ArcGIS® Server: ESRI's Complete Server GIS

ESRI 380 New York St., Redlands, CA 92373-8100 USA
TEL 909-793-2853 • FAX 909-793-5953 • E-MAIL info@esri.com • WEB www.esri.com

ArcGIS Server: ESRI's Complete Server GIS

An ESRI White Paper

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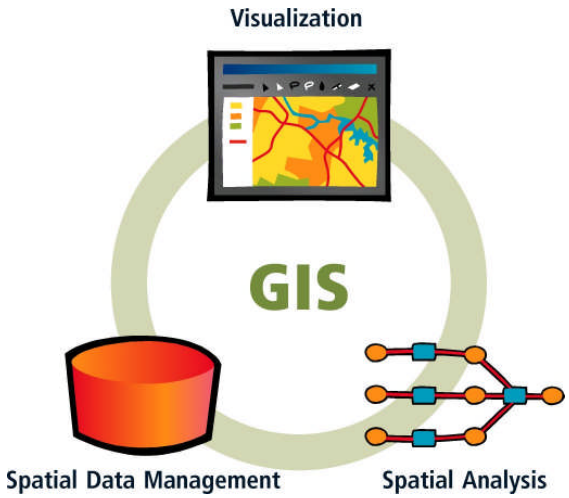
Executive Summary

ArcGIS® Server is a complete and integrated server-based geographic information system (GIS). It comes with out-of-the-box end user services and applications for geodata management, visualization (mapping), and spatial analysis. ArcGIS Server provides a rich, standards-based platform, extensive GIS capabilities, and comprehensive data management tools that promote a centrally managed GIS architecture. ArcGIS Server technology extends geospatial capabilities throughout an organization using browser-based, desktop, and mobile clients.

Centralized data management, lower cost of ownership, and adherence to information technology (IT) standards make ArcGIS Server the keystone information system solution for any enterprise.



ArcGIS Server is a complete server-based GIS, offering spatial data management, visualization, and spatial analysis capabilities.

Centrally Managed GIS

ArcGIS Server is a true enterprise GIS server. It gives organizations the ability to centralize GIS software on application servers and deliver GIS capabilities to large numbers of users over networks. Enterprise GIS users connect to central GIS servers using traditional desktop systems as well as Web browsers and mobile computing devices. ArcGIS Server allows users—at the main office or regional offices, at home, or in the field—to access GIS capabilities through a single shared system.

With this centralized approach to spatial data management, mapping, and spatial analysis, users of GIS services and applications can adapt server-based business logic for their workflows and extend that capability throughout the enterprise.

Spatial Data Management

ArcGIS Server spatial data management capabilities are based on the ArcGIS geodatabase model. The geodatabase provides the common data access and management

framework for the ArcGIS family of products. ArcGIS Server geodata services allow administrators to publish geographic data so that it can be easily consumed during common workflows and user interactions with ArcGIS Desktop. ArcGIS Server can publish geographic data for extraction, checkout/check-in, and database replication.

Mapping

ArcGIS Server visualization and mapping capabilities offer mapping services that support 2D dynamic and cached maps as well as 3D globes. Users can configure rich browser-based Web mapping applications that consume 2D services with point-and-click ease. Three-dimensional mapping services (including globes) can be used by ArcGIS Explorer, ESRI's lightweight client that is included with ArcGIS Server. ArcGIS Desktop can consume 2D and 3D mapping services.

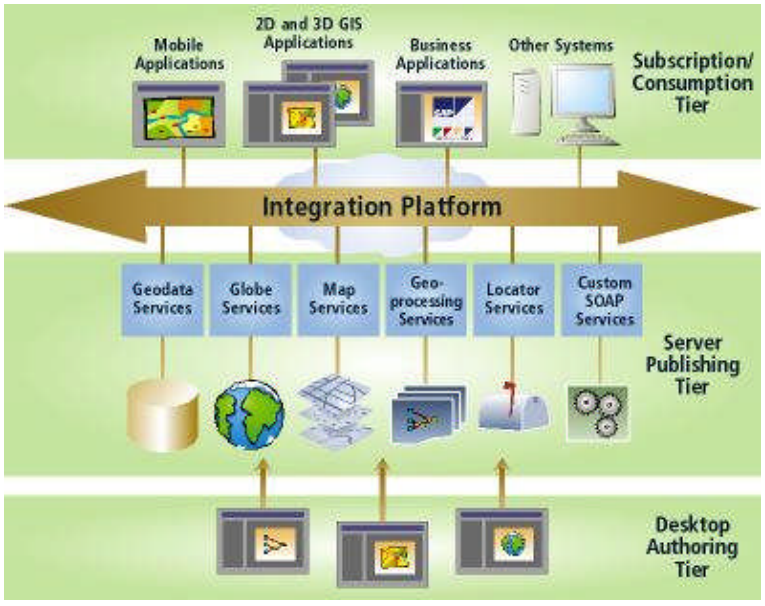
Spatial Analysis

ArcGIS Server spatial analysis capabilities offer server-based analysis and geoprocessing. This includes vector, raster, 3D, and network analytics; models, scripts, and tools; desktop authoring; and synchronous processing.

