

PA GIS 2021

Introduction to ArcGIS Enterprise

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State and Local Government Team



Agenda

Intro to ArcGIS Enterprise

- What is Web GIS?
- What is ArcGIS Enterprise?
- ArcGIS Enterprise - Base Deployment
- ArcGIS Enterprise - Best Practices and Considerations
- Wrap-Up

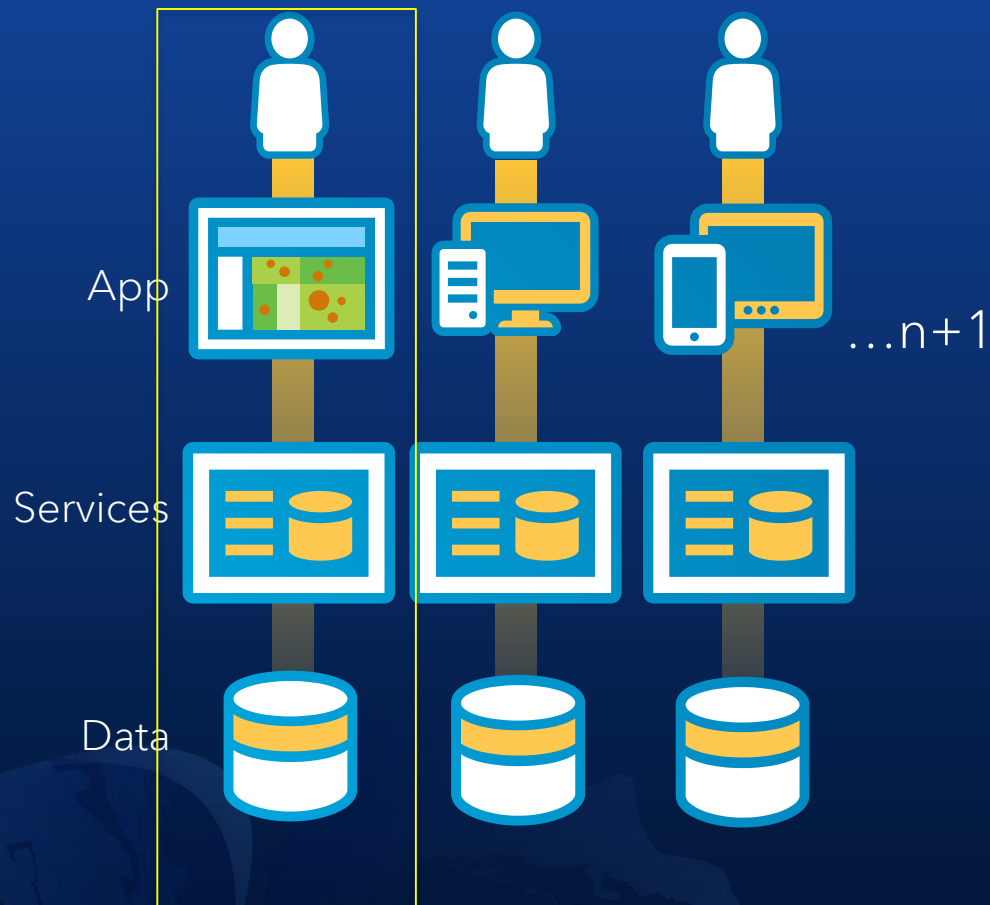
What is Web GIS?



Web GIS | How is it Different from Server GIS?

