



ONEM2M TECHNICAL SPECIFICATION

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

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About oneM2M

The purpose and goal of oneM2M is to develop technical specifications which address the need for a common M2M Service Layer that can be readily embedded within various hardware and software, and relied upon to connect the myriad of devices in the field with M2M application servers worldwide.

More information about oneM2M may be found at: <http://www.oneM2M.org>

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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 reference document (including any amendments) applies.

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

- [1] 3GPP TS 22.368: "Service requirements for Machine-Type Communications (MTC); Stage 1".
- [2] oneM2M TR-0008: "Security Analysis".

2.2 Informative 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 reference document (including any amendments) applies.

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] oneM2M TS-0011: "Common Terminology".

- [i.3] 3GPP2 S.R0146: "M2M System Requirements".

NOTE: Available at http://www.3gpp2.org/Public_html/specs/S.R0146-0_v1.0_M2M_System_Requirements_20120829.pdf.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions are given in oneM2M TS-0011 [i.2].

3.2 Abbreviations

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

CHA	Continua Health Alliance
GSMA	Global System for Mobile Communications Association

HSM	Hardware Security Module
OMA	Open Mobile Alliance
QoS	Quality of Service
SMS	Short Message Service
USSD	Unstructured Supplementary Service Data
WAN	Wide 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

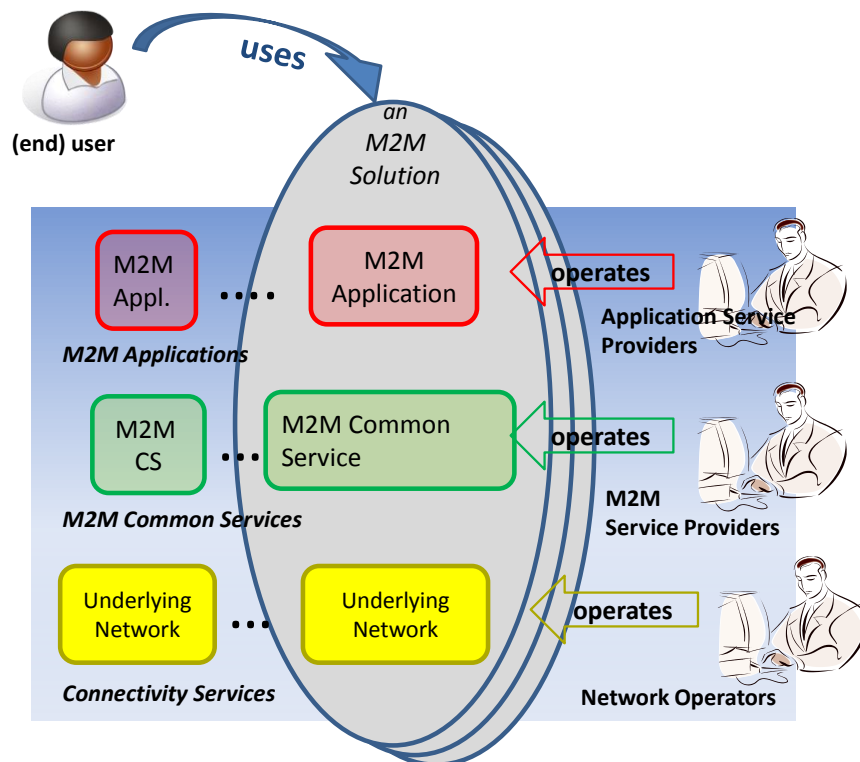


Figure 1: Functional Roles in the M2M Ecosystem

- 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	The oneM2M System shall support the ability to maintain peer-to-peer M2M Session in coordination with application session for those M2M Applications that require it.	Partially implemented in Rel-1 (see note 21)
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 in Rel-1 (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: <ul style="list-style-type: none"> • IP Multimedia communications. • Messaging. • Location. • Charging and billing services. • Device information and profiles. • Configuration and management of devices. 	Partially implemented in Rel-1 (see note 10)

Requirement ID	Description	Release
	<ul style="list-style-type: none"> Triggering, monitoring of devices. Small data transmission. Group management. (see note 1).	
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 detect 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 in Rel-1
OSR-012	The oneM2M System shall support communications between M2M Applications and Devices supporting M2M Services by means of continuous or non-continuous connectivity.	Implemented in Rel-1
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 in Rel-1 (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: <ul style="list-style-type: none"> 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 in Rel-1 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	Implemented

