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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 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.

ArcGIS Enterprise on Kubernetes enables deployments on Amazon Elastic Kubernetes Service (Amazon EKS), Azure Kubernetes Service (AKS), Google Kubernetes Engine (GKE), Rancher (RKE and RKE2), VMWare Tanzu, and Red Hat OpenShift Container Platform. See page 15 for more information on this option.

Deploying ArcGIS Enterprise

Included

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

²You can upgrade using these tools if you first installed your deployment using these tools.

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 15](#) for more information.

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

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	●	●	●	●	●
Ability to upgrade the deployment ²	●	●	●	●	●
Configurable deployment templates		●	●	●	
Configurable machine images				●	●
Command line interface	●	●	●	●	●
Wizard-style interface	●			●	●

ArcGIS Enterprise Standard and Advanced

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

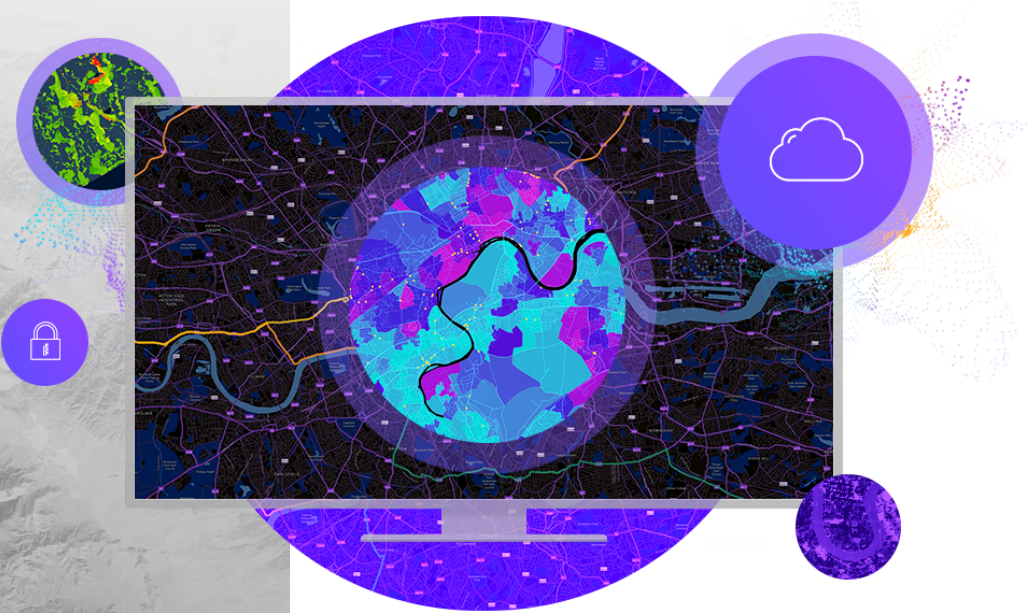
ArcGIS Enterprise Standard includes geodatabase management and access to all the web service types offered by ArcGIS GIS Server Standard. This allows you to enable your maps for the web, support web-based editing using feature services, and publish geoprocessing services from any tool included in ArcGIS Pro 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 Pro 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 advanced GIS capabilities through a microservices architecture.

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 services 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

³Only 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	●	●
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	●	●
Publish geoprocessing services and web tools	●	●
Serve ArcGIS 3D Analyst tools ³	●	
Serve ArcGIS Spatial Analyst tools ³	●	
Process and analyze big data	●	●

Hosted Layer Types

Feature layer	●	●
Map image layer	●	●
Scene 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

⁴ArcGIS Network Analyst extension is required.

⁵Windows 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 ⁴	●	●
Parcel fabric service	●	●
Print service	●	●
Utility network service	●	●

Server Extensions


ArcGIS Network Analyst	●	○
ArcGIS Data Interoperability	○	○
ArcGIS Data Reviewer ⁵	○	○
ArcGIS Workflow Manager ⁵	○	○
ArcGIS Maritime ⁵	○	○
ArcGIS Defense Mapping ⁵	○	
ArcGIS Production Mapping ⁵	○	○
ArcGIS Roads and Highways ⁵	○	○
ArcGIS Pipeline Referencing ⁵	○	○

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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

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

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

Server Capabilities

	ArcGIS GeoEvent™ Server	ArcGIS Image Server	ArcGIS Knowledge Server	ArcGIS Notebooks Server ⁶	Workflow Manager Server	ArcGIS Video 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			●	●		
Create live stream and on demand video layers						●

Service Types

	ArcGIS GeoEvent™ Server	ArcGIS Image Server	ArcGIS Knowledge Server	ArcGIS Notebooks Server ⁶	Workflow Manager Server	ArcGIS Video Server
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

	ArcGIS GeoEvent™ Server	ArcGIS Image Server	ArcGIS Knowledge Server	ArcGIS Notebooks Server ⁶	Workflow Manager Server	ArcGIS Video Server
Imagery layer		●				
Knowledge graph layer			●			
Video service (live stream)						●
Video service (on demand)						●

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● Included

⁸ ArcGIS Notebooks Server Standard is included with ArcGIS Enterprise Standard and Advanced.

