



Esri International User Conference | San Diego, CA
Technical Workshops | July 12, 2011

ArcGIS Server - An Introduction

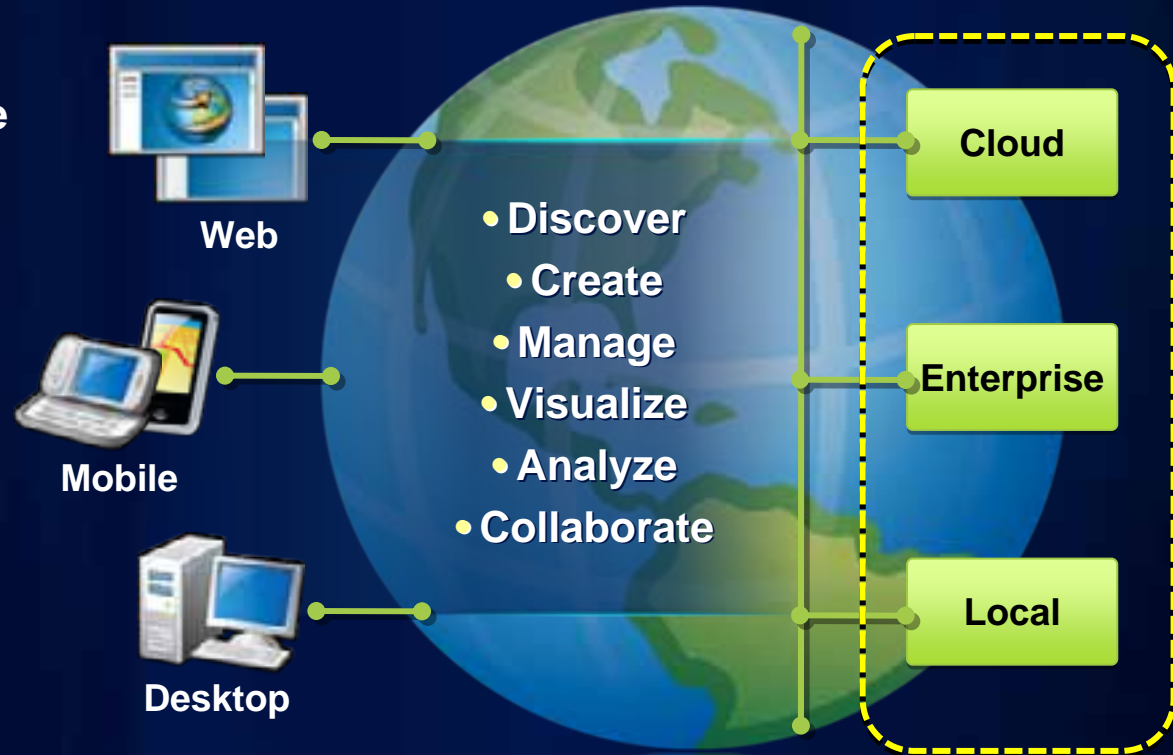
Dan Haag and Derek Law

Agenda

- **What is ArcGIS Server?**
- **Types of Web services**
- **Publishing resources onto the Web**
- **Clients to ArcGIS Server**
- **Editions and Licensing levels**
- **Summary**
- **Questions**

ArcGIS 10 — A Complete System

**Easier
More Powerful
and Everywhere**



ArcGIS Server

Delivering GIS with powerful services and applications

- **Complete, out-of-the-box Web based GIS**
 - Ready to use applications and GIS services for
 - Spatial data management
 - Visualization
 - Analysis
- Platform for developing Web and enterprise applications and services
 - Available for **.NET** and **Java** platforms



