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TECHNICAL SPECIFICATION

**oneM2M Requirements
(oneM2M TS-0002 version 2.7.1 Release 2)**

Reference

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Foreword

This Technical Specification (TS) has been produced by ETSI Partnership Project oneM2M (oneM2M).

1 Scope

The present document contains an informative functional role model and normative technical requirements for oneM2M.

2 References

2.1 Normative references

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the referenced document (including any amendments) applies.

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The following referenced documents are necessary for the application of the present document.

[1] ETSI TS 122 368: "Digital cellular telecommunications system (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); LTE; Service requirements for Machine-Type Communications (MTC); Stage 1 (3GPP TS 22.368)".

2.2 Informative references

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The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

[i.1] oneM2M Drafting Rules.

NOTE: Available at http://member.onem2m.org/Static_pages/Others/Rules_Pages/oneM2M-Drafting-Rules-V1_0.doc.

[i.2] ETSI TS 118 111: "oneM2M; Common Terminology (oneM2M TS-0011)".

[i.3] ETSI TR 118 508: "Analysis of Security Solutions for the oneM2M System".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in ETSI TS 118 111 [i.2] apply.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AE	Application Entity
API	Application Program Interface
BBF	BroadBand Forum
CHA	Continua Health Alliance
CPU	Central Processing Unit
DM	Device Management
GBA	Generic Bootstrapping Architecture
GSMA	Global System for Mobile Communications Association
GW	Gateway
HGI	Home Gateway Initiative
HSM	Hardware Security Module
IP	Internet Protocol
MTC	Machine Type Communications
OMA	Open Mobile Alliance
OSR	Overall System Requirements
OWL	Web Ontology Language
QoS	Quality of Service
RDF	Resource Description Framework
SMS	Short Message Service
UICC	Universal Integrated Circuit Card
USIM	UMTS Subscriber Identity Module
USSD	Unstructured Supplementary Service Data
WAN	Wide Area Network
WLAN	Wireless Local Area Network

4 Conventions

The keywords "shall", "shall not", "should", "should not", "may", "need not" in the present document are to be interpreted as described in the oneM2M Drafting Rules [i.1].

NOTE: According to oneM2M Drafting Rules [i.1] in order to mandate a feature in the oneM2M System but allow freedom to the individual deployment whether to use it or not subsequently requirements are often formulated like:

- ▪ "The oneM2M System shall **support a mechanism** [function, capability...] **to** …"; or

- ▪ "…shall **be able to** …".

This does not mandate usage of the required feature in a M2M Solution.

