

# ETSI TS 118 101 V2.10.0 (2016-10)



TECHNICAL SPECIFICATION

## oneM2M; Functional Architecture (oneM2M TS-0001 version 2.10.0 Release 2)

*iTeh STANDARDS PREVIEW  
(standards.it-eui.com)  
Full standards catalog: <https://standards.it-eui.com/catalog/standards/sist/9c525314-2224-486f-b102-07ec697217e9/etsi-ts-118-101-v2.10.0-2016-10>*



---

**Reference**

RTS/oneM2M-000001v200

---

**Keywords**

architecture, IoT, M2M

**ETSI**

650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C  
Association à but non lucratif enregistrée à la  
Sous-Préfecture de Grasse (06) N° 7803/88

---

**Important notice**

The present document can be downloaded from:  
<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at  
<https://portal.etsi.org/TB/ETSIDeliverableStatus.aspx>

If you find errors in the present document, please send your comment to one of the following services:  
<https://portal.etsi.org/People/CommiteeSupportStaff.aspx>

---

**Copyright Notification**

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.  
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2016.  
All rights reserved.

**DECT™**, **PLUGTESTS™**, **UMTS™** and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members.  
**3GPP™** and **LTE™** are Trade Marks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.  
**GSM®** and the GSM logo are Trade Marks registered and owned by the GSM Association.

# Contents

Intellectual Property Rights .....	14
Foreword.....	14
1 Scope .....	15
2 References .....	15
2.1 Normative references .....	15
2.2 Informative references.....	15
3 Definitions and abbreviations.....	17
3.1 Definitions.....	17
3.2 Abbreviations .....	19
4 Conventions.....	22
5 Architecture Model.....	22
5.1 General Concepts .....	22
5.2 Architecture Reference Model .....	23
5.2.1 Functional Architecture .....	23
5.2.2 Reference Points .....	24
5.2.2.0 Overview.....	24
5.2.2.1 Mca Reference Point.....	24
5.2.2.2 Mcc Reference Point.....	24
5.2.2.3 Mcn Reference Point.....	24
5.2.2.4 Mcc' Reference Point .....	24
5.2.2.5 Other Reference Points and Interfaces .....	24
6 oneM2M Architecture Aspects .....	25
6.1 Configurations supported by oneM2M Architecture.....	25
6.2 Common Services Functions.....	27
6.2.0 Overview .....	27
6.2.1 Application and Service Layer Management.....	27
6.2.1.1 General Concepts .....	27
6.2.1.2 Detailed Descriptions .....	28
6.2.1.2.0 Overview .....	28
6.2.1.2.1 Software Management Function.....	28
6.2.2 Communication Management and Delivery Handling .....	28
6.2.2.1 General Concepts .....	28
6.2.2.2 Detailed Descriptions .....	29
6.2.3 Data Management and Repository.....	29
6.2.3.1 General Concepts .....	29
6.2.3.2 Detailed Descriptions .....	30
6.2.4 Device Management .....	30
6.2.4.1 General Concepts .....	30
6.2.4.1.0 Overview .....	30
6.2.4.1.1 Device Management Architecture .....	30
6.2.4.1.2 Management Server Interaction.....	31
6.2.4.1.3 Management Client Interaction .....	33
6.2.4.1.4 Device Management Resource Lifecycle .....	34
6.2.4.2 Detailed Descriptions .....	34
6.2.4.2.0 Overview .....	34
6.2.4.2.1 Device Configuration Function .....	35
6.2.4.2.2 Device Diagnostics and Monitoring Function .....	35
6.2.4.2.3 Device Firmware Management Function .....	36
6.2.4.2.4 Device Topology Management Function .....	36
6.2.5 Discovery.....	36
6.2.5.1 General Concepts .....	36
6.2.5.2 Detailed Descriptions .....	36
6.2.6 Group Management .....	37
6.2.6.1 General Concepts .....	37

