Network Model Manager (NMM): The Common Information Model (CIM) Component of Network Digital Twin

A modeling environment designed with input from real users, reflecting the best modeling practices and productivity features.

An integration-ready design aligned with ENTSO-e/CGMES and EPRI NMM initiatives.

A collaborative modeling and data engineering solution

- An enterprise view of the power system model, appropriate for transmission, generation, and market systems in past, present, and future time contexts
- Efficient model updates and model accuracy across the Utility Enterprise (Operations, Planning, Markets).
- Network model maintenance across organizational boundaries
- Facilitate integration across tools and processes for different model validations and analysis
- Multiple levels of details for the Network Model required by different stakeholders
- Lowers cost of maintaining tools, processes, and people for modeling activities
- No duplicate modeling work, facilitating better integration across functions and processes
- Model validation with real power flow data within the modeling environment for greater efficiency
- Streamlined Intraday or Days Ahead Congestion Forecast process
- Model Merge, Internal, and Common Grid Model management

Customer Profiles

- Transmission System Operations and Planning
- Regional Transmission Organizations (RTOs and ISOs)
- Market and Generation Operations
- Utility IT Integration

Network Digital Twin – The single source of truth for your power system

Key outcomes

- Enterprise view
- CIM 16 / CGMES compliance
- Power system validation
- Automated and streamlined process
- Engineering efficiency
- Open and non-proprietary
- Meta data driven schema
Network Model Manager components: Source and CIMNet

Source component provides the main data management and persistence mechanism. Source also provides for the diagram layout data (CIM DL support) for network schematic diagrams.

Source leverages the CIM-based schema of the Transmission Management System to streamline the interface between one or multiple systems.

CIMNet component adds “Case” definition, constructed from one to many model parts of various input formats, such as CIM, validation and generates CIM base profiles for export, such as Topology processing (TP profile), Powerflow solution (SV profile) and the Steady State Hypothesis (SSH profile).

CIMNet provides a robust, high-performance solution by leveraging GE’s field-proven, real-time network application suite.

Model parts for the case definition and analysis can be taken from or supplied by Source or other external sources within the enterprise in various formats.

Traditional modeling of electric network takes a leap forward

If you are considering the GE Digital Energy Transmission System or upgrading to a new version of an existing system, you may be looking at modeling only in its traditional support role.

Network Model Manager is the modeling solution that complements the GE Digital Energy system, other Vendor systems and to organizations like ENTSO-E, or other business entities with the electrical utility enterprise which require a model for consumption by other entities, such as planning.

Network Model Manager provides state-of-the-art modeling features that can improve your ability to develop and maintain the complex power system models needed for operational, planning, and markets success.

Key Value Capabilities

- Import and export in multiple formats based on CIM standards
- Edit the model graphically by working directly with the electrical schematic representation
- Import export CIM DL and GL profiles, facilitating interoperability with neighbors
- Support both Bus-Branch and Node-Breaker representation of the model
- Multi-user work environment
- Manage the evolution of the model over time
- Analyze and validate your model using CIMNet engine, leveraging the network kernel of the EMS
Modeling as a focal point of Data Engineering

If you are deploying digital enterprise architecture, you are considering the following factors:

- Enterprise message bus
- Web Services
- Canonical data models for semantic consistency
- The IEC TC57 CIM standards
- The CIGRE D2.24 reference architecture
- EPRI Network Model
- Data mastership and enterprise automated information workflow

Network Management Modeler serves as a central enterprise data engineering solution for collecting, managing, validating and distributing a common view of the power system model (past, present or future) in standard CIM form. This enables applications to exchange business information about the power system using a common reference point.

Extending models via Network Management Modeler meta-data driven schema

When you use a model, you may need to manage data beyond what is required by EMS, or beyond what is defined in the current CIM standard. If so, you need to extend the schema of the data managed by the Network Model Manager.

We have designed Network Model Manager to make this a straightforward, non-programming operation, thanks to the meta-data driven schema.
Key Concepts

A model is a representation of some real-world system, such as a power system, maintained over time: past, present, and future views are available.

A project is an annotated, dated collection of changes to a model. Projects create easy-to-use audit trails of activity and, when specified in the future, provide documentation of plans.

Multiple workspaces support concurrent independent work by multiple users.

A full model may be divided into nonoverlapping Model Authority Sets (MAS) maintained by different parties.

Case construction, consisting of multiple model parts for different point in time, representing different real-world scenarios.

A case can be validated with the CIMNet component and easily exported/shared with other enterprise entities, such as Planning, Operations, and Market systems.

CIMNet the power to evaluate power system conditions

The model together with modeling data is evaluated with the same power flow engine as the one running in Transmission systems, thus providing excellent analysis early in the process.

CIMNet runs directly on CIM model data. It is a high-performing engine.

Model Exchanges – Import/Export

The Network Model Manager (NMM) coordinates with other modeling sources via CIM, or other common industry formats, such as PSS/E or PSLF.

GE is the world’s first Digital Industrial company, harnessing the power of the Industrial Internet to transform power and utility markets. GE helps power customers of all sizes leverage machine data, digital industrial technologies, and analytics.

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