

CIMSpy

A CIM-Based Model Exploratory Tool

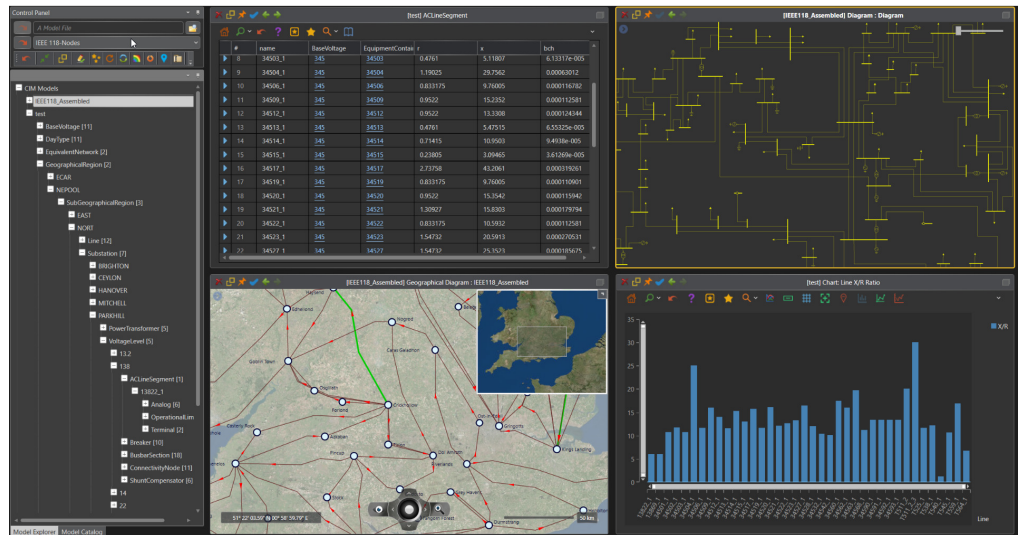
Background

CIMSpy started as an open-source project in 2005. It was originally designed to support EPRI's CIM InterOP (IOP) tests. Since the introduction, it has been widely used in the CIM communities.

Driven by the key requirements of some CIM-related projects in North America and Europe, CIMSpy was rebuilt and commercialized in 2008. A year later, UCTE (now part of ENTSO-E) selected CIMSpy as the baseline for building a CIM-based data engineering tool.

During 2011 – 2017, US Department of Energy awarded three-phase \$2.15 million SBIR Grant in support of R&D of CIMSpy. During this period of time, CIMSpy was renovated twice with an aim to support multiple business practices in a utility organization, ranging from centralized model management to real-time visualization in a control center environment.

Today, CIMSpy is being leveraged by more than 60 electric utilities, ISOs/RTOs, grid coordination organizations, energy trading companies, and EMS/MMS vendors in Europe and North America.



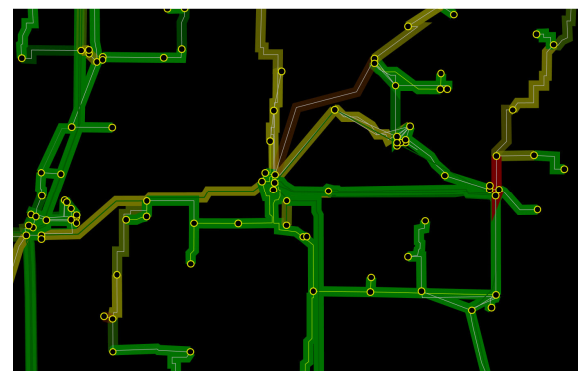
CIMSpy is a standard-based model exploratory tool designed to

address the emerging model exchange and information integration requirements in the power industry. Built upon Common Information Model (CIM) and its related IEC standards, CIMSpy provides comprehensive data engineering functions and rich user experience to help you understand and analyze your CIM-based power system models.

More specifically, CIMSpy is designed to provide an integrated data engineering environment in support of CIM-based model exchange, application integration, and information sharing. Users can load reality-based CIM/XML files

into the tool and perform a variety of data engineering functionalities, including model browsing, visualization, validation, editing, comparison, merging, partitioning, and incremental update. The engineered models can be further exported into various formats such as XML or CSV, ready to be consumed by other CIM-compliant information infrastructures.

Designed as model-driven application, CIMSpy provides a set of infrastructure and application modules that can be readily assembled or configured to meet various project needs, ranging from standard-based model exchange to centralized model management.



