

# Migrating to ArcGIS Server<sup>1</sup>

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**Abstract.** The Illinois Department of Natural Resources, Office of Mines & Minerals, Land Reclamation Division maintains an ArcIMS site serving spatial information about Illinois SMCRA Coal Mine Permits and collateral data providing government, the coal mining industry, consultants, and the general public with current boundaries and attribute values. This paper will describe the process of migrating this application from ArcIMS to the newer ArcGIS Server emphasizing the concept of map services.

Additional Key Words: ArcGIS Server, Map Service, User Interface, Mine Permits

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## ArcIMS

The Illinois Department of Natural Resources, Office of Mines & Minerals, Land Reclamation Division maintains an ArcIMS site serving spatial information about Illinois SMCRA Coal Mine Permits and collateral data providing government, the coal mining industry, consultants, and the general public with current boundaries and attribute values.

ArcIMS, or Internet Map Server, is software that allows for centrally hosting and serving GIS maps and data for use on the Internet. The administrative framework lets users author configuration files, publish maps, design Web pages, and administer the component parts. The Illinois site became available on the internet in December 2004 just prior to the 2004 Atlanta Geospatial Conference.

The spatial data pertinent to Illinois Mine Permits include the permit boundary, the bond release status, the annual affected acres, the post-mining land use, groundwater monitoring wells, NPDES points, and the spatial extent of areas approved for underground mining. The collateral spatial data includes previously mined areas, political boundaries, infrastructure, natural features, and imagery.

The ArcIMS viewer is a set of HTML pages and JavaScript files assembled by one of the ArcIMS programs which defines the look and functionality of your ArcIMS site. The Illinois site uses a generic viewer customized with a few modifications. The term generic viewer will be used in this paper to identify the least complex out of the box tool to display your spatial data with a browser on the internet. Figure 1 is an example of this generic viewer.

