ArcGIS Enterprise: An Introduction

Philip Heede
ArcGIS

ArcGIS Online

- Hosted by Esri (SaaS)
  - Upgraded automatically (by Esri)
  - Esri controls SLA

- Esri-provided content and services
  - Basemaps
  - Living Atlas
  - GeoEnrichment, Routing, ...

Core Web GIS functionality
(Apps, visualization, smart mapping, analysis…)

ArcGIS Enterprise

- In your own infrastructure (Software)
  - Upgraded manually (by organization)
  - Organization controls SLA

- Advanced GIS functionality
  - GIS Server
  - Image Server (optional)
  - GeoEvent Server (optional)
  - GeoAnalytics Server (optional)
ArcGIS Enterprise | Key Features

Smart Mapping and visualization
ArcGIS Enterprise | Key Features

Analytics

Standard Tools | GeoAnalytics Tools | Raster Analysis Tools
ArcGIS Enterprise | Key Features

Geocoding

lat: 45.5169068,
long: -122.6806534
ArcGIS Enterprise | Key Features

Routing
ArcGIS Enterprise | Key Features

Living Atlas Content
ArcGIS Enterprise | Key Features

App Templates
ArcGIS Enterprise | Key Features

3D Maps and Configurable Apps
All of these components existed in the software pre-10.5
ArcGIS Enterprise | Server Roles

GIS Server
Image Server
GeoEvent Server
GeoAnalytics Server
Business Analyst Server
ArcGIS Enterprise | Base Deployment

- ArcGIS Server
- Portal for ArcGIS
- ArcGIS Data Store
- ArcGIS Web Adaptor
ArcGIS Enterprise provides Web GIS in your infrastructure.

The Base ArcGIS Enterprise Deployment refers to the essential deployment pattern of the ArcGIS Enterprise software components that allow for a functional Web GIS.
A single machine deployment

A multitier deployment

Or a highly available deployment of any configuration.
ArcGIS has market leading capabilities for visualizing, analyzing, and editing vector and tabular data, performing fast and efficient routing, doing fast and accurate geocoding, and many other traditional GIS features available through Esri and OGC compliant REST web services
Ability to publish services and share maps and layers from your own business databases

- Enterprise geodatabase (SQL Server, Oracle, PostgreSQL, ..)
- File-based data sources (File geodatabase, shapefiles, ..)
GIS Server: Powering traditional GIS web services and layers

- Map Image Layers (Dynamic Map Services)
- Feature Layers (Feature Services)
- Tile Layers (Cached Map Services, Vector Tiles)
- Web Tools (Geoprocessing Services)
- Geocode services
Anyone using ArcGIS Server 10.1 or higher can upgrade to ArcGIS Server 10.5 without making any changes to their system configuration.
GeoAnalytics Server
ArcGIS has a new way of processing **vector and tabular data** with both spatial (location) and temporal (time) components that is designed **fast distributed analytics and storage**
GeoAnalytics Server | Adding to ArcGIS

- GeoAnalytics adds to existing ArcGIS analysis capabilities

Geoprocessing + GeoAnalytics + Web GIS Layers

Powerful analytics + Distributed analytics and storage + Rich geoinformation model

more + new + extends
Run analytics against data that is too big for a single desktop machine
GeoAnalytics Server | Rich Collection of Analysis Tools

**Summarize Data**
- Aggregate Points
- Join Features
- Reconstruct Tracks
- Summarize Attributes
- Summarize Within

**Find Locations**
- Find Similar Locations

**Analyze Patterns**
- Calculate Density
- Create Space Time Cube
- Find Hot Spots

**Use Proximity**
- Create Buffers

**Manage Data**
- Copy to Data Store
GeoAnalytics Server | Familiar User Interfaces

ArcGIS Pro
Map Viewer
GeoAnalytics Server | Developer Interfaces

Geoprocessing Service
- REST API
- ArcGIS Python API

ArcGIS REST Services Directory
Home > services > System > GeoAnalyticsTools (GPServer)

REST | SOAP

System/GeoAnalyticsTools (GPServer)
Service Description: The GeoAnalyticsTools service is provided for distributed analysis of large datasets.

