Broadband Forum
FTTR Joint Workshop Input

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Broadband Forum Vision & Mission

Broadband Forum's mission is to unlock the potential for new markets and profitable revenue growth by leveraging new technologies and standards in the home, intelligent small business and multi-user infrastructure of the broadband network. The innovative use of NFV, SDN, Ultra-Fast access, IoT (Internet of Things), and open source innovation enables the delivery of exciting ultra-fast broadband services, for the connected home and business, access and converged 5G infrastructure and Cloud.

Our current members include service providers, vendors, test labs, and industry stakeholders.

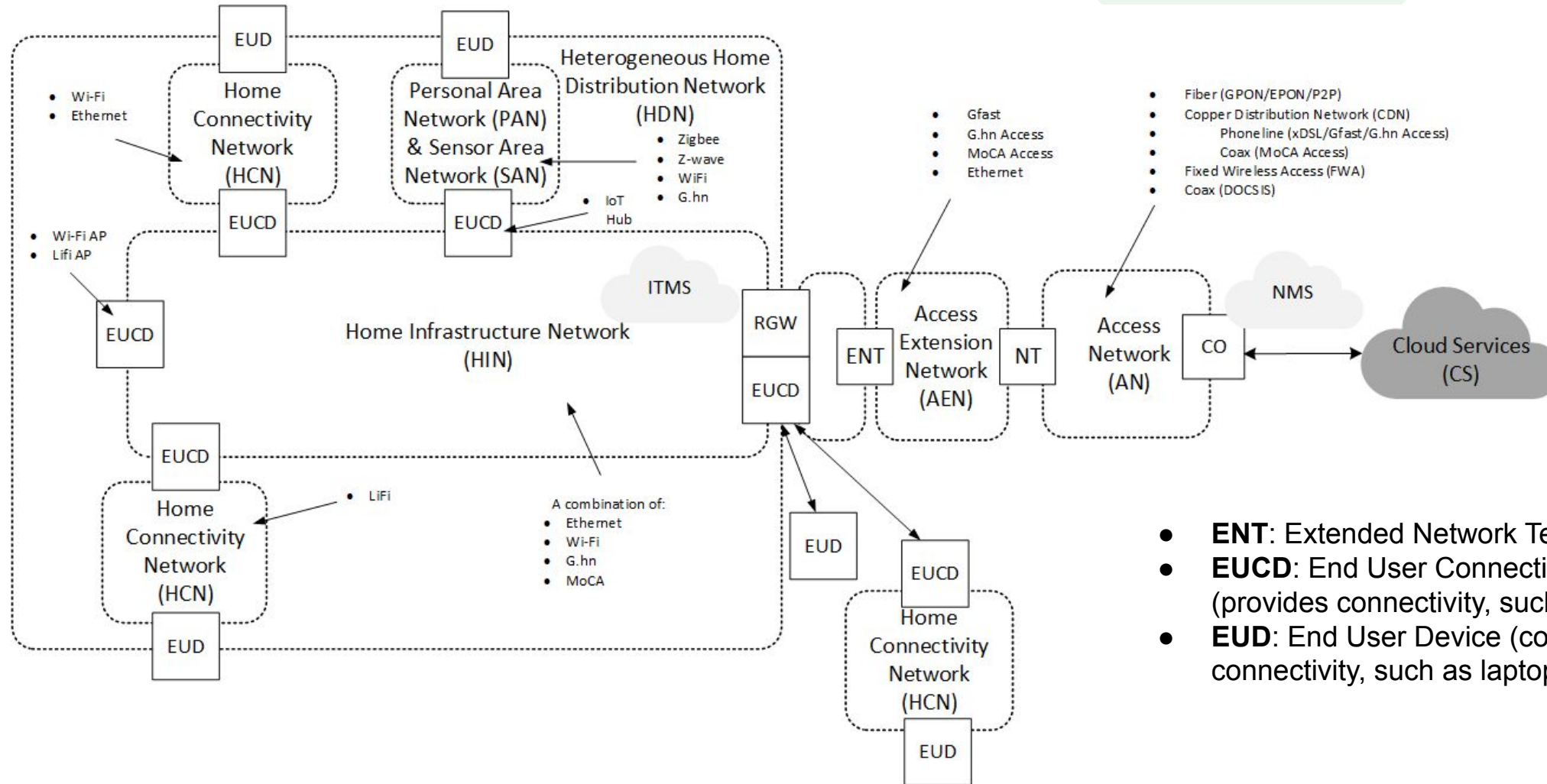Ongoing collaboration with ITU-T, IETF, ETSI, and many other SDOs.