5　Introduction to the M2M ecosystem

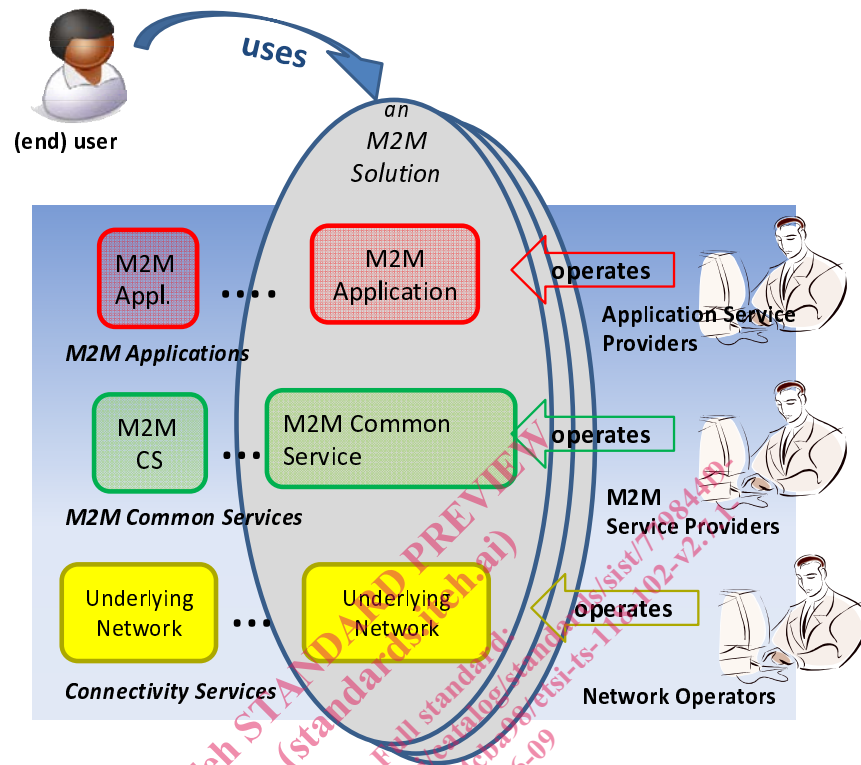## 5.1　Functional roles description

Figure 1: Functional Roles in the M2M Ecosystem

1) The *User* (individual or company – aka: end-user) fulfils all of the following criteria:

   - Uses an M2M solution.

2) The *Application Service Provider* fulfils all of the following criteria:

   - Provides an M2M Application Service.

   - Operates M2M Applications.

3) The *M2M Service Provider* fulfils all of the following criteria:

   - Provides M2M Services to Application Service Providers.

   - Operates M2M Common Services.

4) The *Network Operator* fulfils all of the following criteria:

   - Provides *Connectivity* and related services for *M2M Service Providers.*

   - Operates an *Underlying Network*. Such an Underlying Network could e.g. be a telecom network.

Any of the above functional roles may coincide with any of the other roles. These functional roles do not imply business roles or architectural assumptions.

6   Functional Requirements

6.1   Overall System Requirements

Table 1: Overall System Requirements

Requirement ID	Description	Release
OSR-001	The oneM2M System shall allow communication between M2M Applications by using multiple communication means based on IP access.	Implemented in Rel-1
OSR-002a	The oneM2M System shall support communication means that can accommodate devices with constrained computing (e.g. small CPU, memory, battery) or communication capabilities (e.g. 2G wireless modem, certain WLAN node).	Implemented in Rel-1
OSR-002b	The oneM2M System shall support communication means that can accommodate devices with rich computing capabilities (e.g. large CPU, memory) or communication (e.g. 3/4G wireless modem, wireline).	Implemented in Rel-1
OSR-003 See REQ-2015-0626R01	The oneM2M System shall support the ability to maintain application-to-application communication in coordination with an application session for those M2M Applications that require it.	Not implemented
OSR-004	The oneM2M System shall support session-less application communications for those M2M Applications that require it.	Implemented in Rel-1
OSR-005	The oneM2M System shall be able to expose the services offered by telecommunications networks to M2M Applications (e.g. SMS, USSD, localization, subscription configuration, authentication (e.g. Generic Bootstrapping Architecture), etc.), subject to restriction based on Network Operator's policy.	Partially implemented (see note 9)
OSR-006	The oneM2M System shall be able to reuse the services offered by Underlying Networks to M2M Applications and/or M2M Services by means of open access models (e.g. OMA, GSMA OneAPI framework).Examples of available services are: • IP Multimedia communications. • Messaging. • Location. • Charging and billing services. • Device information and profiles. • Configuration and management of devices. • Triggering, monitoring of devices. • Small data transmission. • Group management. (see note 1).	Partially implemented (see note 10)
OSR-007	The oneM2M System shall provide a mechanism for M2M Applications to interact with the Applications and data/information managed by a different M2M Service Provider, subject to permissions as appropriate.	Implemented in Rel-1
OSR-008	The oneM2M System shall provide the capability for M2M Applications to communicate with an M2M Device (i.e. application in the device) without the need for the M2M Applications to be aware of the network technology and the specific communication protocol of the M2M Device.	Implemented in Rel-1 (see note 11)
OSR-009	The oneM2M System shall support the ability for single or multiple M2M Applications to interact with a single or multiple M2M Devices/Gateways (application in the device/gateway) (see note 2).	Implemented in Rel-1
OSR-010	The oneM2M System shall support mechanisms for confirmed delivery of a message to its addressee to those M2M Applications requesting reliable delivery to dectect failure of message within a given time interval.	Implemented in Rel-1
OSR-011a	The oneM2M System shall be able to request different communication paths, from the Underlying Network based on Underlying Network Operator and/or M2M Service Provider policies, routing mechanisms for transmission failures.	Implemented in Rel-1 (see note 12)
OSR-011b	The oneM2M System shall be able to request different communication paths from the Underlying Network based on request from M2M Applications.	Not implemented
OSR-012	The oneM2M System shall support communications between M2M Applications and M2M Devices supporting M2M Services by means of continuous or non-continuous connectivity.	Implemented in Rel-1

