

# Fiber infrastructure standards in ETSI ATTM

Presented by: **Olivier Bouffant** (Orange) ETSI ATTM AT2 Chair

Additional Authors: Georgi Babinov (SBS), Dominique Roche (eG4U), Xuming Wu (Huawei), Ge Zhang (Huawei)

For: 4<sup>th</sup> Joint Workshop on FTTR

10<sup>th</sup> July 2024

# Agenda

- ETSI ATTM scope
- WG AT2 in ETSI ATTM
- FTTR works in AT2
- Other works on Fiber in AT2
- Summary



# ETSI ATTM scope

**TC ATTM** (The Technical Committee addresses **A**ccess, **T**erminals, **T**ransmission and **M**ultiplexing) - cabling, installations, signal transmission, multiplexing and other forms of signal processing up to digitalization in private and public domain; excluding those aspects that relate to Hybrid Fibre-Coaxial cable networks which are covered by TC Cable.

**ATTM is organized around a set of ETSI work items addressing specific technologies, equipment, installations and regulatory aspects of the physical layer e.g.:**

- Transmission issues of interfaces
- Frequency management on the non-radio communication infrastructures
- Analogue and digital presented communication interfaces of balanced wired (twisted pair), coaxial cable and optical fiber infrastructures
- Interfaces based on new technologies, as far as they are relevant for communication infrastructures
- Point-to-point and point-to-multipoint radio systems and infrastructures used for the fixed service (core and access networks), covering all equipment aspects including antenna parameters
- Transmission related aspects of network architecture(s) (including protection issues)
- Specification of the transmission functions and performance of the network elements such as transmission paths, path elements, sections, systems, functional entities, antenna, cable and optical fibre

# WG AT2 in ETSI ATTM

## WG AT2: Infrastructure, Physical Networks & Communication Systems

- Standardization work on general engineering of ICT networks and sites
- Specifications of network topology and functional requirements
- Specifications of transmission related to optical components, especially optical fibers and passive components
- Specifications of requirements for optical fiber and optical cable characteristics related to transmission system performance
- Specifications of functional and physical characteristics of interfaces, including allocations of overheads
- Standardization work on transmission network protection and future proof
- Standardization work on operational sustainability management (e.g. objective and global KPIs, operational end of life)



