



What Is G.net?

An ESRI® Technical Paper • March 2002

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What Is G.net?

Background

There is widespread recognition that the data layers and tables in most geographic information system (GIS) implementations come from multiple organizations. A GIS organization will develop some, but not all, of their data content. At least some of the layers will be from external sources. Thus GIS data management, by its very nature, is distributed among many users.

Because GIS users are hungry for quality geographic information, there is a fundamental need for users to share their data. Vast resources of information are available, but the task of finding exactly what you need and knowing the quality and currency of the information can be daunting. GIS users need a mechanism to efficiently catalog and search for available geospatial information.

The NSDI and GSDI Vision

The National Spatial Data Infrastructure (NSDI) is a concept developed by the United States and other national, state, and local governments. NSDI and Global SDI (GSDI) promote the vision of a framework for GIS users to openly share geographic information with one another.

The Spatial Data Infrastructure (SDI) concept describes requirements for computer technologies, policies, and people necessary to promote the sharing of geospatial information throughout all levels of government, private industry, nongovernmental organizations, and the academic community. SDI interconnects GIS nodes across the Internet—and, in many cases, over secure networks—to share information with one another openly (i.e., based on standards).



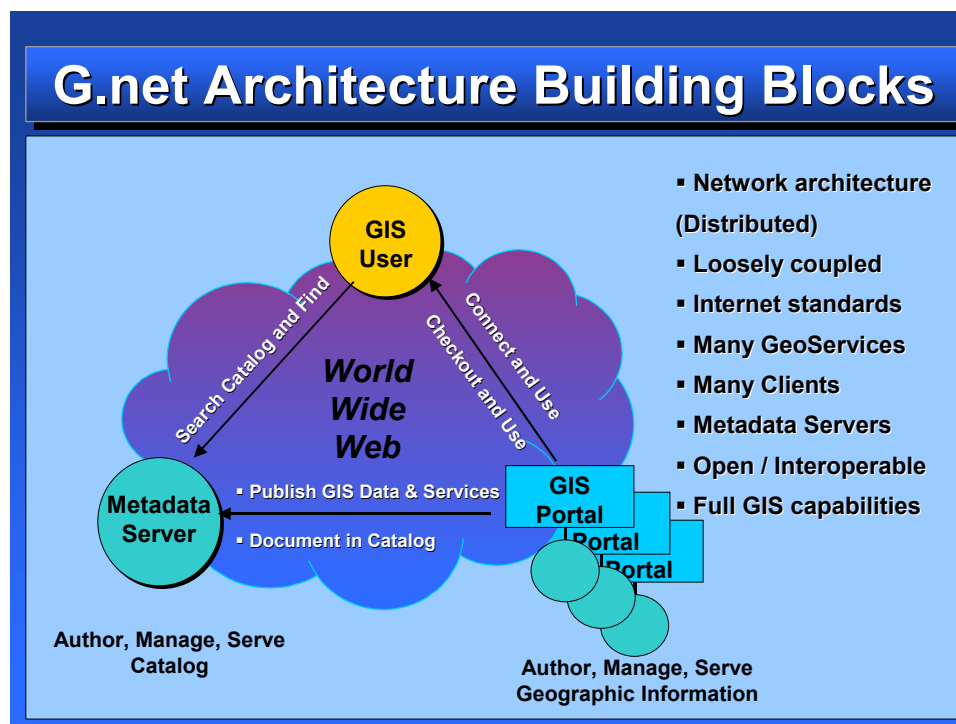
An SDI interconnects GIS nodes across the World Wide Web to promote information sharing and access.

G.net: SDI Building Blocks from ESRI

G.net is how ESRI users participate in a Spatial Data Infrastructure with other users, regardless of their GIS technology platform. G.net describes how ArcGIS™, ArcIMS®, ArcSDE™, and other ESRI® tools are used. Any GIS organization wishing to participate will benefit from using these technologies.

