

# What's new in ArcGIS 10.4



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# What's new in ArcMap

The following sections summarize changes in different functional areas of ArcMap 10.4. Most sections include links to topics with more information for that specific area of the [software](#).

## Geoprocessing

The following are new tools and changes to existing tools for ArcGIS 10.4.

### 3D Analyst toolbox

*New tools*

- [Classify LAS Ground](#)
- [Extract LAS](#)
- [Minimum Bounding Volume](#)
- [Regularize Building Footprint](#)

*Changes*

Tool	Changes
<a href="#">Locate LAS Points By Proximity</a>	Support distance queries from multipatches.
<a href="#">Classify LAS By Height</a>	Support polygon based area of interest for classification extent.
<a href="#">Set LAS Class Codes Using Features</a>	Add class codes values up to 255 and overlap flag for LAS version 1.4 support.
<a href="#">LAS Dataset Statistics</a>	Add support for LAS version 1.4 overlap flag point count in the output text file.

### Conversion toolbox

*Changes*

Tool	Changes
<a href="#">Raster To Other Format</a>	The <code>Raster_Format</code> parameter has two new options: <ul style="list-style-type: none"> <li>• MRF</li> <li>• CRF</li> </ul>

### Data Management toolbox

*New tools*

- [Transform Features](#)
- [Update Enterprise Geodatabase License](#)

Changes

Tool	Changes
<a href="#">Add Rasters To Mosaic Dataset</a>	Two new parameters added: <ul style="list-style-type: none"> <li>• aux_inputs</li> <li>• estimate_statistics</li> </ul>
<a href="#">Alter Mosaic Dataset Schema</a>	The raster_type_names parameter has 12 new options: <ul style="list-style-type: none"> <li>• ZY3-CRESDA</li> <li>• ZY3-SASMAC</li> <li>• ZY1-02C HRC</li> <li>• GF-2 PMS</li> <li>• Sentinel-2</li> <li>• GF-1 PMS</li> <li>• UAV/UAS</li> <li>• HJ 1A/1B CCD</li> <li>• ZY1-02C PMS</li> <li>• SPOT 7</li> <li>• TH-01</li> <li>• GF-1 WFV</li> </ul>
<a href="#">Analyze Control Points</a>	The out_overlap_table parameter is now Optional.
<a href="#">Append</a>	New environment variable added: Preserve Global IDs.
<a href="#">Apply Block Adjustment</a>	New parameter added: DEM.
<a href="#">Compute Control Points</a>	Three new parameters added: <ul style="list-style-type: none"> <li>• area_of_interest</li> <li>• distribution</li> <li>• density</li> </ul>
<a href="#">Compute Tie Points</a>	Two new parameters added: <ul style="list-style-type: none"> <li>• distribution</li> <li>• density</li> </ul>
<a href="#">Copy Raster</a>	Two new parameters added: <ul style="list-style-type: none"> <li>• transform</li> <li>• format</li> </ul>
<a href="#">Create Database Connection</a>	The database_platform parameter has a new option: DAMENG.
<a href="#">Create Database User</a>	When the tool is run against a geodatabase in Oracle or PostgreSQL, it now creates shared log file tables for the user. With the log file tables already created, the database administrator can remove privileges to create tables from the user, if needed, without negatively affecting the user's ability to create large selection sets, edit data, or reconcile versioned data.
<a href="#">Create Enterprise Geodatabase</a>	When you run the tool on an Oracle 12c database, the sde user is granted privileges required to import data using Oracle Data Pump. This allows you to complete your Oracle Data Pump export and import workflows without having to separately grant these privileges.
<a href="#">Create Feature Class</a>	The geometry_type parameter has a new option: MULTIPATCH.
<a href="#">Create LAS Dataset</a>	New parameter added: create_las_prj.
<a href="#">Create Map Tile Package</a>	New parameter added: extent.

