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ARCGIS 10.4 FOR SERVER
FUNCTIONALITY MATRIX



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Table of Contents

Introduction	1
ArcGIS for Server Components	2
How to use this document.....	3
Functionality Matrix Overview	4
Functionality	4
GIS services capabilities.....	5
Extensions and other products	6
ArcGIS applications	7
Capacity	7
Deployment	8
Functionality Matrix Details	8
GIS Portal.....	8
Portal for ArcGIS.....	8
Hosted web layers	9
Feature layers	10
Tile layers	10
Vector tile layers	10
Named User Entitlements.....	10
Web services	11
What are web services?	11
Open Geospatial Consortium Standards.....	12
Real-time data processing	12
What is the ArcGIS GeoEvent Extension for Server?	12
What are stream services?.....	13
Imagery management and processing	13
What is the ArcGIS Image Extension for Server?	14
What are image services?	14
Other ways to serve imagery	14
Web editing	14
What is a feature service?.....	15
What is the geometry service?..	15

Visualizing 3D spatial content	15
What is a scene service?	16
What is a globe service?.....	16
Geoprocessing	16
What is a geoprocessing service?	16
What is advanced geoprocessing?	17
Support for Spatially Enabled Databases	17
Geodatabase management.....	17
Why use a geodatabase?... ..	18
ArcGIS Client Apps and APIs	18
Smartphone and Tablet Apps/Runtime SDKs.....	19
ArcGIS for Server User Stories	19
Resources	19

ArcGIS 10.4 for Server Functionality Matrix

Introduction

Web GIS is a pattern for delivering GIS capabilities and is at the center of Esri's strategic direction for implementing GIS as a platform. The key concept of Web GIS is that all members of an organization can easily access and use GIS content within a collaborative environment. Web GIS leverages your existing GIS investments and makes them discoverable and more accessible. It provides a platform for integrating your GIS with other business systems and promotes cross organizational collaboration making it a system of engagement. In this way, Web GIS extends the reach of GIS to everyone in your organization enabling better decision making.

ArcGIS for Server enables the Web GIS pattern by deploying the ArcGIS Platform in your own infrastructure. This deployment enables anyone in your organization to discover, create, use and share geographic content from anywhere, anytime, on any device. ArcGIS for Server is designed to run in your infrastructure, either on-premises or in virtualized environments. It can be configured to work within your existing IT infrastructure and integrate with your enterprise security systems.

Conceptually, ArcGIS for Server includes three main tiers: services, access, and apps, see Figure 1. The *services* tier includes a GIS Server that enables GIS resources to be shared as GIS web services. The *access* tier includes a portal (aka. Portal for ArcGIS) that represents a gateway to access your GIS content. It is a user-friendly website that connects the people in your organization to the GIS resources and products powered by the GIS Server. Portal users can search and discover your GIS assets, create new maps, leverage application templates, and even create web apps from scratch without programming. Portal for ArcGIS is a destination site in your organization that helps you organize, secure, and facilitate access to spatial information products. Lastly, the *apps* tier includes a collection of ready-to-use productivity applications for the web, smart phones and tablets, and plug-ins for common business systems (such as Microsoft Office, SharePoint, Cognos, Salesforce, and MicroStrategy). All of these tiers comprise the Web GIS pattern in your own infrastructure and are included with ArcGIS for Server.

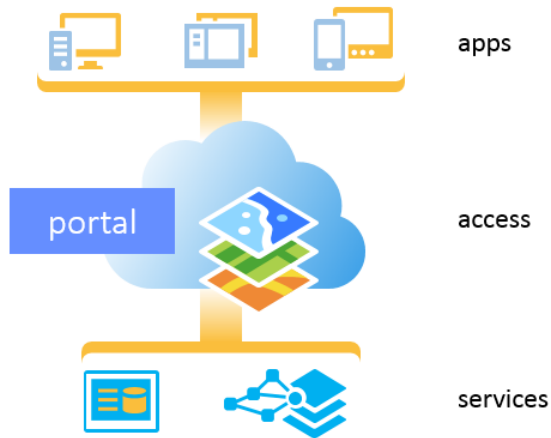


Figure 1: The Web GIS pattern with ArcGIS for Server's three conceptual tiers: services, access, and apps.

Additionally, developers can build customized apps that work with ArcGIS for Server using the ArcGIS REST API, ArcGIS API for JavaScript, and a host of ArcGIS Runtime SDKs.

ArcGIS for Server Components

ArcGIS for Server is a product that includes several different software components. Figure 2 illustrates the ArcGIS for Server components and how they conceptually work together to enable Web GIS in your own infrastructure.