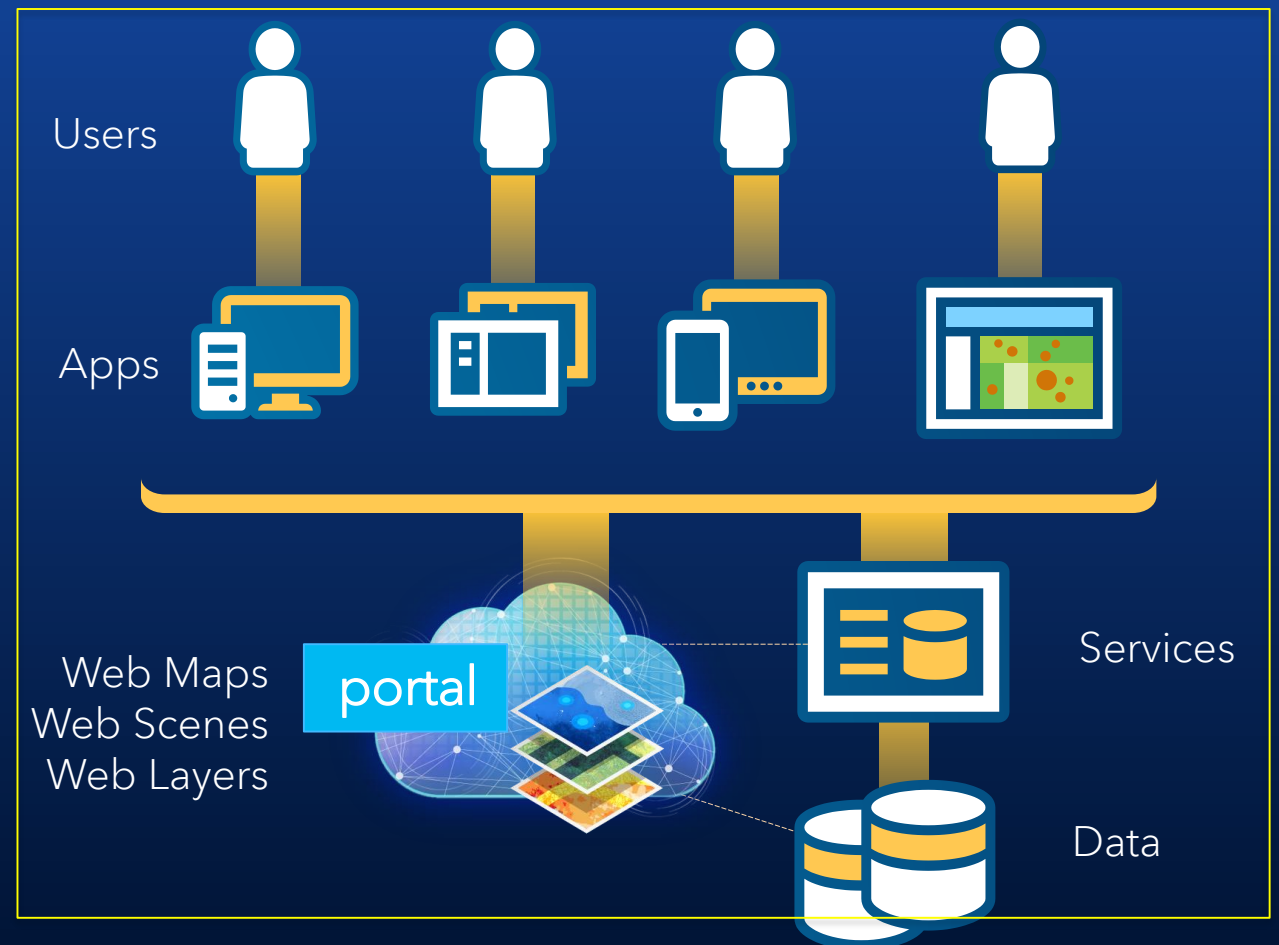
Server GIS

Silo'd use of GIS services within custom applications



Web GIS

Pervasive use of web layers, scenes and maps within all of the ArcGIS apps





ArcGIS Pro



ArcGIS Online



ArcGIS Enterprise



ArcGIS Apps
Geo-Enabled Systems



ArcGIS for Developers



ArcGIS Pro



ArcGIS Online



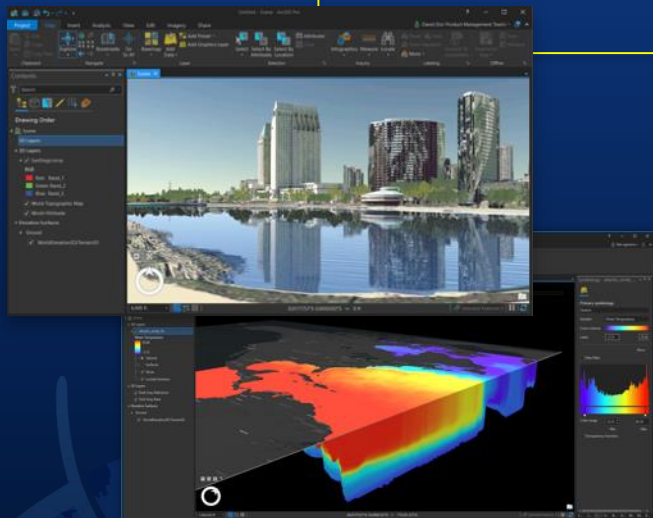
ArcGIS Enterprise



ArcGIS Apps
Geo-Enabled Systems



ArcGIS for Developers





ArcGIS Pro



ArcGIS Online



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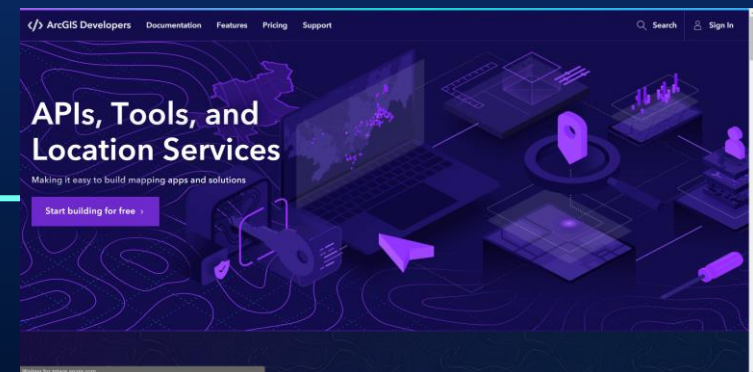
ArcGIS Enterprise



ArcGIS Apps
Geo-Enabled Systems



ArcGIS for Developers





ArcGIS Pro



ArcGIS Online



ArcGIS Enterprise



ArcGIS Apps
Geo-Enabled Systems



ArcGIS for Developers

What is ArcGIS Enterprise?

ArcGIS Enterprise provides full-featured mapping, analytics and data management capabilities, running on infrastructure you control, enabling you to visualize, interpret, and act upon your location-based data.



ArcGIS Enterprise | Capabilities



Publish, host and
serve web services



Share and
collaborate



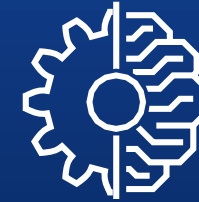
Work with imagery
and raster data



Build and use
applications



Customize the
look & feel of
your GIS



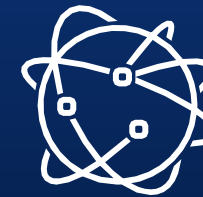
Data science and
machine learning



Web mapping
and analysis



Fuel field
operations



Monitor real-
time data and
your IoT



Access all
kinds of data



Analyze
big data

1 Product

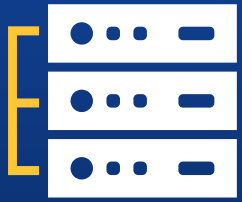
Multiple components



All of these components existed in the software pre-10.5

- Start with the base ArcGIS Enterprise deployment; this is how you get Web GIS in your infrastructure.
- Once you have your base ArcGIS Enterprise deployment configured you **can expand** by adding additional server sites/roles to federate with your base deployment.

