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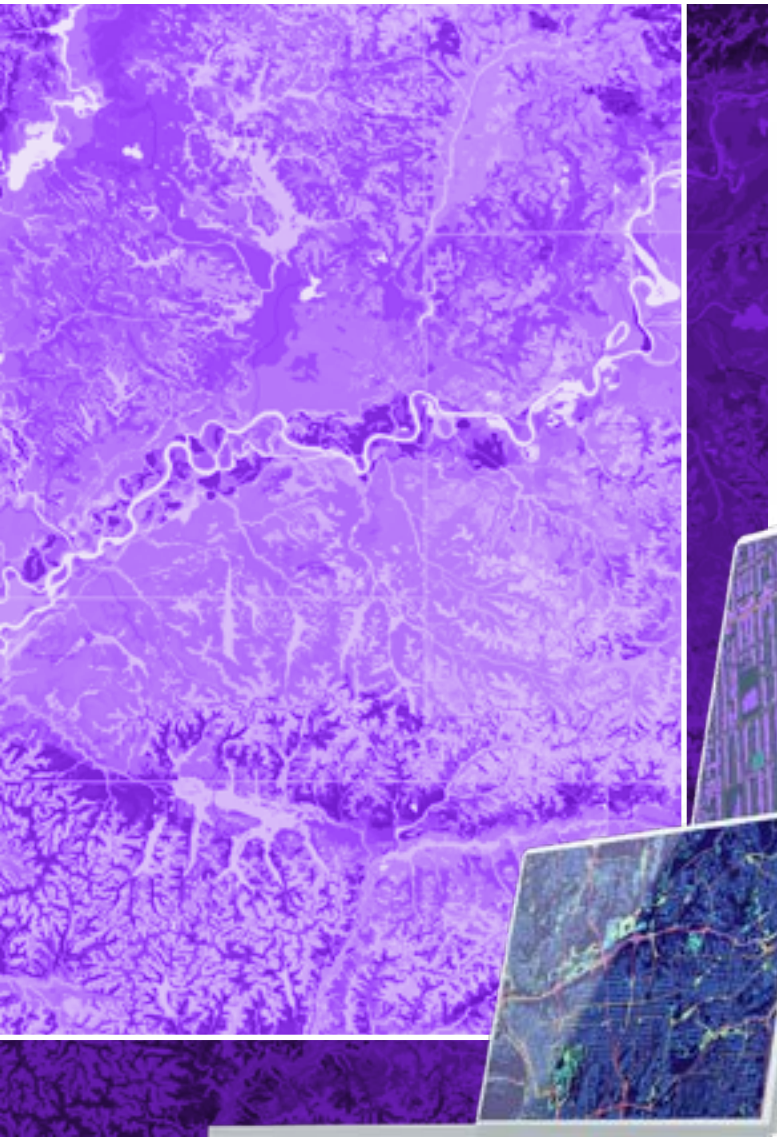
ArcGIS® Enterprise

Functionality Matrix



ArcGIS® Enterprise is the foundational software for geographic information system (GIS) technology—it informs decision-making and transforms complex spatial analysis into easy-to-understand maps, apps, and content. It is software that can be self-hosted in a public cloud, private cloud, or 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 provides robust, enterprise-ready capabilities for powering spatial data management, creating insightful maps and visualizations, and uncovering hidden patterns and trends through advanced analysis.

ArcGIS Enterprise includes options for comprehensive mapping, image exploitation, real-time data processing, big data analysis, and the use of 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.

Deploying ArcGIS Enterprise

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

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.

The following chart introduces the variety of ArcGIS Enterprise deployment options and automation tooling provided. Please note that you can upgrade using these tools if you initially installed your deployment with them.

Deployment	Platform	Environment	Automation Level	Use Case / Audience	Notes
Manual Installations	Windows, Linux	On-premises, Cloud	Low	All users needing full control	Install and configure each component manually
ArcGIS Enterprise Builder	Windows, Linux	On-premises, Cloud	Medium	Beginners or quick single-machine setup	Wizard-based setup for base deployment on one machine
ArcGIS Enterprise Cloud Builder	Windows	Azure, AWS	High	Cloud users preferring GUI-based deployment	Supports single-machine deployments in cloud environments
Cloud Formation Templates	Windows, Linux	AWS	Very High	Advanced cloud users	Automates provisioning and configuration of full ArcGIS Enterprise stack
Chef Cookbooks	Windows, Linux	On-premises, Cloud	Very High	DevOps teams and automation-heavy environments	Automates the deployment, configuration, and upgrades of the full ArcGIS Enterprise stack
PowerShell DSC	Windows	On-premises, Cloud	Very High	Windows administrators automating deployments	Declarative configuration management for ArcGIS Enterprise