Requirement ID	Description	Release
	Infrastructure, or M2M Application Infrastructure, in ways requested by the M2M Application Infrastructure as listed below: <ul style="list-style-type: none"> • 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. 	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 oneM2M System Solution are not available (e.g. WAN connection lost), the oneM2M System shall be able to support the normal operation of components of the oneM2M System 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 in Rel-1
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 conditions are met.	Not implemented in Rel-1
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
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 in Rel-1 (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 in Rel-1
OSR-035	The oneM2M System shall support the exchange of non-M2M Application related relevant information (e.g. Device/Gateway classes) between M2M	Not implemented

Requirement ID	Description	Release
	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 Infrastructure capabilities.	in Rel-1
OSR-036	The oneM2M System should provide mechanisms to accept requests from M2M Application Service Providers for compute/analytics services.	Not implemented in Rel-1
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 in Rel-1
OSR-038	The oneM2M System shall support the inclusion of M2M Application's QoS preference in service requests to Underlying Networks.	Not implemented in Rel-1
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 in Rel-1
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 in Rel-1 (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 22)
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 in Rel-1
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 in Rel-1
OSR-045b	The oneM2M System shall be able to utilize reachability schedules generated by either the M2M Device or the Infrastructure Domain.	Partially implemented in Rel-1 (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 in Rel-1
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	Implemented

Requirement ID	Description	Release
	location information (see note 7).	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
OSR-052	The oneM2M System shall be able to select an appropriate Underlying Network to broadcast or multicast data depending on the network's broadcast/multicast support and the connectivity supported by the targeted group of M2M Devices/Gateways.	Not implemented in Rel-1
OSR-053	The oneM2M System shall provide a means that enables backward compatibility of interfaces among different releases (see note 8).	Not implemented in Rel-1
OSR-054	The oneM2M System shall be able to support an M2M Application, M2M Device, or M2M Gateway to obtain access to resources of another M2M Application, M2M Device, or M2M Gateway.	Implemented in Rel-1
OSR-055	The oneM2M System shall be able to provide the capability of M2M Applications to exchange data with one or more authorized M2M Applications which are not known in advance.	Implemented in Rel-1 (see note 20)
OSR-056	The oneM2M System shall enable discovery of usable M2M Applications on an M2M Gateway or at an M2M Device .	Implemented in Rel-1
OSR-057	The oneM2M System shall enable discovery of M2M Gateways and M2M Devices available to an M2M Application for data exchange.	Implemented in Rel-1
OSR-058	The oneM2M System shall be able to provide time stamps as needed by common service functions.	Implemented in Rel-1
OSR-059	The oneM2M System shall be able to support Role-based access control based on M2M Service Subscriptions.	Implemented in Rel-1
OSR-060	The oneM2M System should support time synchronization with an external clock source.	Not implemented in Rel-1
OSR-061	M2M Devices and M2M Gateways may support time synchronization within the oneM2M System.	Not implemented in Rel-1
OSR-062	The oneM2M System shall enable means of testing the connectivity towards a set of M2M Applications.	Not implemented in Rel-1
OSR-063	The oneM2M System shall be able to manage the scheduling of M2M Service Layer connectivity and messaging between the Infrastructure Domain and M2M Devices/Gateways.	Implemented in Rel-1
OSR-064	The oneM2M System shall be able to aggregate messages depending on message delay tolerance and/or category.	Implemented in Rel-1
OSR-065	The oneM2M System shall provide mechanisms that enable a M2M Service Provider to distribute processing functions to his M2M Devices/Gateways in the	Not implemented

Requirement ID	Description	Release
	Field Domain	in Rel-1
OSR-066	The oneM2M System shall be able to support the placement and operation of M2M Applications in selected M2M nodes per criteria requested by M2M Application Service Providers, subject to access rights.	Implemented in Rel-1
OSR-067	The oneM2M System shall be able to take operational and management action as requested by M2M Applications.	Implemented in Rel-1
OSR-068	When available from an Underlying Network, the oneM2M System shall be able to provide the capability to retrieve and report the information regarding whether an M2M Device is authorized to access Underlying Network services.	Not implemented in Rel-1
OSR-069	When available from the Underlying Network, the oneM2M System shall be able to maintain the M2M Service Operational Status of a M2M Device and update it when the Underlying Network connectivity service status changes.	Not implemented in Rel-1
OSR-070	The oneM2M System shall be able to provide the capability to notify an authorized M2M Application when the M2M Service Administrative State or M2M Service Operational Status of an M2M Device changes, if that M2M Application has subscribed for such notifications.	Partially implemented in Rel-1 (see note 19)
OSR-071	The oneM2M System shall be able to enable an authorized M2M Application to set the M2M Service Administrative State of a M2M Device.	Implemented in Rel-1
OSR-072	The oneM2M System shall be able to initiate a set of well-defined actions (e.g. trigger upon a threshold, compare a value, etc.) to one or more M2M Application(s) on behalf of another M2M Application.	Implemented in Rel-1

NOTE 1: The set of features or APIs to be supported depends on the M2M Common Services and access to available APIs.

