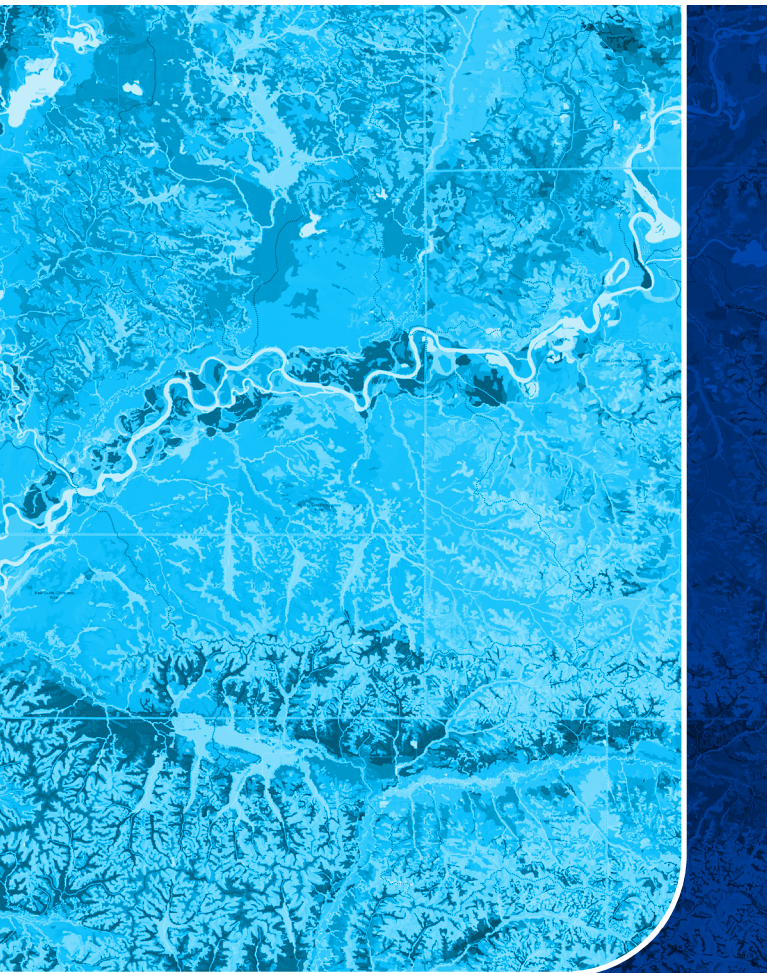esri

10.9.1

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.

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

You can manage, map, analyze, and share GIS data with ArcGIS Enterprise to power your data-driven 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 that provide comprehensive functionality for mapping, image exploitation, real-time data, big data analytics, and data science. It also powers the full suite of applications for field data collection, analytics, operational overviews, 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 wizard-like 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-based private clouds.

ArcGIS Enterprise on Kubernetes is a new deployment option with a separate list of features and capabilities. See page 12 for more information on this option. The remainder of this document applies to the Windows and Linux deployment options.

ArcGIS ENTERPRISE
Functionality Matrix

10.9.1

- **Included**
- **Additional Purchase**

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

[2] Visit **page 13** to learn more about ArcGIS Enterprise on Kubernetes.

[3] Only applicable if you have the corresponding ArcGIS Desktop or ArcGIS Pro extension.

SERVER CAPABILITIES

	GIS Server Advanced	ArcGIS GIS Server Standard	ArcGIS Image Server	ArcGIS GeoEvent Server	ArcGIS GeoAnalytics Server	ArcGIS Notebook Server[1]
Run on Windows	●	●	●	●	●	●
Run on Linux	●	●	●	●	●	●
Run on Kubernetes [2]	●	●				
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 (geocode)	●	●			●	●
Visualize data as a schematic diagram	●	●				
Support disconnected/field editing	●	●				
Publish geoprocessing services and web tools	●	●				
Serve ArcGIS 3D Analyst™ tools [3]	●					
Serve ArcGIS Geostatistical Analyst™ tools [3]	●					
Serve ArcGIS Spatial Analyst™ tools [3]	●					
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						●

