European Network of
Transmission System Operators
for Electricity

ASSESSED ELEMENT PROFILE SPECIFICATION

2021-04-21

SOC APPROVED
VERSION 1.0

Copyright notice:

Copyright © ENTSO-E. All Rights Reserved.

This document and its whole translations may be copied and furnished to others, and derivative works that comment on or otherwise explain it or assist in its implementation may be prepared, copied, published and distributed, in whole or in part, without restriction of any kind, provided that the above copyright notice and this paragraph are included on all such copies and derivative works. However, this document itself may not be modified in any way, except for literal and whole translation into languages other than English and under all circumstances, the copyright notice or references to ENTSO-E may not be removed.

This document and the information contained herein is provided on an "as is" basis.

ENTSO-E DISCLAIMS ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

This document is maintained by the ENTSO-E CIM EG. Comments or remarks are to be provided at cim@entsoe.eu

NOTE CONCERNING WORDING USED IN THIS DOCUMENT

The force of the following words is modified by the requirement level of the document in which they are used.

- SHALL: This word, or the terms “REQUIRED” or “MUST”, means that the definition is an absolute requirement of the specification.
- SHALL NOT: This phrase, or the phrase “MUST NOT”, means that the definition is an absolute prohibition of the specification.
- SHOULD: This word, or the adjective “RECOMMENDED”, means that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course.
- SHOULD NOT: This phrase, or the phrase “NOT RECOMMENDED”, means that there may exist valid reasons in particular circumstances when the particular behaviour is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behaviour described with this label.
- MAY: This word, or the adjective “OPTIONAL”, means that an item is truly optional.

33

Revision History

Version	Release	Date	Paragraph	Comments
1	0	2021-04-21		Approved by SOC.

CONTENTS

Copyright notice:....2
Revision History....3
CONTENTS....4
1 Introduction....6
2 Application profile specification....6
2.1 Version information....6
2.2 Constraints naming convention....6
2.3 Profile constraints....7
2.4 Metadata....9
2.4.1 Constraints....9
2.4.2 Reference metadata....10
3 Detailed Profile Specification....10
3.1 General....10
3.2 (abstract) Terminal root class....12
3.3 (md) FullModel....12
3.4 (md) Model root class....13
3.5 (abstract,CSA) Region root class....16
3.6 (CSA) AssessedElement....16
3.7 (abstract,CSA) SystemOperator root class....17
3.8 (abstract) ConductingEquipment root class....17
3.9 (abstract) IdentifiedObject root class....17
3.10 Boolean primitive....17
3.11 Date primitive....18
3.12 DateTime primitive....18
3.13 (eumd) DateTimeStamp primitive....18
3.14 Duration primitive....18
3.15 (profcim) IRI primitive....18
3.16 String primitive....18
3.17 (profcim) StringFixedLanguage primitive....18
3.18 (profcim) StringIRI primitive....18
3.19 (profcim) URL primitive....19
Annex A (informative): Sample data....20
A.1 General....20
A.2 Header....20
A.3 Assessed element....21

List of figures

Figure 1 – Class diagram AssessedElementProfile::AssessedElementProfile....10
Figure 2 – Class diagram AssessedElementProfile::HeaderAssessedElementProfile....11
Figure 3 – Class diagram AssessedElementProfile::AssessedElementDatatypes....12

List of tables

Table 1 – Attributes of AssessedElementProfile::FullModel 12
Table 2 – Attributes of AssessedElementProfile::Model 13
Table 3 – Attributes of AssessedElementProfile::AssessedElement 16
Table 4 – Association ends of AssessedElementProfile::AssessedElement with other classes 17
Table 5 – Attributes of AssessedElementProfile::IdentifiedObject 17

1 Introduction

The assessed element profile is a profile to exchange a list of assessed elements.

An assessed element is a network element for which the electrical state is evaluated in a regional or cross-regional process and which value is expected to fulfil regional rules function of the operational security limits.[1]

The assessed elements are input data describing the elements that shall be assessed during the security analysis.

These are the elements on which limit violations are potentially detected (scanned assessed elements) and resolved (secured assessed elements) by applying defined and agreed remedial actions. Assessed elements can be a conducting equipment e.g. a line, transformer, breaker, etc or just a terminal i.e. the end of the equipment. In cases where an assessed element is associated with a conducting equipment the whole equipment is scanned meaning limits defined at all sides of the equipment are scanned. In cases where an assessed element is associated with a terminal only the limits defined for this terminal are scanned. In addition, it shall be noted that only elements from an IGM that are designated as assessed elements are scanned. This means that the party performing the analysis will normally not report, optimise or resolve any limit violations for elements that are not designated as assessed elements. This is designed in this way in order to provide more flexibility to the remedial action optimisation engines eventually helping to minimise computational effort and increase performance.

2 Application profile specification

2.1 Version information

The content is generated from UML model file CGMES30v25_501-20v01_HeaderMetaData-10v08_CSA01v35.eap.

This edition is based on the IEC 61970 UML version ‘IEC61970CIM17v40’, dated ‘2020-08-24’.