<a href="#">Create Mosaic Dataset</a>	<p>The <code>product_definition</code> parameter has nine new options:</p> <ul style="list-style-type: none"> <li>• HJ 1A/1B CCD_4BANDS</li> <li>• ZY1-02C PMS_3BANDS</li> <li>• GF-2 PMS_4BANDS</li> <li>• SPOT-7_4BANDS</li> <li>• ZY3-SASMAC_4BANDS</li> <li>• ZY3-CRESDA_4BANDS</li> <li>• GF-1 WFV_4BANDS</li> <li>• GF-1 PMS_4BANDS</li> <li>• TH-01_4BANDS</li> </ul>
<a href="#">Create Pansharpened Raster Dataset</a>	<p>The <code>sensor</code> parameter has seven new options:</p> <ul style="list-style-type: none"> <li>• ZY3-CRESDA</li> <li>• ZY1-02C PMS</li> <li>• GF-2 PMS</li> <li>• TH-01</li> <li>• ZY3-SASMAC</li> <li>• SPOT 7</li> <li>• GF-1 PMS</li> </ul>
<a href="#">Detect Feature Changes</a>	New parameter added: <code>compare_line_direction</code> .
<a href="#">Export Topology Errors</a>	You can now run this tool with an ArcGIS for Desktop Basic license.
<a href="#">Feature Compare</a>	The <code>ignore_options</code> parameter has a new option: <code>IGNORE_FIELDALIAS</code> .
<a href="#">Generate Tile Cache Tiling Scheme</a>	The <code>tile_format</code> parameter has a new option: <code>LERC</code> .
<a href="#">Project</a>	New parameter added: <code>vertical</code> .
<a href="#">Register Raster</a>	The <code>transformation_type</code> parameter has a new option: <code>POLYSIMILARITY</code> .
<a href="#">Synchronize Mosaic Dataset</a>	New parameter added: <code>estimate_statistics</code> .
<a href="#">Table Compare</a>	The <code>ignore_options</code> parameter has a new option: <code>IGNORE_FIELDALIAS</code> .
<a href="#">Warp</a>	The <code>transformation_type</code> parameter has a new option: <code>POLYSIMILARITY</code> .
<a href="#">Warp From File</a>	The <code>transformation_type</code> parameter has a new option: <code>POLYSIMILARITY</code> .

## Editing toolbox

### New tools

[Transform Features](#)

## Multidimension toolbox

### New tools

[Make OPeNDAP Raster Layer](#)

## Server toolbox

### Changes

Tool	Changes
<a href="#">Extract Data and Email Task</a>	<p>The Feature_Format parameter has 14 new options:</p> <ul style="list-style-type: none"> <li>• Autodesk AutoCAD - DXF_R2007 - .dxf</li> <li>• Autodesk AutoCAD - DWG_R14 - .dwg</li> <li>• Autodesk AutoCAD - DXF_R14 - .dxf</li> <li>• Autodesk AutoCAD - DWG_R2004 - .dwg</li> <li>• Autodesk AutoCAD - DXF_R2005 - .dxf</li> <li>• Autodesk AutoCAD - DXF_R2000 - .dxf</li> <li>• Autodesk AutoCAD - DXF_R2010 - .dxf</li> <li>• Autodesk AutoCAD - DWG_R2000 - .dwg</li> <li>• Autodesk AutoCAD - DWG_R2005 - .dwg</li> <li>• Autodesk AutoCAD - DWG_R2013 - .dwg</li> <li>• Autodesk AutoCAD - DWG_R2007 - .dwg</li> <li>• Autodesk AutoCAD - DXF_R2004 - .dxf</li> <li>• Autodesk AutoCAD - DWG_R2010 - .dwg</li> <li>• Autodesk AutoCAD - DXF_R2013 - .dxf</li> </ul>
<a href="#">Extract Data Task</a>	<p>The Feature_Format parameter has 12 new options:</p> <ul style="list-style-type: none"> <li>• Autodesk AutoCAD - DWG_R14 - .dwg</li> <li>• Autodesk AutoCAD - DWG_R2004 - .dwg</li> <li>• Autodesk AutoCAD - DXF_R14 - .dxf</li> <li>• Autodesk AutoCAD - DXF_R2005 - .dxf</li> <li>• Autodesk AutoCAD - DXF_R2000 - .dxf</li> <li>• Autodesk AutoCAD - DXF_R2010 - .dxf</li> <li>• Autodesk AutoCAD - DWG_R2000 - .dwg</li> <li>• Autodesk AutoCAD - DWG_R2005 - .dwg</li> <li>• Autodesk AutoCAD - DWG_R2013 - .dwg</li> <li>• Autodesk AutoCAD - DXF_R2004 - .dxf</li> <li>• Autodesk AutoCAD - DWG_R2010 - .dwg</li> <li>• Autodesk AutoCAD - DXF_R2013 - .dxf</li> </ul>

## Space Time Pattern Mining toolbox

### New Tools

[Visualize Space Time Cube in 2D](#)

[Visualize Space Time Cube in 3D](#)

### Changes

Tool	Changes
<a href="#">Create Space Time Cube</a>	New parameter added: summary_fields.

