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Entwurf

**Angleichung der Codes für die Datenqualität innerhalb des TC 57 –
Teil 100: Benennungs- und Entwicklungsregeln zum Abbilden von
CIM-Profilen auf XML-Schemen
(IEC 57/1191/CDV:2011);
Englische Fassung FprEN 62361-100:2011**

Harmonization of quality codes across TC 57 –
Part 100: Naming and design rules for CIM profiles to XML schema mapping
(IEC 57/1191/CDV:2011);
English version FprEN 62361-100:2011

Harmonisation des codes qualité à travers le CE 57 –
Partie 100: Règles de désignation et de conception dans la mise en correspondance des
profils CIM avec les schémas XML
(CEI 57/1191/CDV:2011);
Version anglaise FprEN 62361-100:2011

Anwendungswarnvermerk

Dieser Norm-Entwurf mit Erscheinungsdatum 2013-04-15 wird der Öffentlichkeit zur Prüfung und
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Weil die beabsichtigte Norm von der vorliegenden Fassung abweichen kann, ist die Anwendung dieses
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Gesamtumfang 32 Seiten

DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik im DIN und VDE

Nationales Vorwort

Die Englische Fassung des europäischen Dokuments FprEN 62361-100:2011 „Angleichung der Codes für die Datenqualität innerhalb des TC 57 – Teil 100: Benennungs- und Entwicklungsregeln zum Abbilden von CIM-Profilen auf XML-Schemen“ (Entwurf in der Umfrage) ist unverändert in diesen Norm-Entwurf übernommen worden.

Die Internationale Elektrotechnische Kommission (IEC) und das Europäische Komitee für Elektrotechnische Normung (CENELEC) haben vereinbart, dass ein auf IEC-Ebene erarbeiteter Entwurf für eine Internationale Norm zeitgleich (parallel) bei IEC und CENELEC zur Umfrage (CDV-Stadium) und Abstimmung als FDIS (en: Final Draft International Standard) bzw. Schluss-Entwurf für eine Europäische Norm gestellt wird, um eine Beschleunigung und Straffung der Normungsarbeit zu erreichen. Dem entsprechend ist das internationale Dokument IEC 57/1191/CDV:2011 „Harmonization of quality codes across TC 57 – Part 100: Naming and design rules for CIM profiles to XML schema mapping“ unverändert in den Entwurf FprEN 62361-100:2011 übernommen worden.

Das internationale Dokument wurde vom TC 57 „Power systems management and associated information exchange“ der Internationalen Elektrotechnischen Kommission (IEC) erarbeitet.

Bei der Abstimmung zu dem Europäischen Schluss-Entwurf bei CENELEC und dem Internationalen Schluss-Entwurf bei IEC [Final Draft International Standard (FDIS)] sind jeweils nur „JA/NEIN“-Entscheidungen möglich, wobei „NEIN“-Entscheidungen fundiert begründet werden müssen. Dokumente, die bei CENELEC als Europäische Norm angenommen und ratifiziert werden, sind unverändert als Deutsche Normen zu übernehmen.

Für dieses Dokument ist das nationale Arbeitsgremium K 952 „Netzleittechnik“ der DKE Deutsche Kommission Elektrotechnik Elektronik Informationstechnik im DIN und VDE (www.dke.de) zuständig.

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Für den Fall einer datierten Verweisung im normativen Text bezieht sich die Verweisung immer auf die in Bezug genommene Ausgabe der Norm.

Der Zusammenhang der zitierten Normen mit den entsprechenden Deutschen Normen ergibt sich, soweit ein Zusammenhang besteht, grundsätzlich über die Nummer der entsprechenden IEC-Publikation. Beispiel: IEC 60068 ist als EN 60068 als Europäische Norm durch CENELEC übernommen und als DIN EN 60068 ins Deutsche Normenwerk aufgenommen.

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Da sich die Benutzer des vorliegenden Normentwurfs der englischen Sprache als Fachsprache bedienen, wird die Englische Fassung der EN 62361-100 veröffentlicht. Für die meisten der verwendeten Begriffe existieren keine gebräuchlichen deutschen Benennungen, da sich die deutschen Anwender in der Regel ebenfalls der englischen Benennungen bedienen. Dieser Normentwurf steht nicht in unmittelbarem Zusammenhang mit Rechtsvorschriften und ist nicht als Sicherheitsnorm anzusehen.

Es ist vorgesehen, auch bei der entsprechenden zukünftigen Deutschen Norm auf die deutsche Sprachfassung zu verzichten und diese in der englischsprachigen Fassung zu veröffentlichen.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

Naming and Design Rules for CIM Profiles to XML Schema Mapping**IEC 62361-Part 100****FOREWORD**

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International Standard IEC 62361-100 has been prepared Working Group 19, of IEC technical committee 57: Power system control and associated communications:

This first edition is the first revision of the standard.

