

INTERNATIONAL STANDARD

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Application integration at electric utilities – System interfaces for distribution management –

Part 11: Common information model (CIM) extensions for distribution

Intégration d'applications pour les services électriques – Interfaces système pour la gestion de distribution –

Partie 11: Extensions du modèle d'information commun (CIM) pour la distribution



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

APPLICATION INTEGRATION AT ELECTRIC UTILITIES – SYSTEM INTERFACES FOR DISTRIBUTION MANAGEMENT –

Part 11: Common information model (CIM) extensions for distribution

FOREWORD

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International Standard IEC 61968-11 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

The text of this standard is based on the following documents:

FDIS	Report on voting
57/1295/FDIS	57/1326/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

This second edition cancels and replaces the first edition published in 2010. It constitutes a technical revision.

Major changes with respect to the first edition are summarised below¹;

- Introduction of new classes to support flexible naming of identified objects (new classes available in base CIM, IEC 61970-301).
- Introduction of new classes to support single line diagrams exchange (new classes available in base CIM, IEC 61970-301).
- Consolidated transmission and distribution models for lines, transformers, switching, sensing and other auxiliary equipment (some Ed.1 classes slightly changed and moved from DCIM to base CIM, IEC 61970-301, other new classes available in base CIM, IEC 61970-301).
- Support for separate phase definitions, typically needed for unbalanced network modelling (new classes available in base CIM, IEC 61970-301).
- Support for temporary network changes through models of cuts, jumpers and clamps (new classes available in base CIM, IEC 61970-301).
- Flexible model for organisations and their roles.
- Support for coordinate systems in description of geographical locations.
- Support for configuration events tracking.
- Lightweight model for assets and asset catalogues.
- Support for linkage between network-oriented models and premises-oriented (metering) models.
- Support for premises area network devices.

In informative sections of this document, words printed in Arial Black apply to terms that are used as tokens in the normative clauses (to facilitate the reading and the text search).

A list of all parts of the IEC 61968 series, under the general title: *Application integration at electric utilities – System interfaces for distribution management* can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

¹ For enhancements in the base CIM, see IEC 61970-301 documenting CIM15.

INTRODUCTION

The IEC 61968 series of standards is intended to facilitate inter-application integration as opposed to intra-application integration. Intra-application integration is aimed at programs in the same application system, usually communicating with each other using middleware that is embedded in their underlying runtime environment, and tends to be optimised for close, real-time, synchronous connections and interactive request/reply or conversation communication models. Therefore, these inter-application interface standards are relevant to loosely coupled applications with more heterogeneity in languages, operating systems, protocols and management tools. This series of standards is intended to support applications that need to exchange data every few seconds, minutes, or hours rather than waiting for a nightly batch run. This series of standards, which are intended to be implemented with middleware services that exchange messages among applications, will complement, not replace utility data warehouses, database gateways, and operational stores.

As used in IEC 61968, a distribution management system (DMS) consists of various distributed application components for the utility to manage electrical distribution networks. These capabilities include monitoring and control of equipment for power delivery, management processes to ensure system reliability, voltage management, demand-side management, outage management, work management, automated mapping and facilities management. Standard interfaces are defined for each class of applications identified in the interface reference model (IRM), which is described in IEC 61968-1.

APPLICATION INTEGRATION AT ELECTRIC UTILITIES – SYSTEM INTERFACES FOR DISTRIBUTION MANAGEMENT –

Part 11: Common information model (CIM) extensions for distribution

1 Scope

This part of IEC 61968 specifies the distribution extensions of the common information model (CIM) specified in IEC 61970-301. It defines a standard set of extensions of common information model (CIM), which support message definitions in IEC 61968-3 to IEC 61968-9, IEC 61968-13 and IEC 61968-14². The scope of this standard is the information model that extends the base CIM for the needs of distribution networks, as well as for integration with enterprise-wide information systems typically used within electrical utilities. The information model is defined in UML which is platform-independent and electronically processable language that is then used to create message payload definitions in different required formats. In this way, this standard will not be impacted by the specification, development and/or deployment of next generation infrastructures, either through the use of standards or proprietary means.

For the purposes of this part of IEC 61968, the distribution CIM (DCIM) model refers to the IEC CIM model as defined by IEC 61970-301 and this part of IEC 61968.

The common information model (CIM) is an abstract model of the major objects in an electric utility enterprise typically involved in utility operations. By providing a standard way of representing power system resources as object classes and attributes, along with their relationships, the CIM facilitates the integration of software applications developed independently by different vendors. The CIM facilitates integration by defining a common language (i.e., semantics and syntax) based on the CIM to enable these applications or systems to access public data and exchange information independent of how such information is represented internally.

IEC 61970-301 defines a core CIM for energy management system (EMS) applications, including many classes that would be useful in a wider variety of applications. Due to its size, the CIM classes are grouped into logical packages, and collections of these packages are maintained as separate International Standards. This document extends the core CIM with packages that focus on distribution management systems (DMS) including assets, work, customers, load control, metering, and others. IEC 62325-301³ extends the CIM with packages that focus on market operations and market management applications. Other CIM extensions may be published as International Standards, each maintained by a separate group of domain experts. Depending on a project's needs, the integration of applications may require classes and packages from one or more of the CIM standards.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60076-1, *Power transformers – Part 1: General*

² IEC 61968-5, IEC 61968-6, IEC 61968-7, IEC 61968-8 and IEC 61968-14 are under consideration.

³ Under consideration.