6.2.6.2	Detailed Descriptions .....	37
6.2.7	Location .....	38
6.2.7.1	General Concepts .....	38
6.2.7.2	Detailed Descriptions .....	38
6.2.8	Network Service Exposure, Service Execution and Triggering .....	38
6.2.8.1	General Concepts .....	38
6.2.8.2	Detailed Descriptions .....	38
6.2.9	Registration .....	39
6.2.9.1	General Concepts .....	39
6.2.9.2	Detailed Descriptions .....	39
6.2.10	Security .....	40
6.2.10.1	General Concepts .....	40
6.2.10.2	Detailed Descriptions .....	40
6.2.11	Service Charging and Accounting .....	41
6.2.11.1	General Concepts .....	41
6.2.11.2	Detailed Descriptions .....	41
6.2.12	Subscription and Notification .....	42
6.2.12.1	General Concepts .....	42
6.2.12.2	Detailed Descriptions .....	42
6.3	Security Aspects .....	43
6.4	Intra-M2M SP Communication .....	43
6.5	Inter-M2M SP Communication .....	44
6.5.1	Inter M2M SP Communication for oneM2M Compliant Nodes .....	44
6.5.1.0	Overview .....	44
6.5.1.1	Public Domain Names and CSEs .....	44
6.5.2	Inter M2M SP Generic Procedures .....	45
6.5.2.0	Overview .....	45
6.5.2.1	Actions of the Originating M2M Node in the Originating Domain .....	45
6.5.2.2	Actions of the Receiving CSE in the Originating Domain .....	45
6.5.2.3	Actions in the IN of the Target Domain .....	45
6.5.3	DNS Provisioning for Inter-M2M SP Communication .....	45
6.5.3.0	Overview .....	45
6.5.3.1	Inter-M2M SP Communication Access Control Policies .....	46
6.5.4	Conditional Inter-M2M Service Provider CSE Registration .....	46
6.6	M2M Service Subscription .....	46
7	M2M Entities and Object Identification .....	47
7.1	M2M Identifiers .....	47
7.1.0	Overview .....	47
7.1.1	M2M Service Provider Identifier (M2M-SP-ID) .....	47
7.1.2	Application Entity Identifier (AE-ID) .....	47
7.1.3	Application Identifier (App-ID) .....	47
7.1.4	CSE Identifier (CSE-ID) .....	48
7.1.5	M2M Node Identifier (M2M-Node-ID) .....	48
7.1.6	M2M Service Subscription Identifier (M2M-Sub-ID) .....	48
7.1.7	M2M Request Identifier (M2M-Request-ID) .....	48
7.1.8	M2M External Identifier (M2M-Ext-ID) .....	49
7.1.9	Underlying Network Identifier (UNetwork-ID) .....	49
7.1.10	Trigger Recipient Identifier (Trigger-Recipient-ID) .....	50
7.1.11	Void .....	50
7.1.12	Void .....	50
7.1.13	M2M Service Profile Identifier (M2M-Service-Profile-ID) .....	50
7.1.14	Role Identifier (Role-ID) .....	50
7.1.15	Token Identifier (Token-ID) .....	50
7.1.16	Local Token Identifier (Local-Token-ID) .....	51
7.2	M2M-SP-ID, CSE-ID, App-ID and AE-ID and resource Identifier formats .....	51
7.3	M2M Identifiers lifecycle and characteristics .....	58
8	Description and Flows of Reference Points .....	60
8.1	General Communication Flow Scheme on Mca and Mcc Reference Points .....	60
8.1.0	Overview .....	60
8.1.1	Description .....	61

8.1.2	Request .....	61
8.1.3	Response .....	70
8.2	Procedures for Accessing Resources .....	74
8.2.0	Overview .....	74
8.2.1	Accessing Resources in CSEs - Blocking Requests .....	74
8.2.1.0	Overview .....	74
8.2.1.1	M2M Requests Routing Policies .....	79
8.2.2	Accessing Resources in CSEs - Non-Blocking Requests .....	79
8.2.2.1	Response with Acknowledgement and optional Reference to Request Context and Capturing Result of Requested Operation .....	79
8.2.2.2	Synchronous Case .....	79
8.2.2.3	Asynchronous Case .....	82
8.3	Procedures for interaction with Underlying Networks .....	83
8.3.1	Introduction .....	83
8.3.2	Description and Flows on Mcn Reference Point .....	84
8.3.3	Device Triggering .....	84
8.3.3.1	Definition and scope .....	84
8.3.3.2	General Procedure for Device Triggering .....	84
8.3.3.2.0	Overview .....	84
8.3.3.2.1	Triggering procedure for targeting ASN/MN-CSE .....	85
8.3.3.2.2	Support for device trigger recall/replace procedure .....	86
8.3.4	Location Request .....	88
8.3.4.1	Definition and Scope .....	88
8.3.4.2	General Procedure for Location Request .....	88
8.3.5	Configuration of Traffic Patterns .....	90
8.3.5.1	Purpose of Configuration of Traffic Patterns .....	90
8.3.5.2	Traffic pattern parameters .....	90
8.3.5.3	General procedure for Configuration of Traffic Patterns .....	91
8.4	Connection Request .....	93
8.5	Device Management .....	93
9	Resource Management .....	93
9.0	Overview .....	93
9.1	General Principles .....	93
9.2	Resources .....	94
9.2.0	Overview .....	94
9.2.1	Normal Resources .....	94
9.2.2	Virtual Resources and Attributes .....	94
9.2.3	Announced Resources .....	94
9.3	Resource Addressing .....	94
9.3.1	Generic Principles .....	94
9.3.2	Addressing an Application Entity .....	96
9.3.2.1	Application Entity Addressing .....	96
9.3.2.2	Application Entity Reachability .....	96
9.3.2.2.1	CSE Point of Access (CSE-PoA) .....	96
9.3.2.2.2	Locating Application Entities .....	96
9.3.2.2.3	Usage of CSE-PoA by the M2M System .....	97
9.3.2.3	Notification Re-targeting .....	98
9.3.2.3.1	Application Entity Point of Access (AE-PoA) .....	98
9.4	Resource Structure .....	99
9.4.1	Relationships between Resources .....	99
9.4.2	Link Relations .....	100
9.5	Resource Type Specification Conventions .....	100
9.5.0	Overview .....	100
9.5.1	Handling of Unsupported Resources/Attributes/Sub-resources within the M2M System .....	103
9.6	Resource Types .....	103
9.6.1	Overview .....	103
9.6.1.1	Resource Type Summary .....	103
9.6.1.2	Resource Type Specializations .....	110
9.6.1.2.1	Specializations of <mgmtObj> .....	110
9.6.1.2.2	Specializations of <flexContainer> .....	111
9.6.1.3	Commonly Used Attributes .....	114

