



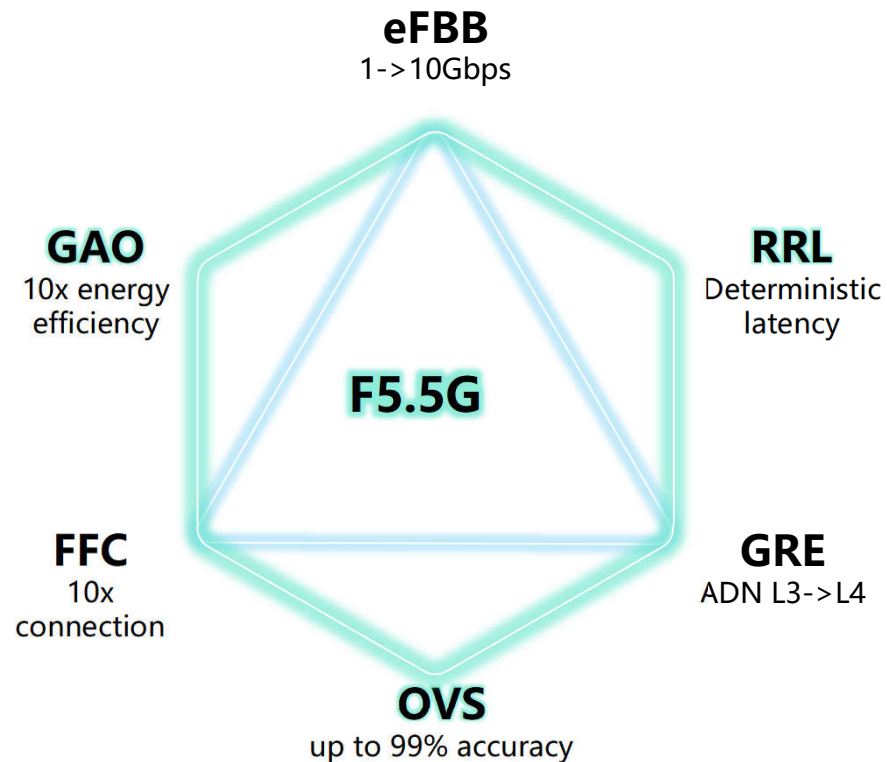
# FTTR Development and Prospects of China Unicom under the F5G-Advanced

**China Unicom**

**Yue Sun**

# Evolution from F5G to F5G Advanced

## F5G-A era Comes

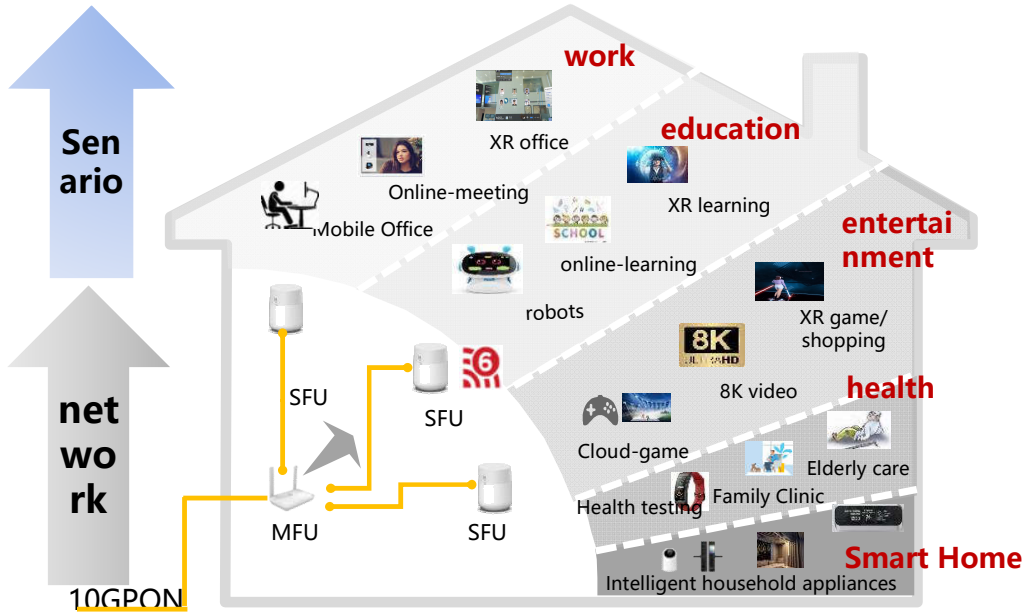


- GAO: Creating a Green and Agile Quality All Optical Network--One hop direct, 10 times energy efficiency improvement
- RRL: Creating an ultra high reliability, deterministic low latency optical network, supporting thousands of industries for digital upgrade.
- OVS: Unlocking the infinite potential of optical networks, upgrade from communication to perception