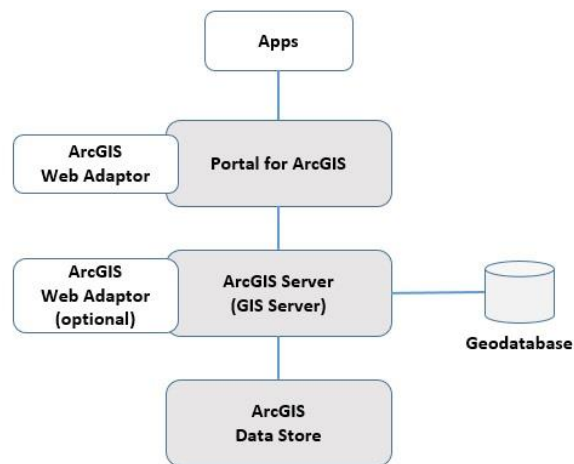


Figure 2: Conceptual diagram of the different components of ArcGIS for Server.

At the bottom of the stack is the ArcGIS Data Store, which is a data storage location for hosted layer data that is shared with Portal. Above it is ArcGIS Server, also commonly called the GIS Server. This component enables you to share your GIS data as GIS web services. Above it is Portal for ArcGIS, which provides a user-friendly website front end to your Web GIS. Portal serves as a

destination point for your organization to search, discover and interact with your GIS assets. Collectively, these three components: Portal for ArcGIS, the GIS Server, and the ArcGIS Data Store are the main parts of an on-premises Web GIS deployment.

At the top of the stack are apps. ArcGIS for Server has many applications that connect and work with Portal for ArcGIS. These include: Collector for ArcGIS, Explorer for ArcGIS, Operations Dashboard for ArcGIS, ArcGIS Maps for Office, Esri Maps for ... (SharePoint, Cognos, Salesforce, and MicroStrategy), and Web AppBuilder for ArcGIS.

Two other important components are the ArcGIS Web Adaptor – which works with 3rd party web servers, and the geodatabase - the native data structure for ArcGIS with a comprehensive information model for representing and managing geographic information.

ArcGIS Server can still be used in the traditional sense as the component of the ArcGIS platform that enables you to share your GIS data and maps as GIS web services, see Figure 3.

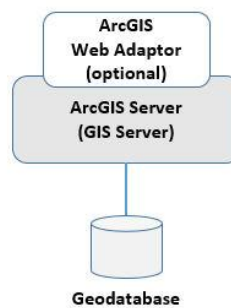


Figure 3: Conceptual diagram of ArcGIS for Server deployed as Server GIS infrastructure.

For medium to large organizations with multiple ArcGIS for Server licenses, they may deploy some GIS Servers following the Server GIS infrastructure pattern in Figure 3, to help support the backend of a larger Web GIS on-premises deployment.

How to use this document

This document is a guide for helping you determine the edition and capacity level of ArcGIS for Server that best fits your organization.

In the overview section that follows, you are presented with GIS services capabilities (including analytics and workflow capabilities), available apps, and the capacity levels of ArcGIS for Server. You should compare this information with the capabilities you need, the number of people in your organization, and the work these people perform.

Next, the details section contains additional information about important concepts that are unique to ArcGIS for Server and its components.

At the end, you will find links to ArcGIS for Server user stories that may be helpful when comparing to your own situation.

As always, your local Esri representative can help you further define what capabilities you require to meet your objectives.

Functionality Matrix Overview

Selecting the Appropriate ArcGIS for Server Edition and Level

When selecting the appropriate ArcGIS for Server edition and level for your organization, consider these two questions:

1. What functionality (GIS service capabilities and applications) do you require?
2. What level of capacity (storage and number of simultaneous connections) do you want to support?

Functionality

ArcGIS for Server is offered in three editions. Each successive edition offers greater functionality.

Basic

With Basic edition, you get geodatabase management and the ability to publish feature services for map visualization and query. Web-based editing using feature services is not available with the Basic edition. You also get the geometry service and the ability to publish geodata services.

Standard

With Standard edition, you get everything in the Basic edition, plus all the GIS web service types offered by ArcGIS Server. This allows you to web-enable your maps, imagery, 3D content, and more. You can also support web-based editing using feature services and publish geoprocessing services from any tool included in ArcGIS for Desktop Standard. Portal for ArcGIS, which enables you to deploy your own portal to enable Web GIS is also included. Standard also includes apps (e.g., Collector for ArcGIS, Explorer for ArcGIS, Operations Dashboard for ArcGIS, ArcGIS Maps for Office, Esri Maps for ... [SharePoint, Cognos, Salesforce, and MicroStrategy], and Web AppBuilder for ArcGIS) that connect and work with content from Portal for ArcGIS.

