



ArcGIS Enterprise: Architecting Your Deployment

Philip Heede



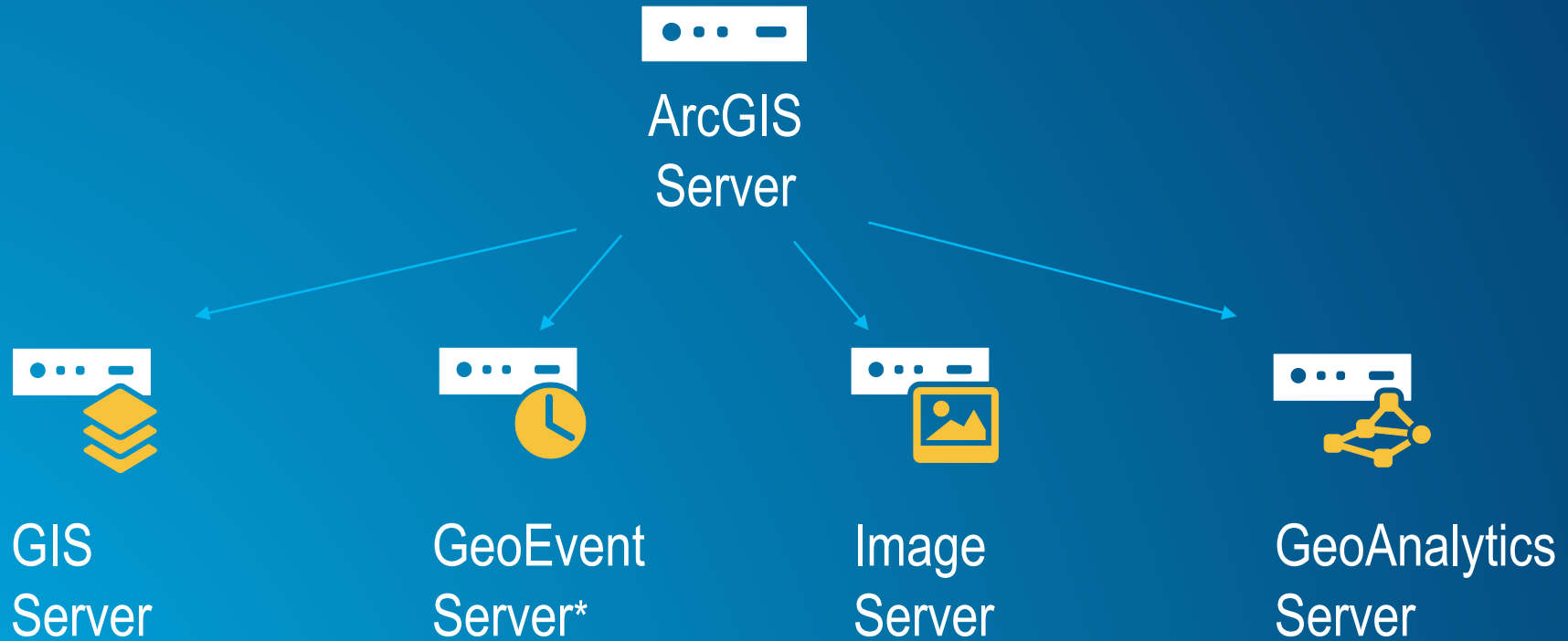
Don't panic!