ArcGIS Enterprise | Software Components



ArcGIS Server



Portal for ArcGIS



ArcGIS Data Store



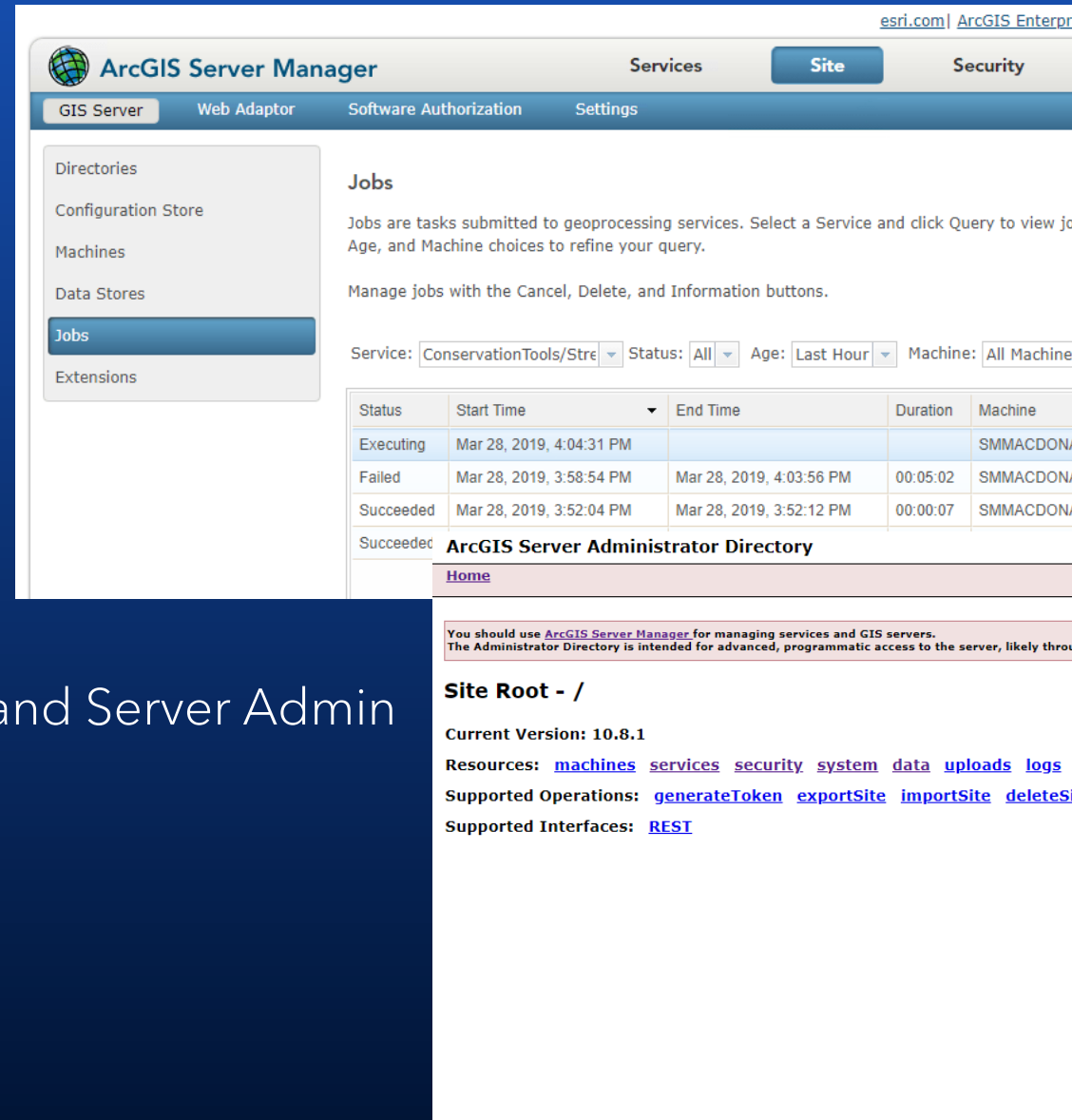
ArcGIS Web Adaptor

Provides the layers, services,
and **horsepower** required to
power your Web GIS.

ArcGIS Server | Capabilities

Publish web services

- Back-end server engine
- Creates web services for sharing and discovery
- Manages your GIS resources
- Managed and Administered via Server Manager and Server Admin
- Licensed in a variety of roles



The screenshot displays the ArcGIS Server Manager web interface. The top navigation bar includes links for [esri.com](#), [ArcGIS Enterprise](#), and tabs for **Services**, **Site**, and **Security**. Below this, a secondary navigation bar contains **GIS Server**, **Web Adaptor**, **Software Authorization**, and **Settings**. On the left, a sidebar menu lists **Directories**, **Configuration Store**, **Machines**, **Data Stores**, **Jobs** (which is selected and highlighted), and **Extensions**. The main content area is titled **Jobs** and contains the following text: "Jobs are tasks submitted to geoprocessing services. Select a Service and click Query to view job details. Use the Status, Age, and Machine choices to refine your query." Below this text, it says "Manage jobs with the Cancel, Delete, and Information buttons." There are filters for **Service:** ConservationTools/Stre..., **Status:** All, **Age:** Last Hour, and **Machine:** All Machine. A table lists job execution details:

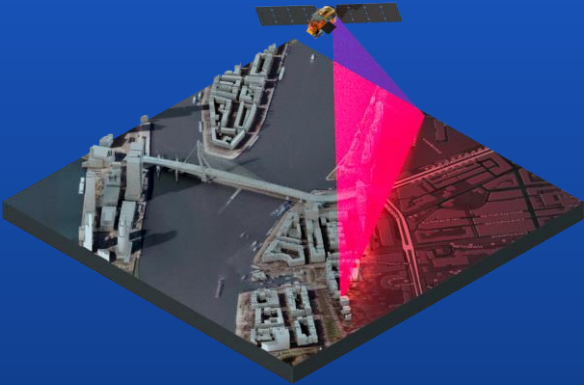
Status	Start Time	End Time	Duration	Machine
Executing	Mar 28, 2019, 4:04:31 PM			SMMACDONA
Failed	Mar 28, 2019, 3:58:54 PM	Mar 28, 2019, 4:03:56 PM	00:05:02	SMMACDONA
Succeeded	Mar 28, 2019, 3:52:04 PM	Mar 28, 2019, 3:52:12 PM	00:00:07	SMMACDONA

Below the table, there is a section titled **ArcGIS Server Administrator Directory** with a [Home](#) link. A warning message states: "You should use [ArcGIS Server Manager](#) for managing services and GIS servers. The Administrator Directory is intended for advanced, programmatic access to the server, likely through..." The bottom of the page shows the **Site Root - /** section with the **Current Version: 10.8.1** and lists of **Resources** ([machines](#), [services](#), [security](#), [system](#), [data](#), [uploads](#), [logs](#)), **Supported Operations** ([generateToken](#), [exportSite](#), [importSite](#), [deleteSite](#)), and **Supported Interfaces** ([REST](#)).

