Home Network Transport

Standards Overview and Work Plan

September 2022 Q1/15 meeting

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Home Network Transport is an ITU-T Project dealing with studies and Recommendations on the Home Network. The present Home Network Transport (HNT) Standards Overview and Work Plan is part of ITU-T SG15 Lead Study Group activities on coordination of Home Network Transport standards.

Home Network Transport Standards Overview and Work Plan

**Issue 14, September 2022**

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| Revision Status Report: Major Updates of Version 14, September 2022 |
| In this version 14, following changes, additions and updates have been made.  1) Section “General” has been reviewed.  2) Section 1 from previous version 13 - Home Network activities in ITU-T Study Groups has been reorganized in 2 new sections:  - new Section 1 - Home Network activities in ITU-T SG15 – WP1/15 - new Section 2 - Home Network activities within other ITU-T Study Groups  3) new Section 1 - Home Network activities in ITU-T SG15 – WP1/15  Table 1.1 - “Published” Recommendations related to Home Network within ITU-T SG15 Question 3/15 has been updated as below:   * ITU-T SG15 Recommendations G.9960 (2018) Amd.3 (02/2022); G.9961 (2018) Amd.4 (05/2022); G.9976 (12/2021) and G.9978 (2018) Amd.1 (05/2022) have been added. * ITU-T SG15 Technical Paper GSTP-OVHN (12/2021) has been added.   Table 1.2 - Recommendations “Under Study” related to Home Network within ITU-T SG15 Question 3/15 has been updated.   * The list of items “Under Study” has been updated with the latest Q3/15 activities resulting from September 2022 SG15 WP1 plenary meeting.   4) new Section 2 - Home Network activities within other ITU-T Study Groups  Table 2 has been updated as below:   * ITU-T SG5: K.137 (01/2022) has been added, K.21 (08/2022) and K.147 (01/2022) has been updated. Reference to liaison SG5-LS16 from ITU-T SG5 in SG15 TD 9 WP1 September 2022 has been added. * ITU-T SG9 Recommendation J.198.1 (01/2022) and J.1612 (01/2022) have been updated. * ITU-T SG15 WP2/15 Recommendations G.651.1 (11/2018); G.652 (11/2016); L.209 (02/2022) and L.400/L.12 (02/2022) have been added. * ITU-T SG16: Recommendation H.721 (03/2022) has been updated. Reference to liaison SG16-LS311 from ITU-T SG16 in SG15 TD 4 WP1 September 2022 has been added. * ITU-T SG20 Recommendation Y.4409/Y.2070 (01/2015) has been added.   5) Section 2 from previous Version 13 - Home Network Activities within ITU-R and other Standard Developing Organizations has been reorganized in 2 new sections: - a new section 3 - Home Network activities in ITU-R Study Groups - a new section 4 - Home Network activities in other Standards Development Organizations  6) new Section 3 - Home Network related activities within ITU-R Study Groups Table 3 has been updated as below:   * ITU-R SG1: Report ITU-R SM.2422-1 (06/2019) has been added and Report SM.2351-3 (06/2021) has been updated. * ITU-R SG5 latest information on Guide to the use of ITU-R texts has been updated. * ITU-R SG6 latest information on Future of Broadcasting (RG-FOB) has been added. Reference to liaison ITU-RSG6-Doc6/233 from ITU-R SG6 in SG15 TD 12 GEN September 2022 has been added.   7) new Section 4 - Home Network related activities in other Standards Development Organizations  Table 4 has been updated as see below:   * Bluetooth Specifications has been updated. * ETSI TC ATTM: TS 101 573 V1.2.1 (2022-04) and TS 102 873 V1.2.1 (2022-04) have been updated. * ETSI TC DECT: EN 300 175 series have been updated with version V2.9.1 (2022-03) and TS 103 636 series have been updated with version V1.3.1 (2021-12). * ETSI ISG F5G: GS F5G 004 V1.1.1 (2022-01); GS F5G 005 V1.1.1 (2022-03);   GR F5G 010 V1.1.1 (2022-04) and GR F5G 008 V1.1.1 (2022-06) have been added. Projects list of ETSI ISG F5G has been added.   * CENELEC TC 205: EN 50491-12-1:2018 has been added. CENELECTC 215: EN 50700:2014 has been added. * IEC TC 86/SC 86A: IEC 60793-2-10:2019+AMD1:2022 CSV has been added.  IEC TC 86/SC 86A relevant item of the work program has been added. * IEC TC 100/TA 18: IEC 62481-1-1:2017; IEC 62514:2010; IEC 62608-1:2014 and IEC 62608-2:2017 have been added. * IEEE 802.3 has been updated. * IEEE 802.11ba-2021 has been added. * IEEE P802.11be, IEEE P802.11bf and IEEE P802.11bb have been updated. * IEEE 802.15.4 has been added and IEEE P802.15.13/D6.0, Jan 2022 has been updated. * IEEE 1901b-2021 has been updated. * MoCA has been updated. * Thread Specification have been added.   8) Section 5 - Taxonomy of the “Web-Based Home Network Transport (HNT) Standards Overview” has been updated.  9) Section 6 - Overview of Home Network applications has been updated  10) Section 7 - List of Contacts has been updated.  11) A new Section 8 – Lead Study Group activities related to the HNT Standards Overview and Work Plan has been added. |

Home Network Transport Standards Overview and Work Plan

Issue 14, September 2022

General… 5

Introduction 5

1. Home Network activities in ITU-T SG15 – WP1/15 6

1.1 Existing Recommendations within ITU-T SG15 – WP1/15 “Transport aspects of   
 access, home and smart grid networks”  6

1.2 Recommendations “Under Study” within ITU-T SG15 – WP1 “Transport aspects of  
 access, home and smart grid networks” 13

2. Home Network activities within other ITU-T Study Groups 16  
 [ITU-T SG5; SG9; SG13; WP2 of SG15; SG16; SG17; SG20]

3.  Home Network activities in ITU-R Study Groups 26  
 [ITU-R SG1; SG5; SG6]

4. Home Network activities in other Standards Development Organizations 31  
 [Broadband Forum; Bluetooth SIG; ETSI; HomeGrid Forum, CENELEC; IEC;   
 IEEE 802.3; IEEE 802.11; Wi-Fi Alliance®; IEEE 802.15; IEEE 1901; IEEE 1905;  
 ISO/IEC; MoCA®; TIA; TTC; Thread Group; CSA (ex. Zigbee Alliance);   
 Z-Wave Alliance]

5. Web-Based Home Network Transport (HNT) Standards Overview 65

6. Overview of Home Networks applications 68

7. List of Contacts 71

8. Lead Study Group activities related to the HNT Standards Overview and Work Plan 75

**HOME NETWORK TRANSPORT** **STANDARDS OVERVIEW AND WORK PLAN**

Issue 14, SEPTEMBER 2022

# General

As home networks become more sophisticated, and as their interactions with the access network become more complex, coordination between access network standards and home network standards becomes of increasing importance. **WTSA-20 reaffirmed** Study Group 15 as **Lead Study Group** on **Home Network Transport (HNT)** within ITU-T and Study Group 15 entrusted Working Party 1/15 (Transport aspects of access, home and smart grid networks), under Question 1/15, with the task to manage and carry out the Lead Study Group activities on Home Network Transport.  
Using a process similar to the access network transport (ANT) standards coordination, a **Home Network Transport (HNT) Standards Overview and Work Plan** has been developed.

The HNT Standards Overview and Work Plan is a living document. The actual version is available at <https://www.itu.int/en/ITU-T/studygroups/Pages/sg15-hnt.aspx>.  
A web-based HNT Standards Overview completes the present document and is available at<https://www.itu.int/net4/ITU-T/landscape#?topic=0.132&workgroup=1&searchValue=&page=1&sort=Revelance>.

# Introduction

The continuing customer demand for ever higher bit rate data services, high-speed Internet access and other innovative services, and the ongoing needs of network operators to leverage in-premises connectivity for distributing within the home IPTV and other services and applications, require the development of new Recommendations and enhancements to existing Recommendations covering all aspects of in-premises networking transceivers. These studies include, but are not limited to, the transport of higher layer protocols, the management and test of the in-premises systems, spectral management aspects and energy saving techniques.

Given the interdisciplinary nature of Home Network applications, it is expected that a high degree of cooperation with other ITU Sectors (ITU-R, ITU-D), ITU-T Study Groups, Questions, Focus Groups (FGs), Joint Coordination Activities (JCAs), Global Strategic Initiatives (GSIs), as well as other international standards bodies will be required.

Within the ITU-T, the study and development of Recommendations related to transport in the Home Network is being carried out in a number of different Study Groups - see in Section 1 Tables 1, 2 and 3 below - e.g. SGs 5, 9, 13, 15, 16, 17 and 20. Also ITU-R and other standards bodies, forums and consortia are active in this area - see in Section 2 Table 4 below - for a list of such activities.

Recognizing that without a strong coordination effort there is the danger of duplication of work as well as the development of incompatible and non-interoperable standards, the ITU-T designated Study Group 15 as the **Lead Study Group** on **Home Network.**To represent the multitude of home networking technologies and services offered to the customer, the Table 6 in **Section 6** provides an overview of Home Network applications and related Home Network technologies.

A critical part of the HNT standardization work is the network of contacts for the development of relevant standards and the tracking of correspondence, usually in the form of liaisons, to guide the work. The list of contacts in **Section 7** provides an overview of the other relevant Study Groups in the ITU and other Standardization Groups corresponding through liaisons with Study Group 15 about matters related to the HNT Standards Overview and Work Plan.

# 1. Home Network activities in ITU-T SG15 – WP1/15

# 1.1 Existing Recommendations within ITU-T SG15 – WP1/15 “Transport aspects of access, home and smart grid networks”

Question 3 of ITU-T SG15 – WP1/15 is responsible for the Home Network standardization activities.  
“Published” Recommendations related to “Technologies for in-premises networking and related access applications” from Question 3 are listed here for convenience in Table 1.1.  
*Note: Starting from the new ITU-T Study Period 2022-2024, Question 18 “Technologies for in-premises networking and related access applications” from the last Study Period has been renumbered to become Question 3 with the same title.*

**Status: September 2022**

Table 1.1 – “Published” Recommendations related to Home Network within ITU-T SG15 Question 3

