



ArcGIS Server Overview

Deployment and Development Use Cases

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Le langage de
la Terre

ESRI s'engage

- **Speaker: Enrique Yaptenco, ESRI**
- **Attendees:**
 - **Which version(s) of ArcGIS are you using?**
 - **Who uses ArcObjects?**
 - **Who uses ArcGIS Engine?**
 - **Who uses ArcIMS?**
 - **How many of you are developers?**
 - **How many develop in VB6, .NET and C++?... and Java?**
 - **How many use Windows?....and Unix?**

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ArcGIS overview

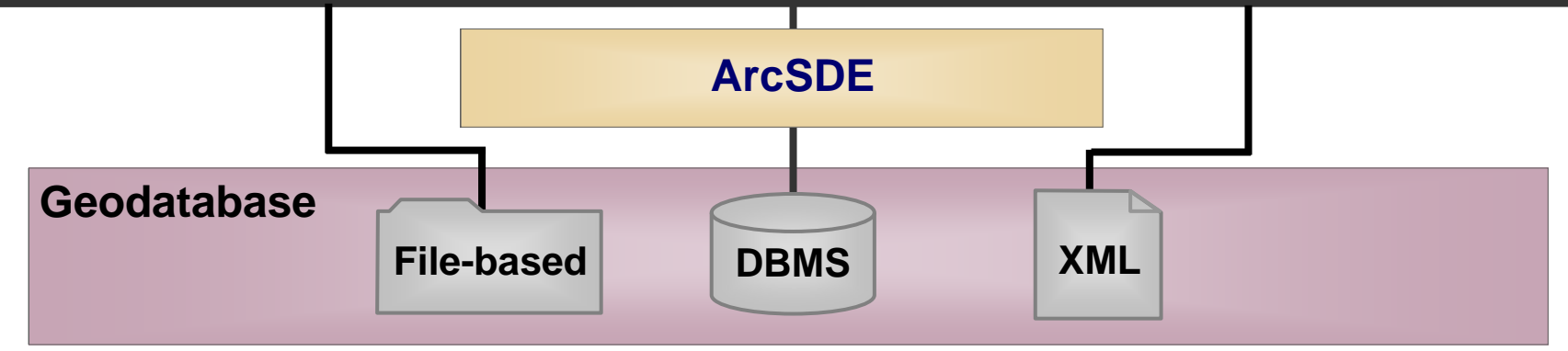
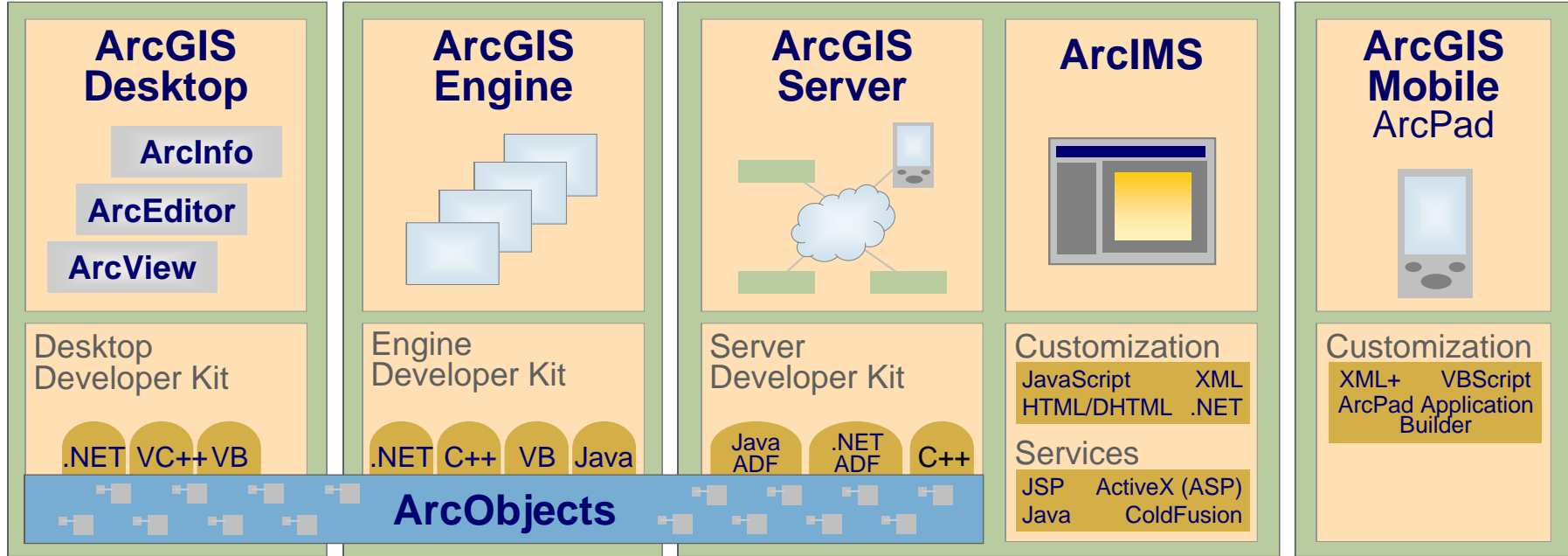


Desktop GIS

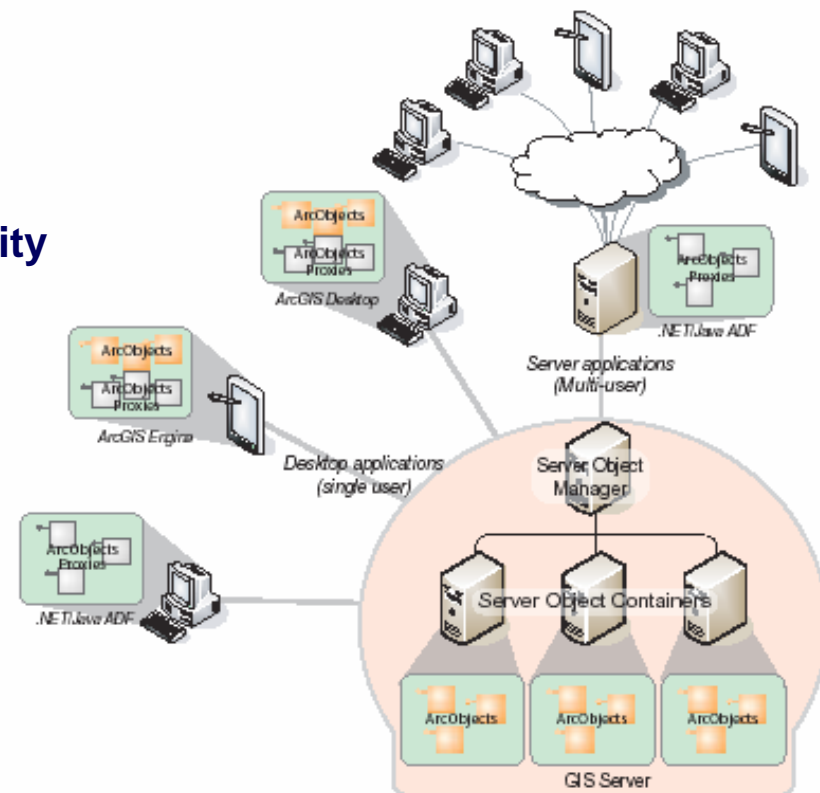
Embedded GIS

Server GIS

Mobile GIS



- Set of software components for building server-based GIS applications
- Designed for
 - Centrally managed applications
 - Exposing advanced GIS functionality
 - Multiple-user support
 - Server-to-server applications