Advanced

With Advanced edition, you get everything in Standard edition, plus the ability to publish geoprocessing services from any tool included in ArcGIS for Desktop Advanced.

GIS Service Capabilities	Editions		
	Basic	Standard	Advanced
Support for Spatially Enabled Databases ¹	Included	Included	Included
Geodatabase Management ²	Included	Included	Included
Create and manage GIS Web Services	Included	Included	Included
Support for web mapping Apps	Included	Included	Included
Support for smartphone and tablet Apps	Included	Included	Included
Hosting/managing map-centric content (aka. Portal for ArcGIS)	-	Included	Included
Image processing and analysis	-	Included	Included
Web Editing	-	Included	Included
Visualizing 3D spatial content ³	-	Included	Included
Geoprocessing	-	Included	Included
Advanced Geoprocessing with Extensions	-	With Analyst Extensions ⁴	Included
Real-Time Data Processing and Monitoring	-	With ArcGIS GeoEvent™ Extension for Server	With ArcGIS GeoEvent Extension for Server

1 - Spatially enabled databases are those that include native database spatial data types. See the Spatially Enabled Databases section for more details.

2 - Requires ArcGIS for Desktop Standard or Advanced.

3 - For scene services, ArcGIS Pro and Portal for ArcGIS configured with a hosting server (ArcGIS Data Store only) is required.

To publish 3D analysis tools as geoprocessing services, the ArcGIS 3D Analyst for Server extension is required.

4 - See list of extensions and other products below.

For more information about each category, see the Functionality Matrix Details section of this document.

You can supplement ArcGIS for Server capabilities by adding extensions and other products.

Extensions and Other Products	Editions		
	Basic	Standard	Advanced
Portal for ArcGIS ¹	-	Included	Included
ArcGIS Schematics for Server	-	Included	Included
ArcGIS Spatial Analyst for Server	-	-	Included
ArcGIS 3D Analyst for Server	-	-	Included
ArcGIS Geostatistical Analyst for Server	-	-	Included
ArcGIS Network Analyst for Server	-	Optional	Included
ArcGIS GeoEvent Extension for Server	-	Optional	Optional
ArcGIS Image Extension for Server	-	Optional	Optional
ArcGIS for INSPIRE	-	Optional	Optional
ArcGIS Data Interoperability for Server ²	-	Optional	Optional
ArcGIS Data Reviewer for Server ²	-	Optional	Optional
ArcGIS Workflow Manager for Server ²	-	Optional	Optional
ArcGIS for Maritime: Server ²	-	Optional	Optional
Esri Defense Mapping for Server ²	-	-	Optional
Esri Production Mapping for Server ²	-	Optional	Optional
Esri Roads and Highways ²	-	Optional	Optional

1 - ArcGIS for Server customers are entitled to a number of named user licenses with their Portal for ArcGIS extension. These named users will be added to any other named user entitlements that the customer may want to allocate to Portal for ArcGIS as well as any additional purchased named users for their Portal. See GIS Portal section for more details.

2 - Windows only

For further details on the typical functions and capabilities included with each extension, refer to [ArcGIS for Server extensions](#).

ArcGIS for Server includes a broad range of ready to use apps. Most apps require a named user license to use. The following table lists which apps are available for each ArcGIS for Server edition.

ArcGIS Applications	Editions		
	Basic	Standard	Advanced
ArcGIS Earth*	Available	Available	Available
ArcGIS Maps for Office	-	Included	Included
Collector for ArcGIS	-	Included	Included
Esri Maps for IBM Cognos	-	Included	Included
Esri Maps for MicroStrategy	-	Included	Included
Esri Maps for Salesforce	-	Included	Included
Esri Maps for SharePoint	-	Included	Included
Explorer for ArcGIS	-	Included	Included
Navigator for ArcGIS**	-	Available	Available
Operations Dashboard for ArcGIS***	-	Included	Included
Web AppBuilder for ArcGIS****	-	Included	Included

* ArcGIS Earth is a separate app that can work with ArcGIS Server web services. It does not require a named user license to use for items shared to public.

** Requires additional licensing.

*** Operations Dashboard for ArcGIS includes two versions:

1. A desktop, Windows-based version for creating and monitoring operation views.
2. A browser-based version for monitoring operation views.