NOTE 2: The relation M2M Network Application to M2M Device/Gateway may be 1:1, 1:n, n:1 and/or n:m.

NOTE 3: No roaming on M2M Service level is assumed by this requirement.

NOTE 4: M2M Service Subscriptions are not Application subscriptions (e.g. Home Energy Management).

NOTE 5: Transparent exchange of information implies information that is mainly interpreted by the M2M Application and the Underlying Network Provider.

NOTE 6: Based on the Event Categories and via interworking with Underlying Networks, the oneM2M System can support differentiated services (by providing Quality-of-Service) requested by M2M Applications.

NOTE 7: Geographical location information can be more than simply longitude and latitude.

NOTE 8: "means" above does not imply only technical mechanisms.

NOTE 9: In Rel-1 only GBA and localization are available

NOTE 10: Rel-1 covers: Location, Charging and billing services, Configuration and management of devices, Device information and profiles, Triggering

NOTE 11: This requirement applies to M2M Devices but not to devices interworked via M2M Area Networks

NOTE 12: Based on device triggering.

NOTE 13: No Support for streamed communication

NOTE 14: Limitations to trigger (via Tsp interface) devices in a roamed-to network.

NOTE 15: Detail syntax to describe Dynamic Context is not specified

NOTE 16: it is possible to deliver CoAP over SMS, but currently SMS message delivery interfaces are not explicitly defined.

NOTE 17: For example, if the battery of Gateway is remained only 10% or below, the Gateway notifies the M2M service platform of the status. The M2M Application in the Infrastructure node will adjust the scheduling of reporting and notification based on the Event Categories associated with each message. Consequently, the M2M Gateway operates longer.

NOTE 18: Only reachability schedules generated by the Infrastructure Domain can be utilized.

NOTE 19: Only the M2M Service Administrative State can be notified. M2M Service Operational Status is not implemented.

NOTE 20: this can be implemented based on preconfigured access rights.

NOTE 21: No support for peer-to-peer service layer session.

NOTE 22: In Rel-1 this is supported by means of the Mca interfaces, mapping the new service module to an AE.

6.2 Management Requirements

Table 2: Management Requirements

Requirement ID	Description	Release
MGR-001	The oneM2M System shall be able to support management and configuration of M2M Gateways/ Devices including resource constrained M2M Devices.	Implemented in Rel-1
MGR-002	The oneM2M System shall provide the capability to discover the M2M Area Networks including information about devices on those networks and the parameters (e.g. topology, protocol) of those networks.	Implemented in Rel-1
MGR-003	The oneM2M System shall be able to provide the capability to maintain and describe the management information model of devices and parameters (e.g. topology, protocol) of M2M Area Networks.	Implemented in Rel-1
MGR-004	The oneM2M System shall support common means to manage devices enabled by different management technologies (e.g. OMA DM, BBF TR069).	Implemented in Rel-1
MGR-005	The oneM2M System shall provide the capability to manage multiple devices in a grouped manner.	Implemented in Rel-1
MGR-006	The oneM2M System shall provide the capability for provisioning and configuration of devices in M2M Area Networks .	Implemented in Rel-1
MGR-007	The oneM2M System shall provide the capability for monitoring and diagnostics of M2M Gateways/Devices in M2M Area Networks .	Implemented in Rel-1
MGR-008	The oneM2M System shall provide the capability for software management of devices in M2M Area Networks.	Implemented in Rel-1
MGR-009	The oneM2M System shall provide the capability for rebooting and/or resetting of M2M Gateways/Devices and other devices in M2M Area Networks.	Implemented in Rel-1
MGR-010	The oneM2M System shall provide the capability for authorizing devices to access M2M Area Networks.	Implemented in Rel-1
MGR-011	The oneM2M System shall provide the capability for modifying the topology of devices in M2M Area Networks, subject to restriction based on M2M Area Network policies..	Implemented in Rel-1
MGR-012	Upon detection of a new device the M2M Gateway shall be able to be provisioned by the M2M Service Infrastructure with an appropriate configuration which is required to handle the detected device.	Partially implemented in Rel-1 (see note 1)
MGR-013	Void	
MGR-014	The oneM2M System shall be able to retrieve events and information logged by M2M Gateways/ Devices and other devices in M2M Area Networks.	Implemented in Rel-1
MGR-015	The oneM2M System shall be able to support firmware management (e.g. update) of M2M Gateways/ Devices and other devices in M2M Area Networks.	Implemented in Rel-1
MGR-016	The oneM2M System shall be able to retrieve information related to the Static and Dynamic Device/Gateway Context for M2M Gateways/Devices as well as Device Context for other devices in M2M Area Networks.	Implemented in Rel-1
MGR-017	The oneM2M System shall be capable of correlating Access Management elements provided by the technology specific Device Management Protocols to Access Management elements used by the oneM2M System	Implemented in Rel-1
Note 1: In Rel-1 no detection mechanism exists, but once an M2M Device is known at the Gateway it can be configured via the GW through DM.		

