Access Network Transport

Standards Work Plan

December 2021 Q1/15 meeting

Contact persons for the project updating:

|  |  |  |
| --- | --- | --- |
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Access Network Transport is an ITU-T Project dealing with studies and Recommendations on the Access Network.

Access Network Transport Standards Work Plan

**Issue 34, December 2021**

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ACCESS NETWORK TRANSPORT STANDARDS WORK PLAN

ISSUE 34, DECEMBER 2021

# General

ANT Standards Work Plan is a living document. The actual version is available at <http://www.itu.int/en/ITU-T/studygroups/com15/Pages/ant.aspx> .

# Introduction

Today's global communications world has obscured traditional boundaries in network access between Telecommunication Network Operators, Private Network Providers, Satellite and Cable TV Networks, Mobile Networks and Information Technologies. This has resulted in a number of different Study Groups within the ITU-T, e.g. SG 9, 13, 15 developing Recommendations related to transport in the access. Moreover, ITU-R and other standards bodies, fora and consortia are also active in this area.

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 WTSC 96 designated Study Group 15 as **Lead Study Group** on **Access Network Transport (ANT) - reaffirmed at the WTSA-16 -** with the mandate to:

1. study the appropriate core Questions (Question 1, 2 and 4/15),
2. define and maintain an overall (standards) framework, in collaboration with other SGs and standards bodies
3. coordinate, assign and prioritize the studies done by the Study Groups (recognizing their mandates) to ensure the development of consistent, complete and timely Recommendations.

Study Group 15 entrusted WP 1/15, under Question 1/15, with the task to manage and carry out the Lead Study Group activities on coordination of Access Network Transport standards.

# 1. Scope

As the mandate of this Lead Study Group role implies, the standards area covered relates to transport, i.e. Circuit Layer (CL), Path Layer (PL) and Transmission Media Layer (TM) in terms of the general protocol reference model for the Access Network ITU-T Recommendation G.902, Fig. 2/G.902.  
The corresponding transport functions include:

1. multiplexing function
2. cross connect function, including grooming and configuration
3. management functions
4. physical media functions.

The outcome of the Lead Study Group activities is twofold, consisting of an:

* access network transport (ANT) standards overview
* access network transport (ANT) standards work plan

The main purpose of **the standards overview** is to identify the existing standards related to the Access Network Transport technologies.

The presentation of the standards overview consists of two matrixes identifying key elements of the access network transport technologies and a listing of the various standards organizations and their standards identified, including their titles and publication dates.

The main purpose of **the standards work plan** is to:

* define a corresponding matrix table, including the various standards organizations,
* provide an overview of ongoing ANT activities,
* monitor progress of ANT standards work,

1. facilitate the coordination/negotiation for additional standards work on ANT to be undertaken,
2. identify lack of standards,
3. identify duplication and/or overlap,
4. discover priorities and market needs.

The **work plan** will reflect the agreement reached between the parties concerned on the necessary actions to remedy the deficiencies identified.

Apart from taking the Lead Study Group role within the ITU-T, Study Group 15 also endeavor to cooperate with ITU-R and other relevant organizations, such as Broadband Forum, ETSI, IEEE , ISO/IEC, etc..

# 2. General Access Network architecture

**Access Network Transport (ANT):**

Based on definitions specified in ITU-T Rec. G.902 the Access Network (AN) provides transport bearer capabilities for the provision of telecommunications services inside of the AN between a service node interface (SNI) providing customer access to a service node and each of the associated interfaces towards the Customer Premises Network(s) which are being grouped as user network interfaces (UNIs) . An Access Network implementation comprises transmission media and access network element (NE) entities.  
An Access Network is delimited by its interfaces. Users are connected via a User Network Interface (UNI) to the network. The AN is connected to the Service Node (SN) via the Service Node Interface (SNI) and to the Telecommunication Management Network (TMN) via a Q3 interface.  
Figure 1 “ General Access Network architecture and boundaries” shows the AN with the UNI, SNI and Q3 interface as the boundaries to other network entities.



Figure 1 “ General Access Network architecture and boundaries” (extracted from ITU-T G.902)

An Access Network element can be configured and managed through a Q3 interface which may be implemented at the Q reference point. This Q reference point is the access point for management information, configuration control, performance monitoring and maintenance as defined in ITU-T Rec. M.3010.

In principle there are no restrictions on the types and number of SNIs and UNIs which an Access Network may implement. The Access Network does not include Customer Premises Networks and/or terminal equipment respectively.

**Functions of Access Network Transport (ANT):**

The Transport Function (TF) provides the paths for the transport of common bearers between different locations in the Access Network (AN) and the media adaptation for the relevant transmission media used.

Examples of transport functions are:

1. multiplexing function,
2. cross connect function including grooming, on demand connection and configuration,
3. management functions,
4. physical media function.

# 3. Correspondents and contacts

A critical part of the ANT 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 below 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 ANT Standards Overview and Work Plan.

