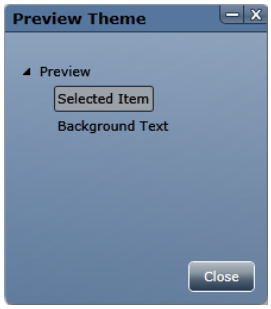


4. Click the left gradient button on the bottom of the dialog box.
5. Select the color to use for one end of the gradient from the color palette.
6. Click the right gradient button on the bottom of the dialog box.
7. Select the applicable color for the other end of the gradient from the color palette.
   If you require finer control over a color, click the **Advanced** link located below the color palette.

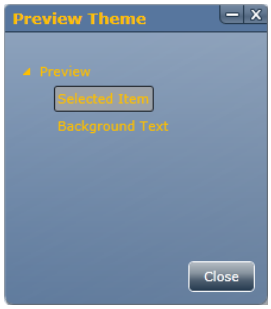
   The web part and the **Preview Theme** dialog box update to display the new background.



Setting the background text color

Steps:

1. Select **Background** > **Text** from the **Theme** drop-down menu.
2. Select the desired color to use for the background text from the color palette. The web part and **Preview Theme** dialog box updates to display the new background text color.



Setting the accent fill

Steps:

1. Select **Accent** > **Fill** from the **Theme** menu.
2. Select the desired color to use for the accent fill from the color palette. The web part and **Preview Theme** dialog box update to display the new accent fill color.

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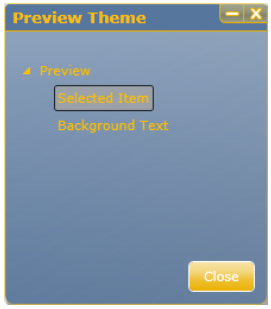
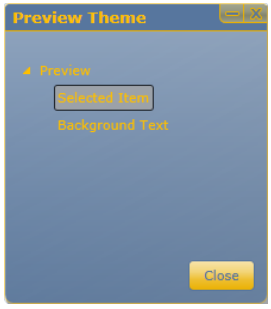


Set the accent text

Steps:

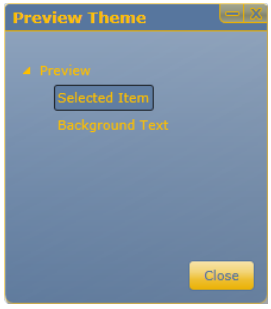
1. Select **Accent** > **Text** from the **Theme** menu.
2. Select the desired color to use for the accent text from the color palette. The web part and **Preview Theme** dialog box update to display the new accent text color.



Setting the selection fill color

Steps:

1. Select **Selection** > **Fill** from the **Theme** menu
2. Select the desired color to use for the selection fill from the color palette. The web part and **Preview Theme** dialog box update to display the new color.



Setting the selection outline color

Steps:

1. Select **Selection** > **Outline** from the **Theme** menu.
2. Select the desired color to use for the outline from the color palette. The web part and **Preview Theme** dialog box update to display the new color.

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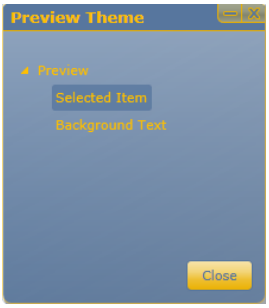

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Print

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Esri Maps for SharePoint provides several printing options for your application. For basic, low-resolution printing, you can choose from the built-in layouts: **Basic** and **With Map Elements**. Printing this way does not require referencing a service. For higher quality printing with the ArcGIS for Server 10.1 Print Service, see the Advanced map printing section below for more details.

Basic map printing

The basic printing option refers to the self-contained print functionality in Esri Maps for SharePoint. While basic printing results in relatively low resolution printouts and offers limited print layout options, it does not require referencing a service. If you require high quality printing or additional layout options, use the ArcGIS 10.1 Print Service. If this is the case, skip this section and refer to the **Advanced map printing** section below.

The print layouts available with the basic print option are as follows:

The **Basic** print layout includes the following:

- The map's current visible extent
- All copyright and attribution information, shown below the map
- The map's title (if specified in the Print configuration dialog box)
- A description (if specified in the Print configuration dialog box)

The **With Map Elements** print layout includes the following:

- Everything in the **Basic** print layout
- An overview map
- Scalebar

Esri Maps for SharePoint supplies the text's font and the printed map's layout. The map draws using the same resolution as shown on the screen and therefore, may not display properly if scaled to a larger map display. The location and scaling of the map cannot be adjusted.

Using the standard Windows printing dialog box, choose the following:

- The printer to which to direct output
- The paper size
- Whether to print in landscape or portrait layout

Advanced map printing

Esri Maps for SharePoint provides a custom, high-quality print tool for the ArcGIS Map Web Part that uses the ArcGIS for Server 10.1 Print Service. By default, Esri Maps for SharePoint uses the Export Web Map Task hosted on ArcGIS Online, but you can configure the Print tool to use your own ArcGIS Server Print Service and a proxy if necessary.

Steps:

1. Place the Map Web Part in Edit mode. See Edit mode and Run mode for instructions.
2. Click **Add Tool** on the **Application** tab of the ribbon.
   The **Add Tool** dialog box appears.
3. In the Tool drop-down menu, select ArcGIS Server Print. You will notice another Print tool listed in the menu; this is the existing Basic Print tool that does not include an option to print from an ArcGIS Server print service.

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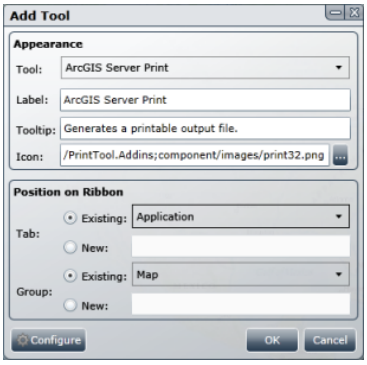
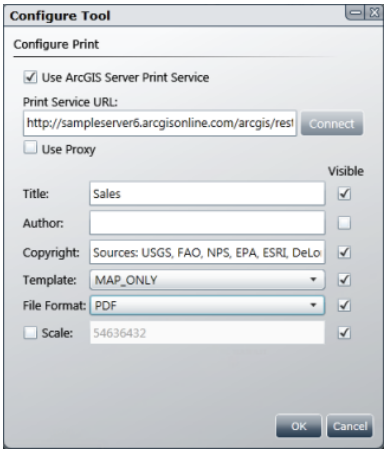


4. Click **Configure** to display the Configure Print dialog box.



5. Check the **Use ArcGIS Server Print Service** check box.
6. Specify the **Print Service URL** if you want to use one different from the default.
   Specify the entire URL to the Print Service, for example, http://<server_name>/arcgis/rest/services/Utilities/PrintingTools/GPServer.
7. Specify the other attributes on the dialog box and click **OK**. Note that end users of the web part cannot configure this print tool; they only see the options configured here.
8. Click **OK** again on the Add tool dialog box to close it.
9. Click **OK** or **Apply** on the ArcGIS Map Web Part properties. The tool is added to the ribbon.

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Change the basemap

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

A basemap provides the geographic context for the content you want to display in a map. In the ArcGIS Map Web Part, the basemap of the current map is displayed at the bottom of the Map Contents panel. The Map Web Part's basemap gallery allows you to choose from several Esri basemaps that are hosted on ArcGIS Online. These basemaps include many options that mix roads, aerial, and topographic data with a variety of symbology. When using the ArcGIS Map Web Part you can choose from the existing maps or configure the basemap gallery to include your custom basemap.

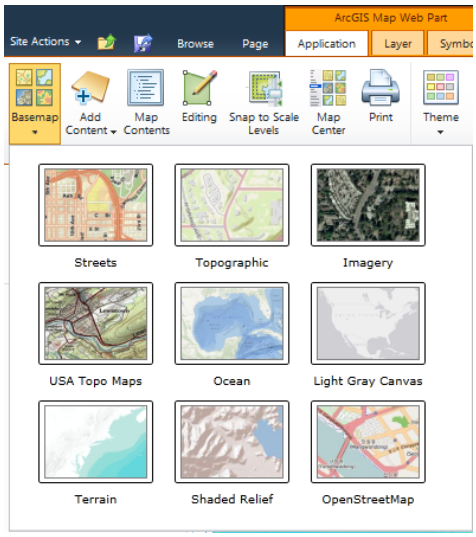
The basemap used in the application is displayed at the bottom of layer list in the **Map Contents** panel. The basemap layer cannot be removed from the **Map Contents** panel, but you may set the basemap's transparency and choose to hide it from the map contents. For more information on showing or hiding the basemap layer in the map contents, see the Map Contents panel.

Note:

- Only ArcGIS Tiled layers, Bing Maps, and OpenStreetMap are supported in the Basemap gallery.
- Dynamic map services are not supported for use as basemaps.
- Secured basemap services are not supported.

Steps:

1. Click the **Basemap** button in the Map group on the **Application** tab.
   The **Basemap gallery** appears.



2. Click a basemap. The Map Web Part's basemap updates to reflect the selected item. All other content in the map will be unchanged.
3. Click the **Basemap** button on the ribbon again to close the **Basemap gallery**.

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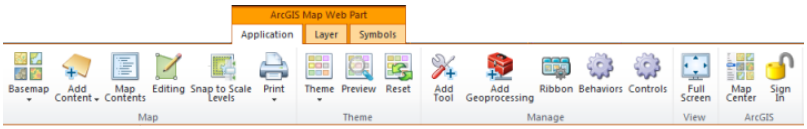
Configure the ribbon

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

When you start using the ArcGIS Map Web Part, you'll notice that most of the web part functionality is organized in the ribbon. The ribbon, a key feature of SharePoint that is leveraged extensively by the Web Part, is similar to what you see in Microsoft Office applications such as Word, Excel, PowerPoint, and Outlook.



Note: To show the ArcGIS Map Web Part tabs, the Map Web Part needs to be selected. To select it, click anywhere within the Map Web Part, including the web part title bar.

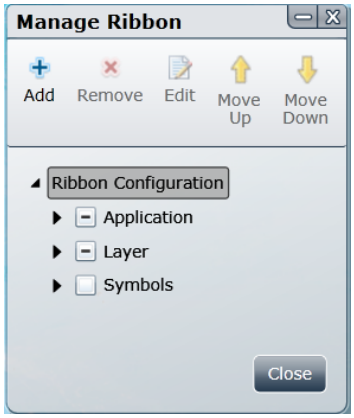
If you have permissions to create or edit an ArcGIS Map Web Part, you can decide what web part functionality is available to the users of this Web Part by configuring the ribbon. Configuring the web part ribbon allows you to control which tabs, groups, and tools (buttons) are shown when the web part is not in Edit mode (all tabs, groups, and tools are shown in Edit mode).

Opening the Manage Ribbon dialog box

Steps:

1. Click the Web Part drop-down menu and click **Edit Web Part**.

2. Click **Ribbon** in the Manage group of the web part **Application** tab.
   The **Manage Ribbon** dialog box appears.



Showing or hiding tabs, groups, and tools

By default, only some tabs, groups, and tools are included on the ribbon when the Map Web Part is not in Edit mode. Some of the tools are included on the Application and Layer tabs, and the Symbols tab is not included at all.

To configure the ribbon, check and uncheck the check boxes in the Manage Ribbon dialog box. The three nodes below the Ribbon Configuration node represent the three tabs that are included with the Map Web Part by default. When you check the check box next to a tab, that tab and all groups and tools within it will be included when the Web Part is in run mode. When you uncheck the check box and it becomes empty, the tab will be excluded from run mode.

Expanding a tab node will reveal nodes that represent all the groups within that tab. When you check the check box next to a group, the group and all the tools within it will be included in run mode, provided the parent tab is also included. When you uncheck the check box and it becomes empty, the group will not be added to the tab.

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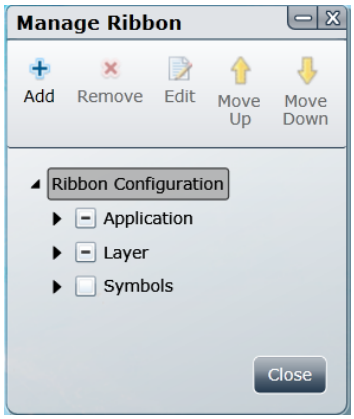
Expanding a group node will reveal all the tools within that group. When you check the check box next to a tool, that tool will be included in run mode, provided the parent group and tab are also included. When you uncheck the check box, the tool will not be included.

Adding a tab

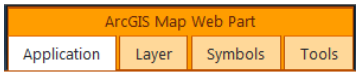
Steps:

1. In the **Manage Ribbon** dialog box, select the **Ribbon Configuration** (root) node and click **Add**.



   The **Add New Tab** dialog box appears.

2. Type a title and a tooltip and click **OK**.
3. Click **OK** or **Apply** in the properties pane to the right of the Web Part.
   When the Web Part loads, the new tab is included on the ribbon.

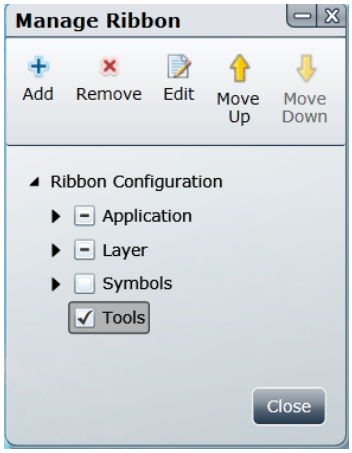


Removing a tab

Note: The three default tabs (Application, Layer, and Symbols) cannot be removed.

Steps:

1. In the **Manage Ribbon** dialog box, select the tab to remove.



2. Click **Remove**.
   The **Confirm delete** dialog box appears.
3. Click **OK**.

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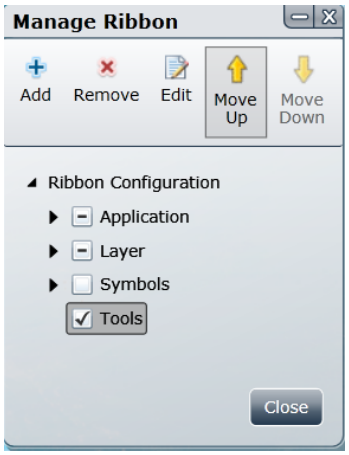
4. Click **OK** or **Apply** in the properties pane to the right of the Web Part.
   When the Web Part loads, the tab is no longer included on the ribbon.

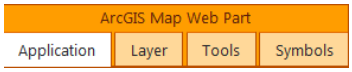
Changing tab order

Steps:

1. In the **Manage Ribbon** dialog box, select the node corresponding to the tab you want to move. The appropriate **Move Up** and **Move Down** buttons become enabled as appropriate.
2. Click the desired arrow to move the tab.



3. Click **OK** or **Apply** in the properties pane to the right of the Web Part.
   When the Web Part loads, the tab order is updated as specified.

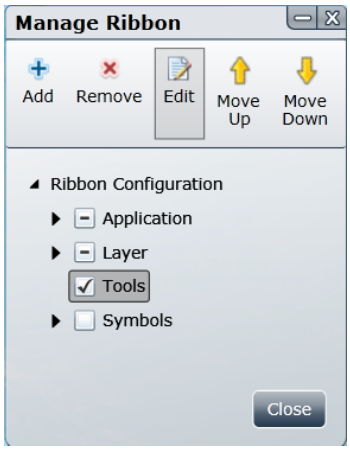


Editing a tab

Note: The three default tabs (Application, Layer, and Symbols) cannot be edited.

Steps:

1. In the **Manage Ribbon** dialog box, select the node corresponding to the tab you want to edit.
2. Click **Edit**.



The **Edit Tab** dialog box appears.

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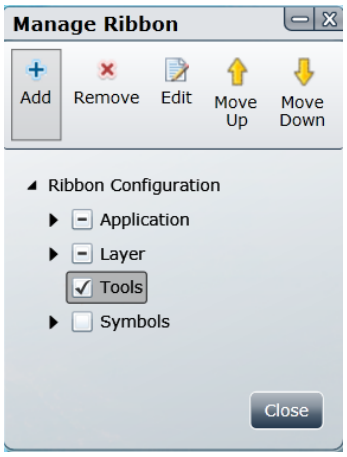
3. Edit the title and tooltip as desired and click **OK**.
4. Click **OK** or **Apply** in the properties pane to the right of the Web Part.
   When the Web Part loads, the tab's title and tooltip are as specified in the **Edit Tab** dialog box.

Adding a group

You can add groups to any tab, regardless of whether it is one of the defaults. To add a group, complete the following steps:

Steps:

1. In the **Manage Ribbon** dialog box, select the node corresponding to the tab where you want to add the group.
2. Click **Add**.



   The **Add New Group** dialog box appears.

3. Type a title and a tooltip and click **OK**.
   If you add a group and do not add tools to that group, the group is not saved.
4. Click **OK** or **Apply** in the properties pane to the right of the Web Part.
   When the Web Part loads, the new group is included in the specified tab on the ribbon.

Removing a group

Note: Groups that are included in the Map Web Part by default cannot be removed.

Steps:

1. In the **Manage Ribbon** dialog box, select the group to remove.
2. Click **Remove**.

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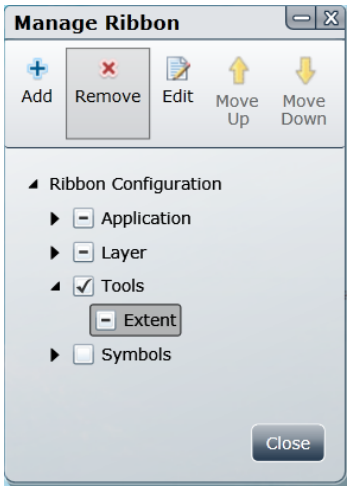


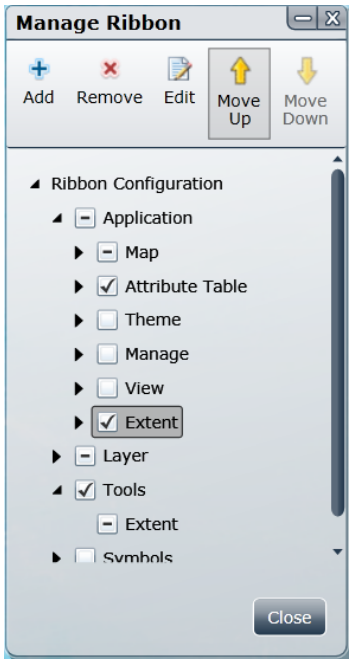
The **Confirm delete** dialog box appears.

3. Click **OK**.
4. Click **OK** or **Apply** in the properties pane to the right of the Web Part.
   When the Web Part loads, the group and its tools are no longer included on the ribbon.

Changing group order

Steps:

1. In the **Manage Ribbon** dialog box, select the group to move. The **Move Up** and **Move Down** buttons are enabled as appropriate.
2. Click the desired arrow to move the group.



3. Click **OK** or **Apply** in the properties pane to the right of the Web Part.
   When the Web Part loads, the order of groups on the ribbon is updated to reflect the change.

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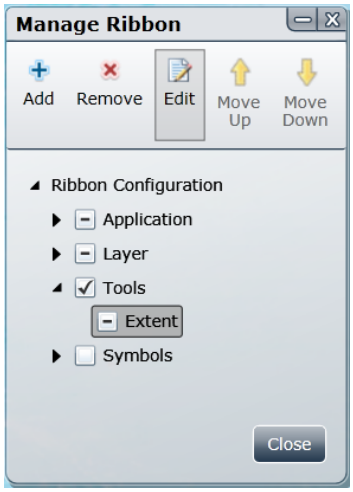
Editing a group

Note: Groups that are included in the Map Web Part by default cannot be edited.

Steps:

1. In the **Manage Ribbon** dialog box, select the group to edit.
2. Click **Edit**.



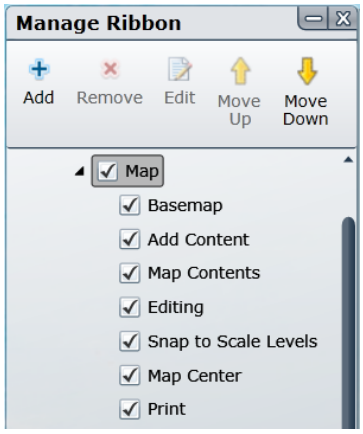
The **Edit Group** dialog box appears.

3. Edit the group's title and tooltip as desired and click **OK**.
4. Click **OK** or **Apply** in the properties pane to the right of the Web Part.
   When the Web Part loads, the group's title and tooltip are as specified on the **Edit Group** dialog box.

Adding a tool

Steps:

1. In the **Manage Ribbon** dialog box, select the group where you want to add the tool.
2. Click **Add**.



The **Add New Control** dialog box appears.

3. Select the tool to add from the **Tool** drop-down menu. You can also change the label, add a tooltip, and change the icon if desired.
4. Click **OK**.

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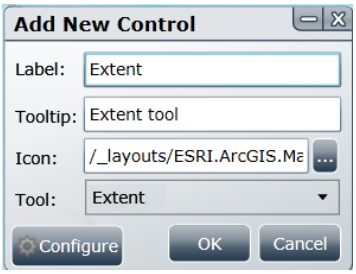


For more information about the tools that appear in this drop-down menu, see Configure add-ins.

If you are adding a geoprocessing tool or another tool that provides additional configuration options, you can click the Configure button to set up the tool. For more information about configuring geoprocessing tools, see Add Geoprocessing tasks.

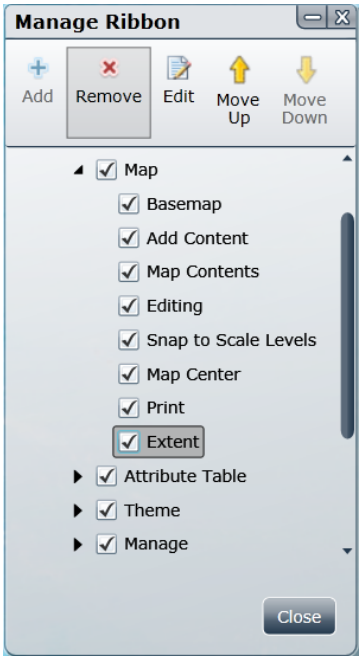
5. The new tool appears in the **Manage Ribbon** dialog box. To make the new tool available to your users, make sure the check box next to it is checked.
6. Click **OK** or **Apply** in the properties pane to the right of the Web Part.
   When the Web Part loads, the new tool is included on the ribbon.

Removing a tool

Tools that are included on the Map Web Part ribbon by default cannot be removed.

Steps:

1. In the **Manage Ribbon** dialog box, select the tool to remove.
2. Click **Remove**.



The **Confirm delete** dialog box appears.

3. Click **OK**.

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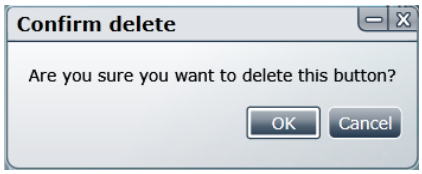


The tool is immediately removed from the list of tools in the **Manage Ribbon** dialog box.