| **Rec. No.** | **Title** | **Status** | **Date** |
| --- | --- | --- | --- |
| [G.9901 (06/2017)](https://www.itu.int/rec/T-REC-G.9901-201706-I) | Narrowband orthogonal frequency division multiplexing power line communication transceivers - Power spectral density specification | Published | 06/2017 |
| [G.9902 (10/2012)](http://www.itu.int/rec/T-REC-G.9902-201210-I) | Narrowband orthogonal frequency division multiplexing power line communication transceivers for ITU-T G.hnem networks | Published | 10/2012 |
| [G.9902 (2012) Amd.1 (03/2013)](http://www.itu.int/rec/T-REC-G.9902-201303-I!Amd1) | Narrowband orthogonal frequency division multiplexing power line communication transceivers for ITU-T G.hnem networks Amendment 1 | Published | 03/2013 |
| [G.9902 (2012) Amd.2 (08/2013)](http://www.itu.int/rec/T-REC-G.9902-201308-I!Amd2) | Narrowband orthogonal frequency division multiplexing power line communication transceivers for ITU-T G.hnem networks Amendment 2: Clarifications on payload encoder and addition of a network admission procedure | Published | 08/2013 |
| [G.9903 (08/2017)](http://www.itu.int/rec/T-REC-G.9903-201708-I) | [Narrow-band OFDM power line communication transceivers for G3-PLC networks](http://www.itu.int/rec/T-REC-G.9903/en) | Published | 08/2017 |
| [G.9903 (2017) Amd.1 (05/2021)](https://www.itu.int/rec/T-REC-G.9903-202105-I!Amd1) | Narrowband orthogonal frequency division multiplexing power line communication transceivers for G3-PLC networks Amendment 1 | Published | 05/2021 |
| [G.9904 (10/2012)](http://www.itu.int/rec/T-REC-G.9904-201210-I) | Narrowband orthogonal frequency division multiplexing power line communication transceivers for PRIME networks | Published | 10/2012 |
| [G.9905 (08/2013)](https://www.itu.int/rec/T-REC-G.9905-201308-I) | Centralized metric-based source routing | Published | 08/2013 |
| [G.9905 (2013) Amd.1 (11/2016)](https://www.itu.int/rec/T-REC-G.9905-201611-I!Amd1) | Centralized metric-based source routing Amendment 1 | Published | 11/2016 |
| [G.9951 (02/2001)](http://www.itu.int/rec/T-REC-G.9951-200102-I) | Phoneline networking transceivers - Foundation | Published | 02/2001 |
| [G.9952 (11/2001)](http://www.itu.int/rec/T-REC-G.9952-200111-I) | Phoneline networking transceivers - Payload format and link layer requirements | Published | 11/2001 |
| [G.9953 (03/2003)](http://www.itu.int/rec/T-REC-G.9953-200303-I) | Phoneline networking transceivers - Isolation function | Published | 03/2003 |
| [G.9954 (01/2007)](http://www.itu.int/rec/T-REC-G.9954-200701-I) | Home networking transceivers - Enhanced physical, media access, and link layer specifications | Published | 01/2007 |
| [G.9958 (03/2018)](https://www.itu.int/rec/T-REC-G.9958-201803-I) | Generic architecture of home networks for energy management | Published | 03/2018 |
| [G.9959 (01/2015)](http://www.itu.int/rec/T-REC-G.9959-201501-I) | Short range narrow-band digital radiocommunication transceivers - PHY and MAC layer specifications | Published | 01/2015 |
| [G.9960 (11/2018)](https://www.itu.int/rec/T-REC-G.9960-201811-I) | Unified high-speed wireline-based home networking transceivers - System architecture and physical layer specification | Published | 11/2018 |
| [G.9960 (2018) Cor.1 (09/2019)](https://www.itu.int/rec/T-REC-G.9960-201909-I!Cor1) | Unified high-speed wire-line based home networking transceivers - System architecture and physical layer specification Corrigendum 1 | Published | 09/2019 |
| [G.9960 (2018) Amd.1 (02/2020)](https://www.itu.int/rec/T-REC-G.9960-202002-P!Amd1) | Unified high-speed wire-line based home networking transceivers - System architecture and physical layer specification Amendment 1 | Published | 02/2020 |
| [G.9960 (2018) Amd.2 (07/2020)](https://www.itu.int/rec/T-REC-G.9960-202007-I!Amd2) | Unified high-speed wireline-based home networking transceivers - System architecture and physical layer specification Amendment 2 | Published | 07/2020 |
| [G.9960 (2018) Cor.2 (10/2020)](https://www.itu.int/rec/T-REC-G.9960-202010-I!Cor2) | Unified high-speed wire-line based home networking transceivers - System architecture and physical layer specification  Corrigendum 2 | Published | 10/2020 |
| [G.9960 (2018) Amd.3 (02/2022)](https://www.itu.int/rec/T-REC-G.9960-202202-I!Amd3) | Unified high-speed wire-line based home networking transceivers - System architecture and physical layer specification Amendment 3 | Published | 02/2022 |
| [G.9961 (11/2018)](https://www.itu.int/rec/T-REC-G.9961-201811-I) | Unified high-speed wireline-based home networking transceivers - Data link layer specification | Published | 11/2018 |
| [G.9961 (2018) Cor.1 (09/2019)](https://www.itu.int/rec/T-REC-G.9961-201909-I!Cor1) | Unified high-speed wireline-based home networking transceivers - Data link layer specification Corrigendum 1 | Published | 09/2019 |
| [G.9961 (2018) Amd.1 (02/2020)](https://www.itu.int/rec/T-REC-G.9961-202002-P!Amd1) | Unified high-speed wireline-based home networking transceivers - Data link layer specification Amendment 1 | Published | 02/2020 |
| [G.9961 (2018) Cor.2 (03/2020)](https://www.itu.int/rec/T-REC-G.9961-202003-P!Cor2) | Unified high-speed wireline-based home networking transceivers - Data link layer specification Corrigendum 2 | Published | 03/2020 |
| [G.9961 (2018) Amd.2 (07/2020)](https://www.itu.int/rec/T-REC-G.9961-202007-I!Amd2) | Unified high-speed wireline-based home networking transceivers - Data link layer specification Amendment 2 | Published | 07/2020 |
| [G.9961 (2018) Amd.3 (04/2021)](https://www.itu.int/rec/T-REC-G.9961-202104-I!Amd3) | Unified high-speed wireline-based home networking transceivers - Data link layer specification Amendment 3 | Published | 04/2021 |
| [G.9961 (2018) Amd.4 (05/2022)](https://www.itu.int/rec/T-REC-G.9961-202205-I!Amd4) | Unified high-speed wireline-based home networking transceivers - Data link layer specification Amendment 4 | Published | 05/2022 |
| [G.9962 (11/2018)](https://www.itu.int/rec/T-REC-G.9962-201811-I) | Unified high-speed wire-line based home networking transceivers - Management specification | Published | 11/2018 |
| [G.9962 (2018) Cor.1 (03/2020)](https://www.itu.int/rec/T-REC-G.9962-202003-P!Cor1) | Unified high-speed wire-line based home networking transceivers - Management specification Corrigendum 1 | Published | 03/2020 |
| [G.9962 (2018) Amd.1 (07/2020)](https://www.itu.int/rec/T-REC-G.9962-202007-P!Amd1) | Unified high-speed wire-line based home networking transceivers - Management specification Amendment 1 | Published | 07/2020 |
| [G.9963 (11/2018)](https://www.itu.int/rec/T-REC-G.9963-201811-I) | Unified high-speed wireline-based home networking transceivers - Multiple input/multiple output specification | Published | 11/2018 |
| [G.9963 (2018) Amd.1 (04/2021)](https://www.itu.int/rec/T-REC-G.9963-202104-I!Amd1) | Unified high-speed wireline-based home networking transceivers - Multiple input/multiple output specification  Amendment 1 | Published | 04/2021 |
| [G.9964 (12/2011)](http://www.itu.int/rec/T-REC-G.9964-201112-I) | Unified high-speed wireline-based home networking transceivers - Power spectral density specification | Published | 12/2011 |
| [G.9964 (2011) Amd.1 (02/2016)](http://www.itu.int/rec/T-REC-G.9964-201602-I!Amd1) | Unified high-speed wire-line based home networking transceivers - Power spectral density specification Amendment 1 | Published | 02/2016 |
| [G.9964 (2011) Amd.2 (09/2016)](https://www.itu.int/rec/T-REC-G.9964-201609-I!Amd2) | Unified high-speed wire-line based home networking transceivers - Power spectral density specification Amendment 2 | Published | 09/2016 |
| [G.9964 (2011) Amd.3 (02/2020)](https://www.itu.int/rec/T-REC-G.9964-202002-P!Amd3) | Unified high-speed wireline-based home networking transceivers - Power spectral density specification Amendment 3 | Published | 02/2020 |
| [G.9970 (01/2009)](http://www.itu.int/rec/T-REC-G.9970-200901-I) | Generic home network transport architecture | Published | 01/2009 |
| [G.9971 (07/2010)](http://www.itu.int/rec/T-REC-G.9971-201007-I) | Requirements of transport functions in IP home network | Published | 07/2010 |
| [G.9972 (06/2010)](http://www.itu.int/rec/T-REC-G.9972-201006-I) | Coexistence mechanism for wireline home networking transceivers | Published | 06/2010 |
| [G.9972 (2010) Cor.1 (04/2014)](http://www.itu.int/rec/T-REC-G.9972-201404-I!Cor1) | Coexistence mechanism for wireline home networking transceivers Corrigendum 1: Revised definition of coexisting systems categories | Published | 04/2014 |
| [G.9973 (08/2017)](http://www.itu.int/rec/T-REC-G.9973-201708-I) | Protocol for identifying home network topology | Published | 08/2017 |
| [G.9976 (12/2021)](https://www.itu.int/rec/T-REC-G.9976-202112-I) | Supporting ultra-high-definition video service over G.hn | Published | 12/2021 |
| [G.9977 (02/2016)](http://www.itu.int/rec/T-REC-G.9977-201602-I) | Mitigation of interference between DSL and PLC | Published | 02/2016 |
| [G.9977 (2016) Cor.1 (08/2017)](http://www.itu.int/rec/T-REC-G.9977-201708-I!Cor1) | Mitigation of interference between DSL and PLC: Corrigendum 1 | Published | 08/2017 |
| [G.9978 (11/2018)](https://www.itu.int/rec/T-REC-G.9978-201811-I) | Secure admission in a G.hn network | Published | 11/2018 |
| [G.9978 (2018) Amd.1 (05/2022)](https://www.itu.int/rec/T-REC-G.9978-202205-I!Amd1) | Secure admission in G.hn network Amendment 1 | Published | 05/2022 |
| [G.9979 (11/2018)](https://www.itu.int/rec/T-REC-G.9979-201811-I) | Implementation of the generic mechanism in the IEEE 1905.1a-2014 standard to include applicable ITU-T Recommendations | Published | 11/2018 |
| [G.9980 (11/2012)](http://www.itu.int/rec/T-REC-G.9980-201211-I) | Remote management of customer premises equipment over broadband networks – Customer premises equipment WAN management protocol | Published | 11/2012 |
| [G.9991 (03/2019)](https://www.itu.int/rec/T-REC-G.9991-201903-P) | High speed indoor visible light communication transceiver - System architecture, physical layer and data link layer specification | Published | 03/2019 |
| [G.9991 (2019) Amd.1 (07/2020)](https://www.itu.int/rec/T-REC-G.9991-202007-P!Amd1) | High-speed indoor visible light communication transceiver - System architecture, physical layer and data link layer specification Amendment 1 | Published | 07/2020 |
| [G.9991 (2019) Cor.1 (10/2020)](https://www.bluetooth.com/specifications/specs/core-specification-supplement-9/) | High-speed indoor visible light communication transceiver - System architecture, physical layer and data link layer specification Corrigendum 1 | Published | 10/2020 |
| [G.9991 (2019) Amd.2 (04/2021)](https://www.itu.int/rec/T-REC-G.9991-202104-I!Amd2) | High-speed indoor visible light communication transceiver - System architecture, physical layer and data link layer specification  Amendment 2 | Published | 04/2021 |
| [G.9992 (03/2019)](https://www.itu.int/rec/T-REC-G.9992-201903-P) | Indoor optical camera communication transceivers - System architecture, physical layer and data link layer specification | Published | 03/2019 |
| [G Suppl. 57 (07/2015)](https://www.itu.int/ITU-T/recommendations/rec.aspx?rec=12577) | Smart home profiles for 6LoWPAN devices | Published | 07/2015 |
| [ITU-T SG15 Technical Paper Wireline Broadband (12/2011)](https://www.itu.int/pub/T-TUT-HOME-2011) | Wireline broadband access networks and home networking | Published | 12/2011 |
| [ITU-T SG15 Technical Paper TPLS.G-HN (07/2015)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=10309" \o "See more details) | Operation of G.hn technology over access and in-premises phone line medium | Published | 07/2015 |
| [ITU-T SG15 Technical Paper GSTP-HNIA (02/2020)](https://www.itu.int/pub/T-TUT-HOME-2020-1) | Use of G.hn in Industrial Applications | Published | 02/2020 |
| [ITU-T SG15 Technical Paper GSTP-HNSG (09/2020)](https://www.itu.int/pub/T-TUT-HOME-2020-2) | Technical paper on the use of G.hn technology for smart grid | Published | 09/2020 |
| [ITU-T SG15 Technical Paper GSTP-FTTR (04/2021)](https://www.itu.int/pub/T-TUT-HOME-2021-1) | Use cases and requirements of fibre-to-the-room (FTTR) | Published | 04/2021 |
| [ITU-T SG15 Technical Paper GSTP-HNAFS (04/2021)](https://www.itu.int/pub/T-TUT-HOME-2021-2) | Architecture, functions and services of home network | Published | 04/2021 |
| [ITU-T SG15 Technical Paper GSTP-OVHN (12/2021)](https://www.itu.int/pub/T-TUT-HOME-2021-3) | Overview of the ITU-T G.hn technology | Published | 12/2021 |
| [J.190 (07/2007)](http://www.itu.int/ITU-T/recommendations/rec.aspx?id=9203&lang=en) | Architecture of MediaHomeNet | Published | 07/2007 |
| [J.191 (03/2004)](http://www.itu.int/ITU-T/recommendations/rec.aspx?id=7202&lang=en) | IP feature package to enhance cable modems | Published | 03/2004 |
| [J.192 (11/2005)](http://www.itu.int/ITU-T/recommendations/rec.aspx?id=8666&lang=en) | A residential gateway to support the delivery of cable data services | Published | 11/2005 |

# 1.2. Recommendations “Under Study” within ITU-T SG15 – WP1 “Transport aspects of access, home and smart grid networks”

Recommendations “Under Study” related to “Technologies for in-premises networking and related access applications” from Question 3 are listed here for convenience in Table 1.2.  
*Note: Starting from the new ITU-T Study Period 2022-2024, Question 18 “Technologies for in-premises networking and related access applications” from the last Study Period has been renumbered to become Question 3 with the same title.* **Status: September 2022**

**Table 1.2 – Recommendations “Under Study” related to Home Network** **within ITU-T SG15 Question 3**

**Table updated with the latest Q3 activities resulting from September 2022 SG15 WP1 plenary meeting**

| **Work item** | **Question** | **Status** | **Timing** | **Approval process** | **Subject / Title** | **Base text(s)** | **Editor(s)** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| [G.9962 Amd.2](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18289) | Q3/15 | Consented | 2022-09 | AAP | Unified high-speed wireline-based home networking transceivers Management Specification: Amendment 2 | [SG15-TD87R1/PLEN (2022-09)](http://www.itu.int/md/T17-SG15-211206-TD-WP1-0697) | [Marcos Martinez](mailto:mmartinez(AT)maxlinear.com) |
| [G.fin-DLL](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18257) | Q3/15 | Under study | 2024 | AAP | High speed fibre-based in-premises transceivers data link layer | [SG15-TD731/WP1 (2021-12)](http://www.itu.int/md/T17-SG15-211206-TD-WP1-0731) | Wu Jia, Xinrui Shi |
| [G.fin-NM](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18258) | Q3/15 | Under study | 2024 | AAP | High speed fibre-based in-premises transceivers network management | No draft yet | Yue Sun, Huzhi Gou |
| [G.fin-PHY](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18256) | Q3/15 | Under study | 2024 | AAP | High speed fibre-based in-premises transceivers physical layer | No draft yet | Xuming Wu, Junwei Li |
| [G.fin-SA](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18226) | Q3/15 | Under study | 2023-04 | AAP | High speed fibre-based in-premises transceivers - system architecture | [TD52R1/WP1](https://extranet.itu.int/meetings/ITU-T/T17-SG15RGM/Q18-201214/Contributions/T17-SG15RGM-Q18-201214-C-0009-R01.docx) (2022-09) | Xinrui Shi, Qiang Cheng |
| [G.hetnet](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18259) | Q3/15 | Under study | 2023-04 | AAP | Terminology & overview of the architecture of Heterogeneous Home Networks | [SG15-TD73/WP1 (2022-09)](http://www.itu.int/md/T17-SG15-211206-TD-WP1-0698) | [Marcos Martinez](mailto:mmartinez(AT)maxlinear.com),[Tony Zeng](mailto:tony.zengyan(AT)huawei.com) |
| [G.hn2](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18205) | Q3/15 | Under study | 2024 | AAP | Evolution of unified high-speed wire-line based home networking transceivers | [SG15-TD714/WP1 (2021-12)](http://www.itu.int/md/T17-SG15-211206-TD-WP1-0714) | [Tony Zeng](mailto:tony.zengyan(AT)huawei.com) |
| [G.IoT](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18214) | Q3/15 | Under study | TBD | AAP | System architecture, PHY layer and DLL layer for IoT Smart Home over PLC | [SG15-TD48/WP1 (2022-09)](http://www.itu.int/md/T17-SG15-210412-TD-WP1-0614) | Yue Sun,[Tony Zeng](mailto:tony.zengyan(AT)huawei.com) |
| [G.uvs-xR](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18290) | Q3/15 | Under study | TBD | AAP | Technical requirements of extended reality service over in-premises networks | [SG15-TD64/WP1 (2022-09)](http://www.itu.int/md/T17-SG15-211206-TD-WP1-0730) | Wu Jia |
| [SUP-FTTR-4B](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18291) | Q3/15 | Agreed | 2022-09 | Agreement | Use case and Requirements of Fibre-to-The-Room for Small Business Applications (FTTR4B) | [SG15-TD72R1 (2022-09)](http://www.itu.int/md/T17-SG15-C-2838) | [Dezhi (James) Zhang](mailto:zhangdzh(AT)chinatelecom.cn),[Tony Zeng](mailto:tony.zengyan(AT)huawei.com), |
| SUP-FTTR-4H | Q3/15 | Under study | 2023-11 | Agreement | Use case and Requirements of Fibre-to-The-Room for Residential Applications (FTTR4H) | No draft yet | Hai Ding  Qizheng Li |
| [TP-UC-HN](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18216) | Q3/15 | Under study | 2023-04 | Agreement | Technical paper on the use of ITU-T G.hn technology for in-home networking | [SG15-TD70/WP1 (2022-09)](http://www.itu.int/md/T17-SG15-211206-TD-WP1-0700) | [Marcos Martinez](mailto:mmartinez(AT)maxlinear.com) |
| [TP-VLC](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=18215) | Q3/15 | Under study | 2023-04 | Agreement | Technical paper on the use of ITU-T Visible Light Communication technology | [SG15-TD72/WP1 (2022-09)](http://www.itu.int/md/T17-SG15-211206-TD-WP1-0701) | [Marcos Martinez](mailto:mmartinez(AT)maxlinear.com) |
| G.9901 Cor 1 | Q3/15 | Consented | 2022-09 | AAP | Narrowband orthogonal frequency division multiplexing power line communication transceivers – Power spectral density specification – Corrigendum 1 | TD-11R1 PLEN (2022-09) | Cédric Lavenu |
| G.9901 Amd 1 | Q3/15 | Determined | 2022-09 | TAP | Narrowband orthogonal frequency division multiplexing power line communication transceivers – Power spectral density specification – Amendment 1 | TD-10R1 PLEN (2022-09) | Cédric Lavenu |
| G.9903 Cor 1 | Q3/15 | Consented | 2022-09 | AAP | Narrowband orthogonal frequency division multiplexing power line communication transceivers for G3-PLC networks – Corrigendum 1 | TD-9R1 PLEN (2022-09) | Cédric Lavenu |
| G.9903 Amd 2 | Q3/15 | Consented | 2022-09 | AAP | Narrowband orthogonal frequency division multiplexing power line communication transceivers for G3-PLC networks – Amendment 2 | TD-8R1 PLEN (2022-09) | Cédric Lavenu |
| TPLS.G-HN | Q3/15 | Agreed | 2022-09 | Agreement | Operation of G.hn technology over access and in-premises phone line medium | TD-88R1 PLEN (2022-09) | Marcos Martínez |

**Work item**: Short name identifying a (draft or approved) Recommendation or other text. It may be a provisional name or the final publication designation (e.g. H.264)  
**Question**: Number of the Question responsible for the development of a work item  
**Status**: Current Approval state of a work item  
**Timing**: Best current estimate of the expected year and month of Determination (TAP), Consent (AAP), or Agreement (non-normative materials) of a work item  
**Approval process**: One of: Traditional Approval Process (TAP); Alternative Approval Process (AAP); or Agreement  
**Subject / Title**: Best current expectation of the full name of a work item  
**Base text(s)**: Previous published version of a work item and/or its latest draft. It may also include reference to A.5 justification documentation.  
**Editor(s)**: Person(s) responsible for coordinating development of a work item

**ITU-T Q3/15 Project FTTR (Fibre to the room)**   
Question 3 of ITU-T SG15 organised a first Joint ETSI ISG F5G (European Telecommunications Standards Institute – Industry Specification Group - Fifth Generation Fixed Network), BBF (Broadband Forum), CCSA TC6 (China Communications Standards Association – Technical Committee 6) and ITU-T SG15 Workshop on “FTTR” (Fibre to the room) on 14 June 2021.  
For more information see workshop programme and presentations at  
<https://www.itu.int/en/ITU-T/Workshops-and-Seminars/2021/0614/Pages/default.aspx>

Question 3/15 of ITU-T SG15 organised a second Joint ETSI ISG F5G , BBF, CCSA TC6 and ITU-T SG15 Workshop on “FTTR” (Fibre to the room) on 28 June 2022.  
For more information see workshop programme and presentations at  
<https://www.itu.int/en/ITU-T/Workshops-and-Seminars/2022/0628/Pages/default.aspx>.

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# 2. Home Network activities in other ITU-T Study Groups

This section provides an overview of the existing Home Network related activities within other ITU-T Study Groups.  
Table 2 below gives an updated overview of such activities.  
  