ArcGIS Enterprise | Software Components



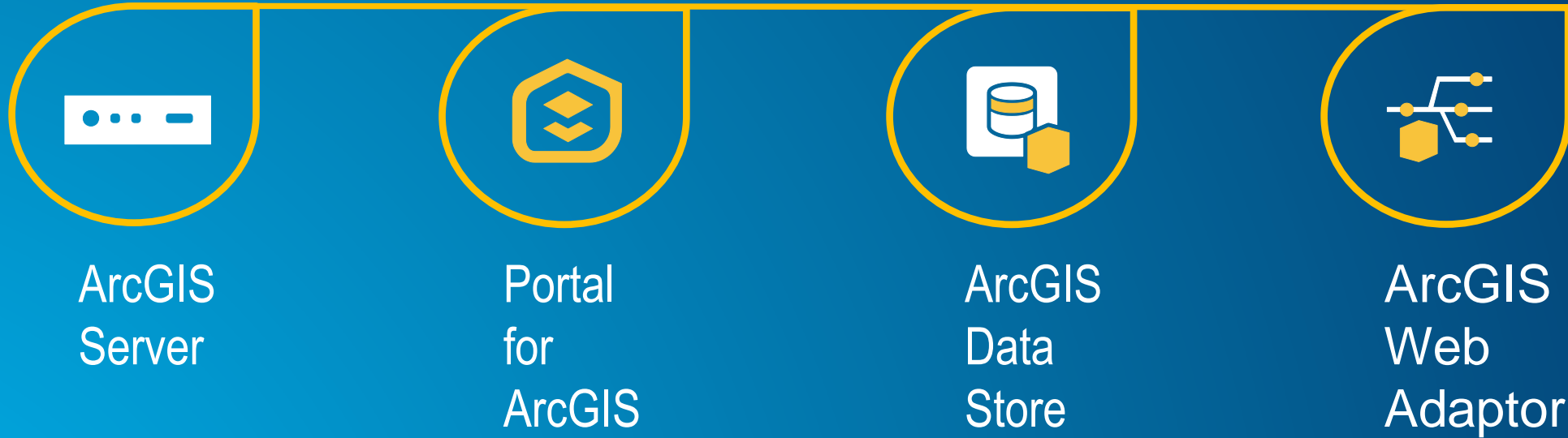
All of these components existed in the software pre-10.5

ArcGIS Enterprise | Server Roles



One software component, multiple server roles

ArcGIS Enterprise | Base Deployment

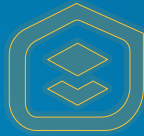


ArcGIS Enterprise | Components of the base deployment



ArcGIS
Server

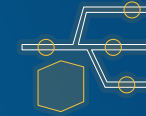
Set up as a GIS Server and configured as the **hosting server**, ArcGIS Server provides the layers, services, and horsepower required to power your Web GIS.



Portal
for
ArcGIS



ArcGIS
Data
Store



ArcGIS
Web
Adaptor

ArcGIS Enterprise | Components of the base deployment



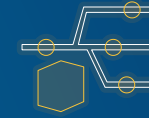
ArcGIS
Server



Portal
for
ArcGIS



ArcGIS
Data
Store



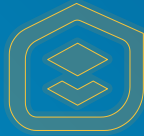
ArcGIS
Web
Adaptor

The **web frontend** and **infrastructure backend** that supports a user's interaction and overall experience with your Web GIS.

ArcGIS Enterprise | Components of the base deployment



ArcGIS
Server

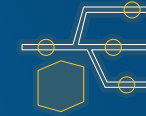


Portal
for
ArcGIS



ArcGIS
Data
Store

The **Esri managed data repository** that stores the spatial content that has been shared to Portal.



ArcGIS
Web
Adaptor

ArcGIS Enterprise | Components of the base deployment



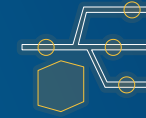
ArcGIS
Server



Portal
for
ArcGIS



ArcGIS
Data
Store



ArcGIS
Web
Adaptor

Relational

Tile Cache

Spatiotemporal

ArcGIS Enterprise | Components of the base deployment



ArcGIS
Server



Portal
for
ArcGIS



ArcGIS
Data
Store



ArcGIS
Web
Adaptor

An Esri built software **load balancer** that appropriately directs network traffic and serves as a **reverse proxy** for Web GIS access.