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ArcGIS Server product



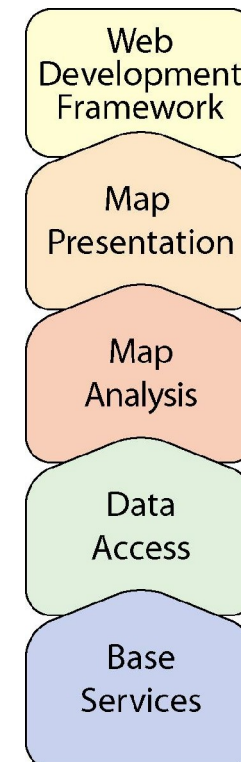
- **GIS Server components**
 - ArcObjects libraries
 - ArcObjects developer kit
- **Application developer framework**
 - Application runtime
 - Java and .NET developer kit
 - Mobile .NET developer kit – available in 9.2
- **Extension options**
 - Spatial, 3D, StreetMap USA
- **Licensed through software authorization**

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What ArcObjects functionality is available?

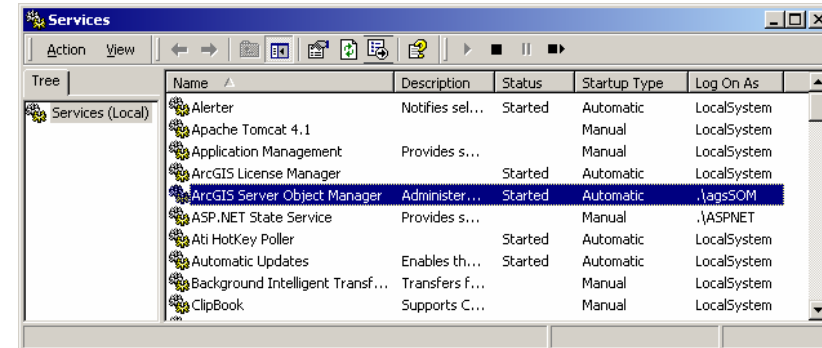
- **Base services**
 - Core functionality, geometry operations
- **Data access**
 - Access to raster and vector data
- **Map analyses**
 - Advanced spatial and SQL queries
- **Map presentation**
 - Labeling, symbolization, thematic rendering
- **Developer components**
 - Developer kit, mapping and 3D controls, toolbar, TOC

ESRI⁺⁺



ArcGIS Server

- **SOM**
 - Operating system service / daemon
 - Load balances requests
 - Manages requests to SOCs
- **SOC**
 - Process that receives requests from the SOM
 - Contains one or more server objects
- **Server objects**
 - Coarse grained ArcObjects
 - Handle incoming requests
 - Call upon appropriate fine grain ArcObjects
- **AGS Operating System User Groups**
 - agsusers: access to SOC and server objects
 - agsadmin: configuration of SOM and SOCs



The screenshot shows the Windows Task Manager Performance tab with the following table of processes:

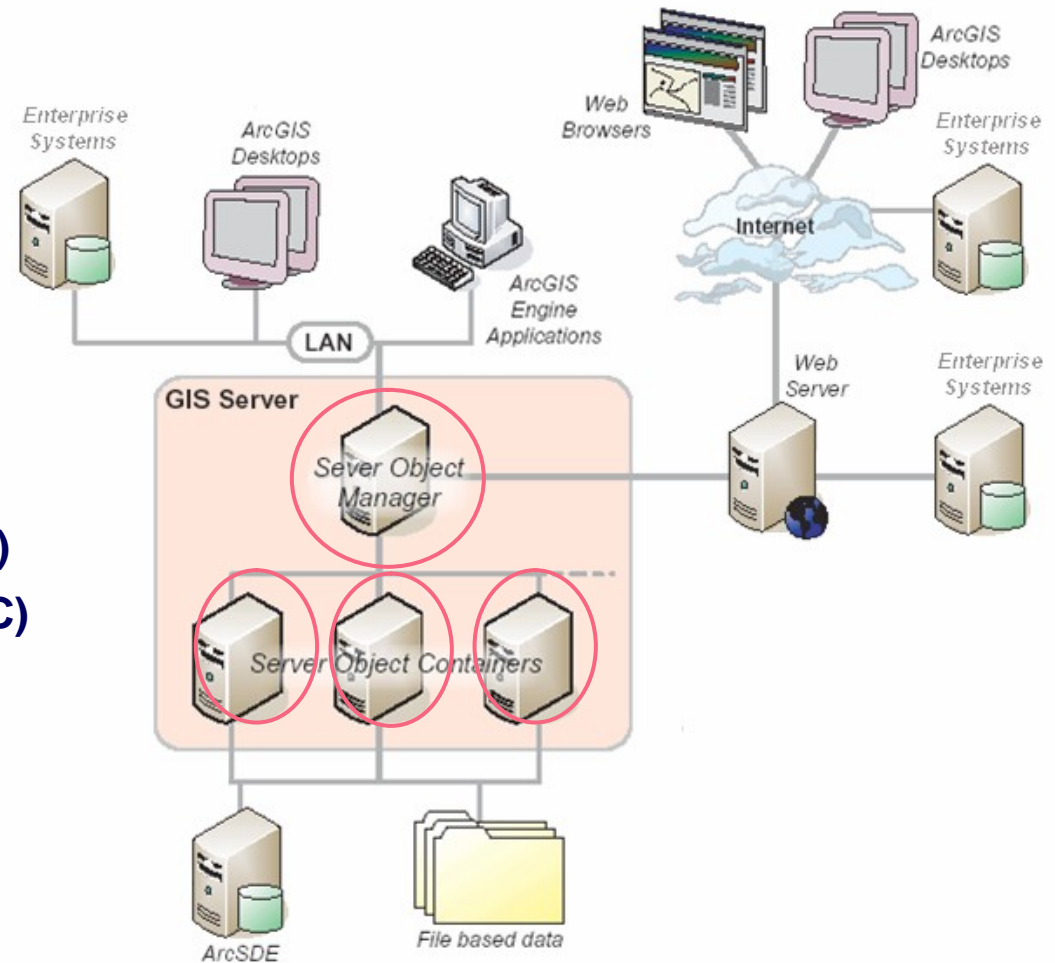
Image Name	PID	CPU	Mem Usage	Threads
ARCGIS.EXE	540	00	3,360 K	2
ArcSOC.exe	1804	00	47,848 K	11
ArcSOC.exe	1976	00	6,960 K	8
ArcSOC.exe	2188	00	57,872 K	12
agsSOM.exe	548	00	9,740 K	24
aspnet_wp.exe	1900	00	35,100 K	11
Ati2evxx.exe	560	00	1,088 K	2
atiptaxx.exe	1540	00	3,088 K	2
CSRSS.EXE	164	00	2,428 K	10
DefWatch.exe	502	00	1,228 K	3