**** Requires a named user license to create new apps (this includes the Developer Edition). Deployed apps do not require a named user if shared to public.

Capacity

The ArcGIS for Server editions described in the previous section are available at two levels, scaled according to capacity: Workgroup and Enterprise.

	Capacity Level	
	Workgroup	Enterprise
Simultaneous connections to multiuser geodatabase	10	Unlimited
Multiuser geodatabase storage capacity	10 GB ¹	Unlimited
Maximum number of licensable cores	4 cores	Unlimited
Maximum number of Portal for ArcGIS named users	10	Unlimited
Distributed deployment of ArcGIS for Server components	Not supported ²	Supported

1 - ArcGIS 10.4 for Server Workgroup ships with Microsoft SQL Server Express 2012, which is limited to databases of up to 10 GB in size.

2 - Workgroup-level components can only be installed on one machine.

Selecting functionalities and the capacity level you want will determine the ArcGIS for Server edition and level you need. For example, ArcGIS for Server Enterprise Standard supports unlimited simultaneous connections, a large multiuser geodatabase, and a standard set of functionality.

Deployment

All editions and levels of ArcGIS for Server must be installed on 64-bit operating systems. The software can be deployed on physical or virtualized servers as well as on cloud infrastructures.

	Deployment Options	
	Workgroup	Enterprise
Windows 64-bit operating systems	Supported	Supported
Linux 64-bit operating systems	Not supported	Supported

For the most up-to-date information about system requirements and supported operating systems, refer to [System requirements](#).

Functionality Matrix Details

GIS Portal

A GIS portal enables an organization to make their geographic content and services available to a larger community beyond the GIS department. It brings geographic information together from various organizational resources in a uniform way, making it easier to search, discover, use, and share that information. It serves as *the* destination for an organization's spatial assets (data, maps, and apps) and enables its staff to work with the same authoritative content.

[Portal for ArcGIS](#) is an extension that is included with ArcGIS for Server Standard and Advanced. It provides a user-friendly, searchable repository for your maps and apps that can be deployed in your infrastructure (on-premises or in the cloud). Portal for ArcGIS is used for creating and sharing web maps and web apps, searching for GIS content in your organization, creating groups to help manage access to content, and providing a collaborative environment for your GIS assets and map information products.

	Editions		
	Basic	Standard	Advanced
Portal for ArcGIS	-	Included	Included

Portal for ArcGIS is a central component of the ArcGIS platform to enable Web GIS in your own infrastructure. It includes:

- A website where people in your organization can search, discover, use and share content.
- A Map Viewer for authoring and saving web maps. This app includes smart mapping capabilities.
- A Scene Viewer for authoring and saving 3D web scenes.
- Configurable application templates that can be leveraged to deploy focused web apps for your web maps.
- Web AppBuilder for ArcGIS for creating and deploying custom web apps for your web maps.
- Administrator tools for managing users, groups, and content.
- The ability to store hosted web layers (tiled and feature services) when configured with a hosting server.
- ArcGIS apps, including Collector for ArcGIS, Operations Dashboard for ArcGIS, ArcGIS Maps for Office, and the Esri Maps for ... apps (SharePoint, Cognos, Salesforce, and MicroStrategy).

Portal for ArcGIS also enables a geo-information model within its framework. This model abstracts your GIS data and maps into web maps, web scenes, and web layers (feature, image, scene, and tiles). These offer additional properties and capabilities that can be used by client apps. For example, you can set display properties and pop-ups for web layers. This level of abstraction enables the data content to be accessed and consumed by client apps in a uniform manner. ArcGIS Pro shares its content to Portal for ArcGIS leveraging this geo-information model.

Portal for ArcGIS is a separate software installation from ArcGIS for Server.

Hosted Web Layers:

When Portal for ArcGIS is configured with a hosting server (an ArcGIS Server site that is federated with Portal and has the ArcGIS Data Store enabled), Portal members can publish content directly to Portal. For example, from ArcGIS for Desktop, ArcGIS Pro, ArcGIS Maps for Office, or through the portal website.

Hosted web layers (aka. hosted web services) are designed for map visualization, editing, and queries. You can publish the following types of hosted web layers:

Feature layers

Hosted feature layers support vector feature querying, visualization, and editing. Hosted feature layers are most appropriate for visualizing data on top of your basemaps. In web apps, hosted feature layers are drawn by the browser and support interactive highlighting, queries, and pop-ups.

You can publish existing features from zipped shapefiles, comma-separated values (CSV) files, feature collections, ArcMap documents, ArcGIS Pro maps, GeoJSON files, or zipped file geodatabases to be hosted as feature layers in your Portal.

