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SERIES Y: GLOBAL INFORMATION
INFRASTRUCTURE, INTERNET PROTOCOL ASPECTS,
NEXT-GENERATION NETWORKS, INTERNET OF
THINGS AND SMART CITIES

Internet of things and smart cities and communities –
Frameworks, architectures and protocols

oneM2M – Requirements

Recommendation ITU-T Y.4500.2

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Recommendation ITU-T Y.4500.2

oneM2M – Requirements

Summary

Recommendation ITU-T Y.4500.2 provides an informative functional role model and normative technical requirements for oneM2M.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T Y.4500.2	2018-05-06	20	11.1002/1000/13499

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* To access the Recommendation, type the URL <http://handle.itu.int/> in the address field of your web browser, followed by the Recommendation's unique ID. For example, <http://handle.itu.int/11.1002/1000/11830-en>.

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

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In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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Recommendation ITU-T Y.4500.2

oneM2M – Requirements

1 Scope

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

The Recommendation contains oneM2M Release 2 specification – oneM2M Requirements V2.7.1 and is equivalent to standards of oneM2M partners including ARIB, ATIS [b-ATIS.oneM2M.TS0002V2.7.1], CCSA, ETSI [b-ETSI TS 118 102], TTA, TSDSI, TTA [b-TTA.oneM2M.TS0002V2.7.1] and TTC [b-TTC.oneM2M.TS0002V2.7.1].

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

- | | |
|-------------------|---|
| [ITU-T Y.4500.11] | Recommendation ITU-T Y.4500.11 (2018), <i>oneM2M – Common terminology</i> . |
| [ETSI TS 122 368] | ETSI TS 122 368, <i>Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); LTE; Service requirements for Machine-Type Communications (MTC); Stage 1 (3GPP TS 22.368)</i> . |

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 application entity (AE) [ITU-T Y.4500.11]: Represents an instantiation of application logic for end-to-end M2M solutions.

3.1.2 common services entity (CSE) [ITU-T Y.4500.11]: Represents an instantiation of a set of common service functions of the M2M environments. Such service functions are exposed to other entities through reference points.

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

AE	Application Entity
API	Application Programming Interface
CMDH	Communication Management and Delivery Handling

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
LWM2M	Lightweight M2M
M2M	Machine to Machine
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

5 Conventions

The keywords "shall", "shall not", "should", "should not", "may", "need not" in the present Recommendation are to be interpreted as described:

Shall/Shall not:

Requirements

- 1) effect on this Recommendation: The Recommendation needs to describe the required feature (i.e., specify a technical solution for the Requirement);
- 2) effect on products: every implementation (M2M solution that complies to this Standard) must support it;
- 3) effect on deployments: every deployment (M2M service based on this Standard) must use the Standardized feature where applicable – otherwise e.g., interoperability problems with other services could arise.

Should/Should not:

Recommendation

- 1) effect on this Recommendation: The Recommendation needs to describe a solution that allows the presence and the absence of the feature;

- 2) effect on products: an implementation may or may not support it, however support is recommended;
- 3) effect on deployments: a deployment may or may not use it, however usage is recommended.

May/Need not:

Permission/Option

- 1) effect on this Recommendation: The Recommendation needs to describe a solution that allows the presence and the absence of the required feature;
- 2) effect on products: an implementation may or may not support it;
- 3) effect on deployments: a deployment may or may not use it.

6 Introduction to the M2M ecosystem

6.1 Functional roles description

Figure 1 shows functional roles in the machine to machine (M2M) ecosystem.

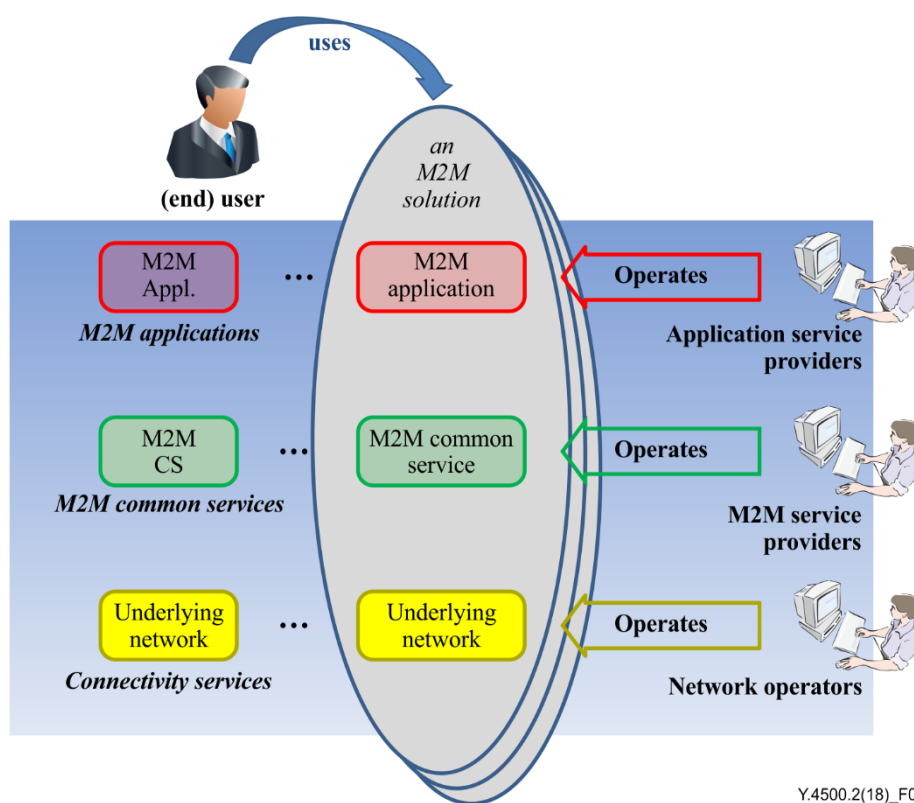


Figure 1 – Functional roles in the M2M ecosystem

- 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.

7 Functional requirements (normative)

7.1 Overall system requirements

Table 1 – Overall system requirements

Requirement ID	Description
OSR-001	The oneM2M system shall allow communication between M2M applications by using multiple communication means based on Internet protocol (IP) access.
OSR-002a	The oneM2M system shall support communication means that can accommodate devices with constrained computing such as a small central processing unit (CPU), memory, battery, or communication capabilities such as 2G wireless modem or certain wireless local area network (WLAN) nodes.
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).
OSR-003	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.
OSR-004	The oneM2M system shall support session-less application communications for those M2M applications that require it.
OSR-005	The oneM2M system shall be able to expose the services offered by telecommunications networks to M2M applications such as short message service (SMS), unstructured supplementary service data (USSD), localization, subscription configuration, authentication (e.g., generic bootstrapping architecture), etc., subject to restrictions based on the network operator's policy.
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 such as Open Mobile Alliance (OMA), Global System for Mobile communications Association (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).
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.