What is ArcGIS?

ArcGIS is a system for working with maps and geographic information. It is used for the following:

- Creating and using maps
- Compiling geographic data
- Analyzing mapped information
- Sharing and discovering geographic information
- Using maps and geographic information in a range of applications
- Managing geographic information in a database

The system provides an infrastructure for making maps and geographic information available throughout an organization, across a community, and openly on the Web.

GIS is for everyone

People in many different roles and with many levels of GIS experience work with a shared set of maps and geographic information using ArcGIS. They can access maps using ArcGIS Desktop software. They can also interact with the system using no GIS software—by using browsers, mobile devices, and Web application interfaces (REST, SOAP, OGC, and so on) to access and work with online GIS and map services. These information publishers determine who can access and use their information (for example, only those in a small workgroup, members of an organization, participants in a focused community, or anyone with a Web connection).

GIS professionals use advanced desktop software to build geographic databases and perform spatial analysis. These users have the role of creating and managing geographic information. They also use ArcGIS Server to publish and share their content as ArcGIS services.

Many other types of users access Web maps and applications that are created and shared by ArcGIS users on the Web.

GIS includes maps, applications, people, and services

In ArcGIS, you work with maps, applications, people, and services.

Maps

Maps represent geographic information. As with all maps, GIS maps contain strong cartography, but they are much more than printed paper maps. GIS maps also contain the geographic data (point, line, and polygon features) used to build the map along with analytic tools to derive interesting results. A GIS map may also contain raster, terrain, or other specialized geographic data.

ArcGIS maps have a number of important characteristics:

- They have a cartographic representation.
● They can include feature, raster, and terrain data.
● They may be editable, allowing you to compile new information.
● They are composed of map layers, which can be combined and used in different ways.
● They may contain the results of analysis models and queries into specialized information systems.
● They are interactive, allowing you to reach through the map into richer information and tools.

GIS maps bring information to life. In ArcGIS, ordinary people work with maps using standard Web interfaces and tools. Any ArcGIS user can open and work with Web maps, accessing and further analyzing information contained in the map. Read the topic How maps are used in GIS for more information on the role of maps in GIS.

Applications

ArcGIS Desktop users work with and compile maps and geographic information, which can be shared as Web maps.

Desktop users play an important role by creating the GIS maps and information, which can be shared as Web services using ArcGIS Server. These are combined and shared in Web maps that provide the primary mechanism for how larger audiences use and experience GIS. Web GIS applications allow everyday users to work with geographic information through a specialized Web map interface designed to support a specific task or activity. This is useful because not everyone in an organization needs to interact with a comprehensive, professional GIS interface. Applications are built with ArcGIS that provide simple interfaces for accessing maps and their associated data using Web browsers and mobile devices.

ArcGIS includes a number of Web map application options.

Rich maps can be created and published using ArcGIS Desktop and ArcGIS Server. These Web maps are discoverable as Web services that can be used to assemble composite Web maps (mashups), which can be used in any ArcGIS client such as those shown here.

All levels of clients can participate in online GIS communities on the Web using this range of GIS client applications. Each client, such as ArcGIS Desktop, can access Web maps and geographic information services. These clients include online tools that are used to get connected to share, discover, and use Web maps and GIS services.
ArcGIS also provides a rich development framework for building and sharing GIS through a common, map-based user experience. Web APIs for building focused applications are available for JavaScript, Flex, and Silverlight. These enable developers to build and share interesting and compelling custom Web applications.

People and communities

People are key in every geographic information system. ArcGIS provides a framework that enables users of all types and levels to participate in a community of users who create and share maps and applications. Professional GIS users have the role of creating and managing geographic information, while other users simply use maps and applications created by the others. These GIS Web maps build on the same familiar user experience that is used for working with consumer Web maps (maps from Google, Bing, and so forth).

ArcGIS has an integrated infrastructure for sharing geographic information as files, multiuser databases, and Web sites. A key component is the ArcGIS.com Web site (www.ArcGIS.com). This is a Web site for people to work with and share GIS maps, Web applications, and mobile applications. Any browser user or mobile user can use Web maps and applications shared at ArcGIS.com.

Web developers can also leverage ArcGIS.com because it provides access to and documentation about free Web APIs for ArcGIS. These APIs can be used to build Web and mobile applications using JavaScript, Silverlight, and Flex.

See What is ArcGIS.com? for more information.

Services

Services are the technical basis for managing and organizing shared geographic information. Services make maps available to people with no GIS software—through Web browsers and mobile devices. ArcGIS server encapsulates a map with its associated data and makes the map
and the data available through a range of Web and mobile application interfaces, which adhere to common Web community standards. See What is ArcGIS Server? to learn more about serving geographic information.

The ArcGIS system

The ArcGIS system has a number of key components:

**ArcGIS Desktop**: This is the ArcGIS software used by GIS professionals. It is powerful and comprehensive GIS software for Windows computers and is used daily for all kinds of GIS activities—for mapping, data compilation and management, spatial analysis, and creating maps and geographic information to be served and used by everyone. ArcGIS Desktop has three product levels: ArcView, ArcEditor, and ArcInfo. See What is ArcGIS Desktop? to learn more.