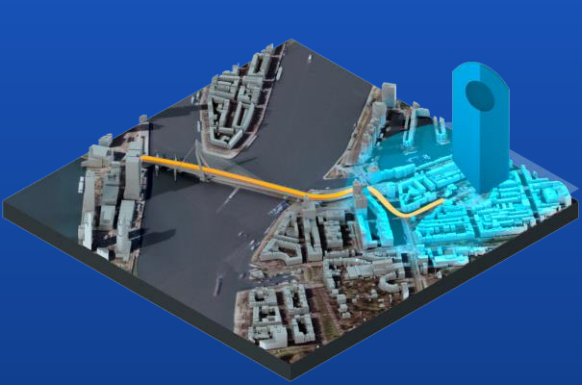


ArcGIS GIS
Server

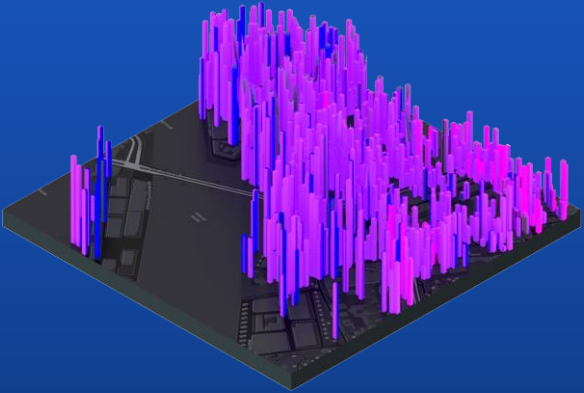
REQUIRED



ArcGIS Image
Server



ArcGIS GeoEvent
Server



ArcGIS
GeoAnalytics
Server



ArcGIS Business
Analyst Server

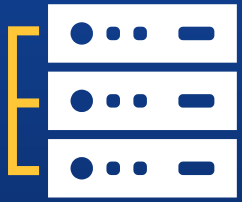


ArcGIS Mission
Server



ArcGIS Notebook
Server

ArcGIS Enterprise | Software Components



ArcGIS Server



Portal for ArcGIS



ArcGIS Data Store



ArcGIS Web Adaptor

Content management
system supporting a user's
interaction and overall
experience with your Web
GIS.

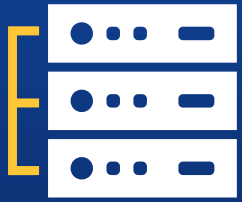
ArcGIS Enterprise portal | Capabilities

Make and share maps

- Search for GIS content within your organization
- Create, save, and share web maps and scenes
- Create and host web mapping apps
- Perform common analytical functions
- Create groups to share GIS information with colleagues
- Share links to GIS apps
- Share map and layer packages to use in ArcGIS Pro or ArcGIS Desktop



ArcGIS Enterprise | Software Components



ArcGIS Server



Portal for ArcGIS



ArcGIS Data Store



ArcGIS Web Adaptor

The **ArcGIS managed data repository** that stores the spatial content that has been *copied* to the system

ArcGIS Data Store | Three Types

Relational Data Store



...

Hosted Feature Layers

Tile Cache Data Store



Scene
Viewer



Scene Layers

Spatiotemporal Big Data Store



Tracker for
ArcGIS



ArcGIS Mission



GeoEvent
Server



GeoAnalytics
Server



Frequently asked question:

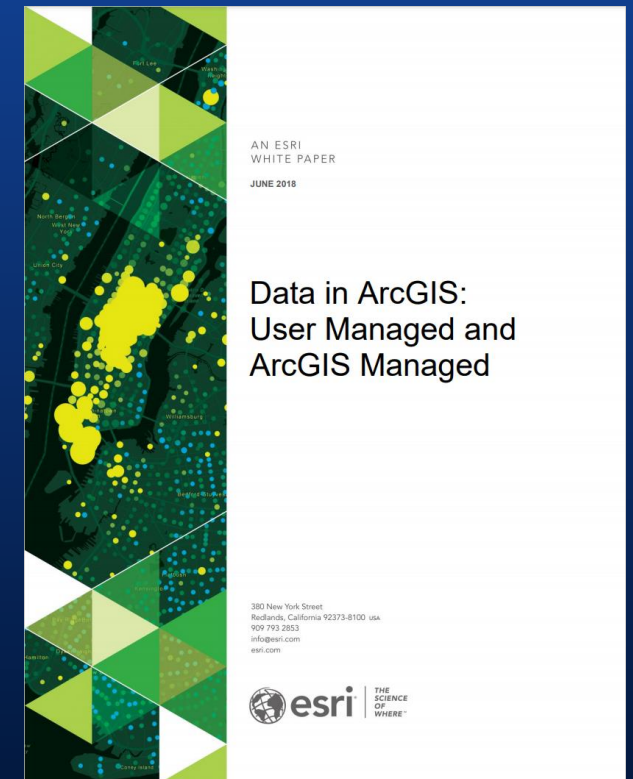
Do I need to put *all* my content in the ArcGIS Data Store?

Answer: No



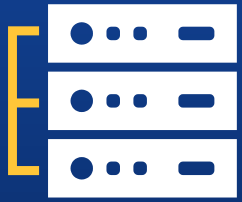
ArcGIS Data Store | Storing Data

- You can register your own data stores with ArcGIS Enterprise
 - Keep your data where it is – you do not need to copy the data to ArcGIS Enterprise when you publish
- The data must be **registered** with the server site
 - Register enterprise geodatabases (SDE)
 - Big data file shares (Hadoop, Hive)
 - Cloud stores (Amazon S3, Azure Blob)
 - Folders (Shapefiles, File GDBs)
- Multiple data stores can be registered to the same server



RESOURCE: [Data in ArcGIS: User Managed and ArcGIS Managed](#)