# ETSI TS 101 573 (2022-04): General engineering of optical building cabling

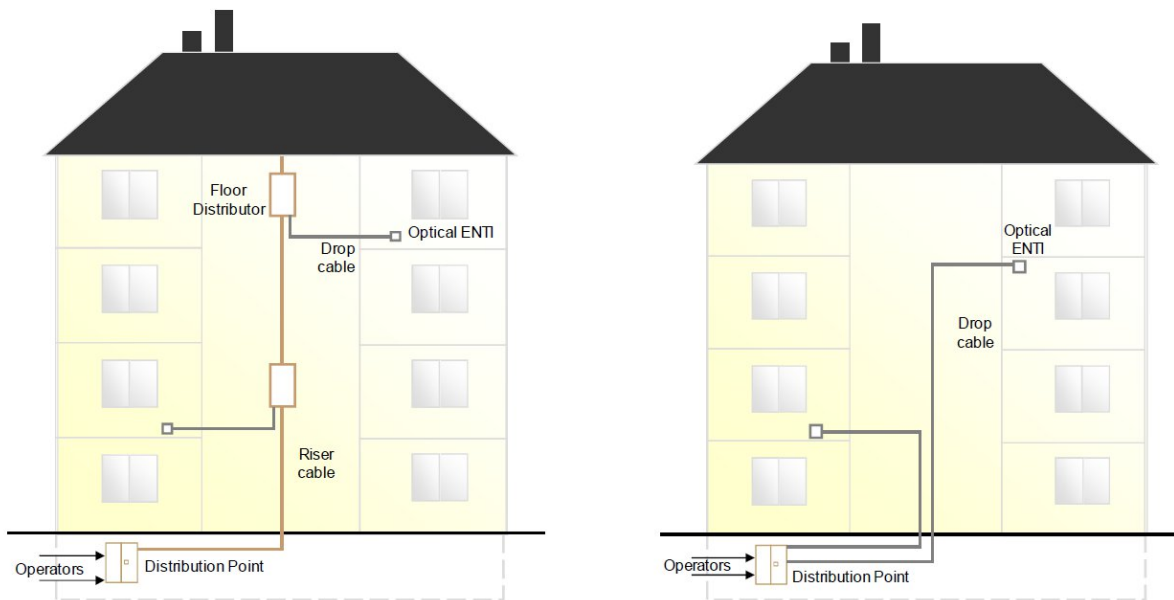


Figure 4: Example of cabling solutions in buildings: The indoor cables may contain one or more fibres for each customer depending on the chosen architecture

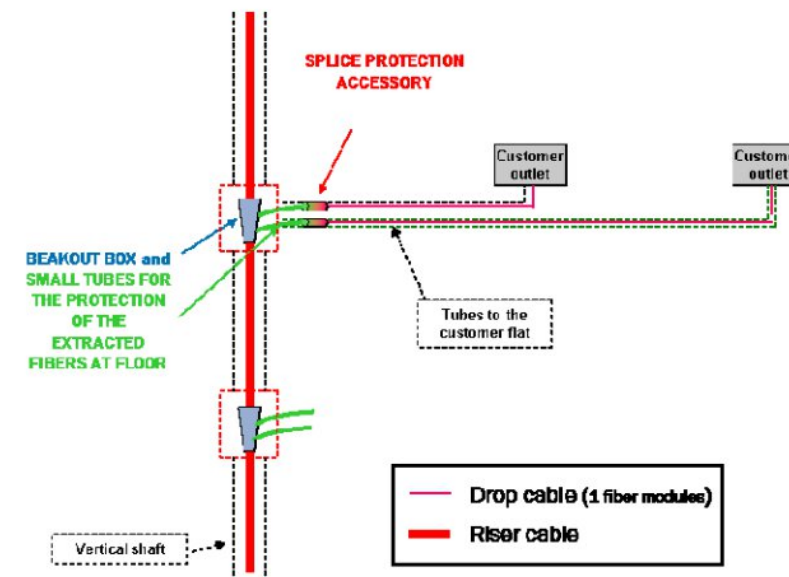


Figure 5: Example of a Distribution System

Engineering of fiber cabling for building are specified. It mainly focus on FTTP/H which fiber is deployed to the entrance of the apartment. The cable type and connector are also recommended.



# FTTR works in AT2



## ETSI TS 103 247

- Single mode Optical Fibre System Specifications for Home Cabling
- Version V1.2.1
- 2018-11

## ETSI TS 103 933

- Fibre deployment for fibre-based in-premises networking
- Version V1.1.1
- 2024-04

# FTTR works in AT2 (1/2)

## ETSI TS 103 247 (2018-11): Single mode Optical Fibre System Specifications for Home Cabling

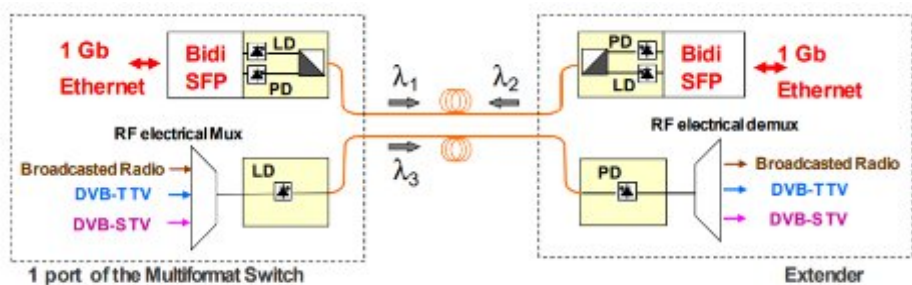


Figure 6: Multiformat link based on hybrid electrical/optical multiplexing (bifibre configuration)