Tile layers

Hosted tile layers support fast map visualization using a collection of pre-drawn map images, or tiles. These tiles are created and stored on the server after you upload your data. Hosted tile layers are appropriate for basemaps that give your maps geographic context. You can publish tiles from a service definition file or ArcMap document that is hosted in your Portal.

Vector tile layers

ArcGIS Pro 1.2 supports the creation of vector tiles, which contain vector representations of data across a range of scales. Unlike raster tiles, they can adapt to the resolution of their display device and even be restyled for multiple uses. When a vector tile package is shared with Portal for ArcGIS, a corresponding vector tile layer is created.

Named User Entitlements

ArcGIS for Server includes a set of named user entitlements to be used with Portal for ArcGIS based on the level and capacity of the implementation.

ArcGIS for Server	Named User Entitlements	
	Workgroup	Enterprise
Advanced	10*	50**
Standard	5*	5**

* ArcGIS for Server Advanced and Standard (Workgroup) customers are limited to 10 named users per ArcGIS for Server implementation.

** ArcGIS for Server Advanced and Standard (Enterprise) customers can purchase additional named user licenses to use with Portal for ArcGIS.

These entitlements may not be applicable if you are licensed under a special program such as: Enterprise License Agreement (ELA), Education site license, etc. Please contact your local Esri representative for more details on named user entitlements.

Portal for ArcGIS is not available with ArcGIS for Server Basic (Enterprise or Workgroup). However, customers are permitted to register services from ArcGIS for Server Basic with their Portal for ArcGIS implementation.

Web Services

Web services make it easy to share GIS resources across client applications, including ArcGIS for Desktop, web mapping applications, mobile devices, and third-party applications.

What are GIS Web Services?

GIS web services are used to share resources over a local network or the Internet. ArcGIS for Server web services conform to web standards (Representational State Transfer [REST]); industry standards (Simple Object Access Protocol [SOAP]); and Open Geospatial Consortium, Inc.® (OGC®), standards.

GIS web services are available as follows:

GIS Web Services	Editions		
	Basic	Standard	Advanced
Geodata service	Included	Included	Included
Feature service (read-only)	Included	Included	Included
Geometry service	Included	Included	Included
Dynamic Map service	-	Included	Included
Cached Map service	-	Included	Included
Image service	-	Included	Included
Feature service (read and write)	-	Included	Included
Geoprocessing service	-	Included	Included
Geocoding (Locator) service	-	Included	Included
Globe service ¹	-	Included	Included
Print service	-	Included	Included
Enterprise Search service	-	Included	Included
Scene service ²	-	Included	Included
Schematic service ³	-	Included	Included
Stream service ⁴	-	Optional	Optional
Network service ⁵	-	Optional	Included
Windows Mobile service ⁶	-	Included	Included
Vector tile service ⁷	-	Included	Included

1 - ArcGIS 10.4.x will be the last major release series to include support for Globe services. We recommend customers use scene services as an alternative to share 3D content as web services.

2 - Scene services can only be published from ArcGIS Pro to Portal for ArcGIS configured with a hosting server (ArcGIS Data Store only).

- 3 - Schematic services require the ArcGIS for Server Schematics extension.
- 4 - Stream services require the ArcGIS GeoEvent Extension for Server.
- 5 - Network services require the ArcGIS Network Analyst for Server extension.
- 6 - Windows mobile services are used for supporting legacy Windows mobile apps only.
- 7 - Vector tile services are created when vector tile packages are shared and uploaded to Portal for ArcGIS configured with a hosting server (ArcGIS Data Store only).

Open Geospatial Consortium Standards

The Open Geospatial Consortium (OGC) is an international industry consortium of 511 companies, government agencies and universities participating in a consensus process to develop publicly available interface standards. ArcGIS for Server Standard and Advanced editions support OGC web services.

The OGC web services that are supported by ArcGIS for Server:

- Web Map Service - WMS (versions: 1.0, 1.1, 1.1.1, and 1.3)
- Web Feature Service - WFS (versions: 1.0, 1.1, and 2.0)
- Web Coverage Service - WCS (versions: 1.0.0, 1.1.0, 1.1.1, 1.1.2, and 2.0.1)
- Web Map Tile Service - WMTS (version 1.0)
- Keyhole Markup Language - KML (version 2.2)
- Web Processing Service - WPS (version 1.0)

The GIS server also supports many optional parts to these specifications please refer to this Esri whitepaper for details: [Esri Support for Geospatial Standards OGC and ISO/TC211](#). ArcGIS 10.4 for Server is listed in the OGC Compliance database and the certification details are available here: [Esri Current OGC Compliant Listings](#).