ArcGIS Server – GIS Services

Many different types available

Applications = **User Experience**



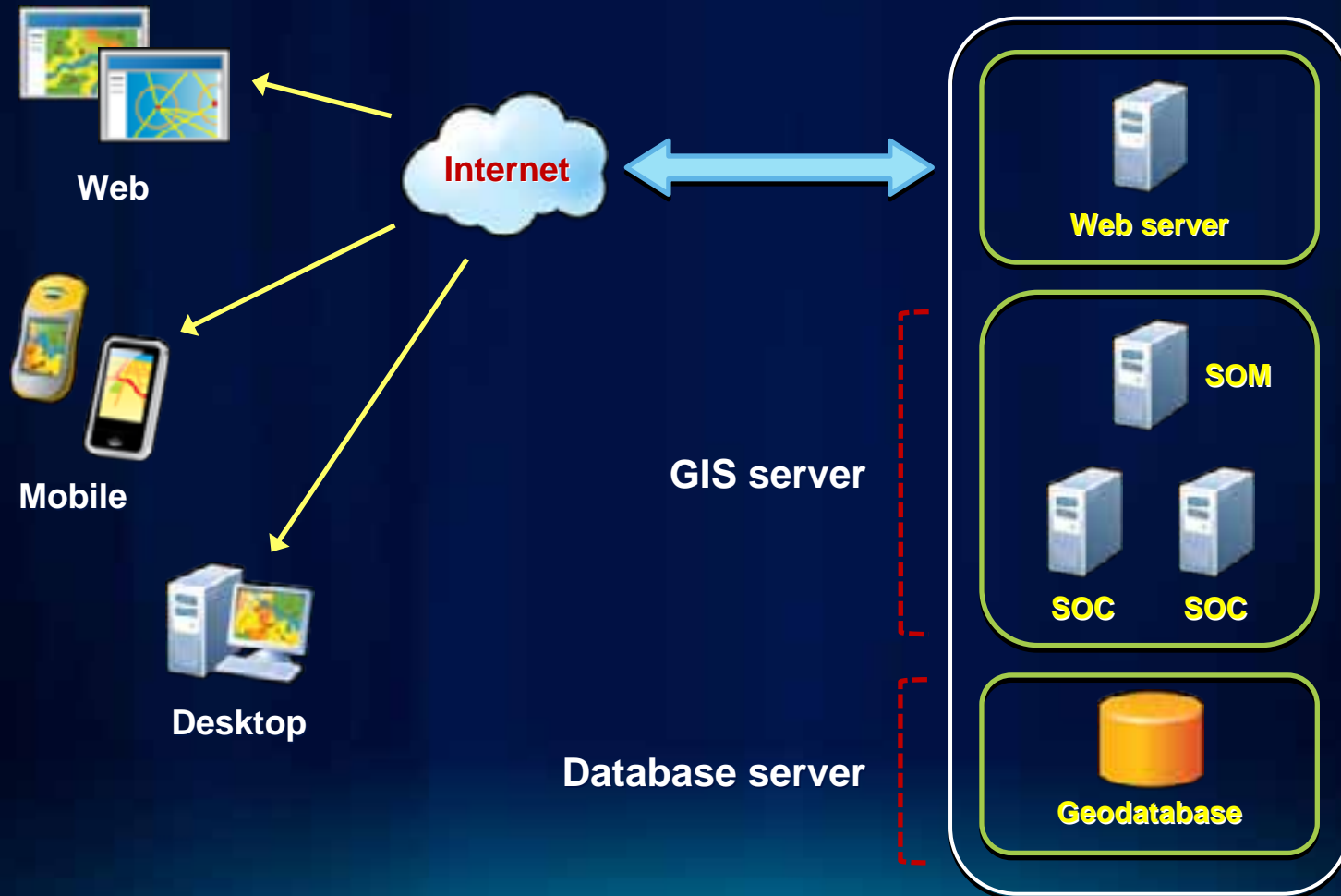
Services = **Capabilities**

ArcGIS Server – Main Components

- 4 main product components:
 1. **Web server**
 2. **Server Object Manager (SOM)**
 - Manages the services running on the server
 - Monitors and balances server resources
 3. **Server Object Container (SOC)**
 - Process that runs GIS services
 - Typically have many SOC processes running
 4. **Geodatabase**
 - ArcSDE technology
- Can be all on one machine or distributed over several machines

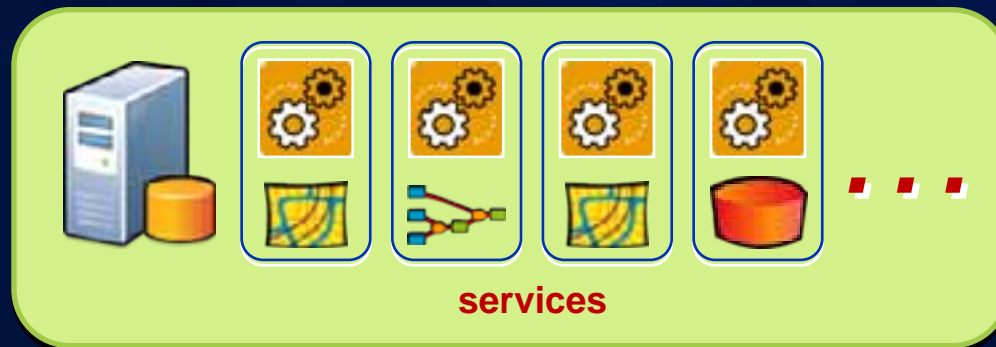
ArcGIS Server – Architecture

Conceptual overview of main components



What are GIS Services?

