ArcGIS for Server: An Introduction

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Agenda

- Product overview
- What is ArcGIS for Server
- Publishing GIS resources onto the web
- Working with ArcGIS Online/Portal for ArcGIS
- ArcGIS client applications
- ArcGIS for Server extensions
- Editions and licensing levels
- Summary
ArcGIS Is a Platform
Enabling GIS Everywhere

Simple
Integrated
Open

Available in the Cloud . . .
. . . and On-Premises
ArcGIS for Server enables Web GIS in Your Infrastructure

Client applications
E.g.: Collector, Dashboard, Explorer, Esri Maps for … Apps, and Web AppBuilder

Portal for ArcGIS
Includes data from ArcGIS Online

GIS Server
ArcGIS Web Adaptor, Enterprise geodatabase, ArcGIS Data Store
What is ArcGIS for Server?

• Enables “Web GIS” in your infrastructure
  - On-premises or in your own cloud
• Ready to use applications and GIS services
  - Spatial data management
  - Visualization
  - Analysis
• Share your GIS work and resources
• Spatially enable your organization
  - Promote “maps everywhere”
ArcGIS for Server Customers
www.esri.com/software/arcgis/arcgisserver/success-stories
ArcGIS for Server enables Web GIS in your infrastructure

**Client applications**
E.g.: Collector, Dashboard, Explorer, Esri Maps for … Apps, and Web AppBuilder

**Portal for ArcGIS**
Includes data from ArcGIS Online

**GIS server**
ArcGIS Web Adaptor, Enterprise geodatabase, ArcGIS Data Store
ArcGIS for Server includes

- **Back end components:**
  - GIS Server
  - Portal for ArcGIS
  - ArcGIS Web Adaptor
  - ArcGIS Data Store
  - Enterprise geodatabase

- **Client apps:**
  - Collector for ArcGIS
  - Operations Dashboard for ArcGIS
  - ArcGIS Maps for Office
  - Esri Maps for … Apps
  - Web AppBuilder for ArcGIS
  - Explorer for ArcGIS
  - Survey123 for ArcGIS
Foundation
What are GIS services?

- **GIS service** → GIS resource running on a server
  - vs. GIS application on your local computer

- Share GIS resource to the web
ArcGIS Server – GIS Server

- Pure web services GIS server
  - Easy install and configuration
  - Self contained, no external dependencies
- Built for resilience
- Designed for enterprise systems
- Works on physical machines or in the cloud
  - E.g., Amazon or Microsoft Azure
- Works with other server-side components
  - ArcGIS Web Adaptor
  - Enterprise geodatabase
  - ArcGIS Data Store
## GIS Server – System Requirements

### Windows

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Minimum OS version</th>
<th>Maximum OS version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows Server 2012 R2 Standard and Datacenter (64 bit [EM64T])</td>
<td>Update: April 2014</td>
<td></td>
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<tr>
<td>Windows Server 2012 Standard and Datacenter (64 bit [EM64T])</td>
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<td>Windows Server 2008 R2 Standard, Enterprise, and Datacenter (64 bit [EM64T])</td>
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<tr>
<td>Windows 7 Ultimate, Professional, and Enterprise (64 bit [EM64T])</td>
<td>SP1</td>
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### Linux

<table>
<thead>
<tr>
<th>Operating system</th>
<th>Minimum OS version</th>
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</thead>
<tbody>
<tr>
<td>Red Hat Enterprise Linux Server 7</td>
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<tr>
<td>Red Hat Enterprise Linux Server 6</td>
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<td>Update 7</td>
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<tr>
<td>Red Hat Enterprise Linux Server 5</td>
<td>Update 7 with libX11 patch</td>
<td>Update 11</td>
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<tr>
<td>SUSE Linux Enterprise Server 12</td>
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<td>No Service Pack</td>
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<tr>
<td>SUSE Linux Enterprise Server 11</td>
<td>Service Pack 2</td>
<td>Service Pack 3</td>
</tr>
</tbody>
</table>
ArcGIS Server Manager

- Web browser based **administrative console** to manage Server
  - Services, site management, security, reporting, and logs
**Server Administrator Directory**

http://<server name>:6080/arcgis/admin

- Enables **scripting of Server administration tasks**
  - E.g., Join machine to a site, start/stop services, security, etc.
- Can be invoked from:
  - Python, Java, JavaScript, C#, PowerShell, Ruby, Scala, Perl, etc.

