

Overview of Geodata Services in ArcGIS Server

Transcript

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Welcome to the ESRI Instructional Series podcast. This broadcast is titled *Overview of Geodata Services in ArcGIS Server*. My name is Derek Law, and I work at ESRI's main office in Redlands, California. I specialize in geodata management and ArcSDE technology. In this podcast, I will talk about geodata services in ArcGIS Server, what capabilities they offer, and provide some general information on their setup and configuration.

This podcase is intended for ArcGIS Server users and GIS managers who would like to learn more about geodata services available in ArcGIS Server.

Geodata services are a type of GIS service that you can publish with ArcGIS Server. They provide remote access to geodatabases, and their contents to a local area network, or LAN, or more significantly, over the Internet. This enables you to share a geodatabase and the datasets it contains to a large number of users, who may be situated at faraway locations from your office.

Geodata services provide three types of capabilities.

1. Data extraction. Data can be copied from a remote geodatabase to a local geodatabase. In ArcGIS Desktop, you can connect via a GIS server to a remote geodatabase, and then easily make a copy of the data on your local machine. During the data extraction procedure, you have the option to specify a subset of data by only selecting certain datasets, and you can also apply spatial filters.

Alternatively, you could choose to extract just the data schema, in other words, the structure of the data, instead of the actual data. This capability is supported for all types of geodatabases, including personal, file, and ArcSDE geodatabases.

2. Geodatabase queries. Geodata services allow queries to be applied against the geodatabase and its contents. For example, you could query for a list of feature classes and a list of versions in the geodatabase. You could also directly query the datasets within the geodatabase, such as querying for certain records in a table or feature class. This functionality is not available out-of-the-box and requires some customization. ArcGIS Server includes a rich application programming interface, or API, that enables you to create custom clients to query the geodatabase. This capability is also supported for all types of geodatabases.

3. Create replicas and synchronize edits with another geodatabase, in other words, geodatabase replication. This is probably the most common application of geodata services: the ability to take data in a source geodatabase and replicate its contents to a target geodatabase, as remotely located.

The replication procedure is performed using a geodata service occurring over a LAN or over the Internet. For this capability, the source geodatabase must be an ArcSDE geodatabase.

If you haven't done so already, I highly recommend that you listen to the two instructional podcasts on geodatabase replication by Owen Evans. They provide an excellent and detailed overview on the topic.

There is also an ESRI white paper available from the ESRI support site, support.esri.com, titled *An Overview of Distributing Data with Geodatabases*.

To quickly review, there are three types of geodatabase replication strategies.

1. Check-out/check-in. This strategy is ideal for field workers or mobile crews who are disconnected from the network. Edits are made in the target geodatabase, and then they are synchronized back to the source geodatabase. To synchronize additional edits from the target geodatabase back to the source geodatabase, you would have to create another check-out replica.
2. One-way. This strategy is for production publication scenarios, where you would have two geodatabases: one for data creation and editing (in other words, the production or source geodatabase), while the other typically contains finished data that you would share with other users (the publication or target geodatabase). Data in the source geodatabase is edited, but data in the target database is considered Read-only. Data changes can be sent multiple times in one direction from the source geodatabase to the target geodatabase, perhaps weekly, monthly, or quarterly.
3. Two-way. This strategy is useful for data collaboration at different organizational levels, for example: sharing and maintaining data copies between municipal, state, and federal governments. It is very similar to one-way replication, however, edits can now also be sent in the opposite direction from the target geodatabase back to the source geodatabase. Data changes can be synchronized multiple times. If the same row is edited in both geodatabases, it is detected as a

conflict during synchronization; and reconcile policies, which are based on the version model, are provided to define how conflicts are resolved.

All three strategies are supported by geodata services.

So far, I have discussed what geodata services are, and their capabilities. Next, I will talk about the two different ways to set up and create a geodata service.