- Title: Assessed Element Vocabulary
- Keyword: AE
- Description: This vocabulary is describing the aseessed element profile.
- Version IRI: http://entsoe.eu/ns/CIM/AssessedElement-EU/1.0
- Version info: 1.0.0
- Prior version:
- Conforms to: urn:iso:std:iec:61970-600-2:ed-1|urn:iso:std:iec:61970-301:ed-7:amd1|file://iec61970cim17v40_iec61968cim13v13a_iec62325cim03v17a.eap|urn:iso:std:iec:61970-401:draft:ed-1|urn:iso:std:iec:61970-501:draft:ed-2|file://CGMES-30v25_501-20v01.eap
- Identifier: urn:uuid:bbad81b9-8517-41b5-bfd7-ed4ac17b8379

2.2 Constraints naming convention

The naming of the rules shall not be used for machine processing. The rule names are just a string. The naming convention of the constraints is as follows.

“{rule.Type}:{rule.Standard}:{rule.Profile}:{rule.Property}:{rule.Name}”

[1] [SOURCE: 2019 Inter-RSC report, BRS CAS consistency function, 4.1]

where

rule.Type: C – for constraint; R – for requirement

rule.Standard: the number of the standard e.g. 301 for 61970-301, 456 for 61970-456, 13 for 61968-13. 61970-600 specific constraints refer to 600 although they are related to one or combination of the 61970-450 series profiles. For CSA profiles, CSA is used.

rule.Profile: the abbreviation of the profile, e.g. TP for Topology profile. If set to “ALL” the constraint is applicable to all IEC 61970-600 profiles.

rule.Property: for UML classes, the name of the class, for attributes and associations, the name of the class and attribute or association end, e.g. EnergyConsumer, IdentifiedObject.name, etc. If set to “NA” the property is not applicable to a specific UML element.

rule.Name: the name of the rule. It is unique for the same property.

Example: C:600:ALL:IdentifiedObject.name:stringLength

2.3 Profile constraints

This clause defines requirements and constraints that shall be fulfilled by applications that conform to this document.

This document is the master for rules and constraints tagged "CSA". For the sake of self-containment, the list below also includes a copy of the relevant rules from IEC 61970-452, tagged "452".

- C:452:ALL:NA:datatypes

  According to 61970-501, datatypes are not exchanged in the instance data. The UnitMultiplier is 1 in cases none value is specified in the profile.

- R:452:ALL:NA:exchange

  Optional and required attributes and associations must be imported and exported if they are in the model file prior to import.

- R:452:ALL:NA:exchange1

  If an optional attribute does not exist in the imported file, it does not have to be exported in case exactly the same data set is exported, i.e. the tool is not obliged to automatically provide this attribute. If the export is resulting from an action by the user performed after the import, e.g. data processing or model update the export can contain optional attributes.

- R:452:ALL:NA:exchange2

  In most of the profiles the selection of optional and required attributes is made so as to ensure a minimum set of required attributes without which the exchange does not fulfil its basic purpose. Business processes governing different exchanges can require mandatory exchange of certain optional attributes or associations. Optional and required attributes and associations shall therefore be supported by applications which claim conformance with certain functionalities of the IEC 61970-452. This provides flexibility for the business processes to adapt to different business requirements and base the exchanges on IEC 61970-452 compliant applications.

- R:452:ALL:NA:exchange3

  An exporter may, at his or her discretion, produce a serialization containing additional class data described by the CIM Schema but not required by this document provided these data adhere to the conventions established in Clause 5.

- R:452:ALL:NA:exchange4

  From the standpoint of the model import used by a data recipient, the document describes a subset of the CIM that importing software shall be able to interpret in order to import exported models. Data providers are free to exceed the minimum requirements described herein as long as their resulting data files are compliant with the CIM Schema and the conventions established in Clause 5. The document, therefore, describes additional classes and class data that, although not required, exporters will, in all likelihood, choose to include in their data files. The additional classes and data are labelled as required (cardinality 1..1) or as optional (cardinality 0..1) to distinguish them from their required counterparts. Please note, however, that data importers could potentially receive data containing instances of any and all classes described by the CIM Schema.

- R:452:ALL:NA:cardinality

  The cardinality defined in the CIM model shall be followed, unless a more restrictive cardinality is explicitly defined in this document. For instance, the cardinality on the association between VoltageLevel and BaseVoltage indicates that a VoltageLevel shall be associated with one and only one BaseVoltage, but a BaseVoltage can be associated with zero to many VoltageLevels.

- R:452:ALL:NA:associations

  Associations between classes referenced in this document and classes not referenced here are not required regardless of cardinality.

- R:452:ALL:IdentifiedObject.name:rule

  The attribute “name” inherited by many classes from the abstract class IdentifiedObject is not required to be unique. It must be a human readable identifier without additional embedded information that would need to be parsed. The attribute is used for purposes such as User Interface and data exchange debugging. The MRID defined in the data exchange format is the only unique and persistent identifier used for this data exchange. The attribute IdentifiedObject.name is, however, always required for CoreEquipment profile and Short Circuit profile.

- R:452:ALL:IdentifiedObject.description:rule

  The attribute “description” inherited by many classes from the abstract class IdentifiedObject must contain human readable text without additional embedded information that would need to be parsed.

- R:452:ALL:NA:uniqueIdentifier

  All IdentifiedObject-s shall have a persistent and globally unique identifier (Master Resource Identifier - mRID).

- R:452:ALL:NA:unitMultiplier

  For exchange of attributes defined using CIM Data Types (ActivePower, Susceptance, etc.) a unit multiplier of 1 is used if the UnitMultiplier specified in this document is “none”.