9.6.1.3.0	Overview .....	114
9.6.1.3.1	Universal attributes .....	114
9.6.1.3.2	Common attributes .....	115
9.6.2	Resource Type <i>accessControlPolicy</i> .....	117
9.6.2.0	Introduction .....	117
9.6.2.1	<i>accessControlOriginators</i> .....	119
9.6.2.2	<i>accessControlContexts</i> .....	119
9.6.2.3	<i>accessControlOperations</i> .....	119
9.6.2.4	<i>accessControlObjectDetails</i> .....	120
9.6.2.5	<i>accessControlAuthenticationFlag</i> .....	120
9.6.3	Resource Type <i>CSEBase</i> .....	120
9.6.4	Resource Type <i>remoteCSE</i> .....	123
9.6.5	Resource Type <i>AE</i> .....	127
9.6.6	Resource Type <i>container</i> .....	130
9.6.7	Resource Type <i>contentInstance</i> .....	132
9.6.8	Resource Type <i>subscription</i> .....	135
9.6.9	Resource Type <i>schedule</i> .....	141
9.6.10	Resource Type <i>locationPolicy</i> .....	142
9.6.11	Resource Type <i>delivery</i> .....	146
9.6.12	Resource Type <i>request</i> .....	148
9.6.13	Resource Type <i>group</i> .....	151
9.6.14	Resource Type <i>fanOutPoint</i> .....	153
9.6.14a	Resource Type <i>semanticFanOutPoint</i> .....	153
9.6.15	Resource Type <i>mgmtObj</i> .....	153
9.6.16	Resource Type <i>mgmtCmd</i> .....	156
9.6.17	Resource Type <i>execInstance</i> .....	158
9.6.18	Resource Type <i>node</i> .....	159
9.6.19	Resource Type <i>m2mServiceSubscriptionProfile</i> .....	164
9.6.20	Resource Type <i>serviceSubscribedNode</i> .....	165
9.6.21	Resource Type <i>pollingChannel</i> .....	167
9.6.22	Resource Type <i>pollingChannelURI</i> .....	167
9.6.23	Resource Type <i>statsConfig</i> .....	167
9.6.24	Resource Type <i>eventConfig</i> .....	168
9.6.25	Resource Type <i>statsCollect</i> .....	171
9.6.26	Resource Announcement .....	172
9.6.26.1	Overview .....	172
9.6.26.2	Universal Attributes for Announced Resources .....	175
9.6.26.3	Common Attributes for Announced Resources .....	175
9.6.27	Resource Type <i>latest</i> .....	176
9.6.28	Resource Type <i>oldest</i> .....	176
9.6.29	Resource Type <i>serviceSubscribedAppRule</i> .....	176
9.6.30	Resource Type <i>semanticDescriptor</i> .....	177
9.6.31	Resource Type <i>notificationTargetMgmtPolicyRef</i> .....	179
9.6.32	Resource Type <i>notificationTargetPolicy</i> .....	180
9.6.33	Resource Type <i>policyDeletionRules</i> .....	182
9.6.34	Resource Type <i>notificationTargetSelfReference</i> .....	183
9.6.35	Resource Type <i>flexContainer</i> .....	184
9.6.36	Resource Type <i>timeSeries</i> .....	186
9.6.37	Resource Type <i>timeSeriesInstance</i> .....	188
9.6.38	Resource Type <i>role</i> .....	189
9.6.39	Resource Type <i>token</i> .....	190
9.6.40	Resource Type <i>dynamicAuthorizationConsultation</i> .....	192
9.6.41	Resource Type <i>trafficPattern</i> .....	193
10	Information Flows .....	196
10.1	Basic Procedures .....	196
10.1.0	Overview .....	196
10.1.1	CREATE (C) .....	196
10.1.1.0	Introduction .....	196
10.1.1.1	Non-registration related CREATE procedure .....	196
10.1.1.2	Registration related CREATE procedure .....	198
10.1.1.2.0	Overview .....	198