Requirement ID	Description	Release
OSR-013	The oneM2M System shall be aware of the delay tolerance acceptable by the M2M Application and shall schedule the communication accordingly or request the Underlying Network to do it, based on policies criteria.	Implemented in Rel-1
OSR-014	The oneM2M System shall be able to communicate with M2M Devices, behind an M2M Gateway that supports heterogeneous M2M Area Networks.	Implemented in Rel-1
OSR-015	The oneM2M System shall be able to assist Underlying Networks that support different communication patterns including infrequent communications, small data transfer, transfer of large file and streamed communication.	Partially implemented (see note 13)
OSR-016	The oneM2M System shall provide the capability to notify M2M Applications of the availability of, and changes to, available M2M Application/management information on the M2M Device/Gateway, including changes to the M2M Area Network.	Implemented in Rel-1
OSR-017	The oneM2M System shall be able to offer access to different sets of M2M Services to M2M Application Providers. The minimum set of services are: • Connectivity management. • Device management (service level management). • Application Data management. In order to enable different deployment scenarios, these services shall be made available by the oneM2M System, individually, as a subset or as a complete set of services.	Implemented in Rel-1
OSR-018	The oneM2M System shall be able to offer M2M Services to M2M Devices roaming across cellular Underlying Networks, subject to restriction based on Network Operator's policy (see note 3).	Implemented with some limitations (see note 14)
OSR-019	The oneM2M System shall support the capabilities for data repository (i.e. to collect/store) and for data transfer from one or more M2M Devices or M2M Gateways, for delivery to one or more M2M Gateways, M2M Services Infrastructure, or M2M Application Infrastructure, in ways requested by the M2M Application Infrastructure as listed below: • action initiated either by an M2M Device, M2M Gateway, M2M Services Infrastructure, or M2M Application Infrastructure; • when triggered by schedule or event; • for specified data.	Implemented in Rel-1
OSR-020	The oneM2M System shall be able to support policies and their management regarding the aspects of storage and retrieval of data/information.	Implemented in Rel-1
OSR-021	The oneM2M System shall be able to provide mechanisms to enable sharing of data among multiple M2M Applications.	Implemented in Rel-1
OSR-022	When some of the components of a M2M Solution are not available (e.g. WAN connection lost), the oneM2M System shall be able to support the normal operation of components of the M2M Solution that are available.	Implemented in Rel-1
OSR-023	The oneM2M System shall be able to identify the M2M Services to be used by M2M Service Subscriptions (see note 4).	Implemented in Rel-1
OSR-024	The oneM2M System shall be able to identify the M2M Devices used by M2M Service Subscriptions.	Implemented in Rel-1
OSR-025	The oneM2M System shall be able to identify the M2M Applications used by M2M Service Subscriptions.	Implemented in Rel-1
OSR-026	If provided by the Underlying Network, the oneM2M System shall be able to associate the M2M Device used by M2M Service Subscriptions with the device identifiers offered by the Underlying Network and the device.	Implemented in Rel-1
OSR-027	The oneM2M System shall provide a generic mechanism to support transparent exchange of information between the M2M Application and the Underlying Network, subject to restriction based on M2M Service Provider's policy and/or Network Operator's policy (see note 5).	Not implemented
OSR-028	The oneM2M System shall enable an M2M Application to define trigger conditions in the oneM2M System such that the oneM2M System autonomously sends a series of commands to actuators on behalf of the M2M Application when these contitions are met.	Not implemented
OSR-029	The oneM2M System shall be able to support sending common command(s) to each actuator or sensor via a group.	Implemented in Rel-1
OSR-030	The oneM2M System shall be able to support the management (i.e. addition, removal, retrieval and update) of the membership of a group.	Implemented in Rel-1
OSR-031	The oneM2M System shall be able to support a group as a member of another group.	Implemented in Rel-1

