



EMPOWERING THE ENERGY TRANSITION



# The Importance of CIM in the Power Industry

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# CIM Introduction

Basic Concepts

# What is CIM?

- The Common Information Model (CIM) is an abstract information model that provides data understanding through the identification of the relationships and associations of the data within a utility enterprise.
- This enhanced data understanding supports the exchange of data models and messages and increases the ability to integrate applications both within the enterprise and with trading partners.
- These trends go beyond exchange or updates of network models to the exchange of specific dynamic data within transactional messages in a real-time environment.

# History of CIM



## Origins of the Utility CIM

Exchanging power systems data between utility companies has been problematic when proprietary formats are used. In the past a company would traditionally use a single software system, whether a custom in-house solution or whether purchased from a large software company, and there would be a single proprietary data standard and format used. With the deregulation of the power industry, the emergence of smarter grids, and the integration of consumer or third-party distributed energy resources (DERs), there is now a greater need to enable interoperability across a wide diversity of companies and systems.

The increase in choice provided by the number of power system software vendors and the different software packages and architectures available add to the challenge of data exchange. These issues point to a requirement for a single, open standard for describing electric utility data and to aid the interoperability between software packages and exchange of information both within one company and between companies.

The Common Information Model (CIM) was developed as an open standard for representing power system components. CIM was originally developed by the Electric Power Research Institute (EPRI) in North America and is now a series of standards under the auspices of the International Electrotechnical Commission (IEC). The standard was started as part of the Control Center Application Programming Interface (CCAPI) project at EPRI with the aim of defining a common definition for the components in power systems for use the Energy Management System (EMS) Application Programming Interface (API), now maintained by IEC Technical Committee 57 Working Group 13 as IEC 61970-301. The format has been adopted by the major EMS vendors to allow the exchange of data between their applications, independent of their internal software architecture or operating platform.

# Deriving Profiles

The CIM is by definition intended to be a single, “common” model. One of the key goals of the CIM is to prevent duplication of data definitions but still define all the data exchanged between the systems within organizations supporting electric grid systems. The IEC 61968 standard includes an Interface Reference Model (IRM, shown in Figure 6-1). This diagram illustrates the breadth of the model itself. The CIM has grown from an initial core set of less than 100 classes to describe a balanced electrical model for EMS, to a model with over 1,000 classes and thousands of associations and attributes

# CIM Interface Reference Model

For our industry to be able to effectively operate millions of pieces of equipment from hundreds of vendors, the CIM reference model must be utilized to be able to exchange key data without custom, costly software interfaces.

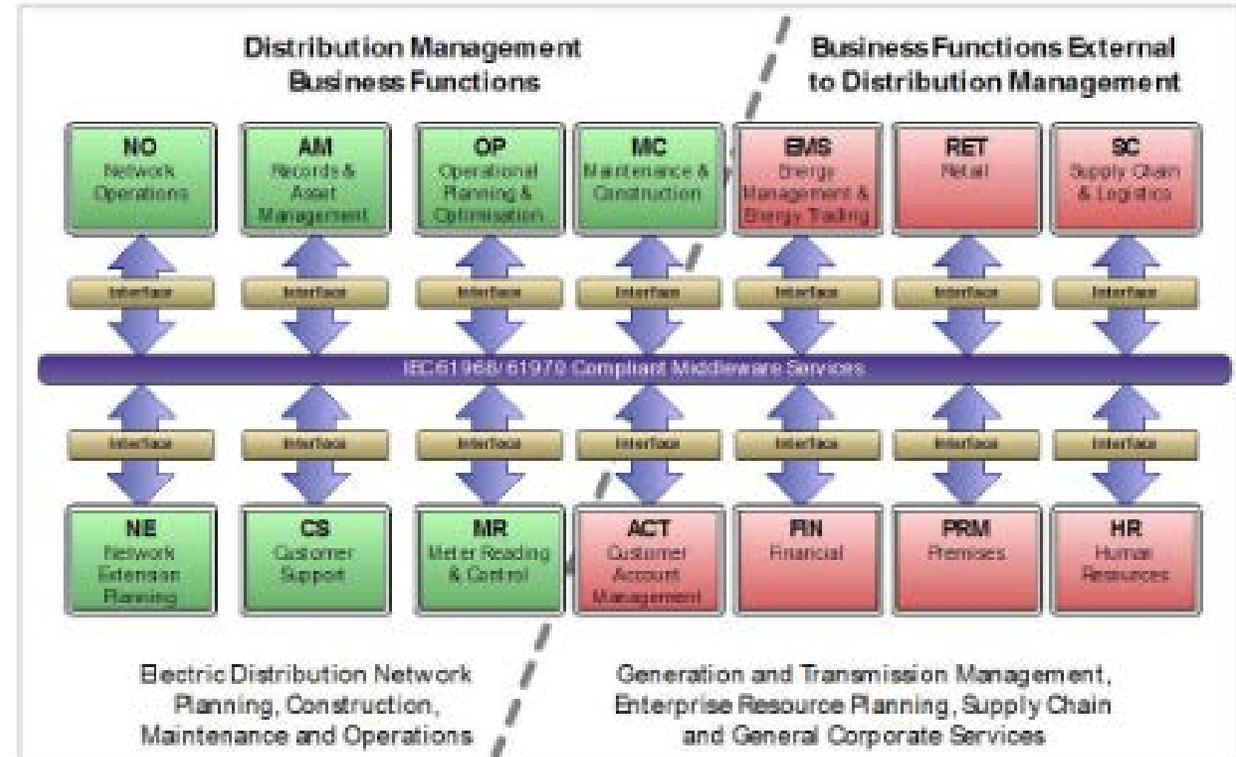


Figure 6-1  
IEC61968-1 Interface Reference Model

# The Core CIM Standards

Standard	Modeling Focus
IEC 61970	Information exchange among systems directly involved with operation and planning of the overall interconnected electric grid which rely on power system network models to analyze the behavior of the entire interconnected grid at all voltage levels. This often involves interactions between systems at various different participants in the grid (that is, RTO, TSO, DSO, microgrid, generator, consumer).
IEC 61968	Information exchange among systems supporting business functions that support power system operations, maintenance and customer support. This includes major business functions such as asset management, work management, meter data management, customer information, geographic information systems and engineering design.
IEC 62325	Information exchange among systems directly involved with electricity market business processes such as transmission capacity allocation, forecasting, bidding, contracts, clearing and settlement.