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ArcGIS Server application components: GIS server

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- One or more machines that provide GIS server capabilities
- Software required
 - Supported OS
- ArcGIS software installed
 - Server Object Manager (SOM)
 - Server Object Container (SOC)
 - ArcObjects

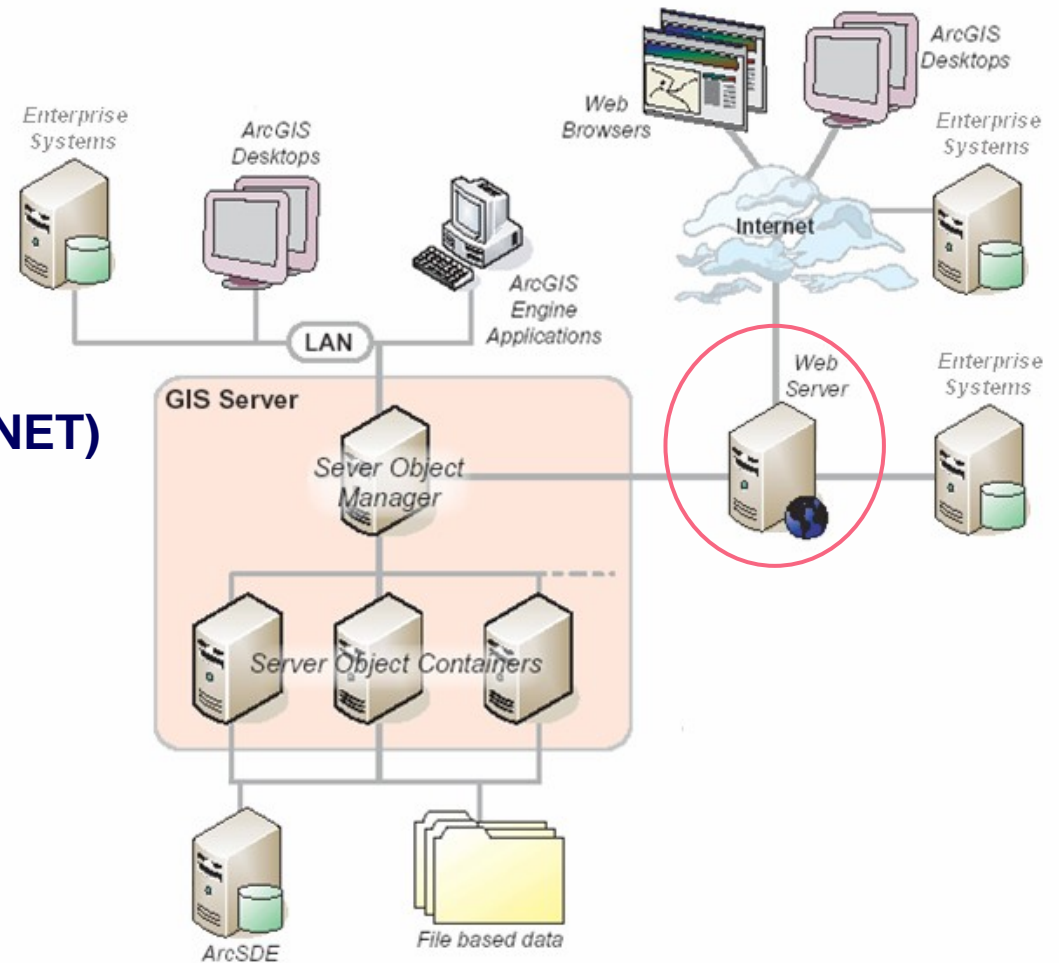


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ArcGIS Server application components: Web App Server

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- Machine that has Web serving capabilities
- Software required
 - Web server
 - Application server (Java/.NET)
- ArcGIS software installed
 - ADF components Java/.NET/Mobile