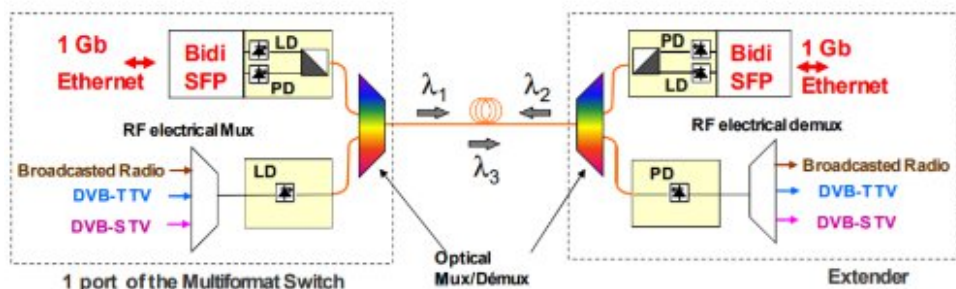


Figure 7: Multiformat link based on hybrid electrical/optical multiplexing (single fibre configuration)

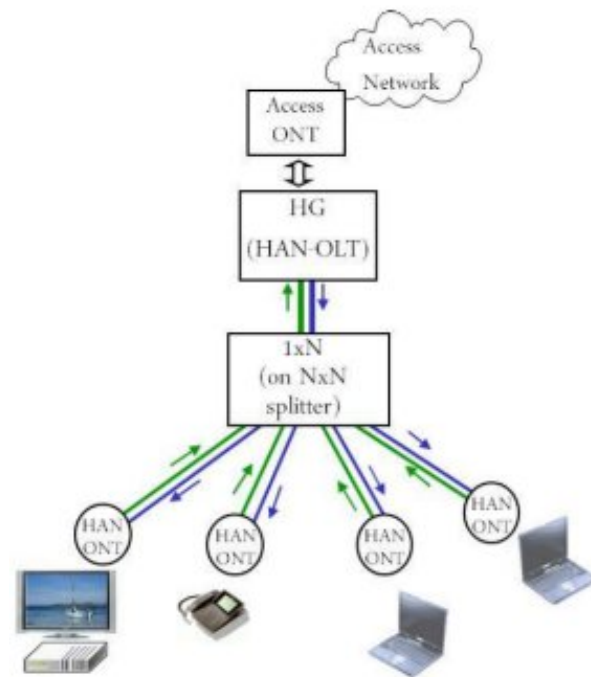


Figure 9: 1 x N PON-like architecture

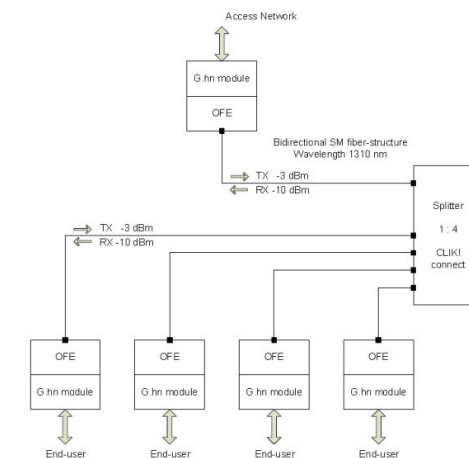


Figure B.1: Centralized mode example



The idea of fiber to the room was firstly proposed. Several different architectures of single mode fiber-based HAN are introduced, requirements of fiber and connectors are proposed.

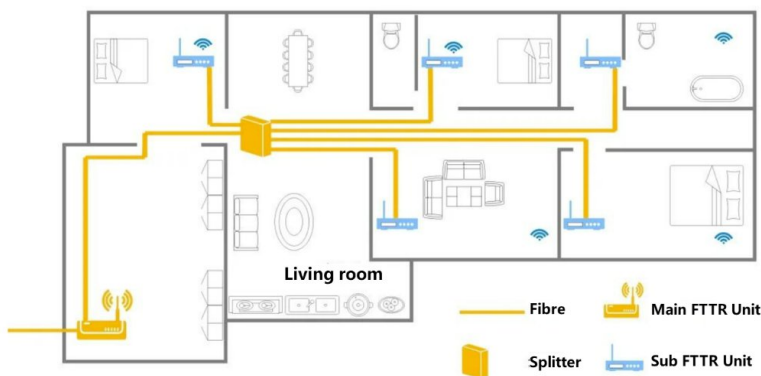
The FTTR system based on Recommendation ITU-T G.9960 (G.hn) was also demonstrated.