**ArcGIS Server**: This is a server-based implementation of ArcGIS and is used to serve the maps, geodatabases, analysis models, and other elements of geographic information that professional users create using ArcGIS Desktop. The GIS services published using ArcGIS Server follow widely adopted Web standards for access and use. ArcGIS Server also includes enterprise geodatabase management and transactional support. ArcGIS Server is widely used in enterprise GIS implementations and for all kinds of Web GIS applications. ArcGIS Server can run on Windows and Linux servers both on-site and in cloud configurations. See What is ArcGIS Server? for more information.

**ArcGIS online**: All parts of the ArcGIS system have integrated online functionality, and the system includes online maps and geographic information. You can find, use, and share information using any ArcGIS client. ArcGIS.com provides a Web site that enables users to work with online maps and geographic information using Web browsers and mobile devices. See What is ArcGIS online? to learn more about the online capabilities of ArcGIS.

**Mobile GIS**: One of the primary Web clients to all information, including GIS, is mobile phones and other devices used in the field such as Tablet PCs and advanced GPS data collectors. A number of mobile clients are available for accessing and using GIS in the field. See What is mobile GIS? for more information.

**ArcGIS Explorer**: ArcGIS Explorer is a free client for connecting to and using ArcGIS online. ArcGIS Explorer supports a number of advanced GIS capabilities and a presentation mode for telling GIS stories using interactive maps. ArcGIS Explorer has two implementations—one as a stand-alone application and another that is used online within any Web browser. See ArcGIS Explorer for more information.

**ArcGIS.com**: ArcGIS.com is a browser-based Web application for using ArcGIS content online. It connects users with Web maps, Web applications, and GIS services—for use within a single organization, in a community, or openly on the Web. ArcGIS.com includes a gallery of GIS maps and data from ESRI and the broad ArcGIS community. ArcGIS.com is also the site for Web developers to access APIs for JavaScript, Flex, and Silverlight. To get started using Web GIS, visit www.ArcGIS.com.

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What is ArcGIS Desktop?

ArcGIS Desktop is the primary product used by GIS professionals to compile, use, and manage geographic information. It includes comprehensive professional GIS applications that support a number of GIS tasks, including mapping, data compilation, analysis, geodatabase management, and geographic information sharing.

ArcGIS Desktop is the platform that GIS professionals use to manage their GIS workflows and projects and to build data, maps, models, and applications. It’s the starting point and the foundation for deploying GIS across organizations and onto the Web.

Desktop applications and shared documents

ArcGIS Desktop includes a suite of applications—ArcMap, ArcCatalog, ArcGlobe, ArcScene, ArcToolbox, and ModelBuilder. Using these applications and interfaces, you can perform any GIS tasks from simple to advanced.

In ArcGIS Desktop, you apply these applications to create and work with a number of different types of geographic information. For example, you create and work with map documents in the ArcMap application, globe documents in the ArcGlobe application, and geoprocessing models in the ModelBuilder application.

As you use ArcGIS Desktop, you will work with a number of elements of GIS information, such as the following:

- Map documents, globe documents, and layers
- Geodatabases
- Geoprocessing toolboxes
- Other data files such as imagery

What users do with Desktop

ArcGIS Desktop users perform a wide variety of GIS work from simple mapping and data compilation to advanced spatial analysis. They use Desktop for 3D GIS, to compile, manage, and maintain multiuser enterprise geodatabases, to perform spatial analysis, to manage imagery and do advanced image processing, and to automate many GIS procedures within their organizations.

Three key tasks are performed by most users including working with maps, spatial analysis, and data compilation. Maps are critical in Desktop because they bring all information to life and are the mechanism used for editing and for delivering spatial analysis to many users. The comprehensive map capabilities that are part of Desktop are also used for virtually any professional mapping activity. For example, see the online Mapping Center to learn more about cartography with ArcGIS.

Maps also provide the basis for editing and data compilation work. ArcMap is the primary application used for advanced data compilation and is used across hundreds of thousands of organizations to compile rich authoritative content for their application domains and areas of interest. These rich data provide the basis for many GIS applications, and much of this information is available online for the ArcGIS community.

Spatial analysis is one of the more interesting and remarkable aspects of GIS. Using spatial analysis, GIS users can combine information from many independent sources and derive an entirely new set of information (results) by applying a large, rich, and sophisticated set of spatial...
operators. GIS professionals use Geoprocessing to "program their own ideas" in order to derive these analytical results. In turn, the results are applied to a wide variety of problems.

A critical role for ArcGIS Desktop users

Many ArcGIS Desktop users have a special role and responsibility to provide high-quality maps and geographic information to others in their organizations and on the Web. They do this by creating and sharing maps, layers, geodatabases, imagery, and analytic models.

ArcGIS documents encapsulate your GIS work for sharing

Maps, geodatabases, and geoprocessing tools are the elements that capture how GIS is used. They define the primary aspects of ArcGIS implementation—from visualization, symbolization, and editing to reporting and analysis. ArcGIS maps (both 2D and 3D) help to bring this information to life.