## 3.1 List of Contacts

| **Body** | **Contact person** | **Link to the Web-Site** | **Status of contact**  **Notes Liaison Tracking** |
| --- | --- | --- | --- |
| ATIS Committee STEP |  | <https://www.atis.org/committees-forums/> |  |
| 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  EUROPEAN COMMITTEE FOR ELECTROTECHNICAL STANDARDIZATION |  | [www.cenelec.eu/](http://www.cenelec.eu/) |  |
| 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> |  |
| CENELEC TC 86A “Optical fibres and optical fibre cables”  CENELEC TC 86BXA “Fibre optic interconnect, passive and connectorised components” |  | <https://standards.cencenelec.eu/dyn/www/f?p=305:7:0:25:::FSP_ORG_ID,FSP_LANG_ID:1258369>  <https://standards.cencenelec.eu/dyn/www/f?p=305:7:0:25:::FSP_ORG_ID,FSP_LANG_ID:1258371> | SG15 TD 535 GEN  December 2021  Liaison Rapporteur Daniel Daems  [daniel.daems@commscope.com](mailto:daniel.daems@commscope.com)  SG15 TD 534 GEN December 2021  Liaison Rapporteur Daniel Daems [daniel.daems@commscope.com](mailto:daniel.daems@commscope.com) |
| ETSI  ETSI= European Telecommunications Standards Institute |  | [www.etsi.org](http://www.etsi.org) |  |
| ETSI TC ATTM (Access Terminals, Transmission and Multiplexing)  ATTM has the following Working Groups  **AT2**: (Infrastructure, Physical Networks & Communication Systems)  **TM4**: (Fixed Radio Systems)  **TM6** (Wireline Access Network Systems) TG IC CG: (Co-ordination Group Cenelec-ETSI Installations & Cabling) | 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) | <https://www.etsi.org/committee/1390-attm>  [portal.etsi.org/home.aspx](http://portal.etsi.org/home.aspx) | SG15 TD 466 WP1 Jan – Feb 2020 |
| ATTM AT2 | Chairman :  Olivier Bouffant  Orange  2 avenue Pierre Marzin  Lannion  France [olivier.bouffant@orange.com](mailto:olivier.bouffant@orange.com) | [portal.etsi.org/home.aspx](http://portal.etsi.org/home.aspx) | SG15 TD 579 WP1 April 2021 |
| ATTM TM4 | Chairman  Dr. Roberto Macchi  SIAE Microelettronica SpA  Via Michelangelo Buonarroti 21  I-20093  Cologno Monzese  Italy  [Roberto.Macchi@SIAEMIC.it](mailto:Roberto.Macchi@SIAEMIC.it)  Vice Chairman & Secretary  Dr. Nader Zein  NEC Europe Ltd. Athene, Odyssey Business Park West End Road  HA46QE South Ru–slip - UK  [nader.zein@emea.nec.com](mailto:nader.zein@emea.nec.com) | [portal.etsi.org/home.aspx](http://portal.etsi.org/home.aspx) |  |
| ATTM TM6 | Chairman  Pat O’Keeffe  eG4U  [Pat.okeeffe@eg4u.ie](mailto:Pat.okeeffe@eg4u.ie) | [portal.etsi.org/home.aspx](http://portal.etsi.org/home.aspx) | SG15 TD 466 WP1 Jan – Feb 2020 |
| ETSI TC CABLE Integrated Broadband Cable Telecommunication Networks |  | <https://www.etsi.org/committee/1392-cable> |  |
| 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> |  |
| ETSI ISG F5G 5th Generation Fixed Network |  | <https://www.etsi.org/committee/1696-f5g> | SG TD 575 WP1 April 2021  Liaison Rapporteur Tony Zeng Huawei China [tony.zengyan@huawei.com](mailto:tony.zengyan@huawei.com) |
| IETF Internet Engineering Task Force |  | <https://www.ietf.org/> |  |
| FSAN=Full Service Access Network The single FSAN Working Group is called Optical Access Network (OAN). Within OAN are the following active Task Groups: Operation and Engineering Task Group Next Generation PON (NG-PON) Task Group | OAN Working Group Chair:Junichi Kani  Operation and Engineering Task Group Co-Chairs: Wang Bo and Jiang Ming  Next Generation PON Task Group Co-Chairs: Peter Dawes | <https://www.fsan.org/> | Contact made through those attending SG15/Q2 meetings. |
| IEC  IEC = International Electro-technical Commission |  | [www.iec.ch](http://www.iec.ch) |  |
| 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 556 GEN and SG15 TD 557 GEN December 2021  Liaison Rapporteur Peter Pondillo Corning Incorporated [pondillopl@corning.com](mailto:pondillopl@corning.com) |
| IEC TC 86 SC 86B Fibre optic interconnecting devices and passive components |  | https://www.iec.ch/dyn/www/f?p=103:7:0::::FSP\_ORG\_ID:1401 | SG15 TD 551 WP1 December 2021  Makoto Murakami Liaison Rapporteur NTT [murakami.makoto@lab.ntt.co.jp](mailto:murakami.makoto@lab.ntt.co.jp) |
| IEC TC 86 SC 86C Fibre optic systems and active devices |  | https://www.iec.ch/dyn/www/f?p=103:7:0::::FSP\_ORG\_ID:1403 | SG15 TD 555 WP1 December 2021  Peter Pondillo Liaison Rapporteur Corning Incorporated [pondillopl@]corning.com](mailto:pondillopl@]corning.com) |
| IEEE 802  IEEE=Institute of Electrical and Electronics Engineers  LAN/MAN Standards Committee |  | [www.ieee802.org/](http://www.ieee802.org/) | [Joint IEEE 802 and ITU-T Study Group 15 Workshop](https://www.itu.int/en/ITU-T/Workshops-and-Seminars/202001/Pages/default.aspx) Geneva, 25 January 2020 |
| IEEE 802.1  Working Group | Glenn Parsons Chair IEEE 802.1 Working Group  [Glenn.parsons@ericsson.com](mailto:Glenn.parsons@ericsson.com) | [www.ieee802.org/1/](http://www.ieee802.org/1/) | SG15 TD 548 GEN December 2021  Liaison Rapporteur Glenn Parsons [Glenn.parsons@ericsson.com](mailto:Glenn.parsons@ericsson.com) |
| IEEE 802.3  Ethernet Working Group | David Law Chair IEEE 802.3 Ethernet Working Group [dlaw@hpe.com](mailto:dlaw@hpe.com) | [www.ieee802.org/3/](http://www.ieee802.org/3/) | SG15 TD 721 WP1 December 2021   SG15 TD 466 GEN April 2021  Liaison Rapporteur Peter Stassar Huawei Technologies [peter.stassar@huawei.com](mailto:peter.stassar@huawei.com) |
| IEEE 802.11  Working Group for WLAN Standards |  | [www.ieee802.org/11/](http://www.ieee802.org/11/) |  |
| IEEE 802.16  Working Group on Broadband Wireless Access |  | [www.ieee802.org/16/](http://www.ieee802.org/16/) |  |
| 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 |
| IEEE 1904 Access Networks Working Group  IEEE 1904.1 Working Group Standard for Service Interoperability in Ethernet Passive Optical Networks (SIEPON) |  | <http://www.ieee1904.org/>  [www.ieee1904.org/1/](http://www.ieee1904.org/1/) |  |
| SCTE  Society of Cable Telecommunications Engineers |  | <https://www.scte.org/> |  |
| ITU=International Telecommunication Union |  | [www.itu.int/en/Pages/default.aspx](http://www.itu.int/en/Pages/default.aspx) |  |
| ITU-R  ITU Radiocommunication Sector |  | [www.itu.int/en/ITU-R/Pages/default.aspx](http://www.itu.int/en/ITU-R/Pages/default.aspx) |  |
| ITU-R WP1A | Philippe Aubineau Counsellor, ITU-R SG1 [philippe.aubineau@itu.int](mailto:philippe.aubineau@itu.int)  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 554 WP1 April 2021 |
| ITU-R WP4B |  | <https://www.itu.int/en/ITU-R/study-groups/rsg4/rwp4b/Pages/default.aspx> |  |
| ITU-R WP5A |  | <https://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5a/Pages/default.aspx> |  |
| 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 WP6A | John Shaw Rapporteur on Power Line Telecommunication (PLT) and general EMC-related potential [shawzone@gmail.com](mailto:shawzone@gmail.com) | <https://www.itu.int/en/ITU-R/study-groups/rsg6/rwp6a/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  ITU Telecommunication Standardization Sector |  | https://www.itu.int/en/ITU-T/Pages/default.aspx |  |
| ITU-T SG5 |  | https://www.itu.int/en/ITU-T/studygroups/2017-2020/05/Pages/default.aspx |  |
| ITU-T SG9 | Satoshi Miyaji Chairman SG9  KDDI Corporation, Japan [sa-miyaji@kddi.com](mailto:sa-miyaji@kddi.com)  Kei Kawamura  Rapporteur for Q1/9  KDDI Corporation ki-kawamura[@kddi.com](mailto:@kddi.com)  Jingyi Xue Rapporteur of Q10/9 ABP, NRTA China [xuejingyi@abp2003.cn](mailto:xuejingyi@abp2003.cn)  TaeKyoon Kim  Rapporteur for Q7/9  ETRI  Broadcasting and Telecommunications Convergence Research Lab. Broadcasting System Research Dept./Digital CATV System Research Team  138 Gajeongno, Yuseong-gu, Daejeon  305-700  Korea (Rep. of) [tkkim@etri.re.kr](mailto:tkkim@etri.re.kr) | <http://www.itu.int/en/ITU-T/studygroups/2017-2020/09/Pages/default.aspx> | SG15 TD 711 WP1 December 2021   SG15 TD 710 WP1 December 2021   SG15 TD 645 WP1 December 2021 (Superseded by TD 710 and TD 711)  SG15 TD 640 WP1 December 2021 |
| ITU-T SG11 | Andrey Kucheryavy Chairman SG11 Saint-Petersburg State University of Telecommunications, Russian Federation [akouch@mail.ru](mailto:akouch@mail.ru) | <http://www.itu.int/en/ITU-T/studygroups/2017-2020/11/Pages/default.aspx> | SG15 TD 506 GEN December 2021 |
| ITU-T SG12 |  | <http://www.itu.int/en/ITU-T/studygroups/2017-2020/12/Pages/default.aspx> |  |
| 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 641 WP1 |
| ITU-T SG17 |  | <http://www.itu.int/en/ITU-T/studygroups/2017-2020/17/Pages/default.aspx> |  |
| ITU-T SG20 |  | <http://www.itu.int/en/ITU-T/studygroups/2017-2020/20/Pages/default.aspx> |  |
| ITU-D  Telecommunication Development Sector |  | https://www.itu.int/en/ITU-D/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> |  |
| SCTE  SCTE=Society of Cable Telecommunications Engineers |  | <https://www.scte.org/> |  |