ArcGIS Enterprise on Kubernetes® enables deployments in the public cloud, in private clouds, or on-premises, including being fully disconnected from the internet. We support the following implementations: Amazon Elastic Kubernetes Service, Azure Kubernetes Service, Google Kubernetes Engine, Rancher (RKE and RKE2), VMware Tanzu Platform, and Red Hat OpenShift Container Platform. ArcGIS Enterprise on Kubernetes is intended for organizations familiar with deploying and managing containerized applications using Kubernetes. Customers interested in deploying on Kubernetes should have a Kubernetes cluster available[1] as well as appropriate expertise in managing a Kubernetes environment.

To learn more, please see Introduction to ArcGIS Enterprise on Kubernetes, explore Kubernetes system patterns at the ArcGIS Architecture Center, and talk with your Esri representative or distributor.

Licensing

ArcGIS Enterprise can be licensed to meet your business needs. ArcGIS Enterprise on Windows and Linux can be licensed through two different editions—Standard and Advanced—while ArcGIS Enterprise on Kubernetes has its own license for an annual subscription. Additional capabilities are available for licensing on Windows, Linux, and Kubernetes without the need to invest in additional point solutions.

ArcGIS Enterprise Standard

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

- For specific details, see the included capabilities for the ArcGIS GIS Server license levels. ArcGIS GIS Server Basic is a limited-capability software available for licensing that primarily provides enterprise geodatabase functionality.

ArcGIS Enterprise Advanced

In addition to providing everything in the Standard edition, ArcGIS Enterprise Advanced uniquely includes ArcGIS Data Pipelines and the ability to publish geoprocessing services from any tool included in ArcGIS Pro Advanced as well as geostatistical models and spatial analysis tools that allow users to interact with and visualize 3D data to gain insights that aren't possible with 2D data.

- ArcGIS Data Pipelines is a no-code data engineering capability that provides users with a visual interface to create, maintain, and automate data integration workflows. Use Data Pipelines to connect to data from a variety of sources; apply tools to clean, format, and blend datasets; and then write the prepared data out to feature layers that are ready for use in mapping and analysis.
- 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™ 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 the fastest fixed route to the closest facility.

ArcGIS Enterprise on Kubernetes

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, 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.

Licensing

ArcGIS Enterprise must be licensed to define allowed compute resources for your deployment and to provide the members of your organization with necessary access and capabilities. The table below covers the licensing options for compute resources. The details of licensing of organization members via user types is covered on pages 11–12.

ArcGIS Enterprise Standard	ArcGIS Enterprise Advanced	ArcGIS Enterprise on Kubernetes
ArcGIS Enterprise Standard offers web-based editing using feature services and geodatabase management. It also includes the ability to share maps on the web and publish geoprocessing services created by any tool in ArcGIS Pro Standard.	ArcGIS Enterprise Advanced and ArcGIS Enterprise on Kubernetes offer everything in the Standard edition, plus the ability to publish geoprocessing services created by any tool in ArcGIS Pro Advanced. Additional capabilities for geostatistical models and spatial analysis tools are also included.	
4 cores of ArcGIS Server Standard (additional cores can be purchased separately through a sales representative)	4 cores of ArcGIS Server Advanced (additional cores can be purchased separately through a sales representative)	64 vCPUs

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● Included

○ Additional License Required

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

ArcGIS GIS Server Standard and ArcGIS GIS Server Advanced

Server Capabilities	ArcGIS GIS Server Advanced	ArcGIS GIS Server Standard
Run on Windows	●	●
Run on Linux	●	●
Deploy in the cloud	●	●
Deploy on-premises	●	●
Deploy disconnected from the open internet	●	●
Script and automate workflows	●	●
Create analytical models and model chains	●	●
Edit data on the web	●	●
Create OGC-compliant web services	●	●
Convert location information to x,y coordinates (geocode)	●	●
Support disconnected/field editing	●	●
Process and analyze data	●	●
Publish geoprocessing services and web tools	●	●
Serve ArcGIS 3D Analyst tools[2]	●	
Serve ArcGIS Spatial Analyst tools[2]	●	
Hosted Layer Types		
Feature layer	●	●
Map image layer	●	●
3D layer	●	●
Raster tile layer	●	●
Vector tile layer	●	●
Content		
ArcGIS Living Atlas of the World	●	●
ArcGIS StreetMap™ Premium	○	○