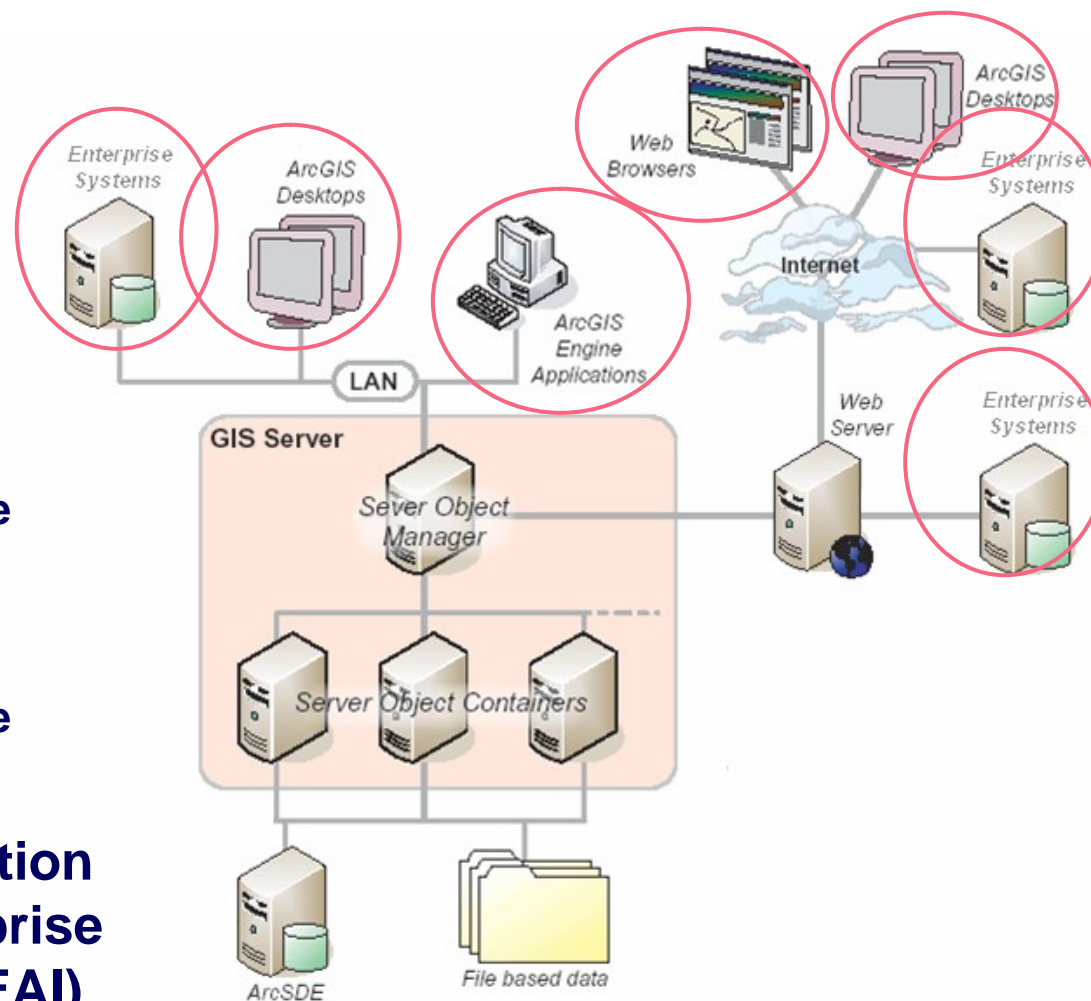


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ArcGIS Server application components: Clients



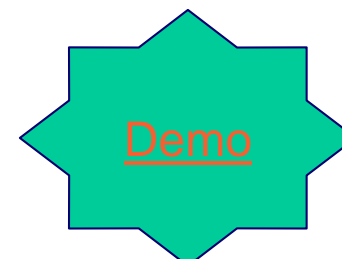
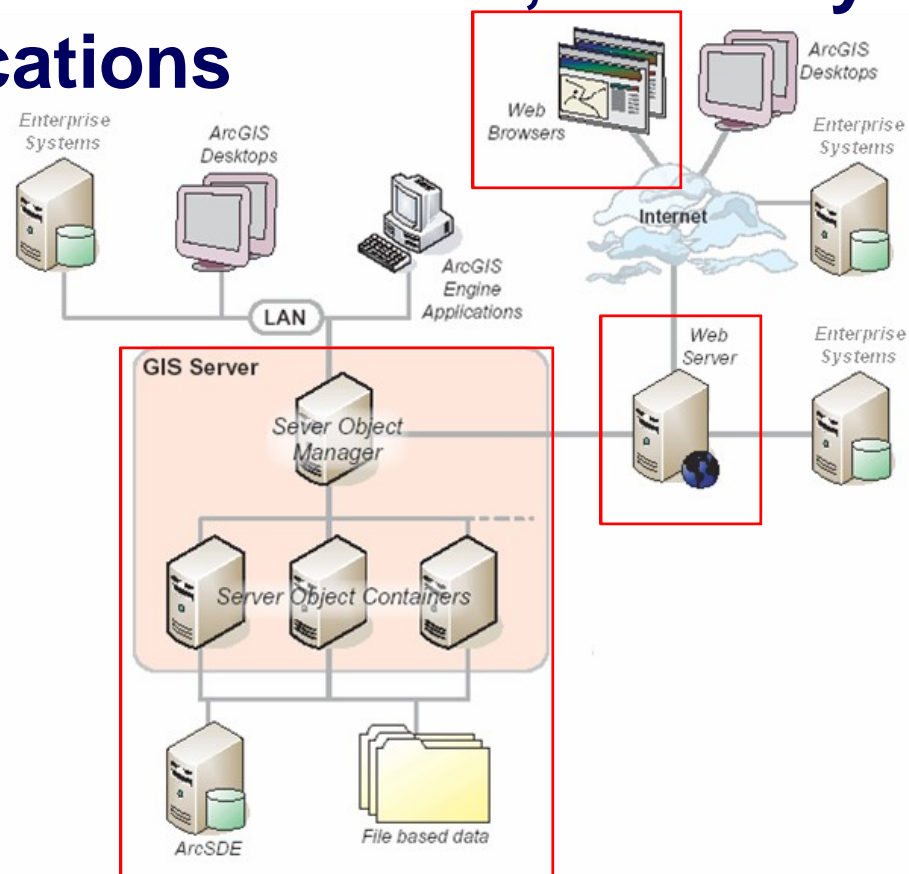
- Application that has network capabilities
- Typically...
 - Intranet
 - Web browser
 - ArcGIS Desktop/Engine
 - Internet
 - Web browser
 - ArcGIS Desktop/Engine
 - Mobile clients (9.2)
- Other enterprise information systems (EIS) and enterprise application integration (EAI) middleware



- **Centrally managed GIS applications with ArcObjects and Web technologies**
 - **Web applications**
 - ASP
 - JSP
 - **Web services**
- **ArcGIS Desktop extensions**
- **ArcGIS Engine applications**
 - **Custom stand-alone**
 - **Embedded**
- **Server-to-server applications / EAI middleware applications**

- **Thin, browser based, centrally managed GIS applications**
 - Simple mapping
 - Simple editing (ex. no snapping environment)
 - Search apps
 - Geocoding apps
 - Network tracing apps
 - Complex GIS functions/query apps

■ Thin, browser based, centrally managed GIS applications



- **Simple GIS applications for PDAs and SmartPhones – available for ArcGIS 9.2**
 - **Supports Simple GUI / Mobile Viewers**
 - **Fully customizable user experience**
 - **GPS Work**
 - **Headless apps**
 - **Workflow driven tasks**
 - **Inventory**
 - **Asset Management and Maintenance**
 - **Field Audits**
 - **Field Data Collection**
 - **Redlining**
 - **Attribute editing**
 - **Simple feature editing**