<table>
<thead>
<tr>
<th>Resources</th>
<th>Supported Operations</th>
<th>Supported Interfaces</th>
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<tbody>
<tr>
<td>machines</td>
<td>generateToken</td>
<td>REST</td>
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<tr>
<td>clusters</td>
<td>exportSite</td>
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<td>services</td>
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<tr>
<td>publicKey</td>
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</tbody>
</table>

*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 use of scripts.*
Services Directory

- **ArcGIS Services Directory** exposes GIS services
  - [http://<servername>/ArcGIS/rest](http://<servername>/ArcGIS/rest)

![ArcGIS REST Services Directory](image)

**Folder: Naperville**
- Current Version: 10.41
- View Footprints In: ArcGIS Online map viewer

**Services:**
- Naperville/CensusTracts (MapServer)
- Naperville/ElevationContours (MapServer)
- Naperville/Hydrology (MapServer)
- Naperville/SewerSystemNetwork (MapServer)
- Naperville/StormwaterNetwork (MapServer)
- Naperville/Streets (MapServer)
- Naperville/GeographyLandCover (MapServer)
- **Naperville/WaterDistributionNetwork (MapServer)**
  - Supported Interfaces: REST, SOAP, Sitemap, Geo Sitemap

**Naperville/WaterDistributionNetwork (MapServer)**
- View In: ArcGIS JavaScript, ArcGIS Online map viewer, ArcMap, ArcGIS Explorer
- View Footprint In: ArcGIS Online map viewer
- Service Description:
  This map displays the water distribution network for the City of Naperville, IL.
ArcGIS Server – Web protocols

- Its GIS services can be accessed via:
  - Representational State Transfer (REST)
  - Simple Object Access Protocol (SOAP)
  - Keyhole Markup Language (KML)
  - Open Geospatial Consortium (OGC)
Demo

Tour of the GIS Server
ArcGIS Web Adaptor

- Enables ArcGIS Server to work with 3rd party web server
  - E.g., Microsoft IIS, IBM Web Sphere, etc.
- Leverage web server features
- Enables web-tier authentication
- Provides more flexibility to control site access
- Conceptually like a reverse proxy
- Optional, but recommended component for GIS Server
  - Required to integrate with your enterprise infrastructure
  - Separate software install
ArcGIS for Server – Enterprise Geodatabase

- Central data repository for your spatial data and storage management
- Enables geospatial data modeling
  - Topology, Geometric network, Network dataset, Mosaic dataset
- Functionality includes: versioned editing, geodatabase replication, and archiving
- Supported DBMS platforms: DB2, Informix, Oracle, PostgreSQL, and SQL Server
- Create with geoprocessing tool
- Also called “Multi-user geodatabase”
ArcGIS Data Store – Introduced at 10.3

• Deploy with Portal for ArcGIS to enable publishing directly to Portal
• Enables
  - Scalable hosted feature services
  - 3D scene services
  - Analysis tools in Portal map viewer
• Highly Available
• Automatic Backup and Recovery
• Required to enable Web GIS on-premises
  - Separate software install
ArcGIS for Server technical sessions

- **Administering Your GIS Server**
  - Tues 1:30 pm Room 3
  - Thurs 3:15 pm Room 2

- **ArcGIS for Server Security: An Introduction**
  - Wed 1:30 pm Room 15A
  - Thurs 8:30 am Room 5B

- **ArcGIS for Server: What’s New**
  - Tues 3:15 pm Room 2
  - Thurs 1:30 pm Ballroom 6D
Publishing GIS Content
Publishing workflow for GIS Services

1. Author
2. Publish
3. Share/Use
1. **Authoring Maps for ArcGIS Server**
   Create professional looking maps for the web

- Leverage ArcMap’s powerful cartographic capabilities
- **WYSIWYG** map authoring user experience
- Follow best practices for optimal maps
Publishing GIS resources

- **Share As Service** wizard
  - Publish GIS service
  - Create service definition file
  - Overwrite an existing GIS service
- **Service Editor**
  - Defines GIS service properties
- **Analyze map for optimization**
  - Fix errors and address warnings
Web Mapping - Terminology
Common ArcGIS for Server concepts

- Map service → probably the most common web service published
- 2 types
  - Cached vs. Dynamic
  - Choice on how you publish data depends on business requirements
Cached Map Service

- Pre-render data as a collection of images stored on the server
- Used for data that does not change frequently
- Typically raster data
Dynamic Map Service

- Map service data content is generated on-the-fly as needed
- Used for data that changes/updated frequently
- Typically vector data
2 Publishing GIS resources

• You can publish
  1. **GIS Service** or
  2. **Service Definition file**
     - Defines service schema and can be used to publish GIS service later

• **All GIS resources are published with the same workflow**
Demo
Publish a map service workflow
Other Types of Web Services

- Many GIS resources can be shared as GIS web services

- Common web workflows
  - Feature services → web editing
  - Geoprocessing services → share spatial analysis tools and models; custom layouts
  - Locator services → geocoding
At 10.4 - Vector Tiles

- Tiles created with ArcGIS Pro 1.2
  - Map tiles for vector data
  - Uses the Mapbox vector tile spec
  - Styling converted to Mapbox GL style spec

- Advantages
  - Display quality
  - Dynamic labeling
  - Map styling

Labels rotate and flip
Publishing technical sessions

- **Best Practices for Caching Maps and Vector Tile Layers**
  - Wed 10:15 am Ballroom 6E
  - Thurs 1:30 pm Room 1 A/B

