GE Energy

The Smallworld 4 Product Suite Integrated with FME®

Bringing enterprise data to where it is needed most

Abstract

Moving to an advanced spatial platform such as GE Energy's Smallworld* 4 Product Suite means eventually leaving behind an existing system. Although these legacy systems might be regarded as technologically redundant, the data stored inside them is still valuable to the enterprise. This situation often represents a significant hurdle to customers who wish to exploit the additional business benefits of a new technology, for example outage management, but face increased costs from a prolonged and expensive data migration exercise.

Migration is an important aspect of the enterprise, but so is the ability to share data. In some cases, there is a business need to export a small proportion of a database to a smaller, lower cost or specialized system that fulfills a specific role within the organization. This self-contained data often needs to be refreshed periodically to a schedule that meets the day-to-day needs of the business.

The limitations of some migration and sharing tools create a difficult situation for many enterprises because it prevents them from putting their data where it is needed most.

A practical, enterprise friendly technology, is the Smallworld 4 Product Suite integrated with Safe Software's Feature Manipulation Engine®(FME). It provides a set of solutions that offer businesses the opportunity to exchange a wide variety of third party data with the Smallworld 4 application either by accessing it directly using the Smallworld Spatial Object Manager* for FME 4 or distributing the data when it is most convenient to do so using the FME Smallworld Suite 4. These technologies simplify data migration and ease the distribution of valuable information throughout the organization.

Built on the foundation of the Smallworld 4 application architecture, GE Energy's Smallworld translator technology provides a tightly integrated, flexible and reliable way to exploit the greatest business benefit from one of an enterprise's most valuable assets: its data.

A marriage of inconvenience

Many enterprises are large sprawling businesses that are often amalgamations of previous acquisitions or mergers. Some of these entities have been in operation for a very long time. Utilities such as electricity, gas and water, for example, have been serving the public since the late 1800s.

The different histories of these enterprises mean that many operate a disparate set of IT systems. Some of these systems might date back ten or twenty years and have since been superseded by better technology. Technology is constantly changing and there is an inevitable lag between innovation and its deployment due to the time and costs involved.

This delay between discovering a real business benefit of a new IT system and realizing its potential is a real predicament for the enterprise. Worse, much of the real value of a legacy IT system is not the defunct functionality it provides, but the data it stores. This marriage of legacy software and valuable data is a real problem for the enterprise. Data that could be analyzed in new and exciting ways, unlocking real business benefits for the enterprise is trapped inside obsolete software that has long since been superseded. Extracting this data from the systems holding it is often one of the most frustrating challenges for today's enterprise.

Protecting a legacy, preparing for the future

Network enterprises, such as telecommunications providers, are large organizations providing a vital service to their community. In many cases if the services they supply fail, there is a serious consequence for their customers: communications, water, heat, electricity are

all essential amenities and without them modern life would quickly become very difficult.

The provision of these important network services requires a massive investment in infrastructure, workforce and technology. The realities of operating such a network mean that rapid, wholesale changes in technology are impractical for a number of reasons:

- In this context enterprise IT solutions require tens of millions of dollars to implement. Repeatedly exchanging one technology for another is simply not cost effective in these highly competitive markets.

- Deployment of a new technology in this environment is often measured in months or years rather than days or weeks due to the scale of the projects involved.

- Many network enterprises are highly regulated by national bodies that mandate levels of service, safety and quality. These regulatory obligations need to be met during change.

All this, of course, makes it harder for network enterprises to quickly adopt a new technology and means that many businesses rely on inefficient IT systems that often cohabit with those they are intended to eventually replace.

In the same way as the words that make up a novel are more valuable than the physical pages on which they are printed, data is much more valuable to the enterprise than the IT systems that host it. This data is valuable for a number of reasons:

- The data represents a significant investment. Data capture exercises alone can cost millions of dollars and take years to complete.

- Some data is valuable because it is historic in nature and difficult to replace. For example, past information about the reliability of network components can often be used to reduce future costs by optimizing a repair program.

- The data is needed to run the business on a day-to-day basis. Complex networks are in a constant state of flux: new build is required to meet increased demand; other infrastructure requires periodic inspection or maintenance. All of this change needs recording.

Migrating data from a legacy system to a new system or sharing data amongst several important systems is, of course, not a new problem, but it is still one that greatly affects the network enterprise.

Importantly, network data also means spatial and topological data – not just attribute data. The spatial relationships between assets allow additional value to be extracted from the data – simply knowing the connectivity of a network can empower potent spatial analytical tools. The relationships between assets may also be more traditional in nature (conventional parent-child joins are an obvious example). Both types of relationship add value to the data that can deliver real business benefits to the enterprise.

Many tools are available that allow the export of data in one format to another but often they are designed for simple, flat attribute data that has none of the eccentricities of spatial data. In the simplest case, these tools simply flatten the information before exporting it, filtering out many of the interrelationships and hence much of the intrinsic value of the data.

Other tools do a better job at preserving the value of the original data by providing a dedicated solution for migrating data from system A to system B. These work well in simple scenarios, but for enterprises with important data stored in a multitude of different systems and formats, these point-to-point solutions often become expensive to implement, administer and maintain (not to mention unwieldy to write applications for).