- **GIS Service = GIS resource running on a server**
 - vs. GIS application on your local computer
- **Almost any GIS operation that you can do locally can also be run using a service**



- **Enables sharing of GIS resources across the Web**

Types of Services in ArcGIS Server



Map

View or query a 2D map on the server



Globe

View or query a 3D globe on the server



Geocode

Perform address matching on the server



Geodata

Perform data replication, extraction, or query over the intranet or Internet



Geoprocessing

Run a tool or model on the server and get the results back



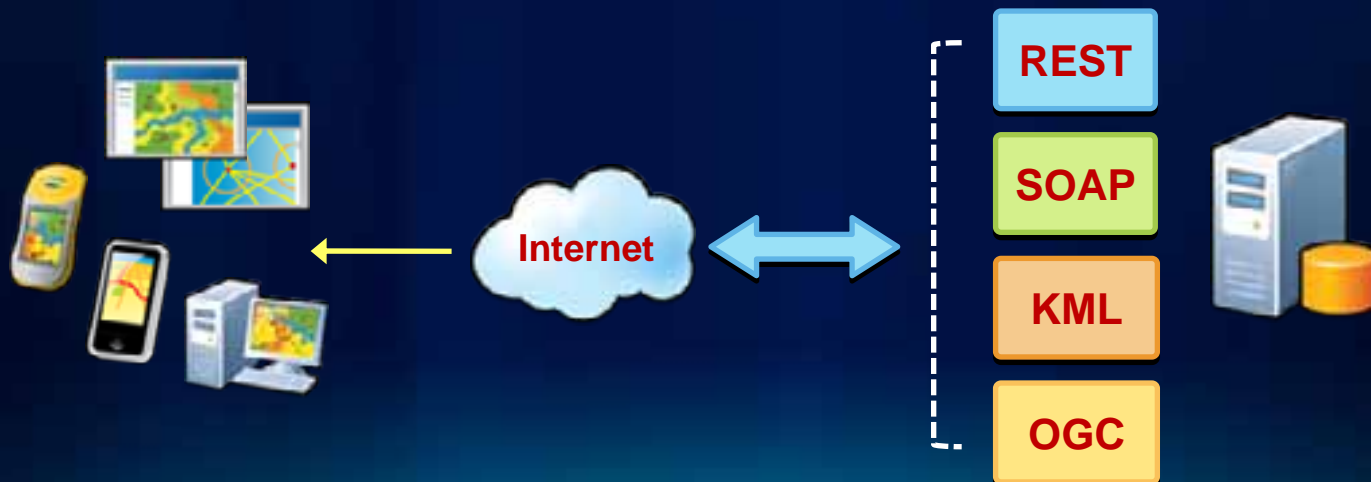
Image

Provide access to raster data through a Web service

ArcGIS Server – Web protocols

Support industry standards

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



ArcGIS Server – Services Directory

View of ArcGIS Server REST endpoint

- **ArcGIS Services Directory exposes REST API**
 - `http://localhost/ArcGIS/rest`