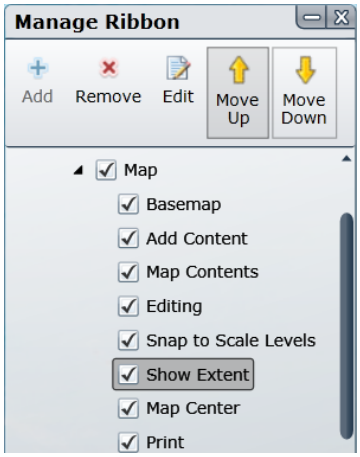
4. Click **OK** or **Apply** in the properties pane to the right of the Web Part.
   When the Web Part loads, the tool is longer included on the ribbon.

Changing tool order

Note: The tools that are included on the Map Web Part ribbon by default cannot be moved.

Steps:

1. In the **Manage Ribbon** dialog box, select the tool to move. The **Move Up** and **Move Down** buttons are enabled as appropriate.
2. Click the desired arrow to move the tool.



3. When the tool is positioned as desired, click **OK** or **Apply** in the properties pane to the right of the Web Part.
   When the Web Part loads, the tool's position on the ribbon is updated to reflect the changes made on the **Manage Ribbon** dialog box.

Editing a tool

Note: The tools that are included on the Map Web Part ribbon by default cannot be edited

Steps:

1. In the **Manage Ribbon** dialog box, select the tool to edit.
2. Click **Edit** .

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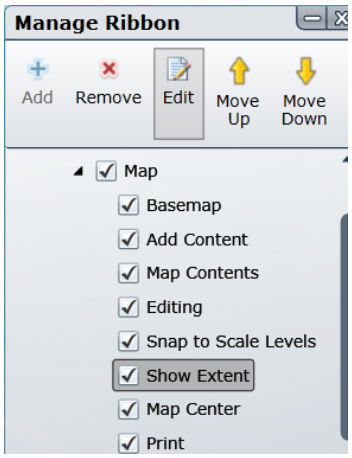
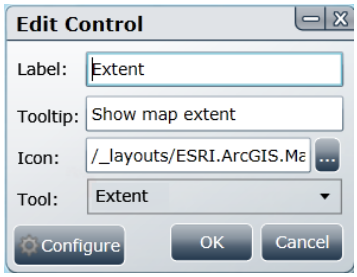


The **Edit Control** dialog box appears.

3. Change the label, tooltip, icon, or additional configuration as desired and click **OK**.



4. Click **OK** or **Apply** in the properties pane to the right of the Web Part.
When the Web Part loads, the tool reflects the changes.

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Add geoprocessing tasks

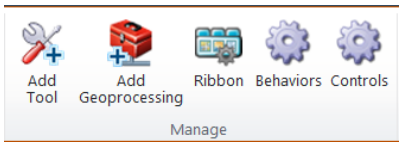
Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

The ArcGIS Map Web Part provides you with the ability to interactively create tools that will execute geoprocessing tasks. If you are unfamiliar with geoprocessing, see What is geoprocessing? When you execute a task in a geoprocessing service, it executes on the server rather than using resources of the client machine where the Viewer is being used.

Steps:

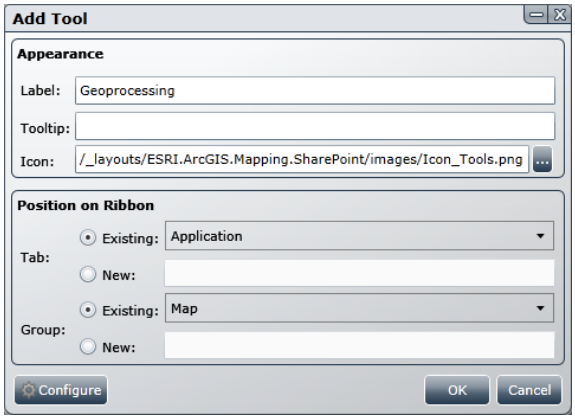
1. Begin by editing the web part.

2. Click **Add Geoprocessing** in the Manage group on the **Application** tab on the web part's ribbon.



The **Add Tool** dialog box appears.

3. Specify the tool's label, ToolTip, and icon. You can also specify the Tab and Group where the tool will reside. Then click **Configure**.



4. Select an ArcGIS Server connection from the drop-down menu or type a URL to an ArcGIS Server in the box. If you typed a URL, click the **Search** button (magnifier icon).

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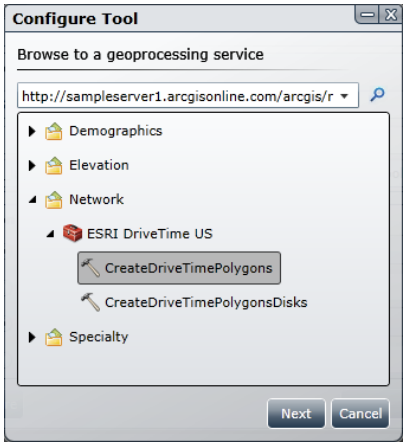
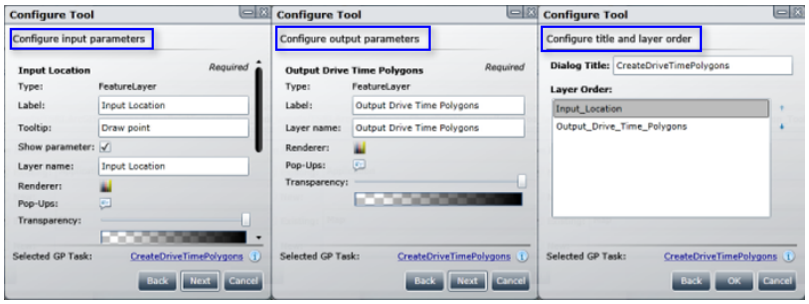
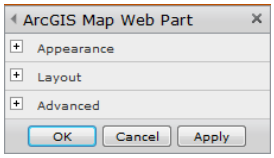
5. The geoprocessing tasks available on that server are listed. Select the desired task and click **Next**.



6. The wizard pages that follow allow you to configure the selected geoprocessing task for use in your application. Click **Next** to browse through the wizard and enter the input parameters, output parameters, dialog box title, and layer order. Click **OK** and click **OK** again when finished.



7. Click the **OK** or **Apply** button in the properties pane to the right of the web part.



The geoprocessing task button is added to the ribbon.

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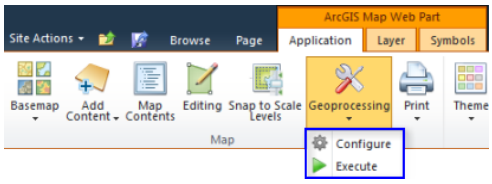

Once you've added the button and you're editing the web part, the following options are available to you:

- Click **Configure** to reconfigure the tool.
- Click **Execute** to run the tool and make its results available on the map for all users.

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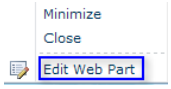
Add behaviors

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

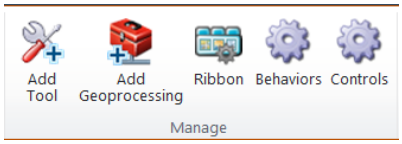
Map behaviors provide a way to expose functionality in the ArcGIS Map Web Part that should always be enabled, for instance, to keep the map at a certain extent or automatically display a splash screen. Any behavior that has been added to the Esri Maps Extensions document library is available for you to add to your ArcGIS Map Web Part. For more information on writing custom tools and behaviors, see Write map behaviors.

Steps:

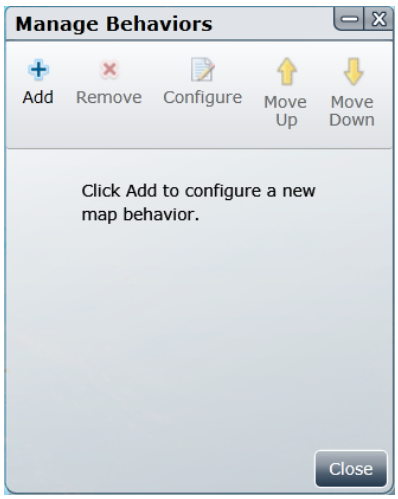
1. Begin by editing the Web Part.



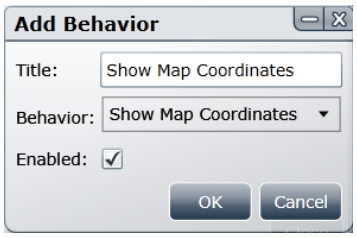
2. Click **Behaviors** in the Manage group on the **Application** tab of the Web Part ribbon.



The **Manage Behaviors** dialog box appears.



3. Click **Add** on the **Manage Behaviors** dialog box. The **Add Behavior** dialog box appears.
4. Type a title and select your behavior from the drop-down menu. Click **OK**.



The behavior is added to the list in the **Manage Behaviors** dialog box. Click **Close**.

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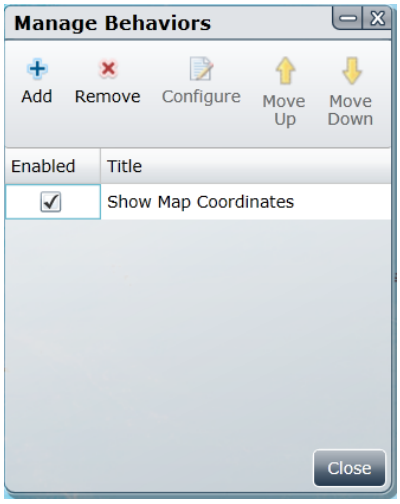
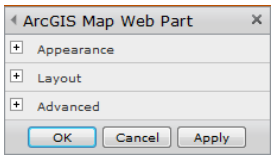


5. At the bottom of the properties pane to the right of the Web Part, click **OK** to save the Web Part. Once the page reloads, the behavior will be included.



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Add tools

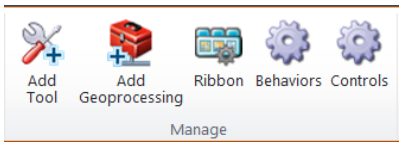
Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Any command that has been added to the Esri Maps Extensions document library is available for you to add to your map. Commands are surfaced in the ArcGIS Map Web Part as tools on the ribbon. Do the following steps to add the command as a tool to use on your map. For more information about creating custom tools, see Write commands

Steps:

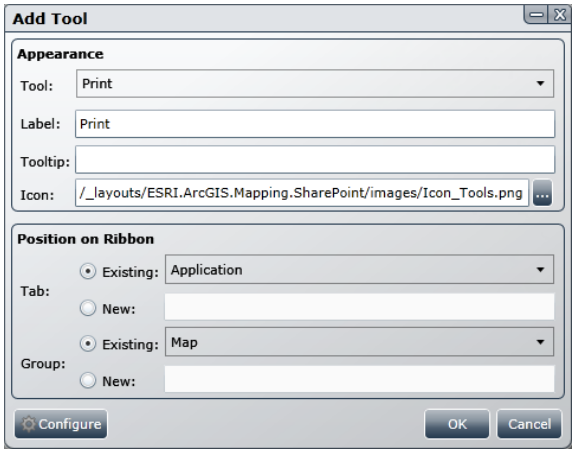
1. Begin by editing the web part.

2. Click **Add Tool** in the Manage group on the **Application** tab on the web part's ribbon.

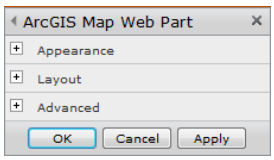


The **Add Tool** dialog box appears.

3. Select your command from the **Tool** drop-down list, type a label, and ToolTip, and select an icon if needed, then click **OK**.



4. At the bottom of the properties pane to the right of the web part, click **OK** to save the web part. When the page reloads, you will notice that a button for the command has been added to the ribbon in the specified tab and group.



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Measure, Print, and Query Related Records tools

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Esri Maps for SharePoint includes three extensions for use with the ArcGIS Map Web Part: Measure, Print, and Query Related Records. These tools provide additional functionality and can be both customized and extended by Esri Maps for SharePoint users.

For developers, the full source code has been made public on ArcGIS Online and provides an example of an advanced tool implemented using best practices. To view the source code, download the samples from ArcGIS Online and open the solution file in Visual Studio. To debug the add-in, follow the instructions provided in the Deployment and Use Instructions text file included with the sample.

- Measure tool—The implementation follows the Model View ViewModel (MVVM) pattern, shows how to interact with the map and add graphics programmatically, demonstrates how to make an add-in localizable, and more.
- Print tool—The implementation demonstrates the Model View ViewModel (MVVM) pattern, interaction with the map, interrogation of layers, leveraging the ArcGIS API for Silverlight's print capabilities, localization, and more.
- Query Related Records tool—The implementation follows the Model View ViewModel (MVVM) pattern, shows how to interact with pop-up window information, add and remove layers programmatically, and more.

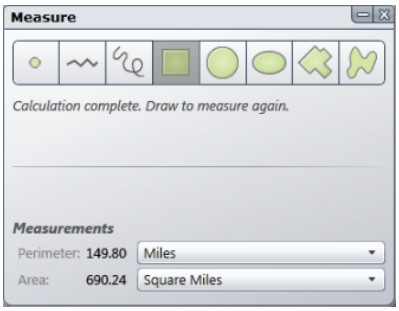
Measure tool

The measure tool allows you to calculate measurements by drawing and measuring points, lines, circles, ellipses, rectangles, and polygons. The measure tool also provides the ability to get the measurements of features on the map. Linear and areal measurements can be retrieved in a number of different units.

Draw and measure geometries

Steps:

1. Add the Measure tool to a toolbar by following the steps in Add tools.
2. Click the **Measure** button on the toolbar to open the **Measure** dialog box.
3. Select the shape to draw. The available shapes, from left to right, are point, line, freehand line, rectangle, circle, ellipse, polygon, and freehand polygon.



4. Draw the shape on the map. When hovering the pointer over the map, a message appears next to the mouse cursor with instructions specific to the type of shape selected for drawing.
5. Once a shape draws on the map, measurements calculate and display at the bottom of the **Measure** dialog box. To change the units used for the measurements, select the applicable unit from the drop-down menus that appear next to the measurements.

Measure features on the map

Steps:

1. Add the Measure tool to a toolbar by following the steps in Add tools.
2. Click the **Measure** button on the toolbar to open the **Measure** dialog box.
3. From the top of the dialog box, click the **Select features to measure** button. If this button is not visible, the map does not contain any measurable layers.

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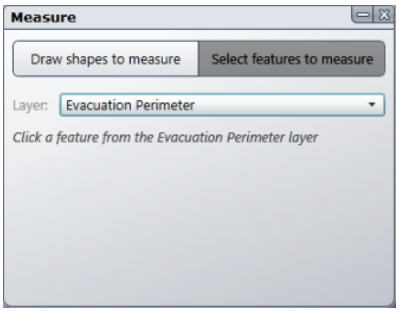


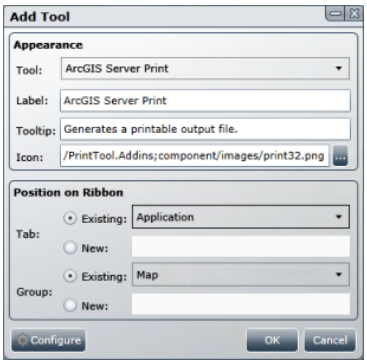
4. From the **Layer** drop-down menu, select the applicable layer.
5. If the selected layer is a map service layer, a subayer drop-down menu appears on the dialog box. If this is visible, select the applicable layer within the map service.
6. Once a feature is clicked, measurements calculate and display at the bottom of the **Measure** dialog box. To change the units used for the measurements, select the applicable unit from the drop-down menus that appear next to the measurements.

Print tool

Esri Maps for SharePoint provides a custom, high-quality Print tool for the ArcGIS Map Web Part that uses the ArcGIS for Server 10.1 Print Service. By default, Esri Maps for SharePoint uses the Export Web Map task hosted on ArcGIS Online, but you can configure the Print tool to use your own ArcGIS Server Print Service and a proxy if necessary.

Steps:

1. Place the Map Web Part in Edit mode. See Edit mode and Run mode for instructions.
2. Click **Add Tool** on the **Application** tab of the ribbon.
   The **Add Tool** dialog box appears.
3. In the Tool drop-down menu, select ArcGIS Server Print. You will notice another Print tool listed in the menu; this is the existing Basic Print tool that does not include an option to print from an ArcGIS Server print service.



4. Click **Configure** to display the Configure Print dialog box.

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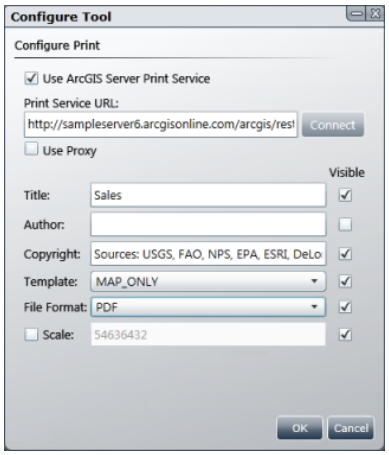

5. Check the **Use ArcGIS Server Print Service** check box.
6. Specify the **Print Service URL** if you want to use one different from the default.
   You must specify the entire URL to the Print Service, for example, http://<server_name>/arcgis/rest/services/Utilities/PrintingTools/GPServer.
7. Specify the other attributes on the dialog box and click **OK**. Note that the end users of the web part will not be able to configure this print tool; they only see the options configured here.
8. Click **OK** again on the Add tool dialog box to close it.
9. Click **OK** or **Apply** on the ArcGIS Map Web Part properties and the tool is added to the ribbon.

Query related records tool

Esri Maps for SharePoint supports finding a feature's related records. If the related records belong to a layer, the geometry of each related record returns and displays on the map as a point, polyline, or polygon. Additionally, the related records display in the attribute table. If the related records belong to a table, the records only display in the attribute table.

The query related records tool is located on the pop-up toolbar and queries the related records of the feature that is clicked. To use this functionality, on-click pop-ups must be enabled for the layer (this is enabled on feature layers by default). When the pop-up displays for a feature, the tool is enabled (visible) if a relationship for the service containing the feature is detected. If there is no relationship detected, the tool is unavailable. After executing the query (clicking the tool), the results return and display in the attribute table and also on the map, if applicable. If there are no related features, a message displays in the pop-up to indicate that no records were found. When the results of the query initially show on the map, they display as a temporary layer, and removed when another query is executed, or if the pop-up is closed. If you want to keep the results as a permanent layer on the map, check the Keep results on map check box.

Note: The query related records functionality is only enabled for features within feature layers.

Add the Query Related Records tool to the pop-up window

The Query Related Records tool is designed for use on the pop-up window, not the main SharePoint ribbon. In Esri Maps for SharePoint, you must edit the DefaultTools.xml file in the Esri Maps Configuration Files.

Steps:

1. Open the Default.xml file in the Esri Maps Configuration Files.
2. Add the following xmlns declaration to the top of the DefaultTools.xml file: `xmlns:QueryRelatedRecords="clr-namespace:QueryRelatedRecords.AddIns;assembly=QueryRelatedRecords.AddIns"`.

```
<ToolPanels xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml" xmlns:esri="
http://schemas.esri.com/arcgis/mapping/2009"
xmlns:QueryRelatedRecords="clr-namespace:QueryRelatedRecords.AddIns;assembly=QueryRelatedRecords.AddIns">
```

3. Add the following lines to the Popup Toolbar section f the DefaultTools.xml file: `<Tool Label="Query Related Records" Icon="/_layouts/15/ESRI.ArcGIS.Mapping.SharePoint/images/`