10.1.1.2.1	CSE Registration procedure .....	198
10.1.1.2.2	Application Entity Registration procedure .....	199
10.1.2	RETRIEVE (R).....	204
10.1.3	UPDATE (U).....	205
10.1.4	DELETE (D).....	206
10.1.4.0	Introduction.....	206
10.1.4.1	Non-deregistration related DELETE procedure .....	206
10.1.4.2	Deregistration related DELETE procedure .....	207
10.1.4.2.0	Overview .....	207
10.1.4.2.1	CSE Deregistration procedure .....	207
10.1.4.2.2	Application Entity Deregistration procedure.....	208
10.1.5	NOTIFY (N).....	208
10.2	Resource Type-Specific Procedures.....	209
10.2.0	Overview .....	209
10.2.1	<AE> Resource Procedures.....	209
10.2.1.1	Create <AE> .....	209
10.2.1.2	Retrieve <AE> .....	209
10.2.1.3	Update <AE> .....	210
10.2.1.4	Delete <AE> .....	210
10.2.1.5	Notify <AE> .....	211
10.2.2	<remoteCSE> Resource Procedures .....	211
10.2.2.1	Create <remoteCSE>.....	211
10.2.2.2	Retrieve <remoteCSE>.....	211
10.2.2.3	Update <remoteCSE>.....	212
10.2.2.4	Delete <remoteCSE>.....	212
10.2.3	<CSEBase> Resource Procedures.....	213
10.2.3.1	Create <CSEBase> .....	213
10.2.3.2	Retrieve <CSEBase> .....	213
10.2.3.3	Update <CSEBase> .....	213
10.2.3.4	Delete <CSEBase> .....	213
10.2.3.5	Notify <CSEBase> .....	214
10.2.4	<container> Resource Procedures .....	214
10.2.4.1	Create <container>.....	214
10.2.4.2	Retrieve <container> .....	215
10.2.4.3	Update <container> .....	215
10.2.4.4	Delete <container>.....	216
10.2.5	Access to Remotely Hosted Resources via <delivery> .....	216
10.2.5.1	Introduction to usage of <delivery> resource type .....	216
10.2.5.2	Create <delivery> .....	219
10.2.5.3	Retrieve <delivery> .....	220
10.2.5.4	Update <delivery> .....	221
10.2.5.5	Delete <delivery> .....	221
10.2.6	Resource Discovery Procedures .....	222
10.2.6.1	Introduction.....	222
10.2.6.2	Discovery procedure via Retrieve Operation .....	222
10.2.7	Group Management Procedures.....	224
10.2.7.1	Introduction.....	224
10.2.7.2	Create <group> .....	224
10.2.7.3	Retrieve <group> .....	225
10.2.7.4	Update <group> .....	225
10.2.7.5	Delete <group> .....	226
10.2.7.6	<fanOutPoint> Management Procedures .....	227
10.2.7.7	Create <fanOutPoint> .....	228
10.2.7.8	Retrieve <fanOutPoint> .....	229
10.2.7.9	Update <fanOutPoint> .....	231
10.2.7.10	Delete <fanOutPoint> .....	232
10.2.7.11	Subscribe and Un-Subscribe <fanOutPoint> of a group.....	234
10.2.7.12	Aggregate the Notifications by group .....	235
10.2.7.13	<semanticFanOutPoint> Procedures .....	236
10.2.7.14	Retrieve <semanticFanOutPoint>.....	236
10.2.8	<mgmtObj> Resource Procedures .....	237
10.2.8.1	Introduction.....	237

