



FME 2007 Release

Giving Raster the Vector Treatment

By Mary Jo Wagner

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Spatial extract, transform and load (ETL) tools such as Safe Software's FME have been bringing geospatial business intelligence to a myriad of organizations for over a decade.

Similar to translators, Spatial ETL solutions will extract data from a data store, transform it to the projection, format or data model requested, and load it into another data store. However, unlike traditional data translators that are typically used when the source system is being abandoned, Spatial ETL systems can create a mirror of the data on both systems. This allows organizations to continue using both systems during the migration process – a feature that is particularly relevant for organizations with legacy systems.

With Safe's FME Spatial ETL as a core data extraction and transformation tool, businesses and government agencies have had the inherent interoperability to create an invaluable data pipe to spatial information and to share that information across the enterprise in real-time. That seamless interconnectivity has provided them the ability to better leverage the information they already have to ultimately make more informed business decisions.

Indeed, with its notably versatile Workbench interface, FME has become the de facto facilitator to harnessing the intelligence held within spatial vector information. And now FME has gone raster.

With FME 2007, GIS and non-professional GIS users who need to use, transform and incorporate raster into their workflow will be able to use all of the lauded features of FME Spatial ETL to leverage their raster imagery. In short, customers will be able to give raster the FME vector treatment.

Ready for raster

Until recently, the geospatial industry has had two distinct raster and vector camps and corresponding sets of tools to store, manage and view the different datasets. This divide developed not from a lack of wanting to converge vector and raster data - the geospatial community has long understood the benefits of raster imagery and how it can add tremendous value to vector layers – but only recently have tools emerged to complement vector data.

The predominant challenge in effectively integrating raster data into business workflows has been its size.

For example, a feature vector dataset for one county may be measured in megabytes, whereas the raster imagery of the same area could equate to tens of gigabytes. For organizations such as state governments that can hold terabytes of raster data, the significant size of raster imagery has made it difficult to store and manage in a database. Instead it has been historically stored in flat file systems, hard drives and DVDs, which can inhibit users' abilities to share and integrate that data effectively.

Over the last few years, however, the industry has heard the growing demands from the mapping community to have tools to better manage and apply raster imagery to their spatial business. The industry has made great strides to address this need by building tools that work with both raster and vector. Both ESRI and Oracle have now added raster support to their databases... What has been missing is a true Spatial ETL tool that handles both raster imagery and vector data.

Similar to its goal when it first launched its Spatial ETL for the vector market, Safe wanted to again serve as the conduit to effectively move and manage raster spatial data. Based on the same FME architecture, FME 2007 provides the framework to load, mosaic, clip, reproject and serve a multitude of raster formats from disparate databases. Now users will have the ability to integrate and easily share gigabytes, even terabytes worth of raster imagery through one Spatial ETL tool.

With the combined ability to truly support vector and raster data, FME 2007 will be the only Spatial ETL tool users will ever need.

Rendering raster support

Over the past three years, Safe has worked closely with a number of its long-standing, early technology adopters such as the Arkansas Geographic Information Office and the UK's Ministry of Defence to develop FME 2007's raster capabilities. Mindful of the complexities in trying to develop a Spatial ETL tool to address and to generically represent the multitude of existing raster formats, Safe focused on storage, interoperability, preserving information and loading/extracting raster data in and out of databases with its first release.

FME 2007 provides a pain-free platform to both load users' raster data into a database system and to leverage that enhanced spatial information. Through FME's workbench interface, users simply indicate the raster data format they'd like to extract, the transformations to apply and the database in which to load it to. FME will then move all of the relevant data to the appropriate database as requested, and will detect and alert users to any problem data during the transaction. Users can also use the geoprocessing features of FME to manipulate the raster data as it's being loaded. For example, using the RasterMosaicker tool, select files are automatically stitched together to create a seamless mosaic in the database.

Once in the database, users can use the FME Spatial ETL tool to quickly and effectively incorporate raster imagery into their varied workflows and share data. Perhaps most importantly, with FME 2007 users have a sophisticated spatial ETL platform to properly serve and distribute raster imagery – regardless of format - via the Web.