Input Data Types

	ArcGIS GeoEvent Server	ArcGIS Image Server	ArcGIS Knowledge Server	ArcGIS Notebooks Server ⁸	Workflow Manager Server	ArcGIS Video 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				●	●	
Video files (on demand)						●
Live stream video (UDP, RTSP, and RTMP)						●

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User Roles and Licensing

User Roles

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 security model based on named users. To access content secured within ArcGIS Enterprise, an individual must be a member of the organization deployment and have an identity within the system.

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

Only certain user 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.

- Included
- Additional License Required
- ⁹Limited 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
Professional Plus	●	●	●	●	●
Professional	●	●	●	●	●
Creator	●	●	●	●	●
Mobile Worker	●	●			
Contributor	●	●			
Viewer ⁹	●				

There are also several extensions available for user types in ArcGIS Enterprise. These extensions provide access to additional capabilities. Extensions available include ArcGIS Advanced Editing, ArcGIS IPS™, and ArcGIS Location Sharing.

User Type Extension	Viewer	Contributor	Mobile Worker	Creator	Professional	Professional Plus
ArcGIS Advanced Editing	○ ¹⁰	○	○	○	●	●
ArcGIS IPS		○	○	○	○	○
Location Sharing	○	○	●	○	○	○

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- Support with specified license
- Additional license required (Advanced Editing user type extension [UTE])

¹⁰ Alternatively supported by licenses for the following: ArcGIS Indoors, ArcGIS Roads and Highways, and ArcGIS Pipeline Referencing

ArcGIS Enterprise Geodatabase Capabilities

Edit Capabilities with Following Data Types

	Contributor	Mobile Worker and Creator	Professional and Professional Plus
Feature data	●	●	●
Table data	●	●	●
Related data (through relationship classes)	●	●	●
Attachments	●	●	●
Annotation (standard or feature-linked)	●	●	●
Dimensions	○ ¹⁰	○ ¹⁰	●
Features in geodatabase topologies	○ ¹⁰	○ ¹⁰	●
Features in utility networks	○	○	●
Features in trace networks	○	○	●
Features in parcel fabrics	○	○	●

Branch Versioning

Change version and view data in version	●	●	●
Create version	○ ¹⁰	○ ¹⁰	●
Edit data in a version	○ ¹⁰	○ ¹⁰	●
Reconcile and post a version	○ ¹⁰	○ ¹⁰	●
Conflict detection and resolution	○ ¹⁰	○ ¹⁰	●
Manage versions (change owner, delete, etc.)	○ ¹⁰	○ ¹⁰	●
Version differences detection	○ ¹⁰	○ ¹⁰	●

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)		○ ¹⁰	●
Edit feature data and post updates (two-way sync no branch versioning)		●	●
Edit utility network, trace network, or parcel fabric features and post updates (two-way sync w/branch versioning)		○	●

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.

¹²Support 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
- IBM Db2
- Microsoft Azure Database for PostgreSQL¹¹
- Microsoft Azure SQL Database¹¹
- Microsoft SQL Server
- PostgreSQL
- SAP HANA
- SAP HANA Cloud¹¹
- Oracle
- Oracle Autonomous Transaction Processing¹¹
- Oracle Base Database Service¹¹

Input data supported by ArcGIS GeoEvent Server¹²

- Hosted feature layers
- Feature services
- Local and network file shares
- Apache 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

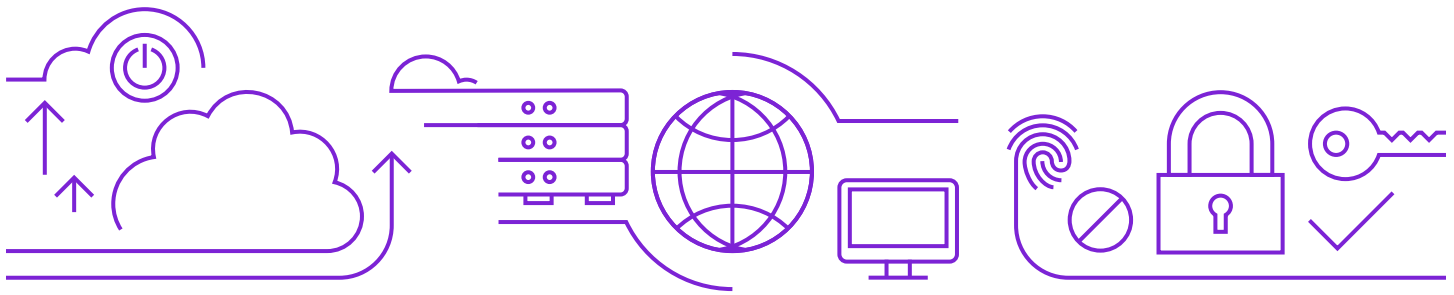
Supported data stores for ArcGIS Image Server

