



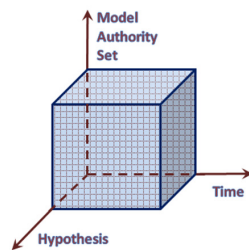
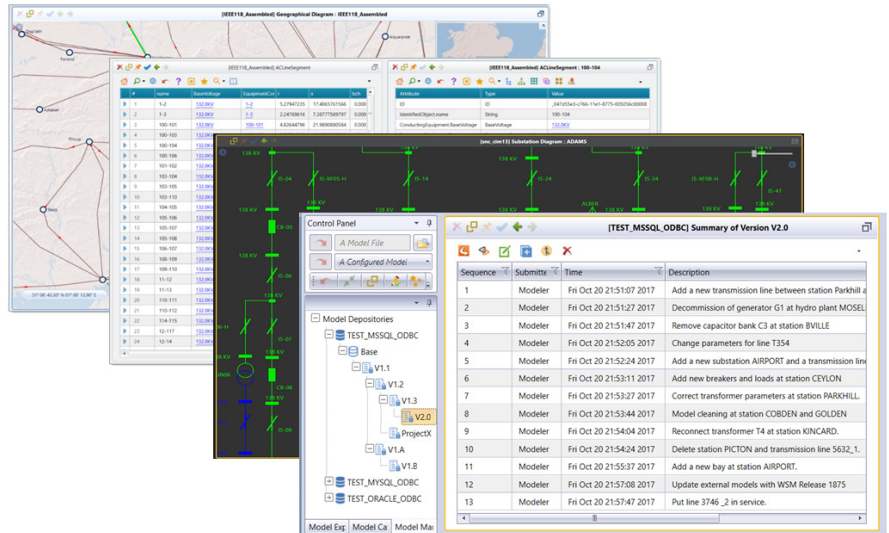
## A Multidimensional Model Management System

### Addressing Emerging Industrial Needs

An electric utility organization normally maintains a variety of enterprise applications to automate business processes ranging from operation, planning, to management of assets, customers, and outages, etc. These legacy applications, typically designed as discrete business functions, model a power system and its operation from their own business perspectives, resulting in a diversity of overlapped and sometimes conflicting information models residing in hundreds of incompatible formats.

As business evolves, electric utility operations now involve multiple business processes across several functional areas and require modeling information residing in heterogeneous systems to be synchronized and interoperable. As an example: for planning and operational look-ahead purposes, there is an imminent need to assemble various what-if study cases by combining information from various systems, including planning tool, EMS, and OMS.

M<sup>3</sup> is targeted to address this emerging and challenging industry-wide requirement.



M<sup>3</sup> is a standard based model maintenance & management tool designed to address the emerging information

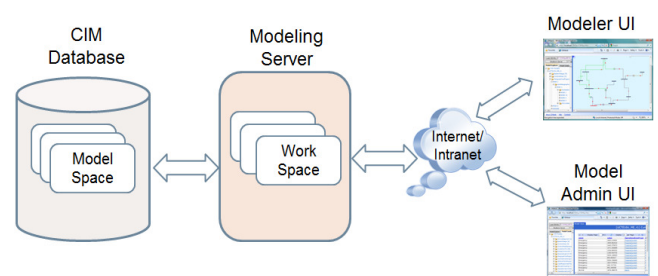
management requirements in the electric power industry. Built upon Common Information Model (CIM) and its related IEC standards, M<sup>3</sup> provides a multidimensional modeling space and comprehensive data engineering functions to help electric utility organizations maintain and manage their CIM-based power system models.

One of the key M<sup>3</sup> use cases is the support of centralized information management in a utility organization. Under this methodology, a modeling entry should be entered once, and then will be available for all of the downstream applications.

Because M<sup>3</sup> is based on CIM, the modeling information, full or incremental, can be exported in the standard CIM/XML formats, ready to be consumed by other CIM-compliant information infrastructures.

Another use case to be targeted by M<sup>3</sup> involves synchronizing planning model with operational model. The tool enables power system planners to derive a base case directly from the reality-based operational EMS model and then rapidly construct numerous study cases with various what-if hypotheses.

Built as a distributed Web-based application, M<sup>3</sup> provides end-users a multidimensional modeling space to perform time-based and multitasking modeling work.



## Key Differentiators

**CIM Support:** As a model-driven solution, M<sup>3</sup> supports any versions of CIM, standard or extended.

**Performance:** Loading large RTO models of thousands of stations from databases takes seconds rather than minutes/hours.

**Database Support:** Oracle, MSSQL Server, or MySQL, it's your choice. M<sup>3</sup> works virtually with any RDBMS with ODBC connection support.