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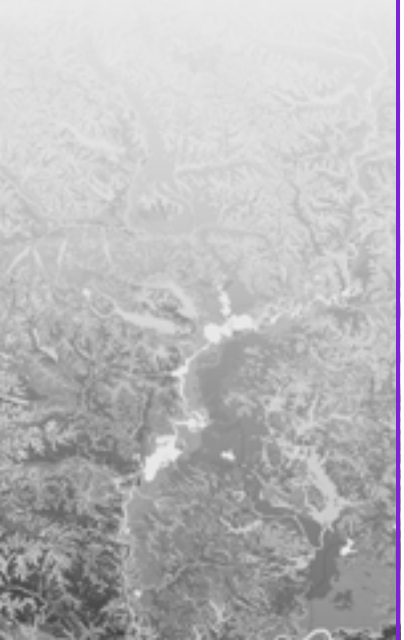
● Included

○ Additional License Required

3 ArcGIS Network Analyst extension is required.



ArcGIS GIS Server Standard and ArcGIS GIS Server Advanced

Service Types	ArcGIS GIS Server Advanced	ArcGIS GIS Server Standard
3D tiles service	●	●
Cached service–map, image	●	●
Dynamic map service	●	●
Feature service	●	●
Geocode service	●	●
Geodata service	●	●
Geometry service	●	●
Geoprocessing service	●	●
Image service (from single raster)	●	●
Network diagram service	●	●
Parcel fabric service	●	●
Print service	●	●
Routing service[3]	●	●
Scene service	●	●
Trace network service	●	●
Utility network service	●	●
Vector tile service	●	●
Version management service	●	●
Server Extensions		
ArcGIS Network Analyst	●	○
ArcGIS Data Interoperability	○	○
ArcGIS Data Reviewer	○	○
ArcGIS Topographic Mapping	○	○
ArcGIS Maritime	○	○
ArcGIS Roads and Highways	○	○
ArcGIS Pipeline Referencing	○	○

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Input Data Types

Both Standard and Advanced editions of ArcGIS GIS Server, along with ArcGIS Enterprise on Kubernetes, support the following input data types:

- 3D objects and multipatch
- Address locators
- Feature data
- Imagery/Raster data (single raster)
- Integrated mesh
- Lidar/Terrain data (single raster)
- Parcel fabric
- Point clouds
- Tabular data
- Trace network
- Utility network

Common Deployment Scenarios and Required Data Types

"My organization works with a large volume of 3D data to build digital twins, and we need to publish different services as sources for a 3D object layer to represent all buildings of the city and a mesh layer for visualizing reality capture." This workflow is fully supported, as you can publish services directly using the following data types:

- Integrated mesh
- 3D objects and multipatch

"We are a utility, telecom, or local government agency managing complex infrastructure and land records with the need to provide this information to our organization through web and mobile applications." This requires specialized data models, which will be used as the source for published services:

- Utility network
- Parcel fabric
- Trace network

"Our primary focus is on large-scale environmental analysis, and we need to serve high-resolution satellite imagery and elevation data." Your core data formats for this work can be published as services using the following:

- Imagery/Raster
- Lidar/Terrain

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4 ArcGIS Data Pipelines Server is included with ArcGIS Enterprise Advanced.

5 ArcGIS GeoEvent Server is deprecating. Read the deprecation notice.

6 ArcGIS Notebook Server Standard is included with ArcGIS Enterprise Standard and Advanced.

To extend the functionality of ArcGIS Enterprise on Windows or Linux, users can add server roles to the base deployment that offer advanced functionality. Server roles support specialized tasks such as processing real-time sensor data, analyzing imagery and video data, leveraging machine learning models, and enhancing situational awareness. Each server role can run on Windows or Linux and can be deployed in the cloud, on-premises, or disconnected from the open internet. Server roles have varying licensing and resource requirements. For detailed information on available server roles and deployment options, refer to the ArcGIS Enterprise documentation.

The matrix below outlines the server capabilities, service types, and hosted layer types for each server role that can be added to the base deployment of ArcGIS Enterprise on Windows and Linux.