■ ArcGIS Desktop Use Cases

■ Extending Desktop with centralized services

■ Out-of-the-box

■ Geocoding services

■ Mapping services

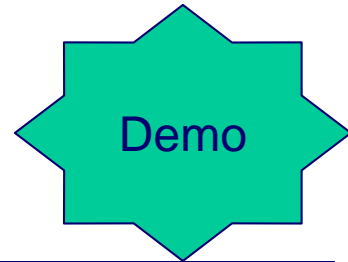
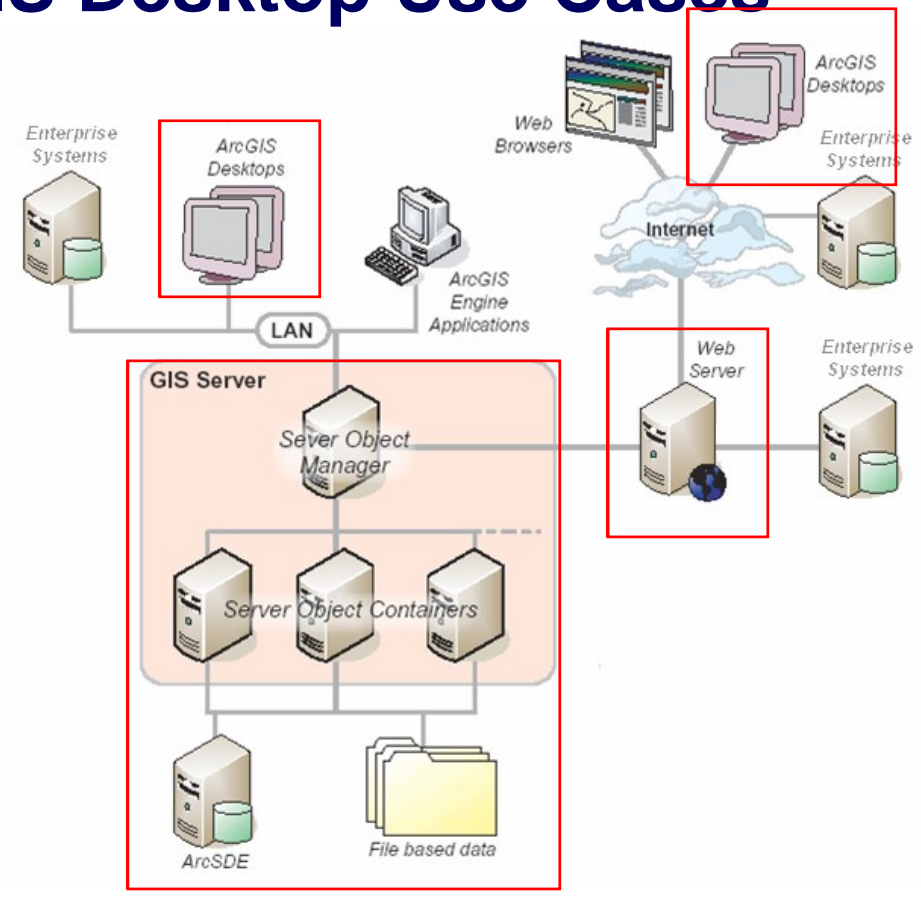
■ Custom commands and tools

■ Custom services

■ Combined centralized services with local data and local functions

■ Connect either via direct connect or via web services

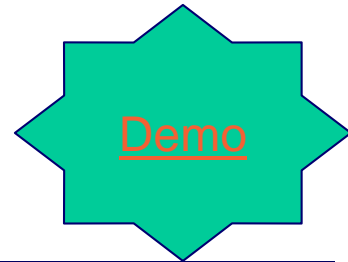
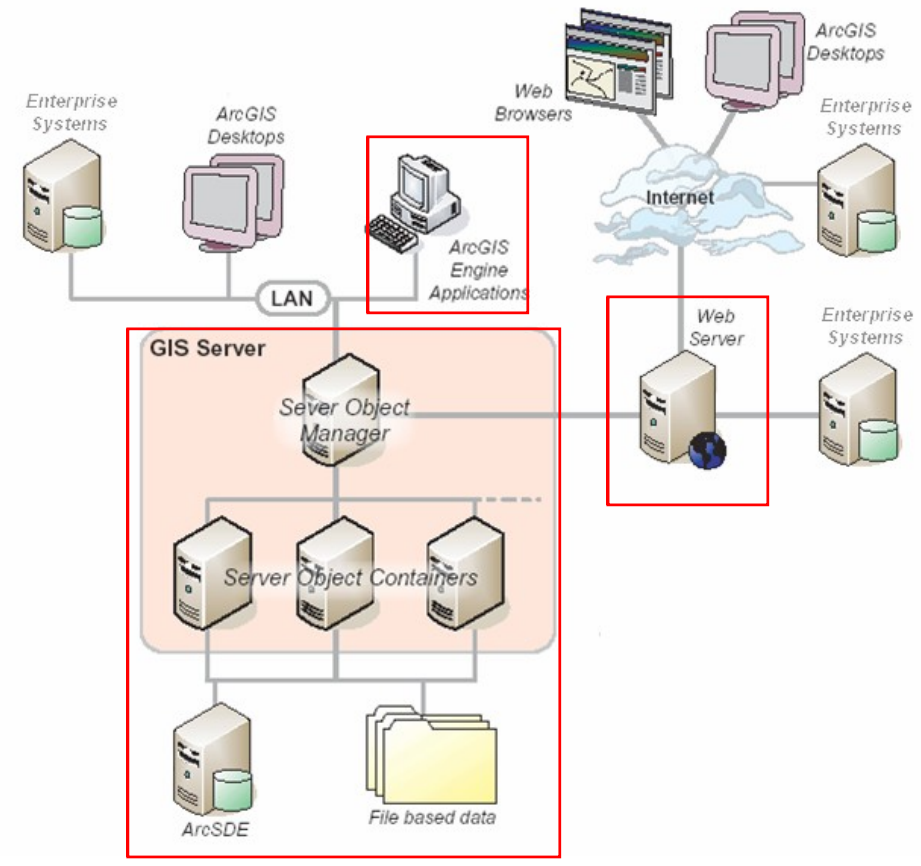
ArcGIS Desktop Use Cases



■ ArcGIS Engine Use Cases

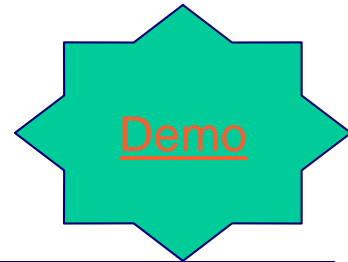
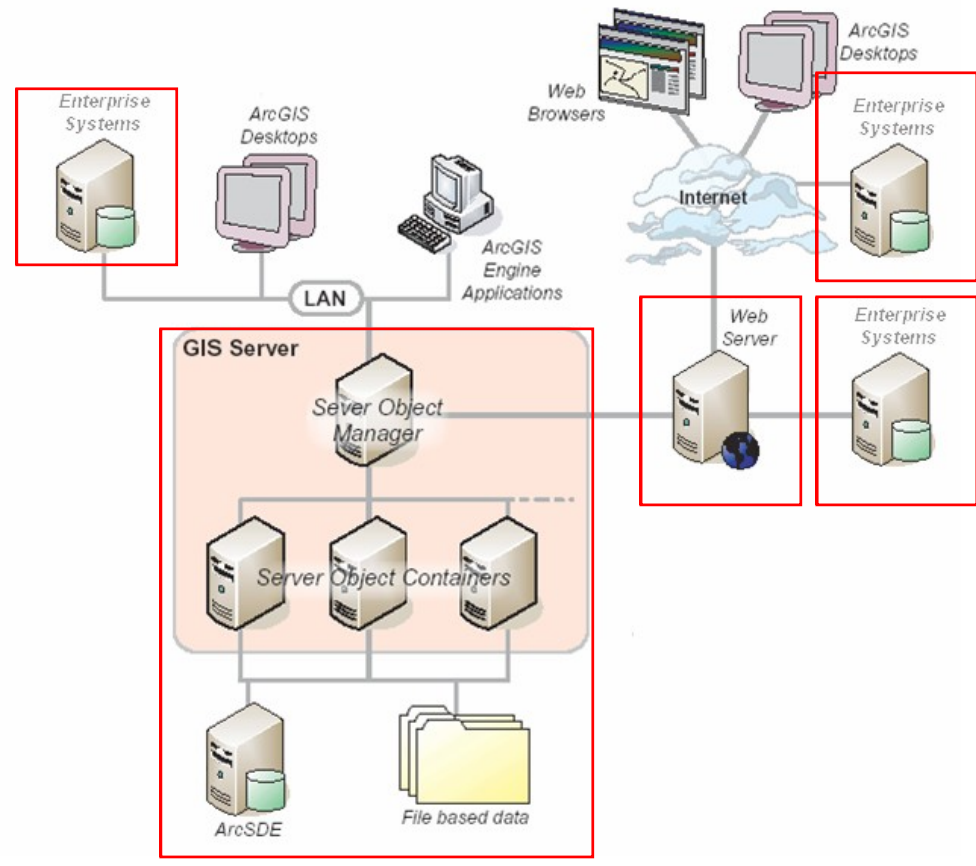
- Desktop like usability with all server deployed, centralized data and functionality
- Centralized map authoring and map dissemination
- Connects via direct connect or via web services
 - Direct connect allows interaction with fine or coarse grained objects

