IEC 61968-9
An interface for smart devices
What is it for?

- Manage distributed resources
- Remote control your home
- Turn off devices when electricity is costly
- Monitor distributed generation and energy storage
- Optimize energy usage in a large scale site
What is it for?

- Read measurements and states
- Send control commands, setpoints and schedules
- Read trend data
- List available devices (eg. Home, warehouse, solar plant)
IEC standardization

*Notes: 1) Solid colors correlate different parts of protocols within the architecture. 2) Non-solid patterns represent areas that are future work, or work in progress, or related work provided by another IEC TC.
Background

- Using IEC 61968-9: Meter Reading and Control
- Defined in the SGEM by the Kalasatama technical consortium (ABB, Fingrid, Helen, HSV, Mitox)

Lightweight protocol, e.g., KNX, PLC, radio or proprietary

IEC 61968-9
IEC 61968-9 when concerning specific customer loads
IEC 62325 when dealing with aggregated loads
The interfaces we looked into

- OpenADR
  + Simple structure
  - Less Power system modeling

- Enerim
  - Strictly Demand Response oriented
  - SGEM specific

- ETSI GS OSG 001
  +/- Lower level, more communication oriented

- oBIX
  + Links to Building Information Modeling

- CIM
  + Integrated from Transmission networks down to usage points
  + Versatile
  - Broad in scope
What is CIM
What we use

- **IEC 61968-100: Implementation profiles**
  - Defines SOAP interface, eg WSDL
  - Defines envelope structure
- **IEC 61969-9: Interfaces for Meter Reading and Control**
  - Defines profiles, eg XSD
  - Defines message structures for AMR & Home Automation
- **IEC 61968-1: Interface architecture**
  - Defines process for extending standard profiles
### What profiles specifically

<table>
<thead>
<tr>
<th>Profile</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>MeterReadings</td>
<td>Message for transferring measurements</td>
</tr>
<tr>
<td>MeterReadSchedule</td>
<td>Message for defining how often a measurement should be updated</td>
</tr>
<tr>
<td>GetMeterReadings</td>
<td>Message for querying measurements of a specific time</td>
</tr>
<tr>
<td>EndDeviceEvents</td>
<td>Spontaneous events</td>
</tr>
<tr>
<td>EndDeviceControls</td>
<td>Control commands (HA &amp; DR)</td>
</tr>
<tr>
<td>EndDeviceConfigAdvanced</td>
<td>Listing available devices and capabilities</td>
</tr>
</tbody>
</table>
Communication on energy market level

- IEC 62325: Framework for energy market communications
  - Defines energy market communications
  - Supported by ENTSO-E
  - Same CIM model in the background
  - Higher level communication
Miksi ja mihin CIM:ä käytetään?

Käyttöalueita mm.:

• Hajautettujen resurssien mittaus, ohjaus ja hallinta
• Mittausten ja tilatietojen keruu
• Ohjausten ja asetusarvojen lähetys
• Kysyntäjousto
• Kodin valvonta ja kauko-ohjaus
• Jne.

Link to Cleen: http://www.cleen.fi/en/
Link to Cleen SGEM: (http://www.sgemfinalreport.fi)
Link to IEC 61969-9: Interfaces for Meter Reading and Control
KNX is a worldwide standard for home and building control

- **CENELEC**
  *EN 50090* – the European Standard for Home and Building Electronic Systems (HBES).

- **CEN**
  *EN 13321-1* – the European Standard for Building Automation.

- **ISO / IEC**

- **GB/Z**
  *GB/Z 20965* – Chinese Standard für Home and Building Control.

- **US Standard**
  *ANSI/ASHRAE 135*
KNX is a worldwide standard for home and building control.

- KNX.org www.pages
- KNX Fi sivut
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