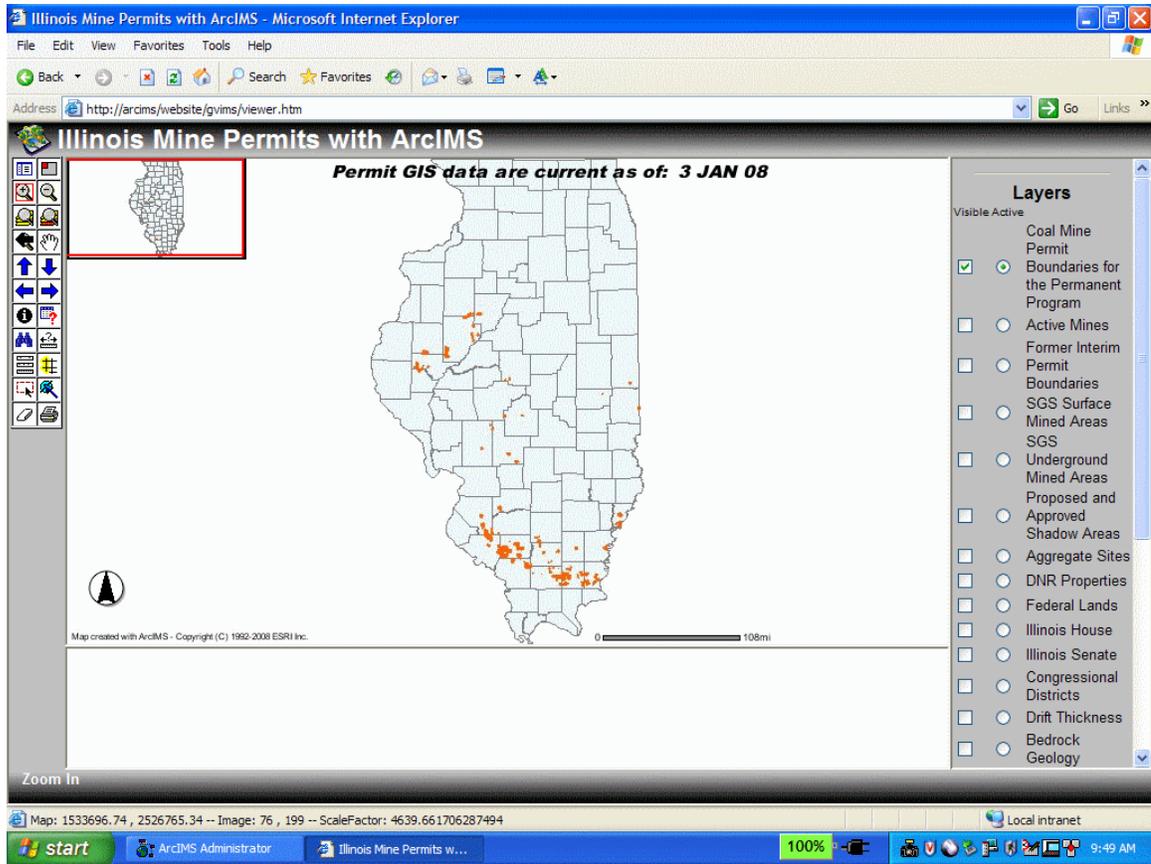


Figure 1. ArcIMS Out of the Box Generic Viewer

## ArcGIS Server

ArcGIS Server is software that allows for centrally hosting and serving GIS maps, data, and applications for use on the Internet. ArcGIS Server is a more robust product, has greater capabilities than ArcIMS, and is available at different licensing levels. Our discussion will not focus on what ArcGIS Server can do for you, but what effort is required to produce a web application similar to the existing Illinois ArcIMS site. Figure 2 is a diagram of extensive ArcGIS Server functionality while the red circles highlight a sub-set of that functionality to be addressed in this paper.