SERVICE TYPES

	GIS Server Advanced	ArcGIS GIS Server Standard	ArcGIS Image Server	ArcGIS GeoEvent Server	ArcGIS GeoAnalytics Server	ArcGIS Notebook Server
Cached service—Map, image	●	●	●			
Dynamic map service	●	●				
Feature service	●	●				
Geocoding service	●	●				
Geodata service	●	●				
Geometry service	●	●				
Geoprocessing service	●	●	●[4]		●[4]	
Image service—From mosaic dataset			●			
Image service—From single raster	●	●	●			
Network service	●	●[5]				
Parcel fabric service	●	●				
Print service	●	●				
Ready-to-use Jupyter Notebook						●
Schematic service	●	●				
Stream service				●		
Utility network service	●	●				

HOSTED LAYER TYPES

	GIS Server Advanced	ArcGIS GIS Server Standard	ArcGIS Image Server	ArcGIS GeoEvent Server	ArcGIS GeoAnalytics Server	ArcGIS Notebook Server
Feature layer	●	●				
Hosted map image layer	●	●				
Imagery layer			●			
Scene layer	●	●				
Raster tile layer	●	●				
Vector tile layer	●	●				

CONTENT

	GIS Server Advanced	ArcGIS GIS Server Standard	ArcGIS Image Server	ArcGIS GeoEvent Server	ArcGIS GeoAnalytics Server	ArcGIS Notebook Server
ArcGIS Living Atlas of the World	●	●				
ArcGIS StreetMap™ Premium (display, routing, geocoding)	○	○				

Legend:
- ● Included
- ○ Additional Purchase

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

[5] ArcGIS Network Analyst™ extension is required.

[6] Windows only

[7] ArcGIS GeoEvent™ Server can ingest data from system files. Data in a system file should be text readable and formatted as delimited text, generic JSON, or XML. GeoEvent Server can poll a feature service's feature layer for feature records and process these as event records. GeoEvent Server integrates with a traditional relational database management system (RDBMS) through a feature service; direct connections to underlying database tables are not supported.

SERVER EXTENSIONS

	GIS Server Advanced	ArcGIS GIS Server Standard	ArcGIS Image Server	ArcGIS GeoEvent Server	ArcGIS GeoAnalytics Server	ArcGIS Notebook Server
ArcGIS Network Analyst	●	○				
ArcGIS LocateXT	○	○				
ArcGIS Data Interoperability [6]	○	○				
ArcGIS Data Reviewer [6]	○	○				
ArcGIS Workflow Manager [6]	○	○				
ArcGIS Maritime [6]	○	○				
ArcGIS Defense Mapping [6]	○					
ArcGIS Production Mapping [6]	○	○				
ArcGIS Roads and Highways [6]	○	○				
ArcGIS Pipeline Referencing [6]	○	○				

INPUT DATA TYPES

	GIS Server Advanced	ArcGIS GIS Server Standard	ArcGIS Image Server	ArcGIS GeoEvent Server	ArcGIS GeoAnalytics Server	ArcGIS Notebook Server
3D features (points, objects, extrusions)	●	●				●
3D scenes	●	●				●
Address locators	●	●				
Big data—Feature	●	●		●	●	●
Big data—Imagery/Raster			●			●
Feature data (points, lines, polygons)	●	●	●	●	●	●
Imagery/Raster data—Mosaic dataset			●			●
Imagery/Raster data—Single raster	●	●	●			●
Integrated mesh	●	●				
Lidar/Terrain data—Mosaic dataset			●			
Lidar/Terrain data—Single raster	●	●	●			
Multipatch data	●	●				
Parcel fabric	●	●				●
Point clouds	●	●				●
Raster elevation surfaces			●			●
Real-time data streams				●		●
Tabular data	●	●	●[7]	●		●
Utility networks	●	●				●

02
03
04
05
06
07
08
09
10
11
12
13

ArcGIS Enterprise Functionality Matrix

User Roles

User capabilities are unlocked by the role you assign a user. You can use the default user roles and create custom roles.