**Status: September 2022**

**Table 2 – Home Network related activities within other ITU-T Study Groups**

| **ITU-T SGs** | **SGs activities related to Home Network and other information** |
| --- | --- |
| **ITU-T SG5**    continuation of **ITU-T SG5**    continuation of **ITU-T SG5** | **ITU-T SG5: Electromagnetic fields (EMF), environment, climate action, sustainable digitalization, and circular economy WP1/5 - EMC, lightning protection, EMF**  Published Recommendations related to Home Network  - Revision ITU-T K.21 (08/2022) : Resistibility of telecommunication equipment installed in customer premises to overvoltages and overcurrents. This Recommendation has enhanced test level values for Ethernet and PoE ports where the IEEE 802.3 LAN A conditions are not met. - ITU-T K.34 (12/2020): Classification of electromagnetic environmental conditions for telecommunication equipment – Basic EMC Recommendation - ITU-T K.66 (11/2019): Protection of customer premises from overvoltages - ITU-T K.74 (03/2015): Electromagnetic compatibility, resistibility and safety requirements for home network devices. This Recommendation provides the description and references to harmonize the newly developed Recommendation and EMC standards.  - ITU-T K.85 (11/2011): Requirements for the mitigation of lightning effects on home networks installed in customer premises - ITU-T K.92 (05/2012): Conducted and radiated electromagnetic environment in home networking  - ITU-T K.93 (12/2016): Immunity of home network devices to electromagnetic disturbances. This Recommendation provides test method for home network equipment against broadband noises.  - ITU-T K.98 (08/2014) and Cor.1 (03/2015), Cor.2 (06/2020): Overvoltage protection guide for telecommunication equipment installed in customer premises. This Recommendation analyses equipment port surge voltages for a.c. mains configuration types of TN-S, TN-C, TN-C-S, TT and IT resulting from a lightning strike to either the telecommunications line or the a.c. mains supply. - ITU-T K.106 (03/2015): Techniques to mitigate interference between radio devices and cable or equipment connected to wired broadband networks and cable television networks. This Recommendation provides guidance to solve interference problems in home networking environments between radio devices and the cable or equipment connected to wired broadband networks and/or cable television networks. - ITU-T K.117 (12/2016): Primary protector parameters for the surge protection of equipment Ethernet ports. This Recommendation specifies the common-mode, differential mode and common mode to differential mode conversion surge parameters and test circuit requirements of an Ethernet port primary protector. The preferred surge generator voltage levels are 2.5 kV, 6 kV and 12 kV, but the test circuits can be used for any surge voltage environmental. Power over Ethernet (PoE) feed requirements are also given. Ethernet signal performance parameters are not covered. - Revision ITU-T K.137 (01/2022): Electromagnetic compatibility requirements and measurement methods for wire-line telecommunication network equipment - ITU-T K.146 (06/2020): Management of interferences on telecommunication transmissions on copper other than speech. This Recommendation deals with the management of electromagnetic interference produced by electrified railways traction systems on telecommunication systems in DSL frequency band. - Revision ITU-T K.147 (01/2022): Ethernet port resistibility testing for overvoltages and overcurrents. This Recommendation covers the different “IEEE 802.3:2018” Ethernet twisted pair implementations, their configurations, how surges are coupled into the system and what surge mitigation measures are used. Both Power over Ethernet, PoE, and Power over Data Line, PoDL, are covered. Following the overview, the rational is given for the Recommendation ITU-T K series surge and power fault test circuit approaches. - ITU-T K Suppl. 3 (10/2015): ITU-T K.20, K.21, K.45, K.82 – Additional criteria to protect telecommunication cabling during a power cross event - ITU-T K Suppl. 15 (09/2018): ITU-T K.20, K.21 and K.44 – Internal DC powering interface surge testing factors - ITU-T K Suppl. 21 (05/2021): ITU-T K.21 – Rationale for setting resistibility requirements of telecommunication equipment installed in customer premises against lightning - ITU-T K Suppl. 25 (05/2021): ITU-T K.117 – Long reach single twisted-pair Ethernet resistibility testing  *SG15 TD 9 WP1 September 2022* In liaison SG5-LS16, ITU-T SG5 informs ITU-T SG15 that with respect to the information sent on 2020, under Question 2/5 for “Protecting equipment and devices against lightning and other electrical events”, a relatively new development is the expansion of automotive single twisted-pair Ethernet (SPE) into domestic and industrial environments.  Single twisted pair power over Ethernet (SPoE) is currently standardised by the IEEE 802.3 to supply up to 50 W to network powered devices (NPD) such as video cameras with pan and tilt. Industrially, there is an SPE variant with a design reach of 1 km. ITU-T SG5 is monitoring this SPE evolution for stability before revising any Recommendations or creating new Recommendations.  **WP2/5 - Environmental efficiency, e-waste, circularity and sustainable ICT networks**   Published Recommendations related to Home Network - ITU-T L.1310 (09/2020): Energy efficiency metrics and measurement for telecommunication equipment. This Recommendation contains Clause 12 dedicated to energy efficiency metric for small networking devices. - ITU-T L.1340 (02/2014): Energy efficiency reference values for telecommunication equipment and infrastructure. This Recommendation contains Clause 9.1 on informative values for small networking devices. - ITU-T L.1383 (10/2021) “Smart energy solutions for cities and home applications” includes specific smart energy applications in cities and homes such as energy sources, energy management functions, etc. - ITU-T [L.1001 (11/2012): External universal power adapter solutions for stationary information and communication technology devices](http://www.itu.int/ITU-T/recommendations/rec.aspx?rec=11826)  - ITU-T L.1006 (12/2016): Test suites for assessment of the external universal power adapter solutions for stationary information and communication technology  - ITU-T L.1410 (12/2014): Methodology for environmental life cycle assessments of information and communication technology goods, networks and services  Work programme of ITU-T SG5 can be found at following URL <https://www.itu.int/ITU-T/workprog/wp_search.aspx?sg=5>  More information about ITU-T SG5 can be found at following URL <https://www.itu.int/en/ITU-T/studygroups/2022-2024/05/Pages/default.aspx> |
| **ITU-T SG9**  continuation of **ITU-T SG9** | **ITU-T SG9: Audiovisual content transmission and integrated broadband cable networks WP1/9 - Cable transport and terminals, including video and data**   *SG15 TD 705 WP1 December 2021* ITU-T SG9 informs that the draft new Recommendation ITU-T J.1612 “The Architecture for Smart Home Gateway” has been AAP consented during its ITU-T SG9 meeting, 15-24 November 2021. This new Recommendation proposes the architecture for a Smart Home Gateway which may co-exist with a STB or a residential gateway, it may also exist as a standalone device in a home environment.  *SG15 TD 721 WP1 December 2021* ITU-T SG19 provides a review and updates of the listed Recommendations below.  Published Recommendations related to Home Network (cable modem, cable set-up box, gateway)  - ITU-T J.126 (12/2007): Embedded Cable Modem device specification  - ITU-T J.128 (10/2008): Set-top Gateway specification for transmission systems for interactive cable television services  - ITU-T J.190 (07/2007): Architecture of MediaHomeNet - ITU-T J.191 (03/2004): IP feature package to enhance cable modems - ITU-T J.192 (11/2005): A residential gateway to support the delivery of cable data services - ITU-T J.193 (06/2004): Requirements for the next generation of set-top-boxes - ITU-T J.195.1 (03/2016): Functional requirements for high speed transmission over coaxial networks connected with fibre to the building - ITU-T J.195.2 (10/2014): Physical layer specification for high speed transmission over coaxial networks - ITU-T J.195.3 (10/2014): Medium Access Control layer specification for high speed transmission over coaxial networks - ITU-T J.196.1 (03/2016): Functional requirements for second-generation HiNoC - ITU-T J.196.2 (10/2016): Physical layer specification of second generation HiNoC - ITU-T J.196.3 (10/2016): Media access control layer specification of second generation HiNoC - ITU-T J.198.1 (01/2022): Functional requirements for third-generation HiNoC  - ITU-T J.290 (11/2006): Next generation set-top-box core architecture  - ITU-T J.291 (11/2006): Next generation set-top-box cable architecture  - ITU-T J.292 (11/2006): Next generation set-top-box media independent architecture  - ITU-T J.293 (06/2008): Component definition and interface specification for the next generation set-top box  - ITU-T J.294 (09/2010): Residential gateway requirements for the support of broadcast and IP-based interactive services over cable television networks - ITU-T J.295 (01/2012): Functional requirements for a hybrid cable set-top box - ITU-T J.296 (06/2012): Specification for hybrid cable set-top box  - ITU-T J.297 (03/2018): Requirements and functional specification of cable set-top box for 4K ultra high definition television - ITU-T J.298 (03/2019): Requirements and technical specifications of a cable TV hybrid set-top box compatible with terrestrial and satellite TV transport  - ITU-T J.1611 (01/2021): Functional requirements for Smart Home Gateway - ITU-T J.1612 (01/2022): The Architecture for Smart Home Gateway  Work programme of ITU-T SG9 can be found at following URL <https://www.itu.int/ITU-T/workprog/wp_search.aspx?sg=9>  More information about ITU-T SG9 can be found at following URL <https://www.itu.int/en/ITU-T/studygroups/2022-2024/09/Pages/default.aspx> |
| **ITU-T SG11** | **ITU-T SG11:Signalling requirements, protocols, test specifications and combating counterfeit telecommunication/ICT devices**  *SG15 TD 34 GEN September 2022*  ITU-T Study Group 11 informs ITU-T SG15 about the reference table and list of ongoing pilot projects on Conformance and Interoperability testing.  *SG15 TD 33 WP1 September 2022*  Refer to section 6 below “Basic field of activities related to the HNT Standards Overview” – item 5 - Update from ITU-T SG15 - Version 15 of living list of CIT activities related to technologies based on ITU-T Recommendations from WP1/15  Work Programme of ITU-T SG11 can be found at following URL <https://www.itu.int/ITU-T/workprog/wp_search.aspx?sg=11>  More information about ITU-T SG11 can be found at following URL <https://www.itu.int/en/ITU-T/studygroups/2022-2024/11/Pages/default.aspx> |
| **ITU-T SG13** | **ITU-T SG13: Future networks and emerging network technologies WP3/13 - Network Evolution, Trust and Quantum Enhanced Networking** Work Programme of ITU-T SG11 can be found at following URL <https://www.itu.int/ITU-T/workprog/wp_search.aspx?sg=13>  More information about ITU-T SG13 can be found at following URL <https://www.itu.int/en/ITU-T/studygroups/2022-2024/13/Pages/default.aspx> |
| **ITU-T SG15 WP2/15**  continuation of **ITU-T SG15 WP2/15** | **ITU-T SG15: Networks, technologies and infrastructures for transport, access and home​** **WP2/15 - Optical technologies and physical infrastructures** Question 5/15 - Characteristics and test methods of optical fibres and cables, and installation guidance Question 7/15 - Connectivity, operation and maintenance of optical physical infrastructures  Published Recommendations related to Home Network - ITU-T G.651.1 (11/2018): Characteristics of a 50/125 µm multimode graded index optical fibre cable for the optical access network - ITU-T G.652 (11/2016): Characteristics of a single-mode optical fibre and cable **-** ITU T G.657 (11/2016): Characteristics of a bending-loss insensitive single-mode optical fibre and cable - ITU-T L.103 (04/2016): Optical fibre cables for indoor applications - ITU-T L.104/L.67 (10/2006): Small count optical fibre cables for indoor applications - ITU-T L.109 (11/2018): Construction of optical/metallic hybrid cables - ITU-T L.111 (10/2020): Optical fibre cables for in-home applications - New ITU-T L.209 (02/2022): Requirements for fibre optic network terminal box (FONT) - Revision ITU-T L.400/L.12 (02/2022): Optical fibre splices  Following new Recommendations relevant to HNT have been consented during the ITU-T SG15 September 2022 meeting: - L.109.1 (ex L.oehc); Type II optical/electrical hybrid cables for access points and other terminal equipment - L.210 (ex L.ncip); Requirements for passive optical nodes: optical wall outlets and extender boxes - Revision of the Guide on the use of ITU-T L-series Recommendations related to optical technologies for outside plant (LSTP-GLSR) has been approved.  Work programme of ITU-T SG15 WP2/15 can be found at URL <https://www.itu.int/ITU-T/workprog/wp_search.aspx?sg=15>  More information about ITU-T SG15 can be found at following URL <https://www.itu.int/en/ITU-T/studygroups/2022-2024/15/Pages/default.aspx> |
| **ITU-T SG16**  continuation of **ITU-T SG16** | **ITU-T SG16: Multimedia and related digital technologies​ WP1/16 - Multimedia content delivery**  *SG15 TD 4 WP1 September 2022* In liaison SG16-LS311, ITU-T SG16 informs ITU-T SG15 that Question 13/16 work item H.721 (V3) - IPTV terminal devices: Basic model - was submitted for consent; see update in list of published Recommendations below - see below updated list with Revision ITU-T H.721 (03/2022). *SG15 TD 642 WP1 December 2021*  ITU-T SG16 informs ITU-T SG15 that it has reviewed the published Home Network Transport Standards Overview and Work plan and did not identify any issues, gaps or overlaps. Further ITU-T SG16 informs that approved Recommendations of the H.7xx series listed below are applicable to Home Networks. ITU-T SG16 also informs ITU-T SG15 on its ongoing work and recommends to await the finalization of two recent draft recommendations related to HNT: - H.IPTV-TDES.6 "IPTV Terminal Device: Virtualized model" - H.IPTV-TDES.7 "IPTV Terminal Device: Home gateway integrated model"  Published Recommendations related to Home Network - ITU-T H.622 (06/2008): A generic home network architecture with support for multimedia services  - ITU-T H.622.1 (10/2008): Architecture and functional requirements for home networks supporting IPTV services - ITU-T H.610 (07/2003): Full service VDSL – System architecture and customer premises equipment  - ITU-T H.622.2 (11/2015): Service capabilities and framework for virtual home networks - ITU-T H.720 (10/2008): Overview of IPTV terminal devices and end systems - Revision ITU-T H.721 (03/2022) : IPTV terminal devices: Basic model - ITU-T H.722 (01/2014): IPTV terminal device: Full-fledged model - ITU-T H.723 (07/2016): IPTV terminal device: Mobile model - ITU-T H.724 (12/2017): IPTV terminal device: Interworking-enabled model of multiple devices - ITU-T H.772 (11/2015): IPTV terminal device discovery  Work programme of ITU-T SG16 can be found at following URL  <https://www.itu.int/ITU-T/workprog/wp_search.aspx?sg=16>  More information about ITU-T SG16 can be found at following URL <https://www.itu.int/en/ITU-T/studygroups/2022-2024/16/Pages/default.aspx> |
| **ITU-T SG17** | **ITU-T SG17: Security WP2/17 - 5G, IoT and ITS security**  Published Recommendations related to Home Network - ITU-T X.1111 (02/2007): Framework of security technologies for home network - ITU-T X.1112 (11/2007): Device certificate profile for the home network - ITU-T X.1113 (11/2007): Guideline on user authentication mechanisms for home network services - ITU-T X.1114 (11/2008): Authorization framework for home networks - ITU-T X.1331 (03/2018): Security guidelines for home area network (HAN) devices in smart grid systems - ITU-T X.1197 (2012), Amd.1 (09/2019) and Erratum 1 (03/2020): Guidelines on criteria for selecting cryptographic algorithms for IPTV service and content protection - ITU-T X.1332 (03/2020): Security guidelines for smart metering services in smart grids  Work programme of ITU-T SG17 can be found at following URL <https://www.itu.int/ITU-T/workprog/wp_search.aspx?sg=17>  More information about ITU-T SG17 can be found at following URL <https://www.itu.int/en/ITU-T/studygroups/2022-2024/17/Pages/default.aspx> |
| **ITU-T SG20** | **ITU-T SG20: Internet of things (IoT) and smart cities and communities (SC&C) WP1/20**  Published Recommendations related to Home Network  - ITU-T Y.4409/Y.2070 (01/2015): Requirements and architecture of the home energy management system and home network services - ITU-T Y.4410/Y.2291 (01/2011): Architectural overview of next generation home networks - ITU-T Y.4415 (06/2018):Architecture of web of objects-based virtual home network - ITU-T Y.4469 (08/2020): Reference architecture of spare computational capability exposure of IoT devices for smart home - ITU-T Y.4465 (01/2020): Framework of Internet of things services based on visible light communications - ITU-T Y.4474 (08/2020): Functional architecture for Internet of things services based on visible light Communications  Work programme of ITU-T SG20 can be found at following URL <https://www.itu.int/ITU-T/workprog/wp_search.aspx?sg=20>  More information about SG20 can be found at following URL <https://www.itu.int/en/ITU-T/studygroups/2022-2024/20/Pages/default.aspx> |

**3.** **Home Network activities in ITU-R Study Groups**

This following list is intended to improve understanding and communication of the on-going work related to Home Network within ITU-R Study Groups and may help identify possible gaps or overlaps.  
Table 3 below gives an updated overview of such activities  
 **Status: September 2022**