10.2.8.2	Create <mgmtObj> .....	238
10.2.8.3	Retrieve <mgmtObj> .....	240
10.2.8.4	Update <mgmtObj> .....	240
10.2.8.5	Delete <mgmtObj> .....	241
10.2.8.6	Execute <mgmtObj> .....	242
10.2.9	External Management Operations through <mgmtCmd> .....	243
10.2.9.1	Introduction .....	243
10.2.9.2	Create <mgmtCmd> .....	244
10.2.9.3	Retrieve <mgmtCmd> .....	244
10.2.9.4	Update <mgmtCmd> .....	245
10.2.9.5	Delete <mgmtCmd> .....	245
10.2.9.6	Execute <mgmtCmd> .....	247
10.2.9.7	Cancel <execInstance> .....	248
10.2.9.8	Retrieve <execInstance> .....	249
10.2.9.9	Delete <execInstance> .....	250
10.2.10	Location Management Procedures .....	251
10.2.10.1	Procedure related to <locationPolicy> resource .....	251
10.2.10.1.0	Overview .....	251
10.2.10.1.1	Create <locationPolicy> .....	251
10.2.10.1.2	Retrieve <locationPolicy> .....	252
10.2.10.1.3	Update <locationPolicy> .....	253
10.2.10.1.4	Delete <locationPolicy> .....	253
10.2.10.2	Procedure when the <container> and <contentInstance> resource contain location information .....	254
10.2.10.2.0	Overview .....	254
10.2.10.2.1	Procedure for <container> resource that stores the location information .....	254
10.2.10.2.2	Procedure for <contentInstance> resource that stores location information .....	254
10.2.11	<subscription> Resource Procedures .....	255
10.2.11.1	Introduction .....	255
10.2.11.2	Create <subscription> .....	255
10.2.11.3	Retrieve <subscription> .....	255
10.2.11.4	Update <subscription> .....	256
10.2.11.5	Delete <subscription> .....	256
10.2.12	Notification Procedures for Resource Subscription .....	257
10.2.12.0	Overview .....	257
10.2.12.1	Procedure for Originator of Notifications and Hosting CSEs .....	257
10.2.12.2	Procedure for Target Receivers of Notifications .....	260
10.2.12.2.0	Overview .....	260
10.2.12.2.1	Notification Target removal handling procedure .....	261
10.2.13	Polling Channel Management Procedures .....	261
10.2.13.1	Introduction .....	261
10.2.13.2	Create <pollingChannel> .....	262
10.2.13.3	Retrieve <pollingChannel> .....	263
10.2.13.4	Update <pollingChannel> .....	263
10.2.13.5	Delete <pollingChannel> .....	263
10.2.13.6	Internal Processing for Polling Channel .....	264
10.2.13.7	Long Polling on Polling Channel .....	264
10.2.13.8	Delivering the response to the request sent over polling channel .....	265
10.2.14	<node> Resource Procedures .....	266
10.2.14.1	Create <node> .....	266
10.2.14.2	Retrieve <node> .....	266
10.2.14.3	Update <node> .....	267
10.2.14.4	Delete <node> .....	267
10.2.15	Service Charging and Accounting Procedures .....	267
10.2.15.1	Introduction .....	267
10.2.15.1.0	Overview .....	267
10.2.15.1.1	Service Event-based Statistics Collection for Applications .....	268
10.2.15.2	Create <statsConfig> .....	269
10.2.15.3	Retrieve <statsConfig> .....	270
10.2.15.4	Update <statsConfig> .....	270
10.2.15.5	Delete <statsConfig> .....	271
10.2.15.6	Create <eventConfig> .....	272
10.2.15.7	Retrieve <eventConfig> .....	272



10.2.15.8	Update <eventConfig> .....	272
10.2.15.9	Delete <eventConfig> .....	273
10.2.15.10	Create <statsCollect> .....	273
10.2.15.11	Retrieve <statsCollect> .....	274
10.2.15.12	Update <statsCollect> .....	274
10.2.15.13	Delete <statsCollect> .....	275
10.2.15.14	Service Statistics Collection Record .....	275
10.2.16	<m2mServiceSubscriptionProfile> Resource Procedures .....	276
10.2.16.1	Create <m2mServiceSubscriptionProfile> .....	276
10.2.16.2	Retrieve <m2mServiceSubscriptionProfile> .....	277
10.2.16.3	Update <m2mServiceSubscriptionProfile> .....	277
10.2.16.4	Delete <m2mServiceSubscriptionProfile> .....	278
10.2.17	<serviceSubscribedNode> Resource Procedures .....	278
10.2.17.1	Create <serviceSubscribedNode> .....	278
10.2.17.2	Retrieve <serviceSubscribedNode> .....	279
10.2.17.3	Update <serviceSubscribedNode> .....	279
10.2.17.4	Delete <serviceSubscribedNode> .....	279
10.2.18	Resource Announcement Procedures .....	280
10.2.18.1	Procedure for AE and CSE to initiate Creation of an Announced Resource .....	280
10.2.18.2	Procedure at AE or CSE to Retrieve information from an Announced Resource .....	281
10.2.18.3	Procedure for AE and CSE to initiate Deletion of an Announced Resource .....	283
10.2.18.4	Procedure for original resource Hosting CSE to Create an Announced Resource .....	284
10.2.18.5	Procedure for original resource Hosting CSE to Delete an Announced Resource .....	285
10.2.18.6	Procedure for AE and CSE to initiate the Creation of an Announced Attribute .....	285
10.2.18.7	Procedure for AE and CSE to initiate the Deletion of an Announced Attribute .....	286
10.2.18.8	Procedure for original resource Hosting CSE for Announcing Attributes .....	287
10.2.18.9	Procedure for original resource Hosting CSE for De-Announcing Attributes .....	288
10.2.18.10	Procedure for original resource Hosting CSE for Updating Attributes .....	289
10.2.18.11	Notification Procedure targeting an AE Announced Resource .....	290
10.2.19	<contentInstance> Resource Procedures .....	290
10.2.19.1	Introduction .....	290
10.2.19.2	<contentInstance> CREATE .....	290
10.2.19.3	<contentInstance> RETRIEVE .....	291
10.2.19.4	<contentInstance> UPDATE .....	291
10.2.19.5	<contentInstance> DELETE .....	291
10.2.20	<request> Resource Procedures .....	291
10.2.20.1	Create <request> .....	291
10.2.20.2	Retrieve <request> .....	294
10.2.20.3	Update <request> .....	294
10.2.20.4	Delete <request> .....	294
10.2.21	<accessControlPolicy> Resource Procedures .....	295
10.2.21.1	Create <accessControlPolicy> .....	295
10.2.21.2	Retrieve <accessControlPolicy> .....	295
10.2.21.3	Update <accessControlPolicy> .....	296
10.2.21.4	Delete <accessControlPolicy> .....	296
10.2.22	<latest> Resource Procedures .....	296
10.2.22.0	Overview .....	296
10.2.22.1	Retrieve <latest> .....	296
10.2.22.2	Delete <latest> .....	297
10.2.23	<oldest> Resource Procedure .....	297
10.2.23.0	Overview .....	297
10.2.23.1	Retrieve <oldest> .....	297
10.2.23.2	Delete <oldest> .....	297
10.2.24	<serviceSubscribedAppRule> Resource Procedures .....	297
10.2.24.1	Create <serviceSubscribedAppRule> .....	297
10.2.24.2	Retrieve <serviceSubscribedAppRule> .....	298
10.2.24.3	Update <serviceSubscribedAppRule> .....	298
10.2.24.4	Delete <serviceSubscribedAppRule> .....	298
10.2.25	<notificationTargetSelfReference> Resource Procedures .....	299
10.2.25.0	Overview .....	299
10.2.25.1	Delete <notificationTargetSelfReference> .....	299
10.2.26	<notificationTargetMgmtPolicyRef> Resource Procedures .....	299