By creating maps and layers as part of this work, you as an ArcGIS Desktop GIS user can encapsulate all of the aspects for how geographic information is displayed, used, queried, managed, and analyzed. This is the basis for sharing your work with other desktop GIS users and, more broadly, on the Web. For example:

- You can double-click to open and work with map documents in ArcMap and globe documents in ArcGlobe. These maps can be shared as a map package.
- You can work with geoprocessing models in ModelBuilder. In addition, you can write model scripts using Python. The models and scripts that you create are managed and shared using toolboxes.

When you download such a package from another user (for example, a map package), ArcGIS Desktop is transformed by the package—it can do all the same work that the original user had designed and built into the shared document.

Working with maps in ArcGIS Desktop

A common pattern for building an interactive map is to combine a series of operational map layers that overlay onto a basemap (such as imagery, terrain, street map, or topography). Basemaps are typically designed to work across a range of map scales. Each operational map layer represents a logical collection of information such as streets, land use, and hydrology.

GIS maps contain tools for interacting and working with the map contents (in other words, the geographic information behind each layer as well as analytic functions that can be used to derive new information). For example, you can use GIS maps for the following:

**Multiscale map display for pan and zoom**

![Multiscale map display](image)
To generate simple information reports

Interactive feature reporting for the simplest (and most efficient) map layers can use simple attribute field pop-ups.

In other cases, it may be important to provide a richer interactive experience for visualizing and comparing features in a particular layer. More detailed reporting and charting can be defined as part of the layer properties.

To visualize analytic results

A map layer can be used to access analytic functions and to display and interact with the results.
Analysis is how you work with the results as map layers to compare, visualize, summarize, and come to better understand their meaning.

To compile and edit features

Map layers can be used to capture new GIS data—editors essentially use the map to add and update features to populate "empty" map layers. The new data is added into geodatabase layers referenced by the map.

Often, enterprise layers are used to share editing and compilation among a number of users. In these cases, the data is stored and managed in a shared multiuser geodatabase.
ArcGIS map documents encapsulate all of these properties

Each GIS map is a specification or design for how geographic information and tools will be used, and GIS maps can be captured, saved, and shared as map documents.

ArcGIS Desktop plays a critical role in GIS deployment and use because it is utilized to create all elements of geographic information: maps, layers, geoprocessing models, geodatabases, and metadata. By creating maps and layers as part of this work, desktop GIS users can encapsulate, and subsequently share, all the aspects for how geographic information is displayed, used, queried, managed, and analyzed.

Online capabilities of ArcGIS Desktop

These ArcGIS documents and packages can also be published as Web services. Using ArcGIS Desktop with ArcGIS Server, you can turn any map, geodatabase, or model into a GIS Web service for sharing in a workgroup, throughout an enterprise, or openly on the Web.

In addition, ArcGIS Desktop includes online capabilities that allow you to share information with others on the Web. You can use these online functions to get connected to other users.
Using ArcGIS Desktop to create and share maps and geographic information

Here is the process.

- **Author.** Utilize ArcGIS Desktop to create maps and the geographic information and tools behind these maps. Using ArcGIS, you can create and save map packages and layer packages that encapsulate all of the GIS aspects necessary for map display, map use, analysis, data compilation, and management.

- **Share.** With ArcGIS Desktop, you can share map packages or layer packages with others. By downloading a layer package that you have chosen to share with me, I can do the same work on my computer that you do on yours. My maps look the same and behave the same; our models and tools are the same; our information schemas are the same; how we edit our features is the same; and so on. This means that you and other GIS users can begin to adopt and share common views and designs for GIS deployments. You can begin to use a common view for accessing and working with rich GIS maps and geographic information.

- **Serve.** Most importantly, you can also publish your maps and layers as GIS Web services using ArcGIS Server. This includes geographic information elements such as geoprocessing models and geodatabases that are referenced by and encapsulated within map packages and layer packages. Serving on the Web opens up access to many potential users.

- **Discover.** GIS Web services are discoverable just like any other Web resource. You can use Google or Bing to find GIS maps and other GIS resources and then put them to use in Desktop.

- **Use.** Any user sitting in front of ArcGIS Desktop, a Web browser, or a mobile phone can discover these GIS maps and other resources and immediately begin to put them to use.

### Online sharing using ArcGIS Web maps

ArcGIS.com has a special application for creating and sharing Web maps. These allow anyone to share GIS content using Web maps, which reference this rich geographic information.

Web maps and Web apps can easily be assembled without programming. For example, at ArcGIS.com, a Web map can be built in your Web browser by searching for and finding map services to use as a basemap. You can add a set of map services for your operational layers plus associated tools and widgets that are included when each operational layer is published as a GIS service. This includes tools for information pop-ups; editing tasks; and properties for using dynamic, time-aware layers.