6.3 Abstraction and Semantics Requirements

6.3.1 Abstraction Requirements

Table 3: Abstraction Requirements

Requirement ID	Description	Release
ABR-001	The oneM2M System shall define a structure of an Information Model for the purpose of exchanging data.	Not implemented in Rel-1
ABR-002	The oneM2M System shall be able to provide translation mechanisms between Information Models used by M2M Applications, M2M Devices/Gateways, and other devices.	Not implemented in Rel-1
ABR-003	The oneM2M System shall provide capabilities to represent Virtual Devices and	Not

	Things.	implemented in Rel-1
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6.3.2 Semantics Requirements

Table 4: Semantics Requirements

Requirement ID	Description	Release
SMR-001	The oneM2M System shall provide capabilities to manage semantic descriptions of resources and M2M Applications, e.g. create, retrieve, update, delete, associate/link.	Not implemented in Rel-1
SMR-002	The oneM2M System shall support a common modeling language for semantic descriptions (including relationships between Things) in order to make them available to M2M Applications.	Not implemented in Rel-1
SMR-003	The oneM2M System shall be able to provide interworking capabilities between different modeling languages for semantic descriptions.	Not implemented in Rel-1
SMR-004	The oneM2M System shall provide capabilities to discover M2M Resources based on semantic descriptions.	Not implemented in Rel-1
SMR-005	The oneM2M System shall support the capability to access semantic descriptions which are outside of the oneM2M System.	Not implemented in Rel-1
SMR-006	The oneM2M System shall be able to support capabilities for performing M2M data Analytics based on semantic descriptions from M2M Applications and /or from the oneM2M System.	Not implemented in Rel-1
SMR-007	The oneM2M System shall be able to provide capabilities for performing Semantic Mash-up using M2M data from M2M Applications and/or from the oneM2M System (e.g. to create Virtual Devices, offer new M2M Services, etc.)	Not implemented in Rel-1

6.4 Security Requirements

Table 5: Security Requirements

Requirement ID	Description	Release
SER-001	The oneM2M System shall incorporate protection against threats to its availability such as Denial of Service attacks.	Partly Implemented in Rel-1
SER-002	The oneM2M System shall be able to ensure the confidentiality of data.	Implemented in Rel-1
SER-003	The oneM2M System shall be able to ensure the integrity of data.	Implemented in Rel-1
SER-004	In case where the M2M Devices support USIM/UICC and the Underlying Networks support network layer security, the oneM2M System shall be able to leverage device's USIM / UICC credentials and network's security capability e.g. 3GPP GBA for establishing the M2M Services and Applications level security through interfaces to Underlying Network.	Implemented in Rel-1
SER-005	In case where the M2M Devices support USIM/UICC and the Underlying Networks support network layer security, and when the oneM2M System is aware of Underlying Network's bootstrapping capability e.g. 3GPP GBA, the oneM2M System shall be able to expose this capability to M2M Services and Applications through API.	Implemented in Rel-1
SER-006	In case where the M2M Devices support USIM / UICC and the Underlying Networks support network layer security, the oneM2M System shall be able to leverage device's USIM / UICC credentials when available to bootstrap M2M security association.	Implemented in Rel-1
SER-007	When some of the components of an M2M Solution are not available (e.g. WAN connection lost), the oneM2M System shall be able to support the confidentiality and the integrity of data between authorized components of the M2M Solution that are available.	Implemented in Rel-1
SER-008	The oneM2M System shall support countermeasures against unauthorized	Implemented