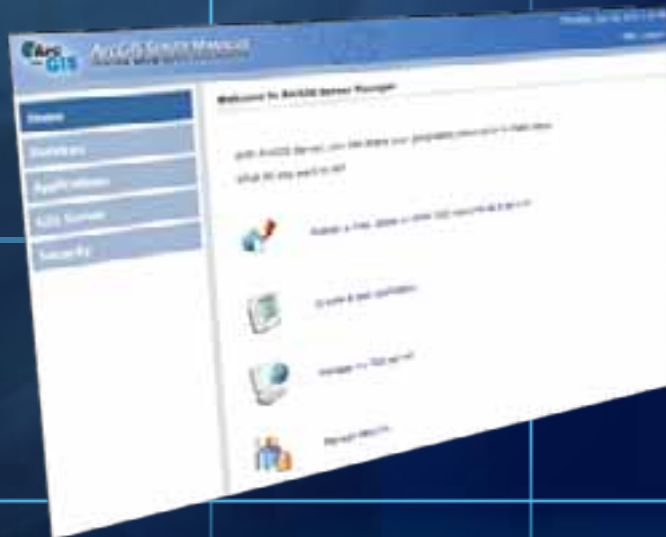
ArcGIS Server Manager

Web-based administration tool



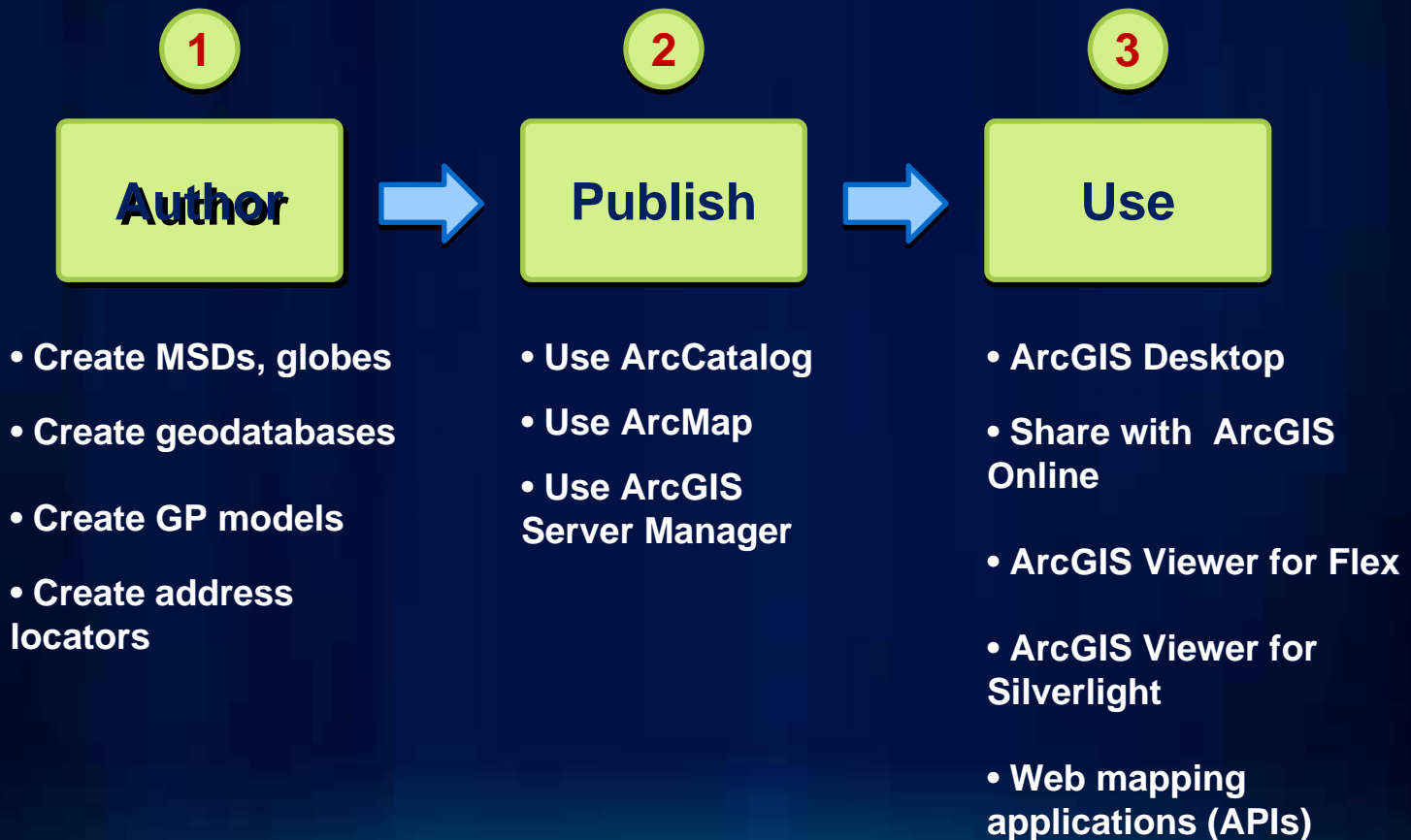
Demo

Explore ArcGIS Server Manager



ArcGIS Server Workflow

3 main steps



1 Authoring Maps for ArcGIS Server

Create professional looking maps for the Web

- Leverage ArcMap's powerful cartographic capabilities
- **WYSIWYG** map authoring
 - Support for all ArcGIS data types
- Follow best practices for optimal maps