Portal for ArcGIS

[Home](#)[Use](#)[Administer](#)[Administer](#) > [Introducing ArcGIS Enterprise](#)

Introducing ArcGIS Enterprise

[What is ArcGIS Enterprise?](#)[Base ArcGIS Enterprise deployment](#)[Tutorial: Set up a base ArcGIS Enterprise deployment](#)[Additional server deployment](#)[About ArcGIS Server licensing roles](#)

Introducing Portal

Base ArcGIS Enterprise deployment

[ArcGIS 10.5 on Windows](#) | [Other versions](#)

- [Single-machine deployment](#)
- [Multitiered deployment](#)
- [Highly available deployment](#)
- [Scaling the base ArcGIS Enterprise deployment](#)

ArcGIS Enterprise includes several software components that are designed to work together. A foundational setup of ArcGIS Enterprise consists of a number of these components configured in a certain way; this is called a base ArcGIS Enterprise deployment. The base deployment consists of the following:

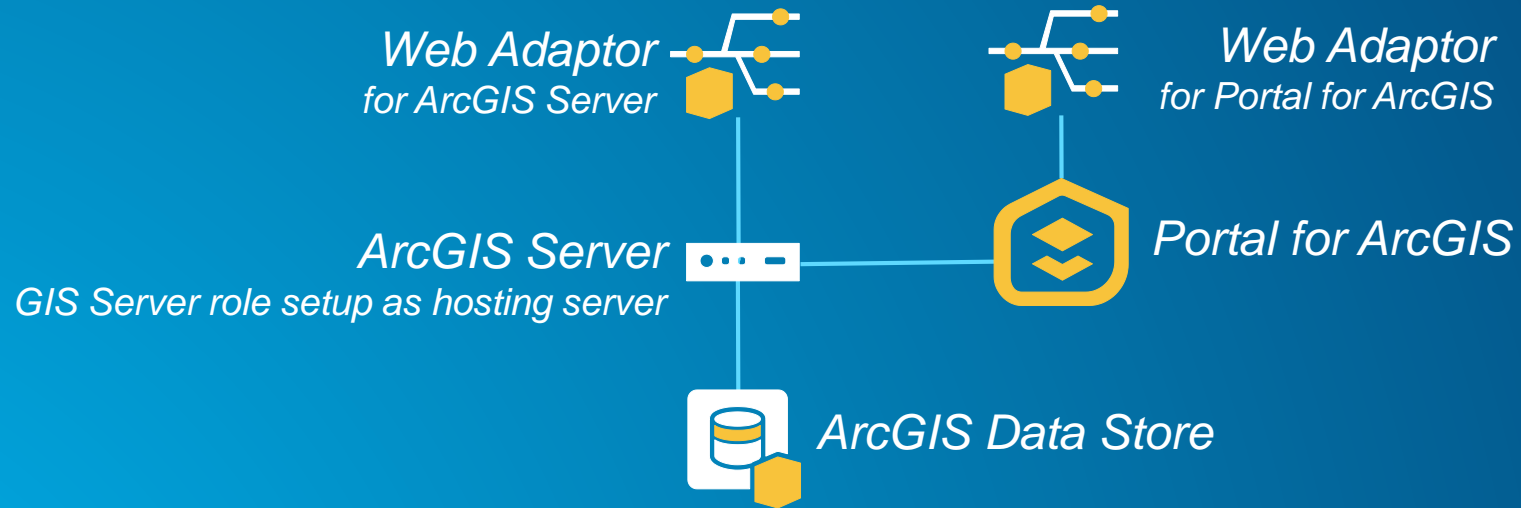
- [ArcGIS Server](#)—This ArcGIS Server must be licensed as [ArcGIS GIS Server Standard](#) or [ArcGIS GIS Server Advanced](#) and configured as the [hosting server](#) for your portal.
- [Portal for ArcGIS](#).

