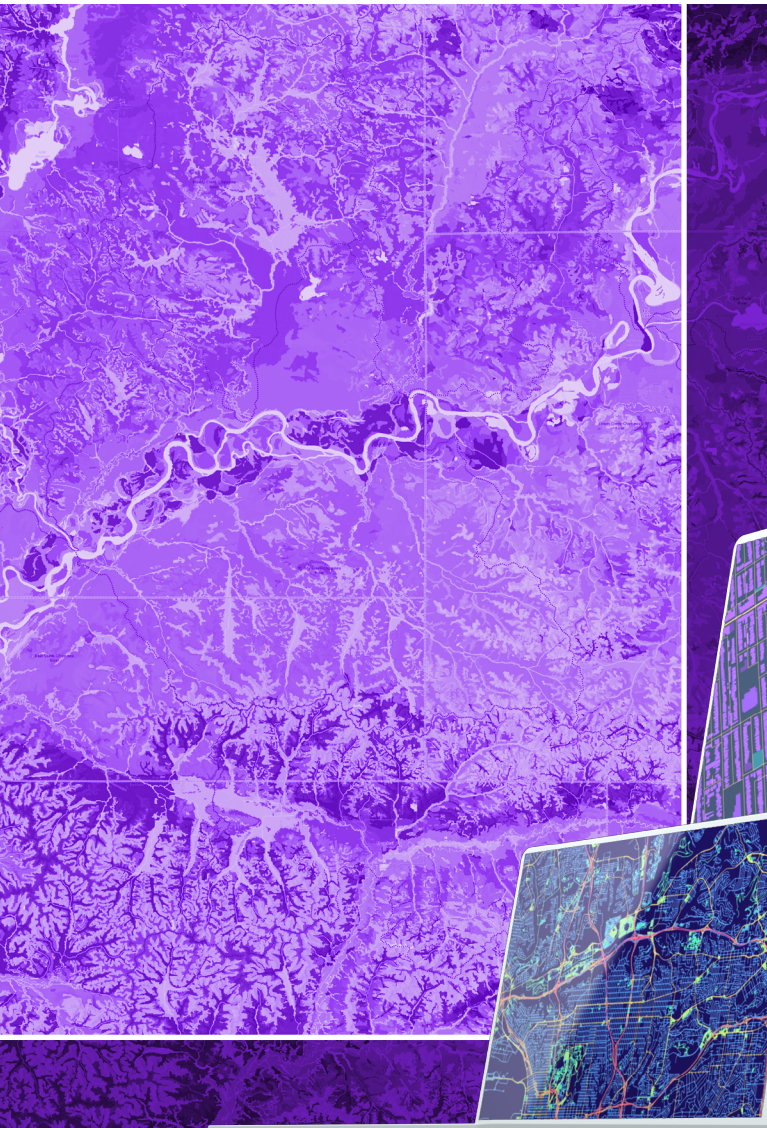
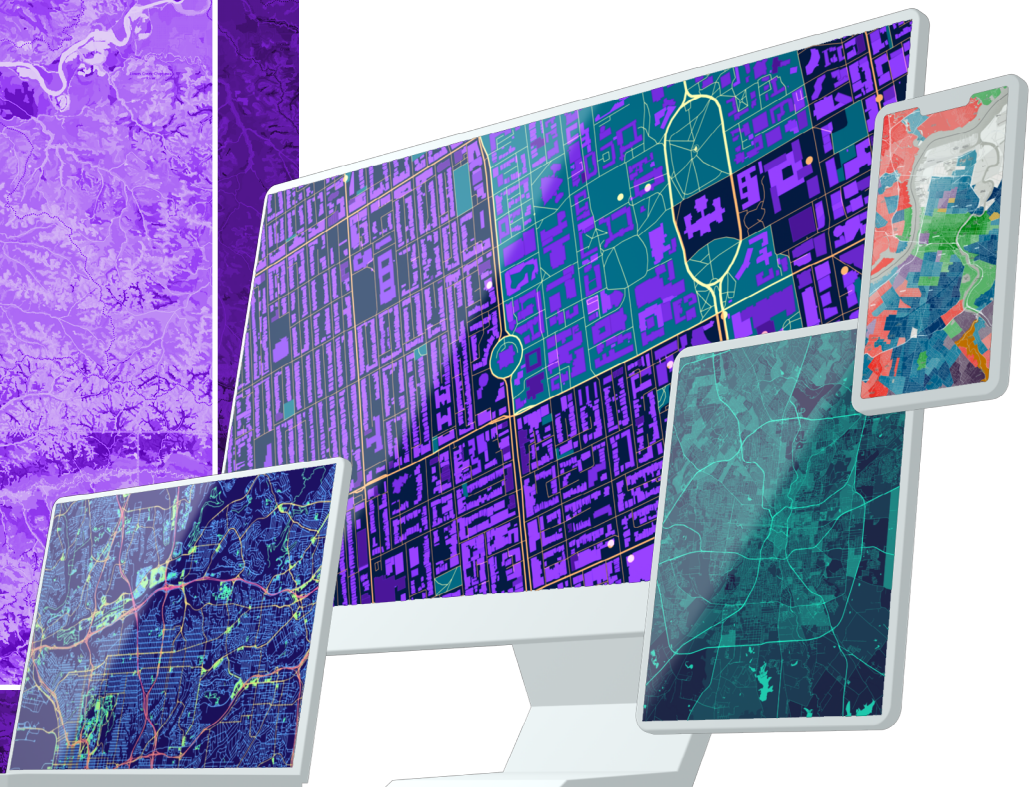