## Spatial Analyst toolbox

### New tools

[Compute Confusion Matrix](#)

[Cost Connectivity](#)

[Create Accuracy Assessment Points](#)

[Train Random Trees Classifier](#)

[Update Accuracy Assessment Points](#)

### Changes

Tool	Changes
<a href="#">Train ISO Cluster Classifier</a>	Two new parameters added: <ul style="list-style-type: none"> <li>• <code>max_merge_distance</code></li> <li>• <code>max_merge_per_iter</code></li> </ul>
<a href="#">Extract Multi Values to Points</a> , <a href="#">Extract Values to Points</a> , and <a href="#">Sample</a>	These tools have been updated to better handle conditions when the locations being sampled are NoData cells. In previous releases, this condition was given a value of 0 when the output format was to a Shapefile or an Info table, since those formats do not have a concept of a <null> value. This may have caused some confusion in cases where a legitimate value of 0 could be returned. A value of -9999 will now be reported for this case.
<a href="#">Cost Allocation</a> , <a href="#">Cost Back Link</a> , <a href="#">Cost Distance</a> , <a href="#">Path Distance</a> , <a href="#">Path Distance Allocation</a> , <a href="#">Path Distance Back Link</a>	New source characteristic parameters added. <ul style="list-style-type: none"> <li>• <code>source_cost_multiplier</code></li> <li>• <code>source_start_cost</code></li> <li>• <code>source_resistance_rate</code></li> <li>• <code>source_capacity</code></li> </ul>

## Python and ArcPy

ArcGIS 10.4 has been upgraded to include Python 2.7.10. Additional third-party libraries including `SciPy`, `pandas`, `Sympy`, and `nose` have been included, and existing third-party libraries including `NumPy` and `matplotlib` have been upgraded to more current releases.

The `GetPackageInfo` function has been added to return a dictionary about packages.

## Mapping

### Publishing

The **Service Editor** now defaults to the **Feature Access** capability when publishing to **My Hosted Services**.

## Editing

The topology edit tool now supports additional commands and keyboard shortcuts for selecting and moving nodes and edges.

- Press the **N** key to select topology nodes.
- Press the **E** key to select topology edges.
- **Move** and **Move To** commands are now available on the topology edit tool context menu.

### Parcel Editing

#### *Parcel merge*

The parcel **Merge** dialog box now has additional options for managing parent parcels. Parent parcels can be deleted, flagged as historic, or remain as current, active parcels.

#### *Parcel division*

When dividing parcels into equal areas, the number of parts on the **Parcel Division** dialog box can be set to 1. Set the number of equal area parts to 1 when a deed calls for a specific area to be divided from the parcel, leaving a remainder parcel.

#### *Mean points*

Performance improvements have been made to the **Mean Points** tool. Furthermore, the tool now always stays active and can be used repeatedly without the need to specify a tolerance.

#### *Least-squares adjustment*

Collinear line sequences in the same plan are straightened during adjustment postprocessing if they lie within the specified **Straighten Collinear Line Sequences** tolerances. These tolerances are available on the **Adjust Coordinates** dialog box.

## Geodata

### Geodatabases and databases

- The [Create Database User](#) tool now creates log file tables for the new user when you run the tool against a geodatabase in Oracle or PostgreSQL that is configured to use shared log file tables (the default setting for these geodatabases). With the log file tables already created, the database administrator can remove privileges to create tables from the user, if needed, without negatively affecting the user's ability to create large selection sets, edit data, or reconcile versioned data.
- Enterprise geodatabases are licensed through an ArcGIS for Server authorization file. The geodatabase stores this authorization information to allow access to the geodatabase. If your organization licenses ArcGIS for Server for a set time period, your geodatabase administrator can run the new [Update Enterprise Geodatabase License](#) tool with a current ArcGIS for Server authorization file to update license information in the geodatabase before the existing license expires. This allows clients to continue working with the geodatabase without interruptions caused by expired licenses.
- Beginning with ArcGIS 10.4, geodatabases in SQL Server require the SQL Server database options READ\_COMMITTED\_SNAPSHOT and ALLOW\_SNAPSHOT\_ISOLATION be set to ON. When you upgrade your geodatabase in SQL Server, the Upgrade Geodatabase tool sets these in the database. When you create a geodatabase in SQL Server using the Create Enterprise Geodatabase tool, the tool sets these options in the database. If you use the Enable Enterprise Geodatabase tool to create a geodatabase, you must either set these options to ON in the database before you run the tool, or grant the geodatabase administrator the permission to ALTER the database. If the geodatabase administrator has ALTER database permission, the Enable Enterprise Geodatabase sets READ\_COMMITTED\_SNAPSHOT and ALLOW\_SNAPSHOT\_ISOLATION to ON in the database.  
To use ArcGIS 10.4 with SQL Server databases or 10.3.1 or earlier release geodatabases, you must manually set on READ\_COMMITTED\_SNAPSHOT in the database.
- A new advanced option—[All records for Tables](#)—has been added to the **Create Replica** wizard. Checking this option allows you to designate the inclusion of all data from all tables in your replica. In earlier releases, you had to set the option to include data for each table individually.
- Beginning with ArcGIS 10.4, you must set an additional option (Return Output Parameters As ResultSet) when [configuring the ODBC driver for connections to Teradata](#).
- ArcGIS now supports connections to Dameng databases. You can connect to view and analyze data in ArcGIS for Desktop. You can also publish map and feature services to ArcGIS for Server.