ArcGIS Enterprise | Base Deployment | Choosing a pattern

- **Choosing a base deployment pattern**
 - All-in-one single machine deployment
 - Multi-tier deployment

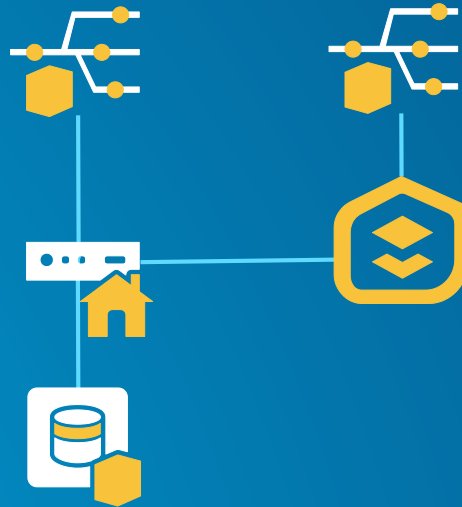
- **Three tiers to consider:**
 - Portal for ArcGIS
 - ArcGIS Server
 - ArcGIS Data Store

ArcGIS Enterprise | Base Deployment | Logical Architecture



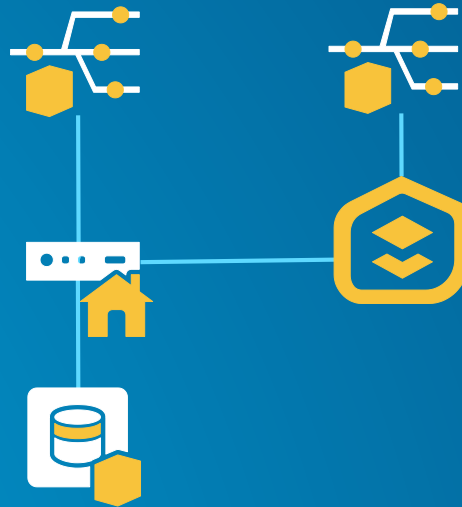
ArcGIS Enterprise | Base Deployment | Logical Architecture

*Don't forget to designate
your GIS server as the
hosting server.*



ArcGIS Enterprise | Base Deployment | Logical Architecture

Configure your data store
*Base deployment contains
relational data store and tile
cache data store*



Portal for ArcGIS

[Home](#)[Use](#)[Administer](#)[Administer](#) > [Introducing ArcGIS Enterprise](#)

Introducing ArcGIS Enterprise

[What is ArcGIS Enterprise?](#)[Base ArcGIS Enterprise deployment](#)[Tutorial: Set up a base ArcGIS Enterprise deployment](#)[Additional server deployment](#)[About ArcGIS Server licensing roles](#)

Introducing Portal

Tutorial: Set up a base ArcGIS Enterprise deployment

[ArcGIS 10.5 on Windows](#) | [Other versions](#) ▾

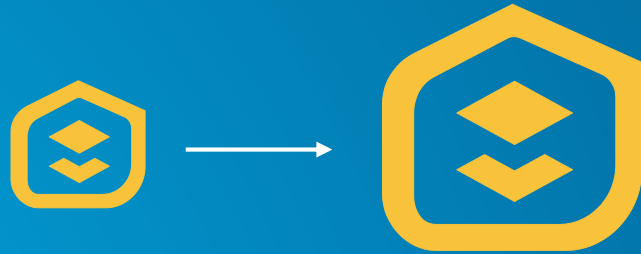
This tutorial provides an overview of setting up a single machine [base ArcGIS Enterprise deployment](#). This configuration is commonly used for testing and prototyping purposes. It enables self-service mapping and can be used with ArcGIS Pro, ArcMap, and other client applications. Although this configuration can be used in a production system, your performance, system architecture, and other requirements will dictate the deployment pattern your production deployment follows.