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

Supported databases for ArcGIS Knowledge Server

- Neo4j Enterprise
- Neo4j AuraDB
- ArangoDB Enterprise

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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 and 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 TLS 1.0 and 1.1 for backward compatibility

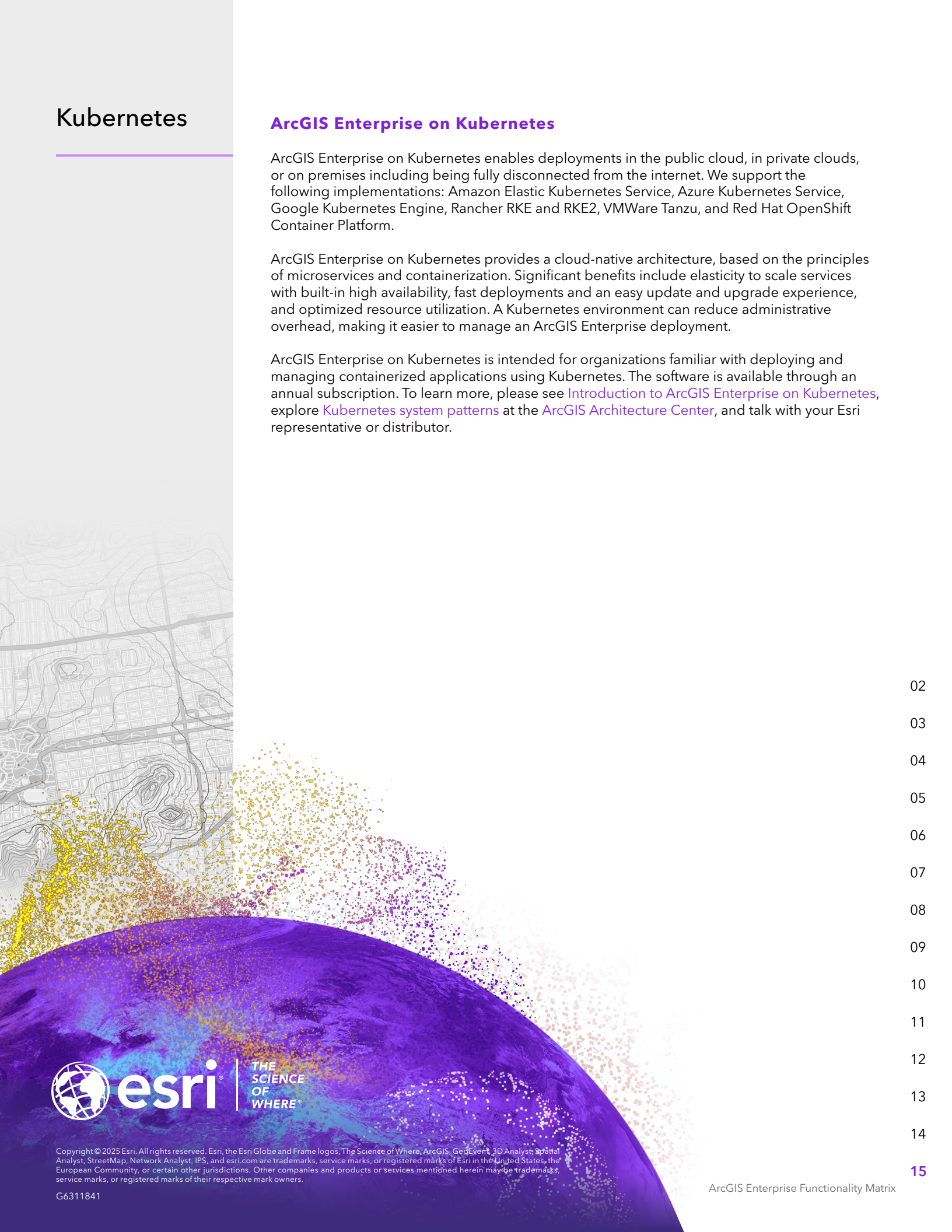
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ArcGIS Enterprise on Kubernetes

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, and Red Hat OpenShift Container Platform.

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 see [Introduction to ArcGIS Enterprise on Kubernetes](#), explore [Kubernetes system patterns](#) at the [ArcGIS Architecture Center](#), and talk with your Esri representative or distributor.



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