- C:452:ALL:IdentifiedObject.name:stringLength

  The string IdentifiedObject.name has a maximum of 128 characters.

- C:452:ALL:IdentifiedObject.description:stringLength

  The string IdentifiedObject.description is maximum 256 characters.

- C:452:ALL:NA:float

  An attribute that is defined as float (e.g. has a type Float or a type which is a Datatype with .value attribute of type Float) shall support ISO/IEC 60559:2020 for floating-point arithmetic using single precision floating point. A single precision float supports 7 significant digits where the significant digits are described as an integer, or a decimal number with 6 decimal digits. Two float values are equal when the significant with 7 digits are identical, e.g. 1234567 is equal 1.234567E6 and so are 1.2345678 and 1.234567E0.

- R:CSA:ALL:Region:reference

  The reference to the Region is normally a reference to the capacity calculation region, which is identified by “Y” EIC code of the capacity calculation region.

- R:CSA:ALL:SystemOperator:reference

  The reference to the System Operator is normally identified by “X” EIC code of TSO.

- R:CSA:AE:AssessedElement:usage

  All elements that need to be scanned for a base case or contingencies shall be explicitly defined. If not specified otherwise in another document, an application that performs contingency analysis will only report violations that occur on an assessed element and will not report any other violations on elements that have operational limits defined, but the object in the equipment is not designated as an AssessedElement. Therefore, the choice which equipment is scanned shall be made considering multiple factors among which the probability of missing potential violations and the performance of the contingency analysis.

- C:CSA:AE:AssessedElement:associations

  An AssessedElement shall be associated with either AssessedElement.ConductingEquipment or AssessedElement.AssessedTerminal.

2.4 Metadata

ENTSO-E agreed to extend the header and metadata definitions by IEC 61970-552 Ed2. This new header definitions rely on W3C recommendations which are used worldwide and are positively recognised by the European Commission. The new definitions of the header mainly use Provenance ontology (PROV-O), Time Ontology and Data Catalog Vocabulary (DCAT). The global new header is included in the metadata and document header specification document.

For this profile, header definitions are embedded directly in the profile. The header and the payload are in principle two different profiles, but they are currently implemented as one profile specification due to limitation in the current standards. With the approval of IEC 61970-501 Ed2 it will be possible to export it as two embedded profiles.

2.4.1 Constraints

The identification of the constraints related to the metadata follows the same convention for naming of the constraints as for profile constraints.

- R:CSA:ALL:wasAttributedTo:usage

The prov:wasAttributedTo should normally be the “X” EIC code of the actor (prov:Agent).

2.4.2 Reference metadata

The header defined for this profile requires availability of a set of reference metadata. For instance, the attribute prov:wasGeneratedBy requires a reference to an activity which produced the model or the related process. The activities are defined as reference metadata and their identifiers are referenced from the header to enable the receiving entity to retrieve the “static” (reference) information that it is not modified frequently. This approach imposes a requirement that both the sending entity and the receiving entity have access to a unique version of the reference metadata. Therefore, each business process shall define which reference metadata is used and where it is located.

3 Detailed Profile Specification

3.1 General

This package contains assessed element profile.

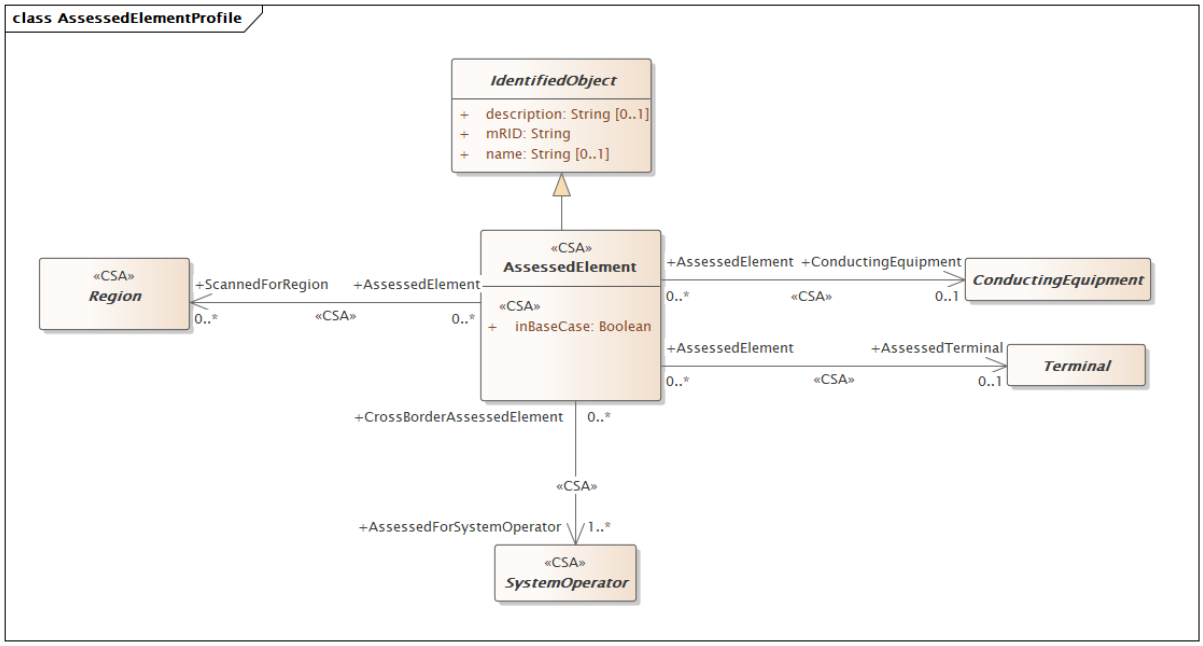

Figure 1 – Class diagram AssessedElementProfile::AssessedElementProfile

Figure 1: The diagram contains the main classes used in the profile.