ArcGIS Enterprise | Software Components



ArcGIS Server



Portal for ArcGIS



ArcGIS Data Store



ArcGIS Web Adaptor

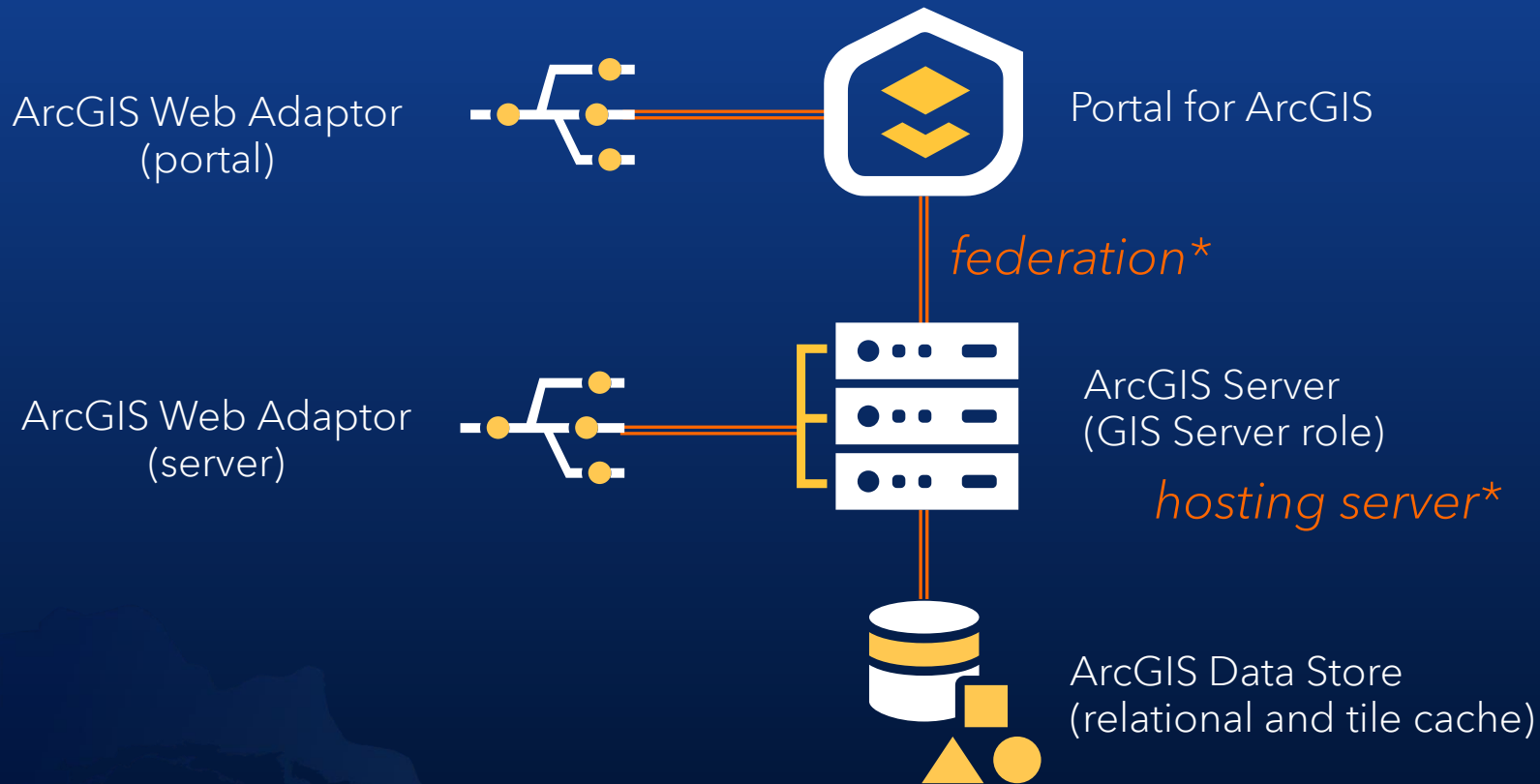
Esri built **reverse proxy** and **load balancer** that appropriately directs network traffic.

ArcGIS Web Adaptor | Benefits

- Integrate ArcGIS Server with your organization's existing web server
- Using the Web Adaptor moves traffic from the default ports (e.g. 6443/7443) to well known ports (443)
- Integrate with single sign-on
- Distributes incoming requests to the ArcGIS Server machines in your site (round-robin)

ArcGIS Enterprise | Base Deployment

- To get started these software components must be installed, authorized, and configured together to create a base ArcGIS Enterprise deployment.

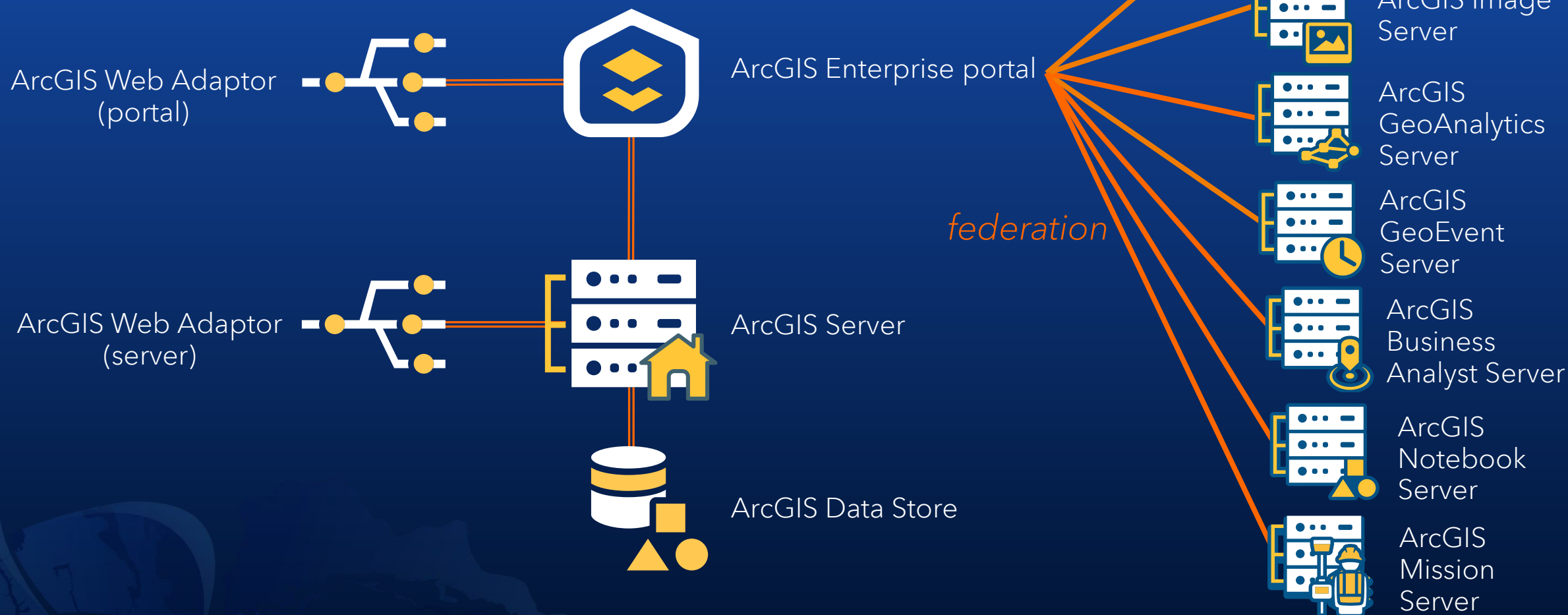


ArcGIS Enterprise | Federation

- Integrates the security and sharing models of your portal with one or more ArcGIS Server sites
 - You will use the **same login** for ArcGIS Server and ArcGIS Enterprise portal
 - Services published to your federated server are automatically create an item in the ArcGIS Enterprise portal