**Table 3 – Home Network related activities within ITU-R Study Groups**

| **ITU-R SGs** | **SGs activities related to Home Network and other information** |
| --- | --- |
| **ITU-R SG1**    continuation of **ITU-R SG1** | **ITU-R SG1: Spectrum Management WP1A - Spectrum engineering techniques**  *SG15 TD 704 WP1 December 2021* In its liaison TD 704 WP1 from December 2021, ITU-R WP1A informs that it has started work on a new Recommendation ITU-R SM.[Optical Wireless].  *SG15 TD 554 WP1 April 2021*  In its liaison in TD 554 WP1 from April 2021, ITU-R WP1A reports that it has noted several areas of current interest in the work plan of ITU-T SG15 Question 18 (Table 3 in the “Home Network Transport Standards Overview and Work Plan- Issue 11, September 2020”) particularly on the use of power wirelines for various narrow-band communication projects supporting smart grid utility management, smart metering and the internet of things. These can suffer disruption from various forms of electromagnetic interference and radio frequency noise, as do radiocommunication systems.  ITU-R WP1A informs that it has started work on studies directed towards the “*Evaluation of radiated electromagnetic disturbances of household appliances and their interferences over an IoT network*” - (see attached document below “Preliminary draft report ITU-R SM.EMI-IoT).  Published standards, technical specifications and reports related to Home Network - Report ITU-R [SM.2422-1 (06/2019)](https://www.itu.int/pub/R-REP-SM.2422): Visible light for broadband communications  More information about ITU-R WP1A can be found at following URL <https://www.itu.int/en/ITU-R/study-groups/rsg1/rwp1a/Pages/default.aspx>  **WP1B - Spectrum management methodologies and economic strategies**  Published standards, technical specifications and reports related to Smart Grid - Report [SM.2351-3 (06/2021)](https://www.itu.int/pub/R-REP-SM.2351): Smart grid utility management systems. This report provides an overview of smart grid communications and features, communication network technologies, reference architecture, wireline and wireless standards and references of deployments in several countries.  More information on ITU-R WP1B can be found at following URL <https://www.itu.int/en/ITU-R/study-groups/rsg1/rwp1b/Pages/default.aspx>  More information about ITU-R SG1 can be found at following URL <https://www.itu.int/en/ITU-R/study-groups/rsg1/Pages/default.aspx> |
| **ITU-R SG5** | **ITU-R SG5: Terrestrial Services WP5A - Land mobile service above 30 MHz (excluding IMT); wireless access in the fixed service; amateur and amateur-satellite services**  - Guide to the use of ITU-R texts relating to the land mobile service, including wireless access in the fixe service (last update: 4 April 2022: see at <https://www.itu.int/oth/R0A06000001/en>  Radio Local Area Networks (RLANs) and Multiple Gigabit Wireless Systems (MGWS) WP 5A conducts work on radio local area networks (RLANs) and Multiple Gigabit Wireless Systems (MGWS) under Question [ITU-R 212-4/5](http://www.itu.int/pub/R-QUE-SG05.212) .   LANs/MGWS could be used to implement a home network. For a description of this work refer to:  - section 8.2 “Nomadic Wireless Access” of the [Guide to the use of ITU-R texts relating to the land mobile service, including wireless access in the fixed service](http://www.itu.int/oth/R0A06000001/en), and in particular Recommendation [ITU-R M.1450-5](http://www.itu.int/rec/R-REC-M.1450/en), which recommends characteristics of broadband radio local area networks,  - section 8.4 “Multiple Gigabit Wireless Systems” of the [Guide to the use of ITU-R texts relating to the land mobile service, including wireless access in the fixed service](http://www.itu.int/oth/R0A06000001/en), and in particular Recommendation [ITU-R M.2003-2](http://www.itu.int/rec/R-REC-M.2003/en), which provides general characteristics and radio interface standards for MGWS in frequencies around 60 GHz and Report [ITU-R M.2227-2](https://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-M.2227-2-2017-PDF-E.pdf) which describes applications, deployment scenarios and technical characteristics of MGWS. - section 11: Cordless Telecommunication Systems of the Guide, and in particular Recommendation [ITU-R M.1033-1](https://www.itu.int/rec/R-REC-M.1033/en) and Report [ITU-R M.1025-1](https://www.itu.int/pub/R-REP-M.1025) which provides technical and operational characteristics of cordless telephones and cordless telecommunication systems.  More information about ITU-R WP5A can be found at following URL <https://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5a/Pages/default.aspx>  More information about ITU-R SG5 can be found at following URL <https://www.itu.int/en/ITU-R/study-groups/rsg5/Pages/default.aspx> |
| **ITU-R SG6**  continuation of **ITU-R SG6** | **ITU-R SG6: Broadcasting Service** *SG15 TD 12 GEN September 2022* In liaison ITU-RSG6-Doc6/233, ITU-R SG6 informs ITU-T SG15 that it has established a Rapporteur Group - Future of Broadcasting (RG-FOB) at its November 2021 meeting to develop draft new ITU-R texts giving a Vision for the Future of Broadcasting.  The RG-FOB members agreed to work on following topics: Section 1 – Introduction Section 2 – User Experience Section 3 – Production Experience Section 4 – Delivery Experience Section 5 – Accessible Experience Section 6 – Sustainable ExperiencePublication of the final text is targeted in Q2 2023.**WP6A - Terrestrial broadcasting delivery**  *SG15 TD 547 WP1 April 2021* In its liaison in TD 547 WP1 from April 2021, ITU-R WP6A Rapporteur on “Power Line Telecommunications (PLT) and General EMC-Related Potential Interference Issues” reports that it has analysed the work plan of ITU-T SG15 Question 18 (Table 3 in the “Home Network Transport Standards Overview and Work Plan- Issue 11, September 2020”) and provides a compilation of its work in the document “Update on recent EMC related issues” attached below.  ITU-R WP6A Rapporteur notes that no issues have been identified that would need an immediate response on possible concerns, but issues with PLT (in Q18 projects G.9904.1, G.Iot and G.uvs) have been identified where further monitoring, supported by studies by the broadcasting community, is essential.  More information about ITU-R WP6A can be found at following URL <https://www.itu.int/en/ITU-R/study-groups/rsg6/rwp6a/Pages/default.aspx>  **WP6B - Broadcast service assembly and access**  More information about ITU-R WP6B can be found at following URL <https://www.itu.int/en/ITU-R/study-groups/rsg6/rwp6b/Pages/default.aspx>  More information about ITU-R SG6 can be found at following URL <https://www.itu.int/en/ITU-R/study-groups/rsg6/Pages/default.aspx> |

**4.** **Home Network activities in other Standards Development Organizations**

This following list is intended to improve understanding and communication of the on-going work related to Home Network in other Standardization Developing Organizations and may help identify possible gaps or overlaps.  
Table 5 below gives an updated overview of such activities  
  