Real-time Data Processing

Real-time data processing is an important consideration for organizations that work with high velocity, high volume data, and both in static formats and in motion data streams. As the number of data sources providing real-time data streams increases, it is becoming more important that your applications are able to consume and immediately display this event data. ArcGIS for Server provides this capability through an optional extension.

What is the ArcGIS GeoEvent Extension for Server?

The [ArcGIS GeoEvent Extension for Server](#) extends the capabilities of ArcGIS for Server, enabling real-time event-based data streams to be integrated as data sources in your enterprise GIS.

	Editions		
	Basic	Standard	Advanced
ArcGIS GeoEvent Extension for Server	-	Optional	Optional

Event data can be filtered, processed, and sent to multiple destinations, allowing you to connect with virtually any type of streaming data and automatically alert personnel when specified conditions occur, all in real-time.

The GeoEvent Extension is capable of consuming event data from multiple real-time data streams. Filters and processors enable analysts to discover and focus on the most interesting events, locations, and thresholds for their operations.

The GeoEvent Extension includes a Manager application similar to the ArcGIS Server Manager but is used to create and configure GeoEvent services. (Note: GeoEvent services are NOT used by ArcGIS for Server client apps.) It also includes:

- Out-of-the-box connectors for common data formats, such as text, RSS, Esri feature JSON, and generic JSON, and data communication channels, such as system file, HTTP, TCP, UDP, WebSocket, and feature services.
- A rich set of processors that perform specific actions on the GeoEvents, such as identification or enrichment as GeoEvents are routed from inputs to outputs.
- A configurable set of standard operators for attribute filtering and a powerful set of spatial filters for filtering GeoEvents based on a spatial relationship with a GeoFence.

The GeoEvent Extension changes your everyday GIS applications into frontline decision applications, helping you respond faster with increased awareness whenever and wherever change occurs.

The GeoEvent Extension is a separate software installation from ArcGIS for Server.

What Are Stream Services?

The GeoEvent Extension allows you to create and publish a stream service that emphasizes low latency, real-time data dissemination, for client-server data flows. Client apps connecting to a stream service begin receiving data immediately upon subscribing to the service. Clients can specify and reconfigure both spatial and attribute constraints without first unsubscribing and then reconnecting to the service.

Stream service content can be incorporated into ArcGIS Online and Portal for ArcGIS web maps as well as exposed through clients developed using the ArcGIS API for JavaScript.

Imagery Management and Processing

ArcGIS for Server provides the ability to effectively process and serve imagery, making imagery and imagery-derived products accessible to a wide range of applications. Image services can serve single images or collections of images in mosaic datasets.

What is the ArcGIS Image Extension for Server?

The [ArcGIS Image Extension for Server](#) is required to serve a mosaic dataset or a raster layer containing a mosaic function in ArcGIS for Server.

A mosaic dataset is a data model in the geodatabase that references large collections of imagery and defines associated mosaic rules and on-the-fly processing. Mosaic datasets are typically created using tools in ArcGIS for Desktop (Standard or Advanced) and provide rich functionality to work with imagery collections. They can be used directly in a desktop or served as image services using ArcGIS for Server. The image service APIs enable applications to access the mosaic datasets as a catalog, control many properties of the image display, as well as access the data values for analysis.

Functionality	Editions		
	Basic	Standard	Advanced
Image Services—From single image	Not Available	Included	Included
Image Services—From mosaic datasets	Not Available	Optional	Optional

What are Image Services?

Image services enable fast serving of imagery and rasters as web services. They can be used for visualization and analysis. Image services can be defined with on-the-fly processing capabilities such as orthorectification, pan sharpening, hillshading, and band algebra.

Image services can directly serve nearly any image source. They can also be used to perform processing to transform the imagery from the original source into different products without requiring preprocessing. Multiple image products can be served from a single source. Image services are accessed using the image service API.

ArcGIS for Server image processing is comparable to ArcGIS for Desktop image processing and analysis capabilities. Image services can be directly served from raster datasets, such as a TIFF file as well as from raster layers, which reference a raster dataset and apply additional processing on the fly.

Other Ways to Serve Imagery

Imagery can also be cached and served directly using ArcGIS for Server.

Imagery from a mosaic dataset can be cached (in Desktop or Server) and served through a map document. Serving imagery as a cache is a scalable method of serving imagery when only visual context and no additional processing or analysis is required.