### LAS Dataset

- There is a new scrollable LAS point profile view. Using the mouse/keyboard keys the area-of-interest profile window will move or rotate and update immediately in the profile window.
- Location of the cursor in point profile window is displayed in ArcMap inside the profile area-of-interest.
- Elevation is now displayed and updated when moving cursor around in point profile window.

### Raster

There have been five improvements for raster types.

- The SPOT-7 raster type is now supported.
- The UAV/UAS raster type is now supported.
- The WorldView-3 raster type now supports the SWIR bands.
- Support netCDF and HDF data stored as irregularly spaced arrays is now supported.
- There have also been improvements within Chinese raster types.

There are several improvements with raster geoprocessing.

- The Segmentation and Classification toolset has a new [Train Random Trees Classifier](#) tool. New parameters were added to the [Train ISO Cluster Classifier](#) tool.
- The [Add Rasters To Mosaic Dataset](#) tool supports two new parameters: Auxiliary input and Estimate mosaic dataset statistics.
- The [Copy Raster](#) tool supports two new parameters: Format and Apply transformation.
- The [Compute Tie Points](#) and [Compute Control Points](#) tools both have two new parameters: Point Distribution and Point Density.
- The [Make Mosaic Layer](#) tool supports the Processing template.



- The [Generate Tile Cache Tiling Scheme](#) tool now supports LERC compression.
- There are two new geoprocessing environment settings added: LERC compression and parallel processing server.

There are three new raster functions: Swath, Interpolate Irregular Data, and Rasterize Feature Class.

The **Georeferencing** toolbar now has three new first-order transformations available: **Only rotation and shift**, **Only shift and scale**, and **Only rotation and scale**.

## What's new in ArcGIS 10.4 for Server

ArcGIS 10.4 for Server includes stability enhancements and improved functionality throughout the product. For a summary of changes in the software, see the following sections.

It's recommended that you review the [deprecation notice](#) to determine if your hardware and software components are still compatible with version 10.4. To review which earlier ArcGIS product versions are compatible with ArcGIS 10.4 for Server, see [Compatibility of ArcGIS for Server with earlier versions](#).

### Chain together multiple server object interceptors (SOIs) for a service

If you're a [server object interceptor \(SOI\) developer](#), you can now chain together multiple SOIs for a map or image service. This allows you to accomplish one or more tasks with multiple SOIs. In previous releases, you could only enable one SOI for a service.

When you chain together multiple SOIs for a service, you need to specify the order in which the SOIs will be executed. For full instructions, see [Enable extensions](#).

### ArcGIS Server read-only mode

At 10.4, you can control changes to your site with read-only site mode. This mode disables publishing new services and blocks most administrative operations. Scaling your site by adding or removing machines is still possible, and the functionality of existing services continues to be available.

When you switch to read-only mode, site configuration files are copied to a local repository on each machine in the site. The site can then read from the local repository in the event of a failure connecting to the configuration store and can operate in a degraded capacity that allows access to the ArcGIS Server Administrator Directory, ArcGIS Server Manager, and ArcGIS Services directory, and keeps most services running as expected. At earlier releases, this was not the case, and the site would be down if such connection issues were to occur.

For more information, see [About ArcGIS Server site mode](#).

You can recover a site that's in read-only mode if its connection to the shared configuration store is lost. See [Recover a site](#) for details.

### Update passwords for registered and managed databases

For security reasons, most organizations require staff to reset passwords on a regular basis. If you use database authentication for the enterprise geodatabases and databases you register with your GIS servers, you can now [import a new database connection file containing the current password](#). This allows your feature services published to the managed database, and your existing map, feature, and image services published from registered databases to continue working.

Connections for new services published from ArcGIS 10.4 for Server can automatically be updated. If you upgrade ArcGIS Server and want the ability to update passwords in the connections used by existing services, the ArcGIS Server administrator must [run ExternalizeConnectionStrings](#) after upgrading the ArcGIS Server site.

## Microsoft Windows 10 support

### ArcGIS Server

At 10.4, you can install ArcGIS Server on Microsoft Windows 10. Additionally, ArcGIS Server Manager supports the Microsoft Edge web browser. For details, see [system requirements](#).

### ArcGIS Web Adaptor (IIS)

At 10.4, you can install ArcGIS Web Adaptor (IIS) on Microsoft Windows IIS 10. For details, see [system requirements](#).

## Microsoft .NET Framework 4.5 support

### ArcGIS Server .NET Extension Support feature

At 10.4, the .NET Extension Support feature requires Microsoft .NET Framework 4.5. In earlier versions, the ArcGIS Server setup required Microsoft .NET Framework 3.5 Service Pack 1 (SP1) to install the .NET Extension Support feature.

