SAFE SOFTWARE

Technology Brief

ArcGIS and FME (FME Extension for ArcGIS)

Key Facts

Capabilities: Direct reading and writing of spatial data in a wide range of formats

Benefits: Flexible data translation and transformation from a familiar environment

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Introduction

ESRI's ArcGIS allows its users to access and interact with a wide variety of data formats, from a number of systems and platforms. Despite this, many users frequently encounter the need to access an even wider variety of formats. Two different but complementary developments were undertaken to provide the benefits of FME technology to ArcGIS users.

Many customers requested that ArcGIS be able to directly access the many formats that are supported by the FME Universal Spatial Data Translator. This integration would provide ArcGIS users with access to a wealth of complementary functionality, including the ability to read and write to a large number of otherwise inaccessible formats. Using the FME Objects data access libraries, an FME plug-in was created for ArcGIS. This plug-in allows both ArcCatalog and ArcMap to directly read and display data in any FME-supported format without the need for any translation. In addition, options were added into the ArcGIS menu system to directly import and export data, in effect initiating a translation without leaving the ArcGIS environment.

In addition to asking for direct integration between FME and ArcGIS, many ArcGIS users also have a requirement to perform mass migrations of data between the Geodatabase and other formats. The FME data transformation and translation suite provides a very productive set of tools for both easily configuring complex data translations and transformations, as well as running them over large amounts of input data. FME has long supported the ESRI ArcSDE, as well as Shape files and coverages, but support for both Personal and ArcSDE Geodatabase was also requested. To accommodate this need,

FME's ability to accept reader/writer "plug-ins" was exercised. Using the FME Plug-in Builder SDK, both a reader and a writer were built for the Geodatabase. The result is that all of the FME transformation suite capabilities - including translation in and out of a wide variety of formats, geometric and attribute manipulations, coordinate conversion systems and visualization with the FME Universal Viewer - can be applied to both Personal and ArcSDE Geodatabases.

ArcGIS meets FME Objects

In order to provide direct access from within ArcGIS to any of the formats and systems from which FME reads, an ArcGIS plug-in was created using the FME component library called FME Objects. FME Objects provides programmatic access to all of the FME readers, writers, and processing facilities. FME Objects presents a common data model, which is independent of format, to its clients. This characteristic allowed a single ArcGIS plug-in to be written on top of FME Objects that still allowed access to all of the FME formats.

FME Objects can be used through a variety of interfaces, including C, C++, Java, COM, and Delphi. For the FME Objects ArcGIS plug-in, the COM interface proved to be the most straightforward and efficient method due to the COM architecture of ArcGIS.

FME Meets ArcGIS Geodatabase

The ArcGIS Geodatabase presents a very powerful and flexible data model, and a requirement of the FME Geodatabase reader/writer was that these capabilities be fully supported. Using the ArcGIS COM APIs, FME readers and writers for both Personal and ArcSDE Geodatabases were created. These readers and writers allowed FME tools such as the graphical FME Workbench transformation configuration builder and the batch-mode command-line FME translator to be applied to Geodatabases of any kind. Facilities are provided for importing data into existing Geodatabase tables, as well as for creating new ones.

FME can also be used on UNIX platforms to access an ArcSDE Geodatabase. In these situations, the FME's ArcSDE reader or writer is used to communicate directly with ArcSDE. If new ArcSDE tables are being created, they can later be registered with the Geodatabase using ArcGIS tools. This option provides UNIX users who have large data migration needs with another way of working with their data using their existing hardware platform.

Conclusion

Extending ArcGIS with FME Objects technology provides ArcGIS users with direct access to dozens of additional data formats. For many workflows, this ability to access the data without performing a translation is very convenient and time saving.

For a variety of other workflows, FME's ability to read and write from both Personal and ArcSDE Geodatabases, as well as directly to ArcSDE, Shape files, and coverages, can provide substantial productivity gains as well as unparalleled interoperability.

These two different but complementary integrations of FME and ArcGIS give great power to the ArcGIS user. The remaining barriers to certain types of data integration with ArcGIS have been overcome!