10.2.26.1	Create <notificationTargetMgmtPolicyRef> .....	299
10.2.26.2	Retrieve <notificationTargetMgmtPolicyRef> .....	300
10.2.26.3	Update <notificationTargetMgmtPolicyRef> .....	300
10.2.26.4	Delete <notificationTargetMgmtPolicyRef> .....	300
10.2.27	<notificationTargetPolicy> Resource Procedures .....	301
10.2.27.1	Create <notificationTargetPolicy> .....	301
10.2.27.2	Retrieve <notificationTargetPolicy> .....	301
10.2.27.3	Update <notificationTargetPolicy> .....	301
10.2.27.4	Delete <notificationTargetPolicy> .....	302
10.2.28	<policyDeletionRules> Resource Procedures .....	302
10.2.28.1	Create <policyDeletionRules> .....	302
10.2.28.2	Retrieve <policyDeletionRules> .....	302
10.2.28.3	Update <policyDeletionRules> .....	302
10.2.28.4	Delete <policyDeletionRules> .....	303
10.2.29	<flexContainer> Resource Procedures .....	303
10.2.29.1	Create <flexContainer> .....	303
10.2.29.2	Retrieve <flexContainer> .....	304
10.2.29.3	Update <flexContainer> .....	304
10.2.29.4	Delete <flexContainer> .....	304
10.2.30	<timeSeries> Resource Procedures .....	305
10.2.30.1	Create <timeSeries> .....	305
10.2.30.2	Retrieve <timeSeries> .....	305
10.2.30.3	Update <timeSeries> .....	305
10.2.30.4	Delete <timeSeries> .....	306
10.2.31	<timeSeriesInstance> Resource Procedures .....	306
10.2.31.1	Create <timeSeriesInstance> .....	306
10.2.31.2	Retrieve <timeSeriesInstance> .....	307
10.2.31.3	Update <timeSeriesInstance> .....	307
10.2.31.4	Delete <timeSeriesInstance> .....	307
10.2.32	<semanticDescriptor> Resource Procedures .....	308
10.2.32.1	Create <semanticDescriptor> .....	308
10.2.32.2	Retrieve <semanticDescriptor> .....	308
10.2.32.3	Update <semanticDescriptor> .....	309
10.2.32.4	Delete <semanticDescriptor> .....	309
10.2.33	<role> Resource Procedures .....	309
10.2.33.1	Create <role> .....	309
10.2.33.2	Retrieve <role> .....	310
10.2.33.3	Update <role> .....	310
10.2.33.4	Delete <role> .....	311
10.2.34	<token> Resource Procedures .....	311
10.2.34.1	Create <token> .....	311
10.2.34.2	Retrieve <token> .....	312
10.2.34.3	Update <token> .....	312
10.2.34.4	Delete <token> .....	312
10.2.35	Semantic Discovery Procedures .....	313
10.2.35.1	Introduction .....	313
10.2.35.2	Discovering and establishing the logical tree in the semantic discovery scope without the use of <semanticFanOutPoint> .....	313
10.2.35.2.0	Overview .....	313
10.2.35.2.1	Annotation-based method .....	313
10.2.35.2.2	Resource link-based method .....	314
10.2.36	Void .....	314
10.2.37	<trafficPattern> Resource Procedures .....	314
10.2.37.1	Create <trafficPattern> .....	314
10.2.37.2	Retrieve <trafficPattern> .....	315
10.2.37.3	Update <trafficPattern> .....	316
10.2.37.4	Delete <trafficPattern> .....	316
10.2.38	<dynamicAuthorizationConsultation> Resource Procedures .....	317
10.2.38.1	Create <dynamicAuthorizationConsultation> .....	317
10.2.38.2	Retrieve <dynamicAuthorizationConsultation> .....	317
10.2.38.3	Update <dynamicAuthorizationConsultation> .....	317
10.2.38.4	Delete <dynamicAuthorizationConsultation> .....	318