Web Map Design – Terminology

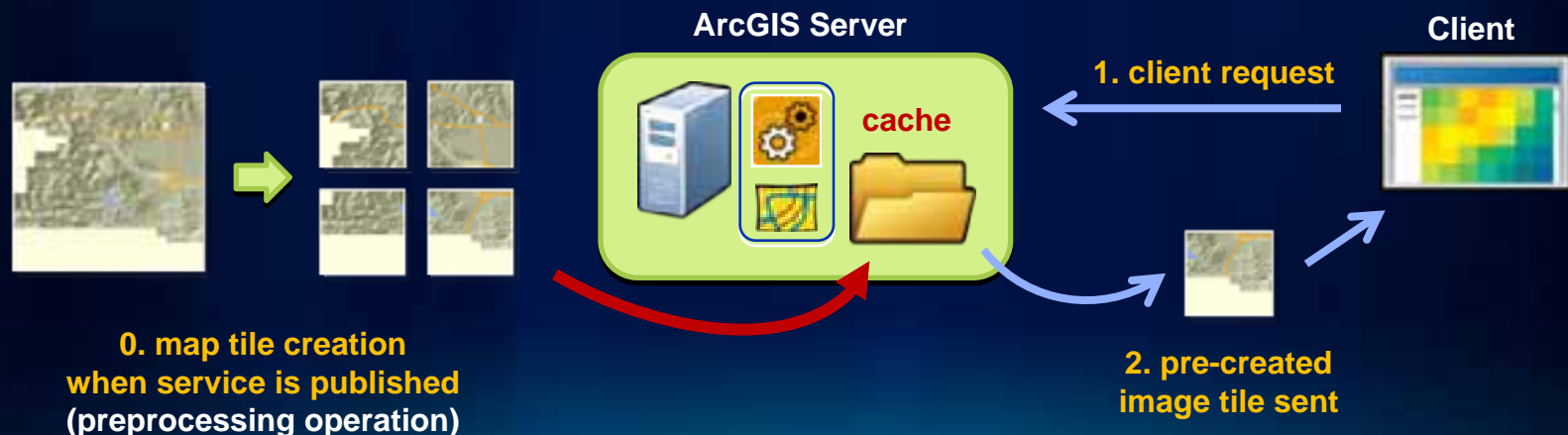
Common ArcGIS Server concepts

- Map service
 - 2 types
 - **Cached** vs. **Dynamic**
 - 2 formats
 - **Optimized** vs. **Classic**
- Web Map
 - Data content
 - **Base Maps** vs. **Operational layers**

Cached Map Service

Type 1

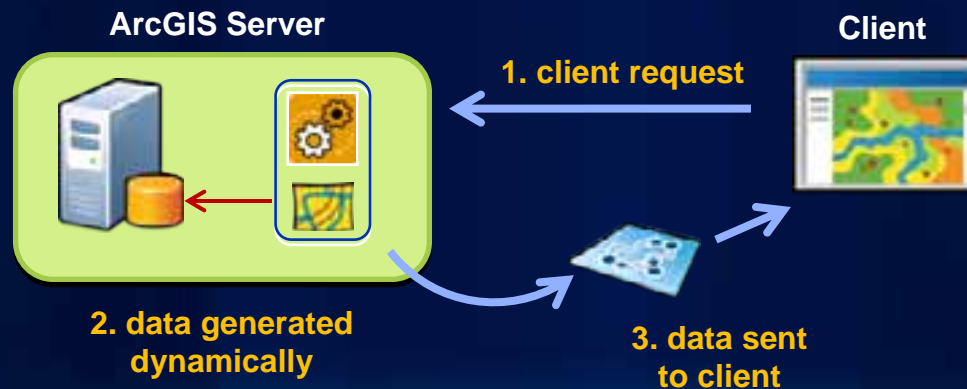
- Pre-render data as a collection of images stored on the server
- Used for data that does not change frequently
- Can be vector and raster data
- ArcGIS 10: **compact cache**



Dynamic Map Service

Type 2

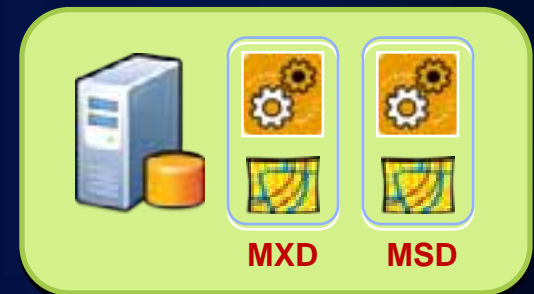
- Map service data content is generated on-the-fly as needed
- Used for data that changes/updated frequently
- Typically vector data



