

ETSI ISG F5G perspective – intelligent FTTR

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Joint Workshop on Fibre in-premises network, Geneva

22/10/2025



Agenda

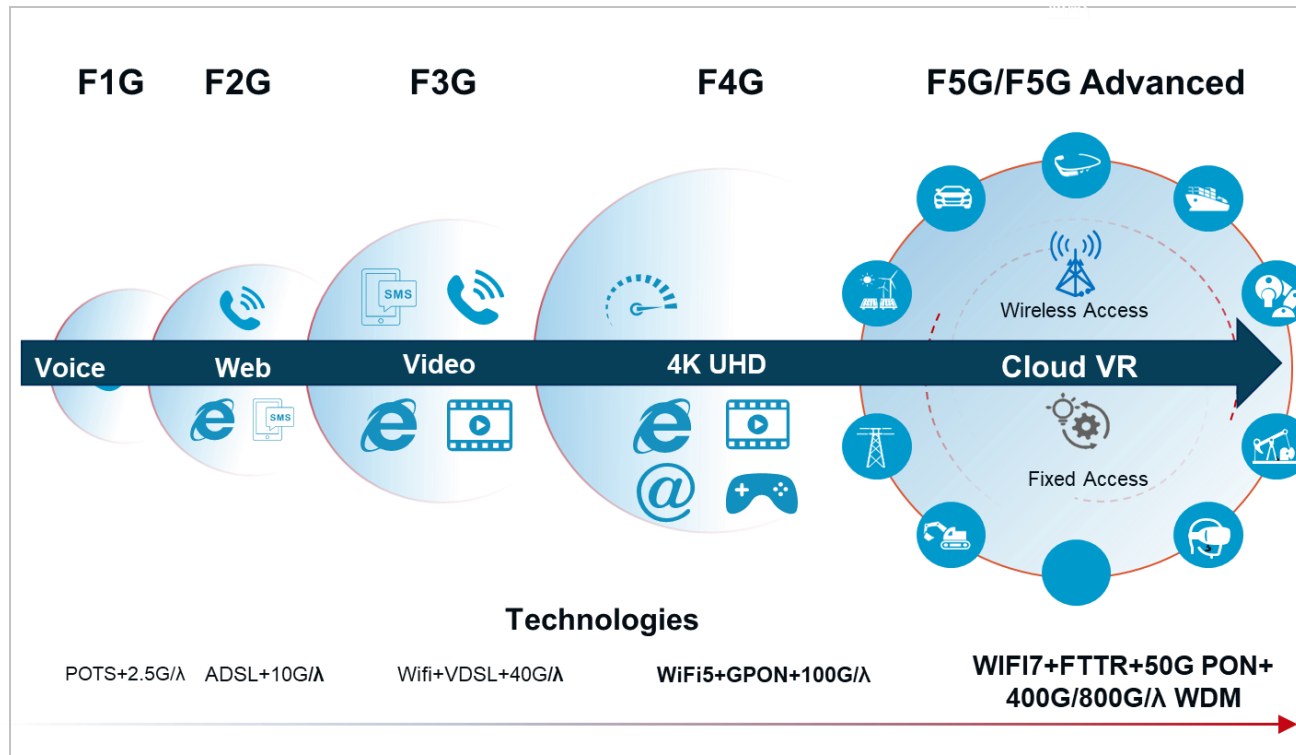
- Introduction to ETSI ISG F5G
- The AI-enhanced FTTR
- Status of FTTR in ETSI