ArcGIS Engine Use Cases



- **Server-to-server communication**
 - **Point-to-point communication, other Enterprise Information Systems (EIS) as a client to ArcGIS Server**
 - **Enterprise Application Integration (EAI) middleware communication, EIS through EAI as a client to ArcGIS Server**
 - **EIS or EAI connect via direct connect or via web services.**
 - **Direct connect allows interaction with fine or coarse grained objects**

Server-to-server communication



- **Batch / Schedule based processes**
 - **Versioning service (reconcile and post)**
 - **Geoprocessing service – available in ArcGIS 9.2**
 - **Any scheduler capable of calling external services**
 - **Custom Server Object built-in scheduler**

- **GIS Server Level**
 - Custom Course Grained Objects development
- **Middleware**
 - Web Services development
- **Consumers (Java/.NET based)**
 - Template based web user interface development
 - ArcGIS Desktop / Engine extension development
 - Mobile Clients – available in ArcGIS 9.2
 - EIS / EAI integration
 - Headless applications

- **Custom Course Grained Objects**
 - **Coarse grained COM object that encapsulate fine grain calls to ArcObjects**
 - **Develop using VB, C++ or .NET**
 - **Proxies are required for DCOM communication**
 - **Java: use JIntegra COM2JAVA utility**
 - **.NET: use .NET interop**
 - **COM object is deployed in the GIS Server**
 - **Proxy object is deployed in the web application or middleware server**



■ Custom Web Services

- Web enabling ArcObjects based services
- Publish services via web standards
 - SOAP
 - HTTP/XML
- Functionality not limited to standard ArcGIS Server Objects
- Requires ASP.NET or J2EE



- **Web Catalog – Template based web services**
 - **Web enabling ArcObjects based services**
 - **Publish services via web standards**
 - **SOAP (HTTP/XML)**
 - **Functionality limited to standard ArcGIS Server Objects**
 - **Requires ASP.NET or J2EE**
 - **Services can be consumed without modification by ArcGIS Desktop and ArcGIS Engine**



- **Template based web user interface**
 - **Java and .NET templates**
 - **Out-of-the-box templates that jump starts development**
 - **The project can be easily extended and modified**



- **Desktop based user interface**
 - **ArcGIS Desktop Extension clients**
 - Extensions, command and tools can be built to access custom services
 - Access can be a direct connect or web services based
 - Direct connect can be used for access to fine or coarse grain objects
 - **ArcGIS Engine clients**
 - The developer has access to the same ArcObjects used in ArcGIS Desktop
 - **Completely custom**
 - Web Services based interaction



- **ArcGIS Server mobile clients – available in ArcGIS 9.2**
 - **Uses the upcoming Mobile ADF (.NET based only)**
 - **Components**
 - **Map Control**
 - **MapCache Component**
 - **Mobile Server Connection Component**
 - **Scale bar Component**
 - **GPS Component**
 - **...**
 - **Visual Studio Templates**

- **EIS or EAI Integration**
 - Systems can use either point-to-point or EIA middleware integration
 - Tightly coupled / direct connection to ArcGIS Server
 - Access to both fine and coarse grain objects
 - Loosely coupled connection to ArcGIS Server
 - Access via web services based coarse grain objects
 - Service Oriented Architecture -- SOA
- **Other headless applications**
 - UI is absent
 - Batch, background, daemon based apps

Integrated Development Environments

- **Java**
 - **IDE: Eclipse, Sun™ ONE Studio, and Borland® JBuilder™**
 - No support for drag&drop of web controls. 9.2 will be better
 - 3rd party Eclipse and JBuilder plug-ins for Apache/Tomcat deployment
 - Sun One Studio fully integrated with Sun Java System Application Server
 - **Ant scripts based templates**
- **.NET**
 - **IDE: Visual Studio .NET**
 - ArcGIS development fully integrated
 - Templates for C# and VB.NET
 - Full drag&drop support for controls in the IDE
 - Fully integrated with IIS/ASP.NET deployment
- **VB6 and C++6 (only for Engine and Desktop client development as well as course grain object development)**
 - **IDE: Visual Studio 6**

- **ArcGIS Developer Help**
 - Developer guide
 - Language specific help (VB, VC++, .NET, Java)
 - Object model diagrams
 - Books and technical documents
 - Samples
- **Developer tools**
 - Add-ins and tools
- **ESRI Developer Network (EDN online)**
 - Latest developer information, discussion forums ...

■ Installation

- ArcGIS Server
- ArcGIS Server developer kit (ArcGIS 3DAnalyst™, ArcGIS Spatial Analyst™, and ArcGIS StreetMap™)
- Web Application Development Framework (Java/.NET ADF)

■ Configuration

- ArcGIS Server permissions
- Developer resources
- Development environment

■ Review product licensing

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ArcGIS Server installation considerations