# Requirement: Network upgrading based on diversified application

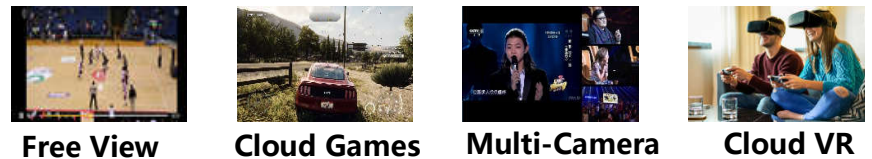


The evolution of user service towards multi-screen, diversified, and intelligent



multi- screen      diversified      intelligent

New services require large bandwidth and low latency to ensure an experience



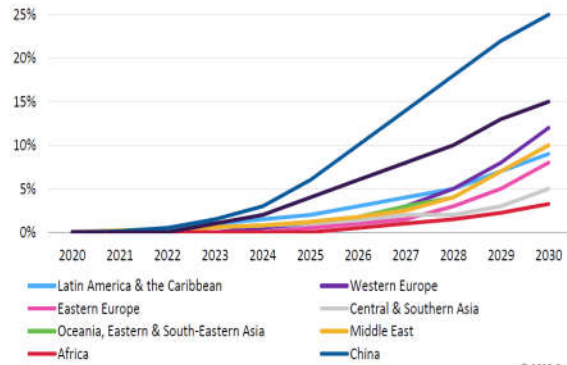
Typical Service	bandwidth	lantency (E2E/home)	SLA
8K/12K XR working	160~480Mbps	10/4ms	Large bandwidth, low latency, moving
4K/8K Cloud game	160Mbps	20/7ms	Large bandwidth, low latency, moving
8K video	150~280Mbps	20/6ms	Large bandwidth, low latency,
Smart home	350Mbps	40/15ms	real-time

# Development space: the space can reach over 630 billion by 2025 in China



Omdia predicts that among China's FTTH users by 2030 FTTR accounts for up to 25%

Figure 5: FTTR share of residential FTTH subscriptions by region, 2020-30



Source: Omdia

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White Paper states by 2025: FTTR accounts for over 15% of broadband users