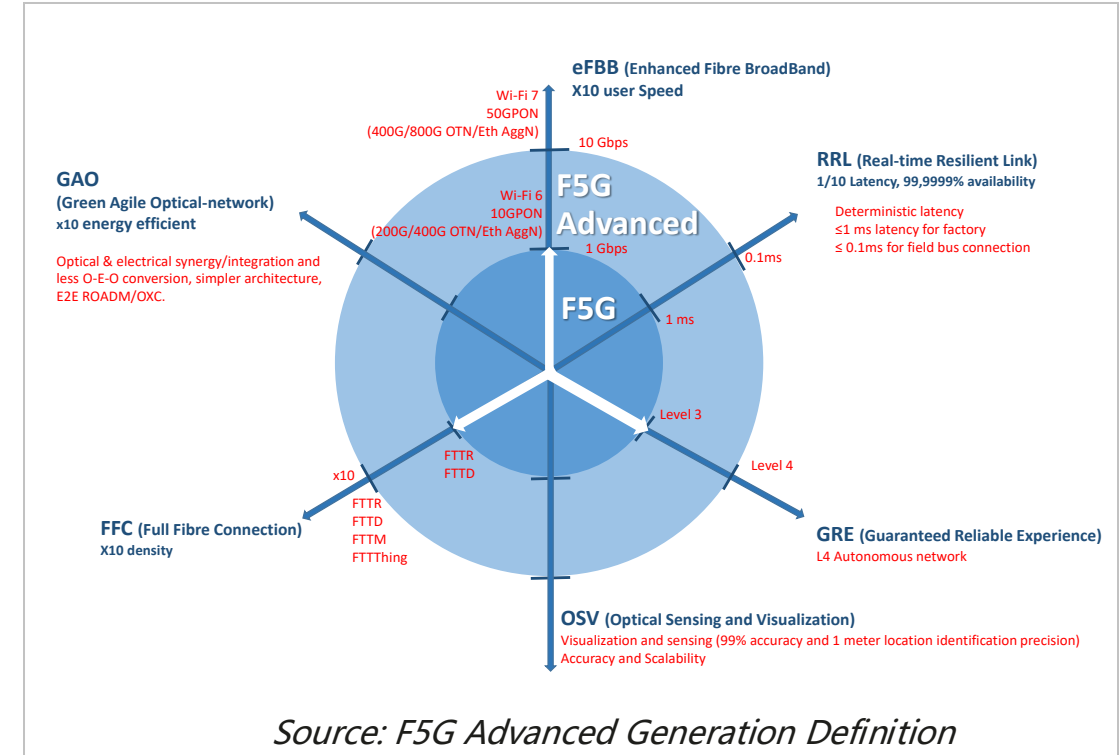
5th Generation Fixed Network Advanced (F5G-A)



The generations definition of fixed networks



Technical characteristics of **F5G-A**



Source: F5G Advanced Generation Definition

- Fibre connectivity is becoming ubiquitous, extending from last “mile” to last “meter”
- F5G Advanced extension for residential, business, and verticals
- Deploying, additions in F5G Advanced Release 4

(https://www.etsi.org/deliver/etsi_gr/F5G/001_099/021/01.01.01_60/gr_F5G021v010101p.pdf)