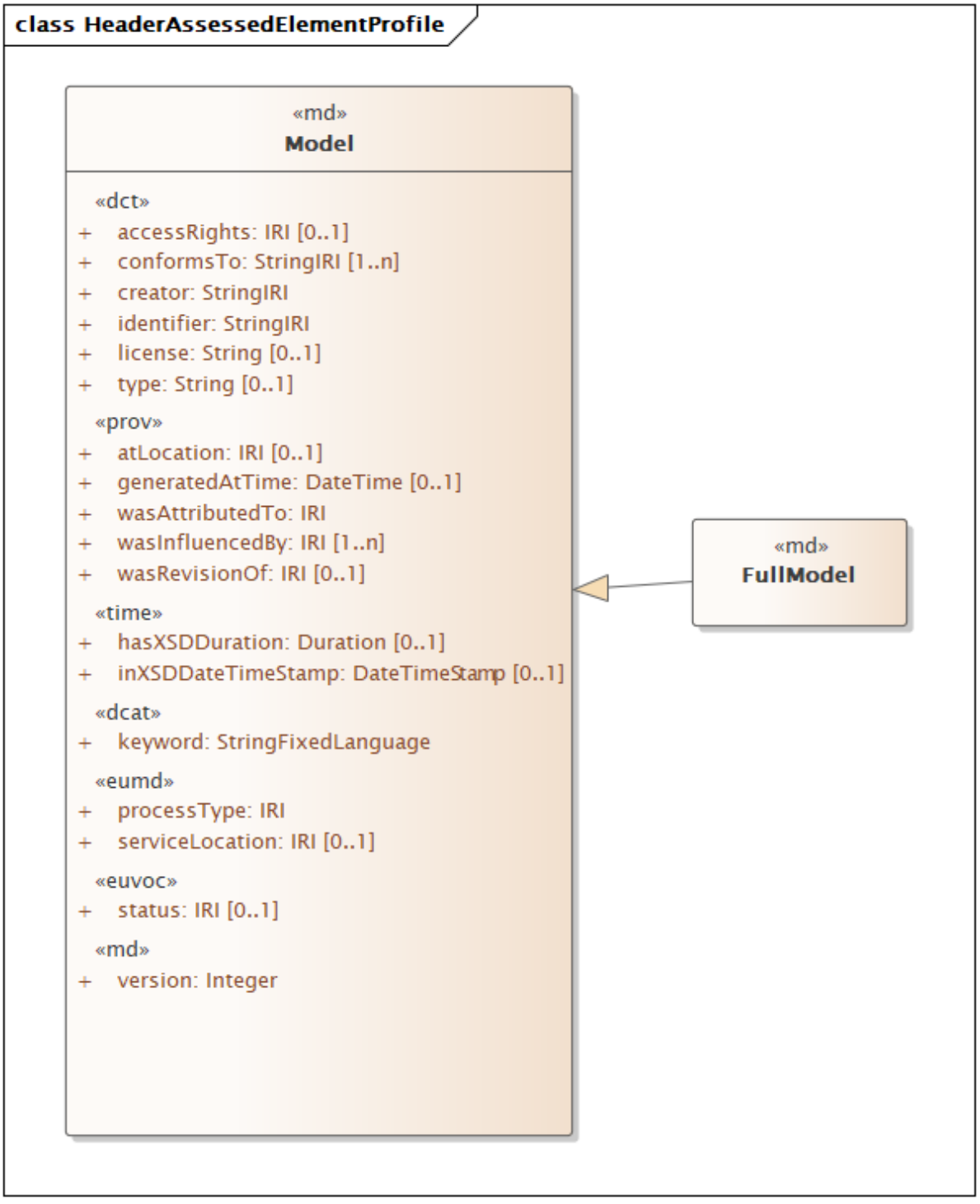

Figure 2 – Class diagram AssessedElementProfile::HeaderAssessedElementProfile

Figure 2: The diagram contains classes related to the header.