ArcGIS ENTERPRISE PORTAL CAPABILITIES

	Administrator	Publisher	User	Data Editor	Viewer
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	●				

Included ●

Additional Purchase ○

[8] Limited capabilities available to Viewer users.

USER TYPE EXTENSION

	Viewer	Editor	Field Worker	Creator	GIS Professional Basic	GIS Professional Standard	GIS Professional Advanced
ArcGIS Knowledge		○	○	○	○	○	○
ArcGIS Utility Network	○ [8]	○	○	○	○	●	●
ArcGIS Trace Network	○ [8]	○	○	○	○	●	●
ArcGIS Parcel Fabric		○	○	○	○	●	●
ArcGIS Workflow Manager	○ [8]	○	○	○	○	○	○

COMPATIBLE USER TYPES
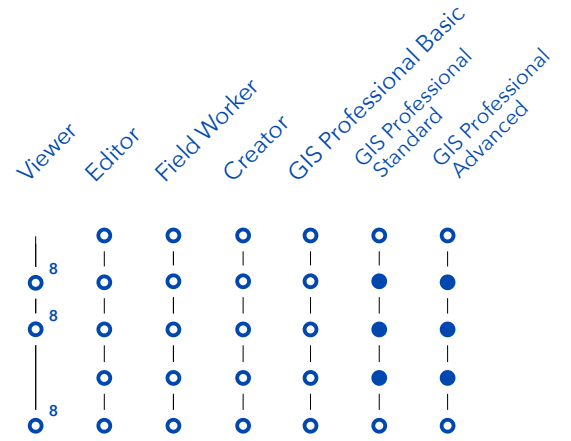
	Viewer	Data Editor	User	Publisher	Administrator
GIS Professional	●	●	●	●	●
Creator	●	●	●	●	●
Field Worker	●	●			
Editor	●	●			
Viewer	●				
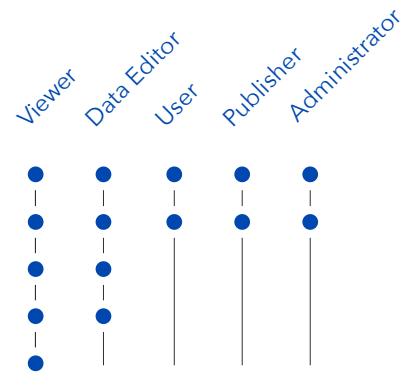
Supported Databases and Data Connections

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

[10] IBM Informix and IBM Db2 for z/OS are only supported when publishing from ArcGIS Desktop 10.x.

[11] GeoAnalytics Server also supports writing your analysis results back to these sources.

[12] Shapefiles, Parquet, ORC, and delimited files are supported.

[13] Support 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 PostgreSQL [9]
Amazon RDS for Microsoft SQL Server [9]
Amazon RDS for Oracle [9]
Amazon RDS for PostgreSQL [9]
Google Cloud SQL for PostgreSQL [9]
Google Cloud SQL for SQL Server [9]
IBM Db2 [10]
IBM Informix [10]
Microsoft Azure Database for PostgreSQL [9]
Microsoft Azure SQL Database [9]
Microsoft SQL Server
PostgreSQL
SAP HANA
SAP HANA Cloud [9]
Oracle
Oracle Autonomous Transaction Processing [9]
Oracle Co-Managed Systems Virtual Machine DB Systems[9]

Supported data warehouses hosted in cloud environments

Amazon Redshift
Google BigQuery
Snowflake

Input data supported by ArcGIS GeoAnalytics Server

Hosted feature layers
Feature services
Stream services
Big data file shares
 - Apache Hadoop HDFS [11]
 - Apache Hive
 - AWS S3 and S3-compatible storage [11, 12]
 - Azure Data Lake Store [11, 12]
 - Local and network file shares [11, 12]
 - Microsoft Azure storage [11]