Key Drivers and Enabling Technologies for F5G Advanced



Drivers

Digitalization & Cloudification, and AI-ification of application



UHD Immersive
10 times bandwidth



Enterprise
Digitalization
One-hop to cloud



FTTM
Higher reliability



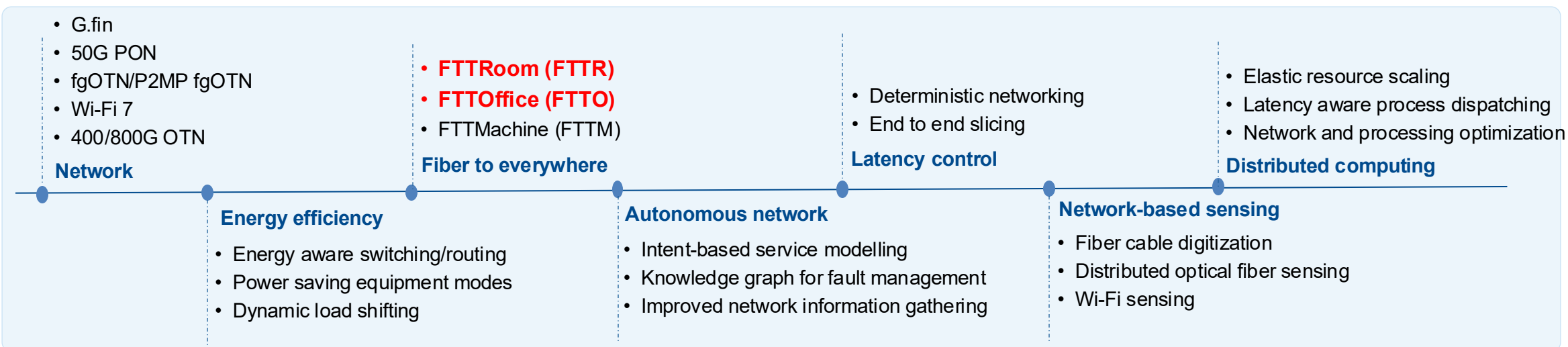