A Spatial Data Infrastructure is built from three fundamental building blocks:

- GIS users who search for useful geographic information and connect to GIS portals for information access.
- Metadata catalog servers that describe and reference geographic information sets at various GIS portals. These are often referred to as clearinghouse nodes.
- GIS portals that provide access to geographic information. The information can be delivered in many forms, such as FTP downloads, online maps, reports, Internet GIS services, and data streaming services.



ArcGIS, ArcIMS, ArcSDE, and other ESRI software can be used to implement all of the functional nodes in a Spatial Data Infrastructure. This architecture is known as G.net.

At its most basic level, a Spatial Data Infrastructure is realized through catalogs holding metadata about available data and services. This is similar in function to the role of the card catalog in a library that references and organizes all library holdings.

As the number of participating organizations and users grows, so will the numbers of entries and complexity of the various metadata catalogs. The need for a metadata server and search tools becomes more critical.

In practice, the G.net building blocks can be assembled in many ways using ArcGIS, ArcSDE, and ArcIMS technology. Each GIS site would provide one or more of the three SDI capabilities. For example, a city might provide a catalog referencing the available data and services at its Web site along with a series of data and mapping services. A small GIS shop would be able to access and use those services in ArcView® seats across the Internet.

In another case, a state government might provide a Metadata Catalog service that describes its available ArcIMS services as well as data and services at other GIS portals within the state. The state might also publish a set of HTML Web pages to publish various Internet Map and Data Services.

How Is ArcGIS Used for SDI?

ArcGIS tools can be used in an SDI in the following ways:

- Client access. ESRI provides many client applications for many user types that can connect to and use standards-based Metadata Servers and GIS portals. These clients include ArcReader™, ArcView, ArcEditor™, ArcInfo™, MapObjects®—Java™, ArcPad™, ArcIMS clients, and wireless client interfaces.
- Create, manage, and serve metadata. With ArcGIS, users can create and update Federal Geographic Data Committee and ISO-compliant metadata. Using the standards-based ArcIMS Metadata Server and ArcSDE, users can manage and serve metadata catalogs on a local network, a secure network, or the World Wide Web. The ArcIMS Metadata Server can be accessed through standards-based ArcIMS services and through interfaces such as Z39.50.
- Create, manage, and serve GIS information. GIS users can openly serve data, metadata, online maps, and other information using ArcIMS. ArcIMS services can be accessed with a wide range of clients via GIS and XML-based Web Services standards.

How to Participate in a Spatial Data Infrastructure

SDI concepts play an important role at a number of levels in the GIS community. Following are some of the possibilities for participation by your organization:

- Be a user. From your GIS seat, you will be able to discover and connect to Metadata Servers to search for important spatial information and services, which can subsequently connect you to GIS portals providing critical data and services.
- Build a GIS portal by publishing data and services. Your GIS shop can publish an ArcIMS Web site with access to data files (e.g., FTP services), online maps, and other GIS services on the Internet. ArcGIS can be used to implement these portals as well as to provide a metadata service to advertise the GIS data and services at your site.
- Build a clearinghouse node. Metadata servers that reference various information collections to serve users regardless of the GIS software they employ can be built using ArcGIS and ArcIMS. Many GIS users want to provide metadata catalog portals for a collection of GIS data and services. A few clearinghouse sites want to provide a catalog of information sets published by many user sites (in addition to their own data and services).
- Participate in the Geography NetworkSM. One way to create and share your geographic information is to register your data and services with the Geography Network portal at www.geographynetwork.com.

- Build a GIS community by creating your own geography network. Using the new Metadata Server in ArcIMS 4, you can collaborate and implement the same building blocks to build your own GIS search portal like the Geography Network. Many focused GIS user groups want to collaborate on information sharing between the members in their community. These user groups can create community-based portals to publish and share geographic information with one another. This may take the form of a loosely coupled collection of GIS portals or a single central portal.