The resulting deployment will include the following:

- An ArcGIS Server machine [licensed as ArcGIS GIS Server](#) and used as a hosting server

ArcGIS Enterprise | Scaling and expanding the base deployment

- **When do you need to scale out the Portal for ArcGIS tier?**
 - Rarely!
 - Use two machines with Portal for ArcGIS for high availability purposes not for scaling



ArcGIS Enterprise | Scaling and expanding the base deployment

- **When do you need to scale out the ArcGIS Server hosting server site?**
 - **If your hosting server is performing double duty:**
 - Hosted services
 - Traditional services published from ArcMap or ArcGIS Pro
 - **If your users are making heavy use of the built-in analysis tools via the map viewer or ArcGIS Pro**
 - **If you have a lot of Insights for ArcGIS users**



ArcGIS Enterprise | Scaling and expanding the base deployment

- **When do you need to scale out the ArcGIS Data Store tier?**
 - Two different types of data stores in the base deployment

- **Relational Data Store**
 - Hosted feature layers
 - Insights for ArcGIS



- **Tile Cache Data Store**
 - Scene Layers (3D)



When to scale relational data store:

- Lots of users requesting data concurrently from many different hosted services: more memory often helpful
- Lots of concurrent requests: CPU can become a bottleneck
- **Monitor for bottlenecks!**

ArcGIS Enterprise | Expanding out from the base deployment

- Multiple reasons and ways to add to the base deployment

1. Adding additional GIS Server sites



- Isolate hosting server site from traditional GIS Server duties
- Have dedicated GIS Server sites for various purposes: heavily used map services, geoprocessing services, ...

2. Adding additional capabilities


- Image Server
- GeoEvent Server
- GeoAnalytics Server




ArcGIS Enterprise | Expanding out from the base deployment

- You can have any number of federated ArcGIS Server sites within your ArcGIS Enterprise deployment
- Different server roles have different recommendations and restrictions

ArcGIS Enterprise | Expanding out from the base deployment

- GIS Server 
 - as many sites make sense for your particular deployment following workload separation recommendations
 - E.g. separate sites for different sets of map services, separate sites for heavy-weight geoprocessing, separate sites for CPU-intensive routing services, ..

- Image Server 
 - as many sites make sense for your particular deployment of *dynamic image services*
 - *there can only be one site for raster analytics*

- GeoAnalytics Server 
 - *there can only be one site for GeoAnalytics Server*

- GeoEvent Server 
 - as many sites as makes sense for your particular deployment
 - *at 10.5 and prior: strong recommendation to use single machine sites*

ArcGIS Enterprise | Adding Image Server to your deployment

- **Image Server provides two distinct capabilities**



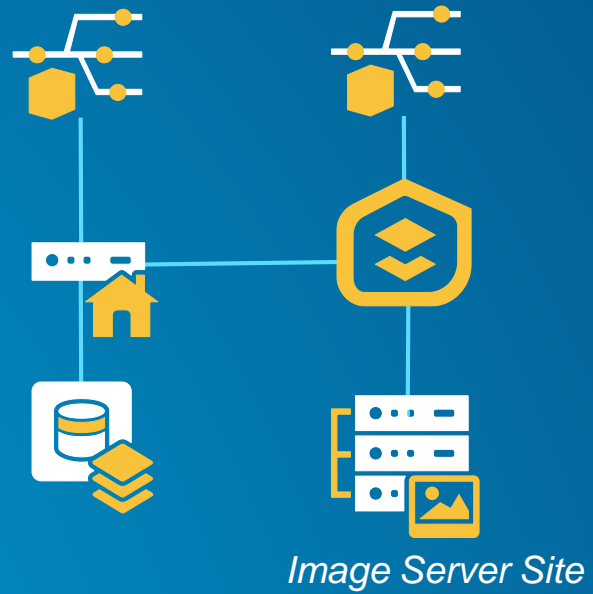
- **Dynamic image services from your own mosaic datasets**

- **Serve large collections of imagery and rasters with dynamic mosaicking and on-the-fly processing**
- ***N* number of sites**