Metaverse
New capability



Network Infrastructure



Enabling technologies

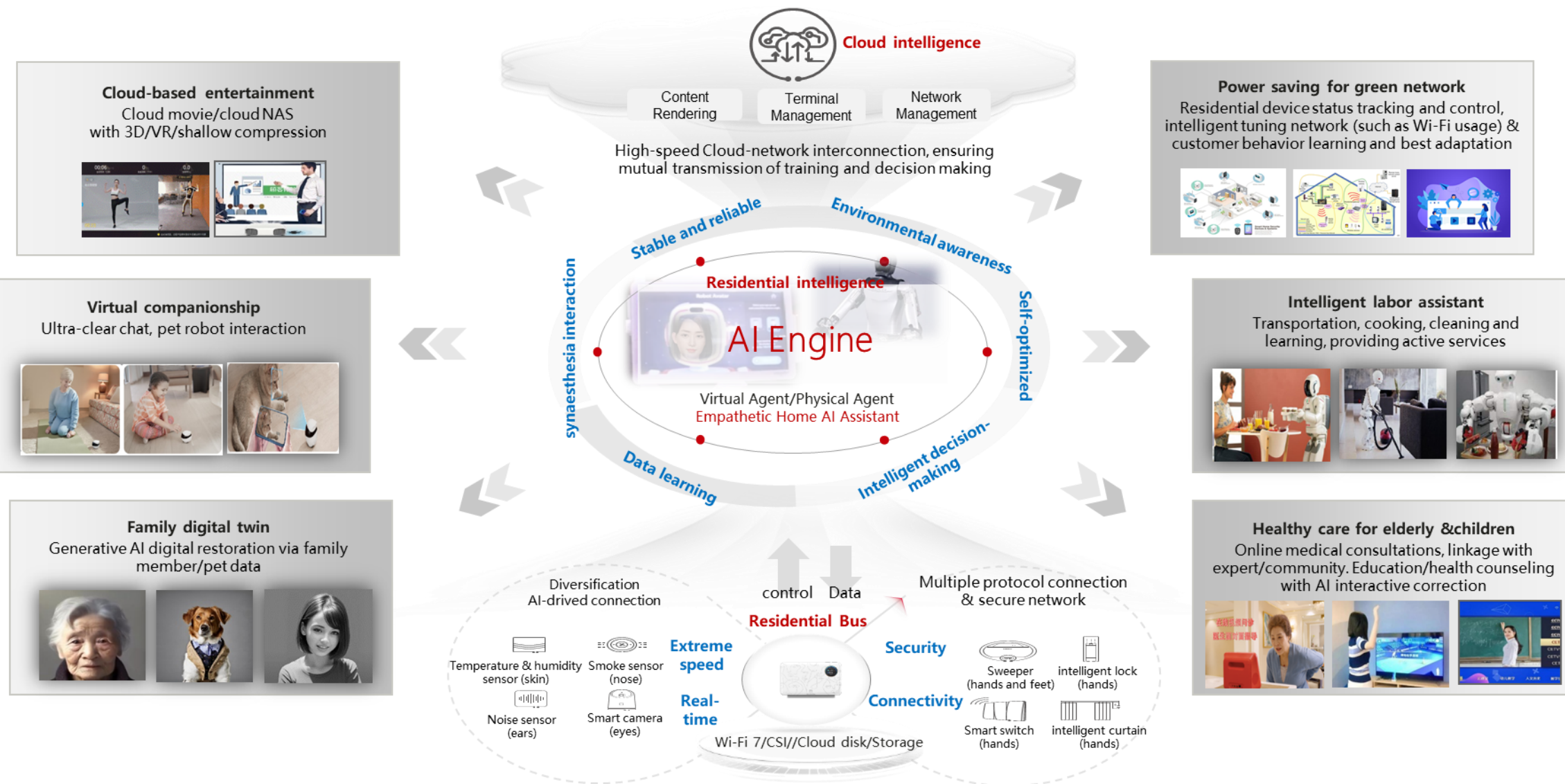


AI-enhanced Intelligent FTTR for New Services, Applications, and Experiences

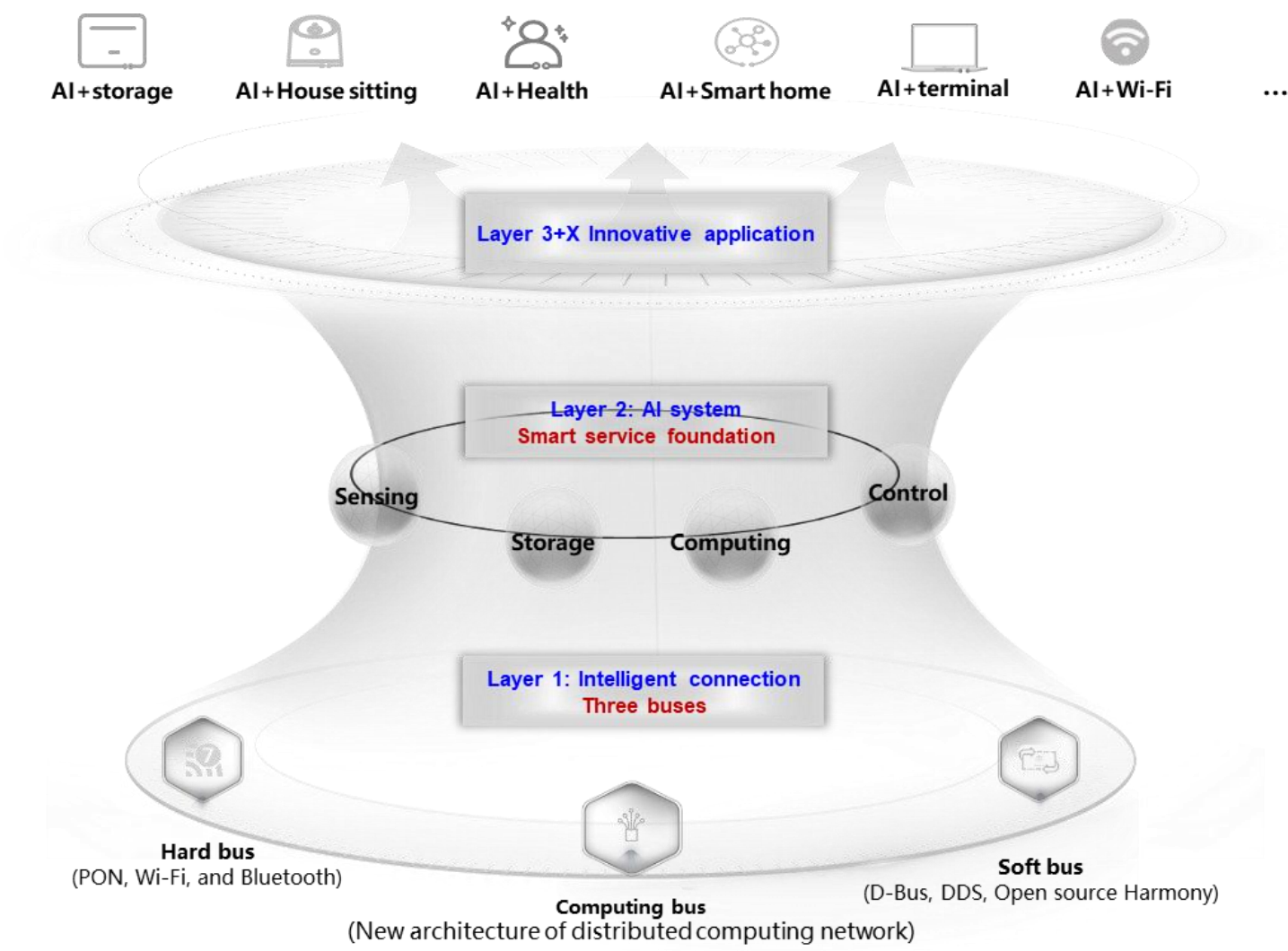
ETSI Whitepaper (coming soon)