Supported database types for query layers

Dameng
SQLite
Teradata

## Input data supported by ArcGIS GeoEvent Server [13]

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

Raster stores supported by ArcGIS Image Server when running raster analytics

Alibaba Cloud Object Storage Service (OSS)
AWS S3 and S3-compatible storage
Local file shares
Microsoft Azure storage
Google Cloud Storage
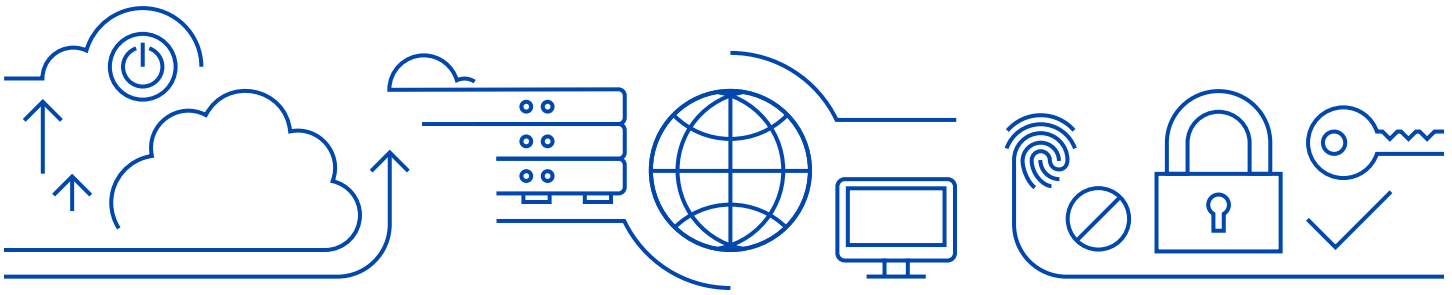
Supported Cloud Environments

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 even easier to install and configure your deployment.

ArcGIS Enterprise on Kubernetes is supported for deployment onto Amazon Web Services (AWS) Amazon Elastic Kubernetes Service (Amazon EKS), Microsoft Azure Kubernetes Service (AKS), Google Kubernetes Engine (GKE), and also for deployment onto private cloud environments based on Red Hat OpenShift.

ArcGIS Enterprise supports cloud-native storage and cloud-managed databases. This includes support for cloud-native storage and cloud-managed databases.
See this functionality matrix for an overview and the documentation for specific details on what features are supported with the different cloud stores.

Cloud-native storage includes the following:

- AWS S3 and S3-compatible storage
- Microsoft Azure storage
- Alibaba Cloud OSS
- Google Cloud buckets

Supported OGC and Open Web Services

As part of Esri's Open Vision, ArcGIS Enterprise can serve out the following Open Geospatial Consortium, Inc. (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

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

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 available[14] as well as appropriate expertise in managing a Kubernetes environment. See the Kubernetes section on 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	Chef	PowerShell DSC	AWS	Azure	ArcGIS Enterprise Builder
Cloud deployments	●	●	●	●	
On-premises deployments	●	●			●
Windows OS	●	●	●	●	●
Linux OS	●	●	●		●
Single-machine deployments	●	●	●	●	●
Multimachine deployments	●	●	●	●	
High-availability deployments	●	●	●	●	
Base ArcGIS Enterprise deployment setup	●	●	●	●	●
ArcGIS Server setup	●	●	●	●	
Image Server setup	●	●	●	●	
GeoEvent Server setup	●	●	●	●	
GeoAnalytics Server setup	●	●	●	●	
Notebook Server setup [15]	●	●	●	●	
Ability to upgrade the deployment [16]	●	●	●	●	●
Configurable deployment templates	●	●			
Configurable machine images			●	●	
Command line interface	●	●	●	●	●
Wizard-style interface			●	●	●

User Type Licensing

USER TYPES

ArcGIS Enterprise uses an identity-based security model. To access content secured within ArcGIS Enterprise, individuals must be a member of the ArcGIS Enterprise deployment and have an identity within the system. Throughout ArcGIS, identities are licensed and allocated through user type licensing.