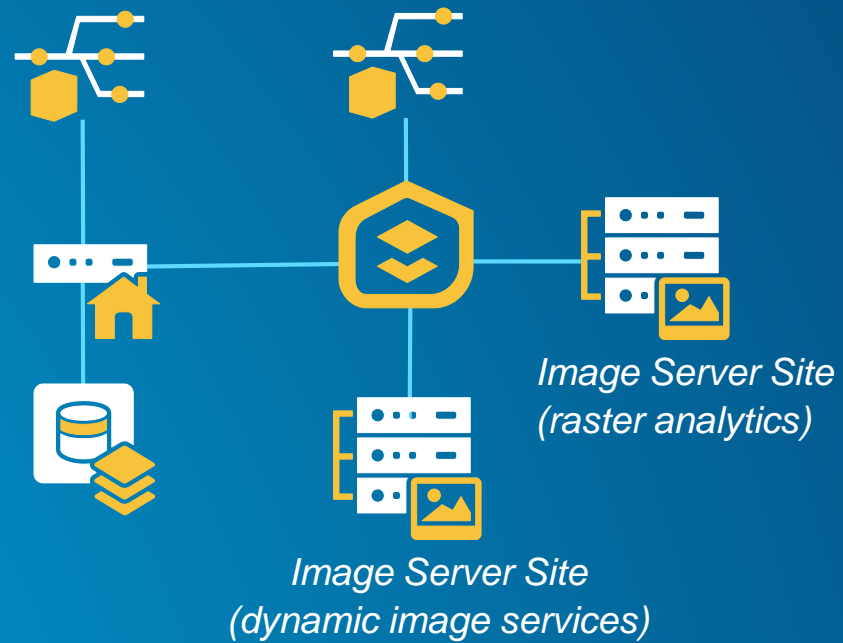
- **Raster Analytics**

- **Extracting information from imagery- distributed processing and analysis of imagery and rasters creating new persisted output at full source resolution**
- **Only 1 site can do raster analytics**
- **Choose whether to have separate site for raster analytics or one site for both traditional dynamic image services and raster analytics. At 10.5 the results of raster analytics will always be hosted out of the raster analytics site (this will change in future releases!)**



ArcGIS Enterprise | Adding Image Server to your deployment



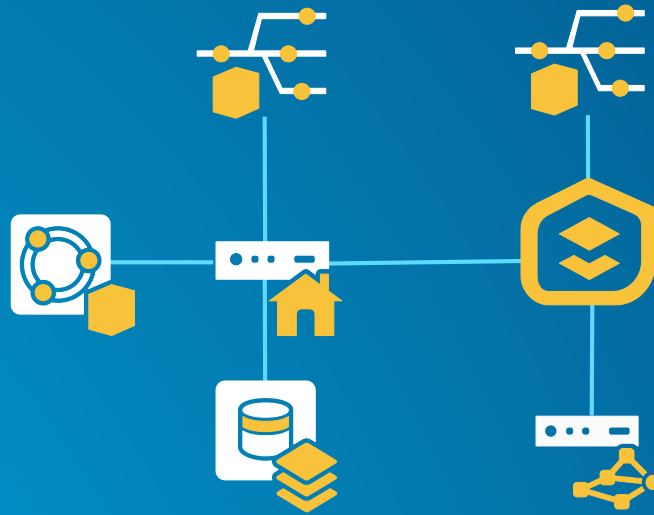
ArcGIS Enterprise | Adding Image Server to your deployment



ArcGIS Enterprise | Adding GeoAnalytics Server to your deployment

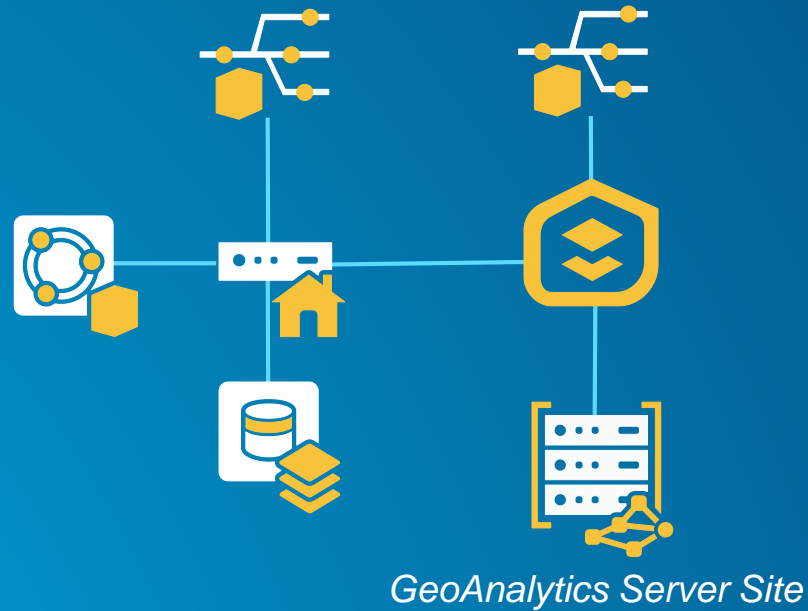
- **GeoAnalytics Server provides distributed computing infrastructure for processing large volumes of vector and tabular data** 