The first method is to publish a geodatabase. In ArcCatalog, or within ArcGIS Server Manager, you can publish a geodatabase as a resource available for ArcGIS Server. This creates a single geodata service. Note that there is no out-of-the-box visualization capability for this service. For example, if you selected a geodata service in ArcCatalog, and tried to preview its contents, you would not see anything.

To visualize its contents, you would need to create a replica from it first, using the Distributed Geodatabase geoprocessing tools available in ArcToolbox. Publishing a geodatabase is available with the ArcGIS Server basic level at both the workgroup and enterprise editions.

The second method is to publish a map document that contains data from a geodatabase, and you would need to enable the geodata access capability. Note that the map can only reference data from one geodatabase. You would publish the map in ArcCatalog, or within ArcGIS Server Manager. This creates two services with the same name: a map service, and a geodata service.

The advantage of this second technique is that you get the benefits of the map service associated with the geodata service. Therefore, you can select the map service in ArcCatalog and preview its contents, which in turn, would enable you to preview the contents of the geodata service. In addition, you could access the map service in ArcMap, then interact with the geodata service with functionality on the Distributed Geodatabase toolbar. Publishing a map is available with the ArcGIS Server standard and advanced levels, at both the workgroup and enterprise editions.

Using this second approach, you can use the geodata service in conjunction with the out-of-the-box Web editor application that can be created in ArcGIS Server Manager. You can easily enable remote editing of datasets in an ArcSDE geodatabase. All geodatabase behavior for editing is supported.

In the last part of this podcast, I will discuss some considerations when implementing geodata services in ArcGIS Server.

The most frequent issue that users can encounter with respect to geodata services is insufficient permissions for the ArcGIS Server Object Container, or SOC account, to ArcSDE geodatabases.

By default, ArcSDE geodatabase connection files are typically stored in user profile directories, therefore, you should ensure a SOC account can access these directories. Or, you can store the connection files in a directory already accessible by the SOC account. In the case of workgroup ArcSDE geodatabases, they use operating system authentication, and the SOC account needs to have access to the SQL Server Express instance and database.

Another common oversight to note is that, by default, the replication capability of a geodata service is disabled. It must be activated to perform geodatabase replication.

When using geodatabase replication functionality in geodata services, you should integrate synchronization with the version management strategy. Consider synchronization order, and synchronize before running reconcile and compress operations.

To create replicas for large geodatabases, we recommend you avoid copying the data across the network between the source and target geodatabases. A suggested work-around: first, load the data into both geodatabases, then use the ArcMap Create Replica wizard, and select the Registered Existing Data option.

For heavy data transfers, and data extraction or geodatabase replication, we recommend that you specify a service output directory. ArcGIS Server messages have a 5 MB size limit, and data is embedded within them by default.

Enabling a service output directory for the geodata service will allow the large datasets to be uploaded and downloaded independently from the service messages. If a service output directory is not specified, you may encounter issues.

Lastly, after you have set up a geodata service, you should enable security protocols on it to protect your data. Compliance for the geodata services is the same as for any other GIS service in ArcGIS Server. You

can use HTTPS protocols or login authentication, which is a new capability at the ArcGIS Server 9.3 release.

To summarize, geodata services provide remote access to geodatabases and their contents with ArcGIS Server. Capabilities of geodata services include data extraction, geodatabase queries, and the ability to synchronize edits with another geodatabase (in other words, geodatabase replication).

There are two ways to enable geodata services: by publishing a geodatabase, or by publishing a map document that references data and a geodatabase.

For more detailed information on geodata services, review the ArcGIS Server online help documentations, located at support.esri.com.

An ESRI Knowledge Base article is also available (number 34161) titled *HowTo: Replicate Multi-User Geodatabases Over the Internet*.

ESRI also offers several instructor-led training classes on ArcGIS server, as well as several live training seminars that are available free.

Thank you for listening, and stay tuned for future podcasts.