Case Studies

CIM-Based Model Exchange

In support of CIM-based model exchanging, CIMdesk (a customized version of CIMSpy) was delivered to ENTSO-E and its 41 Transmission System Operators (TSOs) in 34 European countries. Today passing CIMdesk validation is mandatory for ENTSO-E TSOs.

External Network Modeling

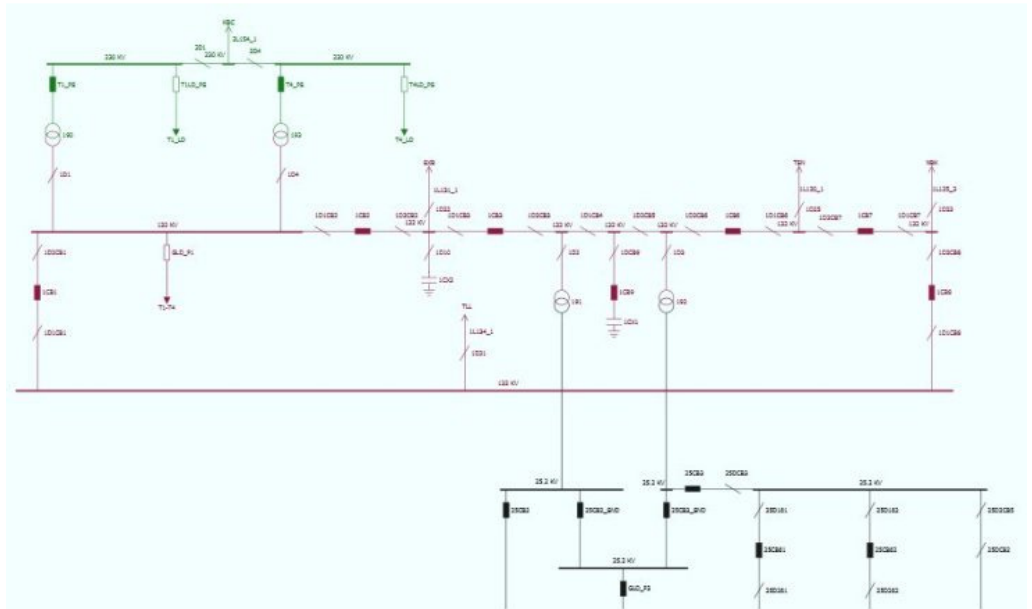
Since 2010, some of the WECC Balancing Authorities have started the projects aimed to update their external EMS models using Peak RC's West-wide System Model. CIMSpy provides comprehensive model analysis, engineering, and visualization functions, assisting project engineers to accomplish this challenging goal.

Exploratory Data Analysis

Analysts at energy trading companies rely on the powerful data analysis and visualization functions of CIMSpy to capture the patterns and insights from large and complex RTO data sets.

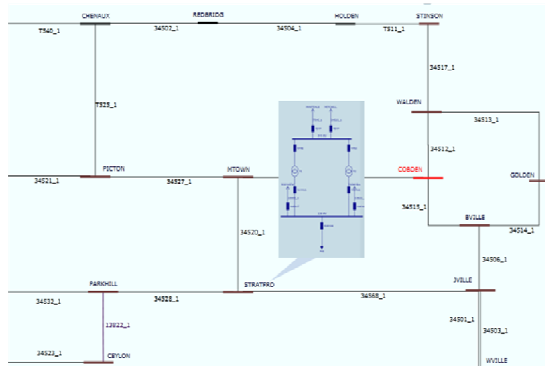
Real-Time Visualization

Schematic and geographical diagrams generated and maintained in CIMSpy have been successfully imported into utility real-time operational systems, providing much-needed situational awareness and decision support.



Key Features :

- ✓ Capability of importing and exporting reality-based large CIM-compliant models of GB size in various formats
- ✓ Comprehensive model browsing features in support of exploratory data analysis, including multi-dimensional data-driven presentations, visual information searching, and visual data mining, aimed to help users seek the useful information from large volume of data
- ✓ Great extensibility and customizability, enabling users to customize and extend the tool to fit their special needs.
- ✓ Powerful model validators, schema-driven and rule-based, ensuring you receive the right data in the right format
- ✓ Broad engineering support for model sharing among utility organizations, including regional model merging/partition and metadata-driven model transformation
- ✓ Ability to compare two models based on the Master Resource ID (MRID)



- ✓ State-of-the-art model visualization capability, enabling users to explore the model intuitively and interactively at different levels
- ✓ Interactive look-and-feel and rich user experience



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