SAS® for Network Optimization and Analytics
Driving Increased Efficiency in Grid Operations and Resource Deployment

Overview

Modernizing technology is a hallmark of the smart grid, allowing utilities to fine-tune operations for improved control, restoration and integration of renewable sources. As utilities invest in advanced energy delivery networks with integrated sensors and communication technologies, they have the chance to implement analytical solutions that use new types of data to optimize network operations.

Advanced analytics from SAS optimize transmission and distribution networks and increase operational efficiency through integration of distributed generation, demand response and renewable generation sources. SAS delivers new insights that make utilities’ business systems smarter, including distribution management systems (DMS), energy management systems (EMS), supervisory control and data acquisition (SCADA) systems, as well as enterprise resource planning (ERP) and enterprise asset management (EAM).

To help improve operations in the smart grid environment, SAS applications for network optimization and analytics incorporate advanced forecasting and optimization, business analytics and visualization, and comprehensive data management capabilities.

Challenges

- **Hard to provision new assets.** Disparate information systems, lack of analytics and inaccurate/incomplete forecasting hamper efforts to optimally provision new network assets.

- **No access to real-time data.** Large data volumes and aging systems make it hard to acquire customized data in near real time to optimize reliability, service quality and costs.

- **Disjointed network performance data.** An explosion of data will make it imperative to connect network performance signals coming from multiple sources.

- **Cost of extending legacy systems.** Utilities must find a cost-effective way to adapt enterprise systems to use new, available data.

"[Utilities] require holistic solutions supporting grid operation, restoration and optimization under new operating conditions that result from the growth of renewable distributed generation and more-active consumer participation in energy markets."

Achieve Long-Term Scalability and Speed

SAS provides in-database analytics and high-performance computing to manage the execution of complex algorithms over shared IT resources with enhanced speed and performance. As a result, you can achieve insights in just seconds – not hours.

Capabilities

Unmatched Analytical Expertise

SAS Analytics is designed and written by highly specialized quantitative software engineers to ensure that the proper numeric algorithms are selected and implemented. You can rely on the results you receive from SAS.

Integrated Environment for Problem Solving

Because analytic capabilities reflecting multiple disciplines are all combined in one integrated environment that’s optimized for analysis, you can solve problems using multiple methods without the limitations of switching tools or moving data.

How SAS® Can Help

Optimize Operations – From the Network to Your Workforce

Our approach brings together advanced analytical tools that utilize proven algorithms, models and predictive analytics to optimize your network operations resources while improving the experience of your energy customers. Whether placing new devices on the network, or identifying the right crew to dispatch for repair, SAS informs your decisions to return the best result at optimal cost. To enhance the understanding of analytical results, SAS integrates visualization capabilities, including geospatial elements.

Make Better Decisions, with Confidence

Our analytics applied to the distribution network fuels evidence-based decisions and empowers your organization with unmatched analytical agility and depth to measure what matters today, reveal best actions, expose threats and incorporate learning into your business processes. We recognize that success requires more than software. To help you further hone your analytical skills and take advantage of various sources of analytical expertise, we provide additional resources in the forms of technical support, education and publications.

Key Benefits

With network optimization and analytics, you can:

- Provision new, complex network assets faster and easier.
- Optimize services through access to customized, near-real-time data.
- Connect and analyze network performance signals to make better decisions.
- Adapt existing systems to manage new types of data.

“"We launched our smart grid initiative as a partnership with our customers to increase energy efficiency," said Craig Johnston, Vice President of Corporate Strategy and Marketing at OGE Energy Corp. “SAS and Cadmus tools allow us to analyze increased customer interval and system load data from the smart grid so we can design new energy management programs and optimize processes for our distribution system. This will contribute to our corporate goal to reduce peak load and delay the need for additional fossil-fuel generating resources until at least 2020."

Analytical Power at Scale and Speed Required

SAS can address the full analytics life cycle, ranging from test and learn on a standalone client to enterprisewide deployments that leverage existing infrastructure in new ways, including in-memory, in-database and high-performance computing.

Robust Data Access, Manipulation and Management

SAS is unmatched in the number of sources and ease with which data can be accessed and assembled in one environment. Data manipulation and management capabilities from SAS provide extreme flexibility and allow transformations and queries— including a visual subsetting of data—that's not possible with other solutions.

Components

Data Mining

SAS® Enterprise Miner™ software streamlines the data mining process to create highly accurate predictive and descriptive models based on analysis of vast amounts of data from across the enterprise. It offers a rich, easy-to-use set of integrated capabilities for creating and sharing insights that can be used to drive better decisions. Forward-thinking organizations today use SAS data mining software to detect fraud, minimize risk, anticipate resource demands, increase response rates for marketing campaigns and curb customer attrition.

Key Differentiators

Only network optimization and analytics provide you with:

• An integrated analytical environment.
• Ability to deliver to scale and speed required.
• Robust data access, manipulation and management capabilities.

Optimization

SAS/OR® software provides a powerful array of optimization, project scheduling and simulation techniques to identify the actions that will produce the best results, while operating within resource limitations and other tight restrictions. It enables organizations to consider multiple alternative actions and scenarios, and determine the best allocation of resources and the best plans for accomplishing goals. Only SAS offers advanced optimization solvers— including linear, mixed integer, quadratic and nonlinear programming—that are fully integrated with a broad suite of analytics, data handling and reporting capabilities.

SAS optimization software provides the best-case scenario to meet specified targets within constraints identified.
Forecasting

With SAS forecasting software, you can analyze and forecast processes that take place over time, identifying previously unseen trends and anticipating fluctuations so you can plan more effectively for the future. Whether you want to understand past trends, forecast the future or better understand how your business functions, our wide range of analytical tools can help ensure your success.

Visualization

SAS Visual Data Discovery provides a point-and-click interface to the advanced analytic capabilities of SAS. Through interactive data visualization, it enhances advanced analytics and exploratory data analysis – leading to better evaluations, faster decisions and more effective presentations of analytic results.

Data Management

SAS Enterprise Data Integration Server is a powerful, configurable and comprehensive solution that can access virtually all data sources; extract, cleanse, transform, conform, aggregate, load and manage data; support data warehousing, migration, synchronization and federation initiatives; support both batch-oriented and real-time master data management solutions; and create real-time data integration services in support of service-oriented architectures.

About SAS

SAS is the leader in business analytics software and services, and the largest independent vendor in the business intelligence market. Through innovative solutions delivered within an integrated framework, SAS helps customers at more than 50,000 sites improve performance and deliver value by making better decisions faster. Since 1976 SAS has been giving customers around the world THE POWER TO KNOW®.