11.1



ArcGIS[®] Enterprise Functionality Matrix





ArcGIS® Enterprise is the foundational software for geographic information system (GIS) technology—mapping and visualization, analytics, and Esri’s suite of geospatial applications. It is software that is self-hosted in public cloud, private cloud, and on-premises infrastructure. ArcGIS Enterprise can be deployed on Windows, Linux, and Kubernetes.

This functionality matrix features the vast and diverse capabilities in ArcGIS Enterprise so you can identify which products, licenses, user types, capabilities, and extensions best fit your needs.

You can manage, map, analyze, and share GIS data to power your decisions. ArcGIS Enterprise comes with enterprise-ready features including full data management control that empowers you to visualize your data spatially, perform analysis in your web browser to discover patterns and trends, and share and collaborate inside and outside your organization.

ArcGIS Enterprise includes options for comprehensive mapping, image exploitation, real-time data processing, big data analysis, and using data science tools. It also powers the full suite of applications for field data collection, analysis, operational intelligence, and workforce tracking.

Powerful, collaborative, and secure—ArcGIS Enterprise epitomizes modern GIS in your infrastructure.

ArcGIS Enterprise comes with tools to get you started—including builders for simple single-machine deployments, Chef and PowerShell Desired State Configuration (DSC) scripts to automate custom deployments, and machine-generated images to jump-start cloud deployments on Amazon Web Services (AWS) and Microsoft Azure.

ArcGIS Enterprise on Kubernetes enables deployments on Amazon Elastic Kubernetes Service (Amazon EKS), Azure Kubernetes Service (AKS), Google Kubernetes Engine (GKE), and Red Hat OpenShift. See page 14 for more information on this option.

Deploying ArcGIS Enterprise

There are three deployment options for ArcGIS Enterprise: Windows, Linux, and Kubernetes.

For Windows and Linux, you can deploy ArcGIS Enterprise manually, installing and configuring each component in sequence, or you can automate the deployment process by using one of the ArcGIS Enterprise deployment automation tools. Customers interested in deploying on Kubernetes should have a Kubernetes cluster available¹ as well as appropriate expertise in managing a Kubernetes environment. See the Kubernetes section on [page 14](#) for more information.

The following matrix compares common deployment characteristics among the ArcGIS Enterprise deployment automation tools for Windows and Linux.

- Included
- Additional License Required

¹See the detailed system requirements for ArcGIS Enterprise on Kubernetes for more information.

²Ubuntu only for AWS, Windows Server 2019 for Azure.

³You can upgrade using these tools if you first installed your deployment using these tools.

Deployment Characteristics	Automation Tool				
	ArcGIS Enterprise Builder	Chef	PowerShell DSC	AWS	Azure
Cloud deployments		●	●	●	●
On-premises deployments	●	●	●		
Windows OS	●	●	●	●	●
Linux OS	●	●		●	
Single-machine deployments	●	●	●	●	●
Multimachine deployments		●	●	●	●
High-availability deployments		●	●	●	●
Base ArcGIS Enterprise deployment setup	●	●	●	●	●
ArcGIS GIS Server Basic setup		●	●	●	●
ArcGIS Image Server setup		●	●	●	●
ArcGIS GeoEvent™ Server setup		●	●	●	●
ArcGIS GeoAnalytics™ Server setup		●	●	●	●
ArcGIS Notebook Server setup ²		●	●	●	●
Ability to upgrade the deployment ³	●	●	●	●	●
Configurable deployment templates		●	●	●	
Configurable machine images				●	●
Command line interface	●	●	●	●	●
Wizard-style interface	●			●	●

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Licensing

ArcGIS Enterprise Standard and Advanced

ArcGIS Enterprise can be licensed in two different editions: Standard and Advanced.

