An Overview of ArcWeb℠ Services

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What Are ArcWeb Services?

ArcWeb℠ Services are ESRI's family of hosted geographic information system (GIS) Web services. Through ESRI® ArcWeb Services, users can access and consume many types of geographic content including basemaps, business data, points of interest, and dynamic data such as weather information. ArcWeb Services can also provide geospatial functionality such as routing, mapping, geocoding/reverse geocoding, address matching, and place finding, all on top of leading commercial data sets. Often, the functionality is also held on the server side. That means users have a wide variety of highly scalable functionality and data that they can include in their applications without having to support or maintain that functionality and data. The result is significant savings of development time, expense, and computer resources.

Advantages of ArcWeb Services

The key advantages of ArcWeb Services include the following:

- Access to vast amounts of current, reliable data and GIS capabilities without having to maintain or store the data
- Ability to combine multiple services and integrate them with your own application environment, leading to limitless possibilities for sharing geographic information
- No need to purchase hardware or software
- No need to obtain updates to data sets because the data accessed via ArcWeb Services is always current
- 24/7 reliability

ArcWeb Services Customers

ArcWeb Services currently deliver approximately 1.5 million transactions each day to many world-class customers including the following:

- Homestore, Inc.
- National Geographic Society
- The Associated Press
- World Wildlife Fund
- National Park Service

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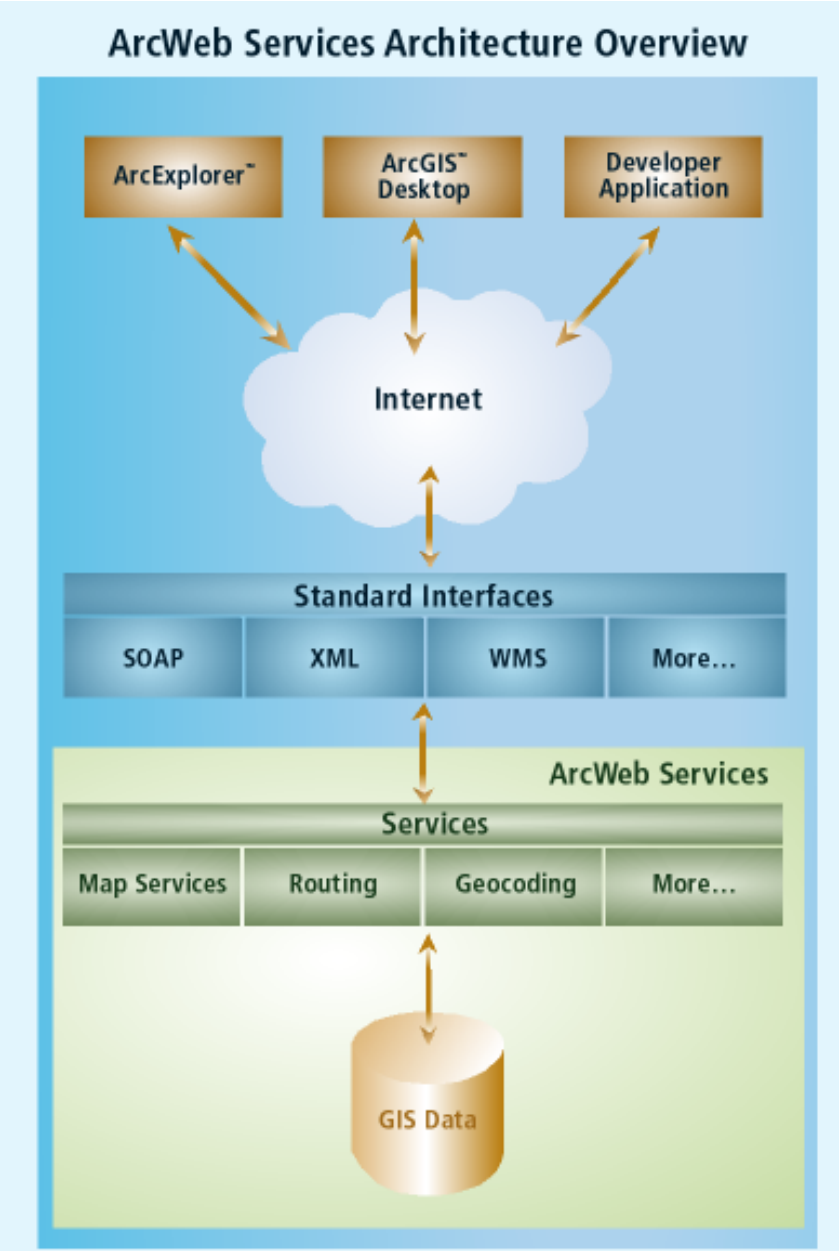

ESRI ArcWeb Services Infrastructure

ArcWeb Services are based on an ESRI-hosted infrastructure designed to provide reliable 24/7 services. This infrastructure is powered by a variety of leading-edge technologies. The system hardware is provided by Sun Microsystems and includes numerous server-class machines that run the Web, mapping, and data servers. Two complete configurations are maintained at geographically separate locations to provide full system redundancy and load balancing. This robust, reliable system has the capability of delivering 5,000,000 maps per day at a 99.9 percent availability rate.