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

FDIS	Report on voting
57/XX/FDIS	57/XX/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.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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

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- 82 • reconfirmed,
 - 83 • withdrawn,
 - 84 • replaced by a revised edition, or
 - 85 • amended.
- 86 A bilingual version of this publication may be issued at a later date.
- 87
- 88

INTRODUCTION

89

90 This standard is one of the IEC 62361 series which define standards that may be used by all
91 Working Groups within TC57. These standards address areas of interest that impact multiple
92 standards and provide consistency for implementations.

93 The Part 100 standard describes a mapping from CIM profiles to W3C XML Schemas and defines
94 the rules that CIM XML messages must adhere to.

95 The principle objective of this standard is to facilitate the exchange of information in the form of
96 XML documents whose semantics are defined by the IEC CIM and whose syntax is defined by a
97 W3C XML schema. This will facilitate the integration of all applications that use the XML Schema
98 messages developed by the WGs and implemented independently by different vendors into their
99 systems.

100 The Common Information Model (CIM) specifies the basis for the semantics for message exchanges
101 defined by WG14 and WG16. The profile specifications, which are contained in other parts of the
102 IEC 61968 and IEC 62325 standards, specify the content of the messages exchanged.

103 The International Electrotechnical Commission (IEC) draws attention to the fact that it is claimed
104 that compliance with this document may involve the use of a patent concerning a computer-based
105 implementation of an object-oriented power system model in a relational database. As such, it does
106 not conflict with the development of any logical power system model including the Common
107 Information Model (CIM), where implementation of the model is not defined.

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122 ISO (www.iso.org/patents) and IEC (http://www.iec.ch/tctools/patent_decl.htm) maintain on-line data
123 bases of patents relevant to their standards. Users are encouraged to consult the data bases for the
124 most up to date information concerning patents.

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Naming and Design Rules for CIM Profiles to XML Schema Mapping

IEC 62361-Part 100

1 Scope

This document describes a mapping from CIM profiles to W3C XML Schemas.

The purpose of this mapping is to facilitate the exchange of information in the form of XML documents whose semantics are defined by the IEC CIM and whose syntax is defined by a W3C XML schema.

2 System Context

The mapping is applied at design time to map a contextual model or CIM profile to a W3C XML Schema.

The concept of a contextual model is borrowed from the UN/CEFACT modelling approach and is commonly used in CIM standards formation. When applied to the CIM, a contextual model is sometimes referred to as a CIM profile or, more simply, a profile.

The formal definition of a CIM profile is not defined in this document but is defined in the WG19 roadmap. However this document does provide an informal definition: a CIM profile is a restricted subset of CIM artefacts, and is the standard against which an instance model can be tested.

In this mapping, a profile defines the semantics of a single type of message that will be encoded in XML.

The CIM may be augmented with project or application-specific extensions. In that case, the references to the CIM in the foregoing can be read as *CIM with extensions*.

The mapping determines:

- A single, standalone XML schema for a given contextual model.
- Indirectly, the syntax of the instance XML documents to be exchanged.
- The relationship between definitions in the XML schema and definitions in the contextual model.
- Indirectly, the relationship between elements in the XML documents exchanged and the definitions in the CIM.

Note that:

- Both the contextual model and its mapped XML Schema are design artefacts and are not necessarily required at the time instance XML documents are exchanged.
- There is, in general, more than one XML Schema that expresses the same syntax. All of these are equivalent from an interoperability perspective. However some forms of XML schema may be preferred over others purely from the perspective of design tools.
- The method used to exchange instance XML documents is not specified.
- The syntax or semantics of any envelope or headers that may be added to the instance documents when they are exchanged is not specified.

3 References

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

181 **3.1 Normative References**

- 182 1. IEC 60050 series, *International Electrotechnical Vocabulary*
- 183 2. IEC 61968 Part 11, *System Interfaces for Distribution Management: Common Information*
- 184 *Model Extensions for Distribution*
- 185 3. IEC 61970-301, *Energy Management System Application Program Interface (EMS-API):*
- 186 *Common Information Model*
- 187 4. IEC 62325-301, *Framework for Energy Market Communications Common Information Model*
- 188 *(CIM) Extensions for Markets*
- 189 5. Extensible Markup Language (XML) 1.1 (Second Edition) W3C Recommendation 16 August
- 190 2006
- 191 6. Namespaces in XML 1.1 (Second Edition) W3C Recommendation 16 August 2006
- 192 7. XML Schema Part 1: Structures Second Edition W3C Recommendation 28 October 2004
- 193 8. XML Schema Part 2: Datatypes Second Edition W3C Recommendation 28 October 2004
- 194 9. Semantic Annotations for WSDL and XML Schema W3C Recommendation 28 August 2007