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```
GeodatabaseRelationshipSelect16.png" Description="Query the related records of the
feature"><Tool.Class> <QueryRelatedRecords:QueryRelatedTool /> </Tool.Class></Tool>.
```

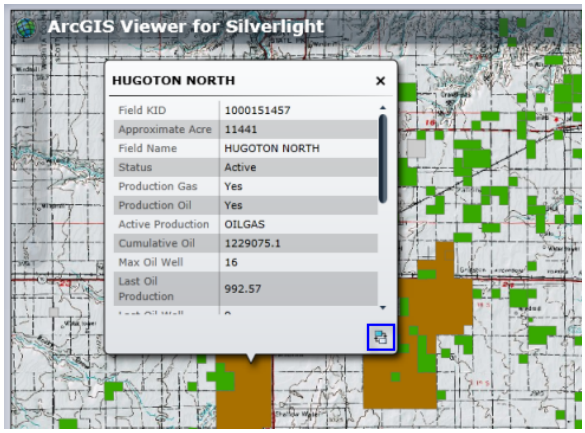
```
<ToolPanel Name="Popup Toolbar" ContainerName="PopupToolbarContainer" Orientation="Horizontal">
  <Tools>
    <Tool Icon="/_layouts/15/ESRI.ArcGIS.Mapping.SharePoint/Images/toolbar/DeleteGraphicCommand16.png">
      <Tool.Class>
        <esri:DeleteGraphicCommand />
      </Tool.Class>
    </Tool>
    <Tool Icon="/_layouts/15/ESRI.ArcGIS.Mapping.SharePoint/Images/toolbar/EditShapeCommand16.png">
      <Tool.Class>
        <esri:EditShapeCommand />
      </Tool.Class>
    </Tool>
    <Tool Icon="/_layouts/15/ESRI.ArcGIS.Mapping.SharePoint/Images/toolbar/EditValuesCommand16.png">
      <Tool.Class>
        <esri:EditValuesCommand />
      </Tool.Class>
    </Tool>
    <Tool
    Icon="/_layouts/15/ESRI.ArcGIS.Mapping.SharePoint/Images/toolbar/AddAttachmentsCommand16.png">
      <Tool.Class>
        <esri:AddAttachmentsCommand />
      </Tool.Class>
    </Tool>
      <Tool Label="Query Related Records"
      Icon="/_layouts/15/ESRI.ArcGIS.Mapping.SharePoint/images/GeodatabaseRelationshipSelect16.png"
      Description="Query the related records of the feature">
      <Tool.Class>
        <QueryRelatedRecords:QueryRelatedTool />
      </Tool.Class>
    </Tool>
  </Tools>
</ToolPanel>
```

4. Save and close the DefaultTools.xml file.
5. Download GeodatabaseRelationshipSelect16.png.
6. Navigate to the Esri Maps Extensions library and upload the icon file from step 5. This icon appears on the pop-up window toolbar when the tool is enabled. Note that the tool is only enabled if related features are detected on the feature layer.

Query records

Steps:

1. Click a feature on the map. If the layer containing the feature has relationships, the Query Related Records tool appears in the pop-up toolbar.



2. Click the tool to execute the query. The results of the query return and a temporary layer is created that displays the features as red points, lines, or polygons. If there are no related records for a feature, a message displays in the pop-up to inform the user. Note that closing the pop-up window or reexecuting the query removes the temporary layer.
3. To add the results of the query to the map permanently (create a layer), check the **Keep results on map** check box. You can toggle this check box to specify whether to keep the results of each query on the map. Once a layer has been added to the map, you can work with it just as with any other layer, including removing, renaming, reordering, and configuring its look and feel (that is, symbology).

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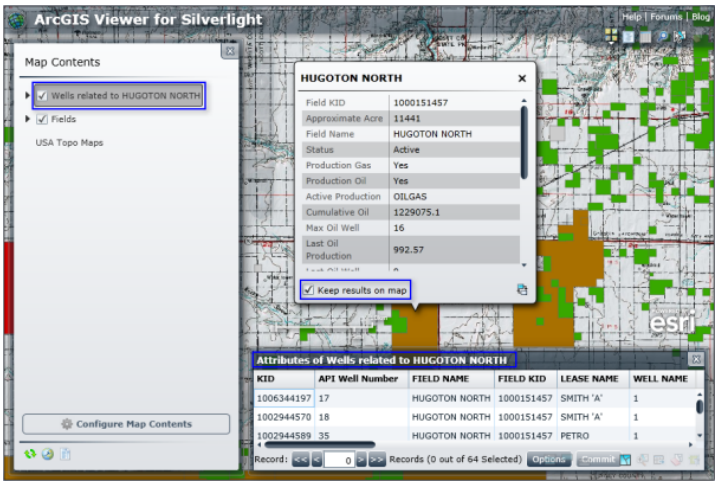

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Add secured services

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

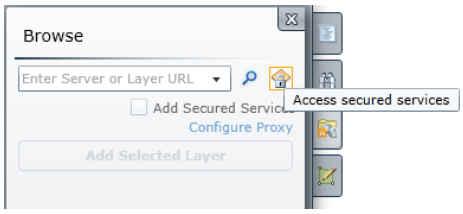
You can add secured ArcGIS Server map services to the ArcGIS Map Web Part via a proxy URL. Web requests are redirected through the proxy, which is responsible for authenticating with the service endpoint. Once you have configured your proxy pages as shown in the Configure a proxy topic, you can access secured services.

Note:

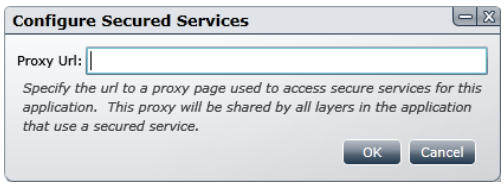
- Secured basemaps and geoprocessing services are not supported.
- Add a layer using secured services only if it requires it. Currently, if **Add secured services** is checked, all layers are added with ProxyUrl.

Steps:

1. With the Map Web Part in Edit Mode, click **Browse** to display the **Browse** panel.
2. On the **Browse** panel, click**Access secured services**. The check box to **Add Secured Services** and the **Configure Proxy** link appear.



3. Click the **Configure Proxy** link, and in the **Configure Secured Services** dialog box that appears, enter the URL to the desired proxy page and click **OK**. The proxy entered will be shared by all layers in the application that use secured services.



Ensure you have entered the proxy url correctly as it is not validated by the ArcGIS Map Web Part.

4. In the **Browse** panel, check the **Add Secured Services** check box. All of the layers you add will now use the defined proxy.
5. To change the proxy, use the **Configure Proxy** link in the **Browse** panel.

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Configure a proxy

Note:
- This topic applies to the Silverlight-based ArcGIS Map Web Part.
- The proxy specifications in this topic are a recommendation. You may use more specific referrers and proxies if necessary.

In the Silverlight-based ArcGIS Map Web Part, a proxy page can be used to access ArcGIS Server services secured with token-based authentication. A proxy page consists of server-side code that runs on your web server. The browser sends the request to your proxy and your proxy in turn forwards the request to the ArcGIS Server service. Esri Maps for SharePoint provides a proxy page, Proxy.ashx, that you can use to handle communication with the ArcGIS Server services used in your application. Download Proxy.zip.

Note: Since the proxy requires extra time and resources on your server, use the proxy page only when your application requires it.

The Proxy.ashx page passes along the HTTP referrer from the applications to the server. Typically, you need one proxy page per application if you are using tokens, because tokens are application specific. The scope for which you choose to define tokens (site, page, and so on) depend on the level at which you want to authenticate. If all Map Web Parts within an entire site consume securd ArcGIS Server services in the same way, it may make sense to define one proxy for the site. If various Map Web Parts within a site differ in how they access secured services,set up a proxy for each page or set of pages that use the same permissions.

When retrieving tokens from the Services Directory (for example, http://<servername>/ArcGIS/tokens/gettoken.html), use the entire URL to the SharePoint site or page instead of just http://<hostname>. In the Proxy.config file, paste the entire token without leading or trailing white spaces. Alternatively, use the URL of just the SharePoint site collection to have the proxy work for all site pages. Detailed instructions are in the next section.

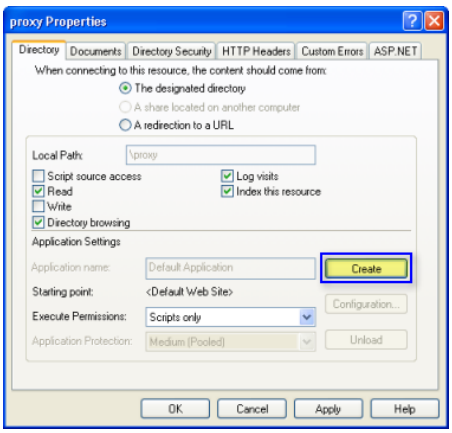
Download and configure the proxy page

The following steps describe how to download and install the proxy page on your web server. The proxy page runs on your local web server, not on an Esri server or on the ArcGIS Server computer (unless your web server also hosts the ArcGIS Server instance). The proxy page does not have to be located on your SharePoint server.

Before proceeding, ensure that you have ASP.NET 2.0 or higher installed and registered with IIS. If ASP.NET is not configured with IIS, follow the instructions for the version of IIS you are running in the ASP.NET and IIS Configuration help topic on MSDN.

Steps:

1. Download Proxy.zip, unzip the file, then save the contents to a folder on your web server's root directory. In IIS, the default location for the web server's root folder is c:\inetpub\wwwroot. If you plan on using the proxy for multiple sites, you can create a folder in the web root directory named proxy and place the contents there.
2. Open **IIS Manager**. See How to: Open IIS Manager for more information about opening IIS Manager depending on the version of IIS you are using.
3. Create a **Web Application** for the proxy folder; these steps differ depending on the version of IIS you are using.
4. For IIS 5 or 6 use the following steps:
   a. In the **Default Web Site**, right-click the proxy directory and click **Properties**.
   b. On the **Directory** tab in the **Application Settings** section, click the **Create** button and click **OK**.



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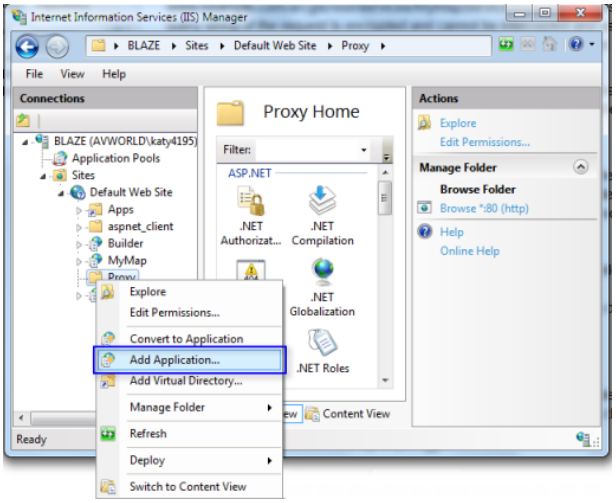
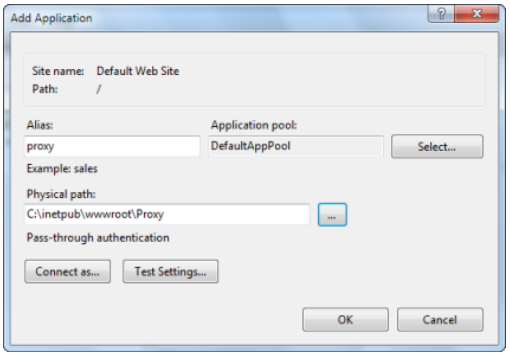
5. For IIS 7, use the following steps. For more information, see Create a Website (IIS 7).
   a. In the **Default Web Site**, right-click the **Proxy** directory and click **Add Application**.



   b. Specify the **Alias** and **Physical Path** in the **Add Application** dialog box, and click **OK**.



6. Obtain a token for the service. If your application uses multiple ArcGIS Server systems that require tokens, obtain a token for each server. For more information on obtaining a token, see Acquiring ArcGIS Tokens.
7. Open the configuration proxy page (proxy.config) in a text or XML editor.
8. For each ArcGIS Server that uses the proxy page, add a <serverUrl> entry to the configuration XML file within the <serverUrls> section. See the proxy configuration file for examples. The serverUrl element can have the following attributes:
   - `url`—URL of the ArcGIS Server machine or the service. If multiple services in the same server are used in the application, the url attribute can point to the services root. If only a single service on the server is used, the url attribute can be set to the full service URL.
   - `matchAll`—Specifies whether to use the token for all requests with this URL stem. If this attribute is true and the url attribute is set to the services root, the entry can be used for multiple services in the application.
   - `token`—Authentication token obtained in step 1. Optional—used only for services secured with token-based authentication.

   If multiple services on the same server are used in the application, the URL can point to the service root (for example, http://www.example.com/arcgis/rest/services), and the `matchAll` parameter can be set to true. Multiple server entries can be added if more than one ArcGIS Server computer is used in the application.

   The `mustMatch` attribute in the containing element controls whether only specified sites can be proxied. This attribute should generally be set to true. If set to false, the proxy page forwards any request to any server. This could potentially allow your proxy page to be used to send requests to third-party servers without your permission.
9. Save the configuration file. Note the URL of your proxy page, as you will need it when adding a secured map service to Esri Maps for SharePoint.

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Once you have configured the proxy page with the application, test the application to ensure requests are processed correctly. The application should function normally as it did before the proxy page was implemented. If not, you may need to troubleshoot the proxy. If your application environment supports debugging mode, you may be able to set a breakpoint in the proxy page and detect whether it is operating correctly.

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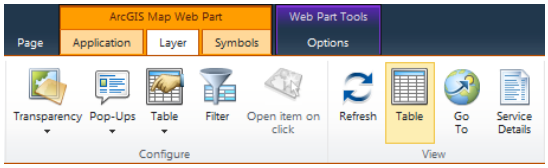
The attribute table

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Layers that are rendered on the client populate the attribute table in the bottom panel of the ArcGIS Map Web Part. This includes ArcGIS Server feature layers, geoRSS layers, and graphics layers. Each layer can be configured to specify the fields included in the attribute table along with their display names.

Open the attribute table

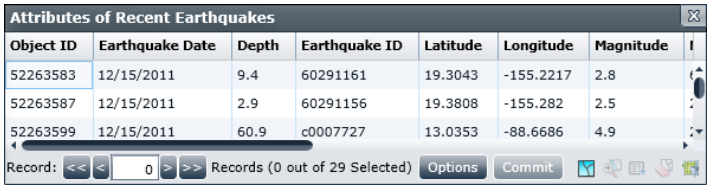
Click the **Table** button of the View group on the **Layer** tab of the ArcGIS Map Web Part ribbon to display the Attribute table for the selected layer.



To configure attribute table fields for a layer, complete the following steps.

Steps:

1. Open the **Map Contents** panel and select the desired layer. For instructions, see The Map Contents Panel.
2. Open the attribute table to view the layer's fields and field names.



3. Locate the **Table** button in the Configure group of the **Layer** tab on the web part's ribbon, and click the **Table** button to open the configuration table.

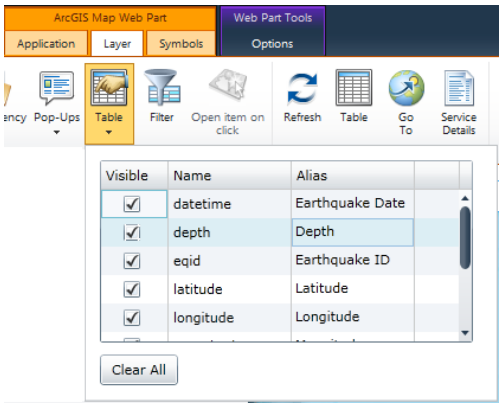


Table configuration options

The columns and button on the Table configuration dialog box are described in the following table:

Component	Description
Visible column	When the check box is checked, the field will be displayed in the table. When unchecked, the field will not appear in the table.
Name column	The name of the field in the underlying data. This value is not displayed in the table and the field is not editable.

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Alias column	The name of the field as it is displayed in the table. This field is editable.
Clear All button	Unchecks all the check boxes in the Visible field. When all are unchecked, the button caption will change to Select All, which will, when clicked, check all the boxes in the Visible field.

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Export feature attributes

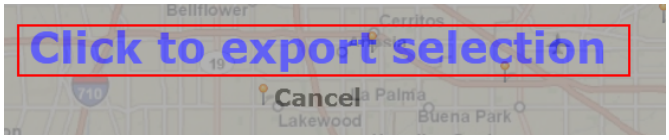
Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

The ArcGIS Map Web Part provides you with the ability to export the attributes of selected features to either a .csv or .txt file format (comma separated). The Export tool is contained in the **Selection** section of the **Layer** tab on the ribbon. The Export tool exports the field names and attribute values for the selected features as they are displayed in the attribute table. To change which fields are exported, configure the field visibility for the Attribute table. For information on selecting features, see Select features.

Steps:

1. Select the desired features using either the **Select** tool or Attribute table.
2. Click the **Export** button on the **Layer** tab of the web part's ribbon.

3. Click the **Click to export selection** text on the Map Web Part to export the selection. To cancel the export operation, click **Cancel**.



4. In the **Save As** dialog box that appears, select the file location, enter a file name, select the file type, then click the **Save** button. The exported file will be available in the location specified.

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Sign in to ArcGIS

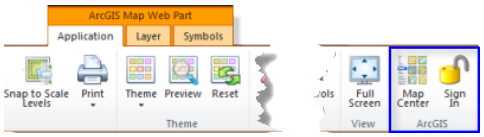
Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Signing in to ArcGIS Online with your Esri Global Account allows you to use the Map Center to open secure (non-public) web maps in the ArcGIS Map Web Part.

Learn more about creating and managing an ArcGIS Online account

Steps:

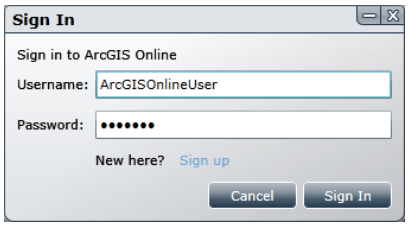
1. Once you have a registered an Esri Global Account for ArcGIS Online, open the Map Center by clicking the **Map Center** button on the **Applications** tab.



2. Click the **Sign In** hyperlink on the upper right corner of the page.

   The **Sign In** dialog box appears.

3. To sign in, type your user name and password, and click **Sign In**.



Note: ArcGIS Online user names and passwords are case sensitive.

Once you have signed in, you can use the Map Center to open secure (non-public) web maps in the Map Web Part.

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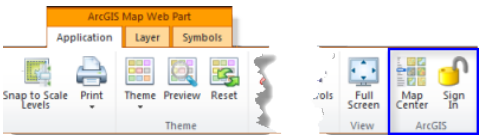
The Map Center

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

The Map Center allows you to open web maps from ArcGIS Online in the ArcGIS Map Web Part. The Map Center provides an easy-to-use interface to search for maps and groups. The Map Center provides access to Featured Maps, maps you have created (My Maps), and maps within groups to which you belong (Groups).

To access the Map Center, click the **Map Center** button on the **Application** tab of the ArcGIS Map Web Part ribbon.



The Map Center appears, hiding the map.

There is a variety of ways to find maps that others have created and made available:

- View Featured Maps, which is a collection of maps that Esri has chosen to highlight.
- Search for maps and groups using keywords.
- Open a group to see the list of maps available in the group.

If you sign in to ArcGIS Online using your Esri Global Account, you can view and open secure (non-public) web maps. Once signed in, the Map Center provides access to the maps you've created on the **My Maps** tab. The **Groups** tab lists the groups you own and those you have joined.

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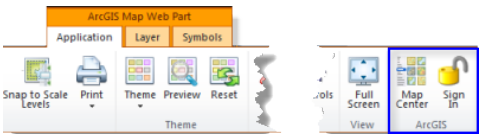
Open a web map

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Web maps provide an easy starting point for creating and configuring a map in Esri Maps for SharePoint. The Map Center of the ArcGIS Map Web Part provides access to web maps created on ArcGIS Online. To access maps in the My Maps or Groups tabs of the Map Center, or web maps you have recently viewed, you need to sign in to ArcGIS Online using either the Sign In button on the ribbon or the link in the Map Center.



The following tabs are included in the Map Center:

- **Recent**—Provides access to web maps that you have opened recently.
- **My Maps**—Displays the web maps that you have created. You must be signed in to ArcGIS Online for this tab to be visible.
- **Groups**—Provides access to web maps belonging to groups you own for which you are a member. You must be signed in to ArcGIS Online for this tab to be visible.
- **Featured Maps**—Lists the web maps that are currently featured on ArcGIS Online.
- **Search**—Provides the ability to search for web maps on ArcGIS Online. Only publically available web maps and web maps to which you have access will be returned.

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Layer types

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

The ArcGIS Map Web Part can display layers on the map that come from many different sources. The capabilities of a layer depend on its source. The different layer types and the capabilities of each are described below.

ArcGIS Server map services

When an ArcGIS Server map service is added to the map, the application retrieves and displays image tiles from the service. The image tiles do not contain any information about the features they show. For this reason, the rendering performance of this type of layer is very good, but its configuration options are limited.

Behavior

- The service is selectable on the **Map Contents** panel.
- The attribute table is not populated.
- Configuration options are limited (notice the number of unavailable buttons on the Layer tab of the ribbon).
- If the service is dynamic, the layers contained by the service are shown on the Map Contents panel. These layers:
  - Cannot be selected (made the active layer).
  - Can be turned on and off by clicking the check box next to them.
- Pop-up windows for the service's sublayers can be enabled and shown when a feature is clicked (on click).
- Pop-up windows cannot be shown when hovering the mouse pointer over features (on hover).

Feature layers

Through the Browse panel, you have the option to add feature layers from a variety of sources, including layers within ArcGIS Server dynamic map services, layers within ArcGIS Server tiled map services, hosted feature services, and on-premises ArcGIS Server feature services. When one of these layers is added to the map, the application retrieves the data from the server for the features the layer contains and draws them as graphics in the client browser. For this reason, this layer type provides a wide range of configuration options, but its rendering performance is not as good as that of layers created from map or image services.

Behavior

- The attribute table is populated.
- The layer can be selected on the **Map Contents** panel.
- Pop-up windows for features within the layer are enabled by default and are displayed when a feature is clicked.
- Pop-up windows can be configured to be shown when the mouse pointer is hovered over the feature.
- Features are selectable.
- Layer symbology can be configured.