**Status: September 2022**

**Table 4 – Home Network related activities in other Standards Development Organizations**

| **SDOs** | **SDOs activities related to Home Network and other information** |
| --- | --- |
| **Broadband Forum** | **Broadband Forum** [https://www.broadband-forum.org](https://www.broadband-forum.org/)  Information about Broadband Forum Projects “Connected Home” can be found at following URL <https://www.broadband-forum.org/projects/connected-home>  Published Broadband Forum Technical Reports related to HNT can be found at following URL <https://www.broadband-forum.org/technical-reports>  Broadband Forum Test Plans related to HNT can be found at following URL <https://www.broadband-forum.org/test-plans>  Broadband Forum Work in Progress related to HNT can be found at following URL <https://www.broadband-forum.org/broadband-forum-resources/work-in-progress> |  |
| **Bluetooth SIG** | **Bluetooth® Technology** <https://www.bluetooth.com/>  Bluetooth® Classic Bluetooth® Low Energy (LE) More information on Bluetooth technology can be found au following URL <https://www.bluetooth.com/learn-about-bluetooth/tech-overview/>  Information on Bluetooth Specificationscan be found at following URL <https://www.bluetooth.com/specifications/specs/>  **-** Bluetooth Core Specification – Revision: v5.3 - Revision Date: 2021-07-13 including document “Bluetooth® Core Specification Version 5.3 Feature Enhancements” can be found at following URL <https://www.bluetooth.com/specifications/specs/core-specification-5-3/>  This specification defines the technologies required to create interoperable Bluetooth devices.  The Bluetooth specification is overseen by the Bluetooth Special Interest Group (SIG) and is regularly updated and enhanced by Bluetooth SIG Working Groups to meet evolving technology and market needs. Bluetooth devices Power Class 1 have a transmit power of 100 mW and an operation range of typically ~ 100m.  Devices power classes 2 and 3 have an operation range of typically ~10 m and ~1 m respectively and are regarded as WPAN devices. Bluetooth is a IEEE 802.15.1 based wireless system.  More information about Bluetooth specifications in development can be found at following URL <https://www.bluetooth.com/specifications/in-development/> |
| **ETSI TC ATTM**  continuation of **ETSI TC ATTM** | **ETSI TC ATTM “Access, Terminals, Transmission and Multiplexing”** <https://www.etsi.org/committee/1390-attm>  Published standards, technical specifications and reports related to Home Network - TS 105 175-1 V2.0.0 (2011-10): Access, Terminals, Transmission and Multiplexing (ATTM); Plastic Optical Fibre System Specifications for 100 Mbit/s and 1 Gbit/s  - TS 105 175-1-1 V1.1.1 (2015-10): Access, Terminals, Transmission and Multiplexing (ATTM); Plastic Optical Fibres; Part 1: Plastic Optical Fibre System Specifications for 100 Mbit/s and 1 Gbit/s; Sub-part 1: Application requirements for physical layer specifications for high-speed operations over Plastic Optical Fibres  - TS 105 175-1-2 V1.1.1 (2015-04): Access, Terminals, Transmission and Multiplexing (ATTM); Plastic Optical Fibres; Part 1: Plastic Optical Fibre System Specifications for 100 Mbit/s and 1 Gbit/s; Sub-part 2: 1 Gbit/s and 100 Mbit/s physical layer for Plastic Optical Fibres - TS 103 247 V1.2.1 (2018-11) : Access, Terminals, Transmission and Multiplexing (ATTM); Singlemode Optical Fibre System Specifications for Home Cabling - TR 102 994 V1.1.1 (2012-08) : Access, Terminals, Transmission and Multiplexing (ATTM); In Home Cabling for Integrated Broadband Cable and Television Services - TS 102 220 V1.1.1 (2014-04): Access and Terminals (AT); Technical Specification: Delivery of Cable based services across a home access to the devices in the home - Revision TS 101 573 V1.2.1 (2022-04): Access, Terminals, Transmission and Multiplexing (ATTM); General engineering of optical building cabling - Revision TS 102 873 V1.2.1 (2022-04): Access, Terminals, Transmission and Multiplexing (ATTM); Optical External Network Testing Interface  Technical specifications related to Smart Grid - TS 104 001 V2.2.1 (2019-01): Open Smart Grid Protocol (OSGP); Smart Metering/Smart Grid Communication Protocol  More information about ETSI ATTM can be found at following URL <https://portal.etsi.org/TB-SiteMap/ATTM/ATTM-ToR>  Work Programme of ETSI ATTM can be found at following URL <https://portal.etsi.org/tb.aspx?tbid=689&SubTB=689,693,851,706,694,695#/> |
| **ETSI TC BRAN**  continuation of **ETSI TC BRAN** | **ETSI TC BRAN “Broadband Radio Access Networks”** <https://www.etsi.org/committee/1389-bran>  Published standards, technical specifications and reports related to Home Network  - EN 300 328 V2.2.2 (2019-07): Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz band; Harmonised Standard for access to radio spectrum. This document covers Wideband Data Transmission equipment. Examples of Wideband Data Transmission equipment are equipment such as IEEE 802.11™ RLANs, Bluetooth® wireless technologies, Zigbee™, etc. - EN 301 893 V2.1.1 (2017-05): 5 GHz RLAN; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU. 5 GHz wireless access systems (WAS) including RLAN equipment are used in wireless local area networks which provide high speed data communications in between devices connected to the wireless infrastructure. This document also addresses ad-hoc networking where devices communicate directly with each other, without the use of a wireless infrastructure. - TR 103 631 V1.1.1 (2019-03): Wireless Access Systems including Radio Local Area Networks (WAS/RLANs) in the band 6 725 MHz to 7 125 MHz. License exempt Wireless Access Systems including Radio Local Area Networks (WAS/RLANs) represent the primary broadband wireless access technologies used for wireless internet access. This document provides information on the intended applications, the technical parameters, mitigation techniques, the relation to the existing spectrum regulation and additional new radio spectrum requirements for technology neutral wireless access systems including radio local area networks (WAS/RLANs) capable of operating in the 6 725 MHz to 7 125 MHz range. - EN 302 567 V2.2.1 (2021-07): : Multiple-Gigabit/s radio equipment operating in the 60 GHz band; Harmonised Standard for access to radio spectrum. This document specifies technical characteristics and methods of measurements for radio equipment with integral antennas operating indoor or outdoor at data rates of multiple-gigabit per second in the 60 GHz frequency range - TR 103 583 V1.1.1 (2019-08): System Reference document (SRdoc); Technical characteristics of Multiple Gigabit Wireless Systems (MGWS) in radio spectrum between 57 GHz and 71 GHz  Broadband Radio Access Networks (BRAN); HIPERLAN Type 2 HIPERLAN/2 systems are intended to be operated as private or public systems making use of the 5 GHz frequency range - TR 101 683 V1.1.1 (2000-02): Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; System Overview - TS 101 475 V1.3.1 (2001-12): Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Physical (PHY) layer - TS 101 761-1 V1.3.1 (2001-12): Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Data Link Control (DLC) Layer; Part 1: Basic Data Transport Functions - TS 101 493-1 V1.1.1 (2000-04): Broadband Radio Access Networks (BRAN); HIPERLAN Type 2; Packet based Convergence Layer; Part 1: Common Part  More information about ETSI BRAN can be found at following URL <https://portal.etsi.org/TB-SiteMap/bran/bran-tor>  Work Programme of ETSI BRAN can be found at following URL <https://portal.etsi.org/tb.aspx?tbid=287&SubTB=287#/> |
| **ETSI TC DECT**  continuation of **ETSI TC DECT**  continuation of **ETSI TC DECT** | **ETSI TC DECT “Digital Enhanced Cordless Telecommunications”** <https://www.etsi.org/committee/1394-dect>  Published standards, technical specifications and reports related to Home Network  **ETSI Classic DECT** - Revision EN 300 175-1 V2.9.1 (2022-03): Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 1: Overview - Revision EN 300 175-2 V2.9.1 (2022-03): Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 2: Physical Layer (PHL) - Revision EN 300 175-3 V2.9.1 (2022-03): Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 3: Medium Access Control (MAC) layer - Revision EN 300 175-4 V2.9.1 (2022-03): Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 4: Data Link Control (DLC) layer - Revision EN 300 175-5 V2.9.1 (2022-03): Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 5: Network (NWK) layer - Revision EN 300 175-6 V2.9.1 (2022-03): Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 6: Identities and addressing - Revision EN 300 175-7 V2.9.1 (2022-03): Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 7: Security features - Revision EN 300 175-8 V2.9.1 (2022-03): Digital Enhanced Cordless Telecommunications (DECT); Common Interface (CI); Part 8: Speech and audio coding and transmission - EN 300 444 V2.5.1 (2017-10): Digital Enhanced Cordless Telecommunications (DECT); Generic Access Profile (GAP)  **ETSI DECT Ultra Low Energy (ULE)** DECT Ultra Low Energy (ULE) is a new technology based on DECT and intended for Machine-to-Machine communications such as Home and Industrial automation. The ULE technology may also be applied to utility meters and related devices and therefore has implications for the operation of smart grids. - TS 102 939-1 V1.3.1 (2017-10): Digital Enhanced Cordless Telecommunications (DECT); Ultra Low Energy (ULE); Machine to Machine Communications; Part 1: Home Automation Network (phase 1) - TS 102 939-2 V1.3.1 (2019-01): Digital Enhanced Cordless Telecommunications (DECT); Ultra Low Energy (ULE); Machine to Machine Communications; Part 2: Home Automation Network (phase 2) - TR 103 445 V1.1.1 (2017-07): Digital Enhanced Cordless Telecommunications (DECT); DECT security technical review; Security review and assessment 2017 - TR 103 422 V1.1.1 (2017-06): Digital Enhanced Cordless Telecommunications (DECT); DECT evolution technical study; Requirements and technical analysis for the further evolution of DECT and DECT ULE  **ETSI DECT-2020 New Radio (NR)**  DECT-2020 NR is a Radio Interface Technology (RIT) designed to provide a slim but powerful technology foundation for wireless applications deployed in various use cases and markets. This radio technology includes, but is not limited to Cordless Telephony, Audio Streaming Applications, Professional Audio Applications, consumer and industrial applications of Internet of Things (IoT) such as industry and building automation and monitoring, and in general solutions for local area deployments for Ultra-Reliable Low Latency Communication (URLLC) and massive Machine Type Communication (mMTC) as envisioned by ITU-R for IMT2020. - Revision ETSI TS 103 636-1 V1.3.1 (2021-12): : DECT-2020 New Radio (NR); Part 1: Overview;  Release 1 - Revision ETSI TS 103 636-2 V1.3.1 (2021-12): : DECT-2020 New Radio (NR); Part 2: Radio reception and transmission requirements; Release 1 - Revision ETSI TS 103 636-3 V1.3.1 (2021-12): : DECT-2020 New Radio (NR); Part 3: Physical layer; Release 1 - Revision ETSI TS 103 636-4 V1.3.1 (2021-12): : DECT-2020 New Radio (NR); Part 4: MAC layer; Release 1  - New ETSI TS 103 636-5 V1.3.1 (2021-12): DECT-2020 New Radio (NR); Part 5: DLC and Convergence layers; Release 1  Roadmap of DECT can be seen in Technical Report: - TR 103 513 V1.1.1 (2019-11): Digital Enhanced Cordless Telecommunications (DECT); DECT Technology Roadmap  More information about ETSI DECT can be found at following URLs <https://portal.etsi.org/TB-SiteMap/dect/dect-tor> <https://www.etsi.org/technologies/dect>  Work Programme of ETSI DECT can be found at following URL <https://portal.etsi.org/tb.aspx?tbid=19&SubTB=19,894#/> |
| **ETSI TC EE** | **ETSI TC EE “Environmental Engineering”** <https://www.etsi.org/committee/1395-ee>  Published standards, technical specifications and reports related to Home Network  - EN 301 575 V1.1.1 (2012-05): Environmental Engineering (EE); Measurement methods for energy consumption of Customer Premises Equipment (CPE). This document defines the energy consumption measurement methods for Broadband CPE telecommunication equipment.  More information about ETSI EE can be found at following URL <https://portal.etsi.org/TB-SiteMap/ee/ee-tor>  Work Programme of ETSI EE can be found at following URL <https://portal.etsi.org/tb.aspx?tbid=28&SubTB=28,29,30,635,853#/> |
| **ETSI ISG F5G**  continuation of **ETSI ISG F5G** | **ETSI ISG - Fifth Generation Fixed Network (F5G)** <https://www.etsi.org/committee/1696-f5g>  Published standards, technical specifications and reports related to Home Network - GR F5G 001 V1.1.1 (2020-12): Fifth Generation Fixed Network (F5G); F5G Generation Definition Release #1 - GR F5G 002 V1.1.1 (2021-02): Fifth Generation Fixed Network (F5G); F5G Use Cases Release #1 - GS F5G 009 V1.1.1 (2021-06): Fifth Generation Fixed Network (F5G); Proof of Concept Framework - GS F5G 003 V1.1.1 (2021-09): Fifth Generation Fixed Network (F5G); F5G Technology Landscape  - New GS F5G 004 V1.1.1 (2022-01): Fifth Generation Fixed Network (F5G); F5G Network Architecture  - GS F5G 005 V1.1.1 (2022-03): Fifth Generation Fixed Network (F5G) F5G High-Quality Service Experience Factors Release #1 - New GR F5G 010 V1.1.1 (2022-04): Fifth Generation Fixed Network (F5G); Security; Threat Vulnerability Risk Analysis and countermeasure recommendations for F5G  - New GR F5G 008 V1.1.1 (2022-06): Fifth Generation Fixed Network (F5G); F5G Use Cases Release #2  *SG15 TD 59 GEN September 2022*  Projects in ETSI ISG F5G  - In 2021, ETSI ISG F5G has published F5G Release 1 (GR-001 Generation Definition and GR-002 Use Cases). The technology landscape (WI-3) summarizes the network requirements and gaps. Specifically, the analysis of network requirements of FTTR is sent to ITU-T Q3 SG15. Multiple projects intend to specify the E2E characteristics, such as WI-4 architecture, WI-5 QoE, WI-6 E2E management, etc. Security (WI-10 and WI-11) is also one of the important aspects in the F5G group.  - In 2022, ETSI ISG F5G is going to publish its Release 2, including the updated version of WI-8 F5G use case version 2, WI-13 F5G technology landscape version 2, WI-14 F5G architecture version 2, WI-5 F5G QoE definition, WI-7 Industrial PON, WI-6 F5G E2E management & control, WI-12 Security framework, WI-11 AN telemetry architecture.  Besides Work Items, the F5G group also published two white papers: - F5G Vision: Fibre to everywhere and everything [https://](NULL)[www.etsi.org/images/files/ETSIWhitePapers/etsi\_wp\_41\_FSG\_ed1.pdf](https://www.etsi.org/images/files/ETSIWhitePapers/etsi_wp_41_FSG_ed1.pdf) - Global Fibre Deployment Index <https://www.etsi.org/images/files/ETSIWhitePapers/WP_47_GFDI.pdf>  A new white paper “F5G advanced and beyond” is currently under development. There are major motivation: The first are those that involve the digitization or cloudification of various service or application domains. The second are those that involve improvements in the network infrastructure itself for various purposes.  More information about ETSI ISG F5G can be found at following URL <https://portal.etsi.org/Portals/0/TBpages/F5G/ISG_F5G_ToR_D-G_APPROVED_20191210.pdf>  Work Programme of ETSI F5G can be found at following URL <https://portal.etsi.org/tb.aspx?tbid=885&SubTB=885#/>  ​​ |
| **HomeGrid Forum** | **HomeGrid Forum** <http://www.homegridforum.org/>  HomeGrid Forum (HGF) is an industry alliance formed to support the development and deployment of a unified coaxial, phoneline, powerline, and plastic optical fiber home networking technology called G.hn (Gigabit Home Networking).  HomeGrid Forum G.hn Certification Testing More information about G.hn Certification can be found at following URL  <https://homegridforum.org/certification-overview/>  *SG15 TD 650 WP1 December 2021* In its liaison TD 650 WP1 from December 2021, HomeGrid Forum informs about the recent developments on the GiGAWire VB™ technology for broadband access applications, based on ITU-T G.hn family of Recommendations and provides details on the G.hn Access standardization profiles addressing broadband access network topologies, as well as the acceleration of the deployments with the GiGAWire VB™ open-source code program.  Additional information about GiGaWire can be found at following URL <https://homegridforum.org/giga-wire-access/> |
| **CENELEC TC 86BXA** | **CENELEC TC 86BXA: Fibre optic interconnect, passive and connectorised components** General information, structure, work programme and published Standards can be found at following URL <https://standards.cencenelec.eu/dyn/www/f?p=305:7:0:25:::FSP_ORG_ID,FSP_LANG_ID:1258371> Business Plan of TC 86BXA: see <https://standards.cencenelec.eu/BPCLC/BP_TC_86BXA.pdf>  Published documents related to Home Network installation and maintenance - CLC/TR 50682:2018: Consideration on the use of OTDRs to measure return loss of single-mode optical fibre connection |
| **CENELEC TC 205** | **CENELEC TC 205: Home and Building Electronic Systems (HBES)**  General information, structure, work programme and published Standards can be found at following URL <https://standards.cencenelec.eu/dyn/www/f?p=305:7:0:25:::FSP_ORG_ID,FSP_LANG_ID:1258281> Business Plan of TC 205: see <https://standards.cencenelec.eu/BPCLC/BP_TC_205.pdf>  Main published documents related to Home Network - EN 50090-1:2011: Home and Building Electronic Systems (HBES) - Part 1: Standardization structure  - EN 50491-6-1:2014: General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS) - Part 6-1: HBES installations - Installation and planning - EN 63044-1:2017: Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS) - Part 1: General requirements - EN 63044-1:2017/A1:2021: Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS) - Part 1: General requirements - EN IEC 63044-6:2021: Home and building electronic systems (HBES) and building automation and control systems (BACS) - Part 6: Requirements for planning and installation  Published documents related to Smart Grid **-** EN 50491-12-1:2018: General requirements for Home and Building Electronic Systems (HBES) and Building Automation and Control Systems (BACS) - Smart grid - Application specification - Interface and framework for customer - Part 12-1: Interface between the CEM and Home/Building Resource manager - General Requirements and Architecture |
| **CENELEC TC 215** | **CENELEC TC 215: Electrotechnical aspects of telecommunication equipment** General information, structure, work programme and published Standards can be found at following URL<https://standards.cencenelec.eu/dyn/www/f?p=305:7:0:25:::FSP_ORG_ID,FSP_LANG_ID:1258297> Business Plan of TC 215: see <https://standards.cencenelec.eu/BPCLC/BP_TC_215.pdf>  Published documents related to Home Network cabling - EN 50173-1:2018: Information technology - Generic cabling systems - Part 1: General requirements - EN 50173-4:2018: Information technology - Generic cabling systems - Part 4: Homes - EN 50700:2014: Information technology - Premises distribution access network (PDAN) cabling to support deployment of optical broadband networks |
| **IEC CISPR** | **International special committee on radio interference - EMC requirements** <https://www.iec.ch/emc/iec_emc/iec_emc_players_cispr.htm> |
| **IEC TC 46/SC 46C** | **IEC TC 46/SC 46C: Wires and symmetric cables** Scope, structure, projects and publications can be found at following URL<https://www.iec.ch/dyn/www/f?p=103:7:::::FSP_ORG_ID:1366>  Published documents related to Home Network cabling - IEC 62807-1:2017: Hybrid telecommunication cables - Part 1: Generic specification |
| **IEC TC 76**  continuation of **IEC TC 76** | **IEC TC 76: Optical radiation safety and laser equipment** Scope, structure, projects and publications can be found at following URL<https://www.iec.ch/dyn/www/f?p=103:7:::::FSP_ORG_ID:1264>  Published documents related to Home Network safety - IEC 60825-2:2021: Safety of laser products - Part 2: Safety of optical fibre communication systems (OFCSs) - IEC 60825-2:2021/COR1:2021: Corrigendum 1 - Safety of laser products - Part 2: Safety of optical fibre communication systems (OFCSs) |
| **IEC  TC 86/SC 86A**  continuation of **IEC TC86/SC 86A** | **IEC TC 86/SC 86A: Fibres and cables** Scope, structure, projects and publications can be found at following URL<https://www.iec.ch/dyn/www/f?p=103:7:::::FSP_ORG_ID:1398>  Published documents related to Home Network cabling - IEC 60793-2-10:2019+AMD1:2022 CSV: Optical fibres – Part 2-10: Product specifications – Sectional specification for category A1 multimode fibres - IEC 60793-2-40:2021:Optical fibres - Part 2-40: Product specifications - Sectional specification for category A4 multimode fibres - IEC 60793-2-50:2018: Optical fibres - Part 2-50: Product specifications - Sectional specification for class B single-mode fibres - IEC 60794-2:2017: Optical fibre cables - Part 2: Indoor cables - Sectional specification - IEC 60794-6:2020: Optical Fibre Cables Part 6: Indoor-Outdoor cables - Sectional specification for Indoor-Outdoor cables - IEC TR 62000:2021: Guidelines for combining different single-mode fibre sub-categories - IEC TR 62362:2020: Selection of optical fibre cable specifications relative to mechanical, ingress, climatic or electromagnetic characteristics - Guidance  *SG15 TD 54 GEN September 2022* Following standards from IEC SC86A WG1 (Fibres) that are relevant to the ANT were published since December 2021**: -** IEC 60793-2-10/AMD1 ED7: Amendment 1 - Optical fibres - Part 2-10: Product specifications - Sectional specification for category A1 multimode fibres  Update on work program Following documents are in ballot process (or in preparation for ballot):  - IEC TR 63309 Ed.1: Active fibres - Characteristics and Measurement Methods – Guidance  **-** Revision of IEC 60793-2-50, Optical fibres – Part 2-50: Product specifications – Sectional specification for class B single-mode fibres (Incorporated 200-micron coating OD into B-654-A,B,C fibres. A note is added to clarify impact on microbend loss sensitivity for higher MFD B-654.B fibre.) |
| **IEC TC 100/TA 18** | **IEC TC 100/TA 18: Multimedia home systems and applications for end-user networks** Scope, structure, projects and publications can be found at following URL<https://www.iec.ch/dyn/www/f?p=103:7:::::FSP_ORG_ID:22351> Published documents related to Home Network - IEC 62481-1-1:2017: Digital living network alliance (DLNA) home networked device interoperability guidelines - Part 1-1: Architecture and protocols - Core architecture and protocols - IEC 62514:2010: Multimedia gateway in home networks - Guidelines - IEC 62608-1:2014: Multimedia home network configuration - Basic reference model - Part 1: System model- IEC 62608-2:2017: Multimedia home network configuration - Basic reference model - Part 2: Operational model |
| **IEEE 802.3**  continuation of **IEEE 802.3** | **IEEE 802.3 Ethernet Working Group** <https://www.ieee802.org/3/>  *SG15 TD 84 WP1 September 2022 and TD 52 GEN September 2022* IEEE 802.3 Working Group communicates following update:  The following provides an update on the current status of HNT related documents and work within the IEEE 802.3 working group. The current revision is IEEE Std 802.3-2022, Standard for Ethernet: <https://standards.ieee.org/ieee/802.3/10422/> As of 22 September 2022, the revision has five approved amendments: IEEE Std 802.3dd-2022, IEEE Std 802.3cs-2022, IEEE Std 802.3db-2022, IEEE Std 802.3ck-2022, and IEEE Std 802.3de-2022.  The following are example HNT applicable technologies in IEEE Std 802.3-2022 (including its amendments):  - The 10BASE-T, 100BASE-TX and 1000BASE-T specifications for operation over various grades of twisted pair cabling have long been used as a home networking technology, and they continue to be applicable.  - Home gateways typically include both IEEE Std 802.11 specified capabilities and 10/100/1000 Mb/s Ethernet ports.  - 2.5GBASE-T, 5GBASE-T and 10GBASE-T provide a migration path for higher bandwidth home networks.  - 1000BASE-RHA is a plastic optical fiber port type targeted for home networks. - Fiber optic Ethernet port types would be applicable to HNT especially in cases where a non-conductive medium is required. It is appropriate to note that BASE-T port types are not specified for outdoor cable installations. - For access to the home, the approved standard includes various speeds of operation for Ethernet Passive Optical Networks. - The standard also includes DTE Power via the MDI (also called Power over Ethernet) capabilities applicable to HNT (e.g., to provide power to security equipment). These specifications include multiple options for BASE-T cabling with options for amount of power provided to the Powered Device.  Other optional Ethernet capabilities have relevance to HNT including:  - Time Sensitive Networking related functions appropriate to support applications running over HNT, and Energy-Efficient Ethernet specifications for many port types to reduce energy consumption. - IEEE Std 802.3.1-2013 specifies SNMP management modules for various Ethernet port types and capabilities. IEEE Std 802.3.2-2018 YANG Data Model(s) specifies YANG data models for selected Ethernet port types.  Much of the current work within the IEEE 802.3 Working Group (current activities are listed on the 802.3 home page <http://ieee802.org/3> may not be applicable to HNT, but a few recent and current activities are highlighted below as possibly related.  - The IEEE P802.3cx Improved PTP Timestamping Accuracy Task Force draft is currently in IEEE Standards Association ballot. This amendment will improve the precision of delay and jitter measurements, for data carried over Ethernet, capabilities that are leveraged by some time sensitive HNT applications. - Single pair Ethernet port types recently added to IEEE Std 802.3 are also being enhanced by IEEE P802.3da: 10 Mb/s Single Pair Multidrop Segments Enhancement, and P802.3dg: 100 Mb/s Long Reach Single Pair Ethernet. These single pair port types though not targeted for HNT use may nevertheless find HNT use. |
| **IEEE 802.11**  continuation of **IEEE 802.11**  continuation of **IEEE 802.11** | **IEEE 802.11 Working Group for Wireless Local Area Networks** <http://www.ieee802.org/11/>  IEEE Std 802.11-2020 - IEEE Standard for Information technology--Telecommunications and information exchange between systems Local and metropolitan area networks--Specific requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications. More information about 802.11-202 can be found at following URL <https://standards.ieee.org/standard/802_11-2020.html>  **Wireless LAN / Wi-Fi 4, 5, 6 and 6E** - IEEE Std 802.11-2020 - Clause 19 (Supersedes IEEE 802.11n-2009 Amendment 5 of IEEE 802.11-2007): IEEE Standard for Information technology--Telecommunications and information exchange between systems Local and metropolitan area networks--Specific requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications - Clause 19: High-throughput (HT) PHY specification Branded as Wi-Fi 4 by the Wi-Fi Alliance.  - IEEE Std 802.11-2020 - Clause 21 (Supersedes IEEE 802.11ac-2013 Amendment 4 of IEEE 802.11-2012): IEEE Standard for Information technology--Telecommunications and information exchange between systems Local and metropolitan area networks--Specific requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications - Clause 21 - Very high throughput (VHT) PHY specification Branded as Wi-Fi 5 by the Wi-Fi Alliance.  - IEEE Std 802.11ax-2021 - IEEE Standard for Information Technology--Telecommunications and Information Exchange Between Systems Local and Metropolitan Area Networks--Specific Requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment 1: Enhancements for High Efficiency WLAN Branded as Wi-Fi 6 and Wi-Fi 6E by the Wi-Fi Alliance.  **Wireless Gigabit / WiGig (mmWave Wi-Fi)** - IEEE Std 802.11-2020 - Clause 20 (Supersedes IEEE 802.11ad-2012 Amendment 3 of IEEE 802.11-2012): IEEE Standard for Information technology--Telecommunications and information exchange between systems Local and metropolitan area networks--Specific requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications - Clause 20 - Directional multi-gigabit (DMG) PHY specification  - IEEE Std 802.11-2020 – Clause 25 (Supersedes IEEE Std 802.11aj-2018 Amendment 3 of IEEE 802.11-2016: Enhancements for Very High Throughput to Support Chinese Millimeter Wave Frequency Bands (60 GHz and 45 GHz): IEEE Standard for Information Technology--Telecommunications and information exchange between systems Local and metropolitan area networks--Specific requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications - Clause 25 - China millimeter-wave multi-gigabit (CMMG) PHY specification  - IEEE Std 802.11ay-2021 - IEEE Standard for Information Technology--Telecommunications and Information Exchange between Systems Local and Metropolitan Area Networks--Specific Requirements Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment 2: Enhanced Throughput for Operation in License-exempt Bands above 45 GHz  **Low-power Wi-Fi**  **Sub 1GHz** - IEEE Std 802.11-2020 – Clause 23 (Supersedes IEEE Std 802.11ah-2016 Amendment 2 of 802.11-2016: Sub 1 GHz License Exempt Operation): IEEE Standard for Information technology--Telecommunications and information exchange between systems - Local and metropolitan area networks--Specific requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications – Clause 23 - Sub 1 GHz (S1G) PHY specification Branded as “Wi-Fi HaLow™” by the Wi-Fi Alliance  **Wake-Up Radio (WUR)**  - IEEE 802.11ba-2021- IEEE Standard for Information Technology--Telecommunications and Information Exchange between Systems--Local and Metropolitan Area Networks-Specific Requirements--Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications - Amendment 3: Wake-Up Radio Operation  **New IEEE 802.11 standardization projects applicable to Home Network**  **IEEE P802.11be** is a new task group to work on a major amendment for next generation wireless LAN to Enable Extremely High Throughput (EHT) and Low Latency for Wi-Fi. The new amendment will define Extreme High Throughput (EHT) physical (PHY) and medium access control (MAC) layers capable of supporting a maximum throughput of at least 30 Gbps. IEEE P802.11be - Standard for Information technology--Telecommunications and information exchange between systems Local and metropolitan area networks--Specific requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment: Enhancements for Extremely High Throughput (EHT) Branded as future Wi-Fi 7 by the Wi-Fi Alliance More information about IEEE P802.11be can be found at following URLs <https://standards.ieee.org/ieee/802.11be/7516/>  <https://beyondstandards.ieee.org/ieee-p802-11be-to-enable-extremely-high-throughput-eht-and-low-latency-for-wi-fi/> <https://www.ieee802.org/11/Reports/tgbe_update.htm>  **IEEE P802.11bf** is a new Task Group about WLAN sensing within the IEEE 802.11 working group. IEEE P802.11bf - Standard for Information Technology -- Telecommunications and Information Exchange Between Systems Local and Metropolitan Area Networks -- Specific Requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment: Enhancements for Wireless Local Area Network (WLAN) Sensing More information about IEEE P802.11bf can be found at following URLs <https://standards.ieee.org/ieee/802.11bf/10365/>  <https://www.ieee802.org/11/Reports/tgbf_update.htm>  **IEEE P802.11bb** is a new Task Group on Light Communications that is focused on introducing necessary changes to the base IEEE 802.11 Stds to enable communications in the light medium – access. IEEE P802.11bb - Standard for Information Technology--Telecommunications and Information Exchange Between Systems Local and Metropolitan Area Networks--Specific Requirements - Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications Amendment: Light Communications More information about IEEE P802.11bb can be found at following URLs <https://standards.ieee.org/ieee/802.11bb/10823/> <https://www.ieee802.org/11/Reports/tgbb_update.htm> |
