Exploration of FTTR development in practice

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October 2025

From FTTH to FTTR

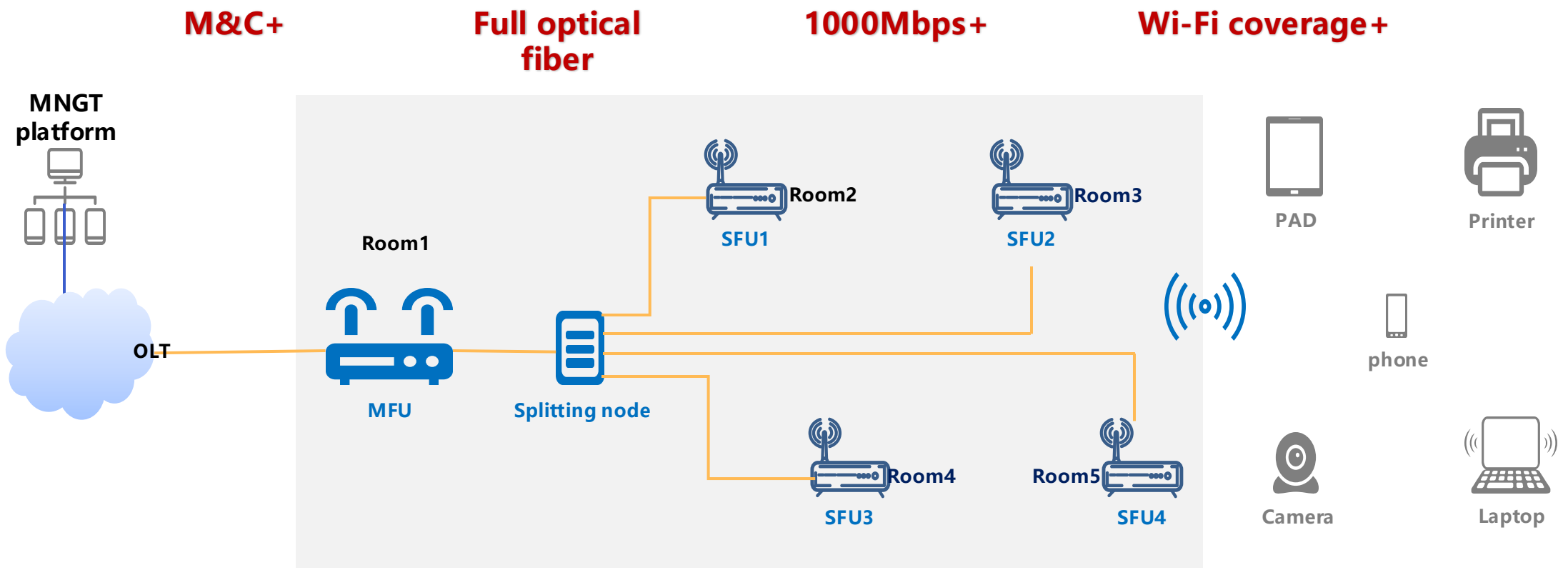
- The FTTH network has been deployed with wide coverage, providing broadband access to more than 600 million users in China.
- With the emergence of new services, user demand for better experiences, the upgrade of access networks, and market trends, the huge FTTH user base is gradually exploring and upgrading to the next-generation FTTR technology.

Access upgrade	User experience	Service	Market
• Access network upgrade • >1000Mbps user +	• In-door Wi-Fi issue • Multi-device interference	• Online services • AI emerging services	• Competition + Cost • SME/home scenarios