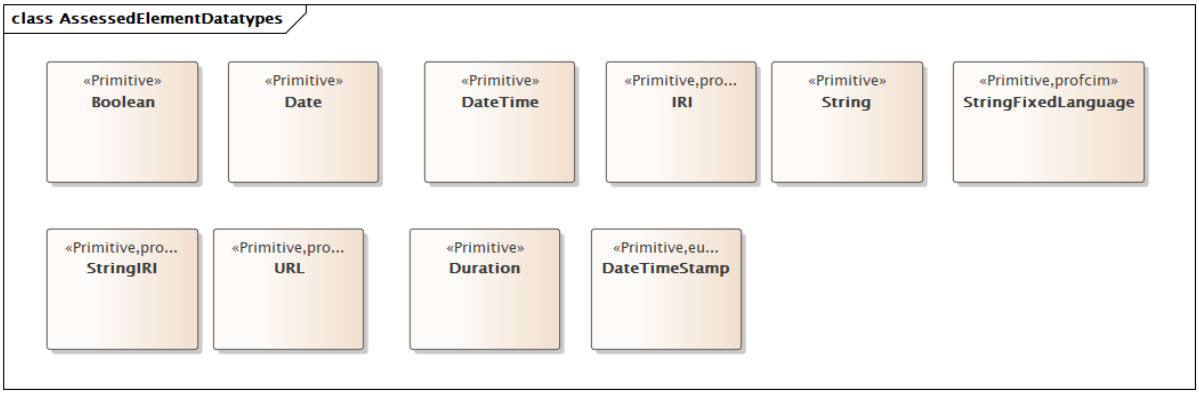

Figure 3 – Class diagram AssessedElementProfile::AssessedElementDatatypes

Figure 3: The diagram shows datatypes that are used by classes in the profile. Stereotypes are used to describe the datatypes. The following stereotypes are defined:
<<enumeration>> A list of permissible constant values.
<<Primitive>> The most basic data types used to compose all other data types.
<<CIMDatatype>> A datatype that contains a value attribute, an optional unit of measure and a unit multiplier. The unit and multiplier may be specified as a static variable initialized to the allowed value.
<<Compound>> A composite of Primitive, enumeration, CIMDatatype or other Compound classes, as long as the Compound classes do not recurse.
For all datatypes both positive and negative values are allowed unless stated otherwise for a particular datatype.

3.2 (abstract) Terminal root class

An AC electrical connection point to a piece of conducting equipment. Terminals are connected at physical connection points called connectivity nodes.

3.3 (md) FullModel

Inheritance path = Model
It represents the full model header and its contents is described by the Model class.
Table 1 shows all attributes of FullModel.

Table 1 – Attributes of AssessedElementProfile::FullModel

name	mult	type	description
version	1..1	Integer	(md) inherited from: Model
status	0..1	IRI	(euvoc) inherited from: Model
keyword	1..1	StringFixedLanguage	(dcat) inherited from: Model
accessRights	0..1	IRI	(dct) inherited from: Model
conformsTo	1..n	StringIRI	(dct) inherited from: Model
identifier	1..1	StringIRI	(dct) inherited from: Model
license	0..1	String	(dct) inherited from: Model
type	0..1	String	(dct) inherited from: Model
generatedAtTime	0..1	DateTime	(prov) inherited from: Model
atLocation	0..1	IRI	(prov) inherited from: Model
wasInfluencedBy	1..n	IRI	(prov) inherited from: Model
wasAttributedTo	1..1	IRI	(prov) inherited from: Model
wasRevisionOf	0..1	IRI	(prov) inherited from: Model

name	mult	type	description
inXSDDateTimeStamp	0..1	DateTimeStamp	(time) inherited from: Model
hasXSDDuration	0..1	Duration	(time) inherited from: Model
processType	1..1	IRI	(eumd) inherited from: Model
creator	1..1	StringIRI	(dct) inherited from: Model
serviceLocation	0..1	IRI	(eumd) inherited from: Model

3.4 (md) Model root class

A Model is a collection of data describing instances, objects or entities, real or computed. In the context of CIM the semantics of the data is defined by profiles. Hence a model can contain equipment data, power flow initial values, power flow results etc.
The Model class describes the header content that is the same for the FullModel and the DifferenceModel. A Model is identified by an rdf:about attribute. The rdf:about attribute uniquely describes the model data and not the CIMXML document. A new rdf:about identification is generated for created documents only when the model data has changed. A repeated creation of documents from unchanged model data shall have the same rdf:about identification as previous document generated from the same model data.
Table 2 shows all attributes of Model.

Table 2 – Attributes of AssessedElementProfile::Model

name	mult	type	description
version	1..1	Integer	(md) The version of the model. If the instance file is imported and exported with no change, the version number is kept the same. The version changes only if the content of the file changes. It is the same logic as for the header id. The version is the human readable id. [CIM context: It relates to the version of the document and not the version of the model which is serialized.].
status	0..1	IRI	(euvoc) Indicates the status of a skos:Concept or a skosxl:Label, or any resource related to controlled vocabulary management. [CIM context: The condition or position of an object with regard to its standing. (Validated, Primary, Backup etc.)].
keyword	1..1	StringFixedLanguage	(dcat) A keyword or tag describing a resource. [CIM context: The intended content type of the model, usually the profile keyword. Used to identify what profiles and content is expected in the document, e.g., Equipment, Boundary, SSH, AE, etc. The same keyword is used for different versions of same profile. It can be also used to identify different content based on the same profile. For instance, as the equipment profile can be used for both boundary data and equipment not related to boundary, the keyword is different to indicate that boundary data is exchanged. In order to avoid ambiguity the property is not exchanged in cases where the document contains multiple profiles referenced by dct:conformsTo.].
accessRights	0..1	IRI	(dct) Information about who access the resource or an indication of its security status.Access

