



oneM2M;
Continuation & integration of HGI Smart Home activities
(oneM2M TR-0022 version 2.0.0)

PREVIEW
(standards.it-euh.eu)
Full standards catalog: <https://standards.it-euh.eu/catalogs/standards/sist/c5e17b2e-80e0-45a3-a51b-e1fe5360c41c/et118-522-v2.0.0-2016-09>



Reference

DTR/oneM2M-000022

Keywords

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	4
Foreword.....	4
1 Scope	5
2 References	5
2.1 Normative references	5
2.2 Informative references.....	5
3 Definitions, symbols and abbreviations	6
3.1 Definitions.....	6
3.2 Symbols.....	6
3.3 Abbreviations	6
4 Conventions.....	6
5 Technical description of HGI Smart Home activities in a generic IoT context	7
5.1 General Introduction to HGI SmartHome concepts and motivation of integration to oneM2M	7
5.2 Smart Home Architecture and requirements for Reference Points, HGI-RD036.....	7
5.3 Smart Device Template	9
5.4 Wireless Home Area Networks consideration, HGI-RD039.....	10
5.5 Home gateway Open platform, HGI-RD048.....	10
6 Integration of HGI SH items into oneM2M work items	11
6.1 Update of oneM2M WIs already including some HGI SH inputs.....	11
6.2 other oneM2M WIs to be involved.....	12
6.3 Potential need for (a) new oneM2M W1(s)	13
History	14

iTeh STANDARD PREVIEW
 (standards.iteh.ai)
 Full standard:
<https://standards.iteh.ai/catalog/standards/sist/c5e7b2e-80e0-45a3-a51b-e1fe5360c41c/etsi-tr-118-522-v2.0.0-2016-09>

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<https://ipr.etsi.org/>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This Technical Report (TR) has been produced by ETSI Partnership Project oneM2M (oneM2M).

iTeh STANDARD PREVIEW
(standards.iteh.ai)
Full standard:
<https://standards.iteh.ai/catalog/standards/sist/c5e17b2e-80e0-45a3-a51b-e1fe5360c41c/etsi-tr-118-522-v2.0.0-2016-09>

1 Scope

The present document is a study of the continuation and integration of some HGI Smart Home activities into oneM2M, following the (PT2) HGI announcement of its closure by June 2016. It includes the description of HGI SH deliverables versus the appropriate oneM2M deliverables for the integration of these HGI achievements.

It intends to be used as a liaison working document with HGI about the status progress of this continuation and integration and is expected to be useful for both HGI and oneM2M to check that all technical items from HGI SH Task Force expected to be integrated are appropriately handled by 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.

Referenced documents which are not found to be publicly available in the expected location might be found at <https://docbox.etsi.org/Reference/>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

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

Not applicable.

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 referenced document (including any amendments) applies.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

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://www.onem2m.org/images/files/oneM2M-Drafting-Rules.pdf>.

[i.2] ETSI TS 118 11 oneM2M TS-0011: "Common Terminology".

[i.3] ETSI TR 118 517: "Home Domain Abstract Information Model".

[i.4] ETSI TR 118 507: "Abstraction and Semantics Capability Enablement".

[i.5] ETSI TS 118 123: "Home Appliances Information Model and Mapping".

[i.6] ETSI TS 118 101: "Functional Architecture".

[i.7] Home Gateway Initiative HGI-RD036: "Smart Home architecture and system requirements".

NOTE: Available at <http://www.homegatewayinitiative.org/userfiles/file/downloads/RD036Publication.pdf>.

[i.8] Smart (Home) Device Template (SDT).

NOTE: Available at <https://github.com/Homegateway/SmartDeviceTemplate/>.

[i.9] Home Gateway Initiative HGI RD039: "Requirements for Wireless Home Area Networks (WHANs) Supporting Smart Home Services".

NOTE: Available at <http://www.homegatewayinitiative.org/userfiles/file/downloads/RD039-Req-for-Wireless-home-area-networks.pdf>.

[i.10] Home Gateway Initiative HGI-RD048: "HG Requirements For HGI Open Platform 2.1".

NOTE: Available at http://www.homegatewayinitiative.org/userfiles/file/downloads/HGI-RD048-HG_Requirements_for_HGI_Open_Platform_2_0_published_text.pdf.

[i.11] ECHONET Consortium

NOTE: Available at <https://github.com/Homegateway/ECHONET-SDT-Contribution>.

[i.12] OSGi Alliance.

NOTE: Available at <http://www.osgi.org>.

[i.13] Eclipse Vorto Project.

NOTE: Available at <http://eclipse.org/vorto>.

[i.14] ETSI TS 118 104: "oneM2M; Service Layer Core Protocol Specification (oneM2M TS-0004)".

[i.15] ETSI TS 118 112: "oneM2M; Base Ontology (oneM2M TS-0012)".