FTTR

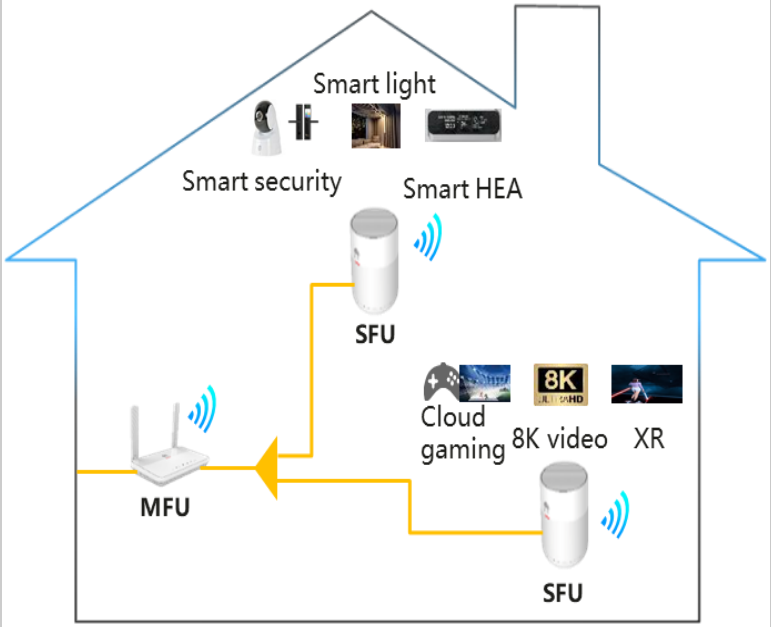
Optical Fibre Extends to Rooms for Better Services

- FTTR features high bandwidth, full coverage, easy scalability, and smart O&M. It provides high-quality, and guaranteed networking services, serving as a powerful tool for improving customer experience and enhancing operator influence.



FTTR Empowers Diverse Typical Scenarios

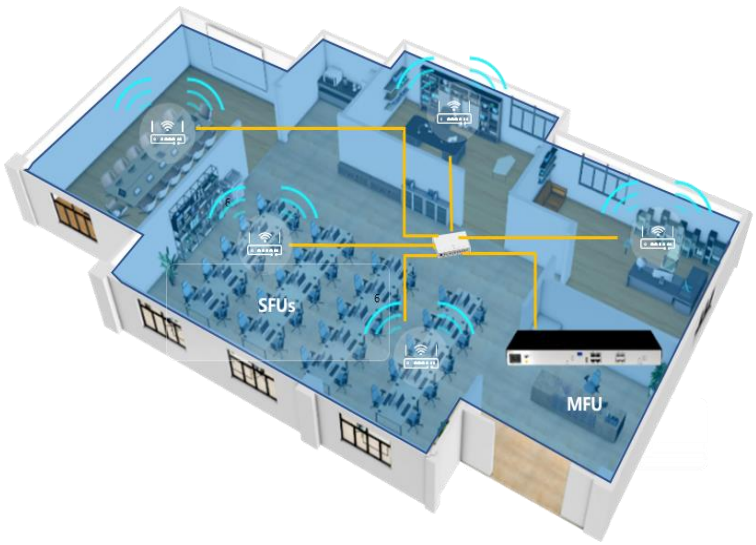
FTTR-H (G.sup80)



- **Aim to enhance smart home experience**: consolidating the foundation of a broadband, full-coverage, and high-quality home network.

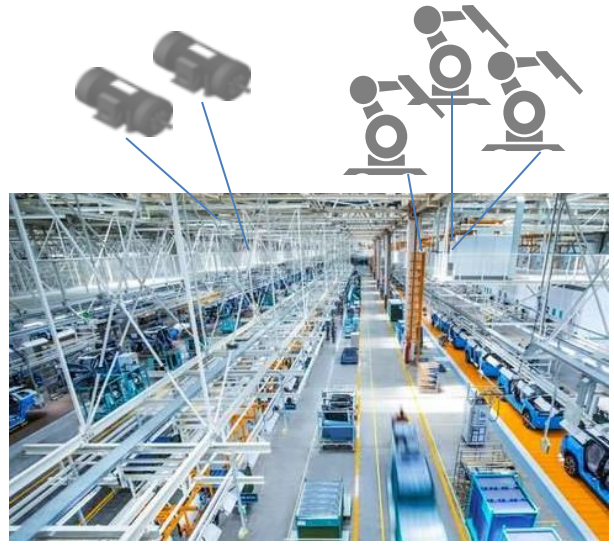
FTTR-B

(SME G.sup78)



- **Focus on typical industries**: Business offices, Restaurants, Leisure and Entertainment, Retail chains, Live streaming, Education institutions, Dormitories, and Smart communities.