Requirement ID	Description	Release
	access to M2M Services and M2M Application Services.	in Rel-1
SER-009	The oneM2M System shall be able to support mutual authentication for interaction with Underlying Networks, M2M Services and M2M Application Services.	Implemented in Rel-1
SER-010	The oneM2M System shall be able to support mechanisms for protection against misuse, cloning, substitution or theft of security credentials.	Implemented in Rel-1
SER-011	The oneM2M System shall protect the use of the identity of an M2M Stakeholder within the oneM2M System against discovery and misuse by other stakeholders.	Implemented in Rel-1
SER-012	The oneM2M System shall be able to support countermeasures against Impersonation attacks and Replay attacks.	Partly implemented in Rel-1 (see note 3)
SER-013	The oneM2M System shall be able to provide the mechanism for integrity-checking on boot, periodically on run-time, and on software upgrades for software/hardware/firmware component(s) on M2M Device(s).	Not implemented in Rel-1
SER-014	The oneM2M System shall be able to provide configuration data to an authenticated and authorized M2M Application in the M2M Gateway/Device.	Implemented in Rel-1
SER-015	The oneM2M System shall be able to support mechanisms to provide Subscriber identity to authorized and authenticated M2M Applications when the oneM2M System has the Subscriber's consent.	Partly implemented in Rel-1 (see note 4)
SER-016	The oneM2M System shall be able to support non repudiation within the M2M service layer and in its authorized interactions with the network and application layers.	Implemented in Rel-1
SER-017	The oneM2M System shall be able to mitigate threats identified in oneM2M TR-0008 [2].	Implemented in Rel-1
SER-018	The oneM2M System shall enable an M2M Stakeholder to use a resource or service and be accountable for that use without exposing its identity to other stakeholders.	Partly implemented in Rel-1
SER-019	The oneM2M System shall be able to use service-level credentials present inside the M2M device for establishing the M2M Services and Applications level security.	Implemented in Rel-1
SER-020	The oneM2M System shall enable legitimate M2M Service Providers to provision their own credentials into the M2M Devices/Gateways.	Implemented in Rel-1
SER-021	The oneM2M System shall be able to remotely and securely provision M2M security credentials in M2M Devices and/or M2M Gateways.	Implemented in Rel-1
SER-022	The oneM2M System shall enable M2M Application Service Providers to authorize interactions involving their M2M Applications on supporting entities (e.g. Devices/ Gateways/ Service infrastructure).	Implemented in Rel-1
SER-023	Where a Hardware Security Module (HSM) is supported, the oneM2M System shall be able to rely on the HSM to provide local security.	Partly implemented in Rel-1
SER-024	The oneM2M System shall enable M2M Applications to use different and segregated security environments.	Partly implemented in Rel-1
SER-025	The oneM2M System shall be able to prevent unauthorized M2M Stakeholders from identifying and/or observing the actions of other M2M Stakeholders in the oneM2M System, e.g. access to resources and services (see note 1).	Partly implemented in Rel-1
SER-026	The oneM2M System shall be able to provide mechanism for the protection of confidentiality of the geographical location information (see note 2).	Implemented in Rel-1
<p>NOTE 1: The above requirement does not cover items outside of the oneM2M System, e.g. Underlying Networks.</p> <p>NOTE 2: Geographical location information can be more than simply longitude and latitude.</p> <p>NOTE 3: Partly supported for Impersonation attacks not supported for Replay attacks.</p> <p>NOTE 4: The oneM2M System has no means to verify a subscriber's consent. This requirement is only fulfillable at application level.</p>		