Intelligent services in residential network



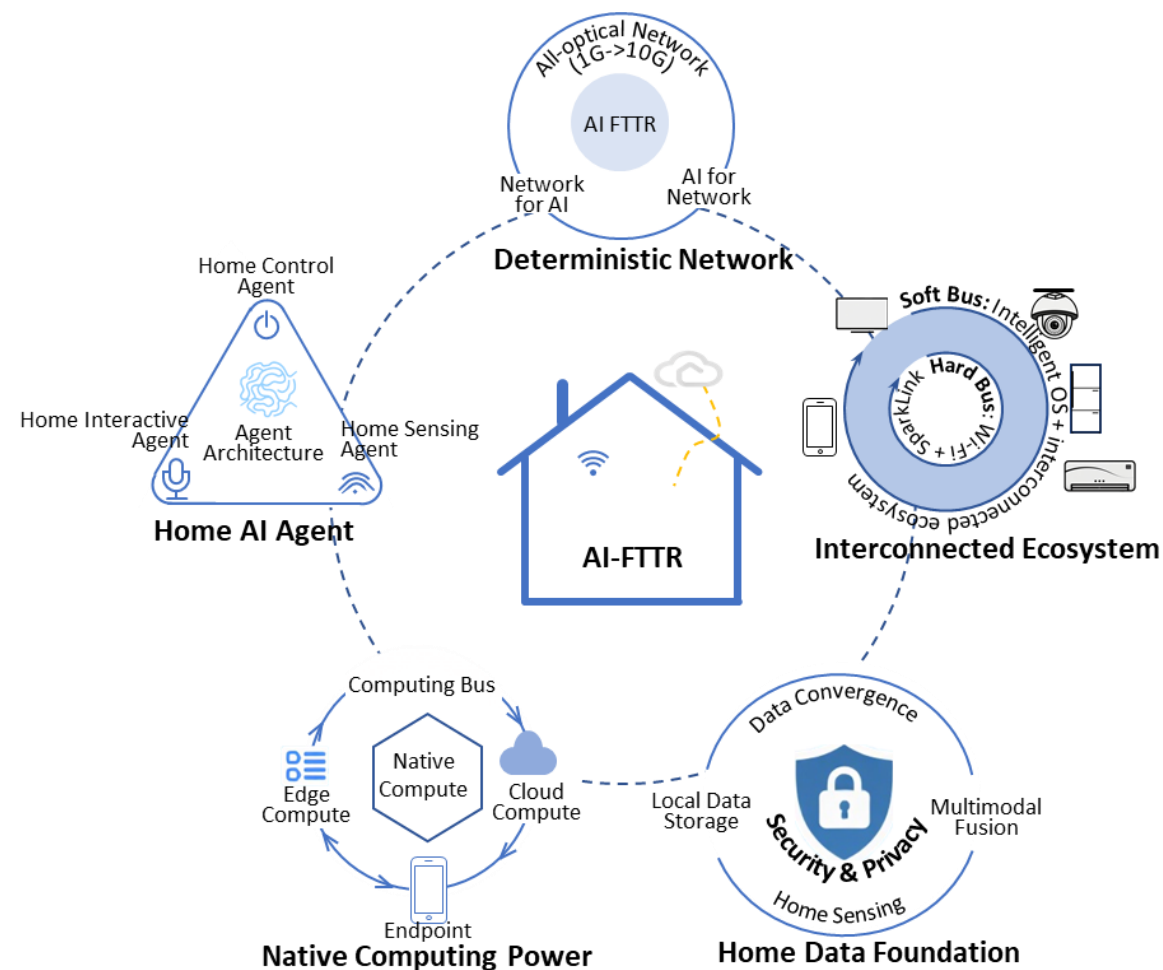
Network architecture of AI-enhanced FTTR network



Characteristics of AI-enhanced FTTR

Enhance Residential and SME FTTR with AI capabilities

- Add computing and storage for running AI workloads
- Upgrade Bandwidth for AI services
- AI for optimization of the user experience
- FTTR as AI gateway accessing AI capabilities
- FTTR hosting AI agents
- Eco-system: integrating communication, sensing, storage, and computing capabilities (FTTH and FTTR)
- Move to multi-modal experience

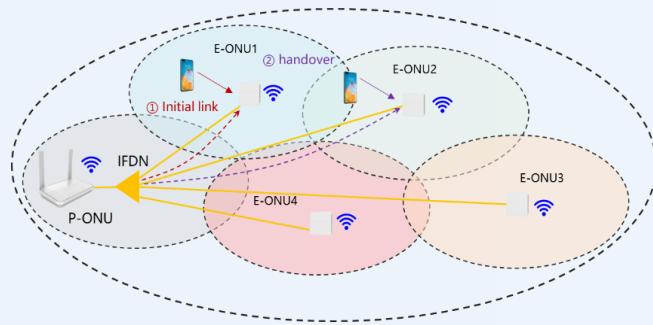


Use cases for FTTR in F5G-A R3 & R4



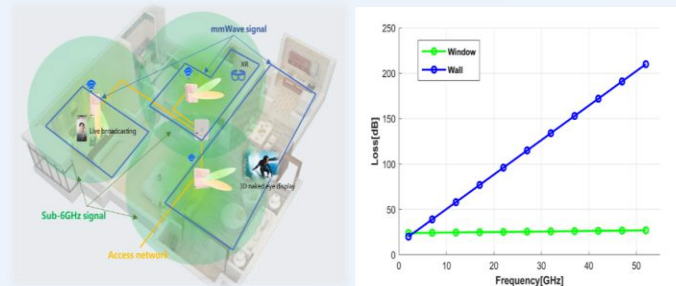
ETSI ISG F5G: Use cases of FTTR in F5G-A R3 & R4