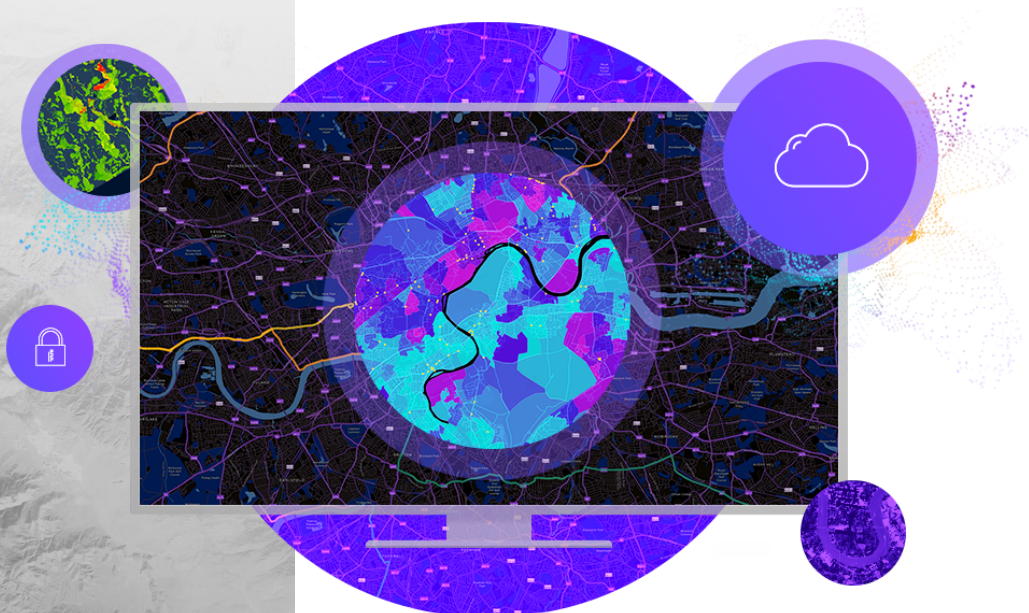
ArcGIS Enterprise Standard includes geodatabase management and access to all the web service types offered by ArcGIS GIS Server Basic. This allows you to enable your maps for the web, support web-based editing using feature services, and publish geoprocessing services from any tool included in ArcGIS Desktop Standard. Finally, you can share maps, apps, and other geographic information with everyone in your organization through the ArcGIS Enterprise portal.

With ArcGIS Enterprise Advanced, you get everything in the Standard edition, plus the ability to publish geoprocessing services from any tool included in ArcGIS Desktop Advanced. Additional capabilities for geostatistical models and spatial analysis tools are also included with the Advanced edition. All other extensions are optionally available for licensing.

For specific details, see the included capabilities for the ArcGIS GIS Server Standard and ArcGIS GIS Server Advanced license levels. ArcGIS Enterprise on Kubernetes has its own license for an annual subscription that provides functionality such as GIS services and portal and data store capabilities.

ArcGIS GIS Server Basic

ArcGIS GIS Server Basic is limited-capability software that primarily provides enterprise geodatabase functionality. It also includes the ability to publish (but not edit) feature and geodata services. ArcGIS GIS Server Basic cannot be federated as part of an ArcGIS Enterprise deployment or designated as a hosting server.



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- Included
- Additional License Required

⁴Visit page 14 to learn more about ArcGIS Enterprise on Kubernetes.

⁵Only applicable if you have the corresponding ArcGIS Pro extension.