10.2.39	Procedure for Time Series Data Detecting and Reporting .....	318
10.3	Notification procedures .....	319
10.3.1	Overview .....	319
11	Trust Enabling Architecture .....	320
11.0	Overview .....	320
11.1	Enrolling M2M Nodes and M2M Applications for oneM2M Services .....	320
11.2	M2M Initial Provisioning Procedures .....	321
11.2.1	M2M Node Enrolment and Service Provisioning .....	321
11.2.2	M2M Application Enrolment .....	321
11.3	M2M Operational Security Procedures .....	321
11.3.0	Overview .....	321
11.3.1	Identification of CSE and AE .....	323
11.3.2	Authentication and Security Association of CSE and AE .....	323
11.3.3	Void .....	324
11.3.4	M2M Authorization Procedure .....	324
11.4	Functional Architecture Specifications for End-to-End Security Procedures .....	325
11.4.1	Functional Architecture Specifications for End-to-End Security of Data (ESData) .....	325
11.4.2	Functional Architecture Specifications for End-to-End Security of Primitives (ESPrim) .....	325
11.4.3	Functional Architecture Specifications for Direct End-to-End Security Certificate-based Key Establishment (ESCertKE) .....	331
11.5	Functional Architecture Specifications for Dynamic Authorization .....	333
11.5.1	Dynamic Authorization Reference Model .....	333
11.5.2	Direct Dynamic Authorization .....	334
11.5.3	Indirect Dynamic Authorization .....	336
12	Information Recording .....	339
12.1	M2M Infrastructure Node (IN) Information Recording .....	339
12.1.0	Overview .....	339
12.1.1	Information Recording Triggers .....	339
12.1.2	M2M Recorded Information Elements .....	339
12.1.2.1	Unit of Recording .....	339
12.1.2.2	Information Elements within an M2M Event Record .....	339
12.1.3	Identities Associations in Support of Recorded Information .....	341
12.2	Offline Charging .....	341
12.2.1	Architecture .....	341
12.2.2	Filtering of Recorded Information for Offline Charging .....	342
12.2.3	Examples of Charging Scenarios .....	342
12.2.3.0	Overview .....	342
12.2.3.1	Example Charging Scenario 1 - Data Storage Resource Consumption .....	343
12.2.3.2	Example Charging Scenario 2 - Data transfer .....	343
12.2.3.3	Example Charging Scenario 3 - Connectivity .....	343
12.2.4	Definition of Charging Information .....	343
12.2.4.0	Overview .....	343
12.2.4.1	Triggers for Charging Information .....	343
12.2.4.2	Charging Messages over Mch Reference Point .....	343
12.2.4.3	Structure of the Accounting Message Formats .....	343
12.2.4.3.1	Accounting-Request Message .....	343
12.2.4.3.2	Accounting-Answer Message .....	344
<b>Annex A (informative):</b>	<b>Mapping of Requirements with CSFs .....</b>	<b>345</b>
<b>Annex B (informative):</b>	<b>oneM2M System and 3GPP MTC Underlying Network Interworking ..</b>	<b>348</b>
B.1	3GPP MTC Underlying Network Introduction .....	348
B.2	3GPP MTC Functionality .....	348
B.2.1	3GPP Release-11 MTC Functionality .....	348
B.2.2	3GPP Release-13 MTC Interworking .....	350
B.2.2.1	General overview of 3GPP Release-13 MTC Interworking .....	350
B.2.2.2	3GPP Release-13 MTC feature for Configuration of Device Communication Patterns .....	353
B.3	ASN/MN-CSE initiated connectivity establishment .....	355
B.3.0	Overview .....	355