If Microsoft .NET Framework 4.5 is not found, the .NET Extension Support feature will not be available for installation. If your operating system includes Microsoft .NET Framework 4.5, make sure it's enabled using Windows Features. If your operating system does not include Microsoft .NET Framework 4.5, you can download it from the installation media and enable it using Windows Features.

For details, see [system requirements](#).

## ArcGIS Web Adaptor (IIS) Microsoft .NET Framework 4.5 support

ArcGIS Web Adaptor requires Microsoft .NET Framework 4.5 in order to be installed. In earlier versions, ArcGIS Web Adaptor required Microsoft .NET Framework 3.5 Service Pack 1 (SP1), 4.0, or 4.5 in order to be installed.

If your operating system includes Microsoft .NET Framework 4.5, make sure it's enabled using Windows Features. If your operating system does not include Microsoft .NET Framework 4.5, you can download it from the installation media and enable it using Windows Features.

For details, see [system requirements](#).

## Service enhancements

The following functionality is new for feature and map services:

- You can enable a new [extract capability](#) when you publish a feature service from ArcMap to ArcGIS for Server. When enabled, extract allows you to export data from the feature service to a file geodatabase or SQLite database using custom clients.
- You can specify the [time zone used for date fields](#) in layers included in map services and feature services when you publish from ArcMap 10.4 to ArcGIS 10.4 for Server. If you have existing map or feature services that contain date fields you want to view in a time zone other than UTC, you can change **Date Field Settings** in the service's **Parameters** in ArcGIS Server Manager to set a time zone and whether to apply daylight savings time.  
Additionally, date fields used for tracking edits made through feature services can use database time if you set the time zone before publishing. Previously, the publisher blocked inclusion of date fields for tracking edits if the fields did not use the UTC time zone. UTC is still the recommended time zone, but if you know all your edits will happen in the same time zone, and if your data needs to work with other systems that use the same time zone and can't convert to and from UTC, you can use database time instead.
- You can include tables and feature classes that are not registered with the geodatabase when publishing a feature service from a map that contains data from an enterprise geodatabase. Previously, you could not publish unregistered tables and feature classes from an enterprise geodatabase.

## Patch notification for extensions

The [patch notification utility](#) now includes information about patches and updates for ArcGIS Server extensions.


## Default HTTP and HTTPS communication protocol

At 10.4, ArcGIS for Server is configured to support both HTTP and HTTPS by default. ArcGIS Server sites upgraded to 10.4 from earlier versions will preserve their settings. For example, a GIS server that uses HTTP only at 10.3 will continue to use HTTP only when upgraded to 10.4.

## Default single cluster mode

At 10.4, ArcGIS for Server defaults to [single cluster mode](#) for new installations. This mode does not include load balancing between machines in the cluster. This reduces network traffic between machines in the site, reduces load on your network, and helps improve monitoring of GIS servers in your site.

When upgrading to 10.4, the mode will be enabled for sites with a single cluster that are not currently using single cluster mode. Single cluster sites already using single cluster mode and sites with multiple clusters at earlier releases will have their settings preserved when upgrading.

 **Note:** In sites using single cluster mode, an [external load balancer](#) or [ArcGIS Web Adaptor](#) must be configured to forward requests to the GIS servers in the site. If no external gateway exists, requests will only be handled by the GIS server designated in the request.

## Security fixes and enhancements

ArcGIS 10.4 for Server includes several fixes and enhancements that improve the security of the software. It's recommended that you [upgrade to 10.4](#) to help protect your ArcGIS Server infrastructure.

## Scan ArcGIS Server for security best practices

ArcGIS 10.4 for Server comes with a Python script tool that scans for some common security issues. The tool checks for problems based on the best practices for configuring a secure environment for ArcGIS Server. See [Scan ArcGIS Server for security best practices](#) for details.

## Geodatabases and databases

The Create Database User tool now creates log file tables for the new user when you run the tool against a geodatabase in Oracle or PostgreSQL that's configured to use shared log file tables (the default for these geodatabases). With the log file tables already created, the database administrator can remove privileges to create tables from the user, if needed, without negatively affecting the user's ability to create large selection sets, edit data, or reconcile versioned data.

Beginning with ArcGIS 10.4, geodatabases in SQL Server require the SQL Server database options `READ_COMMITTED_SNAPSHOT` and `ALLOW_SNAPSHOT_ISOLATION` be set to ON. When you upgrade your geodatabase in SQL Server, the Upgrade Geodatabase tool sets these in the database. When you create a geodatabase in SQL Server using the Create Enterprise Geodatabase tool, these options are set on in the database. If you use the Enable Enterprise Geodatabase tool to create a geodatabase, you must either set these options on in the database before you run the tool, or grant the geodatabase administrator permissions to ALTER the database, which allows the Enable Enterprise Geodatabase to change these settings.