ArcGIS GIS Server Advanced

ArcGIS GIS Server Advanced uniquely includes ArcGIS 3D Analyst™, ArcGIS Spatial Analyst™, and ArcGIS Network Analyst™. ArcGIS 3D Analyst tools allow users to interact with and visualize 3D data to gain insights that aren't possible with 2D data. ArcGIS 3D Analyst provides users with tools to analyze GIS data in a true 3D space, which is critical for analyzing terrain, modeling subsurface and atmospheric features, optimizing site selection, and more. ArcGIS Spatial Analyst provides more than 150 tools and functions that users can embed in their web apps for on-the-fly analysis including suitability modeling, distance and direction calculations, and hydrologic modeling. ArcGIS Network Analyst is included with ArcGIS GIS Server Advanced and provides advanced network data analysis capabilities via web services. Users can deploy powerful network analysis tools such as multipoint optimized routing, turn-by-turn driving directions, service area allocation, and fastest fixed route to the closest facility.

Server Capabilities

	ArcGIS GIS Server Advanced	ArcGIS GIS Server Standard	
Run on Windows	●	●	
Run on Linux	●	●	
Run on Kubernetes ⁴	●	●	
Deploy in the cloud	●	●	
Deploy on premises	●	●	
Deploy disconnected from the open internet	●	●	
Script and automate workflows	●	●	02
Create analytical models and model chains	●	●	
Edit data on the web	●	●	03
Create OGC-compliant web services	●	●	04
Convert location information to x,y coordinates (geocode)	●	●	05
Support disconnected/field editing	●	●	
Publish geoprocessing services and web tools	●	●	06
Serve ArcGIS 3D Analyst tools ⁵	●		07
Serve ArcGIS Spatial Analyst tools ⁵	●		
Process and analyze big data	●	●	08

Hosting Layer Types

	ArcGIS GIS Server Advanced	ArcGIS GIS Server Standard	
Feature layer	●	●	09
Map image layer	●	●	10
Scene layer	●	●	11
Raster tile layer	●	●	
Vector tile layer	●	●	12

Content

	ArcGIS GIS Server Advanced	ArcGIS GIS Server Standard	
ArcGIS Living Atlas of the World	●	●	13
ArcGIS StreetMap™ Premium	○	○	14

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● Included

○ Additional License Required

⁶ArcGIS Network Analyst extension is required.

⁷Windows only.

ArcGIS GIS Server Standard and ArcGIS GIS Server Advanced

Service Types	ArcGIS GIS Server Advanced	ArcGIS GIS Server Standard
Cached service—map, image	●	●
Dynamic map service	●	●
Feature service	●	●
Geocoding service	●	●
Geodata service	●	●
Geometry service	●	●
Geoprocessing service	●	●
Image service (from single raster)	●	●
Network service ⁶	●	●
Parcel fabric service	●	●
Print service	●	●
Utility network service	●	●

Server Extensions

ArcGIS Network Analyst	●	○	02
ArcGIS LocateXT	○	○	
ArcGIS Data Interoperability	○	○	03
ArcGIS Data Reviewer ⁷	○	○	04
ArcGIS Workflow Manager ⁷	○	○	05
ArcGIS Maritime ⁷	○	○	06
ArcGIS Defense Mapping ⁷	○	○	07
ArcGIS Production Mapping ⁷	○	○	08
ArcGIS Roads and Highways ⁷	○	○	09
ArcGIS Pipeline Referencing ⁷	○	○	10

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- Included
- Additional License Required

Input Data Types

	ArcGIS GIS Server Advanced	ArcGIS GIS Server Standard
3D features	●	●
3D scenes	●	●
Address locators	●	●
Big data–Feature	●	●
Feature data	●	●
Imagery/Raster data–Single raster	●	●
Integrated mesh	●	●
Lidar/Terrain data–Single raster	●	●
Multipatch data	●	●
Parcel fabric	●	●
Point clouds	●	●
Tabular data	●	●
Utility networks	●	●



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- Included
- Additional License Required

⁸It is recommended to deploy ArcGIS Notebook Server on Linux. See the documentation for details.

⁹The only geoprocessing services that can be served are those that are preconfigured within the server; you cannot add or modify geoprocessing services.