6.5 Charging Requirements

Table 6: Charging Requirements

Requirement ID	Description	Release
CHG-001	The oneM2M System shall support collection of charging specific information related to the individual services facilitated by the oneM2M System (e.g. Data Management, Device Management and/or Connectivity Management). Collection of charging specific information shall be possible concurrent with the resource usage. The format of the recorded information shall be fully specified including mandatory and optional elements.	Implemented in Rel-1 (see note 4)
CHG-002	The oneM2M System shall support mechanisms to facilitate correlation of charging information (e.g. of a User) collected for M2M Services, M2M Application Services and services provided by underlying network operators.	Partially implemented in Rel-1 (see note 2)
CHG-003	The oneM2M System shall provide means to coordinate charging data records for data usages with differentiated QoS from the Underlying Network.	Not implemented in Rel-1
CHG-004	The oneM2M System shall be able to utilize existing charging mechanisms of Underlying Networks.	Not implemented in Rel-1 (see note 3)
CHG-005	The oneM2M System shall support transfer of the charging information records to the Billing Domain of the M2M Service Provider, for the purpose of: <ul style="list-style-type: none"> • subscriber billing; • inter-provider billing; • provider-to-subscriber accounting including additional functions like statistics. 	Implemented in Rel-1
CHG-006	The oneM2M System should support generation of charging events for the purpose of requesting resource usage authorization from the real time credit control system where the subscriber account is located. The information contained in the charging events and the relevant chargeable events shall be fully specified including mandatory and optional elements (see note 1).	Not implemented in Rel-1
<p>NOTE 1: A chargeable event is any activity, a provider may want to charge for that utilizes the resources and related M2M Services offered by such provider. A charging event is the set of charging information needed by the credit control system for resource authorization.</p> <p>NOTE 2: Information collected can be sent to the Underlying Networks which may use it for charging.</p> <p>NOTE 3: the oneM2M service layer can pass info to Underlying Networks but cannot use underlying network mechanism. Charging can be done by underlying network. This is covered by CHG-002.</p> <p>NOTE 4: only supported in the Infrastructure Node.</p>		

6.6 Operational Requirements

Table 7: Charging Requirements

Requirement ID	Description	Release
OPR-001	The oneM2M System shall provide the capability for monitoring and diagnostics of M2M Applications.	Implemented in Rel-1
OPR-002	The oneM2M System shall provide the capability for software management of M2M Applications.	Implemented in Rel-1
OPR-003	The oneM2M System shall be able to configure the execution state an M2M Application (start, stop, restart).	Implemented in Rel-1
OPR-004	When suitable interfaces are provided by the Underlying Network, the oneM2M System shall have the ability to schedule traffic via the Underlying Network based on instructions received from the Underlying Network.	Not implemented in Rel-1
OPR-005	The oneM2M System shall be able to exchange information with M2M Applications related to usage and traffic characteristics of M2M Devices or M2M Gateways by the M2M Application. This should include support for the 3GPP feature called: "Time controlled" (see note 1).	Not implemented in Rel-1
OPR-006	Depending on availability of suitable interfaces provided by the Underlying Network the oneM2M System shall be able to provide information related to usage and traffic characteristics of M2M Devices or M2M Gateways to the Underlying Network.	Not implemented in Rel-1

NOTE1: "Time controlled" is equivalent to the MTC Features specified in clause 7.2 of 3GPP TS 22.368 [1].

6.7 Communication Request Processing Requirements

Table 8: Communication Request Processing Requirements

Requirement ID	Description	Release
CRPR-001	The oneM2M System shall provide to M2M Applications a communication service which provides buffering of messages to/from M2M Gateway / Device / Infrastructure Domain.	Implemented in Rel-1
CRPR-002	The oneM2M System shall be able to support forwarding buffered messages depending on communication policies and based on service preference associated with the buffered messages.	Implemented in Rel-1
CRPR-003	The oneM2M System shall enable an M2M Application to send a communication request with the following service preference: <ul style="list-style-type: none"> • QoS parameters, including delay tolerance, for initiating the delivery of data; • categorizing communication requests into different levels of priority or QoS classes. 	Implemented in Rel-1
CRPR-004	The oneM2M System shall be able to support concurrent processing of messages within M2M Gateways and/or M2M Devices from different sources with awareness for the service preference associated with the messages while observing the provisioned communication policies.	Implemented in Rel-1
CRPR-005	The oneM2M System shall be able to maintain context associated with M2M sessions (e.g. security context or network connectivity context during the interruption of the session).	Partially implemented in Rel-1 (see note 1)

NOTE 1: Long lived security context and registration is covered, M2M Sessions are not covered.

7 Non-Functional Requirements (non-normative)

This clause is intended to gather high-level principles and guidelines that shall govern the design of the oneM2M System. Such principles and guidelines are fundamental to the design of the oneM2M System. But as they cannot necessarily be expressed as requirements per se, they shall be introduced and expressed in this clause.

Table 9: Non-Functional Requirements

Requirement ID	Description	Release
NFR-001	Continua Health Alliance is incorporating a RESTful approach to its design. To support CHA, oneM2M should consider RESTful styles and approaches while designing the M2M architecture.	Implemented in Rel-1
NFR-002	The oneM2M System should communicate using protocols that are efficient in terms of amount of exchanged information over amount of exchanged data measured in bytes.	Implemented in Rel-1

History

Publication history		
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