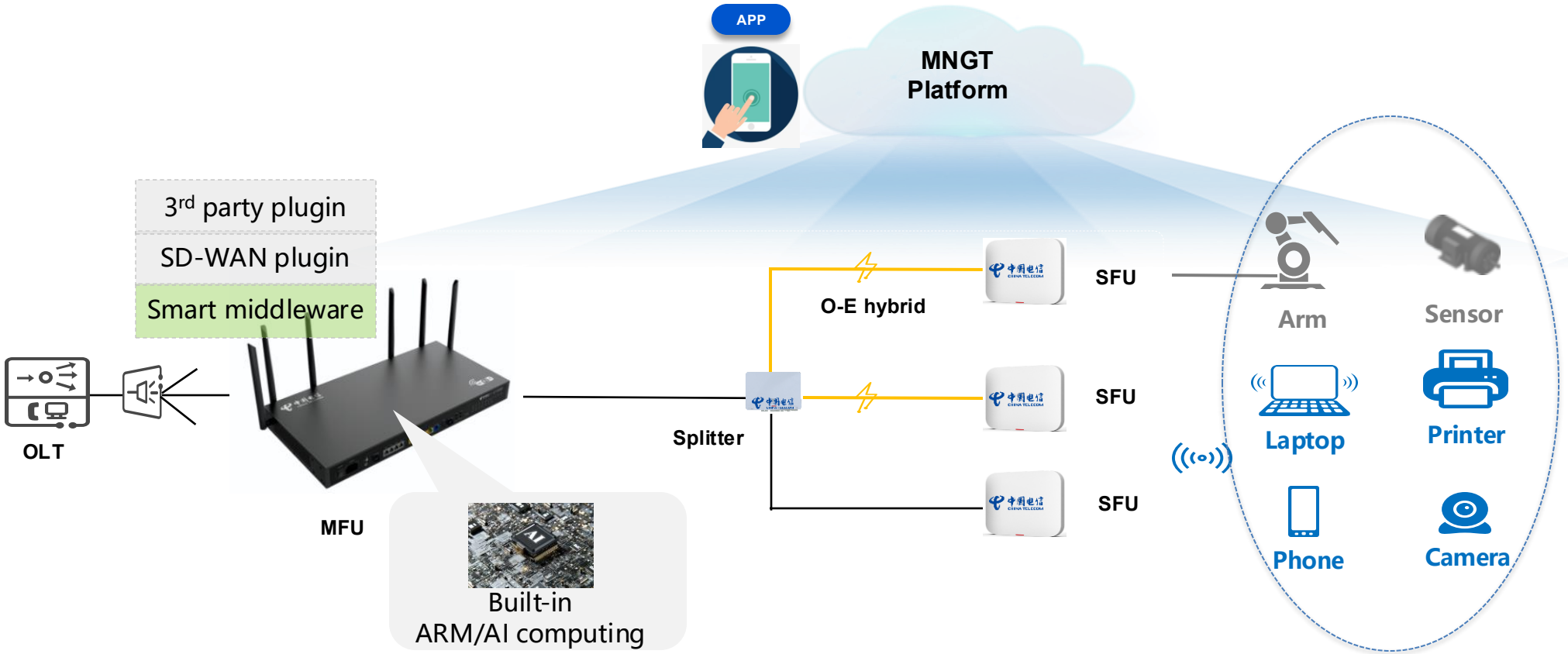
(Industry)



- Industrial FTTR extends optical fibers to industrial terminal nodes to achieve the **integrated** bearing of office, security and production networks and real-time data transmission.