ArcGIS GeoAnalytics Server
 ArcGIS GeoEvent Server
 ArcGIS Image Server
 ArcGIS Knowledge Server
 ArcGIS Notebook Server⁸
 ArcGIS Workflow Manager Server

Server Capabilities

	ArcGIS GeoAnalytics Server	ArcGIS GeoEvent Server	ArcGIS Image Server	ArcGIS Knowledge Server	ArcGIS Notebook Server ⁸	ArcGIS Workflow Manager Server
Run on Windows	●	●	●	●	●	●
Run on Linux	●	●	●	●	●	●
Deploy in the cloud	●	●	●	●	●	●
Deploy on premises	●	●	●	●	●	●
Deploy disconnected from the open internet	●	●	●	●	●	●
Script and automate workflows	●	●	●	●	●	●
Create analytic models and model chains	●	●	●		●	
Edit data on the web	●	●	●	●	●	●
Create OGC-compliant web services			●			
Convert location information to x,y coordinates (geocode)	●				●	
Create dynamic image and raster mosaics			●			
Perform on-the-fly raster processing and analytics			●			
Process and analyze big data	●	●	●		●	
Analyze streaming data in real time		●				
Generate geoenabled alerts		●				
Create and monitor geofences		●				
Use data science Python libraries	●				●	
Leverage built-in scheduling					●	●
Use notebook snapshots					●	
Connect and store data within a graph database				●	●	

Service Types

Cached service—map, image			●			
Geoprocessing service ⁹	●		●			
Image service (from mosaic dataset)			●			
Image service (from single raster)			●			
Ready-to-use Jupyter Notebook					●	
Stream service		●				
Knowledge graph service				●		

Hosting Layer Types

Imagery layer			●			
Knowledge graph				●		

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Input Data Types

	ArcGIS GeoAnalytics Server	ArcGIS GeoEvent Server	ArcGIS Image Server	ArcGIS Knowledge Server	ArcGIS Notebook Server	ArcGIS Workflow Manager Server
3D features					●	
3D scenes					●	
Big data–Feature	●	●			●	
Big data–Imagery/Raster			●		●	
Feature data	●	●	●	●	●	●
Imagery/Raster data (mosaic dataset)			●		●	
Imagery/Raster data (single raster)			●		●	
Labeled property graph				●		
Lidar/Terrain data (mosaic dataset)			●			
Lidar/Terrain data (single raster)			●			
Parcel fabric					●	●
Point clouds					●	
Raster elevation surfaces			●		●	
Real-time data streams		●				
Tabular data	●	●		●	●	●
Utility networks					●	●



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User Roles and Licensing

User Roles

User types provide a flexible way for people to license the capabilities and apps they need to do their work in ArcGIS Enterprise.

User roles are the capabilities granted to individual users and roles are set in the ArcGIS Enterprise portal. For information about specific capabilities for each user type and compatible role, please see the matrix below.

ArcGIS Enterprise Portal Capabilities	Viewer	Data Editor	User	Publisher	Administrator
Browse and view data, layers, web maps, and apps	●	●	●	●	●
Visualize data on a map	●	●	●	●	●
Visualize data in 3D	●	●	●	●	●
Query and filter data dynamically	●	●	●	●	●
Search for a location (geosearch)	●	●	●	●	●
Generate turn-by-turn directions	●	●	●	●	●
Change the way the data is styled (symbolize)	●	●	●	●	●
Measure distances	●	●	●	●	●
Add and create items			●	●	●
Publish layers and services				●	●
Convert location information to x,y coordinates (geocode)			●	●	●
Save data as layers and web maps			●	●	●
Share data, layers, and web maps with others			●	●	●
Create web mapping applications from web maps			●	●	●
Edit data		●	●	●	●
Save modified data as a new item			●	●	●
Analyze data			●	●	●
Secure content using groups			●	●	●
Apply security to data, layers, web maps, and apps			●	●	●
Create views of existing data				●	●
Create tailored websites and pages			●	●	●
Create and manage distributed collaborations					●
Manage licensing					●
Add and manage members					●
Disable member accounts					●
Delete members					●

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User Types

ArcGIS Enterprise uses a named user-based security model. To access content secured within ArcGIS Enterprise, individuals must be a member of the organization deployment and have an identity within the system.

There are five user types—Viewer, Editor, Mobile Worker, Creator, and GIS Professional—each with its own capabilities and included applications. See the [User Types page on esri.com](#) for more information.

- Included
- Additional License Required

¹⁰Limited capabilities available to Viewer users.

Note
The information listed here may not be applicable if you licensed ArcGIS Enterprise as part of a special program, such as an enterprise agreement (EA) or an education site license. Contact your Esri representative for more details on how user types apply to your organization.