130 billion

FTTH -> FTTR Renovation

5000 billion

Digital applications Market



FTTR scenarios Expand to small and micro enterprise scenarios

~47 million

Number of small and micro enterprises by the end of 2022



# FTTR products: Rich variety of equipment and diverse construction tools

## Continuous upgrade of FTTR equipment

Third generation



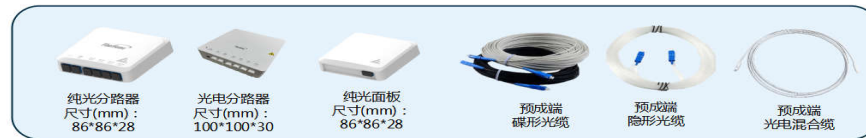
Second generation



First generation



## Diverse construction tools



烽火新一代现场连接器



切割刀定长夹具

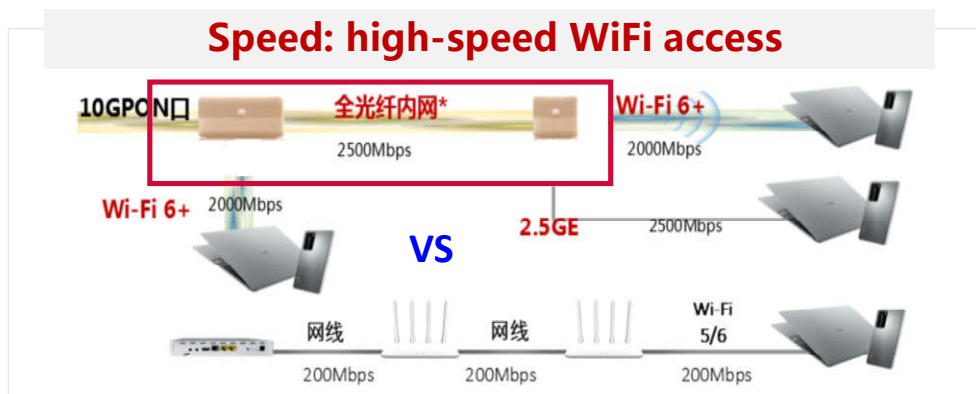


夹具定位 切割光纤

# Network capability: create an ultimate digital experience



## Speed: high-speed WiFi access



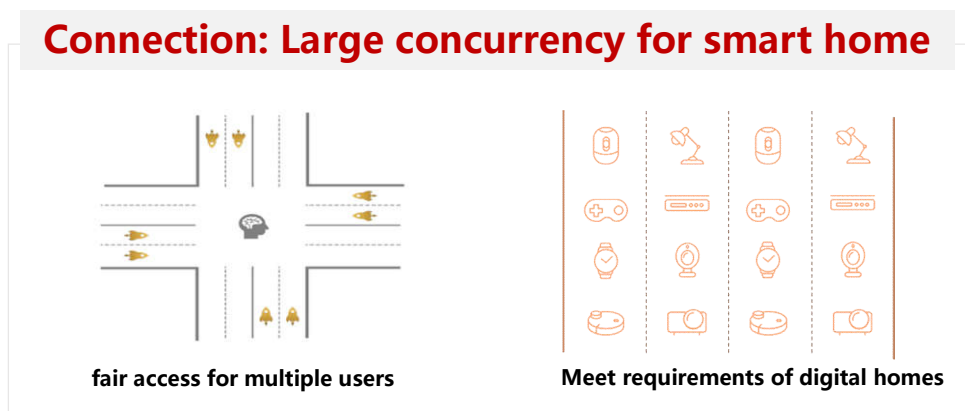
## Coverage: Full house coverage without dead corners



## Roaming: senseless roaming,



## Connection: Large concurrency for smart home



# Optical access: network collaboration provide users with high-quality services



## Broadband boutique network, leading in the application

2 million

FTTR users

*\*As of April 2023*

450 million

No. of covered households

40%

Proportion of 10GPON ports

*\*As of the end of 2022*

## Collaborative development of end-to-end network to ensure experience

Service

5star broadband service



end

10G PON ONU

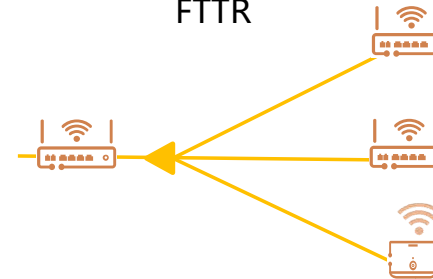


network

10G PON OLT



FTTR



# Service: Consolidate the FTTR base and create a 1+6+3 digital home service system



3 scenario

Internal Operations

External service

Intelligent O&M

+

6 capability

**Network Visualization**

- Device management
- Device Status Query
- User behavior perception

**Terminal controllable**

- Remote device restart
- Signal strength regulation
- plugins management

**Bandwidth adjustment**

- app speed limit
- Game acceleration
- Broadband acceleration

**Value-added service**

- Home Cloud
- Smart home
- Application Usage Analysis

**Intelligent O&M**

- Connection detection
- Installation recognition
- Wi-Fi automatic tuning

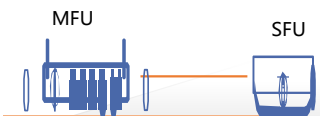
**Safety**

- Device safety
- Network safety monitoring

+

1 Technical base

collaboration of end and network



Intelligent C system

+



Cloud system

- User portrait
- Network analysis
- Data collection



# Intelligent FTTR: Stable and reliable connection (1/2)



## 01

### Network Visualization

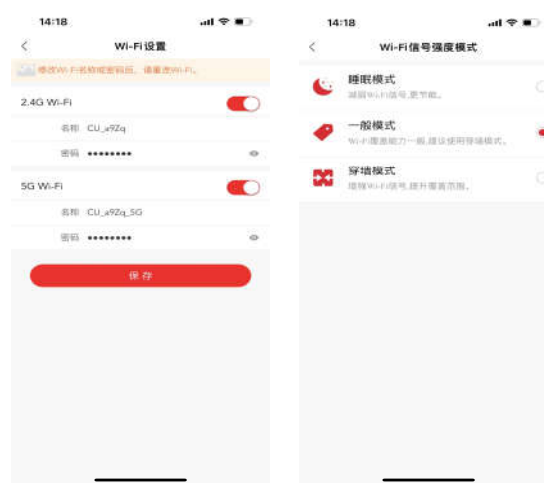
Real time access to home network conditions and terminal usage



