

Shaping the Future

From Data-Chasing to Master Data

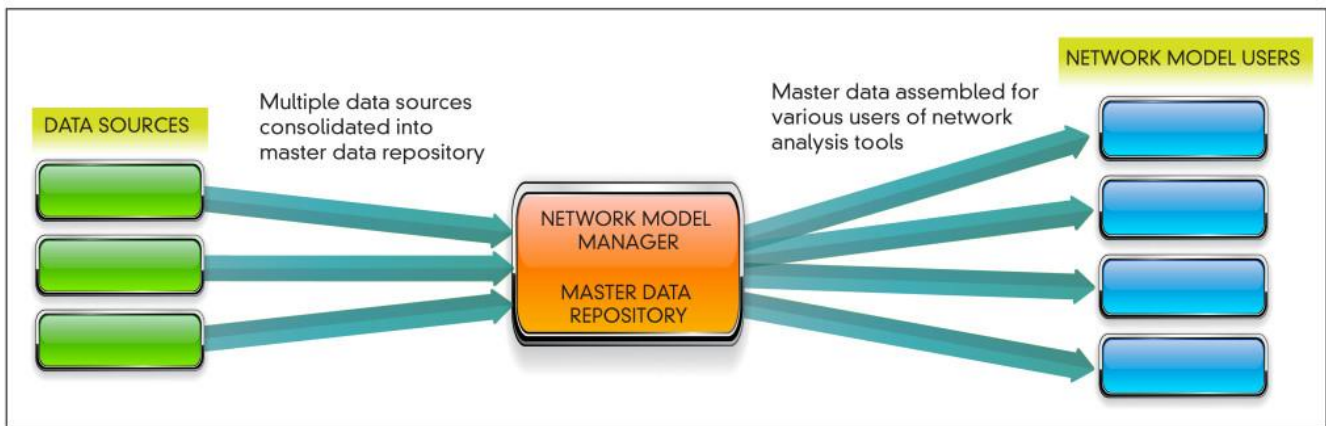
A New Approach to Eliminate Conflicting Data and Support Accurate Grid Analyses

By Robert Ito

Utilities rely on network analysis tools for transmission grid planning, design, and operation. These tools are only as good as the network models that support them, and network models are only as accurate as the data that feeds into them.

Consider this scenario: One network analysis tool indicates that a grid component is at risk of overload. According to another, it's not. If the first tool is correct, operators will need to shift load near term, and system upgrades will be needed longer term. "All that work could end up as a waste of time and money if they're trying to solve a problem that doesn't exist," said John Moseley, a network model engineer at the Electric Reliability Council of Texas. The alternative, however, is also costly: Utility engineers spend valuable time "data-chasing" to figure out whether such discrepancies are the result of an erroneous network model, faulty assumptions about system conditions, or differences in tool algorithms.

Since 2011, EPRI researchers have been exploring the concept of a "network model manager" to store and manage "master" data and assemble it for use by network analysis tools in various utility divisions. A network model manager can eliminate data conflicts that lead to incorrect decisions with negative impacts on grid operations and planning. It can also save significant hours spent entering, synchronizing, and correcting information from multiple sources. Accurate network analyses enabled by a network model manager are especially important today as power companies integrate more renewable generation and distributed energy resources.



How a network model manager works

Breaking Down Silos

Over many decades, more utility domains—such as operations, planning, protection, and markets—have deployed increasingly sophisticated network analysis tools. Because each tool typically has its own users and data managers, silos have developed. For example, employees in operations (concerned with real-time grid monitoring and control) and planning (focused on future grid issues) use different network analysis tools, modeling philosophies, and processes. Combine that with inconsistent data among models, and inefficiencies

abound. Engineers spend time wrangling data instead of analyzing the grid, and errors occur that affect the quality of models and network analyses.

“With an effective network model management tool, you can have one source of data, you can point to the place where particular data came from, and everybody can use it,” said EPRI Technical Leader Pat Brown. “This makes network models more accurate and reduces labor costs. Instead of having ten different engineers entering the same data, you have one engineer entering it, and ten engineers using it.”

To improve network model management in the power industry, Brown has launched projects to assess existing practices and provide guidance to utilities on solutions. EPRI also led a consortium of eight utilities and two vendors to define [industry requirements](#) for a network model manager tool. The effort educated utilities on its value and provided guidance to vendors in developing robust tools.

“We’re pointing out that there is a pervasive problem in the industry, and there’s a tool that can enable a utility to manage its network model data in a more intentional, organized fashion,” said Brown.

The impacts of these efforts are apparent. Utilities and grid operators are expressing more interest, vendors are investing in their respective tools, and the Common Information Model standard is being extended to support more network model manager data exchanges. FirstEnergy and American Electric Power, both participants in EPRI research, have launched major network model management improvement projects.

In 2016, EPRI will continue to work with vendors, utilities, standards groups, research organizations, and other stakeholders to advance efficient network model management.

Key EPRI Technical Experts

Pat Brown