# FTTR works in AT2 (2/2)

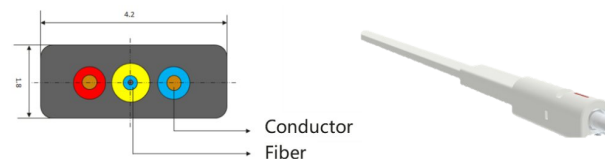
## ETSI TS 103 933 (2024-04): Fibre deployment for fibre-based in-premises networking

### Scope of TS 103 933

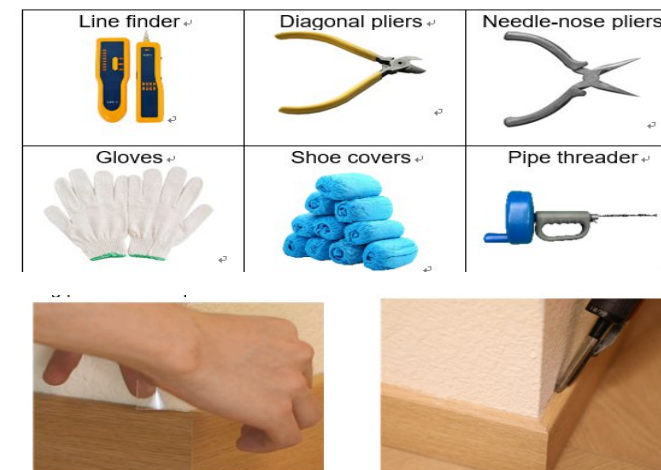
- Define application scenarios, system architecture and general requirements
- Analyze and evaluate energy consumption, environmental impacts and security
- Provide guidance for FTTR system design and network planning, fiber deployment
- Define methods and tools for fiber deployment in premises