These Web maps are created using the content and services that you author using ArcGIS Desktop. Once you have assembled these elements in a Web map, you can save the Web map and share it. Other users, who use Web browsers and mobile clients, can open and use your shared Web map.

### Product levels of ArcGIS Desktop

ArcGIS Desktop is scalable and can address the needs of many types of users. It is available at three functional levels:

1. **ArcView** focuses on comprehensive data use, mapping, and analysis.
2. **ArcEditor** adds advanced geodatabase editing and data creation.
3. **ArcInfo** is a complete, professional GIS desktop containing comprehensive GIS functionality and rich geoprocessing tools. Because of the extensive capabilities of ArcInfo, every GIS site should have at least one copy.

### Optional extensions to ArcGIS Desktop

A number of specialized software capabilities are sold as add-on extensions to ArcGIS Desktop. Each extension enables you to add capabilities such as raster geoprocessing, 3D GIS, and network analysis.

Here is a brief overview of the ArcGIS Desktop extensions:
ArcGIS Server is a comprehensive server-based GIS that provides advanced Web GIS services and applications as well as enterprise geodata management capabilities.

ArcGIS Server is used to build workgroup, departmental, and enterprise GIS applications as well as Web GIS deployments. ArcGIS Server is centrally managed, supports multiple users, provides access to rich GIS functionality, and is built using industry standards.

ArcGIS Server includes the following:

- A set of comprehensive GIS and map services and tasks
- Open, standards-based, Web service interfaces for accessing and using ArcGIS services
- An administrator's console for setting up and managing an ArcGIS Server installation
- Powerful enterprise geodatabase management in a number of DBMSs
  - Oracle
  - SQL Server and SQL Server Express
  - DB2
  - Informix
  - PostgreSQL

In addition to their use in ArcGIS Desktop, these server capabilities can be accessed and used in Web applications and combined with content on the open Web such as GIS content from ArcGIS.com and consumer maps from Bing Maps and Google.

**GIS services**

ArcGIS Desktop users create maps and rich geographic information elements such as analytic models and tools, geodatabases, address and place-name locators, 3D globes, and layer packages. Each of these elements encapsulates not only geographic data but how that data can be viewed and used.

You can open up access to these GIS information sets by publishing these GIS information elements as open Web services using ArcGIS Server. For example, map documents created in ArcMap can be used to create map services, such as multiscale basemaps.

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See [About ArcGIS Desktop extensions](http://www.esri.com) for more information.
GIS Web applications

Once GIS Web services are created, they can be combined in a GIS Web or mobile application. Multiple GIS services are accessed and used from many Web environments.

Standards-based services that are easy to integrate

ArcGIS Server is engineered from first principles to be Web compliant and to support widely adopted Web standards. Publishing information using ArcGIS Server enables these services to be easily used in numerous settings without any "heavy lifting."

ArcGIS Server leverages standard Web interfaces for all services, including these:

- SOAP XML
- REST
- KML

For more information, read about building and sharing Web applications at ArcGIS.com.
OGC services such as WMS, WCS, and WFS
SQL for multiuser geodatabase management
This opens up access to rich geographic information from many types of GIS clients.

Geodatabase management
ArcGIS Server includes capabilities for managing multiuser geodatabases in a number of DBMSs. When you need a large multiuser geodatabase that can be edited and used simultaneously by many users, the geodatabase provides a good solution. ArcGIS Server adds the ability to manage a shared, multiuser geodatabase as well as support for a number of critical version-based GIS workflows. The ability to leverage your organization's enterprise relational database is a key advantage.

Multiuser, transactional geodatabases work with a variety of DBMS storage models (IBM DB2, Informix, Oracle, PostgreSQL, and SQL Server). They take full advantage of underlying DBMS architectures to support the following:
- Extremely large, continuous GIS databases
- Many simultaneous users
- Long transactions and versioned workflows
- Relational database support for GIS data management (providing the benefits of a relational database for scalability, reliability, security, backup, integrity, and so forth)
- SQL types for spatial in all supported DBMSs (Oracle, SQL Server, PostgreSQL, Informix, and DB2)
- High performance that can scale to a very large number of users

Through many large geodatabase implementations, it has been found that DBMSs are efficient at retrieving and working with records containing the type of large geometry elements required for GIS data. In addition, GIS database sizes can be much larger, and the number of supported users greater, than with file-based GIS datasets.

These enterprise geodatabases are enabled using the ArcSDE technology that is part of ArcGIS Server. For information about the ArcSDE geodatabase architecture and how ArcSDE geodatabases leverage relational database technology, review the book of help topics starting with The architecture of a geodatabase.

Supported environments for ArcGIS Server
ArcGIS Server is built to run on Windows servers and in Linux and Java environments. These can be deployed using your own servers on the premises or in the Amazon EC2 Cloud.

ArcGIS Server product options

Functional levels
There are three functional edition levels of ArcGIS Server: Basic, Standard, and Advanced.

**Basic:** This level provides a comprehensive GIS server for spatial data management. It focuses on organizing and managing geographic datasets using ArcSDE technology.