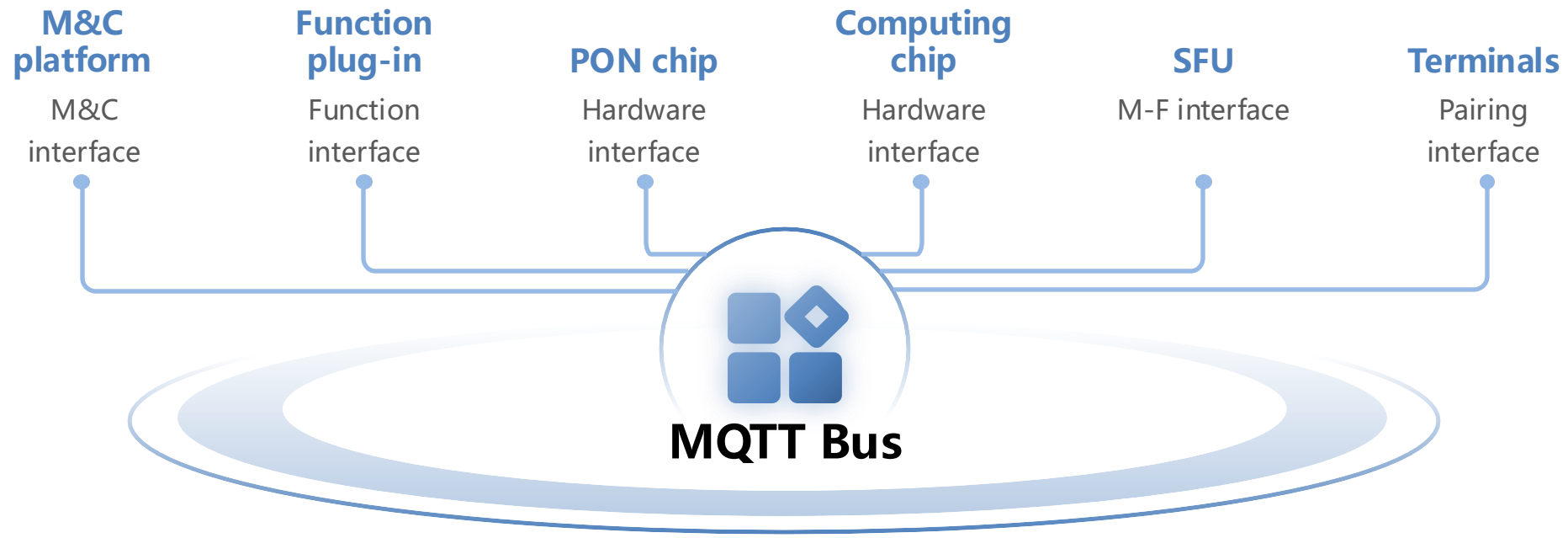
FTTR-B Viewpoint : Connectivity + Capability + Service

- Provide whole scene and comprehensive solutions for business scenarios, expanding from basic connectivity to **“connectivity + capability + service".**
- Seamless integration of connectivity, computing power, terminals and applications.



