IEC TS 61968-14

Edition 1.0 2015-06

TECHNICAL SPECIFICATION

colour inside

Application integration at electric utilities – System interfaces for distribution management –
Part 14: MultiSpeak – CIM harmonization

IEC TS 61968-14:2015-06(en)

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

ICS 33.200

ISBN 978-2-8322-2698-8

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Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC 61968-14, which is a technical specification, has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

This publication contains attached files in the form of xsd files. These are a copy of the text originally contained in Annex D of this publication. These files are intended to be used as a complement and do not form an integral part of the publication.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
57/1504/DTS	57/1555/RVC

Full information on the voting for the approval of this technical specification 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.

A list of all parts in the IEC 61968 series, published 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 website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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.

INTRODUCTION

This part of IEC 61968 seeks to address the need for harmonization between the two leading standards for software interoperability that serve the electric utility industry; MultiSpeak™, which is maintained by the MultiSpeak Initiative, and the common information model (CIM), which is maintained by the International Electrotechnical Commission. While the CIM is an international standard, MultiSpeak has a significant footprint especially among municipal and cooperative utilities and vendors that serve these utilities, particularly in the United States. MultiSpeak is also used in fifteen countries worldwide.

The goal of this technical specification is to harmonize the two standards so that the capability currently inherent in MultiSpeak could eventually be expressed as a profile within the CIM. To that end this particular effort will map V4.1x of MultiSpeak with IEC 61968-9:2009, *Interfaces for meter reading and control* of the CIM. This mapping will occur at the CIM profile level, so that each CIM profile will have a mapping to a corresponding element in MultiSpeak. This will serve two ends; (a) for those that need to translate from interfaces based on one standard to another, this mapping will give a roadmap for how that is accomplished, and (b) this exercise will reveal where alignment currently exists between the two standards and where gaps exist. As each standard goes through successive releases, reviews of business requirements which necessitated the respective releases and updates can be made in both CIM and MultiSpeak to narrow existing gaps.

As part of this exercise this part of IEC 61968 will also give a practical example of the interoperability between the two standards using an archetype of one interface being mapped to another through an enterprise service bus (ESB). This proof of concept will utilize OpenESB as this is open source and freely available. This archetype will cover the on demand meter read use case, where a source application will initiate a request for an on demand read and this request will be served by a destination application. The applications themselves will not be developed; only the interface mapping through an ESB from a MultiSpeak based source to a CIM based destination will be developed.

Multiple standards that cover the same information domain present a problem for the vendor community when developing products, and for the customers that would use these products. The classic challenge becomes one of determining which standards to support or how best to support one or both standards. The problem for the customer is integrating products that follow different standards to work with each other.

As part of a harmonization effort both 1st edition and 2nd edition CIM profiles have been mapped to equivalent MultiSpeak profiles. The reason this approach was used is that the CIM and MultiSpeak models are too large to be compared in their entirety. It was determined that the profile, representing a snapshot of the respective models and something that has been determined to be useful in the exchange of information between systems, would be a better place to begin making comparisons.

The harmonization effort includes mapping of the profiles and an assessment detailing where the profiles correlate, where a transformation needs to occur, e.g. concatenating several fields to map to a single field in the corresponding profile, and where gaps exists.

In addition to the mapping of the profiles, Annex A lists the suggested changes to the respective standards for consideration in future releases.

IEC 61968, taken as a whole, defines interfaces for the major elements of an interface architecture for Distribution Management Systems (DMS). Part 1: Interface Architecture and General Recommendations, identifies and establishes requirements for standard interfaces based on an Interface Reference Model (IRM). Parts 3 to 9 of IEC 61968 define interfaces relevant to each of the major business functions described by the Interface Reference Model.

As used in IEC 61968, a 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.

IEC 61968 is limited to the definition of interfaces and is implementation independent. They provide for interoperability among different computer systems, platforms, and languages. Methods and technologies used to implement functionality conforming to these interfaces are considered outside of the scope of IEC 61968; only the interface itself is specified in this standard.

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

Part 14: MultiSpeak – CIM harmonization

1 Scope

This part of IEC 61968, which is a technical specification, explains how to do a mapping from CIM to MultiSpeak using an XML mapping tool, and the inclusion of an example project that gives practical guidance on the interoperability and mapping of source and destination applications through an ESB using an on demand meter read as the archetype.

This technical specification will also cover the mapping of IEC 61968-9:2009 profiles to equivalent MultiSpeak v.4.1x message profiles.

Each CIM profile will have a corresponding MultiSpeak profile with a prefix of “msp”. For example, CIM EndDeviceEvents matches the MultiSpeak mspEndDeviceEvents.