- The layer can be edited, provided the service is configured to allow editing.

Note: If a URL or hyperlink exists as a field value in a feature layer, the Web Part shows the field as a hyperlink in pop-up windows, but as text strings in the attribute table.

ArcGIS Server image services

ArcGIS Server image services can be added to the map using either Search or Browse. When an image service is added to the map, the Map Web Part retrieves an image tile from the server and displays it on the client. No information about the features shown on the image is sent to the client. For this reason, the rendering performance of image services is very good, but the configuration options are limited.

Behavior

- The attribute table is not populated.
- Layers can be turned on and off by clicking the check box next to them.
- There is limited ability to configure this type of layer. (For example, Pop-Ups, Table, Filter, and so on, are unavailable.)

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SharePoint lists

Through the **Browse** panel, you can also add SharePoint lists to the map. When one of these layers is added, the Web Part retrieves the data for the items that the list contains and draws them as graphics on the client. For this reason, this layer type provides a wide range of configuration options, but its rendering performance is not as good as that of layers created from map or image services.

Example URL: http://mySharePointServer/sites/mySiteCollection/Lists/myList/AllItems.aspx

Behavior

- The attribute table is populated.
- Layers can be selected on the **Map Contents** panel.
- Pop-up windows for features within the layer are enabled by default and are displayed when a feature is clicked.
- Pop-up windows can be configured to be shown when the mouse pointer is hovered over the feature.
- Features are selectable.
- Layer symbology can be configured.

GeoRSS layers

GeoRSS feeds are web feeds that give you a formatted XML file with coordinates and attributes. There are a variety of sources for GeoRSS content; for example, the United States Geological Survey (USGS) National Earthquake Information Center provides a number of feeds that include location and magnitude information for worldwide earthquake activity over various periods of time.

Behavior

- The attribute table is populated.
- Layers can be selected on the **Map Contents** panel.
- Pop-up windows for features within the layer are enabled by default and are displayed when a feature is clicked.
- Pop-up windows can be configured to be shown when the mouse pointer is hovered over the feature.
- Features are selectable.
- Layer symbology can be configured.

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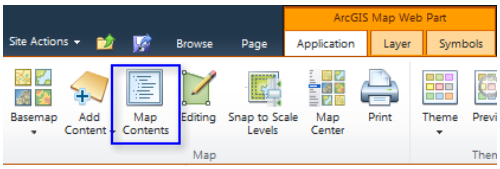
The Map Contents panel

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

The **Map Contents** panel is a central component of the ArcGIS Map Web Part. The **Map Contents** panel displays the list of layers contained in the map, and you can use it to toggle layer visibility on and off. By default, the panel also shows the symbols used for each layer.

In the preceding screen capture, notice that the Cities layer is highlighted. This indicates that it is the selected layer. The selected layer determines the context for the tools on the **Layer** and **Symbols** tabs, as well as the attributes in the attribute table. Put another way, with the Cities layer selected, any tools on the **Layer** tab or the **Symbols** tab—such as the **Rename** button or the **Transparency** slider—operate on the Cities layer. Also, the attribute table shows tabular data from the selected layer.

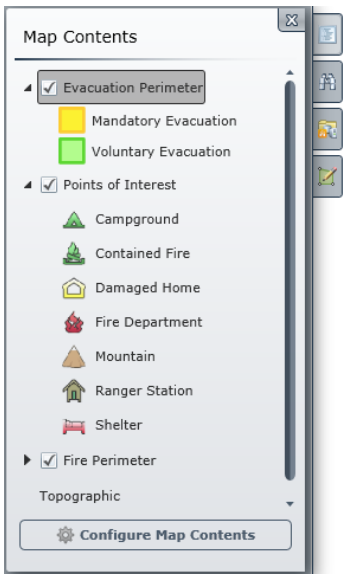
To show the **Map Contents** panel, click the **Map Contents** button on the **Map** tab of the web part's ribbon.



Configuring the Map Contents panel

The **Map Contents** panel can display symbology for layers. Legend configuration includes the following display mode options:

- Contents—Both layer visibility check boxes and layer symbology (legend) are included.
- Layer list—Only layer visibility check boxes are included; layer symbology is not.
- Legend—Only layer symbology is included; layer visibility check boxes are not.



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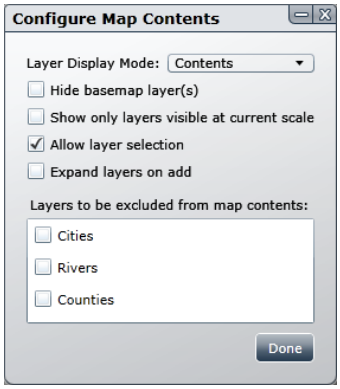
Additional Map Contents configuration options include specifying which layers to include in the Map Contents, whether to show the basemap layer, and the ability to show only the layers visible at the current scale.

To configure the **Map Contents** panel, click **Configure Map Contents** at the bottom of the Map Contents panel. In the **Configure Map Contents** dialog box, choose the Layer Display Mode, check the check box for any desired options, and specify layers to be excluded from the Map Contents. Click **Done** when you are finished.



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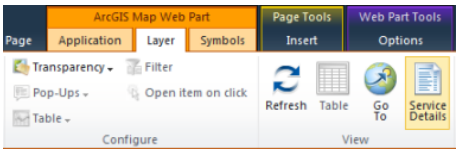
Service details

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

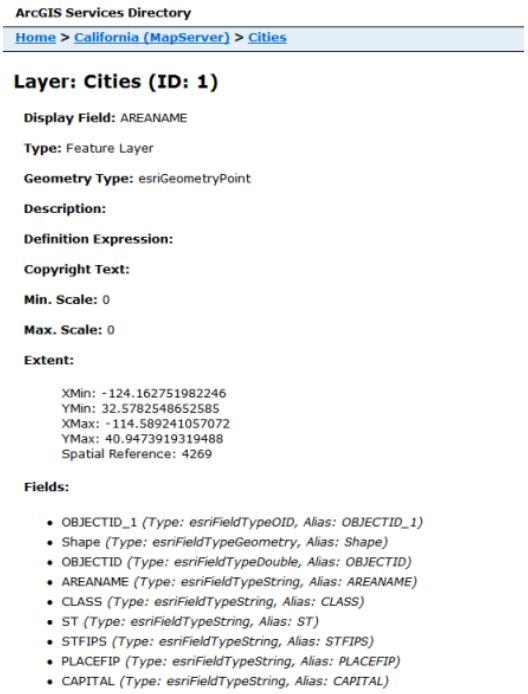
The layer types that are supported in the ArcGIS Map Web Part include ArcGIS Server map services, layers within ArcGIS Server dynamic map services, and ArcGIS image services. You can get information about a specific layer by clicking the Service Details icon on the ribbon.

The Service Details button opens the service endpoint (provided by the ArcGIS Server instance) for the selected map service or layer. For each service, a set of general properties are displayed. For map services, properties include the spatial extent, spatial reference (coordinate system), and supported operations. Additional information may be available depending on the layer type and information provided by the publisher of the service. See the Services Directory topic in the ArcGIS Server REST API help for more information.

Open the **Map Contents** panel and select the desired layer. Click the **Service Details** button in the View group on the **Layer** tab of the ribbon.



The service details open in a new browser window:



ArcGIS Services Directory

Home > California (MapServer) > Cities

Layer: Cities (ID: 1)

Display Field: AREANAME

Type: Feature Layer

Geometry Type: esriGeometryPoint

Description:

Definition Expression:

Copyright Text:

Min. Scale: 0

Max. Scale: 0

Extent:

XMin: -124.162751982246
YMin: 32.5782548652585
XMax: -114.589241057072
YMax: 40.9473919319488
Spatial Reference: 4269

Fields:

- OBJECTID_1 *(Type: esriFieldTypeOID, Alias: OBJECTID_1)*
- Shape *(Type: esriFieldTypeGeometry, Alias: Shape)*
- OBJECTID *(Type: esriFieldTypeDouble, Alias: OBJECTID)*
- AREANAME *(Type: esriFieldTypeString, Alias: AREANAME)*
- CLASS *(Type: esriFieldTypeString, Alias: CLASS)*
- ST *(Type: esriFieldTypeString, Alias: ST)*
- STFIPS *(Type: esriFieldTypeString, Alias: STFIPS)*
- PLACEFIP *(Type: esriFieldTypeString, Alias: PLACEFIP)*
- CAPITAL *(Type: esriFieldTypeString, Alias: CAPITAL)*

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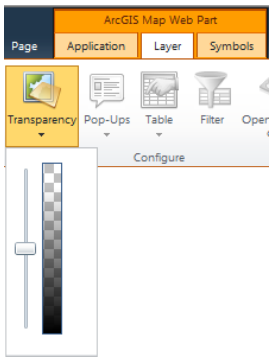
Layer transparency

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

The ArcGIS Map Web Part allows you to configure the transparency of each layer in the map. This allows you to see more or less of certain layers so you can emphasize specific data. Transparency can be configured for all layers, regardless of the layer's data source, including the basemap.

Steps:

1. Open the **Map Contents** panel and select the desired layer.
2. Click the **Transparency** button on the **Layer** tab of the Web Part ribbon. The transparency slider appears in a drop-down window.



3. Move the slider up or down to change the layer's transparency. Moving the slider bar up makes the layer more transparent; moving it down makes the layer more opaque.

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Pop-up windows

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part. For information on configuring pop-up windows in the JavaScript-based Esri Maps Web Part, see Configure and display pop-ups.

The following layer types can have pop-up windows that display a feature's attributes: dynamic map services, layers within ArcGIS Server dynamic map services, cached map services, GeoRSS layers, graphics layers, and SharePoint list layers. For more information on the different layer types and their capabilities, see Layer types.

Note: Hyperlinks are available in pop-up windows if the URL exists as a field value in a feature layer. You cannot add hyperlinks to fields in the ArcGIS Map Web Part. While the field shows as a hyperlink in pop-up windows, it shows as a text string in the attribute table.

Pop-up windows in the ArcGIS Map Web Part

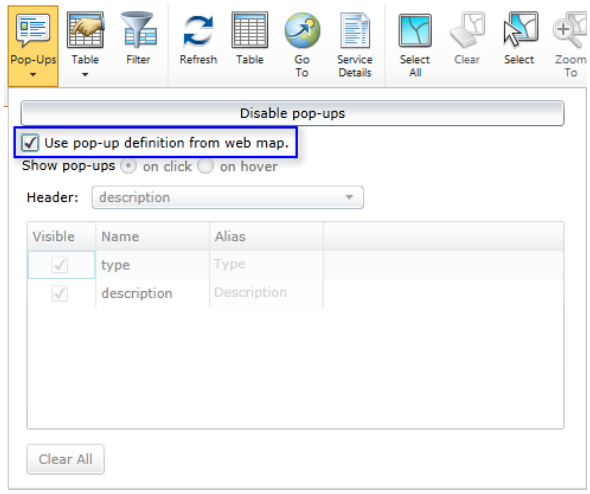
Pop-up windows can be configured to display when you hover over a feature (on-hover mode) or when the feature on the map is clicked (on-click mode). By default, pop-up windows display in on-click mode, which supports the ability to perform basic editing tasks (see Edit features) and the ability to drill down to display attributes from multiple layers in a single pop-up window. On-click pop-up windows and on-hover pop-up windows both support the ability to display specific attributes and user-friendly field names (aliases). On-hover mode is supported only for layers within ArcGIS Server dynamic map services and GeoRSS layers. Editing features is not supported in on-hover mode.

Pop-up windows in web maps

Web maps are maps created in ArcGIS Online that can be consumed by Esri Maps for SharePoint. When creating a web map, you can include a basemap, data layers, an extent, pop-up windows, a legend, a place finder, and so on (see What is ArcGIS Online? for more information). If a web map contains pop-up windows, the configuration of that pop-up window, including attribute lists, descriptions, charts, and so on, is respected in the **Map Web Part**. If you want to change the configuration of the pop-up window from the web map, use the following steps:

Steps:

1. Select the applicable layer in the **Contents** pane.
2. Click **Pop-Ups** on the **Layer** tab of the ribbon. Uncheck the **Use pop-up definition from web map** check box. Configure the pop-up window as necessary.



3. If you want to change back to the original pop-up window configuration from the web map, check the **Use pop-up definition from web map** check box on the **Pop-Ups** menu. Note that your current configuration will be lost by relinking to the pop-up window definition from the web map.
   If the web map contains an editable layer, you can enable editing for that layer (see Edit features for more information) and the editing functionality will be available in the pop-up window.

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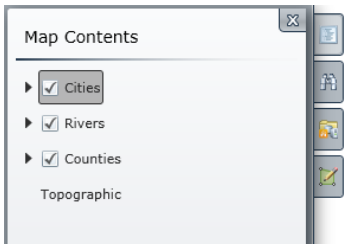
Configuring pop-up windows

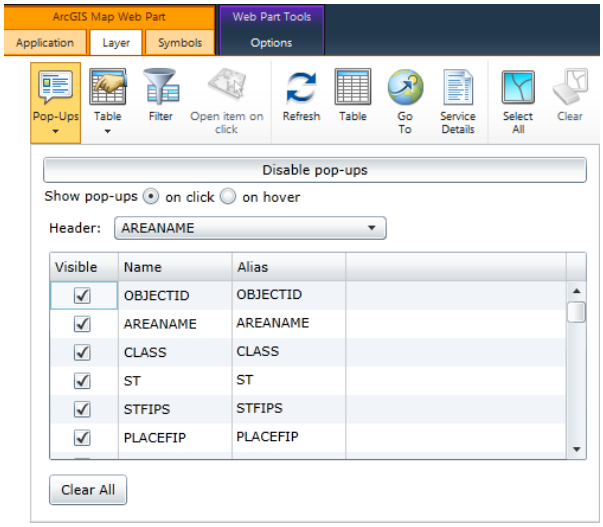
This section describes the configuration options for pop-up windows for layers that support pop-up windows in on-hover mode and on-click mode. Configuration options include whether to display the pop-up windows on click or on hover, which fields to display, which field to use as the pop-up header, and the specification of user-friendly field names (aliases).

Steps:

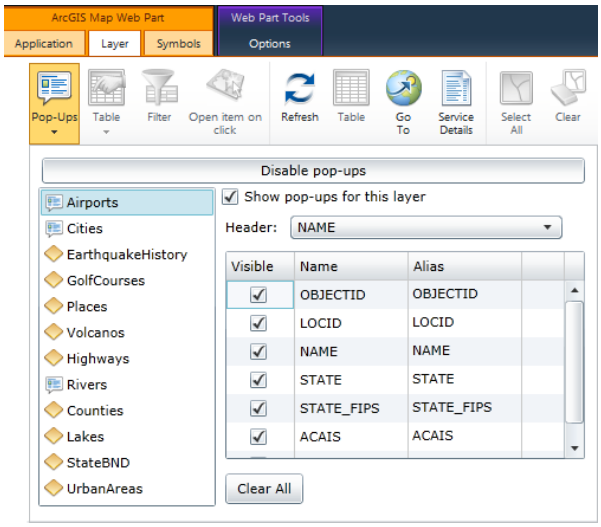
1. Open the **Contents** panel. For instructions, see Map Contents panel.
2. Select the layer in the **Map Contents** panel.



3. Click **Pop-Ups** on the **Layer** tab of the Map Web Part ribbon to open the pop-up window's configuration table.



If the selected layer is a dynamic map service, you will have the option to enable pop-up windows on a per-layer basis.



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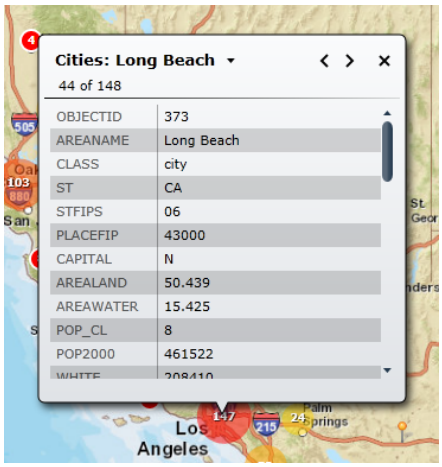
The controls shown on the pop-up windows configuration dialog box are described in the following table.

Pop-up configuration settings

Component	Description
Disable pop-ups button	Click the **Disable pop-ups** button at the top of the dialog box to disable all pop-up windows.
Header field	Select from the list of available fields to specify the header for pop-up windows.
Visible field	When the check box is checked, the field displays in the pop-up window. When unchecked, the field will not appear in the pop-up window.
Name field	The name of the field in the originating table. The value is not displayed in the pop-up window and the field is not editable.
Alias field	The name of the field as it displays in the pop-up window. This field is editable.
Clear All button	Uncheck all the check boxes in the Visible field. When all are unchecked, the button caption changes to **Select All**, which will, when clicked, check all the check boxes in the Visible field.

4. Click anywhere to close the pop-up window configuration dialog box. If you have specified to show pop-up windows on click, the pop-up window displays as shown when you click features in the map.



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Organize layers

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

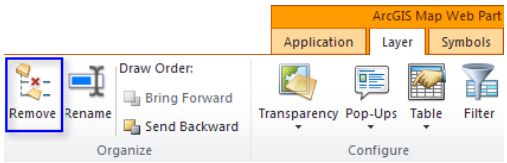
Remove, rename, and change the drawing order of layers using the tools in the **Organize** group in the **Layer** tab of the ribbon.

Removing a layer

Each layer you add to the map can be removed, with the exception of the basemap. Your map must contain a basemap, whether it is one of the default services from ArcGIS Online or your own. For more information, see Configure basemaps.

Steps:

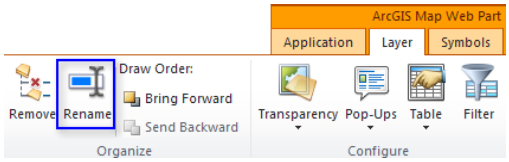
1. Open the **Map Contents** panel.
2. Select the layer to remove.
3. Click **Remove** on the **Layer** tab of the ArcGIS Map Web Part's ribbon.



Renaming a layer

Steps:

1. Open the **Map Contents** panel.
2. Select the layer to remove.
3. Click **Rename** on the **Layer** tab of the Map Web Part ribbon.



4. Type the new layer name and press Enter.

Changing the layer draw order

The order in which layers are listed in the **Map Contents** panel represents how the layers are drawn on the map. Within the map, the layers listed at the top will draw over those listed below them, and so on, down the list. You can easily move layers in the **Map Contents** panel to adjust their drawing order using the **Bring Forward** and **Send Backward** buttons on the ribbon.

In addition to setting the drawing order of layers, you can use transparency settings to further configure how layers display on the map. See Layer transparency for more information.

Steps:

1. Open the **Map Contents** panel.
2. Select the desired layer to move.
3. Choose whether to bring the layer forward or send the layer backward:
   - Click **Bring Forward** to move the layer up in the **Map Contents** panel. The layer draws in front of the layers listed below it in the **Map Contents** panel.
   - Click **Send Backward** to move the layer down in the **Map Contents** panel. The layer draws behind the layers listed above it in the **Map Contents** panel.

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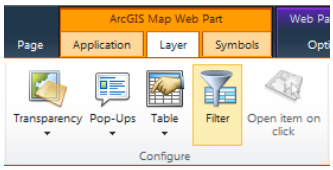
Filter layers

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

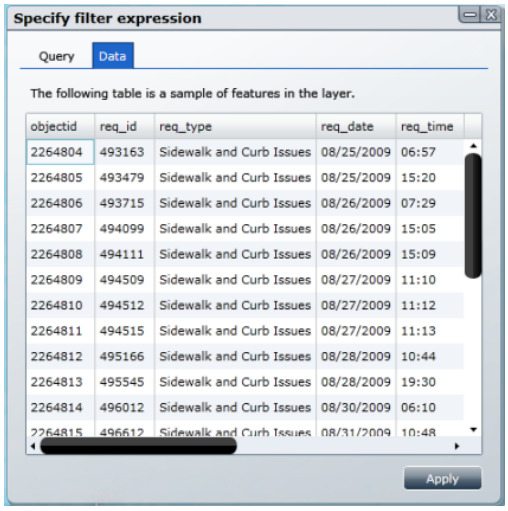
Filtering a layer provides a means of asking questions about the features of an ArcGIS Server feature layer you have added to the map. When filtering a layer, only the features that meet the criteria specified by the filter are shown on the map. For example, you may want to specify a filter on a layer to display graffiti complaints within a specified district or city. In the ArcGIS Map Web Part, you can filter an ArcGIS Server feature layer so that only the features that meet the filter criteria are shown. To filter a layer, see the following steps:

Steps:

1. Open the **Map Contents** panel and select the layer to be filtered.
2. Click the **Filter** button on the **Layer** tab of the ArcGIS Map Web Part ribbon.



3. Click the **Data** tab to see a sampling of the data.



objectid	req_id	req_type	req_date	req_time
2264804	493163	Sidewalk and Curb Issues	08/25/2009	06:57
2264805	493479	Sidewalk and Curb Issues	08/25/2009	15:20
2264806	493715	Sidewalk and Curb Issues	08/26/2009	07:29
2264807	494099	Sidewalk and Curb Issues	08/26/2009	15:05
2264808	494111	Sidewalk and Curb Issues	08/26/2009	15:09
2264809	494509	Sidewalk and Curb Issues	08/27/2009	11:10
2264810	494512	Sidewalk and Curb Issues	08/27/2009	11:12
2264811	494515	Sidewalk and Curb Issues	08/27/2009	11:13
2264812	495166	Sidewalk and Curb Issues	08/28/2009	10:44
2264813	495545	Sidewalk and Curb Issues	08/28/2009	19:30
2264814	496012	Sidewalk and Curb Issues	08/30/2009	06:10
2264815	496612	Sidewalk and Curb Issues	08/31/2009	10:48

4. On the **Query** tab, enter the filter expression and click **OK** to update the layer. For more information on filter expressions, see Building a query expression in the ArcGIS Desktop help.

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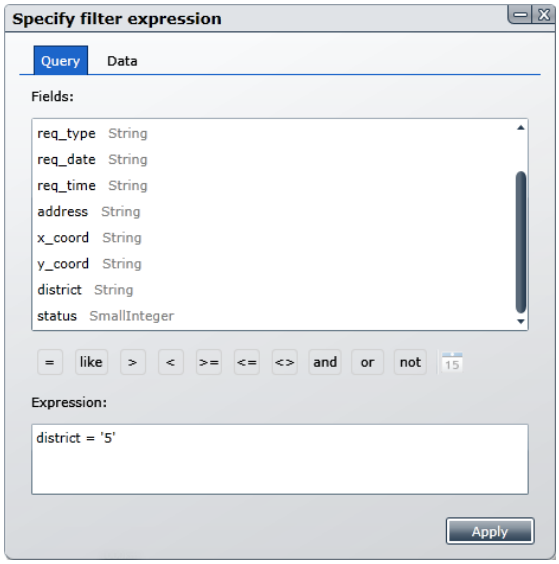

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Select features

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

The ArcGIS Map Web Part allows you to select features from ArcGIS Server layers, geoRSS layers, graphics layers, and SharePoint list layers. The **Selection** tools work with the currently selected layer in the **Map Contents** panel.

Once you have selected specific features on the layer, you can perform tasks on the selected features, such as zooming to them, exporting their attributes, or performing a Find Nearby analysis.

Note: Individual features can only be selected from layers within an ArcGIS Server map service, not the entire map service itself.

Select features interactively

To select features interactively, complete the following steps:

Note: To select multiple features in a layer, press and hold the Ctrl key while selecting. This can be done when selecting on the map and when selecting in the attribute table.

Steps:

1. Open the **Map Contents** panel and select the layer with the features you want.
2. Select features by either clicking the feature on the map to select it or clicking the feature row in the Attribute table.

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Find nearby features

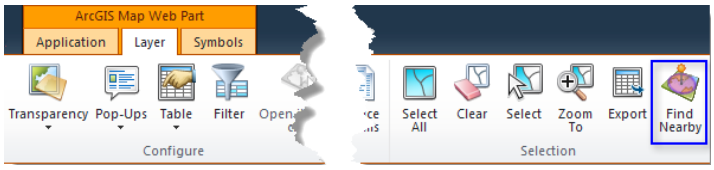
Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

The **Find Nearby** tool allows you to find features in a layer within a specified distance of a selected feature or features. For example, if you have a Cities layer and an Airports layer, you could select a city from the Cities layer, then use the **Find Nearby** tool to locate features (airports) from the Airports layer within a specified distance of the selected city.

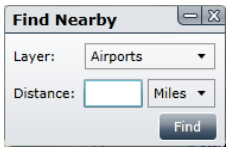
To find nearby features, complete the following steps:

Steps:

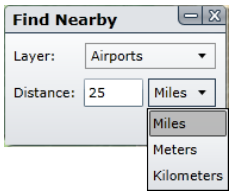
1. Select a feature on the map for use in the find nearby analysis. The **Find Nearby** tool will not be enabled until a feature is selected. See Select features for more information.
2. Click the **Find Nearby** button in the Selection group of the **Layer** tab on the ArcGIS Map Web Part ribbon.



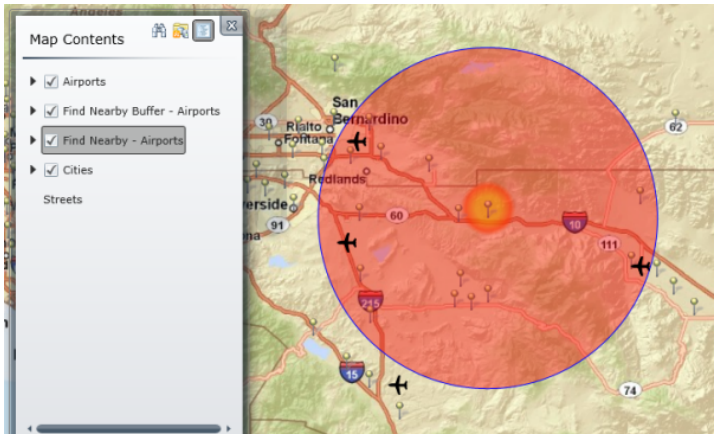
3. On the **Find Nearby** dialog box, select the layer to query from the **Layer** drop-down list.
4. Enter a distance in the **Distance** text box.



5. Select the distance unit type from the drop-down list.



6. Click **Find**. This adds two new layers to the map: one containing all the features retrieved by the query and one containing the buffer that encompasses those features.



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Layer auto updates

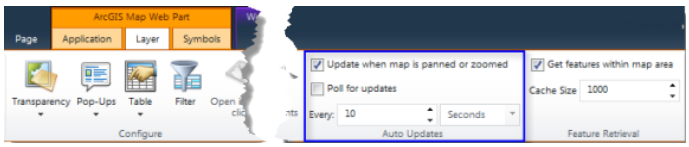
Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