name	mult	type	description
			Rights may include information regarding access or restrictions based on privacy, security, or other policies. [CIM context: Reference to the confidentiality level that shall be applied when handling this model.].
conformsTo	1..n	StringIRI	(dct) An established standard to which the described resource conforms. [CIM context: An IRI describing the profile that governs this model. It uniquely identifies the profile and its version. Multiple instances of the property describe all standards or specifications to which the model and the document representing this model conform to. A document would normally conform to profile definitions, the constraints that relate to the profile and/or the set of business specific constrains. A reference to a machine- readable constraints or specification indicates that the document was tested against these constraints and it conforms to them.].
identifier	1..1	StringIRI	(dct) An unambiguous reference to the resource within a given context. Recommended practice is to identify the resource by means of a string conforming to an identification system. Examples include International Standard Book Number (ISBN), Digital Object Identifier (DOI), and Uniform Resource Name (URN). Persistent identifiers should be provided as HTTP URIs. [CIM context: A unique identifier of the model which is serialised in the document where the header is located. The identifier is persistent for a given version of the model and shall change when the model changes. If a model is serialized as complete (full) model or as difference model exchange the identifier shall be the same. The identifier shall not be used as an identifier of the document which can be different for a given version of a model.].
license	0..1	String	(dct) A legal document giving official permission to do something with the resource. Recommended practice is to identify the license document with a URI. If this is not possible or feasible, a literal value that identifies the license may be provided. [CIM context: Reference to the license under which the data is made available. If no license holder is defined, then the original data provider holds the license.].
type	0..1	String	(dct) The nature or genre of the resource. Recommended practice is to use a controlled vocabulary such as the DCMI Type Vocabulary [DCMI-TYPE]. To describe the file format, physical medium, or dimensions of the resource, use the property Format.
generatedAtTime	0..1	DateTime	(prov) Generation is the completion of production of a new entity by an activity. This entity did not exist before generation and becomes available for usage after this generation. [CIM context:

name	mult	type	description
			The date and time when the model was serialized in the document where the header is located. The format is an extended format according to the ISO 8601-2005. European exchanges shall refer to UTC.].
atLocation	0..1	IRI	(prov) A location can be an identifiable geographic place (ISO 19112), but it can also be a non-geographic place such as a directory, row, or column. As such, there are numerous ways in which location can be expressed, such as by a coordinate, address, landmark, and so forth. [CIM context: Reference to a region or a domain for which this model is provided.].
wasInfluencedBy	1..n	IRI	(prov) Influence is the capacity of an entity, activity, or agent to have an effect on the character, development, or behavior of another by means of usage, start, end, generation, invalidation, communication, derivation, attribution, association, or delegation. [CIM context: A reference to the model on which the model serialised in this document depends on. The references are maintained by the producer of the model. Minimum requirements for the dependency are specified and can be restricted within a business process as long as they do not contradict requirements by standards. For instance, IEC 61970-600-1 defines minimum requirements for the profiles defined in that standard.].
wasAttributedTo	1..1	IRI	(prov) Attribution is the ascribing of an entity to an agent. [CIM context: Reference to the agent (or service provider) from which the model originates.].
wasRevisionOf	0..1	IRI	(prov) A revision is a derivation for which the resulting entity is a revised version of some original. The implication here is that the resulting entity contains substantial content from the original. Revision is a particular case of derivation. [CIM context: When a model is updated the resulting model supersedes the models that were used as basis for the update. Hence this is a reference to the model which are superseded by this model. A model can supersede 1 or more models, e.g. a difference model or a full model supersede multiple models (difference or full). In this case, multiple properties are included in the header. The referenced document(s) is (are) identified by the URN/MRID/UUID in the FullModel rdf:about attribute when full model(s) is (are) referenced and by the URN/MRID/UUID in the DifferenceModel rdf:about attribute when difference model(s) is (are) referenced.].
inXSDDateTimeStamp	0..1	DateTimeStamp	(time) Position of an instant, expressed using xsd:dateTimeStamp, in which the time-zone field is mandatory. [CIM context: The date and time that this model represents, i.e. for which the model is (or was) valid. If used

name	mult	type	description
			in relation with hasXSDDuration it indicates the beginning of the validity period. It is indicating either an instant (in cases where the model is only valid for a point in time) or the start time of a period. If not provided the model is considered valid for any time stamp. The format is an extended format according to the ISO 8601-2005. European exchanges shall refer to UTC.].
hasXSDDuration	0..1	Duration	(time) Extent of a temporal entity, expressed using xsd:duration. [CIM context: The duration of the validity period of the model that it is serialized in the document where the header is located. It is only used in relation to the inXSDDateTimeStamp property which indicates the beginning of the validity period of the model. The end of the validity period is derived from both inXSDDateTimeStamp and hasXSDDuration.].
processType	1..1	IRI	(eumd) The exact business nature. Reference to Business Process configurations.
creator	1..1	StringIRI	(dct) An entity responsible for making the resource. Recommended practice is to identify the creator with a URI. If this is not possible or feasible, a literal value that identifies the creator may be provided. [CIM context: The name of the agent (Modeling Authority) from which the model originates].
serviceLocation	0..1	IRI	(eumd) Reference to a service location (region or a domain).

3.5 (abstract,CSA) Region root class

A region where the system operator belongs to.

3.6 (CSA) AssessedElement

Inheritance path = IdentifiedObject

Assessed element is a network element for which the electrical state is evaluated in the regional or cross-regional process and which value is expected to fulfil regional rules function of the operational security limits.

The information of the validity period of the assessed element is derived from the conducting equipment.