3 Definitions, symbols 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 Symbols

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

3.3 Abbreviations

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

CWMP	CPE (Customer Premises Equipment) WAN (Wide Area Network) Management Protocol
DAL	Device Abstraction Layer
HGI	Home Gateway Initiative
RMS	Remote Management System
SHGW	Smart Home Gateway
SHTF	Smart Home Task Force
WHAN	Wireless Home Area Network
WI	Work Item

4 Conventions

The key words "Shall", "Shall not", "May", "Need not", "Should", "Should not" in the present document are to be interpreted as described in the oneM2M Drafting Rules [i.1].

5 Technical description of HGI Smart Home activities in a generic IoT context

5.1 General Introduction to HGI SmartHome concepts and motivation of integration to oneM2M

The HGI Smart Home Task Force global objective was to defragment the Smart Home market and propose unified concepts identified as of prime importance around the Smart Home Gateway (SHGW) in order to facilitate the adoption and the use of such a product and related services in homes.

These concepts can be categorized into three main trends:

- modularity of the SHGW middleware to allow for flexible evolution of the services offered to the user;
- abstraction of the (possibly various) underlying connectivity technologies of the devices connected to the SHGW;
- identification of reference points that need to be standardized to foster open exposure to mutualized functions at the SHGW level as enablers for local or remote services.

As similar concepts are handled by oneM2M at the Service Layer level for the IoT domain in general, some technical achievements from HGI SHTF can be merged into some of the oneM2M deliverables, which is a supplementary path towards more de-fragmentation of the IoT domain. The remaining subsections of this section 5 summarizes these HGI SHTF achievements to be considered.

5.2 Smart Home Architecture and requirements for Reference Points, HGI-RD036

HGI-RD036 [i.7] deliverable presents the HGI reference architecture for the Smart Home Gateway (SHGW) and identifies the reference points that are at stake to deliver the smart home services, be it locally or remotely.

Figure 5.2-1 shows this reference architecture, which is driven by the requirements of modularity and device abstraction allowed by the SHGW.

The Reference Points between the appliances (devices) and the SHGW and between the SHGW and the Cloud are designated by "RPx" on figure 5.2-1.

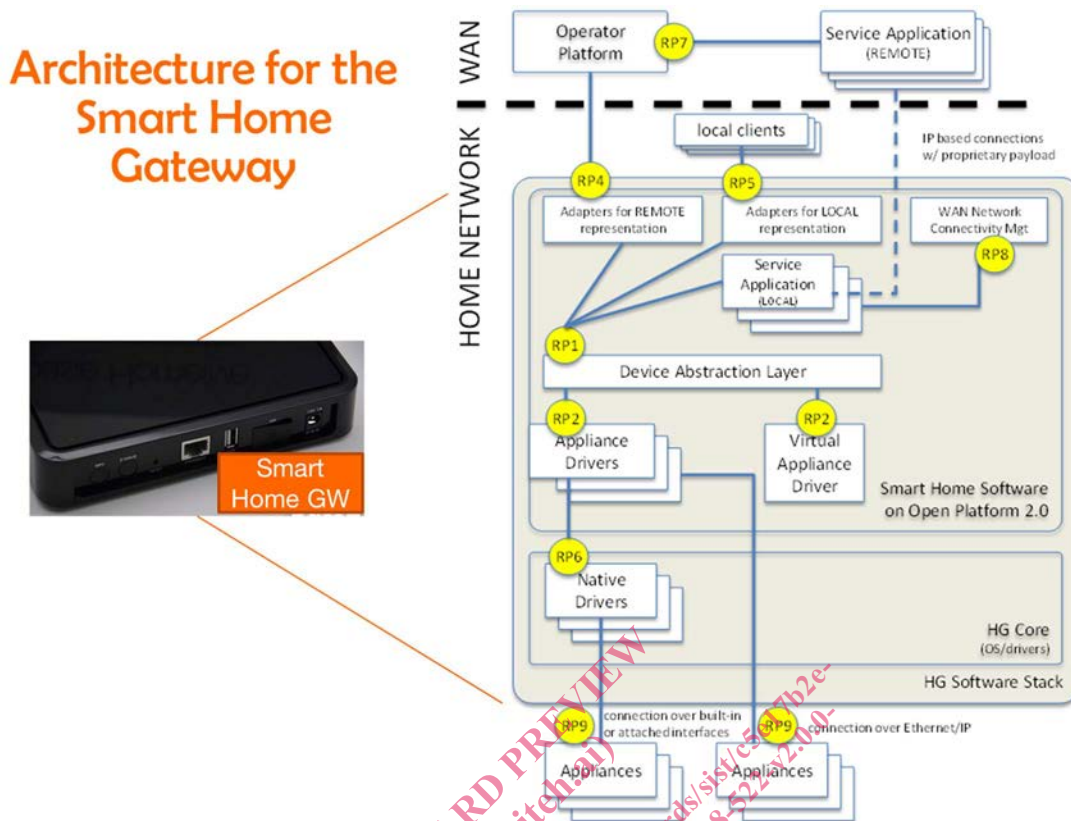


Figure 5.2-1: SHGW reference architecture and Reference Points

When comparing this architecture with the oneM2M architecture ETSI TS 118 101 [i.6], the following points can be examined:

- the SHGW as a oneM2M Middle Node;
- RP4 as an example of oneM2M Mcc reference point;
- RP7 as an example of Mca reference point; and
- RP8 as an example of Mcn reference point.

This comparison is further detailed under clause 6.

As for the Device Abstraction Layer, this is further focused on figure 5.2-2, which points out the distinction between:

- the "south" part of the DAL where the goal is to abstract the various device-connectivity technologies; and
- the "north" part of the DAL where the goal is to decouple the applicative-specific i.e.various applicative domains, with their specific ontologies, and unify the meaning of commands from the application side.

The purpose of device abstraction is indeed to allow creators of applications on SHGWs and/or in the Cloud to discover, identify, read, configure and manipulate devices, without needing to modify the software for each and every manufacturer model or type of wireless access, etc.

Figure 5.2-2 also shows the SDT (Smart Device Template) as part of this Device Abstraction process. This SDT is explained in more details under clause 5.3.

SDT = part of the Device Abstraction Layer

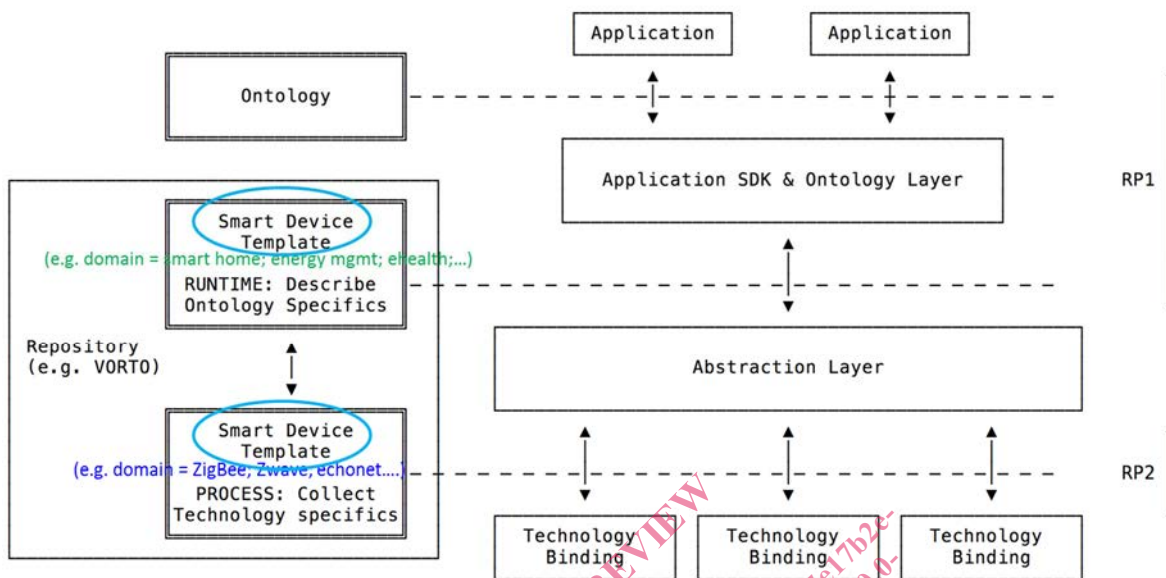


Figure 5.2-2: SDT place in the Device Abstraction process

5.3 Smart Device Template

The SDT (Smart Device Template [i.8]) is an initiative from HGI to find consensus amongst various SDOs and industry alliances to derive a common approach for device modelling. HGI and partners have the approach to agree on a set of automation commands, following a common syntax, which are sufficient to model most home appliance functions.

Every software developed for home gateways or internet-of-things gateways needs to be capable of using various different protocols (DECT ULE, EchonetLite, UpnP, ZigBee®, etc.) to interact with a range of devices designed for the home environment. This adds extreme overheads in integrating, checking and updating code. The purpose of SDT is to describe devices and device services in a way which is independent of the LAN technology, in a format which is convenient and reliable for integration in modern code (Java, C/C++, etc.).

The key goals of the SDT are:

- 1) keep it simple, especially for manufacturers to contribute device information;
- 2) modularity for functions and device types;
- 3) make it easy for developers to create unified APIs;
- 4) be independent of underlying home-area network technologies;
- 5) enable extensibility of the system in place without service interruption;
- 6) allow a pass-through mechanism to enable use of proprietary or technology-specific functions.

The SDT approach is to define re-usable basic functions (or services), labelled "ModuleClass", which can represent the typical functions found in many home automation systems, such as "on/off", "dim a lamp", "receive events from binary sensor", "read data from sensor", etc. Each ModuleClass is composed of a (small) number of actions, datapoint read/write operations, or asynchronous events. For example, an "on/off" ModuleClass would consist perhaps of just one Action, but a "ReadKeypad" Action might have a number of possible events, each with some data value and (usually) a sequence-ID or timestamp start/stop to indicate when and how long each key was pressed.

More details about SDT can now be found in ETSI TR 118 517 [i.3], clause 5.1.3.