Stable & reliable Wi-Fi® connection over FTTR



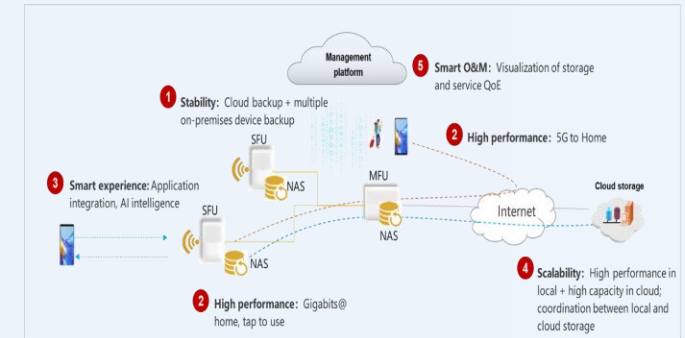
- Service identification & adaptation
- Centralized Wi-Fi control and coordination
- Latency sensitive transmission scheme

On-premises Millimetre Wave (mmWave) WLAN



- mmWave WLAN as a fronthaul network to avoid interference
- Coordination between sub-6GHz and mmWave

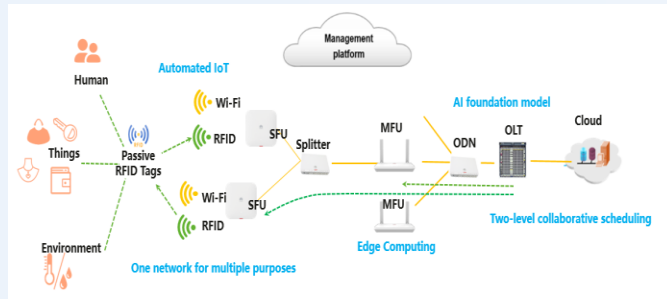
NAS over FTTR



- Smart applications based on NAS functions: intelligent search, mobile apps, high-speed and reliable backup, remote access

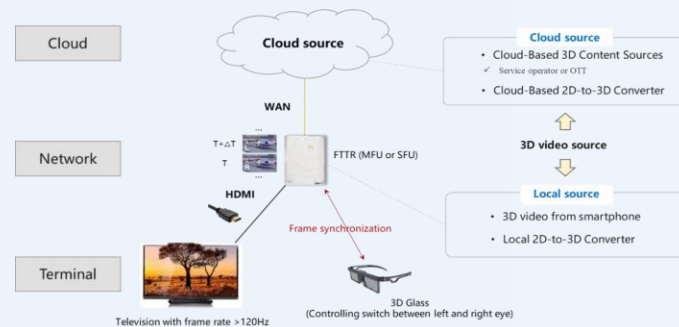
ETSI ISG F5G: Use cases of FTTR in F5G-A R3 & R4

Integrated RFID over FTTR



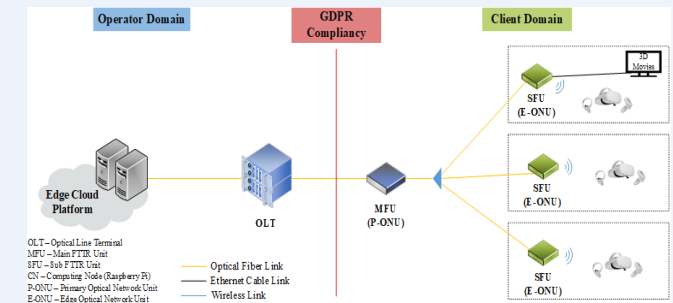
- RFID data can be identified and prioritized
- Higher sensitivity based on beamforming
- Enhanced data privacy & security based on FTTR

3D video enabling via FTTR



- New service: cloud or localized 2D-to-3D conversion of video
- New system: based on FTTR synchronization between TV and 3D glass

Distributed Intelligence with Privacy-Preserving Features for FTTR



- Power consumption monitoring and dynamic adjustment of ONU power mode in real time
- Traffic monitoring and analytics in real-time
- Optical power monitoring & analytics in real-time