195 **3.2 Non-Normative References**

- 196 1. OWL Web Ontology Language Reference W3C Recommendation 10 February 2004
- 197 2. Unified Modelling Language (UML) Specification V2.2, Object Management Group
- 198 3. UN/CEFACT XML Naming and Design Rules Version 3.0 Implementation Verification, 30
- 199 January 2009

200 **4 Notation and Terminology**201 **4.1 Contextual Model Definitions**

202 The mapping definitions apply to a contextual model which could be represented in a number of

203 languages. Two possible representations are given in the appendices.

204 No specific contextual modeling language is assumed by this specification. However, the following

205 concepts are used in this document when referring to the contextual model and are assumed to be

206 capable of expression in whichever language is used.

Contextual Model Concept	Definition
Structured Class	A subset of a plain CIM class with additional restrictions. A structured class may have zero or more object properties, compound properties and simple properties. An instance of a structured class is assumed to have an identity that can be expressed as an mRID. Any subclass of a structured class is also a structured class.
Concrete Class	A structured class that has instances that do not belong to any subclasses.
Abstract Class	A structured class that has no instances except those that belong to its subclasses.

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Contextual Model Concept	Definition
Superclass	Relative to a given class, a more general class whose extent is a superset of the given class.
Subclass	Relative to a given class, a more specific class whose extent is a subset of the given class.
Root Class	A concrete class that may have standalone instances which are not the referent of any object property. A contextual model may assign cardinality bounds to a root class limiting the number of standalone instances that may occur.
Union Class	A subset of a plain CIM superclass defined as a “union” of (some of) its subclasses. Each member of the union is defined as a structured class. Each of these is a subclass of a single, given CIM class. An instance of a union is an instance of one of its constituent structured classes.
Compound Class	A subset of a CIM class defined as “Compound” with additional restrictions. An instance of a compound class is a structured value. It has one or more properties, but it has no identity distinct from the combination of its property values.
Anonymous Class	A concrete or a compound class that is defined as an “anonymous” and will be mapped to an unnamed element. An Anonymous Class must be the referent of some object or compound property.
Simple Property	A subset of a CIM class attribute with additional restrictions. The object of a simple property is a Simple Type, a Basic Type, a Data Type or an Enumeration Class.
Object Property	A subset of a CIM association with additional restrictions and a specific direction from referring class to referent class. The referent of an object property is an instance of a structured class. The restrictions may narrow the referring or referent classes or place bounds on the cardinality of the object property.
By-reference Object Property	A subset of a CIM association, as per object property, defined as “by-reference”. The referent of a by-reference property is either an instance of a structured class or an external instance. An external instance is assumed to exist but is not described in the present message. Pragmatically, a by-reference property is implemented by quoting the referent's identifier (example mRID).

Contextual Model Concept	Definition
Union Object Property	An Object Property defined as “union” or an Object Property whose referent class is a Union Class
Exclusive Property Group	A restriction on a structured class with respects to a group of properties such that only one of the properties may appear in a given instance of the class.
Compound Property	A subset of a CIM class attribute or association whose referent is a class defined as a “Compound”. The Compound class could be an Anonymous one.
Basic Type	A CIM class defined as a “Primitive” (include Integer, Decimal, Boolean, Duration, DateTime, Date, Time, String). A subset of the CIM “Float” class defined as a “Primitive” and marked as “simple precision” or “double precision”. A subset of the CIM “String” class defined as a “Primitive” and marked as “normalized”, “token”, “NMTOKEN”, “Name”, “NCName” and “anyURI”. A basic Type may be used directly in a contextual model without further definition. The value range of each basic type is assumed to be that of the XML Schema Part II Datatype integer, decimal, boolean, duration, datetime, date, time, string, float, double, normalizedString, token, MNTOKEN, Name, NCName and anyURI respectively.
Simple Type	A subset of a CIM class defined as “Primitive” with additional restrictions. As defined above, the value range of such a CIM class is assumed to be one of the XML Schema Part II datatype defined above. The additional constraints narrow this value range by defining one or more facets for that datatype. A simple type instance does not have simple properties or object properties and has no identity distinct from its value. Simple Type could be defined as “Anonymous”
Data Type	A subset of a CIM class defined as “CIMDatatype” with additional restrictions. A Data Type is a class whose instances carry a value and other properties that give meaning to this value. Data Type value and other Data Type properties could be restricted by additional constraints. An instance of a Data Type class is a structured value. It has one or more properties, but it has no identity distinct from the combination of its property values.