Broadband Forum Work Relating to FTTR

Architecture and Requirements for Home Distribution Networks

- New working being initiated as **WT-488**, with target completion date of Q1 2022
- Current challenge for telecom operators and service providers seeking to roll-out future-proofed fiber-grade services is to quickly/easily/cost-effectively deploy reliable broadband connectivity to end users and devices in homes and businesses over high-performance "home" networks
- Modern home networks are composed of a mix of diverse transmission technologies such as Wi-Fi for BB wireless technology, Ethernet/MoCA/G.hn for BB wireline technologies, and Wi-Fi/Zigbee/Z-wave for IoT NB scenario, thus creating a heterogeneous home network infrastructure enabling a service-oriented architecture and application-enabled connected home.
- **WT-488** advances the **TR-419** (AEN) architectural concept of extending the fiber access networks by utilizing existing copper infrastructure and defines architectural, management and operational aspects of deploying home distribution networks (HDN)
- **WT-488** will also give insight into typical use cases, services within home, in-home connection technologies and connectivity of end user devices, and functional and management requirements specific to the HDN architecture (e.g., RGW, Wi-Fi mesh controller)
- For service providers/network operators, **WT-488** provide guidelines on how to implement heterogeneous HDN
- For equipment manufacturers/system integrators, **WT-488** gives direction on how to implement and adapt their equipment for deployment models for connectivity of end user devices

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Broadband Forum Work Relating to FTTR (cont.)

Figure 1/WT-488 General architecture of an end-to-end home network

- **ENT**: Extended Network Terminal
- **EUCD**: End User Connectivity Device (provides connectivity, such as an AP)
- **EUD**: End User Device (consumes connectivity, such as laptop)

Broadband Forum Work Relating to FTTR (cont.)

Connected Home Control & Management

- **CWMP (TR-069) and USP (TR-369)**: remote management protocols for interacting with the FTTR related devices in the home

- **Device:2 Root Data Model for CWMP and USP (TR-181i2)**: data model utilized by the CWMP and USP remote management protocols, which can be extended to expose device configuration and/or diagnostics/metrics related to FTTR
  a. Being augmented for Multi-AP control / management in collaboration with **prpl**
  b. Will be augmented based on requirements from WT-488

- **Compliance testing for TR-069 (BBF.069 program) and USP (BBF.369 program)**: validation of the management agent within the FTTR device and its compliance to the specification(s)

- **OB-USP-Agent**: open-source USP Management Agent that acts as a reference implementation for USP management, directly consumes the TR-181 Device:2 data models

- **TR-124: Functional Requirements for Broadband Residential Gateway Devices** defines requirements around RG devices, including interfaces and capabilities sets.

Broadband Forum Work Relating to FTTR (cont.)

Access | Next

- **TR-280 PON Multi-services Broadband Network Architecture and Nodal Requirements:** defines the requirements for the deployment of G-PON & XG-PON & XGS-PON ONUs in the context of the TR-178 architecture (multi-service broadband).

- **BBF.247 BBF ONU certification program:** tests OMCI conformance of the G-PON, XG-PON and XGS-PON ONUs to requirements defined within the applicable ITU-T documentation when implementing various deployment scenarios

- Both of the above documents are still under active development within the Broadband Forum, as new requirements have been identified by operators

BBF roadmap of related projects

WT-488 "Architecture and Requirements for Home Distribution Networks" (Q1 2022)

WT-124 Issue 7 Residential Gateway Requirements (Q1 2022)

WT-280 Issue 2 "ITU-T PON in the context of TR-178 (multi-service broadband)" (Q4 2021)

WT-181 Issue 2 Amendment 15 Device Data Model (Q3 2021)

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Collaboration on FTTR

- Input to BBF work to ensure alignment of overall network architectures, including nomenclature and reference points
  - Impacts on WT-124, WT-488, and WT-280 (architectures and device requirements)

- Ongoing collaboration on management and control aspects for devices deployed into the subscriber locations (residential and business)
  - Impacts on TR-181 (device data models)

- Input to BBF on new use cases not currently captured or covered in TR-280 and WT-488, such as VR/AR cases that might require specific latency or bandwidth.
  - Necessary to document additional requirements to the access network and home networking to support these use cases

- Approaches to coexistence, or migration, and legacy services (greenfield vs brownfield)
  - Collaboration on the development of requirements to address the above in the context of existing access network requirements
  - Complexity of deploying fiber into existing construction, when no ducts are available

Some Early Questions from the BBF

1. Is the FTTR work proposing a PON or P2P optical architecture?

2. If PON, what considerations have been made towards the broadcast domain that would typically exist within a LAN?

3. With the increasing number of 'ONT like' devices deployed, are there considerations about how the ONTs are registered / reregistered (i.e. consumer moves device in the home or between homes)?

Looking Over the Horizon

It seems a logical next "step" in implementing FTTR, where fiber, splitters, and other infrastructure is deployed into the premises is to "remove" the gateway to extend the access network to the room.

- Is this case being considered?

- If being considered, this would seem to have many implications on the following:

  - Subscriber network security, isolation, and privacy

  - Location of the RG device functionality (i.e. virtual RG)

  - Management & Control of LAN network devices

Upcoming Meetings and Next Steps

- See https://www.broadband-forum.org/category_meetings_and_events/upcoming-meetings

- Q2 2021 Virtual Meeting, June 7-11, 2021

  - 2 teleconferences on Home Networking topics, July/August

- Q3 2021 Virtual Meeting, August/September 30-2, 2021

  - 2 teleconferences on Home Networking topics, October/November

- Q4 2021 Virtual Meeting, November/December 30-3, 2021