- **Creating and Serving Tile Cache Imagery**
  - Tues 1:30 pm Expo: Demo Theater 9 - Imagery

- **Working with Feature Services** (web editing)
  - Tues 3:15 pm Room 31 B/C
  - Thurs 8:30 am Ballroom 6F

- **Creating Geoprocessing Services** (sharing models and tools)
  - Tues 1:30 pm Room 14B
  - Thurs 8:30 am Room 16A
Sharing your GIS Content
3 Share/Use GIS Services

- **Register GIS services in a portal** (ArcGIS Online or Portal for ArcGIS)
  - Leverage GIS services in a Web Map
  - Promotes “maps everywhere” paradigm
- **Directly consume GIS services in client applications**
Portal for ArcGIS
Since 10.3 - Included with ArcGIS for Server Standard and Advanced editions

- **Central destination for your GIS assets**
- Provides a user friendly “front end” to your GIS services
  - Search and discovery
  - Simple mapping
  - Collaboration

- **Solution instead of ArcGIS Online when**
  - Additional security requirements
  - No public cloud option
What is a Web Map?

- Foundation for your maps and apps
- Enables “intelligent maps” → Web Map stores references to web services and data, display and behavior settings
- Supports: smart mapping, pop-ups, editing, analysis, time, etc.

- Create in ArcGIS Online/Portal for ArcGIS map viewer
- Can be leveraged by all other Esri Apps
Data content in a Web Map

**Conceptual terms**

- **Basemaps**
  - Geographic frame of reference
  - Typically contain static data

- **Operational Layers**
  - Information overlays that end users interact with
  - Contain dynamic data

- **Operational layers display on top of basemaps**
Clients to Web Maps

- Web Application Templates
- Web AppBuilder for ArcGIS
- Collector for ArcGIS
- Explorer for ArcGIS
- ArcGIS Maps for Office
- Esri Maps for ... Apps
- Business Apps
- Operations Dashboard for ArcGIS
- ArcGIS Online Portal for ArcGIS
- GIS Server
- ArcGIS Pro
- Web Apps
- Mobile Apps
- Desktop Apps
- Esri Maps for Office
- Explorer for ArcGIS
- Collector for ArcGIS
- Web AppBuilder for ArcGIS
- Web Application Templates
Demo

Explore Portal for ArcGIS and Client Apps
Portal for ArcGIS tech sessions

- **Portal for ArcGIS: An Introduction**
  - Tues 10:15 am Room 2
  - Wed 10:15 am Room 7 A/B
  - Fri 9:00 am Room 5A

- **Portal for ArcGIS: Administration**
  - Wed 1:30 pm Room 31 B/C
  - Thurs 10:15 am Room 2
Web GIS in Large Organizations

- GIS Server for different Depts.
- Organization accesses all of its GIS assets through a portal
  - User friendly UX
  - Search and discovery
  - Collaboration
# ArcGIS for Server – Editions & Levels

## Functionality

<table>
<thead>
<tr>
<th>Edition</th>
<th>Includes</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic</td>
<td>- Enterprise geodatabase</td>
<td>Workgroup: SQL Server Express</td>
</tr>
<tr>
<td></td>
<td>- Geodata services for replication</td>
<td>Enterprise: Any supported database</td>
</tr>
<tr>
<td></td>
<td>- Read only feature services</td>
<td></td>
</tr>
<tr>
<td>Standard</td>
<td><strong>Basic features plus</strong></td>
<td>Workgroup: ”</td>
</tr>
<tr>
<td></td>
<td>- Map, globe, geocoding, geoprocessing (ArcView tools),</td>
<td>Enterprise: ”</td>
</tr>
<tr>
<td></td>
<td>- Web editing, Portal for ArcGIS</td>
<td></td>
</tr>
<tr>
<td>Advanced</td>
<td><strong>Standard features plus</strong></td>
<td>Workgroup: ”</td>
</tr>
<tr>
<td></td>
<td>- Advanced geoprocessing</td>
<td>Enterprise: ”</td>
</tr>
<tr>
<td></td>
<td>- ArcGIS Mobile</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Portal for ArcGIS</td>
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</tbody>
</table>
ArcGIS for Server Extensions

- Support specific workflows
- Examples:
  - Real-time data feeds – GeoEvent
  - Imagery – Image
  - Network analysis – Network Analyst
  - QA/QC workflows – Data Reviewer
ArcGIS for Server Resources

- ArcGIS 10.4 for Server Functionality Matrix whitepaper
- ArcGIS for Server 101 – ArcUser technical article

ARCGIS 10.4 FOR SERVER
FUNCTIONALITY MATRIX
Summary

- ArcGIS for Server enables Web GIS in your infrastructure
- Architecture
- Publishing GIS resources
  - Author > Publish > Share/Use
  - Design patterns and terminology
- Working with ArcGIS Online/Portal for ArcGIS and client applications
- Extensions
- Editions and Levels
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Find the session you want to review
Scroll down to the bottom of the session
Answer survey questions and submit