Compatible User Types

	Viewer	Data Editor	User	Publisher	Administrator
GIS Professional	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Creator	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Mobile Worker	<input checked="" type="radio"/>	<input checked="" type="radio"/>			
Editor	<input checked="" type="radio"/>	<input checked="" type="radio"/>			
Viewer ¹⁰	<input checked="" type="radio"/>				

There are also several extensions available for user types in ArcGIS Enterprise. These extensions provide access to additional capabilities. Extensions available include ArcGIS Utility Network, ArcGIS Trace Network, ArcGIS Parcel Fabric, and ArcGIS Workflow Manager.

User Type Extension

	Viewer	Editor	Mobile Worker	Creator	GIS Professional Basic	GIS Professional Standard	GIS Professional Advanced
ArcGIS Utility Network	<input type="radio"/> ¹⁰	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	
ArcGIS Trace Network	<input type="radio"/> ¹⁰	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	
ArcGIS Parcel Fabric		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	
ArcGIS Workflow Manager	<input type="radio"/> ¹⁰	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

User Types Included with Initial License

(applies only to Windows/Linux but not Kubernetes)

ArcGIS Enterprise Edition	Creator User Type	Viewer User Type
ArcGIS Enterprise Standard	5	Unlimited
ArcGIS Enterprise Advanced	50	Unlimited

Supported Databases and Data Connections

¹¹To use cloud-hosted databases, your ArcGIS Enterprise deployment must be colocated with the database in the same cloud environment.

¹²GeoAnalytics Server also supports writing your analysis results back to these sources.

¹³Shapefiles, Parquet, Optimized Row Columnar (ORC), and delimited files are supported.

¹⁴Support software for the input data sources is shipped. GeoEvent Server also supports writing back to these sources. Support for additional input data sources can be added to the software from the ArcGIS GeoEvent Server Gallery and the ArcGIS GeoEvent Server Partner Gallery.

Supported database types for enterprise geodatabases + query layers

Amazon Aurora PostgreSQL¹¹
 Amazon RDS for Microsoft SQL Server¹¹
 Amazon RDS for Oracle¹¹
 Amazon RDS for PostgreSQL¹¹
 Google Cloud SQL for PostgreSQL¹¹
 Google Cloud SQL for SQL Server¹¹
 Microsoft Azure Database for PostgreSQL¹¹
 Microsoft Azure SQL Database¹¹
 Microsoft SQL Server
 PostgreSQL
 SAP HANA
 SAP HANA Cloud¹¹
 Oracle
 Oracle Autonomous Transaction Processing¹¹
 Oracle Comanaged Systems Virtual Machine DB Systems¹¹

Input data supported by ArcGIS GeoAnalytics Server

Hosted feature layers
 Feature services
 Stream services
 Big data file shares
 - Apache Hadoop HDFS¹²
 - Apache Hive
 - Amazon S3 and S3-compatible storage^{12, 13}
 - Azure Data Lake Storage^{12, 13}
 - Local and network file shares^{12, 13}
 - Microsoft Azure Storage¹²

Input data supported by ArcGIS GeoEvent Server¹⁴

Hosted feature layers
 Feature services
 Stream services
 Local and network file shares
 Kafka
 Network protocols
 - HTTP
 - TCP
 - UDP
 - RSS
 - WebSocket

Supported data warehouses hosted in cloud environments

Amazon Redshift
 Google BigQuery
 Snowflake

Supported database types for query layers

Dameng
 Microsoft Azure Cosmos DB for PostgreSQL
 SQLite
 Teradata

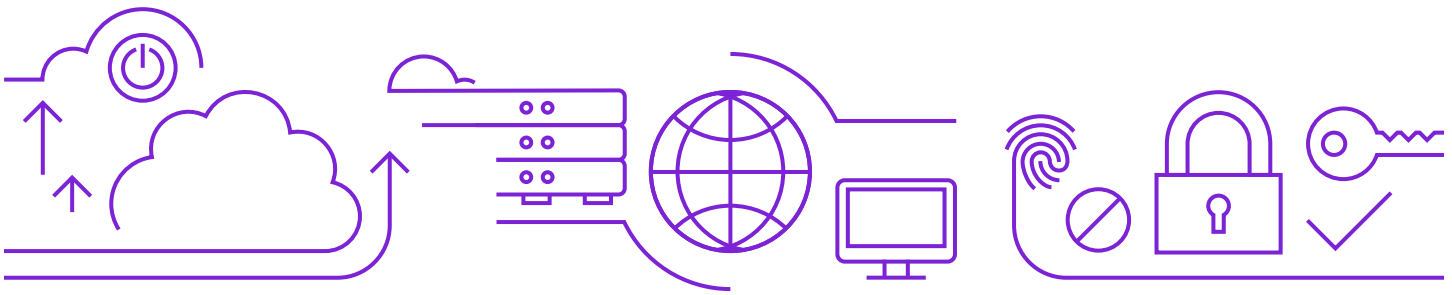
Raster stores supported by ArcGIS Image Server when running raster analytics