Map Service Formats

Depends on the map source file format

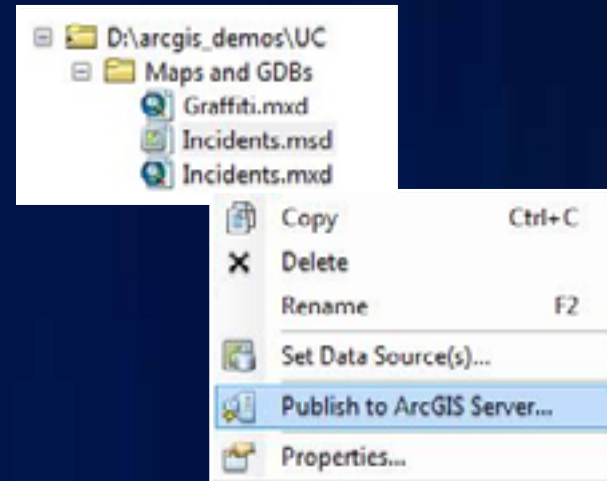
- **Optimized Map Service**
 - **Published from a MSD file**
 - Leverages **Map Services Publishing** toolbar in ArcMap
 - Optimizes map document for the Web
 - Available since 9.3.1 release
 - Strongly recommended
- **Legacy info: “Classic” Map Service**
 - Published from a MXD file



2 Publishing GIS Services

Making resources available over the Web

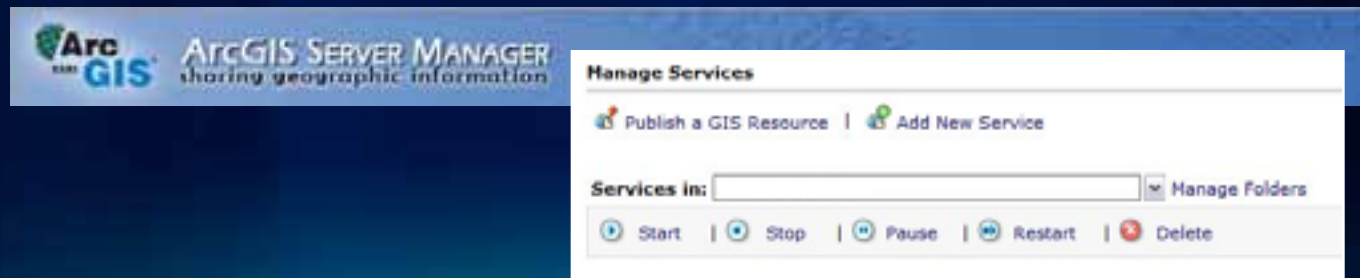
- Use ArcCatalog



- Use ArcMap



- Use ArcGIS Server Manager



Data Content in a Web Map

Common design pattern

- **Base Maps**
 - Geographic frame of reference
 - Contain static data
- **Operational layers**
 - Information overlays that end users interact with
 - Contain dynamic data
- Operational layers display on top of Base Maps

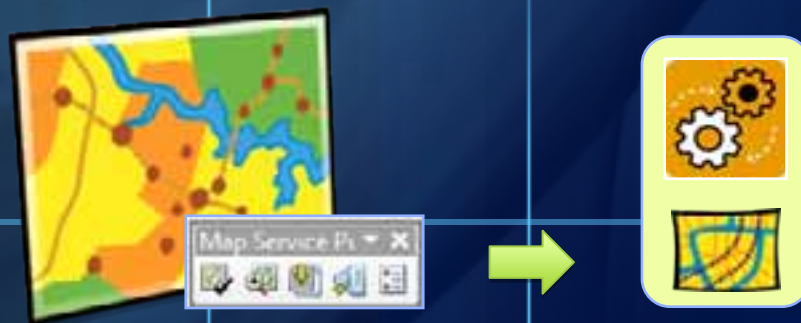


Related UC Sessions ...

- **Designing and Using Cached Map Services**
 - Thurs 3:15 PM Room 8

Demo

Publishing a map service

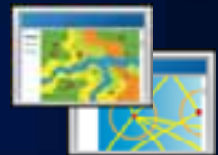


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Clients to ArcGIS Server

Many options available

- **ArcMap, ArcGIS Explorer, ArcReader, and ArcGIS Engine** applications
- **Web Applications**
 - ArcGIS Online: ArcGIS.com Viewer, ArcGIS Explorer Online
 - Browser based: JavaScript, Flex, and Silverlight
- **ArcGIS for SharePoint**
- **Mobile clients**
 - ArcGIS Mobile, ArcGIS for iOS, Android
- **OGC clients**
 - Access via Open Source standards
 - E.g., OpenLayers, Gaia, Google Earth ...