Web Editing

The ability to make spatial and attribute edits and updates to databases and geodatabase-enabled databases via the web is made possible through the following ArcGIS for Server services:

- Feature service
- Hosted feature layer (see previous section on page 10)
- Geometry service (optionally used to support editing workflows)

What is a Feature Service?

Feature services support multiuser database editing across your intranet or the Internet. Through this web service, you can add, delete, and update geographic features from web browsers, mobile applications, and any REST and OGC Transactional Web Feature Service (WFS-T) capable client.

The feature service is implemented as a stateless REST web service, providing maximum performance and scalability. It exposes feature templates created in ArcGIS for Desktop to clients and enables structured editing of your GIS data over the web; this gives clients an intuitive web editing user experience.

Feature services support direct access to spatial types in databases and geodatabases (see the section *Why Use a Geodatabase?*). ArcGIS for Server Standard and ArcGIS for Server Advanced support read and write feature services with native spatial types from your database without the need to register tables in the geodatabase.

What is the Geometry Service?

The geometry service helps applications perform geometric calculations such as buffering, simplifying, calculating areas and lengths, merging, splitting, validating topological relationships, and projecting data. Often, the geometry service is used in combination with the feature service to support sophisticated GIS editing over the web.

Visualizing 3D Spatial Content

Maps typically have 2D data content that are representations of reality and include additional information to enhance our understanding of the world around us. For cases where the vertical axis is important, ArcGIS Pro includes the ability to tilt up a 2D map and view spatial relationships in a three-dimensional scene. This makes the data more understandable and may help to reveal new insights. ArcGlobe is another application that enables 3D visualization.

Working in 3D can highlight influences such as the undulations of the terrain and the 3D extent of features like trees, buildings, and subsurface geology. Additionally, the display of quantitative GIS content such as population, temperature, or relative occurrences of an event, can often be communicated more effectively in a 3D view.

ArcGIS Server supports two types of web services for 3D visualization:

- Scene service
- Globe service*

*ArcGIS 10.4.x will be the last major release series to include support for Globe services. We recommend customers use scene services as an alternative to share 3D content as web services.

What Is a Scene Service?

ArcGIS Pro enables you to create and manage 3D spatial content, which can be shared with Portal for ArcGIS. A scene service is a web service originating from a 3D scene layer in ArcGIS Pro. Scene services (aka. web scene layers) allow you to share 3D content as a web service and can be aggregated together into a web scene. Web scenes are interactive displays of geographic information that are useful when you need to expose 3D data on the web for visualization and analysis.

To enable ArcGIS Pro to share 3D data to Portal for ArcGIS, Portal must be configured with a hosting server. A hosting server is an ArcGIS Server site that is federated with Portal and has the ArcGIS Data Store enabled. ArcGIS Pro can share 3D content to Portal for ArcGIS as a scene service (aka. web scene layer) or as a web scene.

What Is a Globe Service?

A globe service gives you access to 3D content originating from an ArcGlobe document (.3dd). It supports all the same display options that are available when viewing the layer locally. For example, globe services can be created to share 3D objects, such as a virtual city of building features and street furniture, or high-resolution elevation surfaces.

Geoprocessing

ArcGIS for Server provides an extensive array of geoprocessing functionality.

What Is a Geoprocessing Service?

Geoprocessing services are how you expose the powerful analytic capabilities of ArcGIS. They contain geoprocessing tasks, which take simple data captured in a web application, processes it, and returns meaningful and useful output in the form of features, maps, reports, and files.

Geoprocessing takes an input dataset, performs an operation on that dataset, and returns the result of the operation as an output dataset.

With ArcGIS for Server, you can publish geoprocessing services that allow you to submit jobs to the server and return a set of results. Building a geoprocessing service requires that you first create a model using the ModelBuilder™ feature in ArcGIS for Desktop. A model is a logical sequence of geoprocessing tools and/or scripts that help automate a GIS operation. The server accesses the model and does the work, freeing client computer resources and eliminating the problem of having to share copies of the model across client computers.

Geoprocessing supports tools comparable to the ArcGIS for Desktop Standard software-level geoprocessing toolbox.

What Is Advanced Geoprocessing?

Advanced geoprocessing refers to the additional tools available with ArcGIS for Server Analyst Extensions (3D Analyst, Spatial Analyst, Geostatistical Analyst, and Network Analyst). Advanced routing and suitability analysis are also examples of advanced geoprocessing.

ArcGIS for Server Advanced edition includes extensions for specialized advanced analytics.