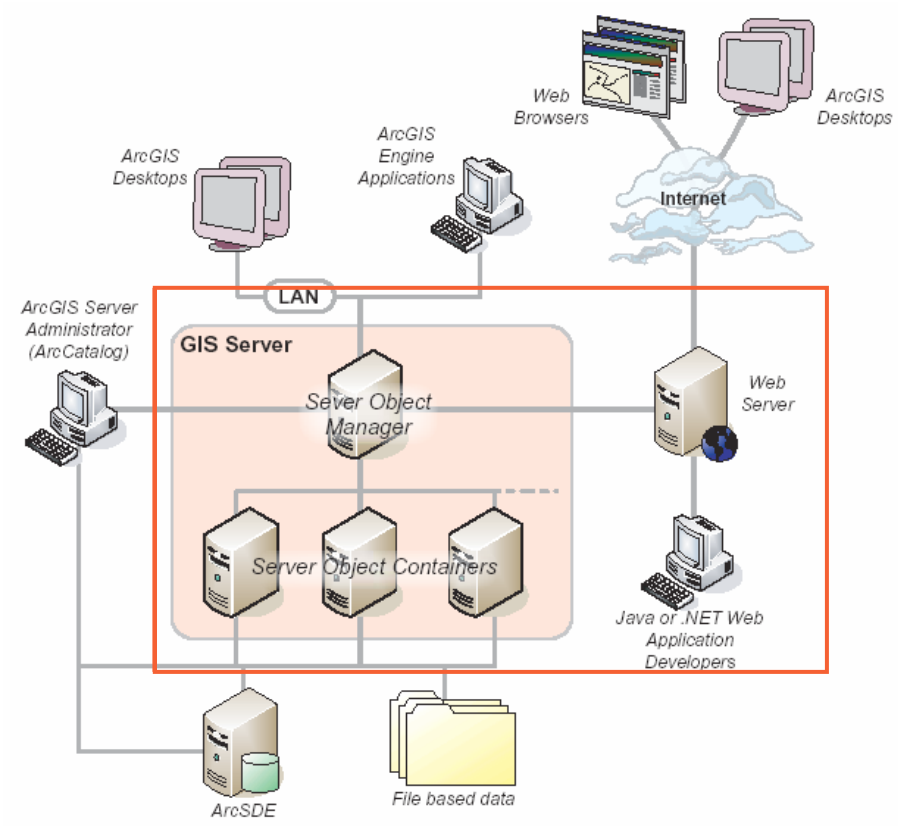
- What type of installation/configuration do you want?
 - Single computer
 - Multi-computer
- Who is doing development?
- Where are you going to develop?
 - Web server (ASP.NET, JSP, Web services)
 - COM objects
- Where do you install the various components?

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Typical single installation (Windows/.NET example)



- Run the installation on one machine
 - Web server
 - Internet Information Server
 - GIS server
 - SOM components
 - SOC components
 - ADF developer kit
 - Server developer kit

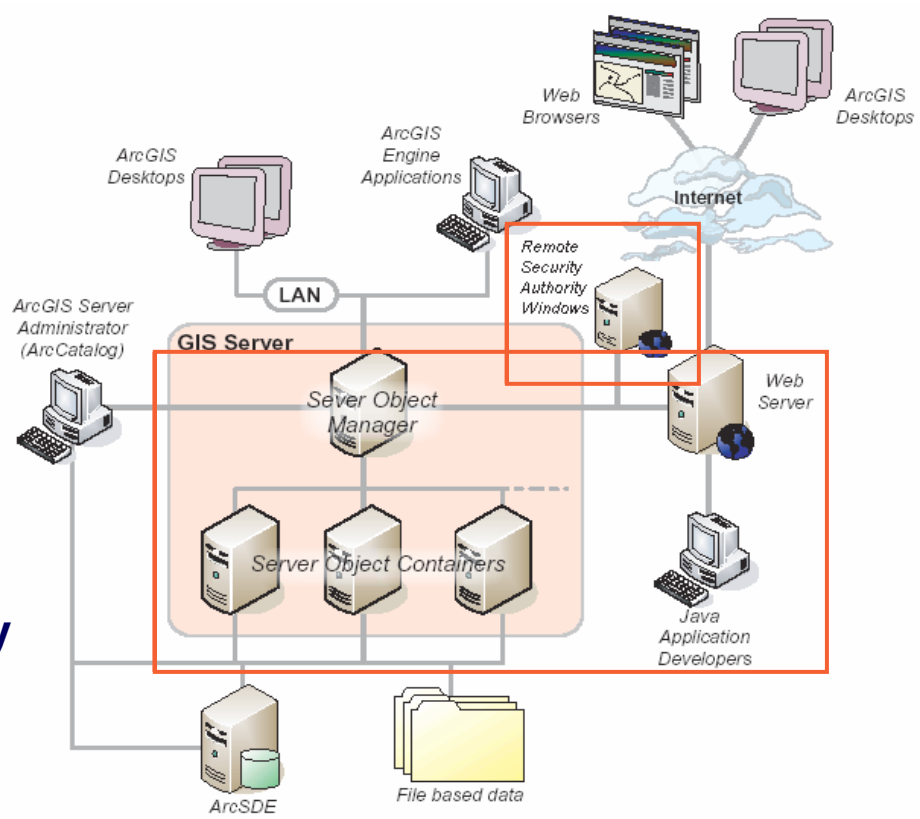


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Typical single installation (UNIX/Java example)



- Run the installation on one machine
 - Web server
 - Apache/Tomcat
 - GIS server
 - SOM components
 - SOC components
 - ADF developer kit
 - Server developer kit
- A separate Windows machine is required for Remote Security Authority



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Typical distributed installation (Windows/.NET Example) **ESRI** ++

- Run different parts of the installation on multiple machines

- Web server

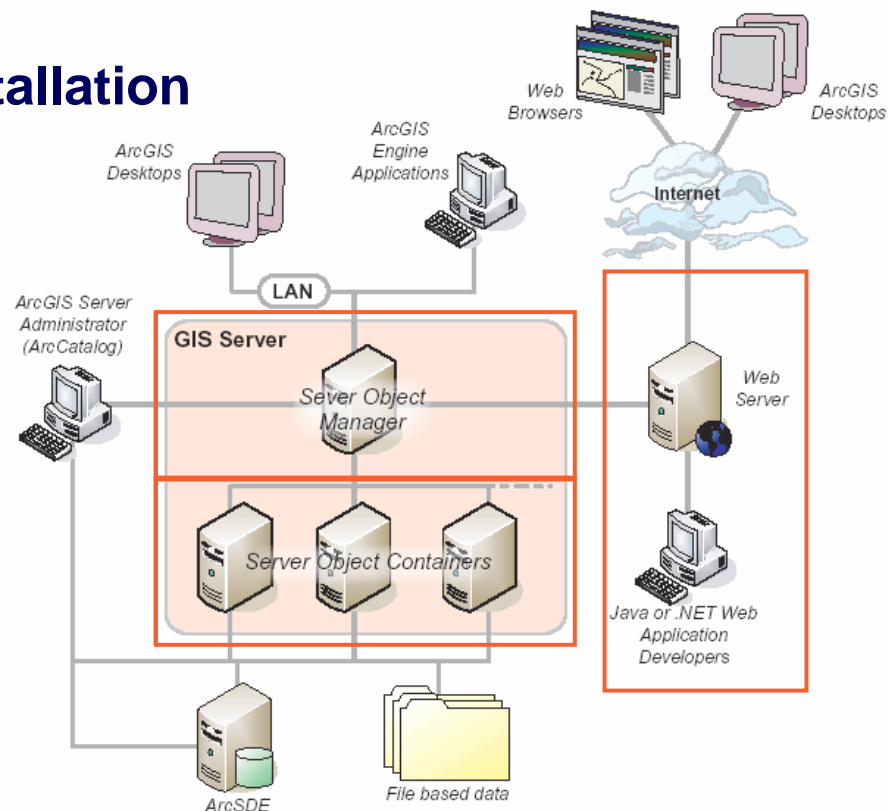
- Internet Information Server
- ADF components

