Overview of ETSI TC M2M Activities

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M2M in the context of IoT

- Smart Energy
- Smart Health
- Smart Consumer
- Smart Transport
- Smart City

Enablers:
- RFID
- NFC
- Radio Access
- Mobile Access
- Fixed Access
- Fixed Transport
- Mobile Transport

= enabler
M2M Applications

- Buildings
  - Home
  - Office
- Production
- Healthcare
- Security
- Energy
- Retail
- Transport
- Home / Hospital
- Mobile
- Generation
- Distribution
- On/Off Road Vehicles
- Supply Chain
- E – Health
- Assisted Living
- Smart Meters, Smart Grid / green Energy
- Intelligent Transport Systems/E-Vehicles/Goods Tracking
- Electronic Monitoring / Military Use
- Goods Tracking / Supply chain Automation
- Production line management, Quality control
- Crime / Terrorism
- Desaster / Emergency
- Stores
- Tourism
- Automation
- Quality control
- Home / Office Automation,
- E – Health / Assisted Living
- Smart Meters, Smart Grid / green Energy
- Intelligent Transport Systems/E-Vehicles/Goods Tracking
Introduction to TC M2M

Scope of TC M2M

- to develop and maintain an end-to-end overall telecommunication high level architecture for M2M
- to identify gaps where existing standards and provide specifications to fill these gaps

Some figures

- Established in Jan 2009, after 8 months of preparation in the ETSI Board
- 8 plenary meetings per year plus numerous ad-hoc meetings
- 3-5 conference calls per week
- Constantly Growing number of documents per meeting (200+)
- Constantly growing plenary participation (70+)
- Growing membership in M2M email list (400+)
- Active delegates from Europe, North America, China, Korea, and Japan and currently about 30% Operators, 60% Manufacturers and 10% others

Open approach

- TC M2M has initiated active liaisons and cooperation with many other SDOs and consortia.
- Published and draft TR/TS are available on the public side of the ETSI server http://docbox.etsi.org/M2M/Open/
Chairman: Enrico Scarrone – Telecom Italia  
Vice Chairmen: Marylin Arndt – France Telecom  
Omar Elloumi – Alcatel Lucent  
Joachim Koss – Cinterion  
Technical Officer: David Boswarthick – ETSI

TC M2M PLENARY

WG1  
Use Cases & Requirements  
Patricia Maritigne  
France Telecom

WG2  
Architecture & Network Interworking  
Paul Russel  
Interdigital

WG3  
Protocols & Interfaces  
Raymond Forbes  
Ericsson

WG4  
Security Aspects  
Francois Ennesser  
Gemalto

WG5  
Management Aspects  
Yongjing Zhang  
Huawei
M2M activities for EU Mandates

EC’s M/411 Smart Metering Mandate:
- EC Mandate issued in March 2009 by DG TREN and sent to the 3 ESO's: CEN, CENELEC, and ETSI
- Objective: to build standards for European smart meters, allowing interoperability and consumer actual consumption awareness

EC’s M/490 Smart Grid Mandate:
- EC Mandate issued in March 2011 by DG TREN and sent to the 3 ESO's: CEN, CENELEC, and ETSI
- Objective: to build standards for European Smart Grids.

ETSI TC M2M is coordinating work inside ETSI and contributing to the mandates M/411 and M/490.
The ETSI M2M Vision

- Horizontal Multi-Service Platform
- Existing Standards Re-use and integration
- Multi – Application
- End to End
- Technology Independent
- M2M Service Capabilities, Resource Based
M2M is inverting the pipes

Pipe (vertical): 1 Application, 1 NW, 1 (or few) type of Device

Horizontal (based on common Layer) Applications share common infrastructure, environments and network elements

M2M Applications providers run individual M2M services. Customer is Device owner

M2M Service provider hosts several M2M Applications on his Platform

Transport Network operator(s) Customer is the M2M service provider

End user owns / operates the Device or Gateway
Value of a standardized horizontal M2M service layer