Benefits of an Integrated GIS Server

ArcGIS Desktop users can author geoprocessing tools and publish them as services that can be used by Web mapping applications, ArcGIS Explorer, and ArcGIS Desktop.

ArcGIS Server, in conjunction with ArcGIS Desktop, offers a workflow that allows for greater productivity. It lets you author data, maps, globes, and models on the desktop; serve them to a GIS server; and use them through Web, desktop, and mobile clients. Enterprise system developers, system architects, and database administrators who develop and maintain enterprise systems will benefit from the ArcGIS Server open, interoperable platform; ability to integrate with other enterprise systems; lower cost of ownership; and scalability.



ArcGIS Server openness and compliance with standards allow services to be published then consumed by many clients aside from those developed by ESRI.

Open, Interoperable Platform

ArcGIS Server adheres to IT standards, providing maximum interoperability and compatibility with enterprise architectures using any of a variety of popular programming languages, development environments, commercial application servers, and database management systems (DBMSs).

ArcGIS Server technology supports interoperability standards in the GIS domain via the Open Geospatial Consortium, Inc.® (OGC®). ArcGIS applications are interoperable with clients that read and write Web Map Services (WMS). Using ArcGIS Server Manager, users can easily create OGC WMS-compliant mapping services and Web applications that use those services. This international standard defines a *map* to be a portrayal of geographic information as a digital image file suitable for display on a computer screen.

In the broader IT domain (World Wide Web Consortium [W3C]), ArcGIS applications are interoperable with clients that read and write KML. KML is the Google Earth™ XML specification that describes geographic features and rasters in three dimensions. ArcGIS Explorer and ArcGIS Desktop applications like ArcGlobe™ read KML. ArcGIS Desktop geoprocessing tools and ArcGIS Server GIS services can output vector features and raster data in KML.

Key IT standards, such as Java™ and .NET, XML, and SOAP, can be used for messaging and data transfer over Web (HTTP) network connections to build local and wide area network enterprise applications.

ArcGIS products have appropriate open application programming interfaces and support key data interchange formats and Web service standards for ensuring relevant GIS and IT interoperability between systems over wired and/or wireless networks.

Integration with Other Enterprise Systems

ArcGIS Server supports integration with other enterprise systems, such as customer relationship management (CRM) or enterprise resource planning (ERP) systems, using industry-standard software. As a result, organizations can gain new value from existing information, which in turn improves the decision-making process and increases return on investment.

Enterprises of all sizes (from single departments to global organizations) are faced with business challenges that are driving them to integrate previously disparate systems. Location is the link that can tie separate pieces of the enterprise puzzle together and create a common operational picture.

ArcGIS Server can greatly enhance the business value of a service-oriented architecture (SOA) implementation. The geocentric workflows supported by server GIS enable integration of disparate business databases through location, increasing the SOA's ability to gain greater value from these established business systems.

Ability to Create Custom Applications and Services Using .NET or Java

The ArcGIS Server Software Development Kit that comes with ArcGIS Server includes

- .NET technology for
  - Web Application Developer Framework (ADF™)
  - Mobile ADF
- Java components for
  - Web ADF
  - Enterprise ADF for creating geospatial Enterprise JavaBeans™

ArcGIS Server ADFs come with a Web mapping application template and AJAX-enabled Web controls for building fast, interactive Internet applications.

Developers can use the following integrated development environments with ArcGIS Server to create custom applications:

- Visual Studio® 2005
- Eclipse
- Sun Java™ Studio Creator

Lower Cost of Ownership

With ArcGIS Server, implementation and all processing capabilities are handled in centralized applications, servers, and databases. This means that the day-to-day administrative costs of version synchronization, certification, software installation, and updates are significantly reduced.