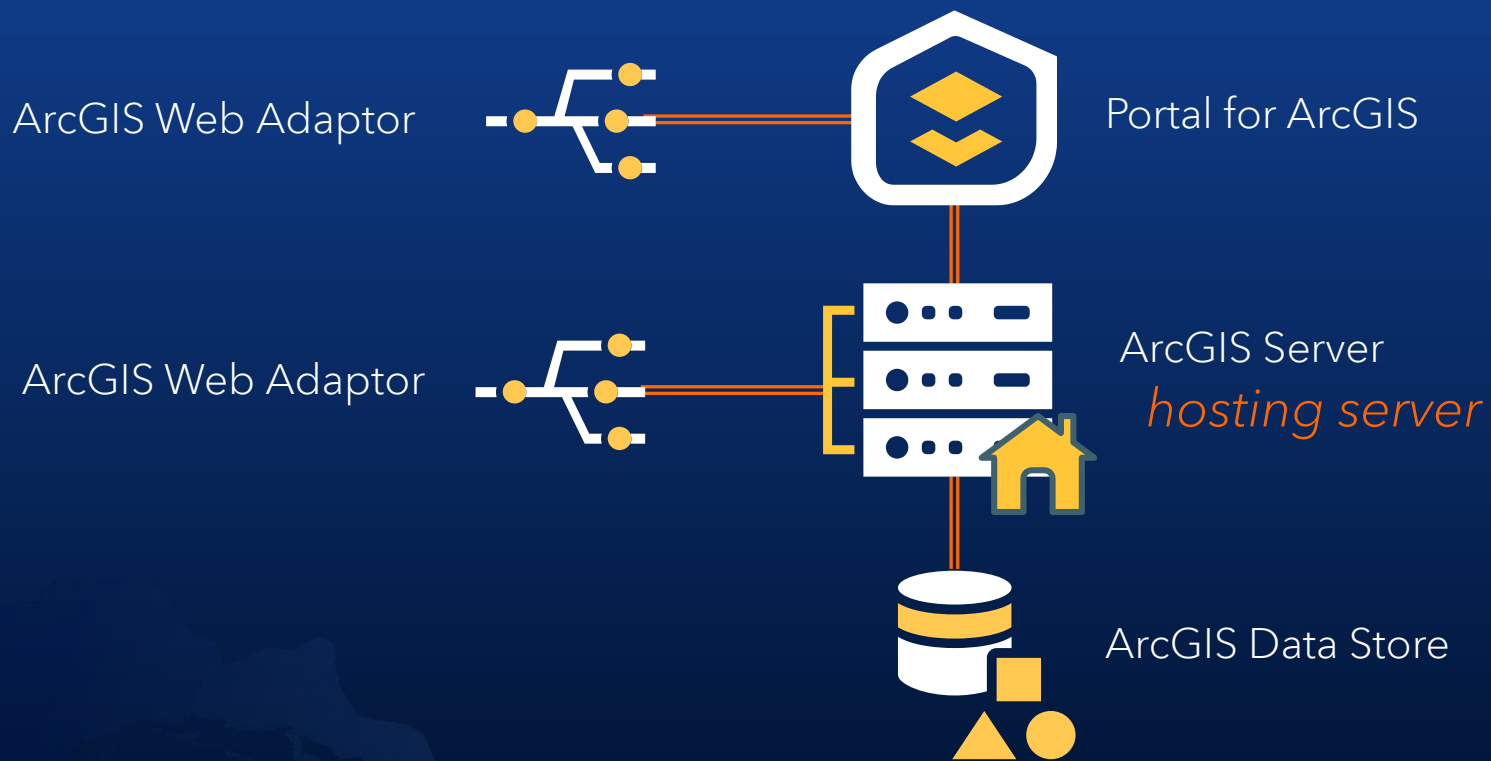
ArcGIS Enterprise | Federation

Federating additional ArcGIS Servers, licensed as other available roles, enables additional capabilities within ArcGIS Enterprise portal.



ArcGIS Enterprise | Base Deployment

- To complete the base deployment an ArcGIS Server site must be designated as hosting server



ArcGIS Enterprise | Hosting Server

- Benefits:
 - Publish hosted layers.
 - Add a zipped shapefile, CSV file, or GPS Exchange Format file to Map Viewer.
 - Batch geocode addresses from a CSV file or table.
 - Perform feature analysis in Map Viewer, Insights for ArcGIS, or ArcGIS Pro.
- Only **one** hosting server site per ArcGIS Enterprise deployment
- Requirements:
 - ArcGIS GIS Server role
 - ArcGIS Data Store with “relational datastore” configuration



1 Product

Multiple components



All of these components existed in the software pre-10.5

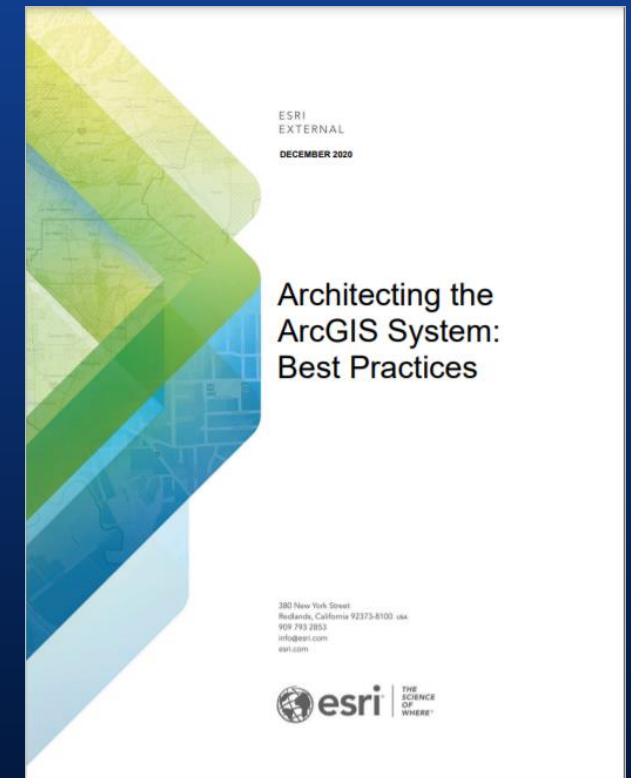
- Start with the base ArcGIS Enterprise deployment; this is how you get Web GIS in your infrastructure.
- Once you have your base ArcGIS Enterprise deployment configured you **can expand** by adding additional server sites/roles to federate with your base deployment.

Best Practices

Maximize your ArcGIS Enterprise deployment

- Publication Strategy
- Distributed GIS
- Managing Identities
- Environmental Isolation
- Load Balancing
- Workload Separation
- Automation
- Security

People, Process, and Technology...