**Standard:** This level provides a comprehensive GIS server for spatial data management and mapping. It includes 2D mapping; 3D globe services; and a suite of related features such as Web editing, geocoding, and routing. All aspects of the Basic edition are included in the Standard edition.

**Advanced:** This level provides users with a comprehensive GIS server for spatial data management, mapping, 3D services, and editing, as well as comprehensive geoprocessing, spatial analysis, and modeling. All aspects of the Basic and Standard editions are included in the Advanced edition.

Multiuser geodatabase support using ArcSDE technology is included with all three editions of ArcGIS Server.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Basic</th>
<th>Standard</th>
<th>Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiuser geodatabase</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Web-based replication</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Map services</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Image services</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Globe services</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Web editing</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Geoprocessing</td>
<td>No</td>
<td>Limited</td>
<td>Yes</td>
</tr>
<tr>
<td>Web applications</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Windows Mobile applications</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>iPhone applications</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
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<tr>
<td>SharePoint Web parts</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Capacity
ArcGIS Server can be implemented in workgroup settings and in enterprises as follows:
- **ArcGIS Server Workgroup:** Limited to run on a single machine and includes the Microsoft SQL Server Express database engine to support geodatabases
- **ArcGIS Server Enterprise:** Runs on multiple computers and works with any DBMS (SQL Server, IBM DB2, Informix, PostgreSQL, or Oracle)
Supports unlimited simultaneous connections to multiuser geodatabases
Contains unlimited storage capacity
Can be installed on either a single server or distributed across multiple servers (Each server requires a license.)

Optional extensions to ArcGIS Server
A number of specialized software capabilities are available as add-on extensions to ArcGIS Server. Each extension enables you to add capabilities such as raster geoprocessing, 3D GIS, and network analysis.

Here is a brief overview of the ArcGIS Server extensions:

<table>
<thead>
<tr>
<th>ArcGIS Server extensions</th>
<th>Advanced level</th>
<th>Standard level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3D extension</strong>: Advanced 3D modeling and analysis</td>
<td>Included</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>Geostatistical extension</strong>: Advanced statistical modeling and analysis</td>
<td>Included</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>Network extension</strong>: Advanced network modeling and analysis</td>
<td>Included</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>Spatial extension</strong>: Advanced raster data modeling and analysis</td>
<td>Included</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>Data Interoperability extension</strong>: Provides Web access to hundreds of data formats</td>
<td>Optional</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>Image extension</strong>: Dynamically serves and processes huge amounts of imagery in dozens of formats on the fly</td>
<td>Optional</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>Workflow Manager extension</strong>: Provides GIS workflow management</td>
<td>Optional</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>Geoportal extension</strong>: Used to create portals to organize, share, and discover GIS resources</td>
<td>Optional</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>Schematics extension</strong>: Advanced network diagrams and models</td>
<td>Optional</td>
<td>Optional</td>
</tr>
</tbody>
</table>

What is mobile GIS?

For many people, the client of choice for accessing and working with Web content is their mobile phone. These devices have enabled people to connect to and use the Internet just as easily as making a phone call.

Connecting to and working with their GIS is also part of this trend. In ArcGIS, a mobile device is another rich Web client that can connect to and utilize Web GIS.

In addition, many users collect information in the field with a mobile device, while others use larger format Tablet PCs in their daily field operations.

ArcGIS supports Web access to ArcGIS services for all these mobile options, and all these mobile clients can access and use ArcGIS Web maps.

ArcGIS supports the use of a broad range of mobile devices—including Tablet PCs, in-vehicle mounted systems, Windows smartphones, and Apple iPhones—to use, collect, update, and share geographic information.

Windows Mobile
ArcGIS for Windows Mobile includes applications for Windows Tablet and Windows Mobile devices. These applications are used to view, collect, and update geographic information in the field.
Support for Windows Mobile also includes a developer's SDK that is used to create custom applications and to extend the out-of-the-box Windows Mobile applications for smartphones and Tablet PCs.

See ArcGIS for Windows Mobile for more information.

 iPhones

ArcGIS for iPhone connects your iPhone to ArcGIS. You can download the ArcGIS iPhone app from the iTunes App Store. You can also use a native Objective-C/Cocoa developer kit to build custom iPhone applications.

See ArcGIS for iPhones for more information.

 ArcPad

ArcPad is designed for GIS professionals who want to take GIS capabilities in the field on mobile devices. This provides field-based staff with the ability to capture, edit, and display geographic information remotely. ArcPad can be used for the following:

- Perform field data collection.
- Integrate GPS, range finders, and digital cameras.
- Share enterprise data with field-workers.
- Improve the productivity of a GIS data collection.
- Improve the accuracy of GIS data through field verification.

See Using ArcPad for more information.

What is ArcGIS online?

GIS enables sharing of maps and geographic information across workgroups, organizations, enterprises, communities, and the public. You can use, create, analyze, share, and do collaborative work using this shared information.

ArcGIS online is the capability of every part of the ArcGIS system to use this shared geographic information and content. Content is shared using the ArcGIS cloud infrastructure.