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# 4. Overview of existing holes/overlaps/conflicts

## 4.1 List of ANT Issues identified/mostly gaps (missing Standardization activities)

**Status: December 2021**

| **No.** | **Subject** | **Status** | **Action** |
| --- | --- | --- | --- |
| 1. | Practicability of the ANT Standards Overview  The implementation of the web-based ANT Standards Overview is closed. The update takes place at the same time as the ANT Standards Overview document update.  The updated web-based ANT Standards Overview is available at [​](https://www.itu.int/net4/ITU-T/landscape#?topic=0.105&workgroup=1&searchValue=&page=1&sort=Revelance)https://www.itu.int/net4/ITU-T/landscape#?topic=0.105&workgroup=1&searchValue=&page=1&sort=Revelance . |  |  |
| 2. | ITU-T SG15 - Question 1 - noted ETSI new group on 5th Generation Fixed Network (F5G) “*shifting the paradigm from Fibre to the Home to Fibre to Everything Everywhere*”. |  | To follow up ETSI F5G activities with Q2/15 and Q18/15 |

## 5. Ongoing Standardization activities in the area of Access Network Transport

**5.1 List of ongoing standardization activities in the area of Access Network Transport within ITU-T SG15 - WP1/15**

**Status: December 2021   
  
Table updated with the latest Q2 and Q4 activities resulting from December 2021 ITU-T SG15 - WP1 plenary meeting**