Support for Spatially Enabled Databases

ArcGIS for Server allows you to work directly with spatial data stored and managed by commercial databases that support spatial types. With ArcGIS for Server Basic edition, you can enable read-only feature services for your data. These feature services will allow you to display and query your database information on a map from web browsers and mobile devices. The following databases are supported:

- ALTIBASE®
- Amazon RDS for Microsoft SQL Server
- Amazon RDS for PostgreSQL
- Dameng
- IBM® DB2®
- IBM Informix® Dynamic Server
- IBM Netezza®
- Microsoft® SQL Server®
- Microsoft Azure® SQL Database
- Oracle®
- PostgreSQL
- SAP HANA®
- Teradata®

Note: All databases are read-only in ArcGIS for Server Basic edition and read/write in ArcGIS for Server Standard and Advanced editions (except for Netezza, which is read-only).

Geodatabase Management

The geodatabase enables ArcGIS for Server to extend the spatial capabilities of databases to support more sophisticated GIS data management workflows such as versioning, and geospatial data models (e.g., topologies, geometric networks, and network datasets).

Why Use a Geodatabase?

Commercial databases support simple spatial features. Geodatabases build on this framework and extend the capabilities of your database to ensure that you can enrich your GIS data models and satisfy the most demanding GIS workflows such as the following:

- Long transactions and conflict resolution (versioning)
- Modeling of utility, water, and transportation networks (geometric networks and network datasets)
- Data validation including topological, attribute, and connectivity rules (topologies)
- Tracking of historic transactions (archiving)
- Complex features: annotations (text), dimensions, parcel fabrics, etc.
- Advanced symbology (cartographic representations)
- Replication across multiple commercial databases in connected and disconnected environments (geodata services)

ArcGIS for Server Enterprise level supports multiuser geodatabases on the following relational database management systems (RDBMS):

- Amazon RDS for PostgreSQL
- Amazon RDS for Microsoft SQL Server
- IBM DB2
- IBM Informix Dynamic Server
- Microsoft SQL Server
- Oracle
- PostgreSQL

ArcGIS for Server Workgroup level only supports Microsoft SQL Server Express.

ArcGIS for Desktop Standard or Advanced includes tools to create a multiuser geodatabase.

ArcGIS Client Apps and APIs

ArcGIS for Server users benefit from a variety of ready to use client applications:

- ArcGIS Online and Portal for ArcGIS map and scene viewers
- Configurable Application Templates
- Collector for ArcGIS
- Operations Dashboard for ArcGIS
- Explorer for ArcGIS
- ArcGIS Maps for Office
- Esri Maps for SharePoint
- Esri Maps for IBM Cognos
- Esri Maps for MicroStrategy
- Esri Maps for Salesforce
- Web AppBuilder for ArcGIS
- ArcGIS Earth

- Navigator for ArcGIS

Web application developers can build custom web mapping apps using the ArcGIS API for JavaScript™.

Smartphone and Tablet Apps/Runtime SDKs

ArcGIS for Server supports a variety of mobile applications across all editions and on many platforms:

- Collector for ArcGIS
- Operations Dashboard for ArcGIS
- Explorer for ArcGIS

Application developers can build custom native apps for desktop and mobile devices using the ArcGIS Runtime SDKs:

- ArcGIS Runtime SDK for iOS
- ArcGIS Runtime SDK for Android
- ArcGIS Runtime SDK for OS X
- ArcGIS Runtime SDK for Qt
- ArcGIS Runtime SDK for Java
- ArcGIS Runtime SDK for .NET

ArcGIS for Server User Stories

Please click the links below for some real customer success stories of working with ArcGIS for Server:

- [Seneca Resources](#)
- [Field crew gets online information with map-portal](#)
- [Spatially Mapping Chick-fil-A Restaurants](#)
- [A Clear View for Retail Success](#)

For more customer stories:

<http://www.esri.com/software/arcgis/arcgisserver/success-stories>

Resources

- [ArcGIS for Server 101 – ArcUser Technical article](#)
- [Portal for ArcGIS 101 – ArcUser Technical article](#)



Esri inspires and enables people to positively impact their future through a deeper, geographic understanding of the changing world around them.

Governments, industry leaders, academics, and nongovernmental organizations trust us to connect them with the analytic knowledge they need to make the critical decisions that shape the planet. For more than 40 years, Esri has cultivated collaborative relationships with partners who share our commitment to solving earth's most pressing challenges with geographic expertise and rational resolve. Today, we believe that geography is at the heart of a more resilient and sustainable future. Creating responsible products and solutions drives our passion for improving quality of life everywhere.

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