The ArcWeb Services system is monitored and maintained by ESRI staff on a 24/7 basis. ESRI staff is on-site during standard business hours (8:00 a.m. to 5:00 p.m., Pacific time) to perform any required system maintenance. ESRI staff is also available by pager during nonbusiness hours if there are system interruptions. If the system hardware, software, network, or applications fail to perform, ESRI systems staff is automatically notified by pager and will address the issue immediately. ESRI has high-level support agreements with our hardware and network vendors that guarantee prompt response, if necessary.

ESRI Internet Technology

ArcWeb Services combine the power and spatial processing capabilities of ArcIMS®, ArcSDE®, and leading third party technologies with a spatial data repository maintained by ESRI. For further information on these technologies, refer to the product sections of the ESRI Web site at www.esri.com/software.

ArcSDE is an application server that facilitates storing and managing spatial data (raster, vector, and survey) in a database management system (DBMS) and makes the data available to many kinds of applications. ArcSDE is open and works with a variety of different databases including Oracle, Informix, IBM DB2, and Microsoft SQL Server.

The ArcSDE server runs on leading UNIX platforms including Sun Solaris, SGI IRIX, IBM AIX, HP–UX, and Hewlett–Packard (HP) Tru64; Microsoft Windows NT and Windows 2000 servers are also supported. ArcSDE is built on standard TCP/IP protocols.

ArcIMS is the foundation for distributing spatial data and applications over the Web and wireless Web. It performs basic spatial functions such as geocoding, reverse geocoding, spatial searching, and mapping. ArcIMS is composed of a multitier, highly scalable architecture consisting of Web server connectors, an application server, a spatial processing server, and a suite of open Extensible Markup Language (XML) application program interfaces (APIs) that allow the application developer community to easily and quickly develop compelling location-based applications.

ArcIMS runs on Microsoft Windows, HP–UX, IBM AIX, Sun Solaris, and Linux platforms. It is built on standard TCP/IP protocols.

ArcIMS and ArcSDE were developed to work together as an integrated back-office solution for fast Internet or Intranet access to vector, raster, and survey data stored in a relational database. ArcSDE also works as an application server, delivering spatial data to many kinds of applications and serving spatial data across the Web and wireless Web.

Available ArcWeb Services

ArcWeb Services are a robust family of GIS Web services. This family includes services for developers, services for ArcGIS users, and ArcWeb Services applications.

ArcWeb Services for Developers

ArcWeb Services for developers are deployed through standard Web protocols including hypertext transfer protocol and XML. ArcWeb Services use the XML-based Simple Object Access Protocol (SOAP) to communicate and, therefore, are compatible with the majority of Web services frameworks available today such as Microsoft's .NET or The Mind Electric's GLUE. Developers do not have to learn new programming languages or environments to use the packaged ArcWeb Services, so they can get up and running very quickly. The ArcWeb Services APIs are fully documented and include tutorials on how to access them using popular development tools.

ESRI's first suite of ArcWeb Services for developers is ArcWeb USA.

ArcWeb USA is a combination of ArcWeb Services focused on U.S. coverage. It includes a rich offering of data content along with several of the most popular services for building custom mapping and locator applications.

With more data being added all the time, ArcWeb USA at the time of this printing includes

- Geographic Data Technology, Inc. (GDT), Dynamap/2000
- United States Geological Survey (USGS) National Elevation Data
- USGS National Land Cover Data
- Federal Emergency Management Agency (FEMA) Q3 Flood Data
- Census 2000 Population
- National Geographic Society TOPO! Data
- *ESRI Data & Maps*

The services included in ArcWeb USA are made available using SOAP protocols, which can be easily integrated into any Web page or custom-built Web-enabled application. ArcWeb USA services include

- Map Image: Generate a dynamic map of a specific location.
- Place Finder: Determine the location of a place (e.g., city, state) anywhere in the world.
- Address Finder: Determine the location of a U.S. street address.
- Route Finder: Generate a route with driving directions for multiple locations.
- Query: Determine the characteristics (e.g., population, flood potential) of a location.
- Point of Interest (POI) Manager: Upload or input custom points of interest for use with services.
- Proximity: Find the nearest points of interest using user-specified parameters.

ArcWeb USA Protocols

ArcWeb USA uses the latest Web service standards to communicate with local applications. It uses a set of methods or function calls that can be invoked remotely from a client machine to get the desired results. This seamless interchange requires that ArcWeb USA communicates in a way that is understood by any remote application. This standardized communication is accomplished through two Internet protocols, SOAP and Web Service Definition Language (WSDL).

In addition, ArcWeb USA is compatible with Web service toolkits, making integration into existing applications easy. The ArcWeb Services in ArcWeb USA are published to a Universal Description, Discovery, and Integration (UDDI) registry so developers can quickly discover them.