B.3.1	Use of DHCP and DNS .....	355
B.3.2	Pre-configuration.....	355
B.4	Serving IN-CSE initiated connectivity establishment.....	355
B.5	Connectivity between oneM2M Service Layer and 3GPP Underlying Network.....	355
B.6	Connectivity Establishment Procedures.....	356
B.6.1	General .....	356
B.6.1.0	Overview .....	356
B.6.1.1	ASN/MN-CSE Initiated Connectivity Establishment Procedure.....	357
B.6.1.2	IN-CSE initiated connectivity establishment procedure over Tsp.....	358
<b>Annex C (informative):</b>	<b>Interworking between oneM2M System and 3GPP2 Underlying Networks.....</b>	<b>361</b>
C.1	General Concepts .....	361
C.2	M2M Communication Models.....	361
C.3	3GPP2 Architectural Reference Model for M2M .....	363
C.4	Communication between oneM2M Service Layer and 3GPP2 Underlying Network.....	363
C.5	Information Flows .....	364
C.5.0	Overview .....	364
C.5.1	Tsp Interface Call Flow .....	365
C.5.2	Point to Point Device Triggering.....	366
C.5.3	Broadcast Device Triggering.....	366
<b>Annex D (normative):</b>	<b>&lt;mgmtObj&gt; Resource Instances Description.....</b>	<b>367</b>
D.1	oneM2M Management Functions.....	367
D.2	Resource <i>firmware</i> .....	367
D.3	Resource <i>software</i> .....	368
D.4	Resource <i>memory</i> .....	371
D.5	Resource <i>areaNwkInfo</i> .....	372
D.6	Resource <i>areaNwkDeviceInfo</i> .....	374
D.7	Resource <i>battery</i> .....	376
D.8	Resource <i>deviceInfo</i> .....	378
D.9	Resource <i>deviceCapability</i> .....	380
D.10	Resource <i>reboot</i> .....	382
D.11	Resource <i>eventLog</i> .....	384
D.12	Resource <i>cmdhPolicy</i> .....	385
D.12.0	Overview .....	385
D.12.1	Resource <i>activeCmdhPolicy</i> .....	387
D.12.2	Resource <i>cmdhDefaults</i> .....	388
D.12.3	Resource <i>cmdhDefEcValue</i> .....	389
D.12.4	Resource <i>cmdhEcDefParamValues</i> .....	392
D.12.5	Resource <i>cmdhLimits</i> .....	394
D.12.6	Resource <i>cmdhNetworkAccessRules</i> .....	396
D.12.7	Resource <i>cmdhNwAccessRule</i> .....	398
D.12.8	Resource <i>cmdhBuffer</i> .....	402
<b>Annex E (informative):</b>	<b>CSE Minimum Provisioning.....</b>	<b>404</b>
<b>Annex F (informative):</b>	<b>Interworking/Integration of non-oneM2M solutions and protocols .....</b>	<b>405</b>
F.1	Introduction .....	405

F.2	Interworking with non-oneM2M solutions through specialized interworking applications .....	405
F.3	Interworking versus integration of non-oneM2M solutions.....	408
F.4	Entity-relation representation of non-IP based M2M Area Network.....	408
F.4.0	Overview .....	408
F.4.1	Responsibilities of Interworking Proxy Application Entity (IPE).....	409
<b>Annex G:</b>	<b>Void .....</b>	<b>410</b>
<b>Annex H (informative):</b>	<b>Object Identifier Based M2M Device Identifier .....</b>	<b>411</b>
H.1	Overview of Object Identifier .....	411
H.2	OID Based M2M Device Identifier.....	411
H.2.0	Overview .....	411
H.2.1	M2M Device Indication ID - (higher arc).....	412
H.2.2	Manufacturer ID - (x).....	412
H.2.3	Model ID - (y).....	412
H.2.4	Serial Number ID - (z).....	412
H.2.5	Expanded ID - (a).....	412
H.3	Example of M2M device ID based on OID.....	413
<b>Annex I (informative):</b>	<b>Resource addressing examples.....</b>	<b>414</b>
I.1	Example resource tree .....	414
I.2	Valid resource IDs.....	415
<b>Annex J (informative):</b>	<b>Bibliography.....</b>	<b>419</b>
<b>Annex K (normative):</b>	<b>Syntaxes for content based discovery of &lt;contentInstance&gt;.....</b>	<b>420</b>
K.1	Introduction .....	420
K.2	'jsonpath' query syntax .....	420
History	.....	421

iTech STANDARD PREVIEW  
 (standards.it-ch.at)  
 Full standard:  
<https://standards.it-ch.at/catalog/standards/sist/9c525314-2224-486f-b102-07ec697217e9/etsi-ts-118-101-v2-10-0-2016-10>