**DBA Support:** Creation of an empty database is all you need from a DBA. M<sup>3</sup> automates rest of the database administration, including schema auto-generation.

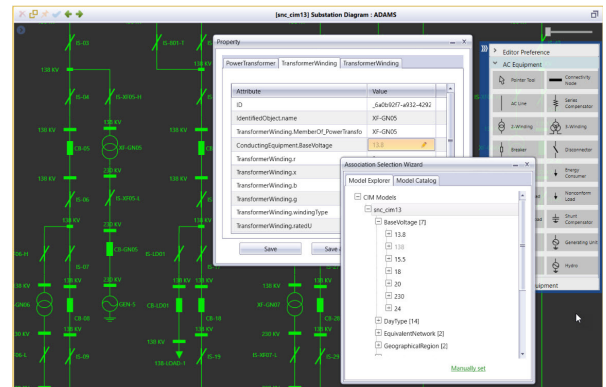
**Standard Compliance:** Models are stored as CIM-based tables, ready for you to build your own CIM-compliant applications.

**Template-based Modeling:** With one mouse-clicking, you add a parallel transmission line or duplicate a substation.

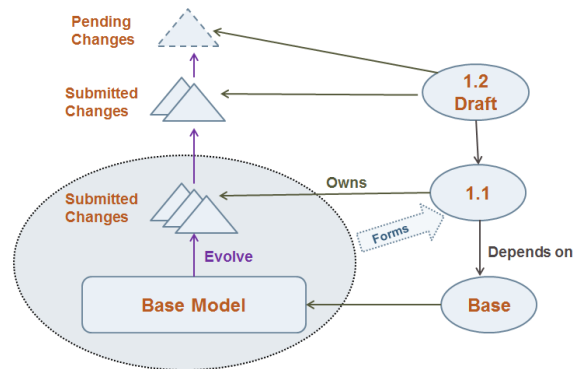
**Full Graphics:** Graphic support is essential for network modeling. Without it, a modeling tool is simply a data entry wizard. M<sup>3</sup>, leveraging the pioneered data-driven visualization techniques, auto-generates various types of one-line diagrams, schematic or geographical, enabling users to maintain their power system models in an WYSIWYG style.

## Key Features:

- ✓ **Graphical Model Editing:** With M<sup>3</sup>, modeling is no longer tedious work. Network topology modeling, for example, is translated into a sequence of graphical activities and data entry is performed in the context of full graphics.

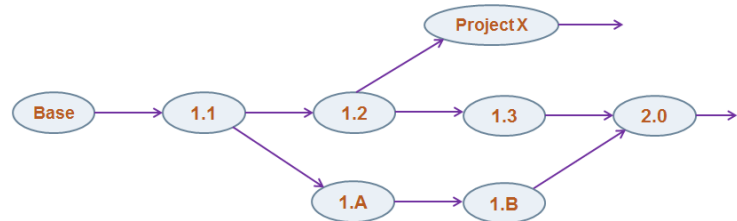


- ✓ **Time-Based:** Unlike legacy modeling tools that model only a snapshot of the grid, M3 allows you to model past, present, and future of the grid. It enables

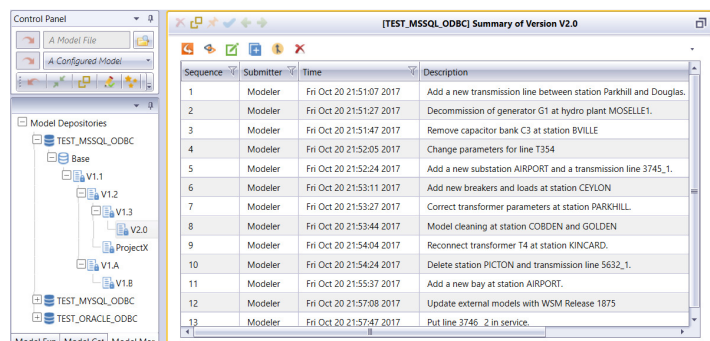


models to evolve with major milestones marked as versions. Users can load any versions of model into workspace. Model changes between any two dependent versions can be extracted as a CIM incremental, ready to be consumed by other utility systems.

- ✓ **Multi-Tasking:** M<sup>3</sup> enables multiple modeling tasks to be performed concurrently and independently in support of various business use cases. The branched model revisions or Projects can later be merged into the main trunk or other branches.



- ✓ **Model Build Automation:** In M<sup>3</sup>, the model build process is seamlessly automated, ranging from drafting, submitting, versioning, to case assembling.



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