| **Work item** | **Question** | **Status** | **Timing** | **Approval process** | **Subject / Title** | **Base text(s)** | **Editor(s)** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| [G.984.5](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16798) | Q2/15 | Consented | 2021-12 | AAP | Gigabit-capable passive optical networks (G-PON): Enhancement band | [SG15-TD802/PLEN (2021-12)](http://www.itu.int/md/T17-SG15-211206-TD-PLEN-0802) | [Junichi Kani](mailto:junichi.kani.wb@hco.ntt.co.jp) |
| G.987.2 Revised (2022) | Q2/15 | Under study | 2022-09 | AAP | Ten gigabit capable passive optical networks (XG-PON): physical media dependent (PMD) layer specification: Revised (2022) | - | Dekun Liu |
| [G.988 (2017) Amd.5](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16986) | Q2/15 | Consented | 2021-12 | AAP | ONU management and control interface (OMCI) specification: Amendment 5 | [SG15-TD816R1/PLEN (2021-12)](http://www.itu.int/md/T17-SG15-211206-TD-PLEN-0816) | [Yuanqiu Luo](mailto:yuanqiu.luo@futurewei.com), [Marta Seda](mailto:marta.seda@calix.com) |
| G.988 Revised (2022) | Q2/15 | Under Study | 2022-09 | AAP | ONU management and control interface (OMCI) specification: Revised (2022) | - | [Yuanqiu Luo](mailto:yuanqiu.luo@futurewei.com), [Marta Seda](mailto:marta.seda@calix.com) |
| [G.9802](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16993) Revised (2022) | Q2/15 | Under study | 2022-09 | AAP | Multiple-wavelength passive optical networks (MW-PONs) | - | [Yuanqiu Luo](mailto:yuanqiu.luo@futurewei.com), [Dechao Zhang](mailto:zhangdechao@chinamobile.com) |
| [G.9802.1 Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16992) | Q2/15 | Under study | 2022-09 | AAP | Wavelength Division Multiplexed Passive Optical Network: general requirement (G.WDMPON.req): Amendment 1 | [SG15-TD684-WP1 (2021-12)](http://www.itu.int/md/T17-SG15-210412-TD-PLEN-0711) | [Fabrice Bourgart](mailto:fabrice.bourgart@orange.com), [Dezhi (James) Zhang](mailto:zhangdzh@chinatelecom.cn) |
| [G.9802.2 (ex G.WDMPON.pmd&tc)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16804) | Q2/15 | Under study | 2022-09 | AAP | Wavelength Division Multiplexed Passive Optical Network: Physical media dependent (PMD) and Transmission Convergence (TC) (G.WDMPON.pmd&tc) (Continuation of the G.9802 series) | [SG15-TD694/WP1 (2021-12)](http://www.itu.int/md/T17-SG15-211206-TD-WP1-0694) | [Peter Dawes](mailto:peter.dawes@vodafone.com), [Derek Nesset](mailto:derek.nesset@huawei.com) |
| [G.9803 (2018) Amd.2](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16801) | Q2/15 | Consented | 2021-12 | AAP | Radio over fibre systems – Amendment 2 | [SG15-TD807R2/PLEN (2021-12)](http://www.itu.int/md/T17-SG15-211206-TD-PLEN-0807) | [Toshiaki Kuri](mailto:kuri@nict.go.jp), [Yuanqiu Luo](mailto:yuanqiu.luo@futurewei.com) |
| G.9804.1 Amd.2 | Q2/15 | Under study | 2022-09 | AAP | Higher Speed Passive Optical Networks: Requirements – Amendment 2 | - | Dezhi (James) Zhang |
| [G.9804.2 Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16990) | Q2/15 | Under study | 2022 | AAP | Higher Speed Passive Optical Networks: Common Transmission Convergence layer Specification - Amendment 1 | - | [Dan Geng](mailto:dan.geng@nokia-sbell.com), [Yuanqiu Luo](mailto:yuanqiu.luo@futurewei.com) |
| [G.9804.3 Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16989) | Q2/15 | Under study | 2022-09 | AAP | 50-Gigabit-capable passive optical networks (50G-PON): Physical media dependent (PMD) layer specification Amendment 1 | - | [Rene Bonk](mailto:rene.bonk@nokia-bell-labs.com), [Dekun Liu](mailto:liudekun@huawei.com), [Dechao Zhang](mailto:zhangdechao@chinamobile.com) |
| [G.9805](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16987) | Q2/15 | Consented | Dec 2021 | - | Coexistence of Passive Optical Network Systems | [SG15-TD811R1/PLEN (2021-12)](http://www.itu.int/md/T17-SG15-211206-TD-PLEN-0811) | [Dekun Liu](mailto:liudekun@huawei.com), [Dezhi (James) Zhang](mailto:zhangdzh@chinatelecom.cn) |
| [G.9806 Amd.3](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16988) | Q2/15 | Under study | 2022-09 | AAP | Higher speed bidirectional, single fibre, point-to-point optical access system - Amendment 3 | [SG15-TD671/WP1 (2021-12)](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG15-211206-TD-WP1-0671) | [Fabrice Bourgart](mailto:fabrice.bourgart@orange.com), [Shan Wey](mailto:jun.shan.wey@verizon.com) |
| [G.9806 Cor.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=17246) | Q2/15 | Consented | 2021-12 | AAP | Higher speed bidirectional, single fibre, point-to-point optical access system - Corrigendum 1 | [SG15-TD801/PLEN (2021-12)](http://www.itu.int/md/T17-SG15-211206-TD-PLEN-0801) | [Fabrice Bourgart](mailto:fabrice.bourgart@orange.com), [Shan Wey](mailto:jun.shan.wey@verizon.com) |
| G.9807.1 Revised (2022) | Q2/15 | Under Study | 2022-09 | AAP | 10-Gigabit-capable symmetric passive optical network (XGS-PON): physical media dependent (PMD) layer specification: Revised (2022) | - | [Ronald Heron](mailto:ronald.heron@nokia.com), [Dekun Liu](mailto:liudekun@huawei.com) |
| [G.9807.3 (ex G.SuperPON)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=15208) | Q2/15 | Under study | 2022 | AAP | Wavelength multiplexed point-to-multipoint 10-Gigabit-capable passive optical network | [SG15-TD585/WP1 (2021-04)](http://www.itu.int/md/T17-SG15-210412-TD-WP1-0585) | [Xuming Wu](mailto:wuxuming@huawei.com) |
| [G.hsp.TWDMpmd](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=14551) | Q2/15 | Under study | 2022-09 | AAP | Higher Speed Passive Optical Networks: TWDM PMD | [SG15-TD574/WP1 (2021-04)](http://www.itu.int/md/T17-SG15-210412-TD-WP1-0574) | [Richard Goodson](mailto:richard.goodson@adtran.com), [Chriss Bernard](mailto:chris.bernard@calix.com) |
| [G.sup55](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16553) | Q2/15 | Agreed | 2021-12 | Agreement | Radio-over-fibre (RoF) technologies and their applications | [SG15-TD808R1/PLEN (2021-12)](http://www.itu.int/md/T17-SG15-211206-TD-PLEN-0808) | [Toshiaki Kuri](mailto:kuri@nict.go.jp) |
| [G.sup.5GBH](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16823) | Q2/15 | Agreed | 2021-12 | Agreement | G.Sup document on 5G small cell backhaul/midhaul over TDM-PON(G.sup 5GBH) | [SG15-TD829R1/PLEN (2021-12)](http://www.itu.int/md/T17-SG15-211206-TD-PLEN-0829) | [Pascal Dom](mailto:pascal.dom@nokia.com), [Wu Jia](mailto:jiawu9@chinaunicom.cn), [Xuming Wu](mailto:wuxuming@huawei.com) |
| [G.sup.45](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16995) | Q2/15 | Under study | 2022-09 | Agreement | Optical access systems power conservation | [SG15-TD673/WP1 (2021-12)](https://www.itu.int/md/meetingdoc.asp?lang=en&parent=T17-SG15-211206-TD-WP1-0673) | [Fabrice Bourgart](mailto:fabrice.bourgart@orange.com) |
| [G.sup.PONslicing](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16996) | Q2/15 | Agreed | 2021-12 | Agreement | Network slicing in a PON context | [SG15-TD821R1/PLEN (2021-12)](http://www.itu.int/md/T17-SG15-211206-TD-PLEN-0821) | [Peter Dawes](mailto:peter.dawes@vodafone.com), [Francois Fredricx](mailto:francois.fredricx@nokia.com) |
| [G.sup.PONslicing](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16996) Revised (2022) | Q2/15 | Under study | 2022 | Agreement | Network slicing in a PON context | [-](http://www.itu.int/md/T17-SG15-211206-TD-PLEN-0821) | [Peter Dawes](mailto:peter.dawes@vodafone.com), [Francois Fredricx](mailto:francois.fredricx@nokia.com) |
| G.sup.PONlatency | Q2/15 | Under study | 2022 | Agreement | Latency control and deterministic capability over a PON system | C2760 | [Dezhi (James) Zhang](mailto:zhangdzh@chinatelecom.cn), [Xuming Wu](mailto:wuxuming@huawei.com) |
| G.sup.eOLT | Q2/15 | Under study | 2022 | Agreement | Enhanced optical line termination with IT functions | C2817 | [Wu](mailto:jiawu9@chinaunicom.cn) Jia, [Yi Jiang](mailto:jiang.yi7@zte.com.cn) |
| [G.994.1 Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16824) | Q4/15 | Consented | 2021-12 | AAP | Handshake procedures for digital subscriber line transceivers - Amendment 1 | [SG15-TD813R1/PLEN (2021-12)](http://www.itu.int/md/T17-SG15-211206-TD-PLEN-0813) | [Miguel Peeters](mailto:miguel.peeters@broadcom.com) |
| G.994.1 Amd.2 | Q4/15 | Under study | 2022-09 | AAP | Handshake procedures for digital subscriber line transceivers - Amendment 2 | - | [Miguel Peeters](mailto:miguel.peeters@broadcom.com) |
| [G.997.2 Amd.3](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16825) | Q4/15 | Consented | 2021-12 | AAP | Physical layer management for G.fast transceivers: Amendment 3 | [SG15-TD814R1/PLEN (2021-12)](http://www.itu.int/md/T17-SG15-211206-TD-PLEN-0814) | [Miguel Peeters](mailto:miguel.peeters@broadcom.com) |
| [G.997.2 Amd.4](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16825) | Q4/15 | Under study | 2022-09 | AAP | Physical layer management for G.fast transceivers: Amendment 4 | - | [Miguel Peeters](mailto:miguel.peeters@broadcom.com) |
| [G.997.3 Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16826) | Q4/15 | Consented | 2021-12 | AAP | Physical layer management for MGfast transceivers - Amendment 1 | [SG15-TD815R1/PLEN (2021-12)](http://www.itu.int/md/T17-SG15-211206-TD-PLEN-0810) | [Miguel Peeters](mailto:miguel.peeters@broadcom.com) |
| G.997.3 Amd.2 | Q4/15 | Under study | 2022-09 | AAP | Physical layer management for MGfast transceivers - Amendment 2 | - | [Miguel Peeters](mailto:miguel.peeters@broadcom.com) |
| [G.9701 (2019) Amd.4](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16829) | Q4/15 | Consented | 2021-12 | AAP | Fast access to subscriber terminals (G.fast) - Physical layer specification: Amendment 4 | [SG15-TD828R1/PLEN (2021-12)](http://www.itu.int/md/T17-SG15-211206-TD-PLEN-0828) | [Les Brown](mailto:lesbrown@sympatico.ca) |
| [G.9701 (2019) Amd.5](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16829) | Q4/15 | Under study | 2022-09 | AAP | Fast access to subscriber terminals (G.fast) - Physical layer specification: Amendment 5 | - | [Les Brown](mailto:lesbrown@sympatico.ca) |
| [G.9702 (ex G.fastback)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=14895) | Q4/15 | Consented | 2021-12 | AAP | Transceiver and system specifications for backhaul applications based on G.fast (G.fastback) | [SG15-TD824R1/PLEN (2021-12)](http://www.itu.int/md/T17-SG15-211206-TD-PLEN-0824) | [Les Brown](mailto:lesbrown@sympatico.ca) |
| [G.9702 (2022)](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=14895) Amd.1 | Q4/15 | Under study | 2022-09 | AAP | Transceiver and system specifications for backhaul applications based on G.fast (G.fastback) – Amendment 1 | - | [Les Brown](mailto:lesbrown@sympatico.ca) |
| [G.9711 Amd.1](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16828) | Q4/15 | Consented | 2021-12 | AAP | Multi-gigabit fast access to subscriber terminals (MGfast) - Physical layer specification - Amendment 1 | [SG15-TD810R1/PLEN (2021-12)](http://www.itu.int/md/T17-SG15-211206-TD-PLEN-0810) | [Eric Wang](mailto:eric.wangxiang@huawei.com) |
| [G.9711 Amd.2](http://www.itu.int/itu-t/workprog/wp_item.aspx?isn=16828) | Q4/15 | Under study | 2022-09 | AAP | Multi-gigabit fast access to subscriber terminals (MGfast) - Physical layer specification - Amendment 2 | - | [Eric Wang](mailto:eric.wangxiang@huawei.com) |