To use ArcGIS 10.4 with SQL Server databases or 10.3.1 or earlier release geodatabases, you must manually set `READ_COMMITTED_SNAPSHOT` to ON in the database.

Enterprise geodatabases are licensed through an ArcGIS for Server authorization file. The geodatabase stores this authorization information to allow access to the geodatabase. If your organization licenses ArcGIS for Server for a set time period, your geodatabase administrator can run the new Update Enterprise Geodatabase License tool with a current ArcGIS for Server authorization file to update license information in the geodatabase before the existing license expires. This allows clients to continue working with the geodatabase without interruptions caused by expired licenses.

ArcGIS now supports connections to [Dameng databases](#). You can publish data from your Dameng database to map and feature services.

## What's new in Portal for ArcGIS 10.4

Portal for ArcGIS 10.4 includes performance, security, and stability enhancements and improved functionality throughout the product. For a summary of changes in the software, see the following sections.

Review the [deprecation notice](#) to determine if your hardware and software components are still compatible with version 10.4. To review which earlier ArcGIS product versions are compatible with Portal for ArcGIS 10.4, see [Portal compatibility with earlier versions of ArcGIS](#).

### Perform analysis

Whenever you look at a map, you inherently start turning that map into information by finding patterns, assessing trends, or making decisions. This process is called spatial analysis, and it's what your eyes and mind do naturally whenever you look at a map. But many patterns and relationships aren't always obvious from looking at a map. In some cases, there may be too much data to present coherently. The way you display the data on the map can change the patterns you see. Spatial analysis tools allow you to quantify patterns and relationships in the data and display the results as maps, tables, and charts. At 10.4, these tools are available in Portal for ArcGIS.

The [tools](#) you'll use to perform spatial analysis are actually hosted as a series of tasks in ArcGIS Server. To expose the tools to your portal members, you'll need to set up [a hosting server](#) for your portal and [grant members privileges](#) to perform analysis. The hosting server performs the work of processing analysis requests, storing the results in the ArcGIS Data Store, and returning results to members in the portal website. For full instructions, see [Configure the portal to perform analysis](#). Additional utility services can also be configured with the portal to enable certain analysis tools.

### Use custom print layouts

You can now provide custom layouts for printing from the map viewer. Layouts are based on what's provided in the organization's print service. When you [configure the portal to print maps](#), you can configure the print layouts for a more customized experience in the map viewer.

### Create groups that allow members to update shared items

You can [create groups](#) that allow members of the group to update items shared with that group. These groups are useful for shift workers in operations centers who need to update maps underlying their apps and dashboards and other situations where multiple people need to update the same item. Updates to an item can include changes to the item details and updates to the content. When members share an item to such a group, they remain the owner of the item. Other group members can update the item. For example, they can add layers to a map and save the map with the updated content. Only the item owner can delete the item and change the sharing properties of the item.

With this new group capability, members of these groups can edit hosted feature layers that have been shared to the group with [full editing control](#) even if the layer is not editable. For example, you could have a public hosted feature layer that isn't editable, and members of the group would have full editing control of the layer.

### Remove multiple languages from search results

By default, Portal for ArcGIS includes content for every supported language. When you or members of your portal search for content, results may be returned that do not apply to your specific language. At 10.4, you can configure your portal to remove Esri-provided content from specific languages from search results. When you do this, search results are limited to the languages you selected.

You'll use the ArcGIS Portal Directory to [remove languages from search results](#).

### Set a default role for new members

Specify which role newly added portal members are assigned. By default, all new members are assigned to the User role. If you want all new members assigned to a different role—for example, if you create a custom role that allows all members to create content—you can [set that as the default role](#).

### Microsoft Windows 10 support

#### Portal for ArcGIS

At 10.4, you can install Portal for ArcGIS on Microsoft Windows 10. For details, see [system requirements](#).

#### ArcGIS Web Adaptor (IIS)

At 10.4, you can install ArcGIS Web Adaptor (IIS) on Microsoft Windows IIS 10. For details, see [system requirements](#).

## Microsoft Edge browser

At 10.4, you can access the portal website using the Microsoft Edge browser. You can also use this browser to access the ArcGIS Portal Directory.

## Security fixes and enhancements

Portal for ArcGIS 10.4 includes several fixes and enhancements that improve the security of the software. It's recommended that you [upgrade to 10.4](#) to help protect your Portal for ArcGIS infrastructure.

### Scan your portal for security best practices

Portal for ArcGIS 10.4 comes with a Python script tool that scans for some common security issues. The tool checks for problems based on the best practices for configuring a secure environment for your portal. See [Scan your portal for security best practices](#) for details.