ArcWeb Services for ArcGIS Users

ESRI offers ArcWeb Services from many of the world's leading commercial data publishers. These Web services represent some of the most current and comprehensive geographic data available anywhere. ArcWeb Services for ArcGIS users incorporate the ArcXML protocol for easy integration with ArcGIS and can be accessed as either an image or feature service. You can use these ArcWeb Services as background layers for other local data, and you can interact with the data in much the same way as you would with a local source on the desktop.

The ArcWeb Services for ArcGIS users currently offered through ESRI are described below.

GDT U.S. Streets—Based on GDT's premier street network database, Dynamap/2000. The Dynamap/2000 database contains more than 13 million addressed street segments along with administrative boundaries, highways, railroads, landmarks, water bodies, and more. Subscription access is available at a national and state level as a feature streaming service or as an image service.

GDT Canadian Streets—Provides a detailed street basemap for Canada. It includes the entire Canadian road fabric containing more than 635,000 addressed streets. The service includes extensive, detailed, and current street information that can be used to plan, analyze, and display strategic initiatives. Subscription access is available at a national and provincial level as a feature streaming service or as an image service.

Tele Atlas U.S. Transportation and Basemap—Based on the Tele Atlas U.S. ArcIMS Route Service. This service provides the foundation for excellent vehicular fleet navigation, logistics, deployment, tracking, and dispatch applications. Subscription access is available at a national and state level as a feature streaming service or as an image service.

Pixxures WebPix USGS DOQQ Mosaic—Based on the USGS digital orthophoto quarter quadrangle (DOQQ) orthorectified aerial photography library. This service provides a seamless mosaic backdrop. It is designed for use as a reference layer for vector extraction and alignment, land use analysis, detailed access and vegetation analysis, emergency response planning, and tactical implementation.

ORBIMAGE OrbView Cities—Covers select cities around the world at 1-m resolution.

WorldSat Global Imagery—Provides WorldSat's 1-km or 2-km pixel resolution, cloud-free images of the world. The imagery was collected and processed from the National Oceanic and Atmospheric Administration (NOAA) series of Advanced Very High Resolution Radiometer (AVHRR) weather satellites, which orbit the earth at an altitude of more than 820 km (520 miles) in space. These data sets are available coregistered to digital elevation data with shaded relief as well as ocean bathymetry based on NOAA's E-TOPO 5 data. The services also include general reference layers, country boundaries, and city points from ESRI.

Meteorlogix Real-Time Weather Services for Cloud Cover—Offers ground-corrected altitude-based remapped satellite cloud cover data updated every 60 minutes. Clouds are delivered at 4-km resolution for smaller view areas up to a scale of 1:16,000,000 and at 16-km resolution for larger view areas with scales beyond 1:16,000,000. Subscription access is available at a national and state level as a feature streaming service or as an image service.

Meteorlogix Real-Time Weather Services for Surface Observations—Provides past one- and 24-hour weather reports taken at station observation locations across North America. Real-time cloud height information is updated on a 60-minute cycle and provided as a direct feed to the GIS desktop. Subscription access is available at a national and state level as a feature streaming service or as an image service.

NEXRAD: Meteorlogix Real-Time Weather Services for Precipitation Intensity—Provides real-time NEXRAD base reflectivity data updated on a 15-minute cycle and provided as a direct feed to enable monitoring and analysis of precipitation intensity (rain, mix, snow) across the United States. Subscription access is available at a national and state level as a feature streaming service or as an image service.

Meteorlogix Real-Time Weather Services for Rainfall—Provides the past one-hour and 24-hour rainfall estimates from NEXRAD digital precipitation array. The measurement units are in inches of water. Rainfall estimates are delivered at 4-km resolution for smaller view areas up to a scale of 1:16,000,000 and at 16-km resolution for larger view areas with scales beyond 1:16,000,000. Subscription access is available at a national and state level as a feature streaming service or as an image service.

Meteorlogix Real-Time Weather Services—Offers a complete weather package incorporating cloud cover, NEXRAD base reflectivity and precipitation type (rain, mix, snow), and surface observations. The weather information is updated on a continuous basis, from every 15 minutes to every hour.

ArcWeb Services Applications

For the end user who wants rapid and easy access to maps and geographic-based reports, ESRI offers applications that have been built using ArcWeb Services. These applications provide up-to-date geographic-based reports and maps that end users can access through a subscription service or download.

ArcWeb Services applications now offered by ESRI include

ESRI Business Information Solutions (ESRI BIS)—Provides industry-specific marketing applications and services such as demographic data reports and maps, customer profiling, site evaluation and selection, target marketing, and much more.

Flood Map Report—Allows users to download a flood map report to help determine the relative flood risk of a specific location. These reports are created using FEMA Q3 Flood Data and GDT Dynamap/2000 street data.

For more information on ESRI's ArcWeb Services, visit www.esri.com/arcwebservices.