ArcGIS Online

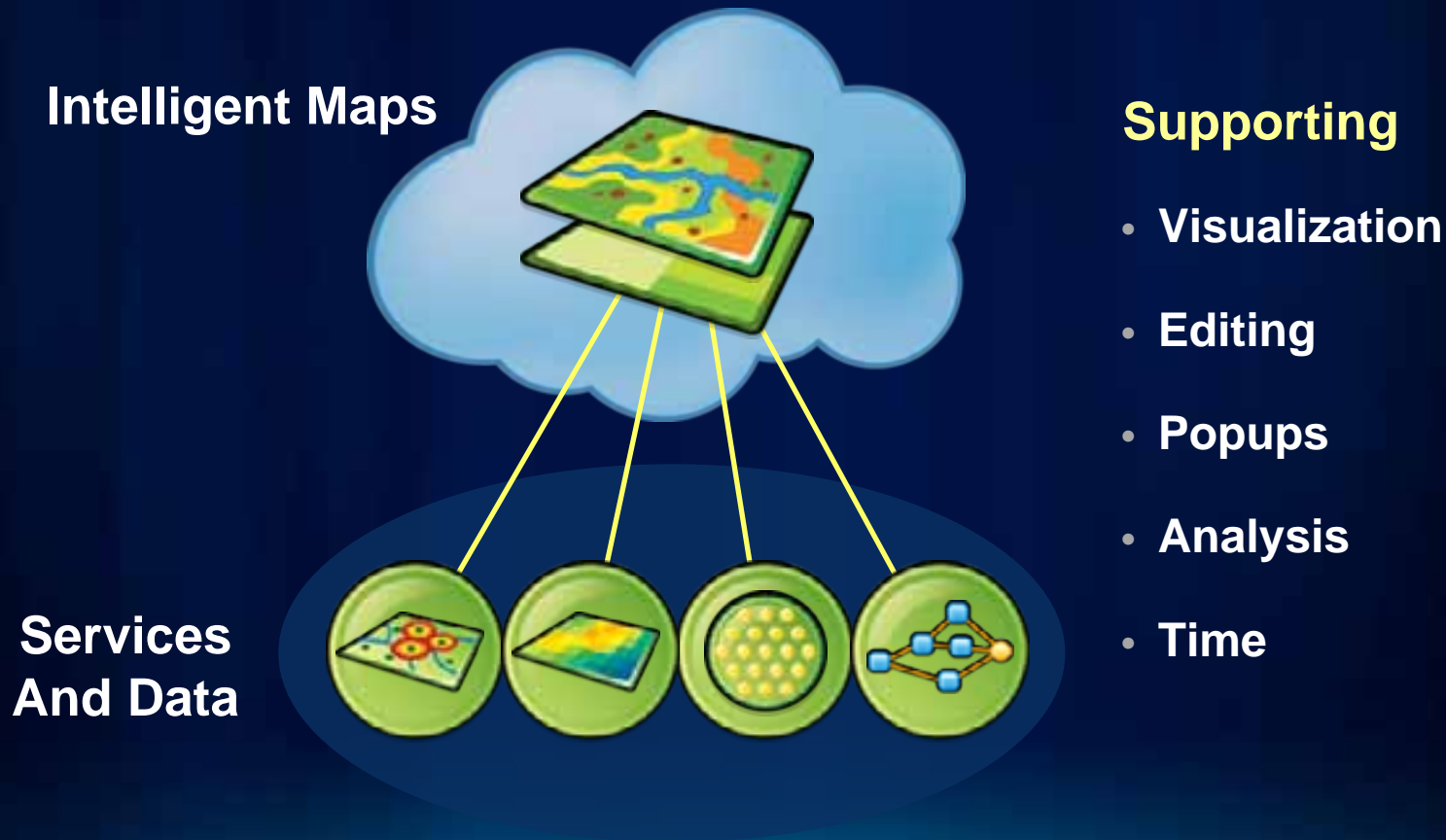
Find, create, and share geographic information

- GIS for everyone
 - **Empowering the non-GIS expert!**
- Public and Private Groups
- Hosted Web applications:
 - **ArcGIS.com Viewer**
 - **ArcGIS Explorer Online**
- Map templates



What is a web map?