SharePoint list layers on your map can be configured to stay up-to-date automatically. Auto update requeries the data underlying a layer and allows you to automatically see changes when layer or table contents have changed. You can enable updating when the map is panned or zoomed or automatically poll for updates at a specified time interval. Auto updates can be enabled on feature layers, geoRSS layers, dynamic map service layers, and SharePoint list layers.

To configure auto updates, complete the following steps:

Steps:

1. Open the **Map Contents** panel. For instructions, see The Map Contents panel.
2. Select the layer to configure.
3. Click the **Layer** tab of the ArcGIS Map Web Part to locate the Auto Updates group. There are two check boxes that control automatic updates for layers typically shown in the Auto Updates group.



- Check **Update when map is panned or zoomed** to cause the layer to update to the latest data when the user interacts with the map by panning or zooming.
- Check **Poll for updates** to cause Esri Maps for SharePoint to check for updates at the interval that has been set in the number box and drop-down menu items below the check box.

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Feature retrieval

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Feature layers within the ArcGIS Map Web Part can be configured to specify the mode used to retrieve features. You can retrieve all the features in a layer at once or only retrieve features within the current extent. The two options are described as follows:

- **Retrieve features within the current extent (default)**—Retrieves features as they are needed, requesting only the features within the current map extent. As the map extent is changed, the features within the new extent are requested and drawn on the map. Features that were previously retrieved remain in the layer. While this method of feature retrieval requires more round trips between the client and server, it has an advantage: only the features needed for map display are downloaded.
- **Retrieve all features**—Retrieves all the features from the layer immediately after the layer is added to the map. This eliminates any need to return to the server for information but can encounter performance problems if the layer contains many features and the map extent is such that many features are visible at one time. Additionally, the number of features in the layer may exceed the maximum number that can be returned by the server in one request. When this is the case, the features beyond the limit are not included in the layer. By default, feature layers in ArcGIS Server 9.3.1 return a maximum of 500 features in one request. Feature layers in ArcGIS Server 10 and later return 1,000 features in one request by default. These defaults can be changed by the server administrator.

You can configure feature retrieval for a layer as follows:

Steps:

1. Open the **Map Contents** panel. For instructions, see The Map Contents Panel.
2. Select the layer to be configured.
3. Go to the **Layer** tab of the ArcGIS Map Web Part to locate the Feature Retrieval group.

- Check **Get features within map area** to enable retrieval of features within the current extent.
- The **Cache Size** defines the maximum number of features the layer can retain. When the map extent is changed, features within the new extent are retrieved, and features that have previously been requested are retained. However, if the number of features in the layer exceeds the value defined for cache size, features will be removed from the layer to bring the number of features within the cache size value range. When this occurs, the oldest features are removed first.

  Note: Features are only removed from the layer on the client; the data on the server remains unchanged.

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Edit features

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Esri Maps for SharePoint provides an intuitive experience for editing features, including changing their geometries and attributes, adding attachments, and creating and deleting them. Editing is available for layers within ArcGIS Server dynamic map services and Spatial Data Service layers (feature layers) if the service was published with feature access enabled. For more information, see Layer types and Publishing feature services. Editing features is only available in the feature pop-up, not the feature data grid.

Once a feature layer has been added to the ArcGIS Map Web Part, editing an existing feature can be done by clicking the feature to display its pop-up. The pop-up includes buttons to add attachments, change the feature's values, edit its geometry, and delete it. See Pop-up windows for more information. If your users need to be able to add new features, enable the **Add Features** panel included with the Map Web Part. With the **Add Features** panel, users can create features by selecting the type of feature they want to add and drawing it on the map.

Note: While pop-ups on feature layers can be configured to show when you hover over or on click, the editing tools are only available for on-click pop-ups. If editing is enabled for a feature layer, that layer's pop-ups only display on click.

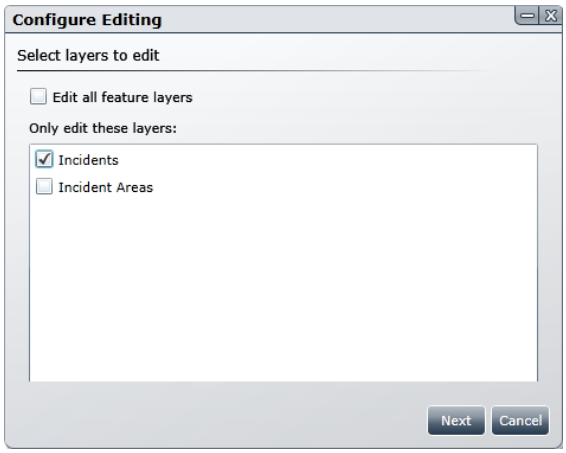
Configuring editing

Editing for feature layers is not enabled by default in the ArcGIS Map Web Part. This ensures that only the layers you want can be edited by your users. You can choose which layers can be edited, as well as other editing options, as follows:

Steps:

1. Click the **Controls** button on the **Application** tab on the ribbon.
2. In the **Configure Controls** dialog box, click the **Editor Configuration** link to open the **Configure Editing** dialog box.

3. In the **Configure Editing** dialog box, select the layers to edit. Only layers that support editing show here. If you select the option to edit all feature layers, editing is automatically enabled on any layers added to the map that support editing.



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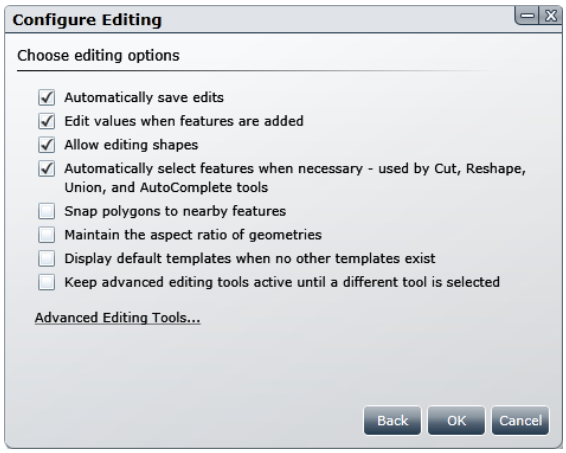
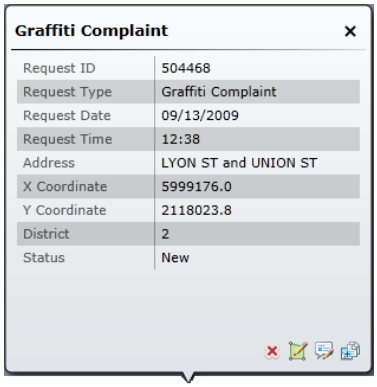
Editing cannot be enabled for layers that have clustering applied. If you attempt to enable editing on a clustered layer, you are prompted to turn off clustering.

4. Click **Next** to show the editing options.
5. Check the check box next to any of the editing options you want to enable and click **OK** to close the **Configure Editing** dialog box.



The **Advanced Editing Tools** section contains tools intended for power users with advanced editing scenarios. When enabled, these appear on a toolbar at the bottom of the **Add Features** panel.

Once you have specified the layers to edit, the pop-ups for those layers include the following editing tools:



- **Delete Feature**—Click the **Delete Feature** button to remove the feature from the layer.
- **Edit Shape**—For point features, click the **Edit Shape** button, then click and drag the feature to the applicable location. For line and polygon features, click the **Edit Shape** button, then use the handles on the bounding box to scale, rotate, and move the shape, or click and drag on vertices to move the vertices of the shape.
- **Edit Values**—Click the **Edit Values** button to edit the feature's attributes. Once you have specified attributes as necessary, click **Apply**. To exit without changing any attributes, click the **Cancel** button or close the pop-up.
- **Add Attachments**—Click the **Add Attachments** button. The **Open** dialog box appears where you can select the applicable attachment.

  Note: Layers that support editing do not necessarily support attachments. To support attachments, the dataset on the server must first be configured to do so. For more information, see Enabling attachments.

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Adding new features

If your users need to create new features, include the **Editing** tool in the **Application** tab on the ribbon. For information about including tools on the ribbon, see Configure the ribbon. With this tool included, users of the Map Web Part can click the button on the ribbon or the editing tab to open the **Add Features** panel, which displays the types of features that can be created.

Note: The feature types displayed in the **Add Features** panel are defined by the feature templates published with the map service (see About feature templates and Publishing feature services). These feature types define the symbol and set of default attributes used when a feature is created.

You can create features using the **Add Features** panel as follows:

Steps:

1. Click the **Editing** tool on the **Application** tab on the ribbon.
   The **Add Features** panel appears.

2. The types of features you can create display in the **Add Features** panel. If you do not see types for a layer you want to edit, ensure that editing is enabled for that layer. Click **Configure Editing** at the bottom of the **Add Features** panel to check this.
3. Click the type of feature you want to add.
4. Draw the feature on the map. If you are adding a point feature, click once on the map to draw the feature. If you are adding a line or polygon feature, click to add vertices, and double-click to complete the feature.
5. Once you are done drawing the feature, its pop-up opens so you can edit the feature's attributes. Type the applicable values, or select them from the drop-down menus and date pickers that appear.
6. Click the **Apply** button to save the feature.

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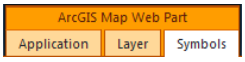
About symbols

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Symbols define all the nongeographic aspects of the appearance of a feature on the map. The ArcGIS Map Web Part provides many options to symbolize features. Layers that get their data from a layer in an ArcGIS for Server map service, a table in a Spatial Data service, or a SharePoint list allow the configuration of symbology, as these layer types are rendered on the client. See Layer types for more information.

To get started configuring symbols, open the **Map Contents** panel and click the layer to select it. Click the **Symbols** tab of the ArcGIS Map Web Part ribbon to view the configuration options as shown in the following screen capture:



Symbol galleries

The ArcGIS Map Web Part provides galleries of symbols that can be used to configure client-side layers. For information on configuring these galleries, see Configure symbols.

Renderers

Renderers define one or more symbols to apply to a layer. There are three types of renderers available in the ArcGIS Map Web Part: single symbol, class breaks, and unique values. Single symbol renderers apply one symbol to all features in a layer. For information on how to symbolize layers with a single symbol, see Single symbol rendering. Class breaks and unique values renderers apply symbols to features in a layer based on attributes of each feature. The renderer specifies which attribute values correspond to which symbol. For information on using the class breaks renderer, see Class breaks rendering. For information on how to symbolize a layer by unique values, see Unique value rendering.

Heat maps and clustering

Point layers also provide the option to generate a heat map or apply clustering. These are methods of aggregating features to aid in visualizing them. See Heat maps and Clustering for more information.

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Select symbols

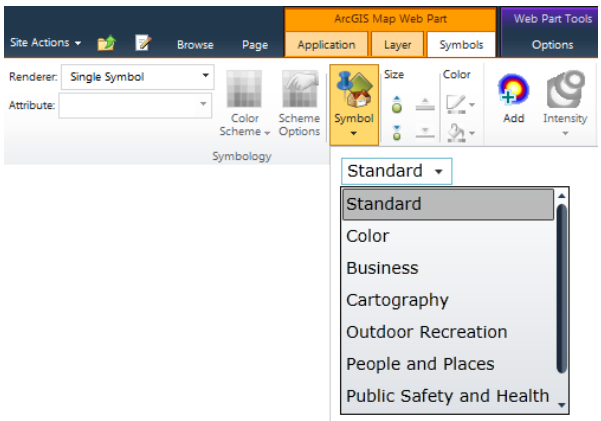
Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Symbol galleries define the sets of symbols available for you to apply to layers. Esri Maps for SharePoint provides a number of galleries containing many symbols by default. Additionally, you can add new galleries and remove or modify existing ones. For more information, see Configure symbols. The easiest way to explore the existing symbol galleries is to click the Symbol button on the ribbon or open the Scheme Options dialog box for a layer. Information on exploring symbol galleries and selecting a symbol is provided in this topic.

Explore symbol galleries

In the ArcGIS Map Web Part, symbol galleries are made available on the **Symbol** drop-down menu and the **Scheme Options** dialog box. The active location depends on the type of renderer specified for the selected layer. Steps for accessing the symbols for the different renderer types are as follows:

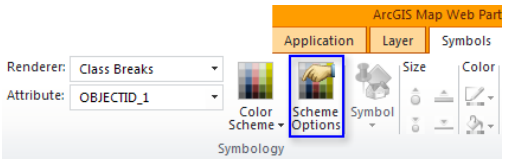
- When a single symbol renderer is being used, you can access the symbols from the **Symbols** tab. Click the **Symbol** button on the **Symbols** tab of the ArcGIS Map Web Part ribbon. The symbols in the first symbol gallery are displayed. To choose a different symbol gallery, click the drop-down menu above the symbols.



- When a class breaks or unique values renderer is being used, the symbols are available on the **Scheme Options** dialog box:

Steps:

1. Click the **Scheme Options** button on the **Symbols** tab of the ribbon.



The **Scheme Options** dialog box appears.

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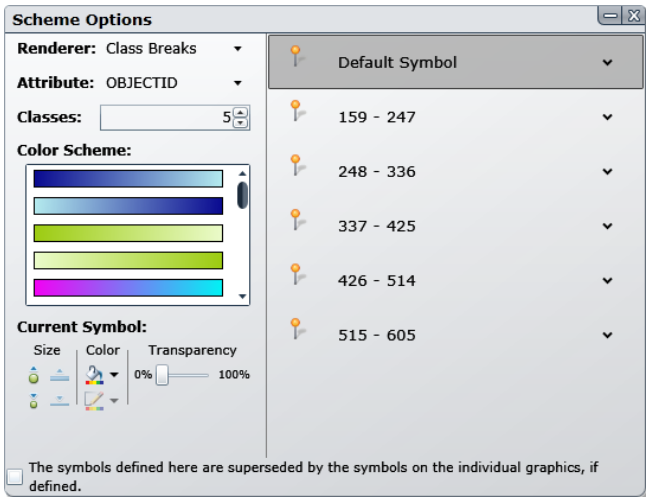
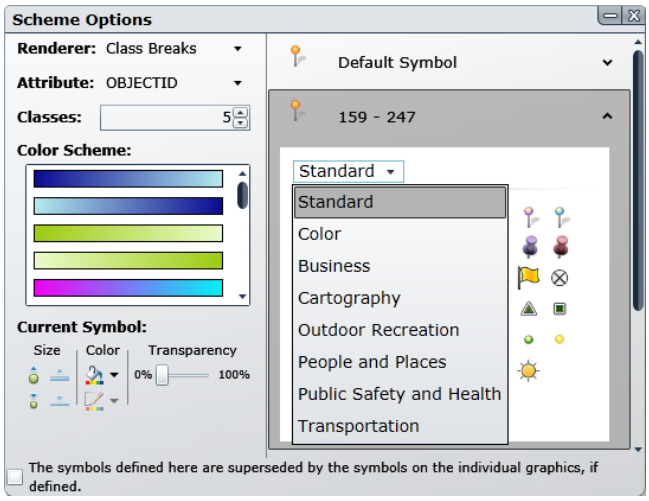


2. Click the symbol to the left or the arrow to the right of one of the group values.

3. To view the symbols defined by other symbol galleries, expand the drop-down menu for the symbols.



Select a symbol

Once you know where to access symbol galleries and symbols, specifying a symbol is straightforward and accomplished with the following steps:

Steps:

1. Choose the layer to specify a symbol from the **Map Contents** panel.
2. If the layer is rendered using a single symbol, click the **Symbol** button on the ribbon. If the layer is rendered using a class breaks or unique values renderer, expand the symbol drop-down menu for the desired class or value on the **Scheme Options** dialog box. See steps 1 through 3 in the previous section for details.
3. Choose the desired symbol gallery.

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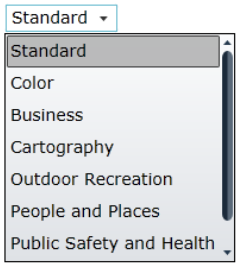

4. Choose the symbol to apply to the layer, class, or value.

5. Use the controls on the ribbon (single symbol renderer) or the **Scheme Options** dialog box (class breaks or unique value renderers) to modify the symbol. Depending on the symbol type, you can adjust the symbol's size, color, transparency, and line or border thickness.
6. If the layer is rendered using a class breaks or unique value renderer, repeat steps 2 through 5 for all the class breaks or unique values you want to specify.

Once you select or modify a symbol, the applicable features on the map are updated with the new symbology.

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Single symbol rendering

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

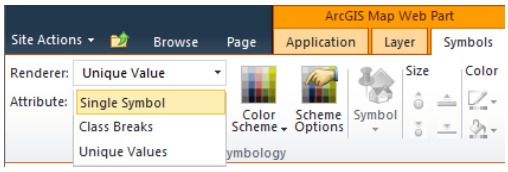
Single symbol rendering can be used to symbolize layers that allow configuration of symbology. For more information on the different layer types and their capabilities, see Layer types. Features in layers that have single symbol rendering applied display on the map with the same symbol.

Configuring single symbol rendering

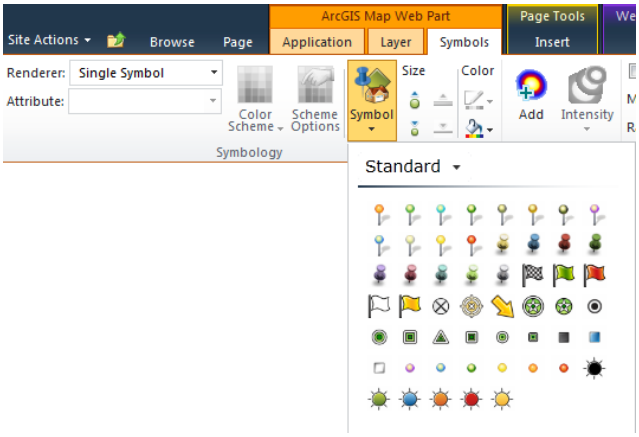
The ArcGIS Map Web Part makes it easy to apply a single symbol to a layer. To do so, complete the following steps:

Steps:

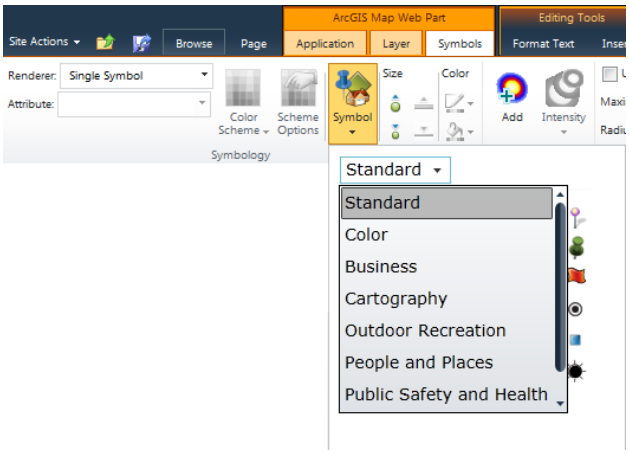
1. Choose the applicable layer on the **Map Contents** panel. For instructions, see Map Contents panel.
2. On the **Symbols** tab of the ribbon, click the **Renderer** arrow and click **Single Symbol**:



3. Configure single symbol rendering:
   a. Select a symbol by clicking the **Symbol** button to open the symbol picker:



   b. To change the symbol gallery shown, expand the drop-down menu at the top of the symbol picker and choose a gallery:



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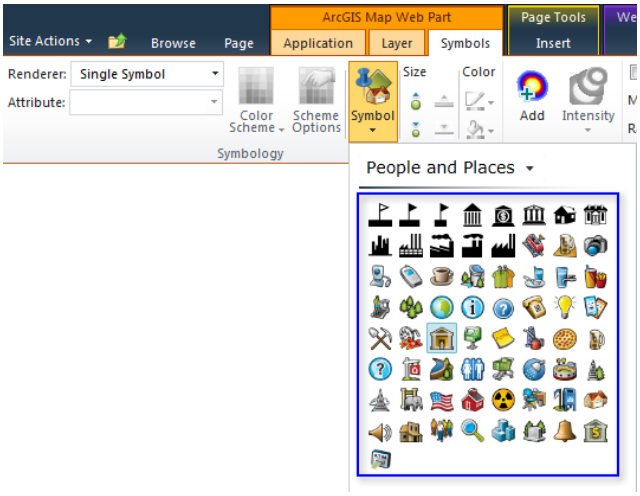
c. To apply a symbol to the layer, choose the applicable symbol from those shown in the symbol picker:



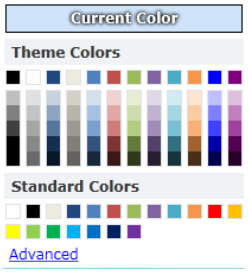
Changing symbol size

The buttons under the **Size** label can be used to change the size of the selected layer's symbol. The enabled buttons and the effect of each, vary depending on the geometry type of features in the selected layer. The variations are described in this section.

- Points—For layers that contain point features, the size buttons with point icons are enabled. These can be used to manipulate the size (that is, width and height) of the point symbol. Click the **Increase Symbol Size** button to increase the size of the symbol, and click the **Decrease Symbol Size** button to decrease the size of the symbol.
- Lines—For layers that have linear features, the size buttons with linear icons are enabled. These can be used to manipulate the width of the line symbol. Click the **Increase Symbol Border Width** button to increase the width of the line symbol, and click the **Decrease Symbol Border Width** button to decrease the width of the line symbol.
- Polygons—For layers with polygon features, the two size buttons with linear icons are enabled. These can be used to manipulate the border width of the polygon symbol. Click the **Increase Symbol Border Width** button to increase the width of the symbol's borders, and click the **Decrease Symbol Border Width** button to decrease the width of the symbol's borders.

Changing symbol color

The buttons under the **Color** label on the **Symbols** tab of the ribbon allow you to specify the color or colors of the selected layer's symbol. Clicking either of these buttons opens a color picker:



When the color picker first opens, a color palette displays as shown above. The currently selected color shows at the top of the color palette under the **Current Color** label. The colors in the **Theme Colors** section derive from the theme of the current SharePoint site. To choose a color, click the applicable color square.

For finer control over the color selection, click the **Advanced** label at the bottom of the color picker. To select a shade of the current hue, click and drag the large color square. The hexadecimal color code and the small square showing the selected color update as you drag the mouse pointer. To change the hue, drag the hue slider (the rainbow-colored slider immediately to the right of the large color square). To change the transparency, drag the transparency slider (all the way to the right of the color picker). You also have the option of specifying a color by typing the hexadecimal color code into the text box at the bottom of the color picker.

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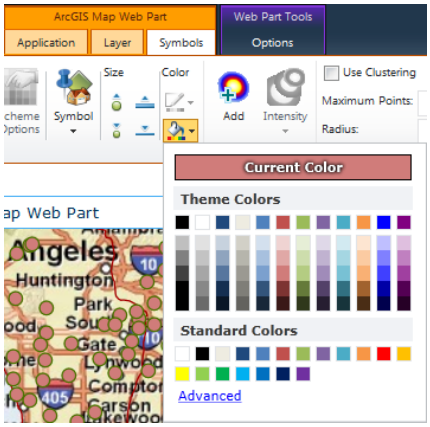
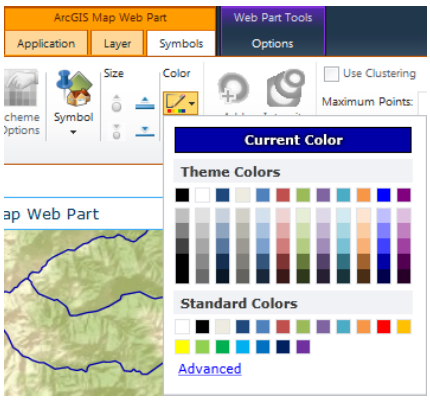
The enabled color buttons and the effect of each vary depending on the geometry type of features in the selected layer. The variations are described as follows:

- Points—For layers that contain point features, the color button with a paint bucket icon is enabled if the layer's symbol supports specification of color. Color cannot be specified, for instance, for image-based symbols. If this button is enabled, use it to manipulate the color of the point symbol:

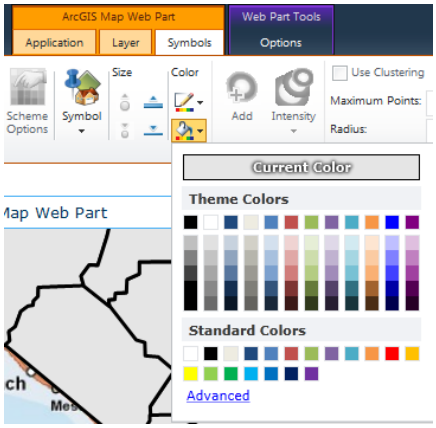


Note: The only presupplied symbols that support specification of a fill color are the symbols in the Colors gallery.

- Lines—For layers that have linear features, the color button with a pencil and line icon is enabled. Colors selected from this color picker determine the color of the line symbol:



- Polygons—For layers with polygon features, both color buttons are enabled. Use the bottom button to set the polygon symbol's fill color, and use the top button to set the polygon symbol's border color:



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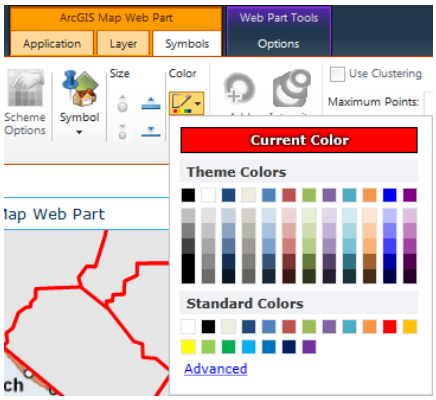

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Class breaks rendering

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Class breaks rendering can be used to symbolize layers that allow configuration of symbology. This includes ArcGIS Server feature layers, geoRSS layers, graphics layers, and SharePoint lists. For more information on the different layer types and their capabilities, see Layer types.

About class breaks

Class breaks are categories with a minimum and maximum value. When applied to a set of data, class breaks divide the data into categories based on the value of a certain field or attribute. Since the definition of a class depends on having a minimum and maximum value, class breaks are only applicable to numeric attributes. A class breaks renderer maps each class to a particular symbol. Graphics with similar values for the attribute get the same symbol.

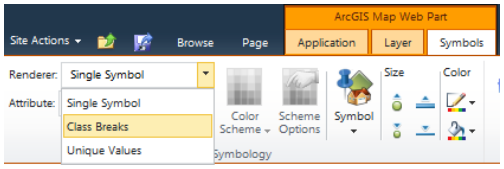
As an example, suppose you have a buildings layer with an attribute that specifies the year each building was built. You want to symbolize buildings constructed since the year 2000 in green, buildings constructed between 1980 and 2000 in yellow, and buildings built before 1980 with red. Suppose that the earliest a building represented in the layer was constructed is 1960. In this case, you would define classes of 1960–1979, 1980–1999, and 2000–2012.

Configuring a class breaks renderer

The ArcGIS Map Web Part makes it easy to apply class breaks rendering to a layer. To do so, follow these steps:

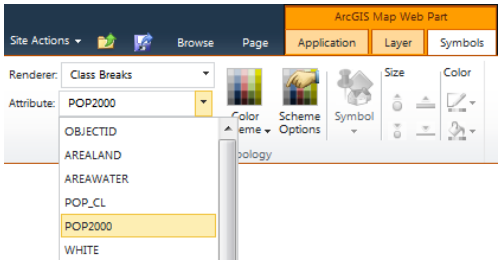
Steps:

1. Select the desired layer on the **Map Contents** panel.
2. On the **Symbols** tab of the ribbon, expand the **Renderer** drop-down menu and choose **Class Breaks**.



The ArcGIS Map Web Part automatically calculates five class breaks for the first numeric field in the layer.

3. Expand the **Attribute** drop-down menu and choose the desired field.



4. Click **Scheme Options** to open the **Scheme Options** dialog box. Specify the number of Classes to use for the class breaks. The default number is five.

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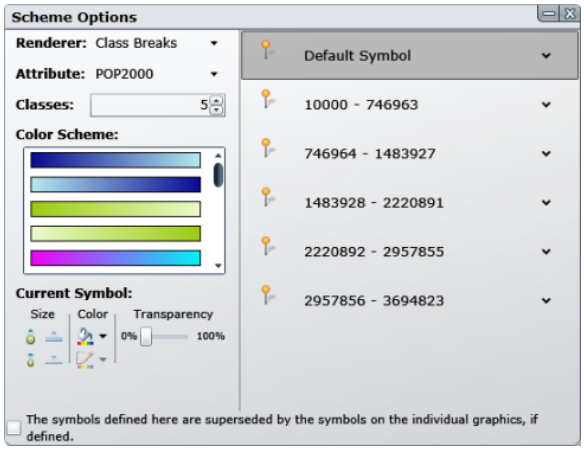
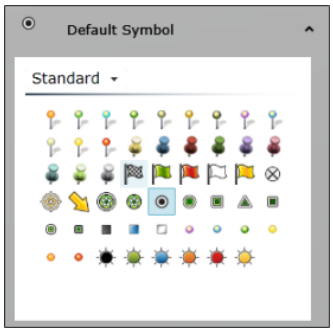


Scheme options dialog box

The following options are available on the Scheme Options dialog box:

- Changing the renderer and attribute—As with the drop-down menus on the ribbon, the renderer and attribute used can also be changed by selecting items from the **Renderer** and **Attribute** drop-down menus on the dialog box.
- Changing the number of classes—To change the number of classes, type the desired number in the text box next to the **Classes** label, or use the Up and Down arrows next to the number.
- Changing the color scheme—Just as you can on the ribbon, you can select a color scheme from the **Scheme Options** dialog box.
- Selecting a class's symbol—To specify the symbol for one class, click the symbol to the left or the Down arrow to the right of the class's value range. Then choose the desired symbol from the symbol picker.



- Modifying a class's symbol—To modify the symbol used by a class, first select the class on the right side of the dialog box. Then use the controls in the **Current Symbol** section of the dialog box to adjust the symbol's size, color, and transparency.

  Note: The size and color controls that are enabled vary depending on the geometry type of the selected layer. For more information about specifying a symbol's size and color, see Single symbol rendering. The number of transparency sliders enabled also varies depending on the geometry type of the selected layer. For line and point layers, only one slider is enabled. In this case, the enabled slider determines the transparency of the entire symbol. For polygon layers, both sliders are enabled. The top slider determines the transparency of the symbol's fill, while the bottom slider determines the transparency of the symbol's border.

- Changing a class's value range—The minimum and maximum values of a class can be changed by clicking a value and typing a new value.

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Unique value rendering

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Unique value rendering can be used to symbolize layers that allow configuration of symbology. This includes ArcGIS Server feature layers, geoRSS layers, graphics layers, and SharePoint lists. For more information on the different layer types and their capabilities, see Layer types.

About unique values

Unique values are sets of values in which each is unique for a particular field or attribute within a given set of data. For example, if a set of data has a field called STATE_NAME that has values { Washington, Washington, Washington, Montana, Connecticut, Connecticut, Connecticut, Florida, Oklahoma, Oklahoma }, the set { Washington, Montana, Florida, Oklahoma } would be a valid set of unique values. Notice that within the set of unique values, no values are repeated. A unique value renderer maps a set of unique values to a set of symbols.

As an example, suppose you have a buildings layer with an attribute that specifies how each building is zoned. To symbolize the buildings differently based on the zoning of each, you could define a unique value renderer that specifies a yellow symbol for residential, purple for industrial, blue for commercial, and so on, for every zoning classification.

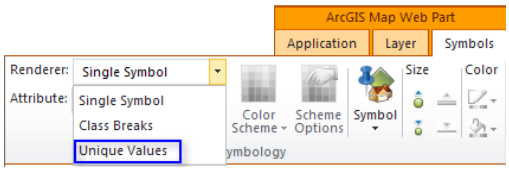
Once you have configured the unique values renderer for a layer, use either the Color Scheme drop-down menu or the Scheme Options dialog box to apply a color scheme.

Configuring a unique values renderer

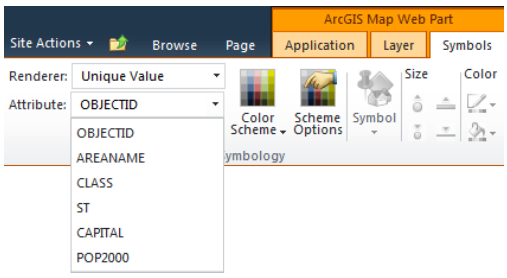
The ArcGIS Map Web Part allows you to apply unique value rendering to a layer. To do so, complete the following steps:

Steps:

1. Select the desired layer on the **Map Contents** panel.
2. On the **Symbols** tab of the ribbon, expand the **Renderer** drop-down menu and choose **Unique Values**:



3. Expand the **Attribute** drop-down menu and choose the desired field:



Color scheme drop-down menu

You can apply a predefined color scheme to the renderer by clicking **Color Scheme** on the ribbon and choosing the desired color scheme from the list that appears:

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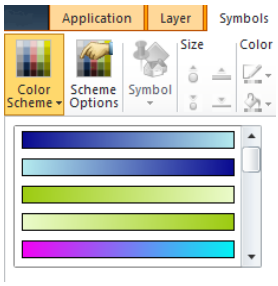
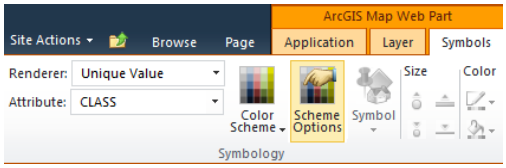


The color scheme is applied differently depending on the geometry type of the selected layer:

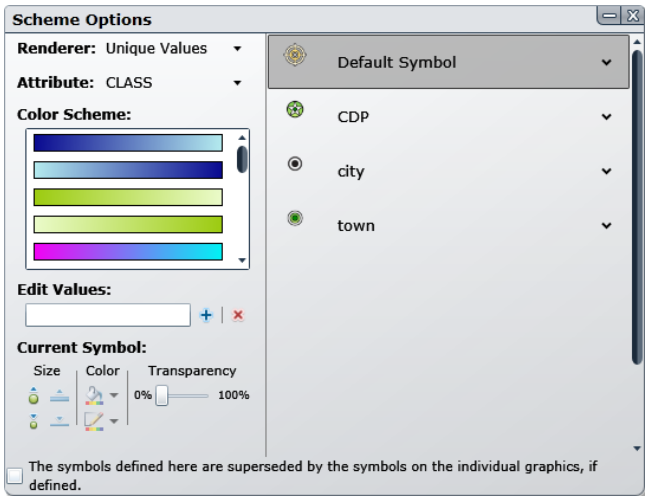
- For a polygon layer, the colors are applied to the fill colors of the polygons.
- For a line layer, the colors are applied to the colors of the lines.
- For a point layer, the color is applied to the selected point symbol. Colors are not applied to picture symbols.

Scheme options dialog box

Options for modifying unique values are provided on the **Scheme Options** dialog box. Click **Scheme Options** on the **Symbols** tab of the ribbon:



The **Scheme Options** dialog box appears.



- Changing the renderer and attribute—As with the drop-down menus on the ribbon, the **Renderer** and **Attribute** drop-down menus on the dialog box can be used to change the renderer and attribute, respectively.
- Changing the color scheme—Just as you can on the ribbon, you can choose a color scheme from the **Scheme Options** dialog box. To do so, choose the desired scheme from the **Color Scheme** list.

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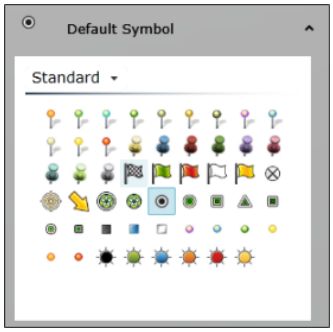
- Selecting a value's symbol—To specify the symbol for one value, click the symbol to the left or the arrow to the right of the value and choose the desired symbol from the symbol picker.



- Modifying a value's symbol—To modify the symbol used by a value, select the value from the right side of the dialog box and use the controls in the **Current Symbol** section of the dialog box to adjust the symbol's size, color, and transparency.

  Note: The size and color controls that are enabled vary depending on the geometry type of the selected layer. For further information about specifying a symbol's size and color, see Single symbol rendering. The number of transparency sliders enabled also varies depending on the geometry type of the selected layer. For line and point layers, only one slider is enabled. When this is the case, the enabled slider determines the transparency of the entire symbol. For polygon layers, both sliders are enabled. The top slider determines the transparency of the symbol's fill, and the bottom slider determines the transparency of the symbol's border.

- Adding or removing values—While the ArcGIS Map Web Part automatically determines the unique values that are present in a layer, you also can manually add or remove values. You might want to add values that are not present in the data, for instance, if you are using a Map Web Part to monitor a set of data that you know will increase. Alternatively, you might want to remove values to prevent features with certain values from being displayed on the map. To add a value, type the desired value into the **Edit Values** text box and click **Add**. To remove a value, choose the value from the right side of the dialog box and click **Remove**.

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Clustering

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Clustering can be applied to point layers that allow configuration of symbology. This includes ArcGIS Server feature layers, geoRSS layers, graphics layers, and SharePoint list layers. For more information on the different layer types and their capabilities, see Layer types.

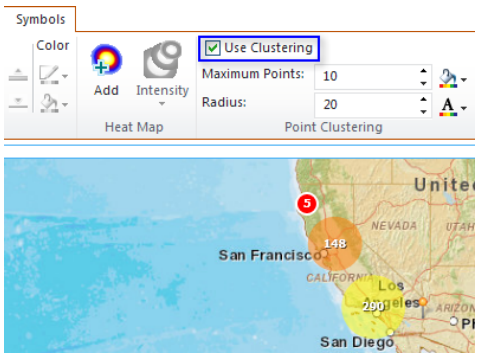
When a layer contains a large number of point features, showing each feature individually on the map is often not useful. In this scenario, point features often overlap, making it difficult to distinguish between features. Even when they do not overlap, it is usually difficult or impossible to visually extract meaningful information when hundreds or thousands of points are shown all at once.

One approach to resolving this issue is to aggregate groups of point features into one symbol. This is called clustering. Within the ArcGIS Map Web Part, clustering will aggregate the points in a layer that are within a certain distance of one another on the screen. Since the clustering is dependent on screen distance, more points are aggregated into fewer groups as you zoom out. Conversely, points are divided into more and more groups as you zoom in. When you zoom in to a level where the clustering area around one point feature no longer contains any other features, that feature will not be clustered but rather will be shown in its location with the symbology specified by the layer's renderer.

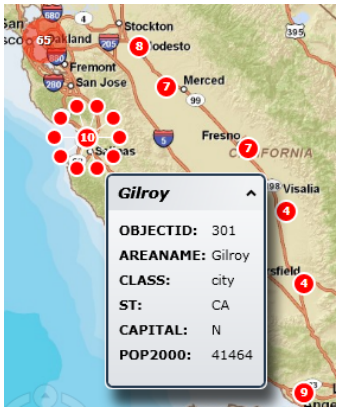
To get started configuring clustering, complete the following steps:

Steps:

1. Choose the desired point layer on the **Map Contents** panel. For instructions, see The Map Contents panel.
2. Check the **Use Clustering** check box to apply clustering to the selected layer.
   The configuration controls in the Point Clustering group will be enabled.



3. Use the **Maximum Points** Up and Down arrows to choose a number for the maximum number of points in a cluster, or click the text box and enter the number manually. This number determines the maximum number of points that can be included in an interactive cluster. The Maximum points setting has an upper limit of 20 that cannot be overridden. Interactive clusters flare out when you hover over them, displaying one flare for each feature within the cluster. You can then pause hover over each flare to view the associated feature's pop-up display.



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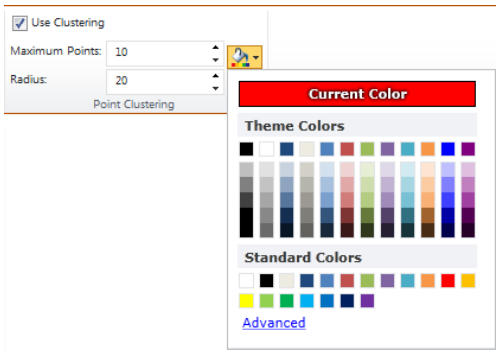
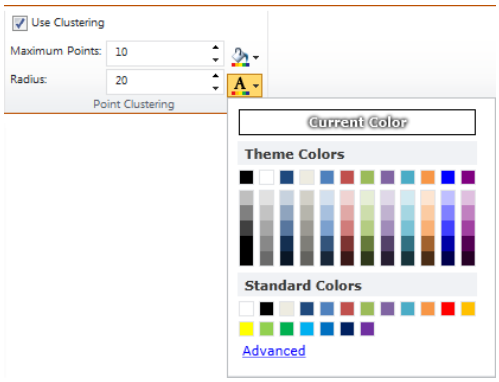
Clusters that contain more features than the number specified here, such as the one with 65 features in the upper left corner of the image above, are not interactive.

4. Use the **Radius** Up and Down arrows to choose the distance (in screen pixels) for the cluster, or click the text box and enter the number manually. Features that are within this distance of one another will be aggregated into a cluster.
5. Click the **Cluster Fill Color** button and choose the fill color of the cluster symbol.



6. Click the **Cluster Fore Color** button and specify the text and border color of the cluster symbol.



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Heat maps

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Heat maps can be created from point layers that allow configuration of symbology. This includes ArcGIS Server feature layers, Spatial Data Service layers, geoRSS layers, graphics layers, and SharePoint lists. For more information on the different layer types and their capabilities, see Layer types.

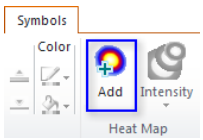
When a layer contains a large number of point features, showing each feature individually on the map is often not useful. In this scenario, point features often overlap, making it difficult to distinguish between features. Even when they do not overlap, it is usually difficult or impossible to visually extract meaningful information when hundreds or thousands of points are shown all at once.

One approach to resolving this issue is to generate a heat map. A heat map represents the geographic density of point features on a map by using colored areas to represent those points. The areas will be largest where the most points are concentrated together. Also, areas of high density, or hot spots, will be symbolized with the color chosen to represent hot areas. While heat maps in general can also incorporate one or more attributes into how they are calculated, heat maps in the ArcGIS Map Web Part only account for geographic location. Consequently, heat maps in the Map Web Part provide an effective way to visualize where the point features in a given layer are most concentrated.

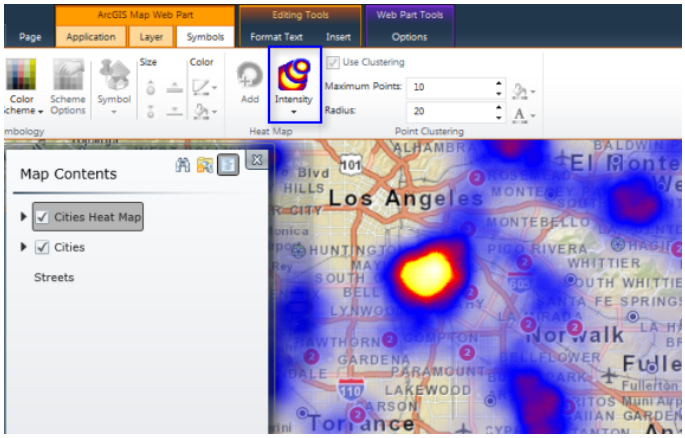
To create a heat map, complete the following steps:

Steps:

1. Choose the point layer on the **Map Contents** panel from which you would like to generate a heat map. For instructions, see The Map Contents panel.
2. Click the **Add** button in the **Heat Map** group on the **Symbols** tab of the ribbon.



A heat map is calculated and automatically added to the map. The heat map also becomes the selected layer, so the **Intensity** and **Color Scheme** buttons will be enabled.



3. Click the **Intensity** button to open the intensity slider. Use the slider to increase or decrease the heat map's intensity.

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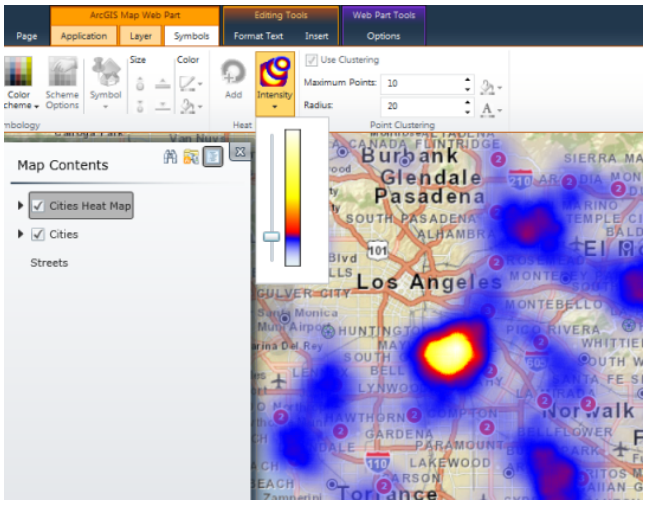

4. Click the **Color Scheme** button to show a list of color gradients that can be applied to the heat map layer. To apply a gradient to the layer, select it from the list.

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Extend the ArcGIS Map Web Part

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Esri Maps for SharePoint allows you to develop custom functionality for the ArcGIS Map Web Part by creating add-ins. Add-ins are Silverlight assemblies that contain one or more commands or map behaviors that interact with the Map Web Part. To help you write extensions, the Map Web Part provides a lightweight, flexible, and extensible application programming interface (API) included in the ArcGIS Extensibility SDK for Silverlight. The API provides access to the map and selected layer and allows you to show dialog boxes within the Map Web Part that can contain any Silverlight FrameworkElement.

Note: The ArcGIS Extensibility SDK for Silverlight 3.1 is built on the ArcGIS API for Silverlight 3.1.

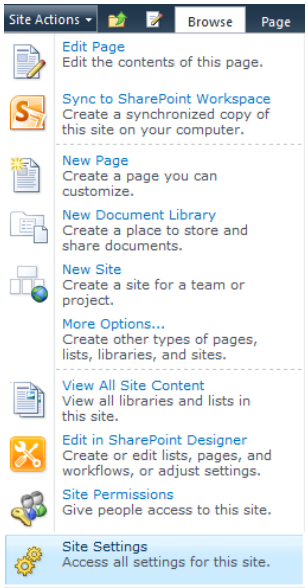
While the extensibility API provides a few points of interaction with the Map Web Part, what you can include in an add-in is open-ended. Within an add-in, you can leverage any Silverlight library, including the ArcGIS API for Silverlight and the native Silverlight API. You can manipulate the map and layers, display any Silverlight user interface (UI), make your components configurable, interact with other Silverlight or JavaScript components on the page, make calls to web services such as those provided by SharePoint or ArcGIS Server, and much more.

Once you have written an add-in, the process for adding it to the Map Web Part is straightforward. Add the compiled Silverlight application (`.xap`) file to the Esri Maps Extensions library. Then when designers edit a Map Web Part within the same site collection, they can add the tools and behaviors contained in your extension through an easy-to-use UI. Tools that are added are exposed as buttons on the ribbon with a label and icon specified by the designer. Clicking a button invokes its associated command. Behaviors that are added are enabled when the Map Web Part loads and can be managed through a dialog box.

To add an add-in to the Map Web Part, complete the following steps:

Steps:

1. Create your add-in, referencing Write tools and Write map behaviors.
2. Browse to the **Site Settings** page by opening the **Site Actions** menu and clicking **Site Settings**.



3. Under the **Esri Maps for SharePoint Administration** heading, click **Legacy ArcGIS Mapping Settings > ArcGIS Mapping Extensions**.

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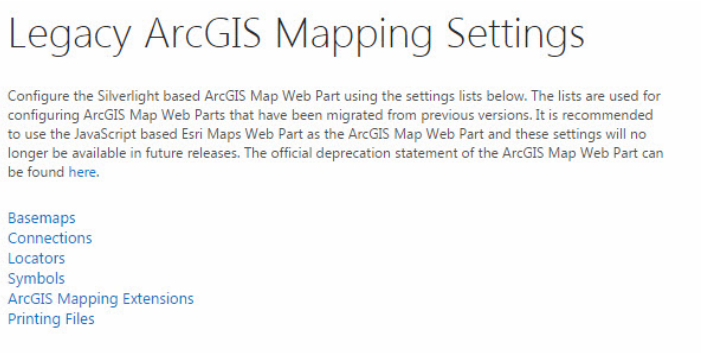
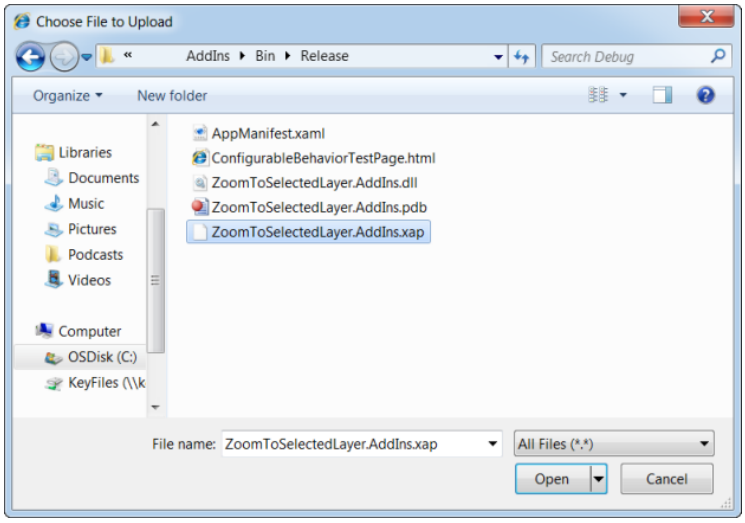


4. Click **Add Document**.
   The **Upload Document** dialog box appears.
5. Click the **Browse** button to open the **Choose File to Upload** dialog box.
6. Locate and select the `.xap` file containing the add-in and click **Open**.



The `.xap` file will be uploaded to the library. Once this is done, the tools and behaviors within the add-in package will be available when adding tools to ArcGIS Map Web Parts within the same site collection.

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Write tools

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Tools provide a way to expose logic in the ArcGIS Map Web Part that should be initiated by the user. If it makes sense to have the functionality you are implementing initiated by having a user click a button on the ribbon, you should encapsulate this functionality in a tool.

The Map Web Part exposes commands (tools) that implement the ICommand interface. This interface provides a few members. In the context of the Map Web Part, these members are used as follows:

- **Execute**—Called when the button on the ribbon corresponding to the command is clicked.
- **CanExecute**—Called frequently by the Map Web Part to check whether the command is in a state where it can be executed. When this method returns true, the corresponding button on the ribbon is enabled. When the method returns false, the button is unavailable.
- **CanExecuteChanged**—Event that can be raised when the executability of the command changes. When this event is raised, the Map Web Part invokes the CanExecute method, allowing the extension to update the state of the command's button on the ribbon.

In addition to implementing these members, you must also add two attributes to the class that implements ICommand. The first is System.ComponentModel.Composition.ExportAttribute, which is included in the System.ComponentModel.Composition assembly provided as part of the Microsoft Managed Extensibility Framework (MEF). This attribute informs the Map Web Part that the command should be made available to add to the ribbon. When you include it on a command you implement, it will always take the following form:

```
[Export(typeof(ICommand))]
public class MyCommand : ICommand
```

The other attribute to add is ESRI.ArcGIS.Client.Extensibility.DisplayNameAttribute. This determines the name of the command as it appears to a designer when adding it to the Map Web Part. This attribute should be specified as follows:

```
[Export(typeof(ICommand))]
[DisplayName("<Name to display>")]
public class MyCommand : ICommand
```

An example of a simple command is shown in the following code. The command displays a message box and is enabled when the map is not null. In this case, the CanExecuteChanged event is not used.

```
[Export(typeof(ICommand))]
[DisplayName("Simple Command")]
public class SimpleCommand : ICommand
{
     public void Execute(object parameter)
     {
          // Show a message box when the command's ribbon button is clicked.
          MessageBox.Show("Simple command executed");
     }

     public bool CanExecute(object parameter)
     {
          // Show as executable (i.e., enable the button on the ribbon) unless the map is null.
          return MapApplication.Current.Map != null;
     }

     public event EventHandler CanExecuteChanged;
}
```

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Write map behaviors

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Map behaviors provide a way to expose functionality in the ArcGIS Map Web Part that should always be enabled. If you are developing functionality to add a capability or modification to the Map Web Part that should always be present, this should be encapsulated as a map behavior. Map behaviors can be used, for instance, to keep the map at a certain extent or expose a method externally to JavaScript or Silverlight messaging.

Behaviors that are developed for use with the Map Web Part must inherit from System.Windows.Interactivity.Behavior<ESRI.ArcGIS.Client.Map>. The Behavior<T> base class provides several members. In the context of the Map Web Part, these members are used as follows:

- **AssociatedObject**—Property that provides a reference to the object to which the behavior is attached. In your Map Web Part extension, this will be the map object.
- **OnAttached**—Method that is invoked when the behavior is attached to an object. You should override this method to perform initialization logic. In the context of the Map Web Part, this occurs when the behavior is attached to the map. This occurs in the following scenarios:
  - When the web part is loading
  - When a user adds or enables the behavior via the **Manage Behaviors** dialog box
- **OnDetaching**—Method that is invoked when the behavior is being detached from an object. You should override this method to perform cleanup logic, such as removing event handlers. In the context of the Map Web Part, this method is invoked when a user removes or disables the behavior via the **Manage Behaviors** dialog box.

To make a behavior available for designers to add to the Map Web Part, you must add two attributes to your behavior class. The first is System.ComponentModel.Composition.ExportAttribute, which is included in the System.ComponentModel.Composition assembly provided as part of the Microsoft Managed Extensibility Framework (MEF). This attribute informs the Map Web Part that the behavior should be made available. When you include it on a behavior you implement, it will always take the following form: Export Attribute.

```
[Export(typeof(Behavior<Map>))]
public class MyBehavior : Behavior<Map>
```

The other attribute to add is ESRI.ArcGIS.Client.Extensibility.DisplayNameAttribute. This determines the name of the behavior as it appears to a designer when adding it to the Map Web Part. This attribute should be specified as follows:

```
[Export(typeof(Behavior<Map>))]
[DisplayName("<Name to display>")]
public class MyBehavior : Behavior<Map>
```

An example of a simple behavior is shown in the following code. The behavior adds a handler to the map's ExtentChanged event when the behavior is attached to the map and removes it when the behavior is detached. The behavior shows a message box with the current extent when the extent changes.

```
[Export(typeof(Behavior<Map>))]
[DisplayName("Simple Behavior")]
public class MyBehavior : Behavior<Map>
{
     protected override void OnAttached()
     {
          base.OnAttached();

          // Add a handler to the map's ExtentChanged event.
          this.AssociatedObject.ExtentChanged += OnExtentChanged;
     }

     private void OnExtentChanged(sender s, ExtentEventArgs args)
     {
          // Show a message box with the new extent.
          MessageBox.Show(this.AssociatedObject.Extent.ToString());
     }

     protected override void OnDetaching()
     {
          // Remove the handler from the map's ExtentChanged event.
          this.AssociatedObject.ExtentChanged -= OnExtentChanged;
     }
}
```

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Create a custom layout

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Layouts allow you to change the look and feel of the Map Web Part. You can create your own custom layout for your Map Web Part by editing the DefaultLayout.xaml file in the Esri Maps Configuration Files document library.

The DefaultLayout.xaml file has the following restrictions:

- You cannot reference other resource dictionaries; therefore, all styles need to be contained within the DefaultLayout.xaml file.
- There is no title area and there are no toolbar containers in this layout, since all tools show up on the SharePoint ribbon.

You can also edit the DefaultLayout.xaml file to include custom controls such as a Chart control, overview map, and search text box. If you create a layout with a custom control, the .xap file containing the custom control's implementation needs to be added to the ArcGIS Mapping Extensions library.

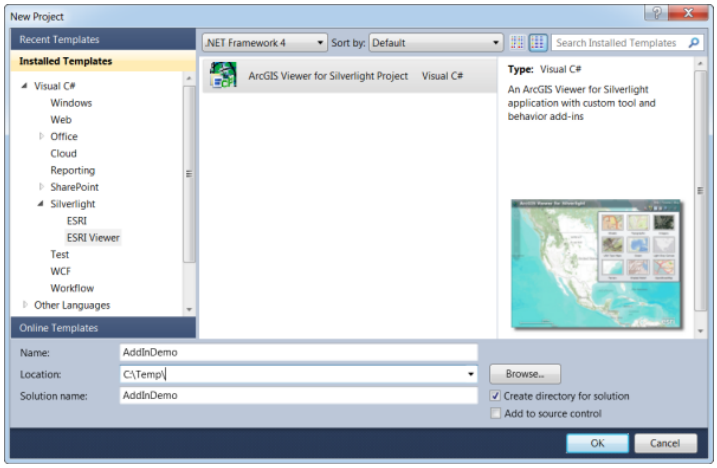
The Map Web Part and ArcGIS Viewer for Silverlight share a common layout framework; therefore, you can adapt the content of any of the Viewer layouts into DefaultLayout.xaml, given the restrictions listed above.

The following steps show how to use the ArcGIS Viewer for Silverlight Visual Studio template to create a custom layout. First, create a new project with the Viewer template, and then customize one of the existing layouts as desired. For more information on the Viewer template, see Visual Studio template.

Create a new project

Steps:

1. Start Microsoft Visual Studio 2010 or 2012.
2. Click **File** > **New** > **Project**. The **New Project** dialog box appears.
3. In the **New Project** dialog box, expand **Visual C#** and expand the **Silverlight** node.
4. Click **ESRI Viewer** under the **Silverlight** node and select **ArcGIS Viewer for Silverlight Project**
5. Type a name for the add-in project in the **Name** text box and click **OK**.



The Add-in solution loads with three projects: one containing add-in code, one containing layouts, and one containing a Viewer website. Each of these projects contains code and examples to help you get started creating custom tools, behaviors, and layouts.

If there are any warnings, you may need to first compile the solution.

Note: You may need to install the Microsoft Silverlight Toolkit from CodePlex for additional Toolkit functionality.

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Create a custom layout

Once you have created a new Visual Studio project using the ArcGIS Viewer for Silverlight Project as described above, complete the following steps to create a custom layout:

Steps:

1. Download the DefaultLayout.xaml file from the Esri Maps Configuration Files document library. You may want to create a backup copy of the DefaultLayout.xaml file before proceeding.
2. In the **<ProjectName>.Layouts** project of the solution you created previously, add the DefaultLayout.xaml file to the Config > Layouts folder.
3. If desired, open the **<ProjectName>.Layouts** project in Microsoft Expression Blend to create your custom layout. You can have the project open in Microsoft Visual Studio and Microsoft Expression Blend at the same time.

   Note: In Expression Blend, you may need to compile the project before editing.

4. Once you have created the desired layout, add the DefaultLayout.xaml file to the ArcGIS Mapping Configuration Files document library.

   Note: The Esri Maps for SharePoint layout file must be named DefaultLayout.xaml.

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Visual Studio template

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

The Visual Studio template installed as part of the ArcGIS Extensibility SDK for Silverlight is designed to aid in the creation of tools (commands) and behaviors for use with the ArcGIS Viewer for Silverlight. Because Esri Maps for SharePoint and ArcGIS Viewer for Silverlight share a common extensibility framework, you can use the Visual Studio template to write add-ins for Esri Maps for SharePoint.

Installing the Visual Studio template

The Microsoft Visual Studio template is installed as part of the ArcGIS Extensibility SDK for Silverlight. The template enables you to easily create add-ins and layouts. While projects created using the template can be opened in Microsoft Expression Blend 5, the template will only appear in the project creation dialog box of Visual Studio. The template is supported on Microsoft Visual Studio 2010 and 2012. Earlier versions of Visual Studio and Expression Blend are not supported.

Note: If you have Visual Studio projects created with version 2.4 of the ArcGIS Extensibility SDK for Silverlight, you must update the Target Silverlight Version to Silverlight 5 in the project properties.

Prerequisites

To use the template, you require the following:

- Microsoft Visual Studio 2012 or Microsoft Visual Studio 2010.
- ArcGIS API for Microsoft Silverlight 3.1.
- Microsoft Expression Blend Preview for Silverlight 5.
- Microsoft Silverlight 5 Tools for Visual Studio 2010 SP1 (if using Visual Studio 2010)
- Microsoft Silverlight Toolkit

Visual Studio template contents

Visual Studio solutions created from the Viewer template include three projects. In the list below, <Project Name> means the name of the project as specified on the New Project dialog box. The projects created as part of the template are as follows:

- <Project Name>—This is a website project containing a fully functional Viewer application. This contains a copy of all the configuration files included with the Viewer. When you compile the solution, the output from the AddIns project and the layouts in the Layouts project are automatically copied to this website.

  Note: This project is not used for developing add-ins for the ArcGIS Map Web Part.

- <Project Name>.AddIns—Contains a tool and behavior to get you started writing your own add-in. See Writing tools and Writing map behaviors for further details.
- <Project Name>.Layouts—Contains a copy of the default layouts deployed with the Viewer. You can open these in Visual Studio or Expression Blend to modify their design or create new layouts.

  Note: See Create a custom layout for more information on custom layouts in ArcGIS for SharePoint.

Creating add-ins

To create an add-in using the template, complete the following steps. To upload an add-in, see Configuring add-ins.

Steps:

1. Start **Microsoft Visual Studio 2010 or 2012**.
2. Click **File** > **New** > **Project**.
   The **New Project** dialog box appears.
3. On the **New Project** dialog box, expand **Visual C#**, and then expand the **Silverlight** node.
4. Click **ESRI Viewer** under the **Silverlight** node and select **ArcGIS Viewer for Silverlight Project**.
5. Type a name for the project in the **Name** text box and click **OK**.

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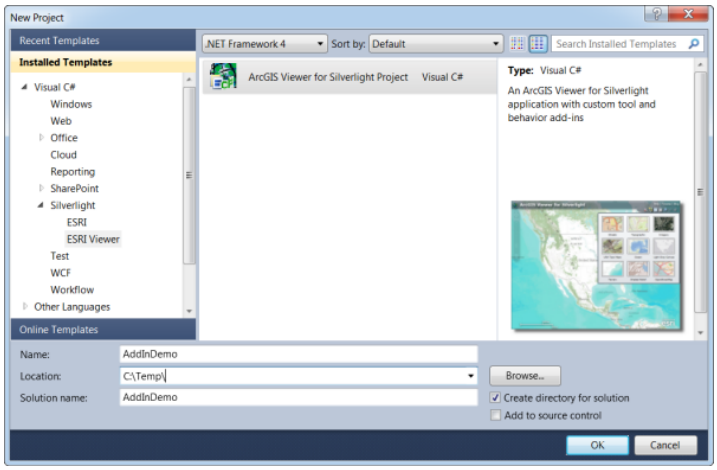


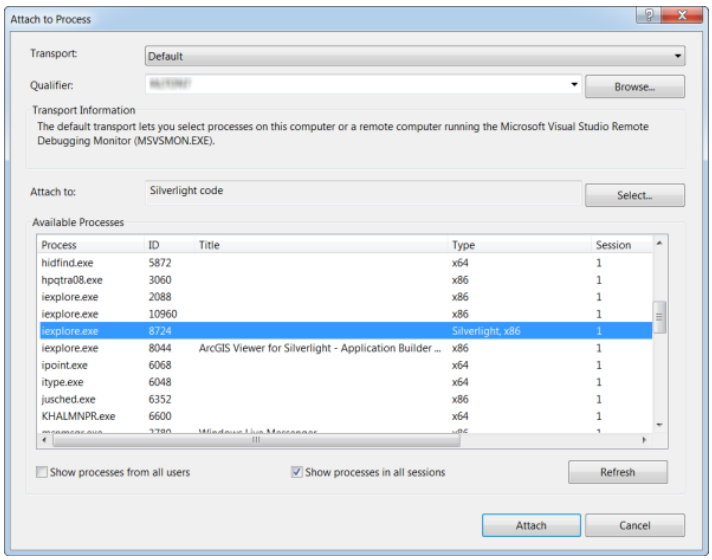
The add-in solution loads with three projects: one containing add-in code, one containing layouts, and one containing a Viewer website. Each project contains code and examples to help you get started creating custom tools, behaviors, and layouts.

Debugging an add-in

You can debug an add-in using Visual Studio and the **Attach to Process** functionality.

Steps:

1. Build your solution and verify that the build succeeds.
2. Upload the resulting add-in `.xap` file to your SharePoint site (see Configuring add-ins).
3. Add the tool to the desired toolbar and save.
4. Add a breakpoint at the desired location in Visual Studio.
5. In Visual Studio, click **Debug** > **Attach to process**.
   The **Attach to Process** dialog box appears.



6. Click the **Select** button to specify the **Attach to** property. The **Select Code** Type dialog box appears.

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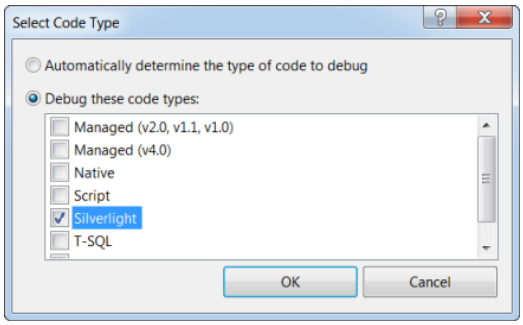

7. In the **Select Code** Type dialog box, check the box for **Silverlight** and click **OK**.
8. On the main **Attach to Process** dialog box, select the browser's process (for example, iexplore.exe, if using Internet Explorer) that is of type **Silverlight** and click **Attach**.

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Best practices: Getting started

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Esri Maps for SharePoint includes an extensibility application programming interface (API) that provides developers access to the map and selected layer, methods to show the user interface (UI) in dialog boxes, and the ability to store and load configuration data. The extensibility API is included in the ArcGIS Extensibility SDK for Silverlight. To get started, first determine whether you will create a tool or a behavior. Once you have decided on the type of add-in to create, see the following section on Working with the Map and Selected layer for detailed information on accessing the map from your add-in.

Tools and behaviors

Tools provide a simple way to surface logic that should be initiated by the user. If it makes sense to have the functionality you are implementing initiated by a user clicking a button on the toolbar, then you should encapsulate this functionality in a tool. An identify tool is an example of a situation where you would provide a button on the toolbar for the user.

Map behaviors provide a simple way to surface functionality that should always be enabled. Map behaviors provide functionality without the need for user interaction. If you are developing functionality to add a capability or modification that should always be present, then this should be encapsulated as a map behavior. Map behaviors can be used, for instance, to constrain the map extent, show mouse coordinates on the mouse pointer, or display an introductory dialog box when the application loads.

For more information and examples, see Write tools and Write map behaviors.

Working with the map and selected layer

The map and selected layer can be accessed through properties on the static ESRI.ArcGIS.Client.Extensibility.MapApplication object. The MapApplication object is available via the MapApplication.Current property. To access the map object, use MapApplication.Current.Map in your add-in code. To access the selected layer, use MapApplication.Current.SelectedLayer. The code for the simple command in the Write tools topic demonstrates accessing the map in the CanExecute method. The following code shows an example of a simple command where the selected layer's ID is shown when the tool is executed and the logic in the CanExecute method is such that the tool will be enabled only if a GraphicsLayer is selected.