The following profiles from IEC 61968-9:2009 are harmonized:

AuxiliaryAgreementConfig
CustomerAccountConfig
CustomerAgreementConfig
CustomerConfig
CustomerMeterDataSet
EndDeviceAssets
EndDeviceControls
EndDeviceEvents
EndDeviceFirmware
MeterAssetConfig
MeterAssetReading
MeterReadings
MeterReadSchedule
MeterServiceRequests
MeterSystemEvents
PricingStructureConfig
ReceiptRecord
SDPLocationConfig
ServiceCategoryConfig
ServiceDeliveryPointConfig
ServiceLocationConfig
SupplierConfig
TransactionRecord

Although the profiles will have some changes as part of the IEC 61968-9:2013, the scope of the harmonization effort for the 2nd edition to MultiSpeak v.5 (release candidate), will be

limited to these same profiles. This will give the practitioner an ample set of mapping examples and allow them to make meaningful comparisons of the changes between IEC 61968-9:2009 and 2013 profiles and the respective mapping to MultiSpeak.

This part of IEC 61968 contains the clauses listed in Table 1.

Table 1 – Document overview for IEC 61968-14

Clause	Title	Purpose
1.	Scope	The scope and purpose of the document are described.
2.	References (Normative)	Documents that contain provisions which, through reference in this text, constitute provisions of this International Standard.
3.	Terms, definitions, and abbreviations	Establish the common terms used in this specification.
4.	Reference and Information Models	Description of general approach to metering system, reference model, use cases, interface reference model, meter reading and control functions and components, message type terms and static information model for both CIM and MultiSpeak.
5.	Document Conventions	Message types related to the exchange of information for documents related to maintenance and construction.
6.	Integration example	The main purpose of this standard is to provide guidance for integration. Since both MultiSpeak and CIM use web services for integration, this section addresses the needs to map the message headers as well as the profiles.
7.	Scope of the profile mappings	Enumerates the profiles that are mapped as part of this specification
8.	1st edition CIM Meter Reading to MultiSpeak 4.1.x Profile Mapping	Gives the reader specific guidance on CIM to MultiSpeak mapping.
9.	2nd edition CIM Meter Reading to MultiSpeak 5.0.x Profile Mapping	Gives the reader specific guidance on CIM to MultiSpeak mapping.
Annex A	EMBEDDED/REUSED CLASS MAPPINGS	Rather than have mappings that appear in several profiles appear over and over, these repeated mappings are located in this annex for reference.
Annex B	Example Mapping of MultiSpeak to CIM-based services	This annex demonstrates one example of how to “wire” MultiSpeak to CIM-based web services through an enterprise service bus.
Annex C	UML of MultiSpeak Equivalent profiles	Provides examples of how to create MultiSpeak equivalents of various CIM profiles.
Annex D	MultiSpeak Equivalent CIM Profiles	This annex provides the XML for the MultiSpeak equivalent of the various CIM Profiles.

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 60050-300, *International Electrotechnical Vocabulary – Electrical and electronic measurements and measuring instruments*

IEC 61968-1, *Application integration at electric utilities – System interfaces for distribution management – Part 1: Interface architecture and general recommendations*

IEC TS 61968-2, *Application integration at electric utilities – System interfaces for distribution management – Part 2: Glossary*

IEC 61968-9:2013, *Application integration at electric utilities – System interfaces for distribution management – Part 9: Interfaces for meter reading and control*

IEC 61968-100, *Application integration at electric utilities – System interfaces for distribution management – Part 100: Implementation profiles*

IEC TR 62051, *Electricity metering – Glossary of terms*

IEC 62055-31, *Electricity metering – Payment systems – Part 31: Particular requirements – Static payment meters for active energy (classes 1 and 2)*

ISO 8601:2004, *Data Elements and Interchange Formats – Information Interchange – Representation of Dates and Times*

ISO 4217:2008, *Codes for the representation of currencies and funds.*

MultiSpeak Version 4.1.6

3 Terms, definitions, and abbreviations

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in given in IEC 60050-300, IEC TS 61968-2, IEC TR 62051, IEC 62055-31 apply.

Where there is a difference between the definitions in this standard and those contained in other referenced IEC standards, then those defined in IEC 61968-2 shall take precedence over the others listed, and those defined in IEC 61968-6 shall take precedence over those defined in IEC 61968-2.

3.2 Abbreviations

AM Asset Management
AMR Automated Meter Reading
AMI Advanced Metering Infrastructure
BPEL Business Process Execution Language
CIM Common Information Model
CIS Customer Information System
DMS Distribution Management System
DR Demand Response
DRMS Demand Response Management System
HAN Home area network
IEC International Electrotechnical Commission
LC Load Control
LMS Load Management System
MAM Meter Asset Management
MDM Meter Data Management
MM Meter Maintenance