**5.2 List of ongoing standardization activities in the area of Access Network Transport in other groups within ITU and other Standards Development Organizations**

The following list contains developing Access Network Transport standards reported by the various groups by incoming Liaison documents or contributions. The list is a living document subject to change from correspondence and liaison statements during interim periods between Study Group meetings.

This list is intended to improve understanding and communication of the on-going work in the different Standardization Groups and may help identify possible gaps or overlaps.

**Status: December 2021**

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| Item No. | Source | Subject / Title | Comment |
| 1. | **Broadband Forum**  *SG15 TD 334 GEN Jan-Feb 2020* | **Broadband Forum** <https://www.broadband-forum.org>  Broadband Forum Technical Committee Chair informs that on October 14, 2019, Broadband Forum took the final step to become ‘open’, adopting new Bylaws, which resulted in the Forum considering all its activities to be ‘open’ for the purposes of the U.S. Export Administration Regulations. The new Bylaws eliminate any restrictions on sharing Forum documentation and allow for anyone with interest to have access to Forum deliberations and documents if they apply for it.  Information about Broadband Forum Projects “Access-Next” can be found at following URL <https://www.broadband-forum.org/projects/access-next>  Published Broadband Forum Technical Reports related to ANT can be found following URL <https://www.broadband-forum.org/technical-reports>  Broadband Forum Test Plans related to ANT can be found at following URL <https://www.broadband-forum.org/test-plans> | Broadband Forum Work in Progress related to ANT can be found at following URL <https://www.broadband-forum.org/broadband-forum-resources/work-in-progress> |
|  | **CENELEC TC86A  TC86BXA** | **CENELEC TC 86A - Optical fibres and optical fibre cables**  Business Plan of TC 86A: see <https://ftp.cencenelec.eu/CENELEC/BP/BP_TC_86A.pdf>  CLC/TR 50510 - 2021 “Fibre optic access to end-user - A guideline to building of FTTX fibre optic network” has been published on 2021-10-01.  **CENELEC TC86BXA - Fibre optic interconnect, passive and connectorised components**  Business Plan of TC86BXA: see <https://ftp.cencenelec.eu/CENELEC/BP/BP_TC_86BXA.pdf> | More information about CLC/TC 86A can be found at following URL <https://standards.cencenelec.eu/dyn/www/f?p=305:7:0:25:::FSP_ORG_ID,FSP_LANG_ID:1258369>  More information about CLC/TC 86BXA 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> |
|  | **IEC TC 86**  *SG15 TD 556 GEN SG15 TD 557 GEN December 2021*  *SG15 TD 551 GEN December 2021*  *SG15 TD 555 GEN December 2021*  continuation of  **IEC TC 86** | **IEC TC 86 - Fibre optics**  **IEC TC 86 SC 86A - Fibres and cables** IEC SC 86A informs about following ANT relevant projects status:- TR 62000 Ed.2 “Guidance inter-fibre compatibility” has been published- 60793-2-10/AMD1 Ed.7 Amendment 1 “Optical fibres - Part 2-10: Product specifications - Sectional specification for category A1 multimode fibres” publication is in preparation. - 60794-1-1 Ed.4 “Optical fibre cables – Generic specification” is in ballot process (TCDV)  **IEC TC 86 SC 86B - Fibre optic interconnecting devices and passive components**  IEC SC86B informs about following ANT relevant projects status: - IEC 61753-131-03 Ed.2 “Performance Standard – Part 131-3: Single-mode mechanical fibre splice for Category OP – Outdoor Protected environment” has been published. - 61753-081-3 Ed.1“Non-connectorized single-mode fibre optic middle-scale 1 x N DWDM devices for category OP – Outdoor protected environment” and - 61753-081-6 Ed.1 “Non-connectorized single-mode fibre optic middle-scale 1 x N DWDM devices for category OP+ – Extended outdoor protected environment” , which are mainly used for metro DWDM (ITU-T G.698.4) and WDM-PON systems, were reviewed and CC was discussed. Most comments were editorial and it was agreed to circulate the 3rd CD.  **IEC TC 86 SC 86C Fibre optic systems and active devices**  IEC SC86C informs about the progress of following ANT relevant projects and envisaged activities: - 61280-4-2 Ed.2 “Fibre-optic communication subsystem test procedures - Part 4-2: Installed cable plant - Single-mode attenuation and optical return loss measurement”. The list of objectives has been agreed for the revision of 61280-4-2.  Future envisaged activities  - Finalization of IEC 61280-4-3 (PON attenuation)  - Revision of 61280-4-2, Installed cable plant - Single-mode attenuation and optical return loss measurement  - Uncertainties calculations for OTDR based attenuation measurement (61280-4-2) | More information about IEC TC 86 can be found at following URL <https://www.iec.ch/dyn/www/f?p=103:7:::::FSP_ORG_ID:1279>  More information about IEC TC 86 SC 86A and work programme can be found at following URL <https://www.iec.ch/dyn/www/f?p=103:7:::::FSP_ORG_ID:1398>  More information about IEC TC 86 SC 86B and work programme can be found at following URL <https://www.iec.ch/dyn/www/f?p=103:7:::::FSP_ORG_ID:1401>  More information about IEC TC 86 SC 86C and work programme can be found at following URL <https://www.iec.ch/dyn/www/f?p=103:7:::::FSP_ORG_ID:1403> |
|  | **ETSI TC ATTM**  *SG15 TD 579 WP1 April 2021* | **ETSI TC ATTM - Access, Terminals, Transmission and Multiplexing** <https://www.etsi.org/committee/1390-attm>ETSI ATTM AT2 informs that it will study the new version of the ANT Standards Overview and Work Plan in its next AT2 meeting.  TC ATTM activities in achieving eco-efficient use of telecommunications networks are described below:  - General eco-efficient engineering of ICT sites and networks: describe practices which shall be taken to improve eco-efficiency of sites and networks for broadband deployment. Documents of TS 105 174 Series: TS 105 174-1 (Generalities), TS 105 174-2 (Broadband Deployment and Energy Management; Part 2: ICT Sites), TS 105 174-4-1 (Broadband Deployment and Energy Management; Part 4: Access networks; Sub-part1: Fixed Access Networks).  - Global KPIs (Key Performances Indicators): describe aspects of Global Key Performance Indicators in relation to energy management. Documents of ES 205 200 Series: ES 205 200-1 (Operational infrastructures, Part 1: General requirements), ES 205 200-2-1 (Operational infrastructures; Part 2: Specific requirements; Sub-part 1: Data centres), ES 205 200-2-2 (Operational infrastructures; Part 2: Specific requirements; Sub-part 2: Fixed Broadband access networks), ES 205 200-3 (Operational infrastructures; Part 3: Global KPIs for ICT Sites)  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#/> | See Terms of Reference (ToR) at <https://portal.etsi.org/TB-SiteMap/ATTM/ATTM-ToR> |
|  | **ETSI TC BRAN** | **ETSI TC BRAN - Broadband Access Radio Networks** <https://www.etsi.org/committee/1389-bran>  Work Programme of ETSI BRAN can be found at following URL <https://portal.etsi.org/tb.aspx?tbid=287&SubTB=287#/> | See Terms of Reference (ToR) at <https://portal.etsi.org/TB-SiteMap/bran/bran-tor> |
|  | **ETSI TC Cable** | **ETSI TC Cable – Integrated Broadband Cable Telecommunications Networks** <https://www.etsi.org/committee/1392-cable>  Work Programme of ETSI Cable can be found at following URL https://portal.etsi.org/tb.aspx?tbid=786&SubTB=786,791,792,793,794#/ | See Terms of Reference (ToR) at <https://portal.etsi.org/TB-SiteMap/CABLE/CABLE-ToR> |
