Why ETSI M2M

- Provide an M2M architecture with a generic set of capabilities for M2M services
- Provide a framework for developing services independently of the underlying network
- Facilitate deployment of vertical applications
- Facilitate innovation across industries by exposing data and information and providing services.
ETSI M2M architecture

- ETSI M2M adopted a RESTful architecture style
  - Information is represented by resources which are structured as a tree
- ETSI M2M standardizes the resource structure that resides on an M2M Service Capability Layer (SCL)
  - Each SCL contains a resource structure where the information is kept
- M2M Application and/or M2M Service Capability Layer exchange information by means of these resources over the defined reference points
- ETSI M2M standardizes the procedure for handling the resources
Features offered by ETSI M2M

- Identification of the M2M Application and the M2M Devices
- Asynchronous and synchronous communication
- Store and forward mechanism based on policies for optimising the communication
- Location information
- Device management based both on OMA DM (wireless) and BBF TR-69 (wireline)
- Mutual authentication between Network Service Capability Layer and Device/Gateway Service Capability Layer that are connected
- Secure channel for transporting data over mId reference point
- And much more ....
R1 provides standardized security mechanism for the reference point *mld*

The device/gateway needs to have keys for securing the connection.

The device/gateway is provisioned with the key M2M Root Key.

The high level procedure are to

- Perform mutual *mld* end point authentication
- Perform M2M Connection Key agreement
- Optionally establish a secure session over *mld*.
- Perform RESTful procedures over the *mld*
Example: Connected home

- Wireless or Wired Networks
- M2M Gateway (GSCL)
- M2M Network (NSCL)
- M2M Devices with Device Application (DA)
- Network Application (NA)
High level deployment

M2M Device & Gateway Domain

- Heating
  - Heating App
- Washing-machine
  - Washing App

M2M Gateway

WIDE AREA NETWORK

- WIRELESS
- MOBILE
- FIXED
- .. OTHER

Example NSCL

mld

mld

SmartHome App
Flow of events

M2M Device & Gateway Domain

- Heating
  - Heating App
- Washing-machine
  - Washing App

M2M Network Domain

- WIDE AREA NETWORK
  - WIRELESS
  - MOBILE
  - FIXED
  - .. OTHER

Example NSCL

SmartHome App

Configure & provision

Register

Configure & provision

Register

myGSCL

M2M Gateway

wifi

Register
Network Application registration

The Network Application registers to the NSCL

- Name of the NSCL = exampleNSCL
- Network application register with the ID = SmartHome-ID
The gateway (GSCL) registers to the NSCL
- Name of the NSCL = exampleNSCL
- Name of the GSCL = myHomeGSCL

Before registration the GSCL and NSCL are authenticated by means of the M2M Communication procedures
As a result of the gateway registration a resource representing the NSCL is created in the GSCL.
The device Applications register to the GSCL

- Name of GSCL = myHomeGSCL
- Device application heating register with the ID = Heating-App-ID
- Device application washing-mashing register with the ID = Washing-App-ID
What’s next

Appropriate access rights needs to be set up.

• For example the network application that knows the GSCL and the applications is setting up the accessRights

information can now be transferred over the mId.
Store information

The information from the 2 device applications are stored in the containers in the NSCL:

- exampleNSCL
  - scls
  - myHomeGSCL
    - containers
      - heaterInfo
      - washingInfo
        - contentInstances
        - subscriptions
Flow of events: add & read data

M2M Device & Gateway Domain

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  - Heating App
- Washing-machine
  - Washing App

M2M Network Domain

- M2M Gateway
  - myHome GSCL

Example NSCL

SmartHome App

Flow of events:
- add
- read
Flow of events: subscribe & notify

**M2M Device & Gateway Domain**

- Heating
  - Heating App
- Washing-machine
  - Washing App

**M2M Network Domain**

- M2M Gateway
- myHome GSCL

Example NSCL

- subscribe
- notify

SmartHome App

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A new Network Application would like to reuse some of the data produced?

- For example the device manufacturer that controls the performance and status of the device
- The utility company that monitors the levels of utilization for each appliances
- ....

All you need to do is to develop the Network Application and

- Ask the “owner” of the information to give you read permission by updating the access right
- Retrieve the information and consume it
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