The measurements and limits are as defined in the steady state hypothesis.

Table 3 shows all attributes of AssessedElement.

Table 3 – Attributes of AssessedElementProfile::AssessedElement

name	mult	type	description
inBaseCase	1..1	Boolean	(CSA) Indicates if the assessed element is scanned in the base case. True means that the assessed element is scanned in the base case. False means it is not scanned in the base case. In case of false the association AssessedElement.Contingency is required.
description	0..1	String	inherited from: IdentifiedObject
mRID	1..1	String	inherited from: IdentifiedObject

name	mult	type	description
name	0..1	String	inherited from: IdentifiedObject

Table 4 shows all association ends of AssessedElement with other classes.

Table 4 – Association ends of AssessedElementProfile::AssessedElement with other classes

mult from	name	mult to	type	description
0..*	AssessedTerminal	0..1	Terminal	(CSA) The terminal that is assessed.
0..*	ConductingEquipment	0..1	ConductingEquipment	(CSA) The conducting equipment that is designated as an assessed element, i.e. the equipment that is assessed.
0..*	AssessedForSystemOperator	1..*	SystemOperator	(CSA) All system operators for which this cross border assessed element is assessed.
0..*	ScannedForRegion	0..*	Region	(CSA) This is the region in which this assessed element is scanned.

3.7 (abstract,CSA) SystemOperator root class

System operator.

3.8 (abstract) ConductingEquipment root class

The parts of the AC power system that are designed to carry current or that are conductively connected through terminals.

3.9 (abstract) IdentifiedObject root class

This is a root class to provide common identification for all classes needing identification and naming attributes.
Table 5 shows all attributes of IdentifiedObject.

Table 5 – Attributes of AssessedElementProfile::IdentifiedObject

name	mult	type	description
description	0..1	String	The description is a free human readable text describing or naming the object. It may be non unique and may not correlate to a naming hierarchy.
mRID	1..1	String	Master resource identifier issued by a model authority. The mRID is unique within an exchange context. Global uniqueness is easily achieved by using a UUID, as specified in RFC 4122, for the mRID. The use of UUID is strongly recommended. For CIMXML data files in RDF syntax conforming to IEC 61970-552, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements.
name	0..1	String	The name is any free human readable and possibly non unique text naming the object.

3.10 Boolean primitive

A type with the value space "true" and "false".

3.11 Date primitive

Date as "yyyy-mm-dd", which conforms with ISO 8601. UTC time zone is specified as "yyyy-mm-ddZ". A local timezone relative UTC is specified as "yyyy-mm-dd(+/-)hh:mm".

3.12 DateTime primitive

Date and time as "yyyy-mm-ddThh:mm:ss.sss", which conforms with ISO 8601. UTC time zone is specified as "yyyy-mm-ddThh:mm:ss.sssZ". A local timezone relative UTC is specified as "yyyy-mm-ddThh:mm:ss.sss-hh:mm". The second component (shown here as "ss.sss") could have any number of digits in its fractional part to allow any kind of precision beyond seconds.

3.13 (eumd) DateTimeStamp primitive

Position of an instant, expressed using xsd:dateTimeStamp, in which the time-zone field is mandatory.

3.14 Duration primitive

Duration as "PnYnMnDTnHnMnS" which conforms to ISO 8601, where nY expresses a number of years, nM a number of months, nD a number of days. The letter T separates the date expression from the time expression and, after it, nH identifies a number of hours, nM a number of minutes and nS a number of seconds. The number of seconds could be expressed as a decimal number, but all other numbers are integers.

3.15 (profcim) IRI primitive

An IRI (Internationalized Resource Identifier) within an RDF graph is a Unicode string that conforms to the syntax defined in RFC 3987.
The primitive is serialized as rdf:resource in RDFXML.
IRIs in the RDF abstract syntax must be absolute, and may contain a fragment identifier.
IRI equality: Two IRIs are equal if and only if they are equivalent under Simple String Comparison according to section 5.1 of [RFC3987]. Further normalization must not be performed when comparing IRIs for equality.
IRIs are a generalization of URIs [RFC3986] that permits a wider range of Unicode characters. Every absolute URI and URL is an IRI, but not every IRI is an URI. When IRIs are used in operations that are only defined for URIs, they must first be converted according to the mapping defined in section 3.1 of [RFC3987]. A notable example is retrieval over the HTTP protocol. The mapping involves UTF-8 encoding of non-ASCII characters, %-encoding of octets not allowed in URIs, and Punycode-encoding of domain names.

3.16 String primitive

A string consisting of a sequence of characters. The character encoding is UTF-8. The string length is unspecified and unlimited.

3.17 (profcim) StringFixedLanguage primitive

A string consisting of a sequence of characters. The character encoding is UTF-8. The string length is unspecified and unlimited.
The primitive is serialized as literal without language support.

3.18 (profcim) StringIRI primitive

An IRI (Internationalized Resource Identifier) within an RDF graph is a Unicode string that conforms to the syntax defined in RFC 3987.
The primitive is serialized as literal without language support.
IRIs in the RDF abstract syntax must be absolute, and may contain a fragment identifier.
IRI equality: Two IRIs are equal if and only if they are equivalent under Simple String Comparison according to section 5.1 of [RFC3987]. Further normalization must not be performed when comparing IRIs for equality.
IRIs are a generalization of URIs [RFC3986] that permits a wider range of Unicode characters. Every absolute URI and URL is an IRI, but not every IRI is an URI. When IRIs are used in operations that are only defined for URIs, they must first be converted according to the mapping defined in section 3.1 of [RFC3987]. A notable example is retrieval over the HTTP protocol. The

mapping involves UTF-8 encoding of non-ASCII characters, %-encoding of octets not allowed in URIs, and Punycode-encoding of domain names.