|  | **ETSI TC EE** | **ETSI TC EE – Environmental Engineering** <https://www.etsi.org/committee/1395-ee>  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#/> | See Terms of Reference (ToR) at <https://portal.etsi.org/TB-SiteMap/ee/ee-tor> |
|  | **ETSI ISG F5G** | **ETSI ISG - Fifth Generation Fixed Network (F5G)** <https://www.etsi.org/committee/1696-f5g>  Work Programme of ETSI F5G can be found at following URL <https://portal.etsi.org/tb.aspx?tbid=885&SubTB=885#/> | See Terms of Reference (ToR) at <https://portal.etsi.org/Portals/0/TBpages/F5G/ISG_F5G_ToR_D-G_APPROVED_20191210.pdf> |
|  | **IEEE 802.1**  *SG15 TD 548 GEN December 2021*  continuation of  **IEEE 802.1** | **IEEE 802.1 Working Group** <https://1.ieee802.org/>  CFM (Connectivity Fault Management) is widely used in Access and the YANG model was coordinated with ITU-T SG15, BBF & MEF.  Within each subgroup of the 802.1 WG there are several ongoing projects of interest as shown below:  1) On Link Layer Discovery Protocol (LLDP) as it has some use in Access.  [P802.1ABdh](https://1.ieee802.org/tsn/802-1abdh/) - Station and Media Access Control Connectivity Discovery - Amendment: Support for Multiframe Protocol Data Units This amendment specifies protocols, procedures and managed objects that support the transmission and reception of a set of Link Layer Discovery Protocol (LLDP) Type Length Values (TLVs) that exceed the space available in a single frame. This amendment defines the transmission of multiple frames, additional TLVs and the procedures needed to support the transmission of those TLVs across multiple frames. This amendment maintains existing functionality while communicating with a peer that supports updated functionality. This amendment defines a method to further restrict the size of the LLDP Data Unit (LLDPDU) and extensions in order to meet timing constraints in the network.  The latest draft ([D2.1](https://www.ieee802.org/1/files/private/dh-drafts/d2/802-1ABdh-d2-1.pdf)) is submitted to Standards Board for approval. An informative [LLDPv2](https://datatracker.ietf.org/meeting/112/materials/slides-112-lsvr-3-ieee-lldpv2-update-00.pdf) tutorial was recently presented to IETF  More information about project P802.1ABdh - Standard for Local and Metropolitan Area Networks - Station and Media Access Control Connectivity Discovery Amendment: Support for Multiframe Protocol Data Units can be found at following URL <https://standards.ieee.org/project/802_1ABdh.html>  2) YANG model (802.1ABcu)  [P802.1ABcu](https://1.ieee802.org/tsn/802-1abcu/) – LLDP YANG data model This amendment specifies a Unified Modeling Language (UML)-based information model and a YANG data model that allows configuration and status reporting for bridges and bridge components with regards to topology discovery with the capabilities currently specified in clauses 10 (LLDP management) and 11 (LLDP MIB definitions) of 802.1AB.  The latest draft ([D2.3](https://www.ieee802.org/1/files/private/abcu-drafts/d2/802-1ABcu-D2-3.pdf)) is submitted to Standards Board for approval. Note that the draft YANG modules are also in the YANG Catalog GitHub <https://github.com/YangModels/yang/tree/master/standard/ieee/draft/802.1/ABcu> More information on project P802.1ABcu - Standard for Local and Metropolitan Area Networks - Station and Media Access Control Connectivity Discovery Amendment: YANG Data Model can be found at following URL <https://standards.ieee.org/project/802_1ABcu.html>  [P802.1ASdn](http://www.ieee802.org/1/files/public/docs2019/cs-PAR-modification-0919-v01.pdf) - Timing and Synchronization for Time-Sensitive Applications - Amendment: YANG Data Model This amendment specifies a YANG data model that allows configuring and state reporting for all managed objects of the base standard. This amendment specifies a Unified Modeling Language (UML)-based figure to explain the managed objects and the associated YANG data model. This project is awaiting an initial draft. |  |
|  | **IEEE 802.3**  *SG15 TD 721 WP1 December 2021*    continuation of  **IEEE 802.3** | **IEEE 802.3 Ethernet Working Group** <http://www.ieee802.org/3/>  Since last IEEE 802.3 Working Group liaison communication, there were several changes in the status of access-related projects within the IEEE 802.3 Working Group:  **Update on IEEE P802.3cp Task Force** The IEEE P802.3cp Task Force has completed its technical work on the development of bidirectional 10 Gb/s, 25 Gb/s, and 50 Gb/s optical access PHYs, supporting operating distances of at least 10 km, at least 20 km, and at least 40 km. The amendment to IEEE Std 802.3-2018 was approved on the 16th of June 2021 and published on the 16th of July 2021. The amendment is: IEEE Std 802.3cp-2021 - IEEE Standard for Ethernet -- Amendment 14: Bidirectional 10 Gb/s, 25 Gb/s, and 50 Gb/s Optical Access PHYs  **Update on IEEE P802.3cs Task Force**  The IEEE P802.3cs Task Force is continuing its technical work on the development of increased-reach Ethernet optical subscriber access (so-called Super-PON), supporting a passive point-to-multipoint ODN with a reach of at least 50 km with at least 1:64 split ratio per wavelength pair, with at least 16 wavelength pairs for point-to-multipoint PON operation. Operation of 10 Gb/s downstream and 2.5 Gb/s and 10 Gb/s upstream is also expected.  The draft standard for this Task Force is currently in the Working Group review stage. The adopted timeline calls for the start of the IEEE SA Ballot by the end of 2021.  **Update on IEEE P802.3cx Task Force**  The IEEE P802.3cx Task Force has started its technical work on the development of optional enhancements to Ethernet support for time synchronization protocols to provide improved timestamp accuracy in support of ITU-T Recommendation G.8273.2 'Class C' and 'Class D' system time error performance requirements. The draft standard for this Task Force is currently in the Working Group review stage. The adopted timeline calls for the start of the IEEE SA Ballot in Q1 2022.  **Update on IEEE P802.3cd Task Force**  The IEEE P802.3dc Task Force is working on a revision of IEEE Std 802.3-2018 as modified by approved amendments IEEE Std 802.3cb-2018, IEEE Std 802.3bt-2018, IEEE Std 802.3cd-2018, IEEE Std 802.3cn-2019, IEEE Std 802.3cg-2019, IEEE Std 802.3cq-2020, IEEE Std 802.3cm-2020, IEEE Std 802.3ch-2020, IEEE Std 802.3ca-2020, IEEE Std 802.3cr-2021, IEEE Std 802.3cu-2021, IEEE Std 802.3cv-2021, IEEE Std 802.3ct-2021, and IEEE Std 802.3cp-2021. Once completed, a new baseline IEEE Std 802.3 version encompassing all the aforementioned amendments will become available. The draft standard for this Task Force is currently in the Working Group review stage. The adopted timeline calls for the start of the IEEE SA Ballot in Q1 2022. | More information about IEEE 802.3cp-2021 can be found at following URL <https://standards.ieee.org/standard/802_3cp-2021.html>    More information about the IEEE P802.3cs Task Force, including the PAR, CSD, and Objectives, can be found at following URL <http://www.ieee802.org/3/cs/index.html>    More information about the IEEE P802.3cx Task Force, including the PAR, CSD, and Objectives, can be found at following URL <http://www.ieee802.org/3/cx/index.html>  More information about the IEEE P802.3dc Task Force can be found at following URL <http://www.ieee802.org/3/dc/index.html> |