Server Capabilities	ArcGIS Data Pipelines Server[4]	ArcGIS GeoEvent™ Server[5]	ArcGIS Image Server	ArcGIS Knowledge Server	ArcGIS Notebook Server[6]	ArcGIS Workflow Manager Server	ArcGIS Video Server	ArcGIS Velocity℠ Server
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)					●			
Share a mosaic dataset as a dynamic image service			●					
Perform on-the-fly raster processing and analytics			●					
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				●	●			
Create live stream and on-demand video layers							●	
Create and run data pipelines								●

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● Included

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

8 ArcGIS Data Pipelines Server is included with ArcGIS Enterprise Advanced.

9 ArcGIS GeoEvent Server is deprecating. Read the deprecation notice.

10 ArcGIS Notebook Server Standard is included with ArcGIS Enterprise Standard and Advanced.

	ArcGIS Data Pipelines Server[8]	ArcGIS GeoEvent™ Server[9]	ArcGIS Image Server	ArcGIS Knowledge Server	ArcGIS Notebook Server[10]	ArcGIS Workflow Manager Server	ArcGIS Video Server	ArcGIS Velocity℠ Server
Service Types								
Cached service–map, image			●					
Geoprocessing service[7]			●					
Image service (from mosaic dataset)			●					
Image service (from single raster)			●					
Ready-to-use Jupyter Notebook					●			
Stream service	●	●						
Knowledge graph service				●				
Video service							●	
Hosted Layer Types								
Imagery layer			●					
Knowledge graph layer				●				
Video service (live stream)							●	
Video service (on demand)							●	
Input Data Types								
3D features					●			
3D scenes					●			
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					●	●		
Video files (on demand)							●	
Live stream video (UDP, RTSP, and RTMP)							●	

User Types and Roles

In ArcGIS Enterprise, **user types** define the base capabilities of members, such as their ability to view, edit, create, publish, or analyze data, along with which applications members can access within an organization. There are six user types—Viewer, Contributor, Mobile Worker, Creator, Professional, and Professional Plus—each with its own capabilities and included applications. For more information on the capabilities and applications included in each user type, refer to the user types overview web page and the documentation.

Once users are licensed with a user type, **member roles** provide fine-grained control over what specific tasks members can perform within ArcGIS Enterprise, and they are managed by the organization's administrator in the ArcGIS Enterprise portal. These roles are compatible with certain user types, meaning that the choice of user type will limit the available member roles. Learn more about member roles in the documentation.

The chart below shows what capabilities are available with each default member role: Viewer, Data Editor, User, Publisher, and Administrator.

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 3D data in a scene	●	●	●	●	●
Query and filter data dynamically	●	●	●	●	●
Search for a location (geosearch)	●	●	●	●	●
Generate turn-by-turn directions	●	●	●	●	●
Change the way the data is styled (symbolized)	●	●	●	●	●
Measure distances	●	●	●	●	●
Add and create items			●	●	●
Publish layers and services				●	●
Convert location information to x,y coordinates (geocode)			●	●	●
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 hosted feature layer views				●	●
Build tailored websites and pages using ArcGIS Enterprise Sites					●
Create and manage distributed collaborations					●
Manage licensing					●
Add and manage members					●
Disable member accounts					●
Delete members					●

User Types and Roles

● Included

○ Additional License Required

11 Limited capabilities available to Viewer user type.

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.

When managing access in ArcGIS Enterprise, administrators should first choose the appropriate user type based on the capabilities and apps that members require. Then, they should assign a compatible member role that provides the necessary fine-grained privileges. By carefully selecting both user types and member roles, administrators can ensure that members have the access they need to perform their tasks effectively without being granted excessive privileges. This approach helps maintain a secure and efficient organizational environment.

Only certain member roles can be assigned to each user type. In order to ensure that your users can be provided access to the right permissions in the ArcGIS Enterprise portal, confirm that they are assigned with a compatible user type.

Compatible User Roles	Viewer[11]	Contributor	Mobile Worker	Creator	Professional	Professional Plus
Viewer	●	●	●	●	●	●
Data Editor		●	●	●	●	●
User			●	●	●	●
Publisher				●	●	●
Administrator				●	●	●

There are also several extensions available for user types in ArcGIS Enterprise. These extensions provide access to additional capabilities. Extensions available include Advanced Editing and location sharing.

User Type Extension	Viewer	Contributor	Mobile Worker	Creator	Professional	Professional Plus
Advanced Editing		○	○	○	●	●
Location Sharing	○	○	●	○	○	○

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● Support with specified license

○ Additional license required (Advanced Editing user type extension [UTE])

12 Alternatively supported by licenses for the following: ArcGIS Indoors™, ArcGIS Roads and Highways, and ArcGIS Pipeline Referencing.

