IEC 62361
Interoperability in the long term – Part 102: CIM - 61850
Harmonization
CIM-61850 task force

- Team - experts from WG13, WG14 and WG10
  - Weekly conference call meeting
  - Any contributors welcome
  - Convenor: Laurent Schmitt
  - Model manager: Herb Falk
  - Meeting organiser: Margaret Goodrich
  - Document editor: Tom Berry

- NWIP status
  - IEC 62361-102 validated by WG19 and internationally approved
  - Working Draft in progress

- A shared area is set-up (under CIM User group banner)
  - http://cimug.ucaiug.org/Projects/CIM-61850/default.aspx
Aims

• “Align” the modeling where applicable and to precisely define a “mapping”.

• Step 1: Use case analysis
  – Use cases that link control center applications and substation automation

• Step 2:
  – identify overlap and duplication of CIM and 61850
  – what is missing in 61850 that is required by CIM
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Work in progress

• Trying to determine how best to define a “mapping”
  – English descriptions
  – Informative diagrams and examples
  – Considering QVT for formal description
  – Change proposed where mapping is ambiguous or complex.

• identify overlap of CIM and 61850
  – what is missing in 61850 that is required by CIM
    • “Required” means considering application profiles
    • Attributes for Automation & control is appropriate in both models
    • Some attributes e.g. for analysis, planning, finance is appropriate only for CIM
Use case: CIM configuration from 61850

Priority 1: Mapping transfer from 61850 SCL to CIM

The prefix numbers for each transfer correspond to the step numbers in Section 4.
Started: Substation data

• functional structure of a substation, and to identify the primary devices and their electrical connections. ...

• Includes:
  – Substation, Plant, Lines or other location container name(s)
  – Voltage Level name(s)
  – Bay name(s)
  – Equipment & Sub-equipment names and types
  – Terminals, Connectivity Nodes & associations
  – Functions & Sub-functions
Started: Substation data – Names and IDs

- Name mapping – proposal #1
  - Add MRID to SCL tNaming element

<table>
<thead>
<tr>
<th>SCL Attribute</th>
<th>SCL Description</th>
<th>CIM Mapping</th>
</tr>
</thead>
<tbody>
<tr>
<td>name</td>
<td>identification of each object within its container. Must be unique within the container. Must be unique within the file for top level objects</td>
<td>Name.name where Name is associated with a NameType “SCL”</td>
</tr>
<tr>
<td>desc</td>
<td>user oriented textual designation</td>
<td>IdentifiedObject.name</td>
</tr>
<tr>
<td>&lt;missing&gt;</td>
<td>Master resource identifier issued by a model authority. The mRID is globally unique within an exchange context.</td>
<td>Synthesize mRID as a concatenation of all the names in the containment hierarchy</td>
</tr>
</tbody>
</table>

- Name mapping – proposal #2
  - Add MRID to SCL tNaming element
Started: Measurements, Status, Controls

• IED instances containing Logical Nodes associated with equipment and containing Data Objects Data Attributes that can be mapped to CIM measurements (analogs, digitals, controls, counters)

• Use case sub-step: Select 61850 measurements for CIM applications (ideally automatically)

• Revise CIM Measurement Model (in progress)
  – Classes & attributes for measurement technique, calculation interval etc
Example of proposal to align CIM
Mapping Equipment & Status

class Measurement_Mapping

tPowerSystemResource
tConductingEquipment

- tEquipment
  - tAbstractConductingEquipment
    - tConductingEquipment
      - type

- tNodeContainer
  - LogicalNode
    - LogicalDevice
      - IED

- CIM::RemoteUnit
  - CIM::RemotePoint
    - CIM::RemoteSource
      - CIM::Measurement
        - CIM::DiscreteValue
          - CIM::Discrete

  - CIM::Discrete

  - CIM::Breaker

- CIM::Equipment

- CIM::PowerSystemResource

- CIM::IdentifiedObject
  - mRID : string
    - name : string

SCL Equipment identification
SCL Status, Control and Settings data
CIM Measurement Data
CIM Equipment Identification

DRAFT
Started: Measurement types

- IEC61850 has a large set of data objects = measurement types.
- May need to clarify descriptions if measurements are to be used in CIM application calculations.
- CIM standards may define enumerations for different application profiles.
  - Measurements for State Estimation (similar to IEC 61970-456 Solved Power System State Interface)
  - Measurements for distribution network management (depends on 61850-90-6 Models)
  - Measurements for Asset Health
  - ...

SISCO
To do: Diagram data

- **Graphics for one line diagram**
  - Mapping required between
    - 61850-6 Annex C Extension syntax for drawing layout coordinates
    - 61970-453 CIM based graphic exchange
To do: Communication configuration

- **Communication for Substation to Control Centre**
  - Will build on principles in 61850-90-2
    - CIM SCADA package will be addressed for configuration issues related to using IEC61850 measurement sources
    - Communications network modelling (lines, routers etc) not in current scope but recognized as important for the future
Questions & Contacts

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