There are five general-purpose user types—Viewer, Editor, Field Worker, Creator, and GIS Professional—each with its own capabilities and included applications. See the User Types page on esri.com for more information on the user types and their capabilities and applications.

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

USER TYPES INCLUDED WITH INITIAL PURCHASE

ArcGIS Enterprise EDITION/LEVEL	CREATOR USER TYPE	VIEWER USER TYPE
ArcGIS Enterprise Standard	5	Unlimited
ArcGIS Enterprise Advanced	50	Unlimited
ArcGIS Enterprise Workgroup Standard	5	0
ArcGIS Enterprise Workgroup Advanced	10	0

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.

Historical—The Viewer user type is functionally equivalent to a Level 1 Named User license in previous releases, and the Creator user type is equivalent to a Level 2 Named User license.

Licensing

ArcGIS ENTERPRISE STANDARD AND ADVANCED

You can license ArcGIS Enterprise in two editions, offered at two different capacity levels. The editions are Standard and Advanced, and the levels are ArcGIS Enterprise and ArcGIS Enterprise Workgroup. Used collectively, the name *ArcGIS Enterprise* refers to any edition or level when there isn't a need to make a distinction.

ArcGIS ENTERPRISE WORKGROUP LEVEL

ArcGIS Enterprise Workgroup is a lower-capacity level of ArcGIS Enterprise. It offers all the same functionality as ArcGIS Enterprise but is designed for use in smaller teams and organizations. The Workgroup level has the following differences:

- There is a limit of 10 simultaneous desktop connections to workgroup geodatabases. Workgroup geodatabases are only supported in Microsoft SQL Server Express and have a maximum size of 10 GB.
- The Workgroup level is only licensed for use with file-based data sources (e.g., file geodatabases) and workgroup geodatabases. It is not licensed for use with enterprise geodatabases.
- The base ArcGIS Enterprise deployment must be an all-in-one installation on a single machine with up to four cores.
- Each server role has a four-core maximum. The additional roles can be deployed on machines that are separate from the base deployment. The spatiotemporal big data store may be configured on a single, separate four-core machine.
- User type extensions cannot be used with Workgroup licensing.
- The Workgroup level of ArcGIS Enterprise supports a maximum of 10 users per deployment regardless of edition. ArcGIS Enterprise Workgroup Standard includes five Creator user types. You can add up to five more user types (Viewer and/or Creator), so long as the total number of users for your deployment does not exceed 10. As ArcGIS Enterprise Workgroup Advanced already includes 10 Creator user types, additional user types (of any level) cannot be added.

For more information, contact your Esri representative.

OTHER LICENSING

ArcGIS GIS Server Basic is limited-capability software that primarily provides enterprise geodatabase functionality. ArcGIS GIS Server Basic cannot be federated as part of an ArcGIS Enterprise deployment and does not enable any Web GIS functionality.

You will apply an ArcGIS GIS Server license for ArcGIS Enterprise on Kubernetes, if you are using that deployment option.

Kubernetes

ArcGIS ENTERPRISE ON KUBERNETES

ArcGIS Enterprise on Kubernetes enables deployments in the cloud with Amazon Elastic Kubernetes Service (EKS), Azure Kubernetes Service (AKS), Google Kubernetes Engine (GKE), and Red Hat OpenShift-based private clouds.

ArcGIS Enterprise on Kubernetes provides a cloud-native architecture, based on the principles of microservices and containerization. Significant benefits include enabling dynamic scaling to handle unpredictable demand for services, streamlined deployments and upgrades, and optimized utilization of infrastructure resources. A Kubernetes environment can reduce administrative overhead, making it easier to manage an ArcGIS Enterprise deployment.

ArcGIS Enterprise on Kubernetes is aimed at complex, multimachine deployments for organizations already familiar with Kubernetes technology. It is offered to ArcGIS Enterprise customers and partners that meet certain eligibility requirements. To learn more, please talk with your Esri representative or distributor.

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