With FME 2007, "raster support" does not mean added functionality to the vector workbench to allow users to take vectors and transform them into rasters. Instead, FME 2007 takes the same sophisticated vector workbench interface and applies it to raster data, providing users with the same flexibility that has made FME the ETL tool of choice in the vector community.

Raster Formats Supported in FME 2007

Popular formats

Image formats: GeoTIFF, MRSID, ECW, JPEG2000, ERDAS Imagine
DEM formats: DTED, CDED, USGS DEM
Database formats: ESRI ArcSDE, Oracle 10g Georaster (writing only)

Additional Raster Formats

Aircom ASSET Data	Graphics Interchange Format (GIF)
Aircom ENTERPRISE Map Data	Hyperion (HDF4)
ARC Digitized Raster Graphics (ADRG)	National Imagery Transmission Format (NITF)
ARC Standard Raster Product (ASRP)	Network Common Data Form (NetCDF)
ASTER (HDF4)	Oracle 10g Georaster (writing only)
Bitmap	PCI Geomatics Database File
Compressed ARC Digitized Raster Graphics (CADRG)	PlaNet
Digital Map Data Format (DMDF)	Portable Network Graphics (PNG)
ENVI .hdr Raw Raster	Tagged Image File Format (TIFF)
ERDAS Raw	Vertical Mapper Grid
ESRI .hdr Raw Raster	WMS (Reading)
ESRI ArcGIS Binary Grid	X11 Pixmap
ESRI ArcSDE (Raster)	Z-Map Format
ESRI ASCII Grid	WMS

A substantial upgrade, FME 2007 offers users enhanced core raster functionality, improved raster processing capabilities and supports for more than 30 raster formats. Rasters with multiple bands, multiple palettes, no-data values, 8bit and 16bit RGB or RGBA color and numeric interpretations are fully supported and easily managed. Users can also select individual bands and palettes for processing and take advantage of logging and viewing capabilities.

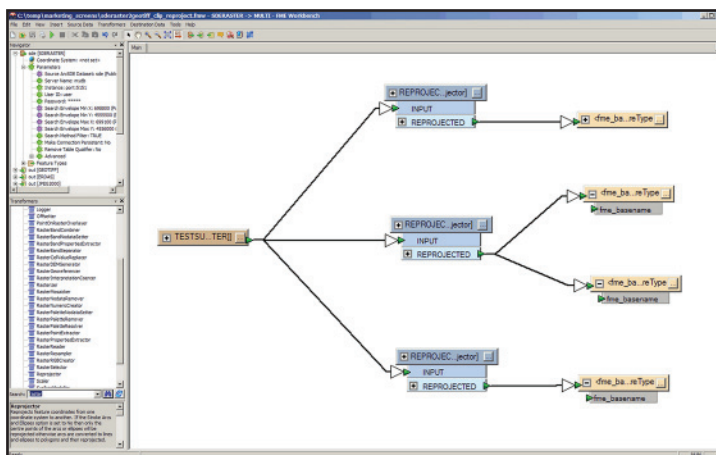
FME 2007 has broadened its support of raster data formats to more than 30 including major image, DEM and database formats as well as some satellite and specialized formats for scientific or military use.

New Raster Transformers Available in FME 2007

- **PointOnRasterOverlayer:** Adds raster band and palette data as attributes on points.
- **RasterBandCombiner:** Creates a single multibanded raster from multiple single banded rasters.
- **RasterBandNodataSetter:** Sets or flags the nodata value of a raster at the band level.
- **RasterBandPropertiesExtractor:** Extracts the band and palette properties of a raster feature and exposes them as attributes.
- **RasterBandSeparator:** Creates multiple single banded rasters from an input multibanded raster.
- **RasterInterpretationCoercer:** Converts the interpretation of selected band(s) or palette(s) on a raster. Replaces the now deprecated RasterColorModelCoercer and RasterDataTypeCoercer.
- **Rasterizer:** Converts vector features to rasters.
- **RasterMosaicker:** Mosaics multiple rasters into one raster. The number of bands and palettes is preserved.
- **RasterNodataRemover:** Removes the nodata flags of all selected bands and all of their palettes.
- **RasterPaletteNodataSetter:** Sets or flags the nodata value of a raster at the palette level.
- **RasterPaletteResolver:** Resolves rasters with palettes into rasters without palettes.
- **RasterPropertiesExtractor:** Extracts the general raster properties of a raster feature and exposes them as attributes.
- **RasterSelector:** Selects the bands and palettes to be operated on by subsequent transformers.