FTTR Testing for functions and performance



ETSI ISG F5G: FTTR testing

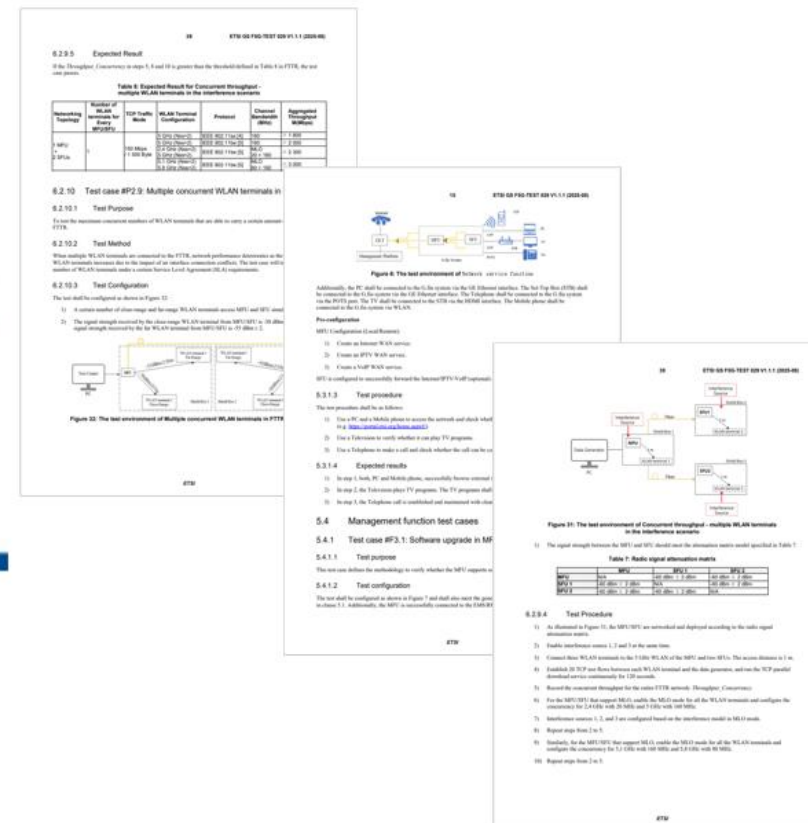
- **Scope:** the newly published Group Specification provides a comprehensive and standardised framework for testing the functionality and performance of FTTR systems based on ITU-T G.709 technology. Its extensive scope covers:

ETSI GS F5G-TEST 029 V1.1.1 (2025-08)



GROUP SPECIFICATION

Fifth Generation Fixed Network (F5G); Test Specification for Residential FTTR Functionality and Performance

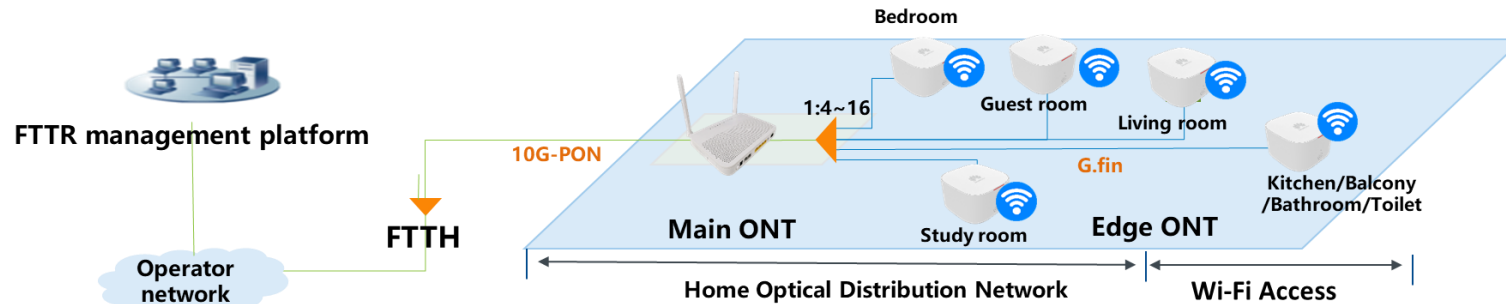


- **Value:** Accelerating Commercial Deployment; Ensuring Quality and Reliability; Fostering a Healthy Ecosystem

ETSI ISG F5G: FTTR deployment guide

- **F5G-0040 (GS) Technical requirements for FTTR Network deployment**

-> **Scope:** This work item specifies the technical requirements for service operators to deploy high-quality FTTR network including network coverage, network connectivity, network performance, and network operations and maintenance.