| **Wi-Fi Alliance®** | **Wi-Fi Alliance®** <https://www.wi-fi.org/> Information about the Wi-Fi generation names and user interface visuals can be found at following URL [Generational Wi-Fi User Guide](https://www.wi-fi.org/download.php?file=/sites/default/files/private/Generational_Wi-Fi_User_Guide_20181003.pdf)  Information about Wi-Fi Alliance work areas can be found at following URL <https://www.wi-fi.org/who-we-are/current-work-areas>  Information about Wi-Fi Certification can be found at following URL <https://www.wi-fi.org/certification> |
| **IEEE 802.15** | **IEEE 802.15 Working Group for Wireless Specialty Networks (WSN)** <http://www.ieee802.org/15/>  Low-Rate Wireless Networks <https://standards.ieee.org/ieee/802.15.4/7029/> - IEEE Std 802.15.4-2020 - IEEE Standard for Low-Rate Wireless Networks  Short-Range Optical Wireless Communications <https://standards.ieee.org/standard/802_15_7-2018.html> - IEEE Std 802.15.7-2018 - IEEE Standard for Local and metropolitan area networks--Part 15.7: Short-Range Optical Wireless Communications  Project of Task Group 13 (TG13) Multi-Gigabit/s Optical Wireless Communications  https://ieeexplore.ieee.org/document/9682664  - P802.15.13D6.0, Jan 2022 - IEEE Draft Standard for Multi-Gigabit per Second Optical Wireless Communications (OWC), with Ranges up to 200 meters, for both stationary and mobile devices P802.15.13 is mainly designed for industrial application. For more information on the TG13 project status can be found at following URL <https://www.ieee802.org/15/pub/TG13.html> |
| **IEEE PLCSC**  **IEEE 1901** | **IEEE Power Line Communications Standards Committee** <https://sagroups.ieee.org/plcsc/>  The list of published standards of the Power Line Communications Standards Committee is available at following URL <https://sagroups.ieee.org/plcsc/published-standards/>  **IEEE 1901 Working Group on Power Line Communications (COM/PLC)** <https://sagroups.ieee.org/1901/>  The scope of the IEEE 1901 Working Group is to maintain and advance the IEEE 1901 standard “IEEE Standard for Broadband over Power Line Networks: Medium Access Control and Physical Layer Specifications” originally approved in 2010. Recent activities included the development of IEEE 1901a-2019 “Amendment 1: Enhancement for Internet of Things Applications” and the revision of IEEE 1901-2010. This has resulted in the publication of IEEE Std 1901-2020 - IEEE Standard for Broadband over Power Line Networks: Medium Access Control and Physical Layer Specifications.  More information about IEEE 1901-2020 can be found at following URL <https://standards.ieee.org/standard/1901-2020.html>  Most recent activities of the Working Group include the work on the P1901b project “Standard for Broadband over Power Line Networks: Medium Access Control and Physical Layer Specifications - Amendment 2: Enhancements for Authentication and Authorization”. The Draft Standard has been approved by SA ballot on 2 October 2021 and the Standard published on 18 February 2022.  1901b-2021 - IEEE Standard for Broadband over Power Line Networks: Medium Access Control and Physical Layer Specifications Amendment 2: Enhancements for Authentication and Authorization More information about IEEE 1901b-2020 can be found at following URL <https://standards.ieee.org/ieee/1901b/10362/>  In May 2022, the Working Group started a new P1901c project: Amendment to IEEE Standard 1901-2020: Enhanced Flexible Channel Wavelet (FCW) physical and media access control layers for use on any media More information about P1901.c can be found at following URL <https://sagroups.ieee.org/1901/> |
| **IEEE PLCSC**  **IEEE 1901.1** | **IEEE Power Line Communications Standards Committee** <https://sagroups.ieee.org/plcsc/>  **IEEE Standard for Medium Frequency (less than 12 MHz) Power Line Communications for Smart Grid Applications** <https://standards.ieee.org/standard/1901_1-2018.html>  - IEEE Std 1901.1-2018 - IEEE Standard for Medium Frequency (less than 12 MHz) Power Line Communications for Smart Grid Applications |
| **IEEE PLCSC**  **IEEE 1901.2** | **IEEE Power Line Communications Standards Committee** <https://sagroups.ieee.org/plcsc/>  **IEEE Standard for Low-Frequency (less than 500 kHz) Narrowband Power Line Communications for Smart Grid Applications** <https://standards.ieee.org/standard/1901_2-2013.html>  - IEEE Std 1901.2-2013 - IEEE Standard for Low-Frequency (less than 500 kHz) Narrowband Power Line Communications for Smart Grid Applications and amendment - IEEE Std 1901.2a-2015 - IEEE Standard for Low-Frequency (less than 500 kHz) Narrowband Power Line Communications for Smart Grid Applications - Amendment 1 |
| **IEEE PLCSC**  **IEEE 1905.1** | **IEEE Power Line Communications Standards Committee** <https://sagroups.ieee.org/plcsc/>  **IEEE Standard for a Convergent Digital Home Network for Heterogeneous Technologies** <https://standards.ieee.org/standard/1905_1-2013.html>  - IEEE Std 1905.1-2013 - IEEE Standard for a Convergent Digital Home Network for Heterogeneous Technologies - IEEE Std 1905.1a-2014 - IEEE Standard for a Convergent Digital Home Network for Heterogeneous Technologies Amendment 1: Support of New MAC/PHYs and Enhancements |
| **ISO/IEC JTC 1/SC 6** | **ISO/IEC JTC 1/SC 6: Telecommunications and information exchange between systems** <https://www.iso.org/committee/45072.html> Published documents related to Home Network  - ISO/IEC 12139-1:2009 - Information technology — Telecommunications and information exchange between systems — Powerline communication (PLC) — High speed PLC medium access control (MAC) and physical layer (PHY) — Part 1: General requirements  - ISO/IEC 12139-1:2009/COR 1:2010 - Information technology — Telecommunications and information exchange between systems — Powerline communication (PLC) — High speed PLC medium access control (MAC) and physical layer (PHY) — Part 1: General requirements — Technical Corrigendum 1 ISO/IEC 12139-1:2009 is a physical and medium access control layer specification with respect to the connectivity for In-home and Access network high speed powerline communication stations. |
| **ISO/IEC JTC 1/SC 25**  continuation of **ISO/IEC JTC 1/SC 25**  continuation of **ISO/IEC JTC 1/SC 25**  continuation of **ISO/IEC JTC 1/SC 25**  continuation of **ISO/IEC JTC 1/SC 25**  continuation of **ISO/IEC JTC 1/SC 25**  continuation of **ISO/IEC JTC 1/SC 25** | **ISO/IEC JTC 1/SC 25: Interconnection of Information Technology Equipment** <https://www.iso.org/committee/45270.html> All information related to ISO/IEC JTC 1/SC 25 is available on the[IEC web site](http://www.iec.ch/dyn/www/f?p=103:7:0::::FSP_ORG_ID:3399)  Scope of ISO/IEC JTC 1/SC 25 The scope of SC 25 is to provide technologies for interconnection of information technology equipment in Customer premises – see also [ISO/IEC JTC 1/SC 25 Scope](https://www.iec.ch/dyn/www/f?p=103:7:1288324492443::::FSP_ORG_ID,FSP_LANG_ID:3399,25)  ISO/IEC JTC 1/SC 25 Subcommittee(s) and/or Working Group(s) responsible for home networks: - SC 25/WG 1 “Home Electronic System (HES)” develops IoT (Internet of Things) standards for the interconnection of electrical and electronic equipment and products for homes and small buildings. - SC 25/WG 3 “Customer Premises Cabling” develops standards for customer premises cabling systems including test procedures, planning and installation guide.  The list of standards published by ISO/IEC JTC 1/SC 25 is available using the URL below [ISO/IEC JTC 1/SC 25 Publications](https://www.iec.ch/dyn/www/f?p=103:22:1288324492443::::FSP_ORG_ID,FSP_LANG_ID:3399,25)  The work programme of ISO/IEC JTC 1/SC 25 is available using the URL below [ISO-IEC JTC 1/SC 25 Work Programme](https://www.iec.ch/dyn/www/f?p=103:23:19262524188633::::FSP_ORG_ID,FSP_LANG_ID:3399,25)  **ISO/IEC JTC 1/SC 25/WG 1 “Home Electronic System (HES)”**  *SG15 TD 546 WP1 April 2021* In its liaison ISO/IEC JTC 1/SC 25 notes that ITU-T SG15 has projects in the field of home networks (“domotics”) such as: - Technical paper on architecture, function, and service of home network - Technologies for in-premises networking and related access applications ISO/IEC JTC 1/SC25 recommends that ITU-T SG15 references standards developed by SC25 that are relevant to SG15 projects. The scope of SC25 covers areas important for home networks and applications, as stated in the following except from the scope:   * Standards for home and building electronic systems in residential and commercial environments to support interworking devices (IoT-related) and applications such as energy management, environmental control, lighting, and security.   In its liaison ISO/IEC JTC 1/SC 25 attaches a summary “Home Electronic System (HES) Overview” dated September 2020 prepared by Dr. Kenneth Wacks - Convener of ISO/IEC JTC 1/SC 25/WG 1 – see attached below.    This summary provides an overview of the more than 50 standards and technical reports published and under development originated in SC25/WG1. This document served as reference for the update of the “List of HES standards and technical reports” below as well as Part 6 of the “Web-Based Home Network Transport (HNT) Standards Overview” - see Section 3 - of the present document.    **Published HES standards and technical reports**  HES standards specify the architecture and protocols of the Home Electronic System. These are found in the ISO/IEC 14543 series. Presently three sets of protocols are specified, namely the ISO/IEC 14543-3 series, the ISO/IEC 14543-4 series and the ISO/IEC 14543-5 series. They all conform to a common architecture specified in ISO/IEC 14543-2-1: see below the list of standards and technical reports for HES Architecture. - TS 15044:2000 - Information technology - Terminology for the Home Electronic System (HES) - 14543-2-1:2006 - HES Architecture Part 2-1: Introduction and device modularity - 14543-3-1: 2006 - HES Architecture Part 3-1: Communication layers - Application layer for network based control of HES Class 1 - 14543-3-2:2006 - HES Architecture Part 3-2: Communication layers - Transport, network and general parts of data link layer for network based control of HES Class 1 - 14543-3-3:2007 - HES Architecture Part 3-3: User process for network based control of HES Class 1 - 14543-3-4:2007 - HES Architecture Part 3-4: System management - Management procedures for network based control of HES Class 1 - 14543-3-5:2007 - HES Architecture Part 3-5: Media and media dependent layers - Powerline for network based control of HES Class 1 - 14543-3-6:2007 - HES Architecture Part 3-6: Media and media dependent layers - Twisted pair for network based control of HES Class 1 - 14543-3-7:2007 - HES Architecture Part 3-7: Media and media dependent layers - Radio frequency for network based control of HES Class 1 - TR 14543-4:2002 - HES Architecture Part 4: Home and building automation in a mixed-use building - 14543-4-1:2008 - HES Architecture Part 4-1: Communication layers - Application layer for network enhanced control devices of HES Class 1 - 14543-4-2:2008 - HES Architecture Part 4-2: Communication layers - Transport, network and general parts of data link layer for network enhanced control devices of HES Class 1 - 14543-4-3:2015 - HES Architecture Part 4-3: Application layer interface to lower communications layers for network enhanced control devices of HES Class 1 - 14543-4-301:2020 - HES Architecture Part 4-301: Application protocols for home air conditioners and controllers - 14543-5-1:2010 - HES Architecture Part 5-1: Intelligent grouping and resource sharing for Class 2 and Class 3 - Core protocol - 14543-5-3:2012 - HES Architecture Part 5-3: Intelligent grouping and resource sharing for HES Class 2 and Class 3 - Basic application - 14543-5-4:2010 - HES Architecture Part 5-4: Intelligent grouping and resource sharing for HES Class 2 and Class 3 - Device validation - 14543-5-5:2012 - HES Architecture Part 5-5: Intelligent grouping and resource sharing for HES Class 2 and Class 3 - Device type - 14543-5-6:2012 - HES Architecture Part 5-6: Intelligent grouping and resource sharing for HES Class 2 and Class 3 - Service type - 14543-5-7:2015 - HES Architecture - Part 5-7: Intelligent grouping and resource sharing for HES Class 2 and Class 3 - Remote access system architecture - 14543-5-8:2017 - HES Architecture - Part 5-8: Intelligent grouping and resource sharing for HES Class 2 and Class 3 - Remote access core protocol - 14543-5-9:2017 - HES Architecture - Part 5-9: Intelligent grouping and resource sharing for HES Class 2 and Class 3 - Remote access service platform - 14543-5-11:2018 - HES Architecture - Part 5-11: Intelligent grouping and resource sharing for HES Class 2 and Class 3 - Remote user interface - 14543-5-12:2019 - HES Architecture - Part 5-12: Intelligent grouping and resource sharing for HES Class 2 and Class 3 - Remote access test and verification - 14543-5-21:2012 - HES Architecture - Part 5-21: Intelligent grouping and resource sharing for HES Class 2 and Class 3 - Application profile - AV profile -14543-5-22:2010 - HES Architecture - Part 5-22: Intelligent grouping and resource sharing for HES Class 2 and Class 3 - Application profile - File profile - 14543-5-101:2019 - HES Architecture - Part 5-101: Intelligent grouping and resource sharing for HES Class 2 and Class 3 - Remote media access profile - 14543-5-102:2020 - HES Architecture - Part 5-102: Intelligent grouping and resource sharing for HES Class 2 and Class 3 - Remote universal management profile  Since these three protocols cannot directly communicate with each other, SC 25/WG 1 has also specified a series of interoperability and gateway standards, the ISO/IEC 18012 and ISO/IEC 15045 series: see below the list of standards and technical reports for product interoperability, gateway and interfaces. - 18012-1:2004 - Guidelines for product interoperability - Part 1: Introduction - 18012-2:2012 - Guidelines for product interoperability - Part 2: Taxonomy and application interoperability model - 15045-1:2004 - HES Gateway - Part 1: A residential gateway model for HES - 15045-2:2012 - HES Gateway - Part 2: Modularity and protocol - 10192-1:2002 - HES Interfaces - Part 1: Universal Interface (UI) Class 1 - TR 10192-2:2000 - HES Interfaces - Part 2: Simple Interface Type 1 - 10192-3:2017 - HES Interfaces - Part 3: Modular communications interface for energy management  For the protection of the home and related communications, a set of standards have been specified. ISO/IEC 24767-1 specifies the security requirements. For protection of the communications between devices in the home that do not have the capability to support IP, a simpler security protocol has been specified in ISO/IEC 24767-2: see below the list of standards for security. - 24767-1:2008 - Home network security - Part 1: Security requirements - 24767-2:2009 - Home network security - Part 2: Internal security services - Secure communication protocol for middleware (SCPM)  In order to support energy harvesting devices, i.e. devices that do not depend on batteries or mains power, very energy-efficient wireless communication protocols have been developed (ISO/IEC 14543-3-10 and ISO/IEC 14543-3-11): see below the list of standards for wireless communication. - 14543-3-10:2020 - HES Architecture Part 3-10: Amplitude modulated wireless short-packet (AMWSP) protocol optimized for energy harvesting - Architecture and lower layer protocols - 14543-3-11:2016 - HES Architecture Part 3-11: Frequency modulated wireless short-packet (FMWSP) protocol optimised for energy harvesting - Architecture and lower layer protocols The ISO/IEC 29145 series specifies an efficient wireless mesh network - 29145-1:2014 - Wireless beacon-enabled energy efficient mesh network (WiBEEM) for wireless home network services - Part 1: PHY layer - 29145-2:2014 - Wireless beacon-enabled energy efficient mesh network (WiBEEM) for wireless home network services - Part 2: MAC layer - 29145-3:2014 - Wireless beacon-enabled energy efficient mesh network (WiBEEM) for wireless home network services - Part 3: NWK layer  In addition to these communication protocol specifications, SC 25/WG 1 published a set of standards to manage energy usage and generation in the home, GridWise, lighting systems and residential security systems. These are found in the ISO/IEC 15067-2, ISO/IEC 15067-3 and ISO/IEC 15067-4 series: see below the list of standards and technical reports for energy management, lighting and residential security systems. - TR 15067-2:1997 - HES Application model - Part 2: Lighting model for HES - 15067-3:2012 - HES Application model - Part 3: Model of a demand-response energy management system for HES - TR 15067-3-2:2016 - HES Application model - Part 3-2: GridWise - Interoperability context-setting framework - 15067-3-3:2019 - HES Application model - Part 3-3: Model of a system of interacting energy management agents (EMAs) for demand-response energy management - TR 15067-3-7:2020 - HES Application model - GridWise transactive energy systems research, development and deployment roadmap - TR 15067-3-8:2020 - HES Application model - Part 3-8: GridWise transactive energy framework - TR 15067-4:2001 - HES Application model - Part 4: Security system for HES  SC 25/WG 1 published also a set of standards for the home network resource management - these are found in the ISO/IEC 30100 series – and a standard ISO/IEC 14762 for the functional safety requirements: see below the list for standards for home network resource management and safety - 30100-1:2016 - Home network resource management - Part 1: Requirements - 30100-2:2016 - Home network resource management - Part 2: Architecture - 30100-3:2016 - Home network resource management - Part 3: Management application - 14762:2009 - Functional safety requirements for home and building electronic systems (HBES)  See also the ISO/IEC Technical Reports on Intelligent homes: - TR 29107-1:2010 - Information technology - Intelligent homes - Taxonomy of specifications — Part 1: The scheme - TR 29108:2013 - Information technology - Terminology for intelligent homes  **ISO/IEC JTC 1/SC 25/WG 3 “Customer Premises Cabling”**  The cabling standards ISO/IEC 11801 series specify a cabling infrastructure supporting the transport of all kinds of information on customer premises with help of primarily balanced cable and optical fibre cable, and in some cases also of correctional cables. Up to now standards have been published for offices, homes, industrial premises and data centres: see below the list of major standards related to home cabling.  - 11801-1:2017 - Generic cabling for customer premises – Part 1: General requirements - 11801-1- Corrigendum 1:2018 - Generic cabling for customer premises — Part 1: General requirements — Technical Corrigendum 1 - 11801-4:2017 - Generic cabling for customer premises – Part 4: Single-tenant homes - 11801-4 – Corrigendum 1:2018 - Generic cabling for customer premises — Part 4: Single-tenant homes — Technical Corrigendum 1 - 14763-2:2019 - Implementation and operation of customer premises cabling - Part 2: Planning and installation - TR 14763-2-1:2011 - Implementation and operation of customer premises cabling - Part 2-1: Planning and installation - Identifiers within administration systems  - 14763-3:2014+AMD1:2018 CSV - Information technology - Implementation and operation of customer premises cabling - Part 3: Testing of optical fibre cabling - TS 29125:2017 and Amd.1:2020 - Telecommunications cabling requirements for remote powering of terminal equipment |
| **MoCA®**  continuation of **MoCA®**  continuation of **MoCA®**  continuation of **MoCA®** | **MoCA®** Multimedia over Coax Alliance <http://www.mocalliance.org/>  *SG15 TD 82 WP1 September 2022* MoCA provided a complete update of the section “MoCA home networking MAC/PHY specifications” as below.  The Multimedia over Coax Alliance, MoCA®, supports three versions of its MoCA home networking MAC/PHY specifications (MoCA Home™ 2.0/2.0 Bonded, MoCA Home™ 2.5 and MoCA Home™ 3.0).  MoCA 1.0 and 1.1 specifications are sunset and the Alliance no longer certifies products using these protocols.  **MoCA Home™ 2.0/2.0 Bonded**  - Up to 1 Gbps MAC data rate - Deterministic (scheduled) media access with 3.6 ms average latency  - Two packet error modes: Very low Packet Error Rate (1e-8) and Nominal Packet Error Rate (1e-6) - Single or dual 100 MHz channels operating in the frequency range of 400…1650MHz - Power states: active, low power, standby and sleep mode - Backward interoperable with MoCA 1.1  **MoCA Home™ 2.5** - Up to 2.5 Gbps MAC data rate  - MoCA protected setup (MPS) - Management Proxy - Enhanced Privacy - Network wide Beacon Power  - Bridge detection   * MoCA Home 2.5 is backward interoperable with MoCA Home 2.0/2.0 Bonded. **NOTE**: MoCASec™ is a peer-to-peer security feature accessible for MoCA Home**™** 2.0/2.0 Bonded and MoCA Home**™** 2.5 via firmware download. Peer-to-peer security is embedded in MoCA Home**™** 3.0.   **MoCA Home™ 3.0** - Up to 10 Gbps MAC data rate with a channel bandwidth of up to 1600 MHz and 5 Gbps with a channel bandwidth of up to 800 MHz - Less channel bandwidth required to achieve 2.5 Gbps of MAC data rate (300 MHz ~ 400 MHz)- Low latency (as low as 1.4 ms) - Provides peer-to-peer security capability  - Strong security and privacy features (support for IEEE Std 802.1X, 128-bit AES-CTR)  - Up to four 400 MHz channels operating in the frequency range of 200…2075MHz  - Support for network-wide reduced power mode - Support for remote password provisioning without user intervention - MoCA Home 3.0 is backward interoperable with MoCA Home 2.0/2.0 Bonded and MoCA Home 2.5.  More details on MoCA Home™ networking technology can be found at: <https://mocalliance.org/technology/index.php>  **MoCA Access™ 2.5** MAC/PHY Specification is a network access standard capable of 2.5 Gbps data rates over coaxial cable.  **MoCA Access™ 2.5** - Fiber extension technology using in-building coaxial cabling. - Based on MoCA 2.5 specification. -Throughput is 2.5 Gbps downstream and 2 Gbps upstream. - Latency is less than 5ms. - Point-to-multipoint serving up to 16 modems (clients). - Works over existing in-building coaxial wiring. - Operating frequency range of 400MHz - 1675MHz. - Co-exists with TV, and cellular (4G/5G) technologies. - Supports standard traffic shaping and QoS up to eight (8) traffic classes. - Strong security support. - Three transmission power modes with 45dB, 55dB or 65dB link budgets and power saving modes. - Included in TR-419 by Broadband Forum:  [Fiber to the extension point, Technical Report TR-419](https://www.broadband-forum.org/technical/download/TR-419.pdf)  Applications include: - Fiber to the building (FTTB) - MDUs, MTEs, Affordable Housing Units, Social and Affordable Housing - Wired backhaul for 4G/5G - Hotels, hospitals, restaurants, offices  MoCA Access supports standard traffic shaping and QoS up to eight (8) traffic classes. It also provides strong security, three transmission power modes with 45dB, 55dB or 65dB link budgets and power saving modes.  More details on MoCA Access can be found at following URL: <http://www.mocalliance.org/access/index.htm>  **MoCA Link™ 2.5** MAC/PHY specification provides a multi-gigabit solution especially designed for sub-millisecond low-latency point to point links over coaxial cabling for fiber extension, satellite, and 5 G connectivity.  **MoCA link™ 2.5** shares the physical characteristics of **MoCA Home™ 2.5.** - Point to point connection for 5G, Fiber PON and Satellite - Ultra-low latency of less than 1 millisecond - Allows low-cost access termination on the street, roof, or outside wall of the premises - Enables reverse power feed - Based on MoCA Home™ 2.5 technology - 2.5 Gbps, Multi-Gigabit speeds - Will be extended to MoCA Link™ 3.0 (10 Gbps) - Ease of deployment using existing coaxial cabling - Ease of deployment reusing deployed coaxial cabling - Operating frequency range of 400MHz - 1675MHz. - Coexists with TV, DOCSIS and cellular (4G/5G) technologies. - Supports standard traffic shaping and QoS up to four (4) queue in actual applications. - Strong security support. - Three transmission power modes with 45dB, 55dB or 65dB link budgets and power saving modes.  More details on MoCA Link™ can be found at following URL: <https://mocalliance.org/mocalink/index.php>  Note: MoCA emphasizes true and realized data rates and has conducted numerous field tests to verify MAC rates. |
| **TIA** | **TIA (Telecommunications Industry Association)** <http://standards.tiaonline.org/>  -TIA-1113 - 2008 Edition, May 2008: Medium-Speed (up to 14 Mbps) Power Line Communications (PLC) Modems using Windowed OFDM |
| **TTC** | **TTC (The Telecommunication Technology Committee)** <https://www.ttc.or.jp/e>  - TTC JJ-300.00 – Version 3.0 – May 25 , 2017: Home-network Topology Identifying Protocol (HIP) |
| **Thread Group** | **Thread Group** <https://www.threadgroup.org/>  Thread Specifications can be found at following URL <https://www.threadgroup.org/support#specifications>  Thread is a IEEE 802.15.4 based wireless system.  More information on Thread solution can be found at following URLs <https://www.threadgroup.org/What-is-Thread/Overview> <https://www.threadgroup.org/What-is-Thread/Developers> |
| **CSA (ex. Zigbee Alliance)** | **Connectivity Standards Alliance (CSA)** <https://csa-iot.org/>  In May 2021 Zigbee Alliance rebranded as Connectivity Standards Alliance.  Zigbee Specifications can be found at following URL: <https://csa-iot.org/all-solutions/zigbee/>  Zigbee is a IEEE 802.15.4 based wireless system.  More information about the Zigbee solution and developer resources can be found at following URL  <https://csa-iot.org/resources/developer-resources/> |
| **Z-Wave Alliance** | **Z-Wave Alliance** <https://z-wavealliance.org/>  Z-Wave PHY and MAC layers are defined by ITU-T Recommendation [G.9959](http://www.itu.int/rec/T-REC-G.9959-201501-I) . Z-Wave Specifications can be found at following URL  <https://z-wavealliance.org/z-wave-specifications/>  More information about Z-Wave technology can be found at following URL <https://z-wavealliance.org/about_z-wave_technology/>  More information on Z-Wave Smart home control can be found at following URL <https://www.z-wave.com/> |