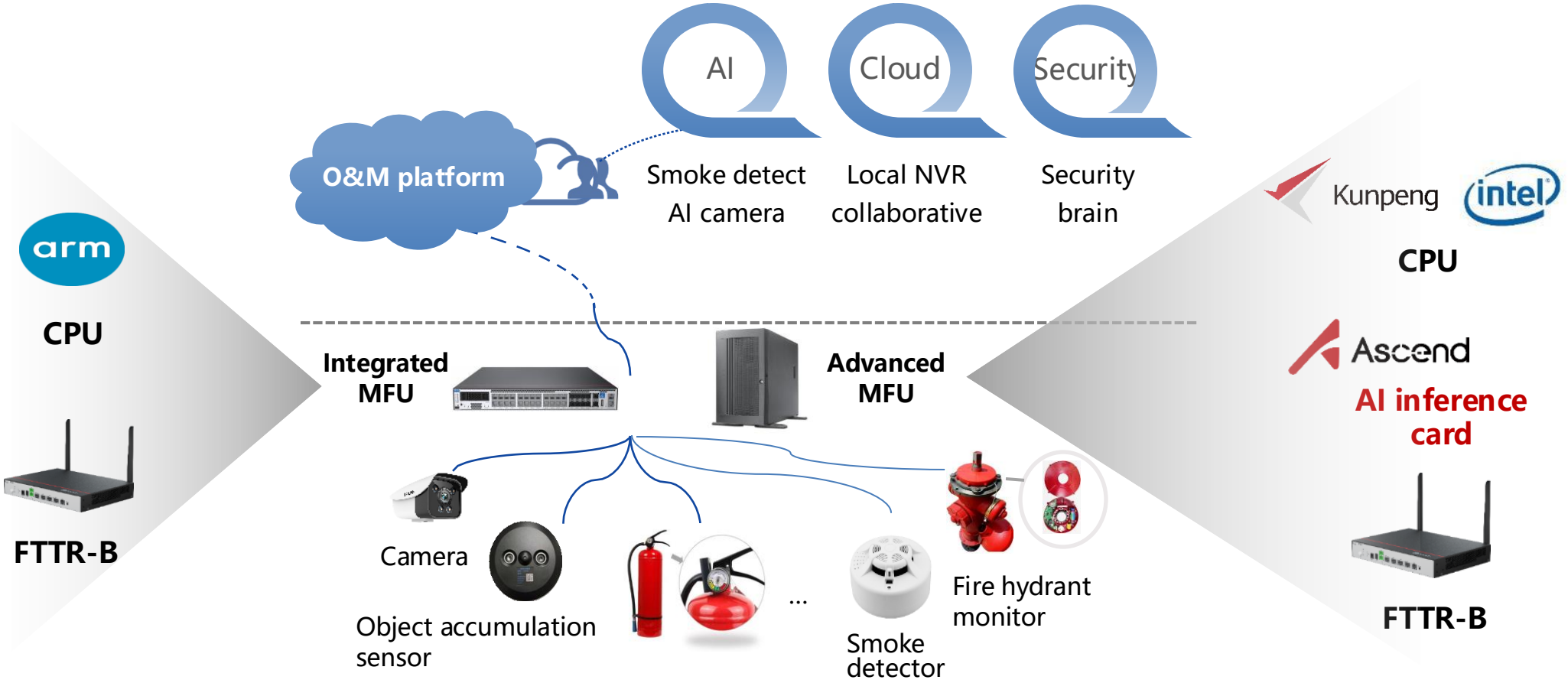
MFU/SFU Capability based on Unified Protocol

- To realize the **interaction and scalability** of network, service and management components
- Based on MQTT protocol, the unification of interface protocols for communication among devices, chip modules and function plug-ins can be achieved.



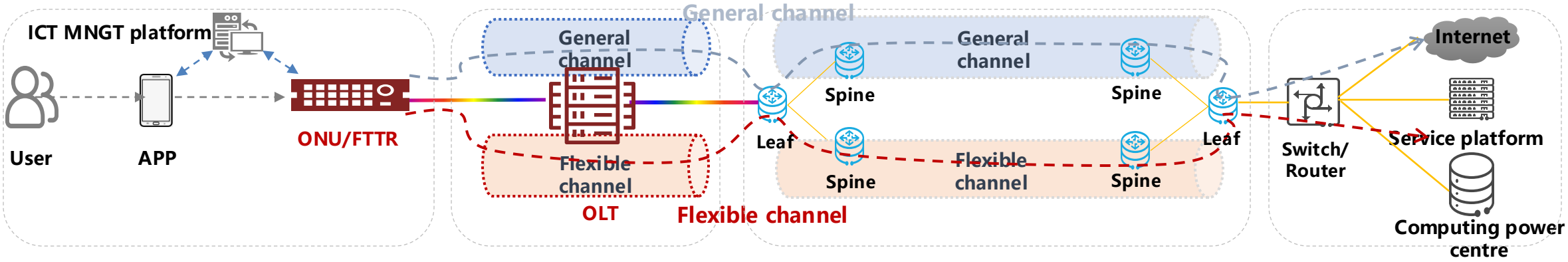
Computing Power Integration for New Services

- **Integrated architecture combines network and computing power** for new SME services
- To develop a series of integrated MFU, creating an innovative model, featuring a simplified delivery mode to meet the requirements of differentiated services and flexible deployment.



UC: Flexible FTTR Network

- Flexible FTTR relies on the PON, through MAN, to leverage key technologies including Service identification and Dynamic interaction, achieving synergy of end-to-end solutions for emerging services like Storage-computing separation, realizing **user-based, digital-commerce like, flexible and low-cost** network access capabilities.