```
[Export(typeof(ICommand))]
[DisplayName("Show GraphicsLayer ID")]
[Category("My Tools")]
[Description("Shows the ID of the selected GraphicsLayer")]
[DefaultIcon("Path to icon, ex: "/Viewer.Addins;component/Images/Identify.png"")]
public class ShowGraphicsLayerIdCommand : ICommand
{
     public void Execute(object parameter)
     {
          // Show the selected layer's ID.
          MapApplication.Current.ShowWindow("Layer ID", new TextBlock()
            {
                Text = MapApplication.Current.SelectedLayer.ID,
                TextWrapping = TextWrapping.Wrap,
                Margin = new Thickness(30),
                MaxWidth = 480
            });

     }

     public bool CanExecute(object parameter)
     {
          // Return true (that is, make the command executable) only if the selected layer is a GraphicsLayer.
          return MapApplication.Current.SelectedLayer is GraphicsLayer;
     }

     public event EventHandler CanExecuteChanged;
}
```

The extensibility API provides an event that fires when the selected layer changes as well as methods to retrieve and set the names of layers. Layer names are how layers are identified in the Map Contents panel. These differ from a layer's ID in that they are meant to be a intuitive name to identify a layer to end users of the Map Web Part, whereas IDs are meant to uniquely identify a layer in the map's layer collection from a programmatic perspective. The SelectedLayer changed event can be accessed via MapApplication.Current.SelectedLayerChanged. Layer names can be retrieved and set through the MapApplication.Current.GetLayerName and MapApplication.Current.SetLayerName methods. The following code shows a simple behavior that displays the selected layer's name in a message box when the selected layer changes:

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```
[Export(typeof(Behavior<Map>))]
[DisplayName("Show Selected Layer Name Behavior")]
[Category("My Behaviors")]
[Description("Shows a message box with the selected layer name")]
public class ShowSelectedLayerNameBehavior : Behavior<Map>
{
     protected override void OnAttached()
     {
          base.OnAttached();

          // Add a handler to the applications's SelectedLayerChanged event.
          MapApplication.Current.SelectedLayerChanged += ShowSelectedLayerName;
     }

     private void ShowSelectedLayerName(object s, EventArgs args)
     {
          // Show a message box with the selected layer name.
          string layerName = MapApplication.Current.SelectedLayer.GetValue(MapApplication.LayerNameProperty) as string;
          MapApplication.Current.ShowWindow("Layer Name", new TextBlock()
            {
                Text = layerName,
                TextWrapping = TextWrapping.Wrap,
                Margin = new Thickness(30),
                MaxWidth = 480
            });
     }

     protected override void OnDetaching()
     {
          // Remove the handler from the application's SelectedLayerChanged event.
          MapApplication.Current.SelectedLayerChanged -= ShowSelectedLayerName;
     }
}
```

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Best practices: Designing and displaying dialog boxes

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

When designing and displaying dialog boxes in your map application, there are many factors to consider, such as how to display the user interface (UI); the overall design and theme; how to achieve smooth integration with the existing application framework; and whether there are actions you want to perform as the dialog box is closing or once it has closed, such as removing a layer from the map.

Displaying the UI

To display the UI (dialog box) within the Map Web Part, the extensibility application programming interface (API) provides two methods—ShowWindow and HideWindow. These methods are available from MapApplication.Current. The MapApplication.Current.ShowWindow method displays any FrameworkElement in a floating dialog box. Pass the object you want to display with the title of the dialog box as a string to the ShowWindow method to display a dialog box. The ShowWindow method optionally accepts a Boolean to determine whether the dialog box is modal, an event handler that is called when the dialog box has started closing, and a second event handler that is called when the dialog box completes closing. To close the dialog box, pass the same FrameworkElement to the MapApplication.Current.HideWindow method.

If you are implementing a command, display the UI as soon as the button is clicked (that is, the command is executed). If your command requires the user to interact with the map, the UI should indicate this.

When using ShowWindow, set the background of your UI to be transparent. The dialog box containing your UI will base its background color on the application's theme colors, which are configurable by users who are designing the application.

For an example of displaying the Silverlight UI in the ArcGIS Map Web Part, suppose that you have implemented the UserControl with the default code-behind class and the Extensible Application Markup Language (XAML) as follows:

```
<UserControl x:Class="MyExtension.SimpleDialog"
     xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
     xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
     xmlns:d="http://schemas.microsoft.com/expression/blend/2008"
     xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006"
     mc:Ignorable="d"
     d:DesignHeight="300" d:DesignWidth="400">
     <Grid x:Name="LayoutRoot" Background="Transparent">
         <TextBlock Text="This is my Silverlight UI!" Margin="20" />
     </Grid>
</UserControl>
```

A tool that shows this control in a dialog box when the tool is executed would be implemented as follows:

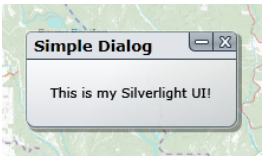
```
[Export(typeof(ICommand))]
[DisplayName("Show A Simple Dialog")]
[Category("My Tools")]
[Description("Tool to show a simple dialog")]
[DefaultIcon("<Insert path to icon>")]
public class ShowDialogCommand : ICommand
{
     private SimpleDialog dialog = null;
     public void Execute(object parameter)
     {
          // Instantiate a new dialog if one does not already exist.
          dialog = dialog ?? new SimpleDialog();

          // Display the dialog.
          MapApplication.Current.ShowWindow("Simple Dialog", dialog);
     }

     public bool CanExecute(object parameter)
     {
          // Return true so that the command is always enabled.
          return true;
     }

     public event EventHandler CanExecuteChanged;
}
```

In a Map Web Part that has the default theme, this dialog box appears as follows:



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Layout customization

Use layout customization to add UI (for example, panels) to the application that you don't want to appear in a floating dialog box. If the UI should always be visible, include it in the layout. To give the user the ability to turn the UI on and off, you can do the following:

- Include a close button or similar element on the UI that sets the Visibility property to Collapsed.
- Create a tool (that is, implement ICommand) that finds the control by using MapApplication.Current.FindControlInLayout and then sets its Visibility property to Visible.

Note: Since layouts will not necessarily include your UI, be sure to handle the case where FindControlInLayout returns null.

Do not programmatically walk the visual tree to dynamically add elements to the application. This approach requires the visual tree to be structured a particular way, and is thus inherently brittle. Code that does this may break from layout to layout and release to release.

Brushes

The Extensibility assembly includes a set of brushes that are used within the ArcGIS Map Web Part. Use the built-in brushes to color your UI. This keeps the colors of your UI consistent with those of the application and allows end users to configure them through the theme controls.

The following brushes are available:

- BackgroundGradientBrush—In the default set of layouts, this is used as the primary background color. This is used as the background for dialog boxes and the side panel.
- BackgroundStartGradientStopColorBrush—References the start color of BackgroundGradientBrush.
- BackgroundEndGradientStopColorBrush—References the end color of BackgroundGradientBrush.
- BackgroundTextColorBrush—Meant to be used for the color of text that is overlaid on the background brushes.
- AccentColorBrush—In the default set of layouts, this color is used to contrast with the background colors, for example, on borders, scroll bars, and buttons.
- AccentTextColorBrush—Meant to be used for the color of text that is overlaid on the background brushes.
- SelectionColorBrush—This is intended to be used as the color of selected elements, for instance, to highlight the selected layer in Map Contents.
- SelectionOutlineColorBrush—Meant to be used in conjunction with SelectionColorBrush to outline selections. This color is used to outline the selected layer in Map Contents.

Actions on closing the dialog box

To initiate an action when a window shown by your add-in is closed, pass an event handler to the onHidingHandler or onHideHandler parameter of the MapApplication.Current.ShowWindow method.

- onHidingHandler—Allows you to perform some logic before the window has closed and, if necessary, cancels the window close operation. You might use this, for example, if the user closes the window during an operation and you want to prompt them as to whether they want to stop the operation.
- onHideHandler—For performing logic after the window has closed. You might use this, for example, to remove a results layer from the map.

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Best practices: Map interaction

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

When you are writing a tool for the ArcGIS Map Web Part that requires mouse interaction, use the Draw surface instead of listening for mouse clicks. With the Draw surface, you can easily capture geometries that are drawn by users of your application. Once you retrieve these geometries, you can add them to a Graphics layer or use them as input for other operations.

When you are writing a tool that captures map clicks, do the following:

- Use the Draw object to capture mouse input. Remember, there may be other tools in the current Viewer application that also capture map clicks. For this reason, you should always use the Draw object, rather than listening to the Map's MouseClick event directly, because only one Draw object can be active at a time. If one Draw object is activated while another Draw object is already active, the second Draw object will be automatically deactivated.
- Listen for changes on the Draw object's IsEnabled property to handle cases where your tool's Draw object has been automatically deactivated. For example, if you implement an identify tool where you have an active Draw object to capture map clicks and a dialog box to show identify results, you would probably want the dialog box to close when another tool that captures map input is selected. This requires listening for changes to the IsEnabled property.

The following code snippet creates a new Draw surface on the map, sets the DrawMode to Point, and listens for the IsEnabled property.

```
private Identify identifyDialog;
private IdentifyTask identifyTask;
private Draw draw;

public void Execute(object parameter)
{
    if (draw == null)
    {
         draw = new Draw(MapApplication.Current.Map) { DrawMode = ESRI.ArcGIS.Client.DrawMode.Point };
         draw.DrawComplete += DrawComplete;

         // Listen to the IsEnabled property.  This is to detect cases where other tools have
         // disabled the Draw surface.
                                   // Utils class shown below.
         Utils.RegisterForNotification("IsEnabled", draw, identifyDialog, OnDrawEnabledChanged);
     }

     draw.IsEnabled = true;
     MapApplication.Current.ShowWindow("Identify", identifyDialog, false, null, IdentifyDialogHidden);
}

// Fires when the drawing action is complete.  Issues an identify operation using the drawn geometry.
private void DrawComplete(object sender, DrawEventArgs e)
{
    MapPoint clickPoint = e.Geometry as MapPoint;

    IdentifyParameters identifyParams = new IdentifyParameters()
    {
        Geometry = clickPoint,
        MapExtent = MapApplication.Current.Map.Extent,
        LayerOption = LayerOption.visible,
        SpatialReference = MapApplication.Current.Map.SpatialReference
    };

    if (identifyTask.IsBusy)
        identifyTask.CancelAsync();
    identifyTask.ExecuteAsync(identifyParams);

    GraphicsLayer graphicsLayer = MapApplication.Current.Map.Layers["IdentifyResultsLayer"] as GraphicsLayer;
    if (graphicsLayer == null)
    {
        graphicsLayer = createResultsLayer();
        MapApplication.Current.Map.Layers.Add(graphicsLayer);
    }
    else
    {
        graphicsLayer.ClearGraphics();
    }

    Graphic graphic = new Graphic() { Geometry = clickPoint };
    graphicsLayer.Graphics.Add(graphic);
}
```

```
public class Utils
{
   public static void RegisterForNotification(string propertyName, object source, FrameworkElement element,
   PropertyChangedCallback callback)
   {
       //Bind to a depedency property.
       Binding b = new Binding(propertyName) { Source = source };
       var prop = System.Windows.DependencyProperty.RegisterAttached(
            "ListenAttached" + propertyName,
            typeof(object),
            typeof(UserControl),
            new PropertyMetadata(callback));

       element.SetBinding(prop, b);
   }
}
```

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Best practices: Graphics layers, symbols, and renderers

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

Using the ArcGIS API for Silverlight, you can dynamically display graphics on a map through a Graphics Layer. A Graphics Layer could, for example, be used to hold polygons drawn by a user or display features that satisfy a user-defined query.

Symbols define all the nongeographic aspects of a graphic's appearance. This includes a graphic's color, border width, transparency, and more. The ArcGIS API for Silverlight includes many symbol classes, each of which allows you to specify symbology in a unique way. Each symbol type is also specific to one geometry type (that is, point, line, or polygon).

Renderers define one or more symbols to apply to a Graphics Layer. The symbol applied to each graphic depends on the graphic's attributes. The renderer specifies which attribute values correspond to which symbol.

The following sections detail several best practices for working with a Graphics Layer, symbols, and renderers.

Set the GraphicsLayer.Renderer property

You must use the GraphicsLayer.Renderer property to set the layer's symbology. If the Renderer property is not set when a Graphics Layer is added to the map, the ArcGIS Map Web Part automatically populates this property with a default renderer; therefore, you should set the GraphicsLayer.Renderer property before the layer is added to the map. A Graphics Layer's Renderer property always overrides any symbols set via Graphic.Symbol.

```
GraphicsLayer gl = new GraphicsLayer()
{
    ID = "IdentifyResultsLayer",
    Renderer = new SimpleRenderer()
    {
          Symbol = identifyDialog.Resources["RedMarkerSymbol"] as Symbol
    }
};
```

Supported renderers

Only UniqueValueRenderer, ClassBreaksRenderer, and SimpleRenderer are currently supported for persistence and configuration. If an unsupported renderer type is used, users will not be able to configure the symbology of the results layer after it has been added to the map. As an example, consider a tool that adds a Graphics Layer to the map. It is possible for users to run such a tool while they are editing the Map Web Part. If they use a supported renderer type, users can configure the symbology of the results layer after it has been added to the map. Additionally, if they save or deploy that application, the results layer will be stored as part of that application's map. These capabilities will not be available on Graphics Layers that use renderer types that do not support persistence and configuration (for example, TemporalRenderer).

If a renderer type other than UniqueValueRenderer, ClassBreaksRenderer, or SimpleRenderer is used, do not allow the tool to be executed from within the Application Builder, because types other than these do not support persistence and configuration. To do this, check whether Application.Current.IsEditMode is true, and, if so, prevent the tool from being run.

GraphicsLayer symbols

Declare the symbols used in your Graphics Layer in a resource collection within your UI's XAML. While symbols can be created programmatically, declaring them in XAML is more concise, more readable, and generally easier to maintain.

```
<UserControl.Resources>
   <ResourceDictionary>
       <esri:SimpleMarkerSymbol x:Key="RedMarkerSymbol" Color="Red" Size="12" Style="Circle" />
   </ResourceDictionary>
</UserControl.Resources>
```

Layer name

To retrieve or set the layer name that is shown in the Map Contents panel, use MapApplication.LayerNameProperty. You can set the name by calling Layer.SetValue(MapApplication.LayerNameProperty, "layer name"), and retrieve the name by calling Layer.GetValue(MapApplication.LayerNameProperty).

```
GraphicsLayer gl = new GraphicsLayer();
gl.SetValue(MapApplication.LayerNameProperty, "Identify Results");
gl.GetValue(MapApplication.LayerNameProperty);
```

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Best practices: Creating configurable add-ins

Note: This topic applies to the Silverlight-based ArcGIS Map Web Part.

The ArcGIS Extensibility SDK for Silverlight provides the ability to make your tools and behaviors configurable. If a tool or behavior is configurable, you can configure the component in the Map Web Part. To expose configuration on a tool or behavior, you need to implement the ESRI.ArcGIS.Client.Extensibility.ISupportsConfiguration interface. This interface requires you to implement the following methods:

- **Configure**—Invoked when a designer clicks the configure button for the tool or behavior. Your configuration logic should be initiated here. Usually, this involves displaying a dialog box to get input from the designer.
- **SaveConfiguration**—Invoked when the input is saved. The string you return from this method is persisted and passed back to the command or behavior when the tool is loaded.
- **LoadConfiguration**—Invoked when the tool initializes. The last string you returned from SaveConfiguration is passed to this method.

For an example of a configurable tool, suppose you have implemented a UserControl that contains the default code-behind and a text box. The Extensible Application Markup Language (XAML) for this control may appear as follows:

```
<UserControl x:Class="MyExtension.ConfigurationDialog"
     xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
     xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
     xmlns:d="http://schemas.microsoft.com/expression/blend/2008"
     xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006"
     mc:Ignorable="d"
     d:DesignHeight="300" d:DesignWidth="400">
    <Grid x:Name="LayoutRoot" Background="Transparent">
        <StackPanel Margin="10" Background="Transparent">
            <TextBlock Text="Configuration Input:" Margin="0,0,0,5" />
            <TextBox Name="InputTextBox" Width="200" />
        </StackPanel>
    </Grid>
</UserControl>
```

This control could be used in a configurable tool as follows:

```
[Export(typeof(ICommand))]
[DisplayName("Configurable Command")]
[Category("My Tools")]
[Description("Example of a configurable command")]
[DefaultIcon(Path to icon, ex: "/Viewer.Addins;component/Images/Identify.png")]
public class ConfigurableCommand: ICommand, ISupportsConfiguration
    {
        private ConfigurationDialog configDialog = new ConfigurationDialog();

        #region ISupportsConfiguration Members

        public void Configure()
        {
            // When the dialog box opens, it shows the information saved from the last
                                                                                //time the command was configured.
            MapApplication.Current.ShowWindow("Configuration", configDialog);
        }

        public void LoadConfiguration(string configData)
        {
            // If the saved configuration is not null, apply it to the configuration dialog box.
            configDialog.InputTextBox.Text = configData ?? "";
        }

        public string SaveConfiguration()
        {
            // Save the information from the dialog box, and
            return configDialog.InputTextBox.Text;

        }

        #endregion

        #region ICommand Members

        public bool CanExecute(object parameter)
        {
            // Return true so that the command can always be executed.
            return true;
        }

        public event EventHandler CanExecuteChanged;

        public void Execute(object parameter)
        {
            // Show the configuration data.
            MapApplication.Current.ShowWindow("Configuration", new TextBlock()
            {
                Text = configDialog.InputTextBox.Text,
                TextWrapping = TextWrapping.Wrap,
                Margin = new Thickness(30),
                MaxWidth = 480
            });
        }

        #endregion
    }
```

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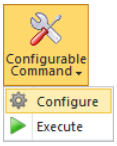
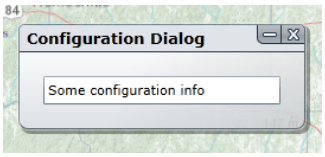
With this command added to the ArcGIS Map Web Part, designers editing the web part initiate configuration by selecting **Configure** from the command's menu.

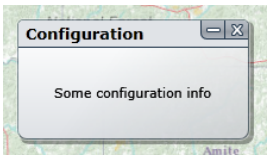


Note: The Configure option is only available while editing the web part. When the web part is not in edit mode, a configurable command is represented on the ribbon as a button. Clicking the button invokes the command's Execute method.

Clicking **Configure** invokes the command's Configure method. With the implementation previously shown, this displays the following dialog box:



When the ArcGIS Map Web Part is saved, the text in the text box is persisted as a string. When the ArcGIS Map Web Part loads, this string is passed to the LoadConfiguration method and used to initialize the configuration String variable. Executing the command—by clicking the command's button—displays a message box that shows the saved configuration string.



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Essential vocabulary

ArcGIS

ArcGIS provides an online infrastructure for making maps and geographic information available throughout an organization, across a community, and openly on the web. By signing in to your ArcGIS organization, you can access ready-to-use maps and apps, or create new maps that help you tell a story. With Esri Maps for SharePoint, you can combine your business data with data from ArcGIS to create rich maps that help you analyze your data visually and make better decisions. ArcGIS also makes it easy to share your maps and map layers within your organization or with colleagues in the field.

For more information, see Esri Maps for SharePoint and ArcGIS.

Basemap

A basemap provides a geographical context, or background, for the content you want to display in a map. With Esri Maps for SharePoint, you can choose from several Esri basemaps hosted on ArcGIS. These basemaps include many options that combine road, aerial, and topographic data with a variety of symbology. If your organization makes them available, you can also access basemaps in your ArcGIS Organization.

Clustering

Clustering in Esri Maps for SharePoint refers to grouping point features within a certain distance of each other into one symbol. This is different from grouping in Esri Maps for SharePoint where features are grouped by a user-specified category and styled accordingly. For more information, see Configure clustering.

Contents pane

The **Contents** pane is a central component of Esri Maps for SharePoint. The **Contents** pane displays the list of layers contained in the map, provides the ability to toggle layer visibility, and provides a starting point for setting layer properties such as styling, heat maps, transparency, visible range, clustering, and pop-ups.

Coordinate system

Coordinate systems provide a framework for defining real-world locations.

In Esri Maps for SharePoint, there are two supported coordinate systems: World Geodetic Survey 1984 (WGS84) and Web Mercator.

WGS84 is a geographic coordinate system in which every location on the earth is specified by a set of numbers (coordinates). Coordinates are often expressed as latitude and longitude values. Web Mercator is a projected coordinate system in which locations are identified by x,y coordinates on a grid, with the origin at the center of the grid. Coordinate values in the Web Mercator system generally have 6, 7, or 8 digits to the left of the decimal, and the units are meters. If you are unsure as to which coordinate system you should use, please contact the originator of your data or the person who collected it.

Coordinates

A set of values represented by the letters x and y that define a position within a spatial reference. Coordinates are used to represent locations in space relative to other locations. Coordinates are often shown in latitude-longitude pairs, where x coordinates range from -180 to 180 and y coordinates range from -90 to 90, or as values with 6, 7, or 8 digits to the left of the decimal point. When using Esri Maps for SharePoint, these value pairs are often composed of the values from two columns in your data.

Feature

Geographic features are representations of things located on or near the surface of the earth. Geographic features can occur naturally (such as rivers and vegetation), can be constructions (such as roads, pipelines, wells, and buildings), and can be subdivisions of land (such as counties, political divisions, and land parcels). Geographic features are most commonly represented as points, lines, or polygons. In Esri Maps for SharePoint, data you have added is often referred to as features on the map.

Feature service

A feature service is a collection of geographic features. Each feature in the collection has a location, set of properties, map symbology, and pop-up. In Esri Maps for SharePoint, you can search for feature services on ArcGIS and add them to your map. When you add a feature service to your map, it becomes one or more layers in the map.

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Grouping

Grouping in Esri Maps for SharePoint is the process of placing features in user-specified categories and styling them accordingly. See Feature display and style for more information.

Heat map

A heat map represents the geographic density of point features on a map by using colored areas to represent those points. The areas are largest where the most points are concentrated together. See Add a heat map for more information.

Layer

A layer is the way in which Esri Maps for SharePoint visually represents geographic datasets. A layer can be thought of as similar to a legend item on a paper map. On a road map, for example, roads, national parks, political boundaries, and rivers might be considered different layers. When you add SharePoint business data to a map, Esri Maps for SharePoint creates a layer and displays it on the **Contents** pane. Once the layer is created, functionality such as determining visibility, configuring style, and setting transparency are all enabled.

Lines

Lines represent the shape and location of geographic objects too narrow to depict as areas (such as street centerlines and streams).

Map

A map displays geographic data and allows you to explore and interact with that data. In Esri Maps for SharePoint, you can add SharePoint data directly to the map and combine it with additional content from ArcGIS Online.

Map service

A map service is a pre-styled collection of map cartography organized by location and scale. In Esri Maps for SharePoint, you can search for map services on ArcGIS and add them to your map. When you add a map service to your map, it becomes one or more layers in the map.

Pan (the map display)

Shift a map image relative to the display window without changing the viewing scale. Panning a map can also be thought of as moving the map image in the display window so that you can see different parts of the map.

Points

Points represent discrete locations of geographic features too small to be depicted as lines or areas, such as well locations, telephone poles, and stream gauges. Points can also represent address locations, Global Positioning System (GPS) coordinates, or mountain peaks.

Polygons/Areas

Polygons are enclosed areas (many-sided figures) that represent the shape and location of homogeneous features such as states, counties, parcels, and land-use zones. Polygons are often called areas.

Web map

An ArcGIS web map is an interactive display of geographic information that you can use to tell a story and answer questions. For example, you can create a map that addresses the question, 'How many people in the United States live within a reasonable walk or drive to a supermarket?' The map could contain layers showing neighborhoods within a 10-minute drive or 1-mile walk to a supermarket, and for context, a topographic basemap that includes cities, roads, and buildings overlaid on land cover and shaded-relief imagery. In Esri Maps for SharePoint, you can search for web maps on ArcGIS and add them to your map. When the web map is added to your map, the individual layers in the web map become layers in your map.

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