However, providing access to legacy data does not necessarily mean it needs to be migrated (a point often missed by many IT providers). The nature of the enterprise means that it is often impractical to

switch off one system the day after opening the box on the new system. Legacy systems, despite their age, might still be economically viable and perform a useful function within the organization. In other cases, cost or operational demands might mean that it is essential that service to customers be maintained throughout the transition to a new technology.

Periodically converting data from one system to another means that the operational data is no longer current: businesses start to make decisions based on the state of the network as it was yesterday, last week or even a month ago. In some cases this is perfectly acceptable, in others it might lead to poor business decisions being made from data that is simply out of date.

Clearly businesses need a pragmatic solution that:

- Allows legacy systems to co-exist while they are still needed.
- Enables data to be shared with a wide variety of systems that can make the best use of the information.
- Facilitates the phasing in of new systems at a pace that makes sense to the enterprise.
- Preserves the real value of their data as it is handed down to future generations of applications that can better exploit it.

In great shape
GE Energy's Smallworld translator products are a set of innovative data access, migration and sharing technologies built on the established Smallworld 4 software architecture that can access data stored in over 120[1] third party formats and systems including:

- AutoCAD® DXF™
- ESRI® ArcSDE™
- ESRI Personal and Enterprise land GeoDatabase
- MapInfo MID/MIF™
- IBM® GFIS

Smallworld Spatial Object Manager for FME 4
The key business benefits of the Spatial Object Manager (SOM) architecture is covered in another white paper, but to summarize, a SOM allows data from a wide variety of disparate sources and different formats to be easily made available to Smallworld applications in a consistent way[2].

Using the Smallworld Spatial Object Manager for FME 4 application, administrators can easily configure access to third party data sources allowing Smallworld 4 software applications to exploit data in legacy systems quickly delivering real business benefits to the enterprise without having to incur the delay associated with explicitly converting the data.

The Smallworld Spatial Object Manager for FME 4 application supports read access to the following ESRI data sources:

- ESRI ArcSDE 8.x
- ESRI Personal GeoDatabase (Access) 8.x (Windows® only)
- ESRI Enterprise GeoDatabase (SDE)

FME Smallworld Suite 4
Using Smallworld 4 translator technologies, enterprises can migrate data at a pace that makes greatest business sense to them.

An enterprise might decide to start the migration process by first using the Smallworld Spatial Object Manager for FME 4 application to quickly gain access to the data. Then, when it makes business sense to the enterprise, the data can be migrated.

A Universal Viewer is provided that helps with the planning of the migration by allowing third party data to be previewed prior to translation. In most cases, third party data files can be viewed simply by dragging and

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[1] Access to some third party data might require installation of additional software.
[2] Version 1 of the Smallworld Spatial Object Manager for FME 4 is certified for ESRI formats only.

dropping them into an instance of a Universal Viewer. This simple yet powerful tool allows administrators to examine the data prior to import, to see what the exported data will look like and hence optimize the mapping configuration before migrating a single byte.

The process of mapping one data source to another is often a convoluted process that historically required dedicated scripts or special hand crafted configuration files to deal with the individual peculiarities of each system or format.

The FME Smallworld Suite 4 includes a dedicated, data mapping tool called Workbench that greatly simplifies this process. Also, additional data access points are provided in the Smallworld 4 Explorer application allowing destination and source tables to be defined simply be dragging and dropping them into place. Workbench can detect these tables automatically picking up their characteristics and using this information to simplify the migration process.

Using an intuitive graphical based approach, Workbench allows administrators to easily map information between the source data format and the Smallworld 4 data format. It also allows intricate spatial relationships to be retained while at the same time hiding the inherent complexity of the mapping process from the end user. Also included is a powerful mechanism called Factories that can be used to modify data during the import process so that the value of the source data can be fully exploited. For example, an aggregator factory can be used to combine data in two source tables into a single destination table. These mapping rules can be saved as a configuration file that may be re-used at a later date or shared by others throughout the organization.

Together Workbench and the Universal Viewer reduce the guess work and risk of the migration process.

Once the administrator has completed the mapping, it can then be used in the FME Smallworld Suite 4 to perform the actual migration and conversion of data from the existing data source to the Smallworld 4 database.

The FME Smallworld Suite 4 application also supports custom coordinate systems allowing spatial data mapped in one projection system to be transformed to another projection system during migration: a useful feature if the enterprise covers a very large territory or has just acquired a competitor in a different geographic region.

Integrated for business

When third party data is migrated to Smallworld 4 using the FME Smallworld Suite 4 technology, the data retains its important spatial, topological and data model relationships. The data also integrates seamlessly with existing Smallworld 4 application functionality such as the Explorer, object editors, plotting and with the Smallworld 4 application's powerful network analysis applications. This tight integration is important for a number of reasons:

- It presents a consistent user interface to the operator irrespective of the actual source or type of data that helps minimize training costs.

- It provides a consistent API for network applications making them more robust and quicker to implement.

Conclusion

The integration between the Smallworld 4 platform and Safe Software's FME technology suite provides a powerful set of data migration and sharing tools that streamline the often complex and time consuming process of migrating data from one system to another while retaining the richness of the data to be processed. This advanced technology provides a pragmatic solution that recognizes the distinctive characteristics of the network enterprise by providing a bridge from the old to the new and by allowing businesses to maximize the use of one of its most precious resources, its data, where it is needed most.

In summary:

- To gain read only access to existing data, use the Smallworld Spatial Object Manager for FME 4.

- To migrate data from an existing system to Smallworld 4, use the FME Smallworld Suite 4.

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