- Reduces investment barriers to new markets
- Simplifies M2M for users and App developers
- Faster time for new M2M services to markets
- Interoperable solutions push cost down
- Reduced complexity, Standard APIs and protocols, Scalable horizontal solution, Reduced initial investment costs.
- Better network efficiency
- Same service layer for many verticals, Network independent, use best networks for deployment needs.
- Simplicity of deployment, Allows to trail new services, Less expensive to roll out than dedicated solution.
- Standard interfaces, protocols opens vendor ecosystem, Reduces solution cost and improves interoperability.
- Hiding the complexity of underlying networks to Applications developers, foster innovation of new services.
Simple M2M Architecture

- M2M Application
- M2M Gateway
- Client Application
- M2M Application Domain
- Service Capabilities
- M2M Core
- M2M Area Network
- M2M Gateway
- M2M Device Domain
- Application Domain
- Network Domain
... based on existing Technologies

Core Networks
- 3GPP (GPRS, EPC)
- ETSI TISPAN
- ATTM
- NGN

M2M Area Networks
- PLC
- SRD
- UWB
- ZigBee
- M-BUS
- Wireless M-BUS
- IEEE 802.15

Access Networks
- xDSL
- Hybrid FiberCoax
- PLC
- Satellite
- GERAN, UTRAN, eUTRAN
- WLAN
- SRDs
- UWB
- WiMAX

Smart Energy
Smart User
Smart Health
Smart Transport

Application Domain
Network Domain
M2M Device Domain
M2M – High Level Architecture

M2M Device & Gateway Domain

- M2M Device
  - M2M Application (DA)
  - Proprietary M2M Device

- M2M Gateway
  - M2M Service Capability (DSCL)
  - M2M Service Capability (GSCL)

REFERENCE POINTS

M2M Network Domain

- M2M Application
- M2M Application
- M2M Application

WIDE AREA NETWORK

- WIRELESS
- MOBILE
- FIXED
- .. OTHER

M2M Service Capabilities Layer (M2M NSCL)
ETSI M2M has 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 optimizing 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 \textit{mId}

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 \textit{mId} end point authentication
- Perform M2M Connection Key agreement
- Optionally establish a secure session over \textit{mId}.
- Perform RESTful procedures over the \textit{mId}
Completed the first release of M2M specifications which addresses urgent market needs and provides an end-to-end architecture to support multiple M2M-type applications.

ETSI M2M Release 1 core standards are published as a set of three specifications which are available for download from the ETSI website:

- Requirements in ETSI TS 102 689
- Functional architecture in ETSI TS 102 690
- Interface descriptions in ETSI TS 102 921

ETSI M2M had also created a series of highly popular technical workshops. The 2011 edition held last October saw over 240 participants and live demonstrations of real life implementations of ETSI M2M specifications.

http://cftvideo.com/etsi/m2mdemos/
TC M2M future activities

- TC M2M have started work on M2M Release 2, and already set priorities;
- Potential aspects under consideration for M2M Rel-2 are:
  - charging, data models and semantics, security extensions, the standardised use of operators’ network interfaces, multi-operator service platforms, service discovery, Area Network Management and service interworking profiles.
- ETSI TC M2M are discussing with several SDOs and standardization groups on setting up the oneM2M initiative (planned for summer 2012)
- The objective is to have the M2M release 2 completed by the start of technical activities in the oneM2M partnership project.
- ETSI is planning a major M2M workshop in October 2012, with much wider scope than previous years as well as testing / demos and extended discussion with our standards partners.
ETSIM2M Specifications Work

Use Cases [Stage 0]

- TR 102 691 Smart Metering
- TR 102 732 eHealth
- TR 102 857 Connected consumer
- TR 102 898 Automotive
- TR 102 897 City automation

Stage 1
- TS 102 689 M2M Service Requirements

Stage 2
- TS 102 690 M2M Functional Architecture
- TR 102 699 M2M Definitions
- TR 102 725 Re-use of 3GPP nodes by M2MSC layer

Stage 3
- TS 102 921 M2M Communications; mla, dla and mld interfaces
- TR 101 531 Re-use of 3GPP nodes by M2MSC layer
- TS 101 405 BBF TR-069 compatible Management Objects
- TR 101 584 Semantic support for M2M Data
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