Alibaba Cloud Object Storage Service (OSS)
 Amazon S3 and S3-compatible storage
 Azure Data Lake Storage
 Local file shares
 Microsoft Azure storage
 Google Cloud Storage

Supported databases for ArcGIS Knowledge Server

Neo4j

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Supported Cloud Environments

ArcGIS Enterprise can be deployed in any cloud platform using infrastructure that meets the system requirements. For AWS and Microsoft Azure, ArcGIS Enterprise comes with prebuilt images and deployment tooling that makes it easier to install and configure your deployment.

ArcGIS Enterprise on Kubernetes is supported for deployment onto Amazon Web Services, Amazon Elastic Kubernetes Service, Microsoft Azure Kubernetes Service, Google Kubernetes Engine, and Red Hat OpenShift.

ArcGIS Enterprise supports cloud-native storage and cloud-managed databases. See the documentation for specific details.

Cloud-native storage includes the following:

- Amazon S3 and S3-compatible storage
- Microsoft Azure storage
- Alibaba Cloud OSS
- Google Cloud Storage

Supported OGC and Open Web Services

As part of [Esri's open vision](#), ArcGIS Enterprise can serve out the following Open Geospatial Consortium (OGC) and open web services:

- 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)
- Web Processing Service (WPS) (version 1.0)
- Keyhole Markup Language (KML) (version 2.2)
- GeoJSON
- OGC API

ArcGIS Image Server can serve out Web Coverage Service at the same versions listed.

Security, Authentication, and Authorization

ArcGIS Enterprise comes with a robust and effective security framework that includes options for managing access and enforcing permissions for secured resources. Supported [configurable security settings](#) include the following:

- Web-tier authentication (IWA, PKI)
- GIS-tier authentication with multifactor authentication (built-in identity)
- Integration with SAML 2.0 and OpenID Connect identity providers
- Enterprise groups (Active Directory, LDAP, and SAML 2.0)
- Transport Layer Security (TLS) 1.3 and 1.2, with the option to enable TLS 1.0 and 1.1 for backward compatibility

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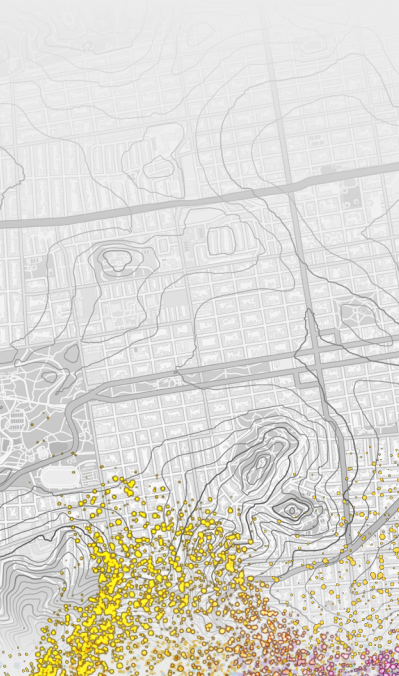
Kubernetes

ArcGIS Enterprise on Kubernetes

ArcGIS Enterprise on Kubernetes enables deployments in the public cloud with Amazon Elastic Kubernetes Service, Azure Kubernetes Service, and Google Kubernetes Engine, and in private clouds or on premises with Red Hat OpenShift.

ArcGIS Enterprise on Kubernetes provides a cloud-native architecture, based on the principles of microservices and containerization. Significant benefits include elasticity to scale services with built-in high availability, fast deployments and an easy update and upgrade experience, and optimized resource utilization. A Kubernetes environment can reduce administrative overhead, making it easier to manage an ArcGIS Enterprise deployment.

ArcGIS Enterprise on Kubernetes is intended for organizations familiar with deploying and managing containerized applications using Kubernetes. The software is available through an annual subscription. To learn more, please talk with your Esri representative or distributor.



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