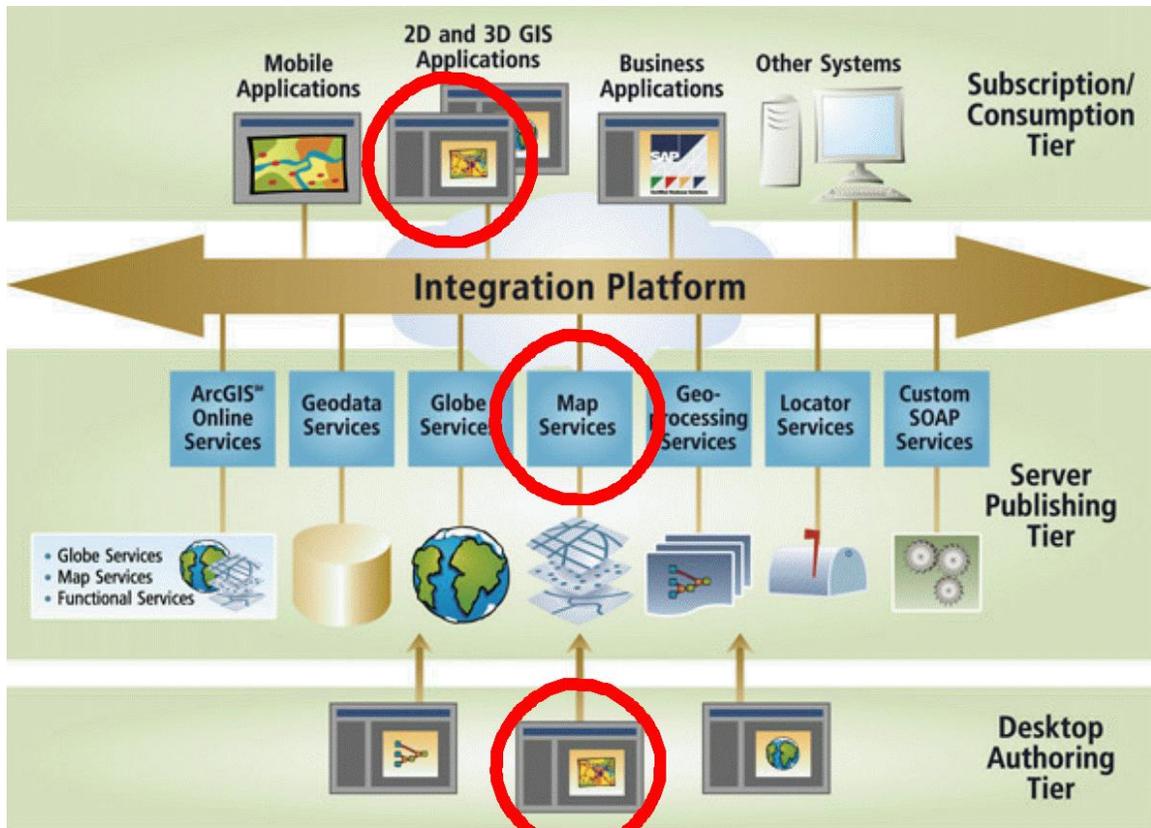


Figure 2. Our Focus within ArcGIS Server Functionality.

This process may be divided into three discrete parts. These parts are: authoring GIS content, serving content, and consuming GIS content. Some technical details have been omitted to simplify our discussion.

### Authoring GIS Content

Less effort is required to author GIS content with ArcGIS Server than ArcIMS because the primary tool for this purpose is ArcMap. ArcMap is known to all GIS users of ArcGIS Desktop. So, if you know how to make a map with ArcMap then you already know how to author content for ArcGIS Server. You may author off-line, but it follows that all pathnames to your spatial data must be identical on the server as to that on your ArcMAP computer where you develop your map document. ArcMap stores your map document in the .MXD file.

The .MXD file is the most basic configuration file used with ArcGIS Server. This is in the contrast to ArcIMS where you most learn new skills to develop a configuration file. It should be noted that the .MXD file is not the only type of configuration file that may be used, but this wider capability is not covered in this paper.

Identical fonts are important on both the ArcMAP computer and ArcGIS Server. Forethought is also important in that a poorly designed configuration file will slow the response time on the ArcGIS Server. A “best practice” would be to use the ESRI\_optimized style for all relevant symbols. As well, hyperlinks, which are linked references from one point in an electronic document to another document activated by clicking the link, work very differently in ArcMap and ArcGIS Server than ArcIMS.

## **Serving Content**

ArcGIS Server takes a configuration file and creates, or publishes, a service available to Internet users. What is a service, a web service, or a map service?

### **Map Service**

A service is a persistent software process that provides data or other computing resources for client applications. A web service is a software component or service accessible over the World Wide Web for use in other applications. A generalized definition for a map service is a service that provides spatial data to clients locally or on the web. Our map service is a web service.

A service runs on a server which is a hardware device. ArcGIS Server is software but the name may be ascribed to the computer running the software. Components of the software may be spread across various physical computers.

ArcGIS Server, like ArcIMS, creates or publishes a service from a configuration file and makes that service available for clients everywhere. All map services may be viewed with ArcGIS Server viewers, ArcGIS Explorer, and ArcGIS Desktop. ArcGIS Server can publish other type of services, but the focus here is the transition of the Illinois application from ArcIMS to ArcGIS Server so the discussion of other types of services

will be curtailed. Parties interested on other services may refer to product documentation.

#### Publishing GIS resources as service

Your GIS resource is your map document stored as a .MXD file. To create or publish your map service you may use ArcCatalog., but more likely you will use GIS Server Manager. ArcGIS Server Manager is the interface used by the ArcGIS Server system administrator to control most aspects of ArcGIS Server. Your ArcGIS Server map service is now available on the World Wide Web to be used or “consumed”.

### **Consuming GIS Content**

Your map service published to the internet may be displayed in various ways. It may be used in ArcMap or the free ArcGIS Explorer. For our purposes, the most common method is the ArcGIS Server generic viewer which may be displayed with any common browser such as MS Internet Explorer. It is important to emphasize that the browser is the only software that the user requires on their computer. The user need not be concerned with the software that created the content.

#### Generic User Interface

A generic viewer may be created rapidly with the ArcGIS Server Manager. The generic viewer may include: some or all of the layers in the map service; certain map elements such as scale and north arrow; and the general visual appearance or theme as seen in Figure 3. Potentially, the viewer may display more than one map service.