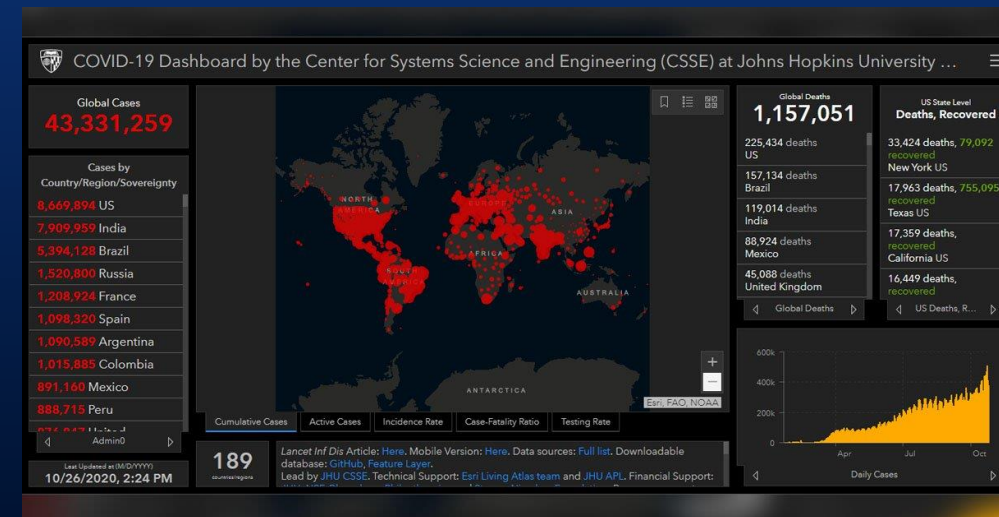


RESOURCE: [Architecting the ArcGIS System: Best Practices](#)

Publication Strategy

Deliver content in a performant, reliable, secure manner

- Performance
 - ArcGIS Enterprise – reliant on your IT infrastructure
 - ArcGIS Online – cloud-hosted SaaS environment
- Reliability
 - ArcGIS Enterprise – you manage the SLA
 - ArcGIS Online – Esri manages the SLA (99.9%)
- Security
 - ArcGIS Enterprise – manage authoritative, sensitive data
 - ArcGIS Online – public consumption, FedRAMP Low



Distributed GIS

Empowers modern GIS capabilities

- Model after your organization's structure
- Provide a trusted collaboration for business units that work with sensitive data
- Establish distributed collaborations based on business need



Managing Identities

Uniquely and securely describe user access

- Provide identities to everyone in the organization that needs to use GIS
- Create roles and groups to control access to content and capabilities
- You can integrate with external identity providers if that's required by your organization



Built-in identity store

Users configured within your portal

SAML-based identity provider

Flexibility for both built-in and enterprise users

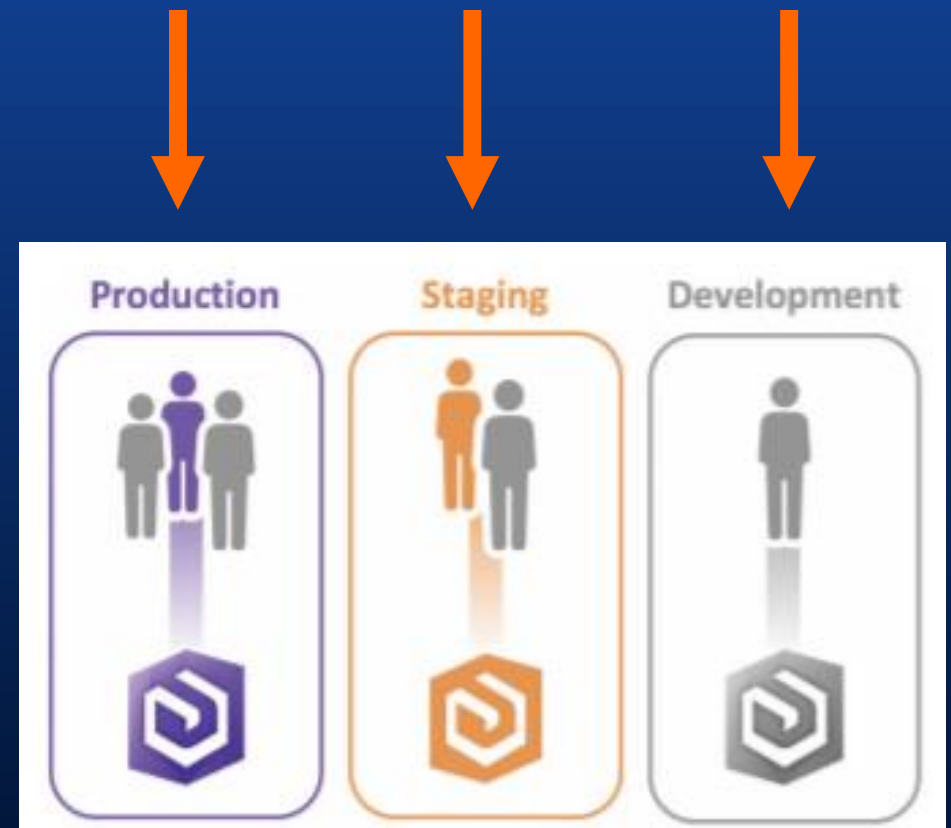
Enterprise identity store (AD, LDAP)