ArcGIS is used to share and disseminate geographic information as Web maps and GIS services. GIS professionals use ArcGIS Desktop and ArcGIS Server to create map services and other GIS services to share rich information—as Web maps, image services, editing services, geoprocessing services, and so forth. Once published, these can be discovered and used in many Web clients.

Using this approach, each GIS organization can make its information available to nonspecialists. This also enables the integration of information across organizations, providing a strong basis for collaboration.

How has ArcGIS Online changed in Version 10?

In previous releases, ESRI hosted a Web site named ArcGIS Online through which ESRI created and shared a gallery of ready-to-use Web maps and geographic data. All of the content was managed by ESRI, and this Web site was focused on providing access to map services and other GIS services.

At Version 10, ESRI still provides rich Web maps and GIS services. In addition, the ArcGIS system has been enabled to work everywhere:

- On the Web
- Using mobile devices and cell phones
- On desktops and in workgroups and enterprises, where GIS professionals compiled and publish rich, interactive maps and geographic information

At ArcGIS 10, the Web is now fully integrated into all aspects of the system, allowing you to share information with others using the Web (in addition to ESRI's maps and data). All parts of the ArcGIS System (desktop, mobile, arcgis.com, server, and so on) have integrated online functionality (which is referred to as ArcGIS online).

The online capabilities of ArcGIS

Since all products in the ArcGIS system have online capabilities built in, you can manage your own maps and geographic information online and share these across user groups, which you can create, manage, and join for collaborative work.
Your content can be referenced in the Map and App Galleries that are part of ArcGIS online. You can view these on the Web at www.ArcGIS.com. Once you share your content, it can subsequently be discovered and used by others.

Users can work with the online capabilities built into all ArcGIS clients to find and use this shared information.

**How users share information online using ArcGIS**

All ArcGIS clients are fully integrated with the Web, enabling you to incorporate Web and online information into your GIS projects. Here are some example ways in which you can share maps and geographic information using ArcGIS.

**Creating and sharing a map and layer packages using ArcGIS Desktop**

ArcGIS Desktop users can share their work with others using map packages and layer packages. Other Desktop users can search for, discover, and use their shared packages.

Here’s how to get connected online and share a layer package.

1. Sign into ArcGIS online in ArcMap.

2. Right-click the desired layer in the map’s Table of Contents, and select *Create Layer Package*.

3. Specify that you want to upload the layer package to ArcGIS online.
4. Validate the contents and click **Share**. Then, fill out the layer package properties panel. Optionally, you can specify the groups with which to share the package.

Subsequently, other Desktop users can get connected online to search for, discover, and download shared layer packages and other Desktop content.

**Creating and sharing Web maps across the ArcGIS community**

You can use [www.ArcGIS.com](http://www.ArcGIS.com) to create and share Web maps. Web maps are online maps that reference a set of map and GIS services for use on any ArcGIS client—in desktops, Web applications, mobile devices, and ArcGIS Explorer Online. Each Web map is composed of one or more Web map services that are combined to create a useful map experience for ArcGIS users.
Web maps can be shared and used through the Web by anyone without the user having to install any ArcGIS software. A person can simply use their Web browser, mobile phone, or ArcGIS Explorer Online to access and use these Web maps. Web maps also work with ArcGIS Desktop as well.

Web maps bring geographic information to life and provide access to rich GIS information and tools that are behind each map display. ArcGIS.com has a web application that enables anyone to create and share Web maps.

Creating and sharing content in focused user groups

With an ArcGIS online login, you can create and join user groups. These are focused user communities who want to work together more closely. Users can define these groups and invite others to join.

You also have control over the content that you load into ArcGIS online and with whom you share it. You may choose to share certain content elements with a small set of users.

Who uses ArcGIS online?

- **ArcGIS Desktop users.** These users have full GIS installed on their desktops. They compile GIS maps and their underlying geodatabases along with imagery, geoprocessing models, locators, and other ArcGIS documents. These documents and datasets can be shared among ArcGIS Desktop users as map packages, layer packages, and other ArcGIS elements. These users also often use ArcGIS Server to publish and serve much of their organization’s GIS content for use on the Web and on mobile devices in the field.

- **Web GIS and mobile users.** These users access ArcGIS.com from their Web browsers and mobile devices. They do not have any GIS software on their computers, but they can consume and apply GIS Web maps and applications that are created and published by the desktop user community.

- **Web developers.** Developers use free Web APIs for ArcGIS to create focused map applications that can be deployed in the ArcGIS system. They can publish their Web and mobile applications in the ArcGIS.com application gallery.

Who shares with whom? | What do they share? | How do they share?
--- | --- | ---
Desktop user to desktop user | • Map documents and globe documents  • Layers  • Models and scripts  • Geodatabases  • Locators  • Image mosaics  • Web maps | Use ArcGIS Desktop to connect online and manage content in online workspaces and share content via groups.