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|  | **IEEE 802.11** | **IEEE 802.11 Working Group for Wireless Local Area Networks** <http://www.ieee802.org/11/>  **WiGig** IEEE Std 802.11ay-2021 has been approved and published on 28 July 2021  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 | More information about IEEE 802.11ay can be found at following URL <https://standards.ieee.org/standard/802_11ay-2021.html> |
|  | **IEEE 802.16** | **IEEE 802.16 Working Group on Broadband Wireless Access Standards** <http://www.ieee802.org/16/>Note: The IEEE 802.16 Working Group on Broadband Wireless Access Standards is currently in an inactive state of hibernation. |  |
|  | **IEEE 1904** | **IEEE 1904 Access Networks Working Group** <http://www.ieee1904.org>  IEEE 1904 WG is responsible for the maintenance of: - IEEE Std 1904.1-2017 - IEEE Standard for Service Interoperability in Ethernet Passive Optical Networks (SIEPON) - IEEE Std 1904.1-Conformance01-2014 “Standard for Conformance Test Procedures for Service Interoperability in Ethernet Passive Optical Networks, IEEE Std 1904.1(TM) Package A”  - IEEE Std 1904.1-Conformance02-2014 - Standard for Conformance Test Procedures for Service Interoperability in Ethernet Passive Optical Networks, IEEE Std 1904.1(TM) Package B  - IEEE Std 1904.1-Conformance03-2014 - Standard for Conformance Test Procedures for Service Interoperability in Ethernet Passive Optical Networks, IEEE Std 1904.1(TM) Package C  IEEE Std 1904.2-2021 “IEEE Standard for Control and Management of Virtual Links in Ethernet-based Subscriber Access Networks” has been approved by the IEEE Standards Association Standards Board on June 16, 2021.  The Working Group is currently developing:  - [IEEE P1904.4 Standard for Service Interoperability in 25 Gb/s and 50 Gb/s Ethernet Passive Optical Networks (SIEPON.4)](https://www.ieee1904.org/4/index.shtml) | More information about IEEE 1904.1 can be found at following URL <https://standards.ieee.org/standard/1904_1-2017.html>  More information about IEEE 1904.2 can be found at following URL <https://standards.ieee.org/standard/1904_2-2021.html>  More information about IEEE P1904.4 can be found at following URL <https://standards.ieee.org/project/1904_4.html> |
|  | **IEEE 1901** | **IEEE 1901 Working Group on Power Line Communications** <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 1901-2020 - IEEE Standard for Broadband over Power Line Networks: Medium Access Control and Physical Layer Specifications.  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. | More information about IEEE 1901 can be found at following URL <https://standards.ieee.org/standard/1901-2020.html>    More information about the draft IEEE 1901.b can be found at following URL <https://ieeexplore.ieee.org/document/9530471> |
|  | **ITU-R SG1**  *SG15 TD 554 WP1 April 2021* | **ITU-R SG1: Spectrum Management** ITU-R WP1A: Spectrum engineering techniques  In its liaison in TD 554 WP1 from April 2021, 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”. The liaison regards Home Networks and IoT. | 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>  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> |
|  | **ITU-R SG5** | **ITU-R SG5: Terrestrial Services**  WP5A “Land mobile service excluding IMT; amateur and amateur-satellite service” - ITU-R WP5A updated the “Guide to the use of ITU-R texts relating to the land mobile service, including wireless access in the fixe service” on 29 July 2021: see at <https://www.itu.int/oth/R0A06000001/en>  ITU-R WP5C - Fixed wireless systems; HF and other systems below 30 MHz in the fixed and land mobile services  ITU-R WP5D – IMT Systems | 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>  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 WP5C can be found at following URL <https://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5c/Pages/default.aspx>  More information about ITU-R WP5D can be found at following URL <https://www.itu.int/en/ITU-R/study-groups/rsg5/rwp5d/Pages/default.aspx> |
|  | **ITU-R SG6**  *SG15 TD 547 WP1 April 2021* | **ITU-R SG6: Broadcasting Service** ITU-R WP6A: Terrestrial broadcasting delivery  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 4 (Section 5.1 in the Access Network Transport Standards Work Plan - Issue 32, 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 G.fast/G.mgfast have been identified where further monitoring, supported by studies by the broadcasting community, is essential. | 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>  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> |
|  | continuation of **ITU-R SG6** | ITU-R 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> |
|  | **ITU-T SG9**  *SG15 TD 640 WP1 December 2021*    *SG15 TD 711 WP1 December 2021 and  SG15 TD 710 WP1 December 2021* | **ITU-T SG9: Broadband cable and TV** ITU-T Study Group 9 proposes two updates of the table on Organization of ANT Relevant Standards by Transmission Medium and Technology – Annex 2.1 of the ANT Standards Overview document :  - ITU-T J.1110 (J.fdx-fspec) (04/2021): Functional specification for in-band full-duplex in HFC based network  - ITU-T J.481 (ex J.cable-rf-ip) (04/2021): Requirements of cable network for RF and IP secondary distribution of television programmes  ITU-T SG9 informs ITU-T SG15 that during its ITU-T SG9 meeting, 15-24 November 2021, the work item J.HiNoC3-REQ “Functional requirements for third-generation HiNoC” has been consented and is planned to be published with the number ITU-T J.198.1,  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/2017-2020/09/Pages/default.aspx> |
|  | **ITU-T SG11**  *SG15 TD 506 GEN December 2021* | **ITU-T SG11: Signalling requirements, protocols, test specifications and combating counterfeit products**  ITU-T Study Group 11 informs ITU-T SG15 about the reference table and list of ongoing pilot projects on Conformance and Interoperability testing (see : [www.itu.int/go/reference-table](http://www.itu.int/go/reference-table) and [www.itu.int/go/pilot-projects](http://www.itu.int/go/pilot-projects)) and invites to update the tables.  Refer to section 6 below “Basic field of activities related to the ANT Standards Overview” – item 5 – regarding the update from ITU-T SG15 related to technologies based on ITU-T Recs. 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/2017-2020/11/Pages/default.aspx> |
|  | **ITU-T SG15 WP2/15** | **ITU-T SG15: Transport, Access and Home**  WP2/15 “Optical technologies and physical infrastructures”  Q5/15 ”Characteristics and test methods of optical fibres and cables, and installation guidance” Q16/15 “Connectivity, operation and maintenance of optical physical infrastructures”  Work Programme of Q5/15 and Q16/15 can be found at following 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/2017-2020/15/Pages/default.aspx> |
|  | **ITU-T SG16**  *SG15 TD 641 WP1 December 2021* | **ITU-T SG16: Multimedia** ITU-T SG16 informs ITU-SG15 that SG16 did not have any recent standardization activities in the area of Access Network Transport.  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/2017-2020/16/Pages/default.aspx> |
|  | **ITU-D SG1 and  ITU-D SG2** | **ITU-D SG1: Enabling environment for the development of telecommunications/ICTs** Question 1/1: Strategies and policies for the deployment of broadband in developing countries Question 5/1: Telecommunications/ICTs for rural and remote areas ITU-D SG1 published two new Output Reports 2018-2021:  - ITU-D Question 5/1 Output Report 2018-2021 (2021): Telecommunications/ICTs for rural and remote areas – see report at<https://www.itu.int/en/myitu/Publications/2021/07/22/13/20/Telecommunications-ICTs--for-rural-and-remote-area>  - ITU-D Question 1/1 Output Report 2018-2021 (2021): Strategies and policies for the deployment of broadband in developing countries – see report at <https://www.itu.int/en/myitu/Publications/2021/07/22/15/17/Strategies-and-policies-for-the-deployment-of-broadband-in-developing-countries>  **ITU-D SG2: ICT services and applications for the promotion of sustainable development** Question 1/2 : Creating smart cities and society: Employing information and communication technologies for sustainable social and economic development | More information about ITU-D SG1 can be found at following URL <https://www.itu.int/net4/ITU-D/CDS/sg/mandate.asp?lg=1&sp=2018&stg=1>  More information about ITU-D SG2 can be found at following URL <https://www.itu.int/net4/ITU-D/CDS/sg/mandate.asp?lg=1&sp=2018&stg=2> |