**5.** **Web-Based Home Network Transport (HNT) Standards Overview**

A web-based HNT Standards Overview has been set up in order to make the standards lists in Section 1.1 (Table 1.1), Section 1.2 (Table 1.2), Section 2 (Table 2) , Section 3 (Table 3), Section 4 (Table 4) and related applications in Section 6 (Table 6) more manageable and user-friendly. The web-based overview is organized by Home Network Transport mediums and the various systems and technologies. It also provides examples of Home Network applications as listed in Section 6 (Table 6). The web-based HNT Standards Overview enables an easy identification and download of the publicly available Standards, Recommendations, Technical Specifications and Reports related to each system, technology and associated technical matters. The web-based HNT Standards Overview focuses on the most relevant published and updated documents related to Home Network. The taxonomy used for these web-based HNT Standards Overview is described in the table 5 below**.**The items (i.e. titles of Standards, Recommendations, etc.) are available by topics & sub topics, responsible ITU Working Groups and other SDOs. They are also searchable on number, title and description. The topics, subtopics and items of the web-based HNT Standards Overview appear alphanumerically listed; this is inherent in the data base system.   
The web-based HNT Standards Overview is hosted on the ITU-T SG15 website page “Documentation” and available at following URL  
<https://www.itu.int/net4/ITU-T/landscape#?topic=0.132&workgroup=1&searchValue=&page=1&sort=Revelance>

|  |  |  |  |
| --- | --- | --- | --- |
| **Table 5 - Taxonomy of the Web-based Home Network Transport Standards Overview** | | | |
| **Part 1: General on Home Network** | | | |
| **Home Network architecture and functions** | **Home Network security** |  |  |
| **Part 2: Home gateways** | | | |
| **Part 3:** **G.hn technology** | | | |
| **Part 4: Wireline home networking** | | | |
| **Over phone line** - HomePNA transceivers - Phoneline Enhanced HomePNA transceivers - Phoneline G.hn unified transceivers | **Over powerline – Power Line Communications (PLC)** - Narrowband PLC transceivers - Broadband PLC transceivers - Powerline G.hn unified transceivers - Mitigation of interference | **Over coaxial cable** - Multimedia over Coax Alliance (MoCA) - Coax Enhanced HomePNA transceivers - Coax G.hn unified transceivers - HiNoC - High performance network over Coax | **Over Ethernet twisted-pair cable** - IEEE 802.3 transceivers over Catx cable - Catx G.hn unified transceivers |
| **Over plastic optical fibre (POF)** - ETSI POF based home networking - IEEE 802.3 transceivers over POF - POF G.hn unified transceivers | **Over glass optical fibre** |  |  |
| **Part 5: Wireless home networking** | | | |
| **General on WLAN and WPAN Wireless Access** | **IEEE 802.11 Wireless LAN / Wi-Fi** | **IEEE 802.11 Wireless Gigabit (WiGig)** | **IEEE 802.11 Wake-Up Radio** |
| **Sub 1 GHz Wireless LAN** | **IEEE 802.15.4 based low-rate wireless networks** | **Bluetooth technology** | **Z-Wave** |
| **ETSI HiperLAN Type 2** | **ETSI DECT (Digital Enhanced Cordless Telecommunications) -** Classic DECT - DECT Ultra Low Energy (ULE) **-** DECT-2020 New Radio (NR) | **Optical wireless communications -** Visible Light Communication / Li-Fi |  |
| **Part 6: Home Network applications** | | | |
| **General on Smart Home Network** | **Cable-based video services and IPTV** | **Internet connectivity** - Internet connectivity over wireline networking - Internet connectivity over wireless networking | **In-home Access Points connectivity -** In-home Access Points connectivity over wireline networking - In-home Access Points connectivity over wireless networking |
| **Personal and close proximity connectivity** | **IoT / Domotics applications** - IoT / Domotics over wireline networking - IoT/ Domotics over wireless networking |  |  |
| **Part 7: Smart Grid applications** | | | |
| **Part 8: Home and Building Automation Systems** | | | |
| **Home and Building Electronic Systems (HBES)** - HBES general requirements | **Home Electronic System (HES)** - HES terminology and architecture - HES interoperability, gateways and interfaces - HES security - HES wireless communication – AM and FMWSP, WiBEEM - HES home network resource management - HBES safety requirements | **HES Applications** - HES energy management, GridWise and lighting - HES residential security systems |  |
|  | | | |
| **Part 9: Home Network cabling** | | | |
| **Part 10: Environment and power supply of Home Network equipment** | | | |
| **Part 11: Safety and protection of Home Network equipment** | | | |
| **Part 12: Operation and Maintenance (OAM) of Home Network** | | | |
| **Management of Home Network devices** | **Data models for Home Network** | **Performance testing of Home Network equipment** | **Conformance testing of Home Network equipment** |