3.19 (profcim) URL primitive

A Uniform Resource Locator (URL), colloquially termed a web address, is a reference to a web resource that specifies its location on a computer network and a mechanism for retrieving it. A URL is a specific type of Uniform Resource Identifier (URI), although many people use the two terms interchangeably.URLs occur most commonly to reference web pages (http), but are also used for file transfer (ftp), email (mailto), database access (JDBC), and many other applications.

Annex A (informative): Sample data

A.1 General

This Annex is designed to illustrate the profile by using fragments of sample data. It is not meant to be a complete set of examples covering all possibilities of using the profile. Defining a complete set of test data is considered a separate activity to be performed for the purpose of setting up interoperability testing and conformity related to this profile.

A.2 Header

```
<!--Header -->
  <md:FullModel rdf:about="urn:uuid:d2630bd5-9578-4fab-9647-13991c692d07"><!-- ID of the Full Model in RDF-->
    <!-- ID of the Full Model in Data Model-->
    <dct:identifier>urn:uuid:d2630bd5-9578-4fab-9647-13991c692d07</dct:identifier> <!--This is an example for mRID of the header -->
    <!-- creation time of the Document  -->
    <prov:generatedAtTime>2021-01-28T17:01:03Z</prov:generatedAtTime>
    <!-- Version of the Document -->
    <md:version>1</md:version>
    <!-- Validity/scenario period / delivery day [Optional]-->
    <time:inXSDDateTimeStamp>2021-11-25T17:00:00Z</time:inXSDDateTimeStamp>
    <time:hasXSDDuration>P1Y</time:hasXSDDuration>
    <!-- Description -->
    <dct:description>This is an example of assessed element</dct:description>
    <!-- Profile, Schema or Specification -->
    <dct:conformsTo>http://entsoe.eu/ns/CIM/AssessedElement-EU/1.0</dct:conformsTo>
    <dct:conformsTo> http://entsoe.eu/ns/CIM/AssessedElement-EU/constraints/1.0</dct:conformsTo> <!--This is an example how to refer to SHACL constraints -->
    <!-- Message Type -->
    <dcat:keyword>PaneModel</dcat:keyword>
    <!-- Model Dependency-->
    <prov:wasInfluencedBy rdf:resource="urn:uuid:f0063d01-1dac-46f0-91a4-2b7479991173" />
    <!—Model revision -->
    <prov:wasRevisionOf rdf:resource="urn:uuid:8341cd19-779b-4a84-bafb-06b8bb56f767" />
    <!-- Modeling Authority -->
    <prov:wasAttributedTo rdf:resource="urn:eic:10X1001A1001A094"/>
    <!-- Modeling Region -->
    <prov:atLocation rdf:resource="urn:eic:10YBE----------2"/>
    <!-- Status -->
```

```
... <euvoc:status rdf:resource="http://entsoe.eu/StatusType#Validated"/>
    <!-- License -->
... <dct:license>http://publications.europa.eu/resource/authority/licence/EUPL_1_2</dct:license>
    <!-- Process Type -->
    <eumd:processType rdf:resource="urn:entsoe.eu:ProcessTypeList#CSA"/>
    <!-- Type -->
....<dct:type>dataset</dct:type>
    <!-- Modelling Authority of the originator of the model -->
    <dct:creator>urn:eic:10X1001A1001A094</dct:creator>
    <!-- Confidentaliaty for Security Plan -->
    <dct:accessRights rdf:resource="http://entsoe.eu/MVS/2016/Confidentialyt/OPDE_Secret"/>
    <!—Service Location -->
.... <eumd:serviceLocation rdf:resource="urn:eic:10Y1001A1001A94A" />
  </md:FullModel>
```

A.3 Assessed element

```
  <csa:AssessedElement rdf:ID="_fd1919e8-b8f9-41d6-870e-785700665e4c">
    <cim:IdentifiedObject.name>AE1</cim:IdentifiedObject.name>
    <cim:IdentifiedObject.mRID>fd1919e8-b8f9-41d6-870e-785700665e4c</cim:IdentifiedObject.mRID>
    <csa:AssessedElement.inBaseCase>true</csa:AssessedElement.inBaseCase>
    <csa:AssessedElement.ConductingEquipment rdf:resource="#_00f5b7fc-e6f4-435d-8826-35abbf388ec7" />
    <csa:AssessedElement.AssessedForSystemOperator rdf:resource="#urn:entsoe.eu:10X1001A1001A094" />
    <csa:AssessedElement.AssessedForSystemOperator rdf:resource #urn:entsoe.eu:10X1001A1001A361" />
    <csa:AssessedElement.ScannedForRegion rdf:resource="#urn:entsoe.eu:10Y1001C--00059P " />
    <csa:AssessedElement.ScannedForRegion rdf:resource="#urn:entsoe.eu:10Y1001C--000239" />
  </csa:AssessedElement>
```