Tasks:
- AggregatePoints
- DescribeDataset
- JoinFeatures
- CreateBuffers
- CalculateDensity
- ReconstructTracks
- CreateSpaceTimeCube
- CopyToDataStore
- SummarizeAttributes
- SummarizeWithin
- FindSimilarLocations
- FindHotSpots

Execution Type: esriExecutionTypeAsynchronous
GeoAnalytics Server | Why?

- Applicable to anyone with ArcGIS Desktop
  - Helps you get “big jobs” done faster
  - Example: aggregate 6 million points into 44,000 polygons in 1.5 minutes on a single server

- Applicable to anyone performing automated regular analysis on large datasets
  - Fully scriptable in custom solutions

- GeoAnalytics is *out of the box* and *ready to use* within your ArcGIS system
  - familiar and simple interfaces
  - integrated with the rest of the platform so results can be instantly visualized and refined
  - faster prototyping, R&D, and insight into your data
Image Server
with Raster Analytics
Image Server

An ArcGIS Server licensing role dedicated to the efficient processing, analysis and dissemination of imagery and rasters

- **Dynamic Image Services** – ‘Making your imagery accessible’
  - Serve large collections of imagery and rasters with dynamic mosaicking and on-the-fly processing

- **Raster Analytics** – ‘Extracting information from imagery’
  - Enabling massive distributed processing and analysis of imagery and rasters
Ability to publish services and share image layers from your own mosaic datasets performing on-the-fly analysis using advanced raster functions and models.
ArcGIS has a new way to create and execute spatial analysis models and raster processing chains which leverages distributed storage and analytics.
Raster Analytics adds to existing ArcGIS concepts

**Dynamic Raster Models**
- on-the-fly processing

**Geoprocessing Models / spatial analysis**
- powerful analytics

**Server-based distributed processing and storage**
- Scalable distributed analytics with persisted storage

**Web GIS Layers**
- Rich geoinformation model

**Portal**
- extends
• Run models against data that is too big for single desktop
  - Global rasters (big geography)
  - Large Scale (high resolution)
  - Large Collections (many)

• Run models and meet time constraints
Evolutions of GIS
GIS evolutions do not replace one another, they complement and elevate each other.
ArcGIS Enterprise | Web and Distributed GIS Pattern Evolution

Begin with ArcGIS Online & SaaS

Customer Managed Infrastructure
On-premises
Private Cloud
Public Cloud
(AWS, Azure, others)
Managed Services

ArcGIS Online

ArcGIS Server

ArcGIS Server

Portal

Portal

Portal

Begin with ArcGIS Enterprise & Software
ArcGIS Enterprise | Web and Distributed GIS Pattern Evolution

Begin with ArcGIS Online & SaaS

Customer Managed Infrastructure
- On-premises
- Private Cloud
- Public Cloud (AWS, Azure, others)
- Managed Services

ArcGIS Online

Begin with ArcGIS Enterprise & Software
ArcGIS Enterprise | Server GIS vs. Web 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

Diagram:
- Users
- Apps
- Services
- Data
- Portal
- Web Maps
- Web Scenes
- Web Layers
A named user is your identity within Web GIS.
ArcGIS Enterprise | Named Users

Level 1
Equivalent built-in roles: Viewer
Can view content, including maps, apps, and data.
Cannot create or own content.

Level 2
Equivalent built-in roles: Viewer, User, Publisher, Administrator
Can create, view, share, and own content, including maps, apps, and data. Specific permissions will vary depending on privileges granted.
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.
The web frontend and infrastructure backend that supports a user’s interaction and overall experience with your Web GIS.
The Esri managed data repository that stores the spatial content that has been shared to Portal.
ArcGIS Enterprise | Anatomy of Web GIS in Your Infrastructure

- ArcGIS Server
- Portal for ArcGIS
- ArcGIS Data Store
- ArcGIS Web Adaptor

- Relational
- Tile Cache
- Spatiotemporal
ArcGIS Enterprise | Anatomy of Web GIS in Your Infrastructure

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