Consolidated applications, database servers, and centralized data centers offer a number of advantages including

- Reduced GIS software installation and maintenance costs
- Centralized management of data stores
- A more secure environment for data and applications
- Integration of GIS applications and data with other centrally hosted enterprise applications
- Reduced network bandwidth utilization between client software, file servers, and geodatabases
- Support for remote users on low-bandwidth connections

Because ArcGIS Server provides a rich, standards-based platform and extensive GIS capabilities, there is no need to install special software on the client machines. The intuitive, browser-based design of ArcGIS Server Web mapping applications reduces the need for GIS training of end users. The integrated architecture of ArcGIS means that existing ArcGIS Desktop users can immediately consume and use GIS services in their everyday workflows. With this open environment, organizations can provide geospatial capabilities to a wide range of distributed users with minimal investment in additional hardware, software, and infrastructure.

Scalability

ArcGIS Server levels can be scaled to support both large enterprise configurations and small workgroups.

- **ArcGIS Server Enterprise** is designed for large organizations needing to share geographic data, maps, and analyses with the highest level of system flexibility and scalability. ArcGIS Server Enterprise can be implemented across a distributed computing environment and is designed to leverage various enterprise-class DBMSs.
- A**rcGIS Server Workgroup** is engineered for small organizations or departments with users who wish to share data, maps, and spatial analyses from a single server. Workgroup users can connect via the Internet or intranet with a variety of clients including ArcGIS Desktop, ArcGIS Explorer, browser-based applications, and

mobile devices. ArcGIS Server Workgroup includes an embedded DBMS to simplify spatial data management and provide an affordable database management solution.

Out-of-the-Box Functionality

ArcGIS Server is offered at three levels of functionality:

- **Advanced—**ArcGIS Server Advanced is designed for GIS organizations that want to provide a central, server-based GIS for distributing GIS services across the organization or over the Internet. It is the most complete edition. It provides editing capability, spatial data management, visualization (both 2D and 3D), and spatial analysis.

- **Standard—**ArcGIS Server Standard is designed for GIS users who want to provide a central, server-based GIS for publishing geographic data as maps and globes. It provides spatial data management and visualization (both 2D and 3D).

- **Basic—**ArcGIS Server Basic is designed for GIS users who want shared access to geographic data. It provides core geodatabase management tools and technology for data storage, management, and distribution (Web-based data replication).

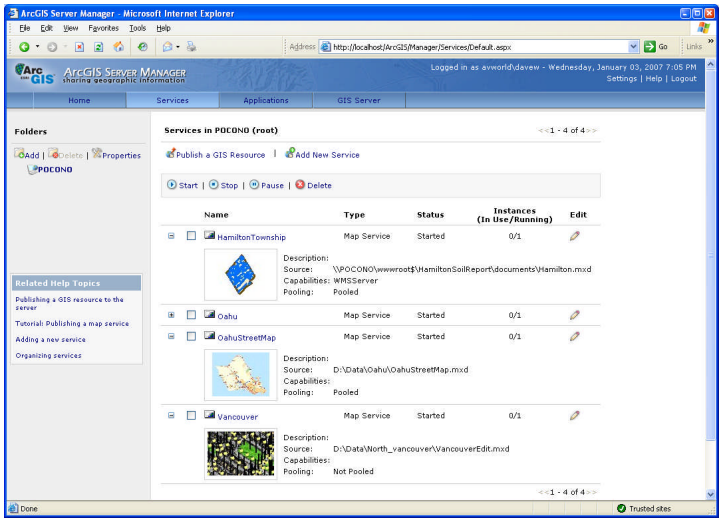
ArcGIS Server includes an easy-to-use, browser-based Manager for publishing services, creating applications, and administering GIS servers.

Publishing GIS Services

A GIS service represents a GIS resource—such as a map, globe, locator, or geodatabase connection—that is located on the server and is made available to client applications. Services make it easy to share the use of resources across clients. The server stores the resource, hosts the service, and does the GIS work, sending back a common format of results—such as images or text—to the client.

The ArcGIS Desktop applications ArcMap™, ArcCatalog™, and ArcGlobe are used to author or create GIS resources. For example, a map document is created using ArcMap. An address locator or geodatabase is created using ArcCatalog. A globe document is created using ArcGlobe, and a toolbox is created using either ArcMap or ArcCatalog.

Once a GIS resource is created, it can be published to the GIS server. ArcGIS Server Manager offers an easy-to-use wizard for creating services. From Manager, users can also add and remove services, edit service properties, and organize services in folders.



ArcGIS Server Manager includes easy-to-use wizards for creating and managing services and Web applications as well as tools for administering the GIS server.

ArcCatalog can also be used to publish a GIS resource to the server by navigating to the resource in the Catalog tree, right-clicking on it, and clicking Publish to ArcGIS Server.

When publishing a GIS resource—using Manager or ArcCatalog—it can be enabled with capabilities that define the various ways clients can use the service. For example, a mapping service might be enabled with geocoding capability to allow someone using the service to find a place by its address.

Manager or ArcCatalog can be used to publish and enable a variety of different services. The capabilities that are available for a resource vary depending on what type of GIS resource is used and, in the case of a map document, which layers are inside.

- A **mapping service** provides access to the contents of a map document (.mxd) or a published map document (.pmf). This capability is always enabled when publishing a map service.

- The **Web Map Service** is an Open Geospatial Consortium, Inc.-compliant map service that meets the international standard for Open Geodata Interoperability Specification (OGIS). The service can be consumed by any client that supports the OGC WMS specification including ArcGIS Desktop and Web mapping applications created with ArcGIS Server. WMS capability is always available when publishing a map service.

- A **mobile data service** provides mobile applications with access to the contents of a map document through a Web service. Mobile Web services are designed to be consumed by mobile applications running in handheld devices, such as Pocket PC, Tablet PC, and Smartphone, which have hardware limitations in display, memory, and processing power. Mobile capability is always available when publishing a map service.

- A **globe service** provides access to a 3D view of a globe, originating from an ArcGlobe document (.3dd). Supported clients, such as ArcGlobe, ArcGIS Explorer, and ArcReader™, can access the globe service remotely.

- A **Keyhole Markup Language service** uses the Google Earth XML specification that describes geographic features and rasters in three dimensions. The service can be consumed by ArcGIS Explorer, Google Earth, and ArcGlobe. KML capability is always available when publishing a map service.

- A **geoprocessing service** provides access to geoprocessing models that run on the server and allows organizations to centralize geodata and geoprocessing operations. Once published, geoprocessing services can be used by a number of different client applications including ArcGIS Explorer, Web mapping applications, and ArcGIS Desktop. If a toolbox containing the geoprocessing operations the user wants to run in a model or group of models has been published to the GIS server or the models have been added to the ArcMap table of contents as tool layers and published to the GIS server, then the geoprocessing capability is available when publishing a map service.

- A **geodata access service** provides access to a geodatabase through the LAN, WAN, or Internet using ArcGIS Server. The service exposes the ability to perform geodatabase replication operations, make copies using data extraction, and execute queries in the geodatabase. The geodatabase can be published directly to create a geodata service, or the user can publish a map document that includes a geodatabase to create a geodata service and a corresponding map service. The GIS resource must be an ArcSDE® connection file (.sde), personal geodatabase, file geodatabase, or a map document with a layer from a geodatabase.

- A **network analysis service** provides access to transportation network analysis operations such as routing, closest facility location, or service area analysis. These services use the ArcGIS Server Network extension to perform analysis on a network dataset. A Network license is required on the server, and the map document must contain a network analysis layer. The service can be consumed using the developer tools included with ArcGIS Server.

- A **geocode service** allows users to type an address and receive a map with the geocoded result. Once the service is created, developer tools included with ArcGIS Server can be used to consume the geocode service in client applications. An address locator (an address locator file [.loc], ArcView® 3 locator [.mxs], ArcSDE locator, personal geodatabase locator, or file geodatabase locator) must be created as a GIS resource using ArcGIS Desktop, then published to the GIS server.

High-performance mapping services can be created by caching them for use at particular map scales. Mapping services with a map cache draw much faster than those without a cache because the server simply returns one or more precreated, cached images to the client instead of dynamically creating one at the time of request. ArcCatalog or caching geoprocessing tools located in ArcToolbox™ can be used to create cached mapping services. For more information on creating and managing cached mapping services, see ArcGIS Server Help at webhelp.esri.com.

Creating Web Mapping Applications

Manager offers an easy-to-use wizard for creating a Web mapping application. It also includes mechanisms for publishing ArcGIS Explorer maps and KML network links on the server. Manager is used to configure the functionality of the Web mapping application by choosing from a list of powerful out-of-the-box tasks including editing, find address, find places, geoprocessing, query attributes, and search attributes. Manager can also be used to customize the look and feel of the application. No Web development or programming experience is required to configure the Web mapping application. For

advanced customizations, applications created in Manager can be edited within an integrated development environment (IDE) such as Microsoft® Visual Studio or Eclipse.

ArcGIS Server allows the Web mapping application to seamlessly integrate mapping services running on the same GIS server or different GIS servers including ArcGIS Server Internet connections (via HTTP), ArcGIS Server local connections, ArcIMS® image services, and ArcWeb℠ Services hosted by ESRI. For example, a service running on an ArcIMS server can be combined with one running on ArcGIS Server.

Administering GIS Servers

Manager also makes it possible to configure the machines and directories in the server system and troubleshoot the server using its logs. Server administration means setting up and adjusting the appropriate hardware, software, and settings so that the ArcGIS Server system runs as smoothly as possible and meets user needs. Through Manager, ArcGIS Server provides a number of administrative tools including

- **Starting, stopping, deleting, and pausing services—**Manager gives administrators control over the availability of machine resources. For example, if the mapping services reference a server containing a geodatabase and that server is down for maintenance, an administrator can pause the map service until the database is available again. Services can also be permanently removed.

- **Adding and removing folders—**Manager is used to organize services in folders. The folders can be based on geographic regions, levels of security, Web service messaging format, or other criteria.

- **Creating server directories—**These directories represent physical directories on the network that are accessible to all the server object container (SOC) machines of the GIS server. There are three types of server directories: Cache, Jobs, and Output. As needed, the GIS server writes temporary files to one or more of these directories. The server also periodically cleans these directories by deleting files within them at a specified interval.

- **Specifying the log file location—**Log files are an important tool for monitoring and troubleshooting problems with the GIS server. The GIS server's logs maintain a record of all events in the server and are not deleted when the server is stopped. Log files can be viewed in Manager.

- **Adding SOCs—**Manager is used to quickly add SOC machines to the ArcGIS Server configuration. The SOC machines host services and are the work centers of the GIS server.

- **Setting the capacity of an SOC—**If one of the SOC machines is considerably more powerful than the others, setting a high-capacity value on that machine and a lower value on the other machines may improve performance.

A second way to administer the GIS server is through the GIS Servers node in ArcCatalog. Step-by-step help topics for server administration in ArcCatalog are available in both the ArcGIS Server and ArcGIS Desktop help systems. ArcGIS Server Manager can perform all the administrative functions that are available in ArcCatalog except for creating map and globe caches.

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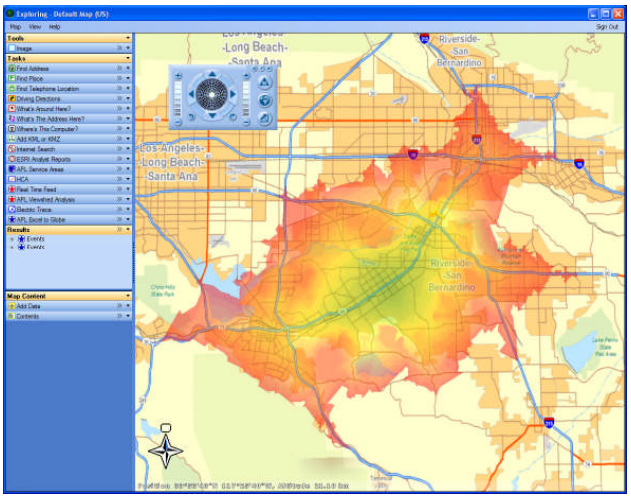
Client Applications

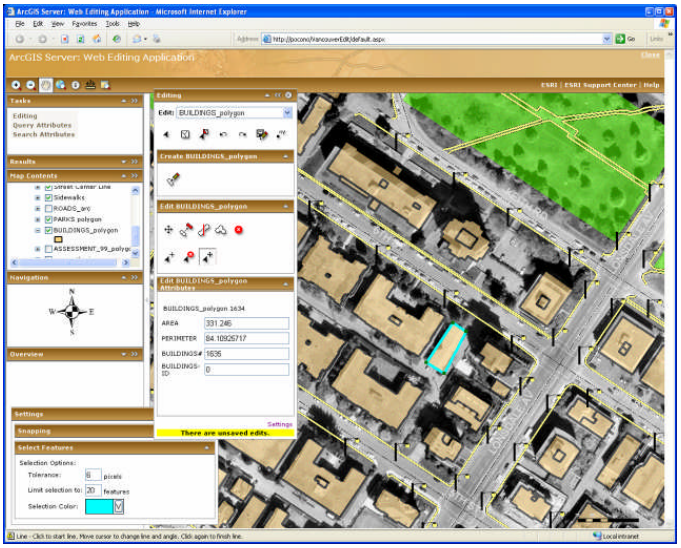
ArcGIS Server is an open and interoperable server that supports a broad range of clients including

- **ArcGIS Explorer—**ArcGIS Explorer is a lightweight client that is included with ArcGIS Server. It offers an easy way to deliver access to GIS content and capabilities. ArcGIS Explorer supports 3D mapping services as well as geoprocessing services for spatial analysis. With ArcGIS Explorer, users can consume and fuse standard Web services including those from ArcGIS Server, ArcIMS, WMS servers, and others.



ArcGIS Explorer is a lightweight desktop client that is included with ArcGIS Server.

- **Web Mapping Applications—**ArcGIS Server delivers out-of-the-box browser-based applications called Web mapping applications. These applications can be configured with out-of-the-box tasks such as querying or editing. Web mapping applications support 2D mapping services and other analytical services (e.g., geocoding and geoprocessing).



ArcGIS Server comes with browser-based Web applications for editing.

- **ArcGIS Mobile—**ArcGIS Server Software Developer Kit (SDK) supports mobile application development for the .NET platform. It includes a set of tools for building and deploying 2D mobile applications that are powered by ArcGIS Server. These developer components support mobile applications that work in various states of connectivity (connected, periodically connected, and not connected).

Developers can use ArcGIS Mobile to build mobile applications for the .NET platform.

ArcGIS Mobile allows developers to build geocentric applications that provide basic GIS functionality including map display and navigation, GPS support, and GIS editing. ArcGIS Mobile can also be used to enhance existing nonspatial line-of-business applications, such as CRM and field service automation systems, with geospatial capabilities.

- **ArcGIS Desktop—**ArcInfo®, ArcEditor™, and ArcView can be used as desktop clients to author, publish, and consume ArcGIS Server capabilities. Out of the box, ArcGIS Desktop supports 2D services; 3D services are supported with the ArcGIS 3D Analyst™ extension.

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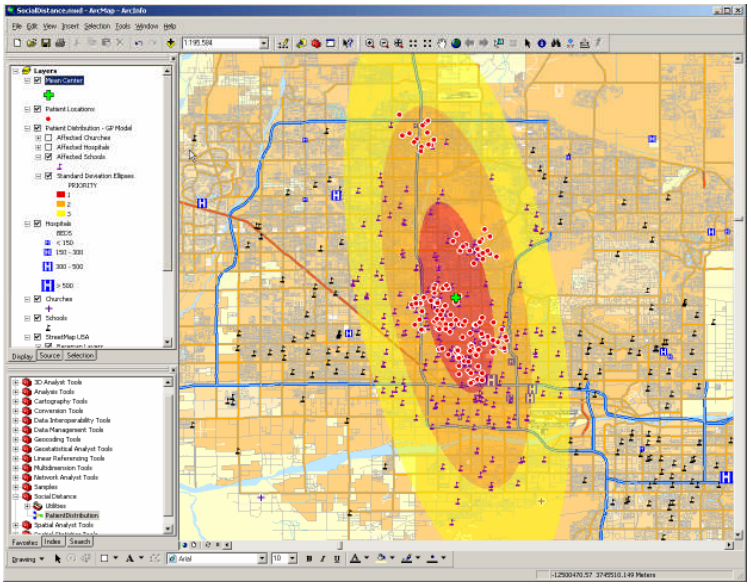


ArcGIS Desktop can act as a client to ArcGIS Server.

To learn more about ArcGIS Desktop, visit www.esri.com/desktopgis.

In addition, ArcGIS Server supports a series of open APIs and standards that allow virtually any other client (e.g., CAD, GIS, image processing, and SQL-based applications) to interact with and use the mapping, spatial analysis, and data management services of ArcGIS Server. These services can also be called on, and integrated with, other Web services using standard Web service protocols such as SOAP and XML.

How ArcGIS Server Is Used

With ArcGIS Server, seemingly simple applications can be created that potentially use very sophisticated functionality and a large volume of data. These applications can be used on mobile and desktop systems as well as via the Web. As a result, ArcGIS Server can be implemented successfully in virtually any industry.

GIS Professionals

GIS professionals can use ArcGIS Server as a platform to publish and promote their work in the form of shared maps, globes, processes, and functions. This helps them standardize geographic processing techniques and workflow scenarios, reduce software deployment costs, and ease implementation burdens. The fully integrated framework of ArcGIS means that ArcGIS Server can be used by GIS professionals to improve project collaboration and elevate the quality of workmanship at every step along the way from prototype to project completion.

From small communities to large jurisdictions and from federal agencies to international corporations, GIS professionals rely on fully integrated, commercial off-the-shelf software like ArcGIS. Mapping agencies and map book publishers use ArcGIS Server in combination with ArcGIS Desktop to produce publication-quality maps and map book products. ArcGIS interoperability and its standard development environment allow organizations like these to build custom management systems that help cartographers streamline their workflows and produce consistent, high-quality products.

To learn more about an application like this, read the *Rand McNally & Company: Producing Commercial Maps Efficiently and Accurately* case study at www.esri.com/library/casestudies/randmcnally.pdf.

Application Developers

Application developers can consume the services published by GIS professionals when building new or customizing existing applications without having to become GIS experts.

ArcGIS Server provides a rich Application Developer Framework for both the Java and .NET environments. Web application developers can build responsive, easy-to-use applications that leverage the latest AJAX and Web control technologies.

An application developer can quickly build an easy-to-use end user application for a city's economic development program using published mapping and geoprocessing services created by the GIS team. The application layout can be customized and Web controls added to further simplify the user experience, allowing the application to serve multiple departments. For example, a hot spot application can be designed that allows users to rank and prioritize critical spatial factors such as proximity to subway stops or tax incentive areas, zoning requirements, demographics, and specific property information. Submitting the criteria settings kicks off sophisticated, behind-the-scenes geoprocessing on the server, resulting in a map showing hot spots—the most desirable business-siting locations. Users can pan and zoom on the map from a citywide overview to a street-by-street analysis.

To learn more about an application like this, read the *City of Philadelphia Mayor's Office of Information Services—DecisionMaps and ArcGIS Server: Matching Business Needs with Philadelphia Assets* case study at www.esri.com/library/casestudies/philadelphia-pa.pdf.

End Users

End users can consume Web services based on ArcGIS Server via focused applications that are infused into their other applications. Depending on the level of integration, users may not even realize they are implementing GIS techniques and processes. Making GIS transparent to users via services enriches their applications while ensuring they adhere to the best practices and techniques as defined by GIS professionals.

End users often need only to accomplish specific tasks, utilizing their unique skills to solve recurring problems, evaluate common issues, update information systems, produce reports, or contribute to interdisciplinary processes. For example, the integration of an ArcGIS Server application with a traditional reporting mechanism allows users in a public works department to perform quality control inspection of individual road features that are being transitioned from a legacy database to a geodatabase for the purpose of producing a new, updated map book. Users are presented with electronic reports, itemized by road segment, with a link that launches a Web mapping application. The map is automatically zoomed to the road segment and displayed with other map elements and attributes to help the inspector evaluate the quality of the data, eliminating the need to switch between computer applications or have paper reference materials cluttering the desk.

To learn more about an application like this, read the *County of San Bernardino, California:* Traffic Road Book *Quality Control Using ArcGIS Server* case study at www.esri.com/library/casestudies/sanbernardino.pdf.

IT Administrators

IT administrators can use GIS services and integrate them into the broader IT landscape in support of various business workflows. For example, GIS services can be integrated with work order management systems, financial systems, supply chain management, business intelligence reporting, and executive dashboards, to name a few. ArcGIS Server fits the worldwide IT trend of consolidating servers and applications, reducing the cost of updates and system maintenance.

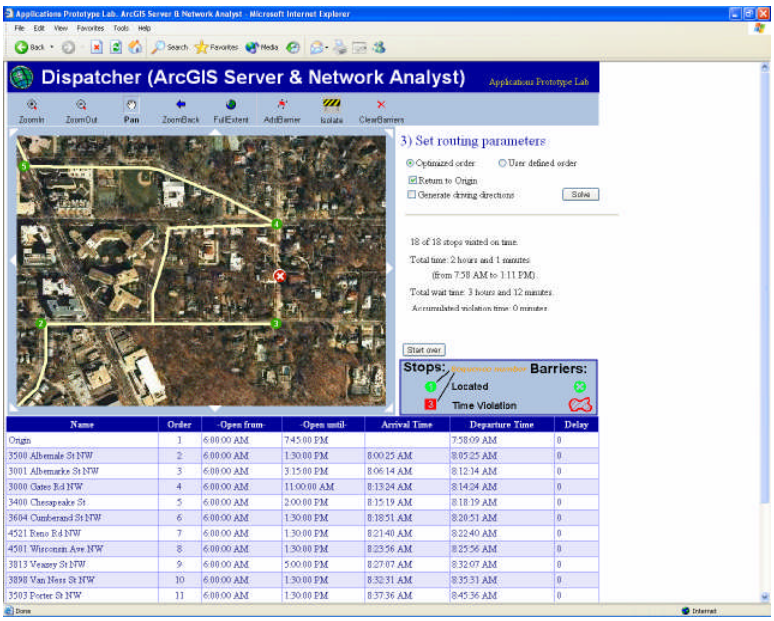
Systems and information service departments can leverage significant investments in GIS data and IT infrastructure by providing centralized GIS processing and analysis to support departmental workflows and improve enterprise-wide data management. For example, multiple geo-enabled applications can be served from central servers, allowing control over corporate content and focused management solutions. Desktop users, field crews, and supervisors all share common application frameworks but with different levels of access and functionality based on their needs and responsibilities. Desktop users can run analyses and generate mailing address reports used to notify residents in a selected area of upcoming construction. Field crews have access to property and utility information, creating maps and reports to support their daily tasks. Supervisors can view job histories segmented by inspection regions, analyzing performance and maximizing resource deployment.