 - **One site for GeoAnalytics Server**
 - **Requires spatiotemporal big data store to be configured with the base deployment**
 - **Note: ArcGIS Data Store (relational, tile cache, spatiotemporal) is always configured with *the hosting server site***
 - **Provide at least 16 GB memory and at most 64 GB for spatiotemporal big data store**
 - **Many variables go into sizing multi-machine deployment**
 - **More machines or more cores or more memory does *not* always mean faster processing!**

ArcGIS Enterprise | Adding GeoAnalytics Server to your deployment





GeoAnalytics Server Site

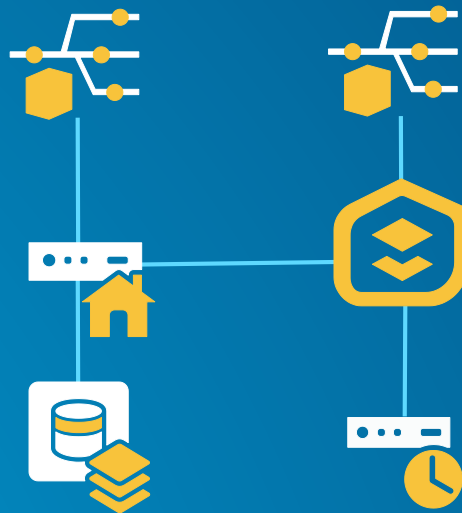
ArcGIS Enterprise | Adding GeoAnalytics Server to your deployment



ArcGIS Enterprise | Adding GeoEvent Server to your deployment

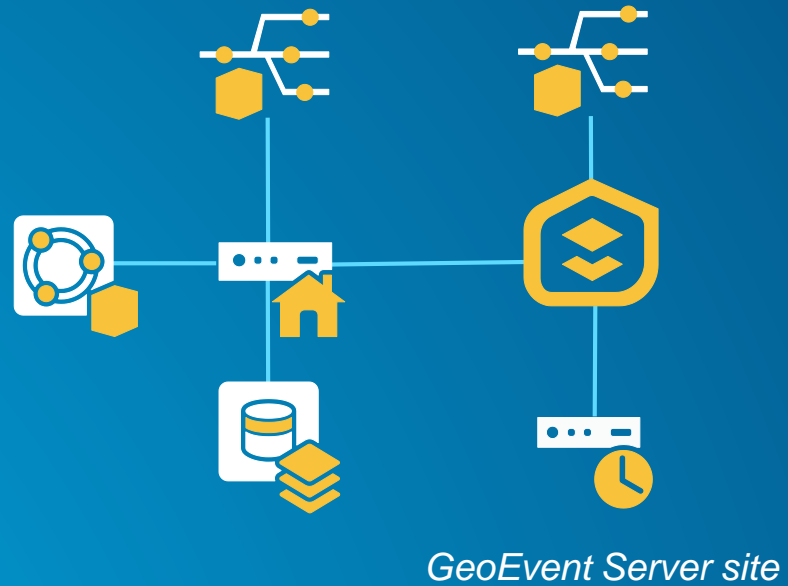
- **GeoEvent Server provides the ability to create GeoEvent services to process real-time data ingestion and processing**  
- **At GeoEvent Server 10.5 and prior the strong recommendation is to use *single machine* sites**
- **Each machine must be powerful enough to handle peak throughput for the combined set of GeoEvent services (scale up!)**
- **To handle multiple input stream that go beyond a single machine: use additional separate GeoEvent Server sites**
- **Archiving large volumes of data: use spatiotemporal big data store**