Users configured externally and imported

Environment Isolation

Establish system reliability

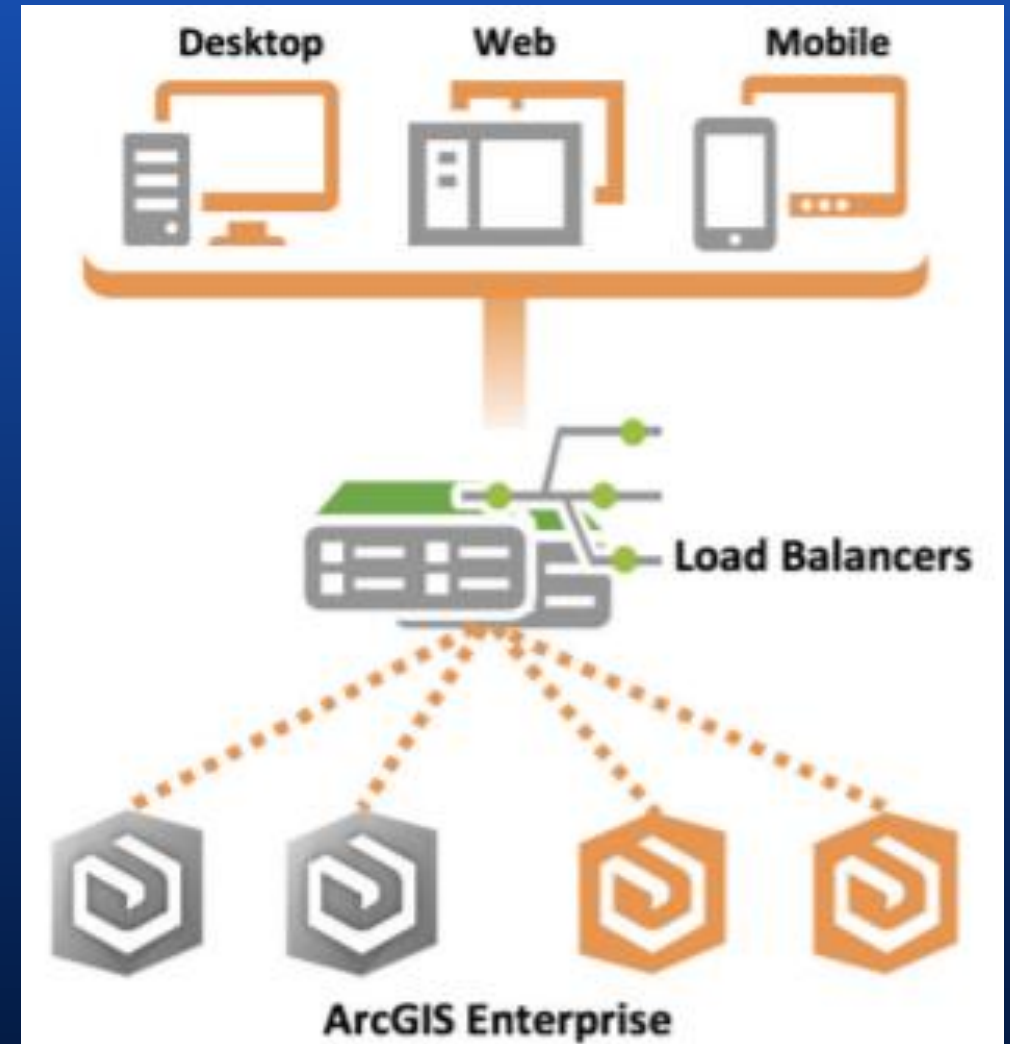
- Production
 - The live system that supports end users
- Staging
 - A workplace to test system changes prior to rolling live
- Development
 - A workplace where developers can explore and experiment



Load Balancing

Optimize system resource utilization

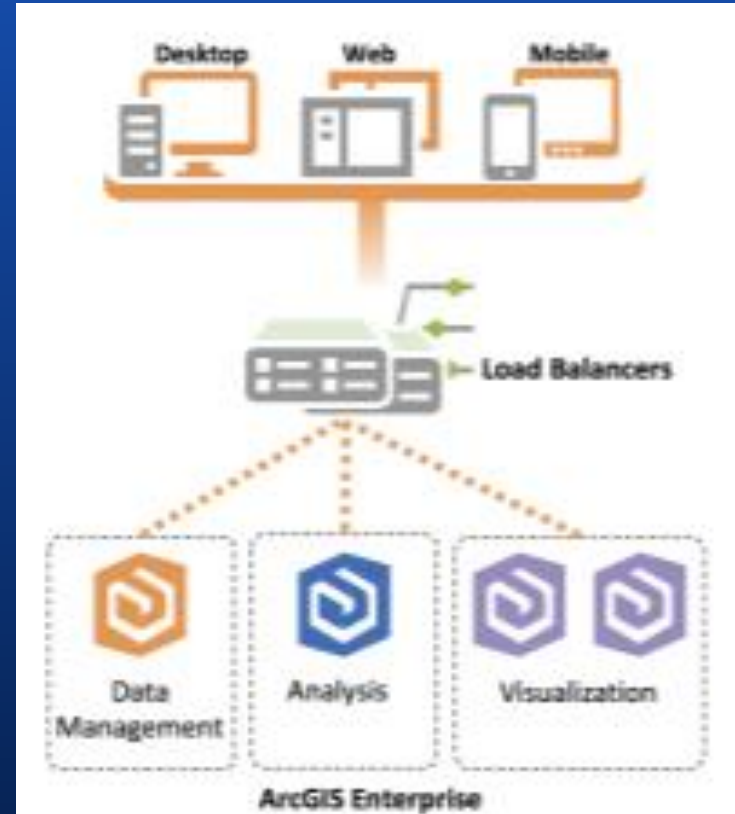
- Benefits
 - Helps balance system utilization
 - Reduce risk
 - Simplify service delivery and growth
 - Improve backend server security
- ArcGIS Web Adaptor
 - Simple ArcGIS Enterprise configuration (i.e., base deployment)
 - Require web-tier authentication
- Third-party load balancer
 - Advanced load-balancing requires
 - + ArcGIS Web Adaptor for web-tier authentication



Workload Separation

Isolate and configure workflows on machines

- Consider different workflows to understand the impact of each one
- Allocate necessary hardware resources
- Use GIS Patterns of Use, SLAs and performance expectations
- Pair the level of demand with level of machine



Automation

Streamline administrative workflows and repetitive tasks

- Improves efficiency, consistency, and productivity
- Automate deployment, administration and analysis
- Reduce human error and speed up manual tasks

Deployment

All-in-one
wizard



ArcGIS
Enterprise
Builder

Machine Images
and CloudBuilders



Azure



AWS

Script-based



Chef



PowerShell
DSC

Administration and Analysis



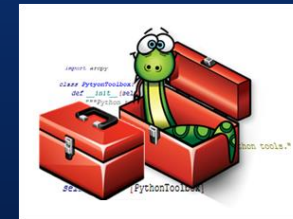
ArcGIS
Python API



ArcGIS
Notebooks



ArcGIS REST
API



ArcPy



Command
Line Utilities

Security

Ensure a reliable ArcGIS Enterprise deployment

- Include user-level authentication
- Use ArcGIS Monitor to track system health
- Follow the “Architecting the ArcGIS System” best practices and leverage the ArcGIS Online Security Advisor
- Review ArcGIS security, privacy and compliance guidelines regularly



RESOURCE: [ArcGIS Online Security Advisor](#)

Summary

- A Modern GIS brings together Desktop, Server, and Web GIS
- Web GIS enables everyone across an organization to discover, use, and share geographic information
- ArcGIS Enterprise provides a foundational Web GIS in your own infrastructure
- Start with a base deployment, and expand from there with additional sites/roles
- Leverage best practices to maximize the value of your ArcGIS Enterprise deployment
- Esri is here to help

Thank You!

Intro to ArcGIS Enterprise

- Daniel Wickens, Solution Engineer
dwickens@esri.com
- Mary McColley, Solution Engineer
mmccolley@esri.com

Additional Resources:

- [ArcGIS Enterprise Overview](#)
- [ArcGIS Enterprise Documentation](#)
- [ArcGIS Server licensing roles](#)
- [Data in ArcGIS: User Managed and ArcGIS Managed](#)
- [Architecting the ArcGIS System: Best Practices](#)
- [ArcGIS Online Security Advisor](#)