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# 6. Basic field of activities related to the ANT Standards Overview

This list 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.

Those are:

**Status: December 2021**

| **Work Item** | **Title** | **Meeting results** | **Work during interim period** |
| --- | --- | --- | --- |
| 1 | Maintain and update the ANT Standards Overview together with other Study Groups and in conjunction with ITU-R and other relevant organizations. | The ANT Standards Overview was updated based on liaison statements from cooperating standards bodies and input from WP1/15 in the meeting. These changes have been made and a new version 36 – December 2021 has been created. | Maintain existing correspondence relationships with appropriate groups |
| 2 | Maintain and update the web-based ANT Standards Overview. | The web-based ANT Standards Overview has been updated |  |
| 3 | Maintain and update the ANT Standards Work Plan, identify “gaps and overlaps” by observing ongoing standardization activities. | The ANT Standards Work Plan was updated based on liaison statements from cooperating standards bodies and input from WP1/15 in the meeting. These changes have been made and this new Version 34 – December2021 has been created. | Maintain existing correspondence relationships with the appropriate groups. |
| 4 | ITU inter-Sector coordination: Serve as focal point to and provide co-ordination with other Study Groups | The new version of the Access Network Transport (ANT) and Home Network Transport (HNT) Standards Overviews and Work Plans have been provided via LS 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. | Update done during the December 2021 meeting. Updated list has been provided via LS to SG11. | Maintain existing correspondence relationships with the appropriate groups |

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