The stopping point of this paper is the quickly assembled generic viewer. A customized viewer will require programming knowledge or availability of programming staff. The programming tools for a customized viewer would be MS Visual Studio or Java, depending on the Application Development Framework which are sets of developer tools.

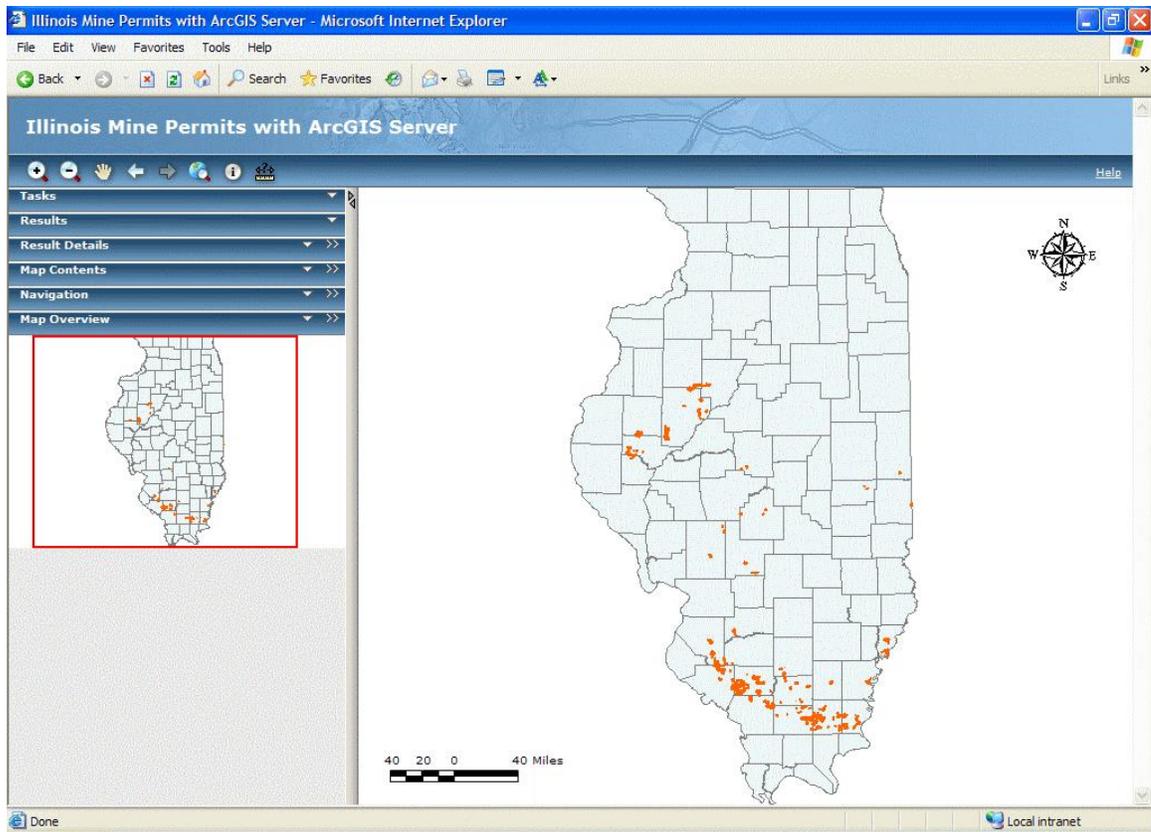


Figure 3. ArcGIS Server Out of the Box Generic Viewer

### Parting Thoughts

In this Illinois example, and in most large organizations, virtually everything needed to purvey spatial data is controlled by an entrenched Information Technology (IT) bureaucracy. IT staff are often under resourced so progress on GIS interest may be marginalized. I am certain that this situation is known elsewhere.

With ArcGIS Server, a GIS user working with ArcMap and with access to needed resources can rapidly publish a service to the web with a generic viewer which will produce an alternative product to ArcISM.

If your organization has an existing ArcIMS installation and the other formidable capabilities of ArcGIS Server are not required, there is little reason to make the transition.

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