In addition to this true raster-to-raster support, FME 2007 offers users a myriad of geoprocessing tools or “transformers” to manipulate and to read raster imagery. Using these tools, users can create rasters from varied source data such as user input, vector input or surface model input and then resample, reproject, offset, scale, georeference, clip, tile or mosaic any raster data user’s select. Indeed, with FME 2007’s enhanced data manipulation features users can create detailed datasets suitable to their specific business need.

By approaching the raster world with the same successful model Safe has applied to the vector world, geospatial users now have, for the first time, a tool that is dedicated to helping solve the problem of moving and serving raster data, regardless of file size.



FME 2007 provides a pain-free platform to load raster or vector data into a database system and to leverage that enhanced spatial information. Through FME’s Workbench interface, users simply indicate the data format they’d like to extract, the transformations to apply, and the destination database to load the transformed data into. FME moves all of the relevant data to the appropriate database and alerts users to any problem data during the transaction. Users can also apply FME’s geoprocessing transformers to manipulate the data as its being loaded.

Reveling in raster

Size has always mattered in the issue of properly moving and storing raster imagery. By rendering file size and data format irrelevant, FME 2007 stands to not only serve as a viable integration and distribution mechanism for raster data on the desktop, it finally renders raster distribution relevant over the Web.

The Arkansas Geographic Information Office (AGIO) based in Little Rock is a telling example of FME 2007's capabilities. Responsible for coordinating spatial data development with all levels of government and the private sector, the AGIO launched the United States first statewide, enterprise-class geospatial information system in January 2001. Called GeoStor, the geospatial data warehouse stores over four terabytes of raster and vector spatial data covering the 75 counties of Arkansas and offers Web-based data search and delivery capability using any standard web browser.

With a desire to begin offering Web feature services and Web image services through GeoStor, the AGIO needed a solution that would deliver raster as well as vector data via the Web and provide both data types in multiple formats and coordinate systems according to user specifications. FME 2007 has been serving as this raster/vector Web solution and according to Learon Dalby, the AGIO's GIS manager, it has performed "beautifully."

FME 2007 transforms data to the required raster formats, effectively manages large raster datasets, and provides a powerful re-projection engine that efficiently converts raster data to the coordinate system and format specified by the user. And it moves it quickly. Dalby says GeoStor can retrieve, clip, reproject, reformat, and ship a 480Mb file in 10 minutes.

"Powered by FME 2007, GeoStor can quickly handle a huge volume of requests, making critical information immediately available to the public," says Dalby. "Having a single, accessible source for all important data layers reduces duplication and data production costs, and allows users to access information with comparatively minimal demands on AGIO staff. FME 2007 serves as an instrumental GeoStor component, allowing all vector and raster datasets to be stored in a seamless manner, reducing duplicative efforts and saving costs."

Indeed, for organizations that need to combine vector and raster data in their workflows, such as utilities, oil and gas, telecommunications and geointelligence, FME 2007 will provide a complete Spatial ETL system to handle all types of spatial data, giving them the opportunity to adopt a holistic approach to business operations, to streamline business processes and achieve cost transparencies, without sacrificing data integrity.

It is all part of Safe's plan to give raster the FME vector treatment.

About Safe Software

Established in 1993, Safe Software is the maker of FME, a powerful spatial ETL (Extract, Transform and Load) platform that enables translation, transformation, and web-based distribution of geospatial data in over 190 GIS, CAD, raster and database formats. FME is used in over 116 countries by all levels of government, the utilities sector, and resource industries including mining, oil and gas, and forestry. The latest release of FME features over 13 new transformers for raster data.

For more information on FME 2007 Highlights and FME's Raster Capability visit www.safe.com/2007 and access Safe Software's Highlights Report.



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