Flexible Provisioning

- Rapid service activation/deactivation and accurate service identification
- **One-click self-service for users with flexible billing**

Flexible Bandwidth

- **Service-level slicing and two-layer DBA** enable real-time awareness of service traffic fluctuations and dynamic adjustment of network bandwidth resources.

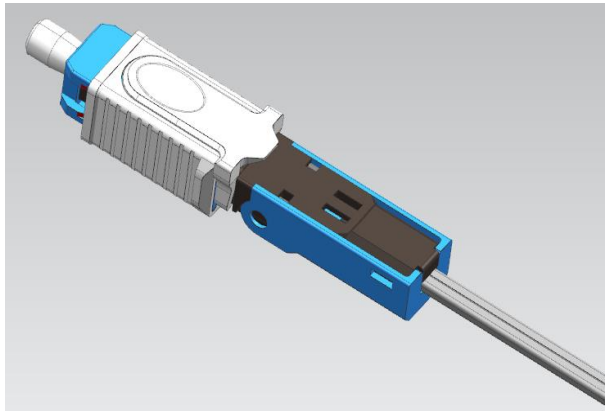
Flexible Quality

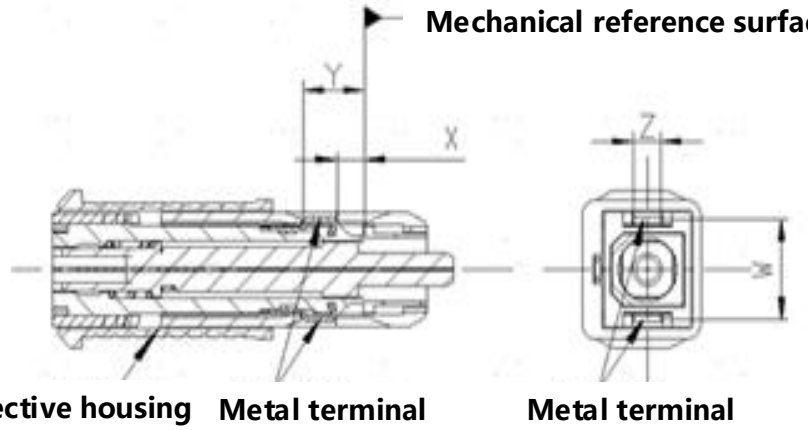
- Match forwarding paths for services, monitor real-time link status
- SLA visualization, Service experience visualization and O&M quality improvement.

Unify O-E Hybrid Interfaces to Enhance Safety and Reliability

☐ Enhance safety and reliability in remote power supply scenarios

- Add protective devices for conductive contacts on opto-electrical connectors
- Improve the safety of remote power supply through safety detection mechanisms





XC/UPC

SC II

SC I

SC compatible

A variety of interfaces lead to customized and poor versatility of opto-electrical hybrid cables

Potential Requirement on FTTR Coexistence

- For 10 millions of existing FTTR users based —— The requirement on **partial upgrading** is existed.
- To consider the device lifecycle, to protect existing investment, to reduce the complexity of FTTR installation process, and to support differentiated needs especially in SME scenarios.

(Currently study as supplement CoexFIN in SG15 Q3)

Example: PON+FTTR full optical campus

Example: tiktok LIVE shopping office

Summary

- Driven by the network demands of emerging services, the existing FTTH market is upgrading to FTTR. In practice, FTTR has formed two typical scenarios: FTTR-H and FTTR-B. For the FTTR-B scenario, FTTR could provide comprehensive solutions, extending from basic connectivity to "**Connectivity + Services + Capabilities**". Based on the MQTT protocol, China Telecom has built a unified, open, and extensible network, laying a technical foundation for business services.
- Flexible FTTR has been implemented as a typical use case to achieve flexible service provisioning, bandwidth, and quality, providing flexible network support for emerging services among AI, cloud and security, such as Storage-computing separation.
- From the perspective of improving safety and reliability, the opto-electrical hybrid interfaces need to be unified. Besides, the coexistence scenarios of FTTR can be explored for the potential requirements in the future network migration.

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Thank you!