### Configure trusted servers

The map viewer, Web AppBuilder, and the configurable apps now fully support editing feature services secured with web-tier authentication. To take advantage of this support, administrators can [configure trusted servers](#) that allow Portal for ArcGIS to automatically pass through credentials.

### Fine-grained access control of federated servers

10.4 introduces a new security option for federated servers. You can update a federated server to control which portal members have administrative and publisher access to the server. See [Administer a federated server](#) for more information.

### Improved federation experience

At 10.4, the experience of federating your portal with ArcGIS Server has been improved. Portal for ArcGIS now provides more informative error messages and portal logs when problems are encountered with federation.

### New utility for changing the Portal for ArcGIS account

You can change the Portal for ArcGIS account using the new `configureserviceaccount` utility. This tool sets the account to run the Portal for ArcGIS service and grants required privileges on Portal for ArcGIS directories used by the service. See [Changing the Portal for ArcGIS account](#) for details.

### Changes to configuring a highly available portal

Portal for ArcGIS no longer uses the `portalha` tool for creating a highly available portal. Instead, there is a new step in the process of setting up Portal for ArcGIS: with one machine, you [create a portal](#). The second machine then joins this newly created portal. See [Configuring a highly available portal](#) for more information.

### New tool for web GIS disaster recovery

A new tool—`webgisdr`—is available in the Portal for ArcGIS tools directory that lets you export a single file containing related parts of a web GIS deployment. The exported file contains portal items and settings, hosted web layers, federated and hosting server settings and, if you use ArcGIS Data Store, hosted feature layer data and hosted scene layer tile caches. Store the exported file in a secure place and use it to [restore a web GIS deployment](#), or you can use the file to [replicate your web GIS to a standby deployment](#) that you can bring online if the primary deployment fails.

### Store standards-based metadata

Members of the portal Administrator role can [enable metadata](#) for items, and configure the metadata editing and viewing experience with a supported standard. Standards-based metadata allows you to provide more information about an item than what is available on the details page. It also applies a style to support a metadata standard such as FGDC CSDGM Metadata or North American Profile of ISO019115 2003.

### Use local views in the scene viewer

3D content can be displayed within two different scene environments—a [global world view](#) and a [new local \(or plane\) world view](#). Global views are currently the more prevalent view type, where 3D content is displayed globally and shown in the form of a sphere. A global canvas is well suited for data that extends across large distances and where curvature of the earth must be accounted for, such as global airline traffic paths or shipping lanes.

Local views have a fixed extent in which you work. They are better suited for small-extent data, such as a college campus or a mine site, and allow you to display layers in projected coordinate systems. Local views can also be very effective for scientific data display, where the relative size of features is a more important display requirement than the physical location of the content on a spheroid.

## Review address placement

If your portal's hosting server uses ArcGIS Data Store, you can [review and place addresses](#) that Portal for ArcGIS couldn't locate on the map when you publish a hosted feature layer from a CSV file containing addresses. You can also review the accuracy of the addresses that Portal for ArcGIS did place on the map. This helps you improve the accuracy of your hosted feature layers.

## Share vector tile packages

Vector tile packages you create in ArcGIS Pro 1.2 can be uploaded to your portal and published as [hosted tile layers](#). Vector tile packages deliver cartographic content in a compact binary format that includes both geometry and metadata. Tile layers created from vector tile packages take less time to create, require less disk space compared to raster tiles, and can be rendered in multiple styles.

See [Share a package](#) in the ArcGIS Pro help for information on creating a vector tile package.

## New options for hosted feature layers

You can now [export hosted feature layers to feature collections](#). This is useful if you want to create a copy of the features saved as part of the map. Changes made to the feature collection are only reflected in the map and do not affect the hosted feature layer from which you exported it.

You can also [export hosted feature layers to a GeoJSON file](#), which you can download and share with others. They can add the GeoJSON file to their own portal and [publish it as a hosted feature layer](#).

When you add a CSV file to your portal, you now have the option to [publish the CSV as a table](#). This allows you to create layers containing nonspatial attribute information, and also allows you to publish CSV files that do not contain spatial information such as addresses or x, y coordinates.

Owners and administrators of hosted feature layers can [open the layer in the map viewer and edit even if the layer does not have editing enabled](#).

If your portal's hosting server uses ArcGIS Data Store, owners and administrators of hosted feature layers can now use a table in the map viewer to [calculate values](#).

## New and improved map styles

Three new [map styles](#) are available in the map viewer. These styles perform calculations based on the attribute fields you specify to illuminate differences or trends in your data.