ArcGIS Enterprise Geodatabase Capabilities

	Contributor	Mobile Worker and Creator	Professional and Professional Plus
Edit Capabilities with the Following Data Types			
Feature and table data	●	●	●
Related data (through relationship classes)	●	●	●
Attachments	●	●	●
Annotation (standard or feature-linked)	●	●	●
Dimensions	○[12]	○[12]	●
Features in geodatabase topologies	○[12]	○[12]	●
Features in utility networks	○	○	●
Features in trace networks	○	○	●
Features in parcel fabrics	○	○	●
Branch Versioning			
Change version and view data in version	●	●	●
Create and manage versions (change owner, delete, etc.)	●	●	●
Edit data in a version	●	●	●
Reconcile and post a version	○[12]	○[12]	●
Conflict detection and resolution	○[12]	○[12]	●
Version differences detection	○[12]	○[12]	●
Working with Data Offline			
View and query feature data	●	●	●
Download updates to feature data (one-way sync)	●	●	●
View and query utility network, trace network, and parcel fabric features	●	●	●
Download updates to utility network, trace network, or parcel fabric features (one-way sync)	●	●	●
Edit feature data and post updates (two-way sync with branch versioning)		●	●
Edit feature data and post updates (two-way sync, no branch versioning)		●	●
Edit utility network, trace network, parcel fabric, or features participating in geodatabase topologies (two-way sync with branch versioning)		○[12]	●
Attribute Rules			
Create and manage attribute rules			●
Execution of calculation and constraint rules while editing	●	●	●
Execution of batch calculation and validation rules	○	○	●

Supported Databases and Data Connections

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

Supported databases for query layers plus enterprise geodatabases

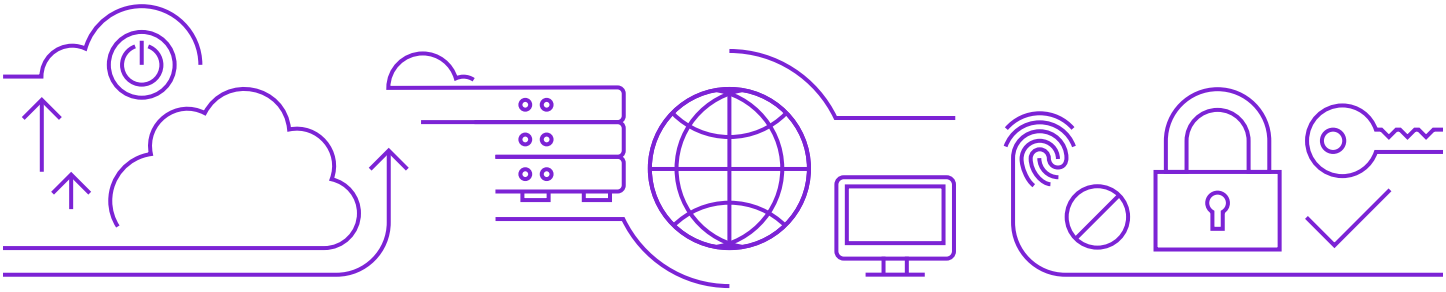
Amazon Aurora PostgreSQL[13]
Amazon RDS for Microsoft SQL Server[13]
Amazon RDS for Oracle[13]
Amazon RDS for PostgreSQL[13]
Google Cloud SQL for PostgreSQL[13]
Google Cloud SQL for SQL Server[13]
IBM Db2
Microsoft Azure Database for PostgreSQL[13]
Microsoft Azure SQL Database[13]
Microsoft SQL Server
PostgreSQL
SAP HANA
SAP HANA Cloud[13]
Oracle
Oracle Autonomous AI Database[13]
Oracle Base Database Service[13]

Supported cloud data warehouses for query layers

Amazon Redshift[13]
Google BigQuery[13]
Snowflake[13]

Supported databases for query layers

Dameng
Elasticsearch
OpenSearch
SQLite
Teradata



Supported Cloud Environments

ArcGIS Enterprise can be deployed in any cloud platform using infrastructure that meets the system requirements. ArcGIS Enterprise supports cloud object stores, cloud databases, and cloud data warehouses. It also comes with prebuilt images and deployment tooling that makes it easier to install and configure your deployment. See the documentation for details.

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 backward compatibility

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