Fibre network deployment for home scenarios



An example of optical and electrical hybrid fibre

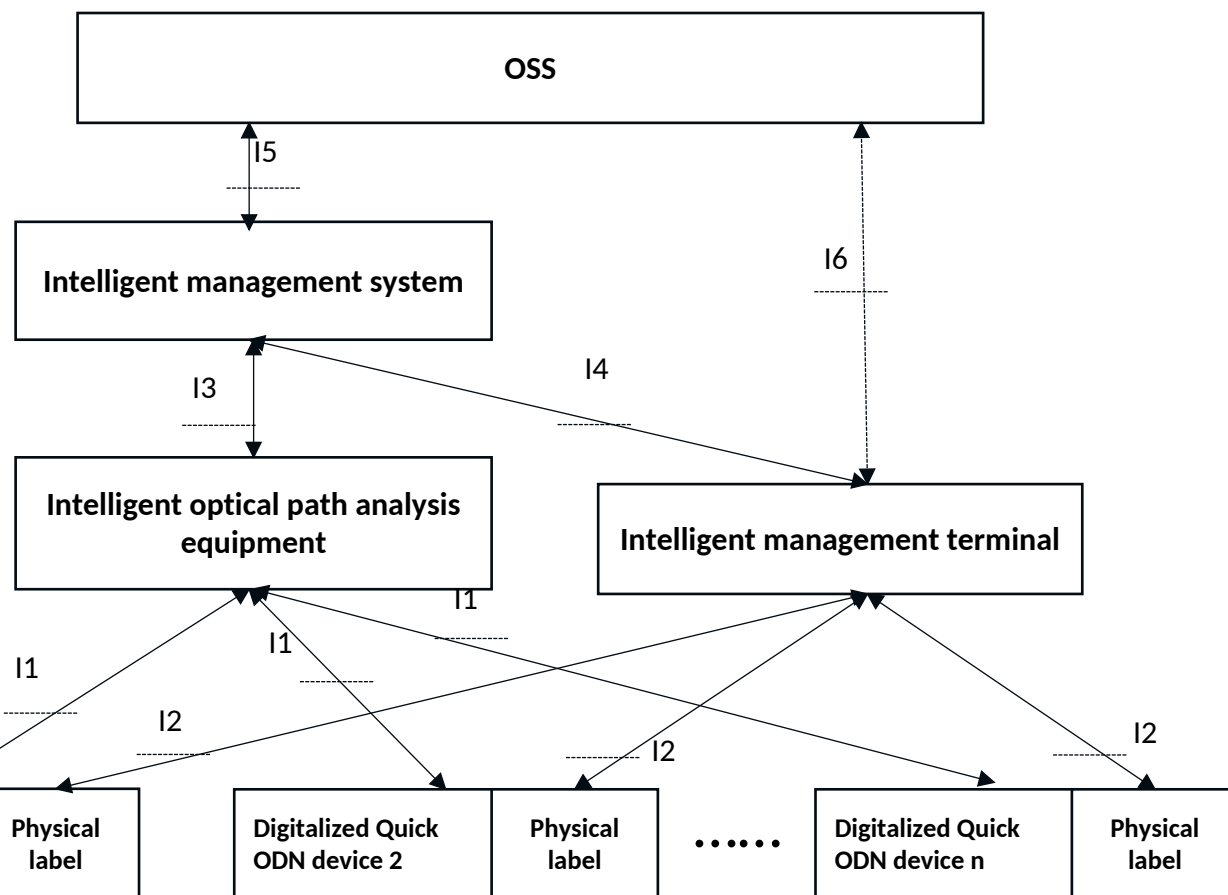


In-premises fibre deployment methods and tools



# Other works on Fiber in AT2 (1/2)

## ETSI TS 104 021-1 (in preparation): ODN Quick Construction and Digitalization; Part 1: General and Guidance



### Scope of future TS 104 021-1

- Composition of the digitalized quick ODN
- General requirements on physical label, digitalized quick ODN devices, intelligent management terminal, intelligent optical path analysis equipment and intelligent management system

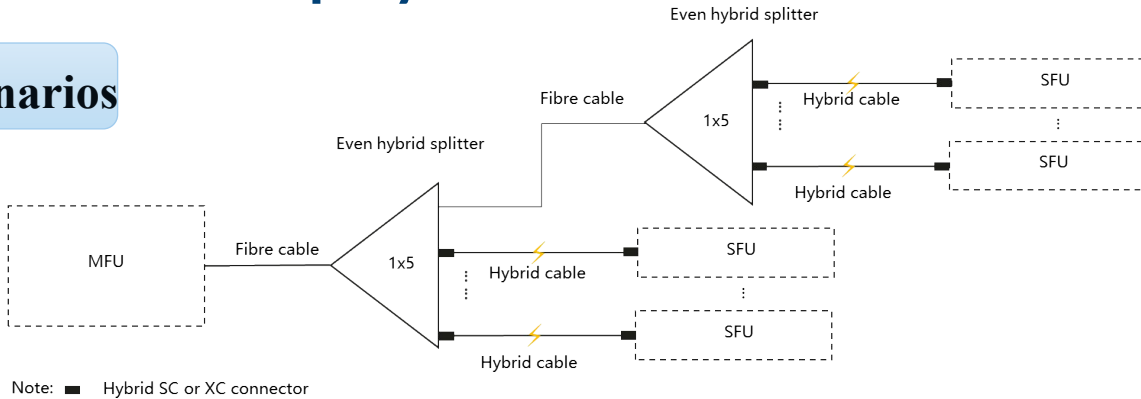


# Other works on Fiber in AT2 (2/2)

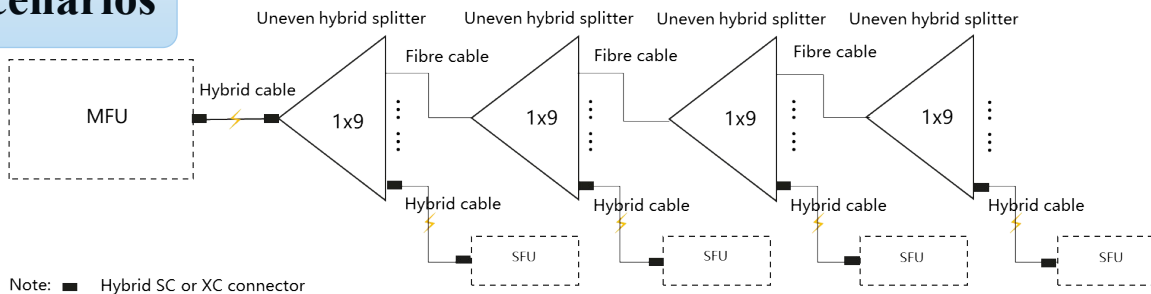
## ETSI Future TR on Deployment of Indoor Fibre Distribution Network Hybrid Cabling System

