The benefits of a multi-user versioned editing environment with replication to web-services

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The BLM is hosting a CITRIX farm for GIS data for three states. Leveraging the power of SDE allows for a multi-user versioned environment. This allows editors around the state to work on the same dataset. One goal is to give each office autonomy over their local data, while making it easier to compile edits statewide. The edit database is replicated to a publishing SDE to keep the work of managing data separate from the hosting. The publishing SDE is used to host geodata services that can be accessed by local users with caching providing better performance. The geodata services is also used as access points for other states and for the National Operations Center (NOC). The NOC maintains connections to these geodata services through replication and can use them to build national datasets through FME Workbenches.

With this system, edits can move from a field office to a national compilation efficiently. Through scripting, this process can be automated after the initial edit and post.
The Bureau of Land Management's mission is to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.
Data is collected through the state offices and passed to the National Operations Center (NOC) for national compilations.
National Operations Center (NOC)  
**CITRIX Hosted States**  
Distributed Versioned Tree Editing

Allows each field office to manage their edits independently in a field office versioned owned by a headless database account.
Managing Operations via Scripting

- The field office uses the headless database account to post edits to the field office version.
- A python script reconciles and posts all of the district version to default and performs maintenance on the SDE.
- Consistent and tight
Publication SDE

- After the edits from the field offices are posted, the next part of the script synchronizes the Edit SDE with the Publication SDE.

- This keeps the work of managing data separate from where the Geodata Service and Web Services are served from.
Geodata Service

• Beginning in 10.0 SDE, a Geodata Service could be published from the server as an access point for data
• Each BLM state is building a Geodata Service
• The Geodata Service allows the NOC to create a replica of a state’s data without needing database user credentials
Feature Manipulation Engine (FME) Workbench

- Each State’s data is replicated to a local NOC SDE
- The BLM utilizes FME and the ArcGIS Data Interoperability extension to compile individual state datasets into a seamless national database
- FME is used to detect changes in the data after each replica synchronization
- FME allows for data to be re-projected from each State's working projection to a Geographic projection as data is loaded
Feature Manipulation Engine (FME) Workbench (continued)

- Changed features, as well as added and deleted features are identified and processed in the national database accordingly.
- Data quality checks are performed as data is compiled, and the process can produce error reports, or be stopped if an error is encountered during the compilation process.
- This entire process will be scripted and run nightly, collecting daily updates and providing feedback regarding the quality of the data.
QA/QC

- Workbench performs QA/QC on data through Data Reviewer and returns an email to the state leads with problems discovered.
FME Workbench
FME Transformer
National Publication SDE

- The workbench populates a compilation SDE with data from each of the states
- This is replicated to Publication SDE where the data will be available for internal webservices and a geodata service
- The Geodata service will allow states to consume national datasets which will improve data quality
Workflow from Field Office to National Compilation

- State Edit Default Version
- State Publication
- State Publication
- NOC State
- Replica
- Replica
- Replica
- Replica
- Geodata Service Replica
- Geodata Service Published

States:
- Child FO Version
- Child FO Version
- Child SO Version

Users:
- Child User Version (Moe)
- Child User Version (Curley)

Manual Field Office Post

Scripted Reconcile and Post
Scripting

- With the ability to script each piece of this, it is possible to have data edited by the field office available in a national dataset overnight.
- This feedback loop should keep national datasets current and increase the ability to provide quality data.
Conclusions

• Enterprise GIS within the BLM is a reality
• Rapid update cycle within the BLM
• Data quality feedback loop
• Consistent workflow process with SDE versioning across multiple BLM states
Questions?

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