- GIS server manager

- SOM

- GIS server containers

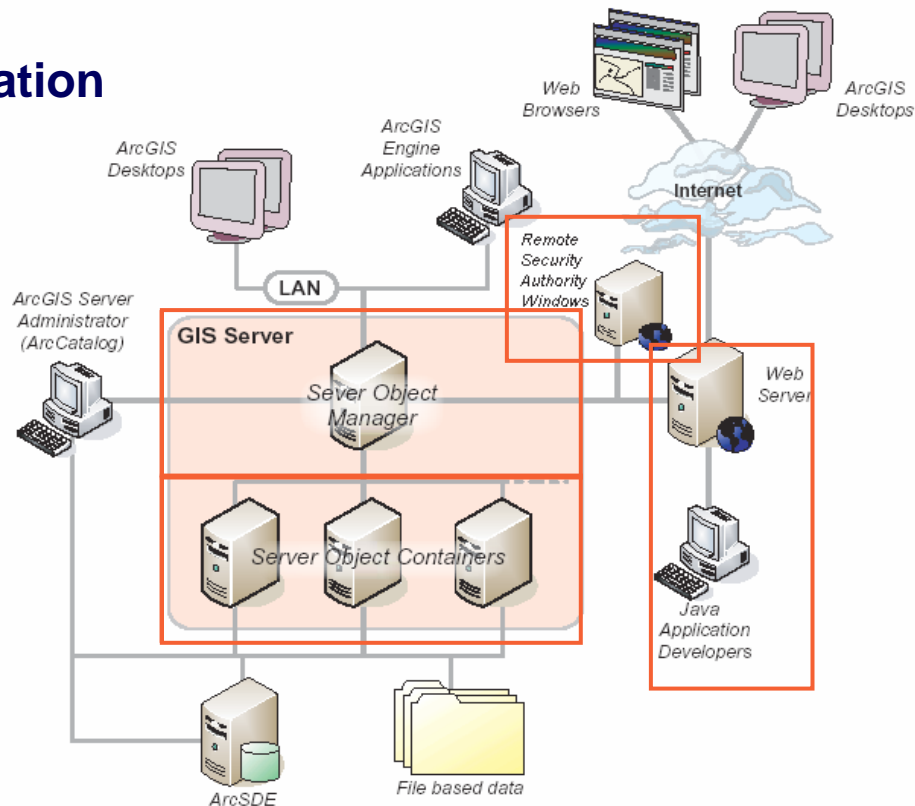
- GIS server
 - SOC
 - Server developer kit



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Typical distributed installation (Unix/Java Example) **ESRI** ++

- Run different parts of the installation on multiple machines
- Web server
 - Internet Information Server
 - ADF components
- GIS server manager
 - SOM
- GIS server containers
 - GIS server
 - SOC
 - Server developer kit
- A separate Windows machine is required for Remote Security Authority



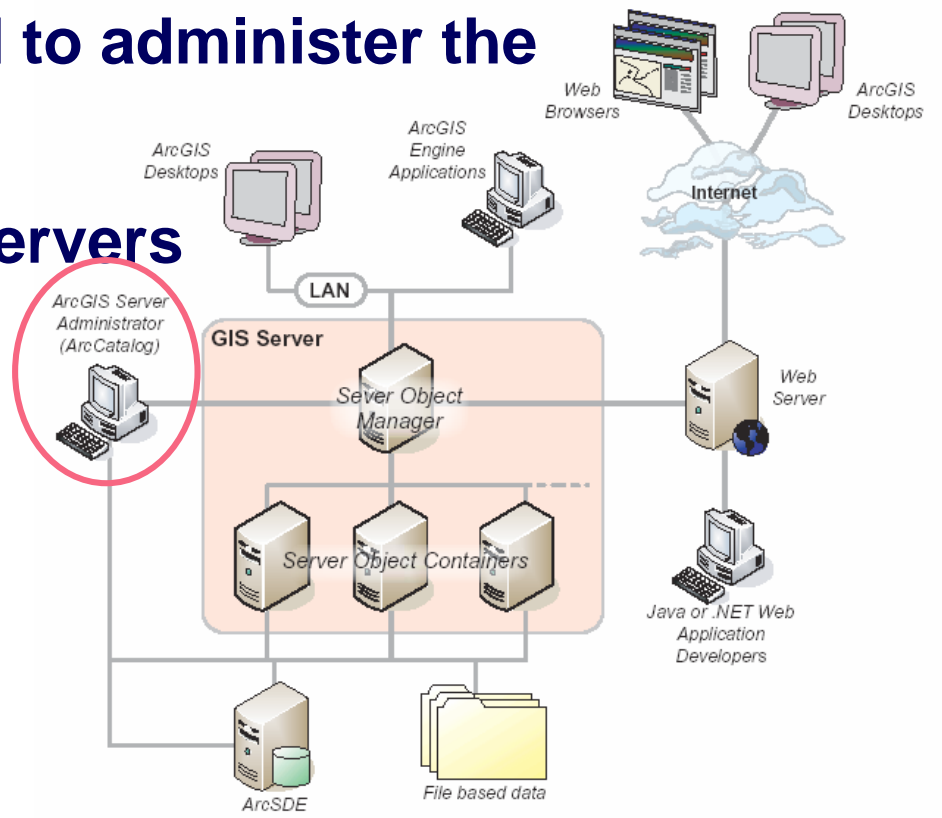
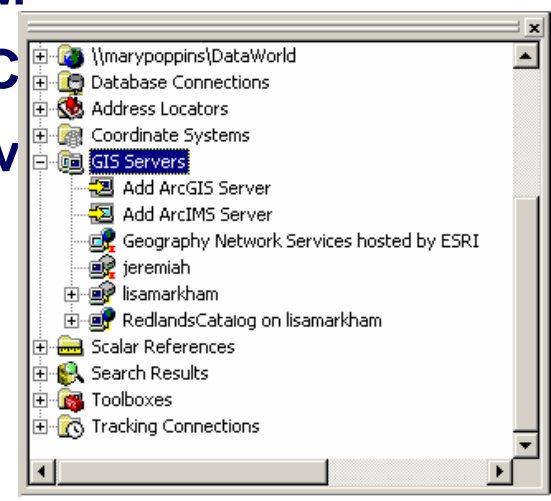
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GIS server administration with ArcCatalog



- Desktop application used to administer the GIS server
- Provides access to GIS servers
- Manages GIS server

- SOM
- SOC
- Serv



2005 Questions and Answers