**6. Overview of Home Networks applications**

**Table 6 – Examples of Home Network applications and related Home Network technologies**

| **Technology** | **Standards** | **Internet connectivity** | **In-home Access Points connectivity** (Note 1) | **Personal and close proximity connectivity** (Note 2) | **IoT / Domotics applications** (Note 3) | **Smart Grid / Energy Management** |
| --- | --- | --- | --- | --- | --- | --- |
| **Wireline home networking** | | | | | | |
| **HomePNA (Phoneline)** | G.9951  G.9952  G.9953 G.9954 | X |  |  |  |  |
| **G.hn  (Phoneline)** | G.9960  G.9961  G.9962  G.9963 G.9964 | X | X |  | X |  |
| **Narrowband  PLC  (Powerline)** | G.9901 G.9902  G.9903  G.9904  G.9905 |  |  |  | X | X |
| IEEE 1901.1 IEEE 1901.2 IEEE 1901.2a |  |  |  |  | X |
| **G.hn  Broadband  PLC  (Powerline)** | G.9960 G.9961 G.9962 G.9963 G.9964 | X | X |  | X | X |
| **Other  Broadband  PLC  (Powerline)** | IEEE 1901 IEEE 1901b | X | X |  | X | X |
| IEEE 1901.1 |  |  |  |  | X |
| **MoCA (Coax)** | MoCA Alliance | X | X |  |  |  |
| **HiNoC (Coax)** | J.195 series J.196 series J.198.1 | X | X |  |  |  |
| **HomePNA (Coax)** | G.9954 | X | X |  |  |  |
| **G.hn (Coax)** | G.9960 G.9961  G.9962  G.9963 G.9964 | X | X |  | X |  |
| **IEEE 802.3**  **Ethernet (Catx)** | 1000BASE-T  2.5GBASE-T 5GBASE-T 10GBASE-T | X | X |  |  |  |
| 10BASE-T1L 10BASE-T1S |  |  |  | X |  |
| **G.hn  (Catx)** | G.9960 G.9961 G.9962  G.9963 G.9964 | X | X |  | X |  |
| **ETSI (PoF)** |  | X | X |  |  |  |
| **IEEE 802.3 (PoF)** | 1000BASE-RHA | X | X |  |  |  |
| **G.hn (PoF)** | G.9960  G.9961  G.9962  G.9963;  G.9964 | X | X |  | X |  |
| **Over glass optical fibre** | G.fin series **(*Under study*)** | X | X |  | X |  |
| **Wireless home networking** | | | | | |  |
| **IEEE 802.11** | Wi-Fi 4, 5, 6, 6E | X | X |  | X |  |
| WiGig mmWave Wi-Fi |  |  | X |  |  |
| **IEEE 802.11 Low power  Wi-Fi** | Sub-1 GHz IEEE 802.11ah Wake-Up Radio IEEE 802.11ba |  |  |  | X |  |
| **IEEE 802.15.4 based Low-Rate Wireless Networks** | IEEE 802.15.4 Thread |  |  |  | X |  |
| Zigbee |  |  |  | X | X |
| **Bluetooth** | Bluetooth Classic Bluetooth Low Energy (LE) |  |  | X | X |  |
| **ITU-T G.9959 Sub-1 GHz based Wireless Networks** | G.9959 Z-Wave |  |  |  | X | X |
| **DECT** | DECT ULE |  |  |  | X |  |
| Classic DECT DECT-2020 NR |  |  | X | X |  |
| **LiFi** | G.9991 IEEE 802.15.7 | X |  | X | X |  |
| **CENELEC “HBES” and ISO/IEC JTC 1/SC 25 “Home Electronic System”** | | | | | | |
| **HBES and HES** |  |  |  |  | X | X |

Note 1: Access Point connectivity to provide e.g. in-home Wi-Fi backhauling.  
Note 2: Personal connectivity for Personal Area Network (PAN) and close proximity connectivity e.g. cordless communication and multiple gigabit links typically at ranges of around 10 m for in-room use.  
Note 3: Connectivity to IoT and domotics applications e.g. to support Smart Home.

**7. List of Contacts**

| **Body** | **Contact person** | | **Link to the Web-Site** | **Status of contact**  **Notes Liaison Tracking** |
| --- | --- | --- | --- | --- |
| Broadband Forum | Lincoln Lavoie Broadband Forum Technical Committee Chair [lylavoie@iol.unh.edu](mailto:lylavoie@iol.unh.edu) | | [www.broadband-forum.org/](http://www.broadband-forum.org/) | SG15 TD 334 GEN  Jan-Feb 2020  Liaison Rapporteur Frank Van der Putten [frank.van\_der\_putten@nokia.com](mailto:frank.van_der_putten@nokia.com) |
| CENELEC CLC/TC 205,  "Home and Building Electronic Systems (HBES)" |  | | <https://standards.cencenelec.eu/dyn/www/f?p=305:7:0:25:::FSP_ORG_ID,FSP_LANG_ID:1258281> |  |
| CENELEC CLC/TC215,  "Electrotechnical aspects of telecommunication equipment” |  | | <https://standards.cencenelec.eu/dyn/www/f?p=305:7:0:25:::FSP_ORG_ID,FSP_LANG_ID:1258297> |  |
| IEC TC 86 SC 86A Fibres and cables |  | | <https://www.iec.ch/dyn/www/f?p=103:7:0::::FSP_ORG_ID:1398> | SG15 TD 54 GEN September 2022  Liaison Rapporteur Sudipta Bhaumik Sterlite Technologies Ltd, India [sudipta.bhaumik@stl.tech](mailto:sudipta.bhaumik@stl.tech) |
| ETSI TC ATTM  Access Terminals, Transmission and Multiplexing | Chairman: ATTM Dominique Roche eG4U [dominique.roche@eg4u.org](mailto:dominique.roche@eg4u.org)  ATTM Technical Secretary  Pat O’Keeffe  eG4U  [Pat.okeeffe@eg4u.ie](mailto:Pat.okeeffe@eg4u.ie)  ATTM AT2 Olivier Bouffant ATTM/AT2 Chairman [olivier.bouffant@orange.com](mailto:olivier.bouffant@orange.com) | | <https://www.etsi.org/committee/1390-attm> | SG15 TD 580 WP1 April 2021 |
| ETSI TC DECT  Digital Enhanced Cordless Telecommunications |  | | <https://www.etsi.org/committee/1394-dect> |  |
| ETSI ISG F5G 5th Generation Fixed Network | |  | <https://www.etsi.org/committee/1696-f5g> | SG15 TD 59 WP1 September 2022  Liaison Rapporteur Tony Zeng Huawei China [tony.zengyan@huawei.com](mailto:tony.zengyan@huawei.com) |
| ETSI TC EE Environmental Engineering | |  | <https://www.etsi.org/committee/1395-ee> |  |
| ETSI BRAN Broadband Radio Access Networks | |  | <https://www.etsi.org/committee/1389-bran> |  |
| IEEE 802.3 | David Law Chair, IEEE 802.3 Ethernet Working Group [dlaw@hpe.com](mailto:dlaw@hpe.com) | | <http://www.ieee802.org/3/> | SG15 TD 84 WP1 September 2022  SG15 TD 52 GEN September 2022  Liaison Rapporteur Tom Huber Nokia USA [tom.huber@nokia.com](mailto:tom.huber@nokia.com) |
| IEEE 802.11 |  | | <https://www.ieee802.org/11/> |  |
| IEEE 802.15 |  | | <http://www.ieee802.org/15/> |  |
| IEEE 1901 Working Group on Power Line Communications (COM/PLC) | Chair,  Jean-Philippe Faure  [jean-philippe.faure@progilon.com](mailto:jean-philippe.faure@progilon.com) | | <https://sagroups.ieee.org/1901/> | SG15 TD 639 WP1 April 2021 |
| MoCA®  Multimedia over Coax Alliance | Roberta Silverstein, Managing Director Multimedia over Coax Alliance, MoCA (R) [robertas@mocalliance.org](mailto:robertas@mocalliance.org) | | [www.mocalliance.org](http://www.mocalliance.org) [www.mocainyourhouse.com](http://www.mocainyourhouse.com) | SG15 TD 82 WP1 September 2022 |
| HomeGrid Forum |  | | <http://www.homegridforum.org/> | SG15 TD 650 WP1  December 2021 |
| ITU-R WP1A | John Shaw Chairman, Correspondence Group on EMC Related Interference and  Coexistence of wired telecommunication systems with radiocommunication systems [shawzone@gmail.com](mailto:shawzone@gmail.com) | | [www.itu.int/en/ITU-R/study-groups/Pages/default.aspx](http://www.itu.int/en/ITU-R/study-groups/Pages/default.aspx) | SG15 TD 704 WP1 December 2021  SG15 TD 554 WP1 April 2021 |
| ITU-R WP5C |  | | [www.itu.int/en/ITU-R/study-groups/rsg5/rwp5c/Pages/default.aspx](http://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5c/Pages/default.aspx) |  |
| ITU-R WP5D |  | | [www.itu.int/en/ITU-R/study-groups/rsg5/rwp5d/Pages/default.aspx](http://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5d/Pages/default.aspx) |  |
| ITU-R WP6 | Yukihiro Nishida Chairman ITU-R Study Group 6 [nishida.y-fe@nhk.or.jp](mailto:nishida.y-fe@nhk.or.jp) | | <https://www.itu.int/en/ITU-R/study-groups/rsg6/Pages/default.aspx> | SG15 TD 12 GEN  September 2022 |
| ITU-R WP6A | John Shaw Rapporteur on Power Line Telecommunication (PLT) and general EMC-related potential [shawzone@gmail.com](mailto:shawzone@gmail.com) | | <http://www.itu.int/en/ITU-R/study-groups/rsg6/Pages/default.aspx> | SG15 TD 547 WP1 April 2021 |
| ITU-R WP6B | Paul Gardiner Chairman, WP6B [paul.gardiner@eu.sony.com](mailto:paul.gardiner@eu.sony.com) | | <https://www.itu.int/en/ITU-R/study-groups/rsg6/rwp6b/Pages/default.aspx> |  |
| ITU-T SG5 | Fryderyk Lewicki WP1/5 Chairman Orange Polska [fryderyk.lewicki@orange.com](mailto:fryderyk.lewicki@orange.com) | | <http://www.itu.int/en/ITU-T/studygroups/2017-2020/05/Pages/default.aspx> | SG15 TD 9 WP1 September 2022 |
| ITU-T SG9 | Jingyi Xue Rapporteur of Q10/9 ABP, NRTA China xuejingyi@abp2003.cn  Shizhu Long Shenzhen Skyworth Digital Technology Co. Ltd  China Rapporteur of Q6/9 [longshizhu@skyworth.com](mailto:longshizhu@skyworth.com) | | <http://www.itu.int/en/ITU-T/studygroups/2017-2020/09/Pages/default.aspx> | SG15 TD 7012 WP1 December 2021  SG15 TD 705 WP1 December 2021 |
| ITU-T SG11 | Andrey Kucheryavy SG11 Chairman [akouch@mail.ru](mailto:akouch@mail.ru) | | <http://www.itu.int/en/ITU-T/studygroups/2017-2020/11/Pages/default.aspx> | SG15 TD 471 GEN April 2021 |
| ITU-T SG13 |  | | <http://www.itu.int/en/ITU-T/studygroups/2017-2020/13/Pages/default.aspx> |  |
| ITU-T SG16 | Sarra Rebhi Office National de la télédiffusion Tunisia [rebhi.sarra@telediffusion.net.tn](mailto:rebhi.sarra@telediffusion.net.tn) | | <http://www.itu.int/en/ITU-T/studygroups/2017-2020/16/Pages/default.aspx> | SG15 TD 4 WP1 September 2022  SG15 TD 642 WP1 December 2021 |
| ITU-T SG17 | Jonghyun Baek Rapporteur of Q6/17 [jhbaek@kisa.or.kr](mailto:jhbaek@kisa.or.kr) | | <http://www.itu.int/en/ITU-T/studygroups/2017-2020/17/Pages/default.aspx> | SG15 TD 483 WP1 September 2020 |
| ITU-T SG20 |  | | <http://www.itu.int/en/ITU-T/studygroups/2017-2020/20/Pages/default.aspx> |  |
| ITU-D SG1 | Mr Vadym Kaptur Co-Rapporteur for Question 1/1  A.S. Popov Odessa National Academy of Telecommunications Ukraine [vadim.kaptur@onat.edu.ua](mailto:vadim.kaptur@onat.edu.ua)  Mr Fred Onchoka Ong'aro Co-Rapporteur for Question 1/1 Communications Authority of Kenya (CA) Kenya [ongaro@ca.go.ke](mailto:ongaro@ca.go.ke) | | https://www.itu.int/net4/ITU-D/CDS/sg/index.asp?lg=1&sp=2018&stg=1 | SG15 TD 653 WP1 December 2021 |
| ITU-D SG2 |  | | https://www.itu.int/net4/ITU-D/CDS/sg/index.asp?lg=1&sp=2018&stg=2 |  |
| ISO/IEC JTC 1/SC 25 | Marco Peter Secretary ISO/IEC JTC 1/SC 25 [peter@zvei.org](mailto:peter@zvei.org) | | <https://www.iso.org/committee/45270.html> | SG15 TD 546 WP1 April 2021 |
| TIA = Telecommunication Industry Association TR-41, TR-42 |  | | <https://standards.tiaonline.org/> |  |

# 8. Lead Study Group activities related to the HNT Standards Overview and Work Plan

This list of Lead Study Group activities should be used to identify work items, to show the current status and should be taken as a permanent living document that will accompany the work through the Study Period.

**Status: September 2022**

| **Work Item** | **Title** | **Meeting results** | **Work during interim period** |
| --- | --- | --- | --- |
| 1 | Maintain and update the HNT Standards Overview and Work Plan document together with other ITU-T Study Groups and in conjunction with ITU-R and other relevant standards organizations. | The HNT Standards Overview and Work Plan document has been updated based on received liaison statements (LS) from other ITU-T and ITU-R Study Groups, and other cooperating standards bodies, new approved documents and work plan from ITU-T SG15 WP1 Q3, WP2 Q5 & Q7 , LS from ITU-T SG15 liaison Rapporteurs and new published documents observed on the web-sites of other relevant standards organizations. These changes have been incorporated in the new version 14 – September 2022 of the HNT Standards Overview and Work Plan document . | Maintain existing correspondence relationships with appropriate groups |
| 2 | Maintain and update the web-based HNT Standards Overview. | The web-based HNT Standards Overview has been accordingly updated: see at  <https://www.itu.int/net4/ITU-T/landscape#?topic=0.132&workgroup=1&searchValue=&page=1&sort=Revelance> |  |
| 3 | Identify "gaps, overlaps and conflicts" by observing on-going standardization activities. | ITU-T SG15 Q1/15 noted the activities of ETSI new group on 5th Generation Fixed Network (F5G) activities *“shifting the paradigm from Fibre to the Home to Fibre to Everything Everywhere*”. | To follow up ETSI F5G activities with Q2/15 and Q3/15. |
| 4 | Communicate with other groups, inside and outside ITU-T as needed for coordination purposes and serve as focal point to provide ITU inter-Sector coordination with other ITU-R and ITU-D Study Groups. | The new version of the HNT Standards Overviews and Work Plan document has been provided via LS for action to ITU-T TSAG, ITU-T SG5, SG9, SG13, SG16, SG17, ITU-R SG1, SG5, SG6, ETSI TC ATTM, ISO/IEC JTC 1/SC 25, IEEE 802.3, Broadband Forum, MoCA and via LS for information to ITU-T SG20 as well as ITU-D SG1 and SG2. | Maintain existing correspondence relationships with the appropriate groups. |
| 5 | Maintain and update a living list of the conformance and interoperability testing (CIT) activities in other organizations related to technologies based on ITU-T Recs. from WP1/15. | Updated list (SG15 TD 33 WP1: Version 15 of living list of CIT activities related to technologies based on ITU-T Recommendations from WP1/15) has been provided via LS for information to ITU-T SG11. | Maintain existing correspondence relationships with the appropriate groups |

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