### low-density scenarios

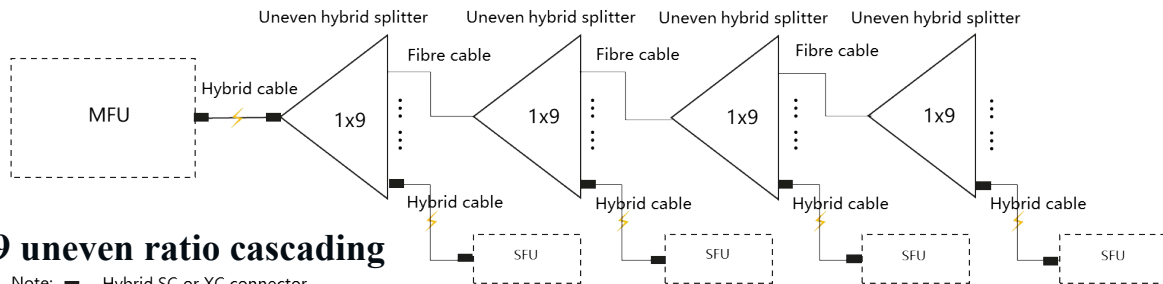
#### one-level splitting



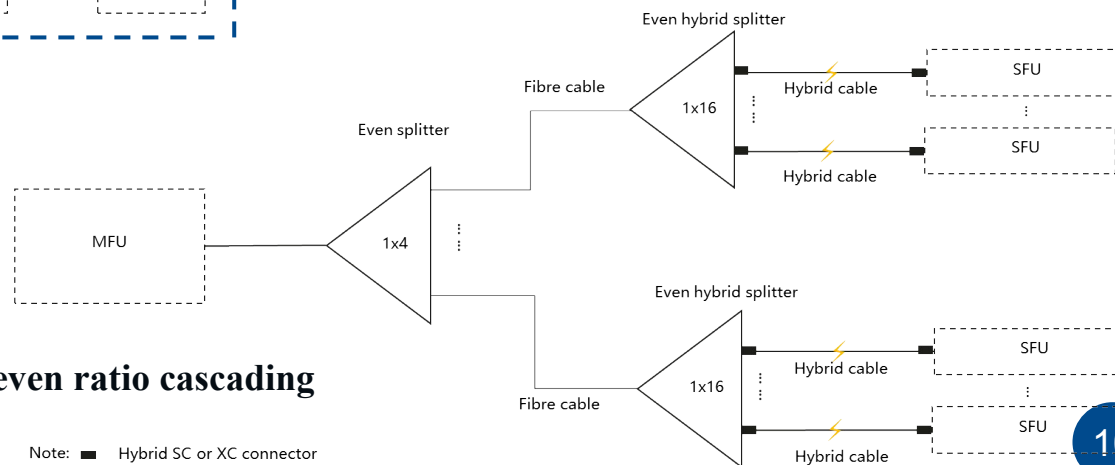
### medium-density scenarios



### high-density scenarios



#### even ratio cascading



### Scope of future TR

- Structure of Indoor Fibre Distribution Network (IFDN) Hybrid Cabling System
- Main functional elements and their characteristics,
- Deployment details and acceptance items.

# Summary

1. TC ATTM in ETSI is responsible for the standardization of access, terminals, transmission and multiplexing as well as supported services at the operational level (e.g. for smart communities).
2. WG AT2 of TC ATTM is responsible for general engineering of networks and global KPIs including fiber infrastructure, physical networks & communication systems in buildings.
3. The idea of fiber-based home network was proposed in ATTM in 2018, and several relevant work items are released or under study
4. More ideas on fiber infrastructure and physical networks & communication systems in buildings are welcome in ATTM AT2.





**Thank you for your attention**

Follow us on:

