



Automating Data Management for Best-Practice Geospatial Systems

Case Study: Shire of Esperance

“We all have data management tools developed outside of the FME ecosystem. We found that you don’t need to hunt down equivalent FME transformers or rewrite your processes to begin with. The workbenches can be easily designed to utilise the existing tools and enhance them.”

Bradley Cartledge, IT Operations Coordinator, Shire of Esperance



Industry

Local Government



Customer

Shire of Esperance, Western Australia



Challenge

Automate and secure data migration between development, testing and production environments of the geospatial information system (GIS) which supports the Shire of Esperance’s operations



Solution

Employ Safe Software’s FME software to encapsulate, automate and secure PowerShell and other tools developed by the IT department and make them available to GIS officers as easy-to-use apps

Key Benefits:

- Greatly reduced the maintenance burden of the best-practice GIS system on the IT department
- Allowed GIS officers to securely manage data migration between different geospatial servers
- Accelerated development with encapsulation and reuse of existing data migration tools
- Increased the speed, ease of use and sustainability of data management processes
- More scalable processes enable ongoing GIS system improvements and innovation

Overview

Located around 700 kilometres south-east of Perth, the Shire of Esperance is a developing Western Australian local government area with over 14,000 residents. The town of Esperance is a regional port and popular tourist destination with a moderate, Mediterranean-like climate, serving an area rich in natural attractions.

The Esperance district has a spectacular and unspoilt coastline and contains five National Parks, making up one-fifth of the total shire area of over 50,000 square kilometres. It also boasts the Recherche Archipelago, which comprises more than 100 islands and is protected by an A-class reserve status.

The Shire of Esperance's geospatial information systems are fundamental to developing and maintaining local government assets, providing services to residents, and managing urban and regional planning. In recent years, the Shire has migrated these systems from an Intramaps interactive mapping portal to ESRI ArcGIS Enterprise to support ongoing GIS systems improvements and innovation.

A major advance in the new GIS system is the maintenance of three separate environments for development, testing and production. Staff now have access to systems for testing and training without impacting live data. This allows improvements to be developed quickly without risking data integrity or disrupting day-to-day operations, and is considered industry best practice.

Challenge

However, the new ESRI GIS system posed significant challenges for the Shire's information technology (IT) department, particularly in managing geospatial data. To begin with, migrating information across the three environments was very labour intensive. It involved using Python notebooks to clone geospatial items and track their identifiers and the systems they belonged to.

Over time, the IT department streamlined this process by developing a PowerShell script to retrieve and publish geospatial items and to edit data sources across different systems. Later, it developed a more sophisticated PowerShell module to copy map feature services by calling application programming interfaces (APIs) that maintained the same identifiers across different ESRI environments. For other geospatial item types, it leveraged the ArcGIS Notebook Server and Python notebooks to run the appropriate cloning process.

At this point, the Shire could maintain three ESRI environments with synchronised item identifiers, achieving the industry best practice it had aspired to. GIS system users could now quickly move between

production and test systems to perform testing or training, or compare changes to an item between systems for current developments, without impacting operations or the integrity of live data.

At the same time, the IT department had created a large maintenance burden for itself. The various data migration processes could only be performed by the IT department – rather than GIS system users – due to the administrative privileges and security credentials required, as well as the specialised knowledge needed to determine which tool to use in a particular circumstance.

Solution

Fortunately, the Shire of Esperance had another solution at its disposal. For over ten years, it has licensed Safe Software's FME, a low-code enterprise integration platform with comprehensive spatial data capabilities, supported by 1Spatial by VertiGIS, the leading global Safe Software Partner and FME reseller in Australia. The Shire had been using FME primarily to extract, transform and load (ETL) data between systems, and automate these ETL processes.

The IT department also set about building FME Workbenches to encapsulate its various geospatial data migration solutions. Instead of redeveloping its processes, it used FME to run the existing PowerShell and other solutions on an FME Flow server. This saved weeks of work, according to Bradley Cartledge, IT Operations Coordinator at the Shire of Esperance.

"We were able to parameterise each workbench for different environments and set conditional values," said Cartledge. "Account credentials and API connections with the different servers could now be managed by FME, not shared with users, allowing us to securely provide access outside the IT department."

The workbenches were then published to the FME Flow server as Workspace Apps. This allowed the Shire to document the purpose of each tool and how to use it. The IT department then consolidated the tools into Gallery Apps, giving individual users a portal with a consistent user interface where they only see the Workspace Apps they had been granted access to.

The new FME solution has greatly reduced the IT department's maintenance burden. Spatial data management tasks that previously required hours of work can now be completed in five minutes, with much of this work now performed outside the IT department. Processes are now well-documented within FME and much easier to troubleshoot than before, ensuring they remain sustainable even with staff changes.

The Future

According to Cartledge, there are many ways to extend the benefits of using FME. For example, instead of encapsulating the existing PowerShell and other data migration tools, they could be rebuilt entirely in FME, which would have performance benefits and make them even easier to maintain.

Of even greater benefit, and therefore a higher priority, is consolidating the multiple migration processes from Gallery Apps into a single FME tool that takes appropriate action based on the type and identifier of the geospatial data item. This would be easier to use and save staff time, since multiple items could be processed at once without requiring user intervention.

“FME workbenches can manage the credentials and connections while the FME Flow server can be used with the Workspace Apps to provide per-user or group privileges. This allows the transfer of administrative tasks to other users without the need to share or create additional credentials.”

“After using some of the latest features of FME in a spatial context, we can see how to apply them to our non-spatial processes. We have a few things in the pipeline that we plan to present to the organisation to automate repetitive or bulk tasks associated with different system integrations.”

– Bradley Cartledge, IT Operations Coordinator,
Shire of Esperance

“The Shire of Esperance has demonstrated how FME can be used to enable process improvements by building on current solutions as opposed to ripping them out and replacing them. They were able to quickly build something that worked and could be enhanced going forward.”

– Michael Studdert, Pre-Sales Consultant & Account Manager, 1Spatial by VertiGIS