Requirement ID	Description	Release
OSR-032	The oneM2M System shall be able to support Event Categories (e.g. normal, urgency) associated with data for M2M Applications when collecting, storing and reporting that data (see note 6).	Implemented in Rel-1
OSR-033	Based on the Dynamic Device/Gateway Context of the M2M Gateway and/or Device and the defined Event Categories, the oneM2M System shall provide the capability to dynamically adjust the scheduling of reporting and notification of the M2M Device/Gateway (see note 17).	Partially implemented (see note 15)
OSR-034	The oneM2M System shall support seamless replacement of M2M Devices as well as M2M Gateways (e.g. redirecting traffic, connection, recovery, etc.).	Not implemented
OSR-035	The oneM2M System shall support the exchange of non-M2M Application related relevant information (e.g. Device/Gateway classes) between M2M Device/Gateway and M2M Service Infrastructure for the purpose of efficient communication facilitation. This includes the capability for an M2M Device to report its device class to M2M Service Infrastructure and for the M2M Service Infrastructure to inform M2M Device of the M2M Service Infrastruture capabilities.	Not implemented
OSR-036	The oneM2M System should provide mechanisms to accept requests from M2M Application Service Providers for compute/analytics services.	Not implemented
OSR-037	The oneM2M System shall enable an M2M Application to request to send data, in a manner independent of the Underlying Network, to the M2M Applications of a group of M2M Devices and M2M Gateways in geographic areas that are specified by the M2M Application.	Not implemented
OSR-038	The oneM2M System shall support the inclusion of M2M Application's QoS preference in service requests to Underlying Networks.	Not implemented
OSR-039	The oneM2M System shall be able to authorize service requests with QoS preference at service level, but shall pass M2M Application's QoS preference in service requests to Underlying Network for authorization and granting or negotiation of the service QoS requests.	Not implemented
OSR-040	The oneM2M System shall be able to leverage multiple communication mechanisms (such as USSD or SMS) when available in the Underlying Networks.	Not implemented (see note 16)
OSR-041	The oneM2M System shall provide a mechanism, which supports the addition of new M2M Services to the oneM2M System as independent portable modules by means of the oneM2M interfaces.	Partially implemented (see note 21)
OSR-042	The oneM2M System shall be able to support different QoS-levels specifying parameters, such as guaranteed bitrate, delay, delay variation, loss ratio and error rate, etc.	Not implemented
OSR-043	The oneM2M System shall be able to verify that members of a group support a common set of functions.	Implemented in Rel-1
OSR-044	The oneM2M System shall support communication with M2M Devices which are reachable based on defined time schedules (e.g. periodic) as well as M2M Devices which are reachable in an unpredictable and spontaneous manner.	Implemented in Rel-1
OSR-045a	The oneM2M System shall be able to receive and utilize information provided by the Underlying Network about when an M2M Device can be reached.	Not implemented
OSR-045b	The oneM2M System shall be able to utilize reachability schedules generated by either the M2M Device or the Infrastructure Domain.	Partially implemented (see note 18)
OSR-046	The oneM2M System shall be able to support a capability for the M2M Application to request/disallow acknowledgement for its communication.	Not implemented
OSR-047	The oneM2M System shall be able to support mechanism for the M2M Devices and/or Gateways to report their geographical location information to M2M Applications (see note 7).	Implemented in Rel-1
OSR-048	The oneM2M System shall provide an M2M Service that allows M2M Devices and/or Gateways to share their own or other M2M Devices' geographical location information (see note 7).	Implemented in Rel-1
OSR-049	The oneM2M System shall be able to provide the capability for an M2M Application to selectively share data (e.g. access control) among applications.	Implemented in Rel-1
OSR-050	If communication over one communication channel provided by the Underlying Network can only be triggered by one side (Infrastructure Domain or Field Domain), and alternative channel(s) is (are) available in the other direction, the oneM2M System shall be able to use the alternative channel(s) to trigger bidirectional communication on the first channel.	Implemented in Rel-1
OSR-051	Depending on availability of suitable interfaces provided by the Underlying Network the oneM2M System shall be able to request the Underlying Network to broadcast/multicast data to a group of M2M Devices in a specified area.	Implemented in Rel-1