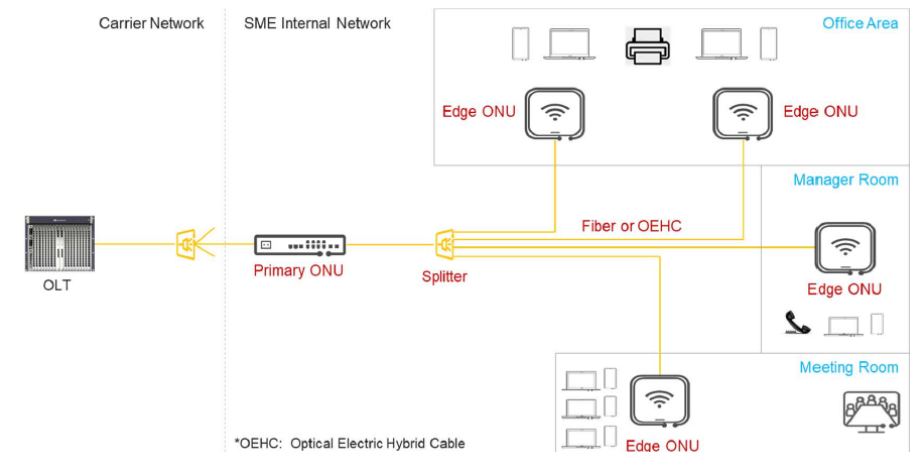
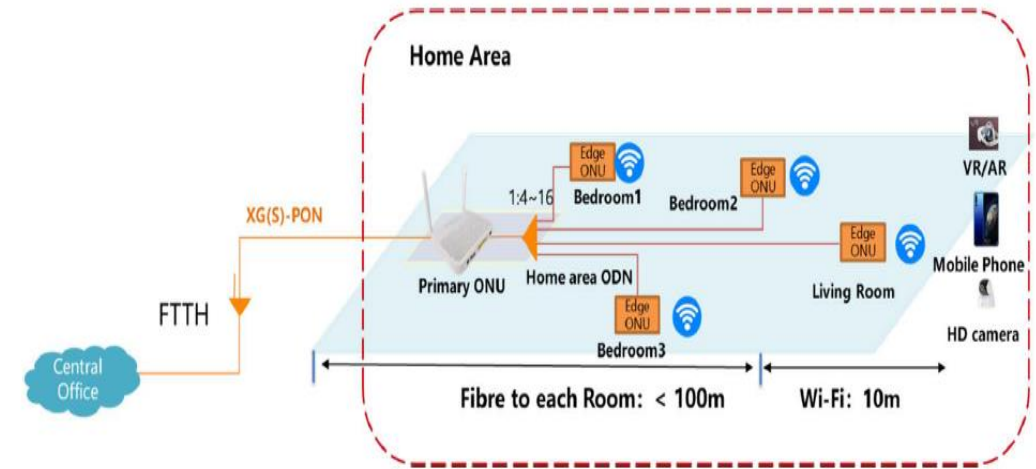


- FTTR Network Architecture
- Deployment guidelines for FTTR networks
 - pre-deployment
 - ✓ Network planning guidelines
 - during-deployment
 - ✓ Network performance guidelines
 - ✓ Network security guidelines
 - ✓ Network management guidelines
 - after-deployment
 - ✓ Network parameter collection guidelines
 - ✓ Network performance optimization guidelines

- Deployment method for FTTR networks
 - pre-deployment
 - ✓ Network coverage simulation
 - during-deployment
 - ✓ Optical fiber deployment
 - ✓ MFU and SFU location
 - ✓ Master-slave connection mode
 - ✓ WiFi configuration
 - ✓
 - after-deployment
 - ✓ Network parameter collection
 - ✓ Network performance optimization

Summary: FTTR Status in ETSI ISG F5G

- FTTR concept defined for Residential and SMEs (Release 2)
- FTTR use cases and system requirements (Release 3&4)
 1. FTTR with mmWave Wi-Fi
 2. RFID over FTTR
 3. Centralized control of FTTR+Wi-Fi for optimized operation
 4. FTTR integrated with Network Attached Storage (NAS)
 5. 2D to 3D high-resolution Video Transcoding
 6. Optimized power consumption
 7. Improved QoE (roaming and QoS)
 8. LLMs managing FTTR
- FTTR Test Specification (published)
- FTTR Deployment Guideline (new work item)
- AI-enhanced FTTR Whitepaper





Thank you for your attention

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