Desktop user to Web user | • Web maps  • Web applications  • References to ArcGIS services:  ■ Map services  ■ Image services  ■ Globe services  ■ Geoprocessing services  ■ Locator services  ■ Geodata services | • Use ArcGIS Server to publish map and GIS services  • Create and share Web maps at ArcGIS.com and their local server node  • Create and share Web and mobile apps at ArcGIS.com and their local server node

Web user to Web user | • Web maps | Create and share Web Maps at ArcGIS.com

Web developer to Web user | • Custom Web applications | Create Web apps using the free Web API’s for ArcGIS. These Web apps use Web maps.
What is ArcGIS.com?

ArcGIS.com (www.ArcGIS.com) is a Web site for working with online GIS maps and applications. It includes

- A gallery of ready-to-use Web maps and applications, published by ESRI and the ArcGIS community, that you can use in your Web browser and on mobile devices without having to download special GIS software
- A browser-based map viewer that you can use to create and share your own Web maps
- A way for user communities and groups to organize and share information
- Free ArcGIS Web APIs for JavaScript, Flex, and Silverlight for use by Web developers

The ArcGIS.com Web site is where professional GIS users share information with all kinds of Web GIS users. The professional GIS community uses ArcGIS Desktop and Server to create and publish rich maps and geographic information services that are mashed up and referenced in Web maps. They can share their Web maps online with the ArcGIS community.

Many ArcGIS professionals create and share their maps and geographic information using ArcGIS.com. This enables the ArcGIS community to include anyone with Web access to discover and use this shared content. No software is required to use ArcGIS.com—just a Web connection. If you can use a consumer Web map (like Google Maps or Bing Maps), you can use and apply ArcGIS.com.

This is the hub Web site where you can register, discover, use, and mash up ArcGIS maps and services.

What can you find at ArcGIS.com?

ArcGIS.com has a repository where ArcGIS users and others publish and share maps and geographic information. This Web site includes the following:

- **Maps**: A gallery of interactive Web maps from ESRI and the user community.
- **Applications:** A gallery of Web and mobile applications.

- **Groups:** ArcGIS users can set up and join user groups (communities) that share GIS content with one another and perform other related collaborative activities.

- **User workspaces:** Each ArcGIS user can upload and manage ArcGIS content—for example, Web maps, map packages, layer packages, toolboxes, custom desktop add-ins, and references to ArcGIS services for sharing. This content can be shared in focused ways among a small user group or more openly with larger communities.

- **ESRI Data and Maps:** ESRI provides a wide range of rich geographic datasets and Web maps at ArcGIS.com. You’ll find multiscale...
basemaps for imagery, street maps, topographic maps, and other key reference maps. A number of demographic layers and natural resource layers are also available from ESRI.

- **Free Web APIs and developer resources:** Web developers can use free ArcGIS APIs to build GIS applications that fuse and work with the shared content published as GIS maps and geographic information services by the ArcGIS user community. See the App Galleries at ArcGIS.com for more information and helpful links.

- **Search and discovery:** You can use the search interface to search for and find GIS maps and information that are shared at ArcGIS.com, served from a particular ArcGIS Server Web site, or available on the World Wide Web.

**Web maps**

An ArcGIS Web map is an organized set of map service layers that can be opened and used together as a single map. Web maps can be shared on the Web and opened in any ArcGIS client application—for example, in ArcMap, ArcGIS Explorer Online, ArcGIS.com, iPhones, and so on. This is significant because this enables you to use GIS maps to open up and share access to your geographic information and knowledge.

Web maps are how ArcGIS users share and disseminate their geographic information as Web map layers that reference rich GIS services. Individuals use ArcGIS Desktop and ArcGIS Server to create map services and other GIS services to share their geographic information—map services, image services, editing services, geoprocessing services, and so forth. Once published, these can be discovered and used to create ArcGIS Web maps that can be used anywhere in the ArcGIS system.

Web maps can be combined (that is, mashed up). This enables anyone with a Web browser to connect to ArcGIS.com and assemble and share Web maps.

**Creating and sharing Web maps at ArcGIS.com**

Here is a simple process for Web map creation and sharing.

1. Create a Web map using the ArcGIS.com map application by adding basemap service(s) and operational layers.
2. **Save the Web map.** All users can register and create a workspace at ArcGIS.com that allows them to save Web maps and other content for sharing with others.
3. **Share the Web map.** Your new Web map can be shared at ArcGIS.com and discovered in the map gallery.

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**Creating, sharing, and using Web maps at ArcGIS.com**

Regardless of whether you have ArcGIS Desktop software or no GIS software at all, you can use the ArcGIS Web Map application at ArcGIS.com to create your own Web maps that can be shared with all kinds of users. These individual Web maps can be assembled and shared as composite Web maps and subsequently used by anyone. No software is necessary. All users need is a Web browser or mobile device and a Web connection.

While anyone can create ArcGIS Web maps, many advanced ArcGIS users will create and share Web maps of their authoritative, trusted content and operational information for their end users. These ArcGIS Desktop users create map documents, which can be published as map services using ArcGIS Server.

The corresponding ArcGIS Map Services will be discovered on the Web and used as Web maps, which can be mashed up and combined. This enables Web map users to create and share their own Web maps that reference rich GIS content that is published by the ArcGIS user community.

Web maps can be shared and discovered in the [map gallery](#) at ArcGIS.com. You can search for Web maps in user group pages, in the map gallery, or on the open Web.
Web browser users can create and share their own Web maps at ArcGIS.com
Web maps can be combined (that is, mashed up). Anyone with a Web browser can use ArcGIS.com to combine Web maps to create and share their own new Web map.

ArcGIS Web Map clients
ArcGIS provides a series of Web clients to work with Web maps:

- **ArcGIS Web Map**: For creating, sharing, and using ArcGIS Web maps
- **ArcGIS Explorer Online**: A version of ArcGIS Explorer that runs in your Web browser
- **ArcGIS API for Flex**: A configurable GIS Web application and API
- **ArcGIS for SharePoint**: GIS Web parts for adding Web maps into your SharePoint Web sites
- **ArcGIS for Windows Mobile**: Web maps and applications for the Windows smartphone and Tablet PCs
- **ArcGIS for iPhone**: Web maps and applications for the Apple iPhone

ArcGIS for developers

The ArcGIS architecture for developers can be thought of as a series of clients and servers connected through a simple services model. ArcGIS clients connect to and use GIS services. The servers expose these services. 
Developer support for ArcGIS is based on this client-server paradigm.
ArcGIS includes a rich suite of clients (services clients), designed for a variety of platforms—ranging from Web to mobile to full workstation desktops. ArcGIS also includes a set of servers that expose GIS services. These servers are designed to run as hosted services in the cloud, as enterprise servers, or as a local GIS runtime. Desktop GIS can also be used to access and work with GIS files on their local networks.

ArcGIS clients

ArcGIS includes a number of clients that can be used and supports various development APIs depending on which client you use.

**ArcGIS Desktop**

Most critically, ArcGIS Desktop is used to create and work with rich geographic information, which is subsequently shared and deployed across the ArcGIS system. ArcGIS Desktop is used to build maps, geographic data, and analytic models and perform GIS project work. It is also the primary workstation used to compile GIS data.

ArcGIS Desktop is used to create and publish the map packages and layer packages that fuel the rest of the ArcGIS system and GIS services on the Web.

ArcGIS Desktop can be customized and extended using ArcObjects APIs for .NET, Java, or C++. ArcObjects is a comprehensive set of software components used to write add-ins and extensions to Desktop.

For more information on writing add-ins for ArcGIS Desktop, see using .NET or using Java.

For information on writing ArcGIS extensions, see Extending ArcGIS with .NET or with Java.

**ArcGIS Engine**

ArcGIS Engine can be used independently of ArcGIS Desktop to write custom applications and embed ArcGIS into other desktop applications by use of APIs for .NET, Java, and C++.

Like ArcGIS Desktop, ArcGIS Engine is also based on the ArcObjects component library. For more information, visit the [ArcGIS Engine resource center](#).

**Web applications**

At [ArcGIS online](#), you can access and work with a series of Web APIs for JavaScript, Flex, and Silverlight to build custom Web applications for use with ArcGIS.
These Web applications connect to and leverage map services and other geographic information services from ArcGIS server nodes, ArcGIS online, and consumer mapping servers on the open Web.

There are a number of Web client options for JavaScript, Flex, and Silverlight.

Another option is to use ArcGIS Explorer Online, which can be used to work with Web maps, create and share map presentations, and tell stories with maps. Map-based storytelling is a critical mechanism used to communicate key messages.

**ArcGIS for SharePoint**

ArcGIS services can also be used in SharePoint Web sites as Web parts for ArcGIS. This allows you to embed ArcGIS Web maps and use them within SharePoint applications. Your Web maps can access and use map services and other GIS services.

See [Using ArcGIS for SharePoint](#) for more details.

**Mobile GIS applications**

ArcGIS provides support for a number of mobile clients including Windows Mobile phones, Tablet PCs, and Apple iPhones. For more information, see the [Mobile GIS Resource Center](#).

**ArcGIS services**

ArcGIS Server deploys ArcGIS capabilities in a server-based architecture. GIS maps, data, and geoprocessing models can be deployed as Web services and accessed by virtually any client for use by GIS professionals and other users. GIS services can be deployed and scaled using banks of computers, both on-site in your organization and in cloud servers on the Web.

Users create important GIS maps and information using ArcGIS Desktop and publish these as Web services using ArcGIS Server. In this way, ArcGIS Server provides broad access to information and the ability to scale your GIS to fit any configuration or situation.

Supported Web service APIs include SOAP, REST, and OGC protocols (such as WMS, WFS, and WCS). See [ArcGIS services](#) for more information.

**Resources for ArcGIS developers**

The ArcGIS Resource Center includes a set of [Web pages for ArcGIS developers](#).
This resource center is a guide for all developers to find relevant developer resources for working with any part of ArcGIS. You can also find help topics, blogs, forums, videos, and useful code samples to help you with your development work.

There are also strong developer communities that you can connect with to download and share useful application code and custom applications.