To learn more about an application like this, read the *City of Mesa: Enterprise GIS Improves Workflow and Data Management* case study at www.esri.com/library/casestudies/city-of-mesa.pdf.

ArcGIS Extensions

ArcGIS Server capabilities can be increased by adding optional extensions.

- The **ArcGIS Server Network extension** provides network-based spatial analysis capabilities including routing, travel directions, closest facility, and service area analysis. The Network extension is available with ArcGIS Server Standard and Advanced.



The ArcGIS Server Network extension supports service area analysis, routing, generating travel directions, and finding closest facility.

- The **ArcGIS Server Spatial extension** provides a broad range of powerful spatial modeling and analysis features that allow developers to create and analyze cell-based raster data, perform integrated vector-raster analysis, and derive information about their data. The Spatial extension is available with ArcGIS Server Advanced.

- The **ArcGIS Server 3D extension** provides advanced GIS functions for three-dimensional modeling such as cut-fill, line of sight, and terrain modeling. The 3D extension is available with ArcGIS Server Advanced.

- The **ArcGIS Server Data Interoperability extension** enables custom ArcGIS Server applications to directly access hundreds of data formats. The extension also provides access to data translation tools and brings spatial extraction, transformation, and loading (ETL) capabilities to custom server applications via the geoprocessing framework. The Data Interoperability extension is available with ArcGIS Server Standard and Advanced.

Conclusion

ArcGIS Server has extensive functionality, can deal with terabytes of data, and uses a standards-based approach, making it ideal for providing GIS capabilities to a wide range of distributed users. In addition, the lower cost of ownership and scalability embodied in ArcGIS Server means that organizations can create compelling business cases that demonstrate a good return on investment. As a result, organizations new to GIS can build systems based on this architecture. Existing GIS organizations can use ArcGIS Server to efficiently offer access to their GIS applications throughout the enterprise. ArcGIS Server integrates well with the larger IT environment, so the benefits of spatially enabled information can be shared with a greater number of people at a lower cost. ArcGIS Server represents the keystone information system solution for any enterprise.

ESRI
380 New York Street
Redlands, California
92373-8100 USA

Phone: 909-793-2853
Fax: 909-793-5953
E-mail: info@esri.com

For more than 35 years, ESRI has been helping people make better decisions through management and analysis of geographic information. A full-service GIS company, ESRI offers a framework for implementing GIS technology and business logic in any organization from personal GIS on the desktop to enterprise-wide GIS servers (including the Web) and mobile devices. ESRI GIS solutions are flexible and can be customized to meet the needs of our users.

For More Information

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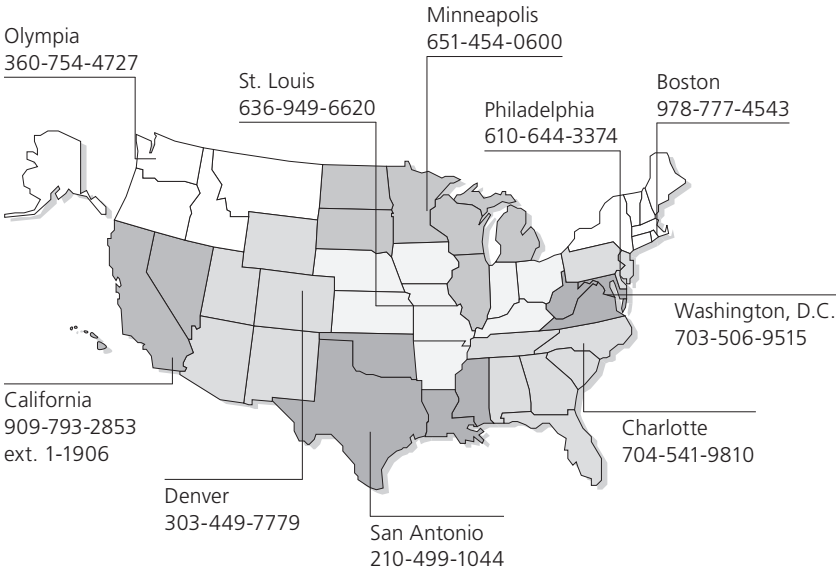

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