- Use the **Color & Size** style to illustrate the convergence of two numeric attributes using increasing symbol size (for count values) and different shades (for rates). For example, symbol size could vary depending on the number of homes built before 1970, and be shaded differently based on rates of childhood neurological disorders. You choose the color and size of the point symbols.
- Use the **Unique symbols & Size** style to map a count attribute (such as number of owner occupied households) but using a unique color for each value found in another field (such as a county name). With this style, you choose a text or numeric field with unique values, and a numeric field, and adjust each attribute's map symbol settings as needed.
- Use the **Compare A to B** style to map the ratio between two numbers, such as percentages, indexes, or simple ratios. For example, you may want to see the ratio of households with cable television subscriptions to households with satellite television subscriptions. Or, you may want to see the ratio of people with a college degree to those without one, on the map. With this style, you choose the attributes in your data, and adjust the sliders in the histogram as desired to make the comparison.

In addition to the new map styles described above, histogram sliders have improved precision and are easier to use. It's more evident that you can manually set values for any numbers you see near the histogram. For example, you can press the [Control](#) or [Command](#) key while moving the top or bottom slider to enable the opposite slider to move an equal distance away or toward the center handle. You can also hover over an individual bar in a histogram to see more details.

## Changes in configurable app templates

The app gallery has been redesigned to make it easier to choose the configurable app you want to use. You can filter based on the purpose of the app and search to refine the set of apps you see.

The following [configurable app templates](#) are new in Portal for ArcGIS 10.4:

- [Crowdsourcing Manager](#)

- [Crowdsourcing Polling](#)
- [Crowdsourcing Reporter](#)
- [Minimalist](#)
- [Time Aware \(10.4 version\)](#)

The following app templates have been retired. Use the suggested replacement app templates instead.

Retired app template	Replacement app template
Classic Viewer	<a href="#">Map Tools</a>
Chrome Twitter	<a href="#">Public Information</a>
Legend	
Time Aware	<a href="#">Time Aware (10.4 version)</a>
Twitter	<a href="#">Public Information</a>

**Tip:** Esri does not maintain the code on retired templates, and retired templates are not available from the map viewer. However, you can download the source code and API for retired templates and host them on your own web server. Instructions are included in readme files included with the download file.

## New functionality in Web AppBuilder

The following functionality has been added to Web AppBuilder. For more information, see [Web AppBuilder for ArcGIS Help](#).

### New widgets

- The Analysis widget provides an easy way to use Portal for ArcGIS spatial analysis tools in your application. You can configure one tool per widget or multiple tools in a widget.
- The Batch Attribute Editor widget allows you to simultaneously edit multiple attributes.
- The Image Measurement widget allows you to perform measurements on image services with mensuration capability.
- The GeoLookup widget enriches a list of latitude and longitude points. You supply a CSV file of points to the widget and it intersects the points with polygon layers on the map to get values associated with the points.
- The Incident Analysis widget defines an area of interest and identifies what's happening around the area, such as current weather, demographic info, and features close to the area.
- The Reviewer Dashboard widget displays data quality result statistics as infographics pie and bar charts to summarize data quality issues identified in your GIS data.
- The Feature Report widget enables you to collect and manage data quality feedback from users.
- The Search widget replaces the existing Geocoder widget. In addition to the functionality in the Geocoder widget, the new Search widget supports searching and suggestions on multiple sources, and it has options to add placeholder text for all search sources and search by current map extent.
- The Stream widget visualizes and controls real-time data feeds from streaming feature layers.
- The Summary widget dynamically summarizes numeric attributes for features based on the map extent.
- A new Zoom Slider widget provides interactive zoom controls in the map display.

### New functionality in existing widgets

- The Attribute Table widget has a filter to limit features and can be expanded automatically when the app starts. It also updates layers when they are changed in the map.
- The Edit widget now carries over the editable attributes configured in the map.
- The Geoprocessing widget supports uploading data to use in geoprocessing services that have upload capability.
- The Layer List widget has configurable context menus.
- The Zoom Slider widget provides interactive zoom controls in the map display.
- The Query widget has configurable sorting rules for query results.



## General

- Five new themes are available—Billboard, Box, Dart, Jewelry box, and Launchpad.
- The Foldable theme and Tab theme have better responsive designs.
- A new option is available to have widgets already opened when the web app starts.
- Six new URL parameters enable you to find a location or feature, supply login, query feature, add point, switch locale, and specify WKID to zoom or pan the map.
- The app state, including map extent and layer visibility, is now automatically saved when you close your browser.
- Support is added for imagery layers that include visualization with scientific data.

## Language changes in the portal website

- The website can now be viewed in Traditional Chinese (Taiwan) and Traditional Chinese (Hong Kong) [languages](#).
- The name for simplified Chinese in the [language drop-down list](#) has changed from Chinese (Simplified Han) to Simplified Chinese.