The foundation for your maps and applications



ArcGIS Online templates

- Easily create a web application for a web map with predefined templates



Demo

Explore ArcGIS Online templates



ArcGIS Viewer for Flex

Built on the ArcGIS API for Flex



- Configure application via XML files
 - Look and feel
 - Capabilities
 - Content
- Ideal for focused/vertical applications
- Application Builder forthcoming
- Extensible with Flex API



esri.com/flexviewer

Formerly 'Sample Flex Viewer', now fully supported

Demo

ArcGIS Viewer for Flex



ArcGIS Viewer for Silverlight

Built on the ArcGIS API for Silverlight



- **Easily and quickly** build Web applications
- Includes Application Builder
 - **WYSIWYG user experience**
- No programming, nor configuration file editing
- Ideal for novice Web application creators
- Extensible with Silverlight API



Demo

ArcGIS Viewer for Silverlight
and



Related UC Sessions ...

- **Working with ArcGIS Online**
 - Fri 9:00 AM Room 3
- **Creating Web Applications with ArcGIS**
 - Thurs 3:15 PM Room 6C
- **ArcGIS Viewer for Silverlight – An Introduction**
 - Thurs 1:30 PM Room 5 A/B
- **ArcGIS Viewer for Flex – An Introduction**
 - Thurs 8:30 AM Room 5A/B

ArcGIS Server Web Mapping APIs

Client-side programming

- Allow developers to easily build custom Web applications
 - **ArcGIS API for JavaScript**
 - **ArcGIS API for Flex**
 - **ArcGIS API for Silverlight**
- Built on a simple architecture
 - **Use REST services endpoint**
 - Web services based
- Enables creation of RIAs utilizing ArcGIS Server
- **Choice depends on developer experience and style preference**



Web Application Development Options

	ArcGIS API for JavaScript	ArcGIS API for Flex	ArcGIS API for Silverlight
Web interfaces	REST	REST	REST
Execution	Client side (pure browser)	Client side (browser and Flash player)	Client side (browser and Silverlight player)
Development	Any text editor or Aptana, Visual Web Developer, etc.	Flash Builder or text editor with Flex SDK compiler	Visual Studio or Visual Web Developer
Languages	JavaScript and HTML	ActionScript and MXML	.NET (C#, VB.NET) and XAML

Related UC Sessions ...

- **ArcGIS API for JavaScript (Intro)**
 - Thurs 10:15 AM Room 27B
- **ArcGIS API for Microsoft Silverlight/WPF (Intro)**
 - Thurs 10:15 AM Room 8

ArcGIS Server – Editions and Levels

Capacity 

Functionality 

Edition	Includes	Level	
		Workgroup	Enterprise
Basic	<ul style="list-style-type: none"> • ArcSDE technology • Geodata services for replication 	<ul style="list-style-type: none"> • SQL Server Express • 10 users 	<ul style="list-style-type: none"> • Any supported database • Unlimited users
Standard	Basic features plus <ul style="list-style-type: none"> • Map, globe, geocoding, geoprocessing (ArcView tools), • Web editing 	“	“
Advanced	Standard features plus <ul style="list-style-type: none"> • Advanced geoprocessing • ArcGIS Mobile 	“	“

ArcGIS Server Resource Center

- Central location for ArcGIS resources
- SDK for ArcGIS Server APIs
- Sample GIS Server
- ArcGIS Online
- Help
- ArcGIS Server Development Blog
- Support



Summary

ArcGIS Server: Complete, out-of-the-box Web based GIS

- Enables sharing of GIS services
- 4 main components:
 - Web server, SOM, SOC, and geodatabase
- Publishing map services
 - Design patterns and terminology
- ArcGIS Server has many different clients
- Web Mapping APIs future direction
 - JavaScript, Flex, and Silverlight
- Editions and licensing



Related UC Sessions ...

- **Best Practices for Designing Effective Map Services**
- Designing and Using Cached Map Services
- **Creating Web Applications with ArcGIS**
- Working with ArcGIS Online
- **ArcGIS Viewer for Silverlight – An Introduction**
- ArcGIS Viewer for Flex – An Introduction
- **ArcGIS API for JavaScript (Intro)**
- ArcGIS API for Flex (Intro)
- **ArcGIS API for Microsoft Silverlight/WPF (Intro)**

- Online evaluations

www.esri.com/sessionevals