ArcGIS Enterprise | Adding GeoEvent Server to your deployment

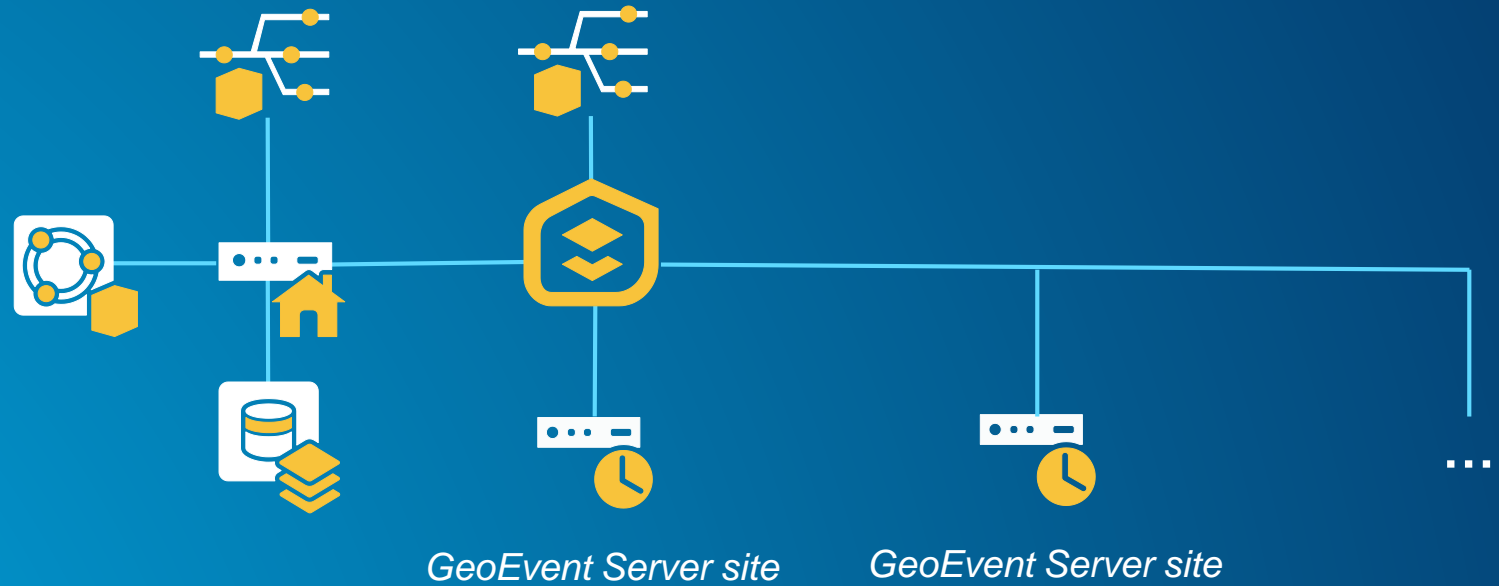


GeoEvent Server site

ArcGIS Enterprise | Adding GeoEvent Server to your deployment



ArcGIS Enterprise | Adding GeoEvent Server to your deployment



Key takeaways

- **ArcGIS Enterprise is designed for the federated server model**
 - **Features that require the federated server model:**
 - ArcGIS Pro publishing
 - Raster Analytics and GeoAnalytics
 - Archiving large volumes of data from GeoEvent Server
 - ...
- **Understand the base deployment**
- **Understand the individual server roles and the recommendations and requirements of each- they're not all the same!**



Summary

Summary

Don't panic!

Q&A



esri

**THE
SCIENCE
OF
WHERE**