## 02

### Terminal controllable

Based on gateway C system  
Achieve the control of FTTR device



## 03

### Bandwidth adjustment

Dynamic bandwidth adjustment,  
providing a flexible experience

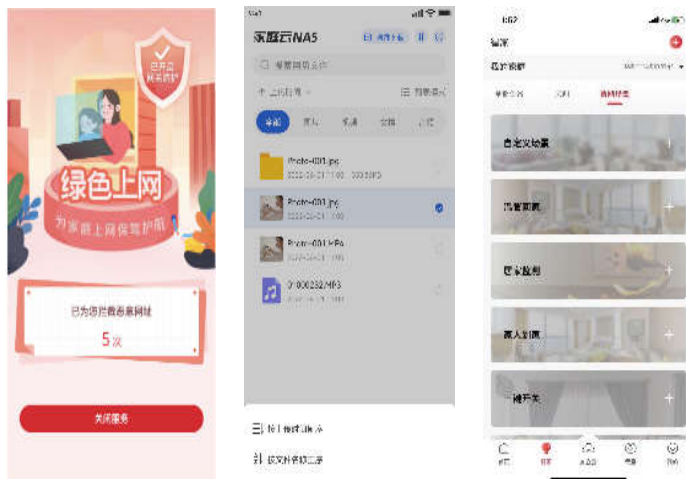


# Intelligent FTTR: Stable and reliable connection (2/2)

## 04

### Value-added service

Enrich products and enhance user ARPU



## 05

### Intelligent O&M

Improve operation and maintenance efficiency



## 06

### Safety

Building a Safe Home Brand



# Use case: upgraded FTTR for better WiFi experience, providing users with 2000M service



## 2000M service

### Leading a New trend for Broadband

#### three major service commitments

#### “联通智家—臻宽带”套餐资费

套餐类型	U系列档位	月资费 (元/月)	宽带	5G号码	组网服务
臻·1000M 智臻 光宽带	U9	509	1000M	1500G + 3000分钟	·享全屋光宽带 FTTR 服务 ·享 WiFi6 组网服务
	U8	399	1000M	1000G + 2000分钟	·享 WiFi6 组网服务 (以上二选一 同叠加办理 “智能享臻直降优惠”)
臻·1000M 智臻 光宽带	U7	299	1000M	800G + 3000分钟	·享全屋光宽带 FTTR 服务 + ·享 WiFi6 组网服务
	U6	196	1000M	400G + 1500分钟	·享 WiFi6 组网服务 +

**“网必快”**

· 全屋光宽带 FTTR 服务  
· 享 WiFi6 组网服务

**“速必达”**

· 尊享全屋光宽带 FTTR 服务 +  
· 享 WiFi6 组网服务

**“慢必赔”**

· 尊享全屋光宽带 FTTR 服务 +  
· 享 WiFi6 组网服务

好宽带，一定要服务到用户的WiFi上，它是智慧家庭的新的数字基础设施。选宽带，要配好服务。兼具高速率、广WiFi、好服务才是真的好宽带。

品牌名称	U20	U21
合约期月资费 (元/月)	599	799
合约期 (月)	36	36
标准月费 (元/月)	699	899
宽带产品 (单价)	300	300
必选产品	宽带	2000M (上行200M) (加30元/月再享一条200M光宽带或加60元/月再享一条500M光宽带)
	全屋光宽带 FTTR 专属匹配服务	FTTR服务【一主一从】——专属FTTR全屋WiFi覆盖服务 (价值75元/月, 包含提供价值1500元FTTR专属上网终端)
可选业务	5G	150GB全国流量 +3000分钟国内语音 / 500GB全国流量 +4000分钟国内语音
	副卡	套餐包含最多4张副卡, 与主卡共享套餐内流量及语音
可选业务	管家类服务	夜间服务 管家类增值业务按照有标准资费收取
	通话及IPTV	每条宽带包含首台IPTV月租 (市场价值13元/月/台) 包含回话月租 (市场价值21.6元/月), 第一部回话含300分钟国内拨打或接听语音包300分钟通话; 第二部回话含100分钟国内拨打

## China Unicom subsidiaries have successively released 2000M service

### Liao Ning



### Shang Hai



### He Bei



### Zhe Jiang

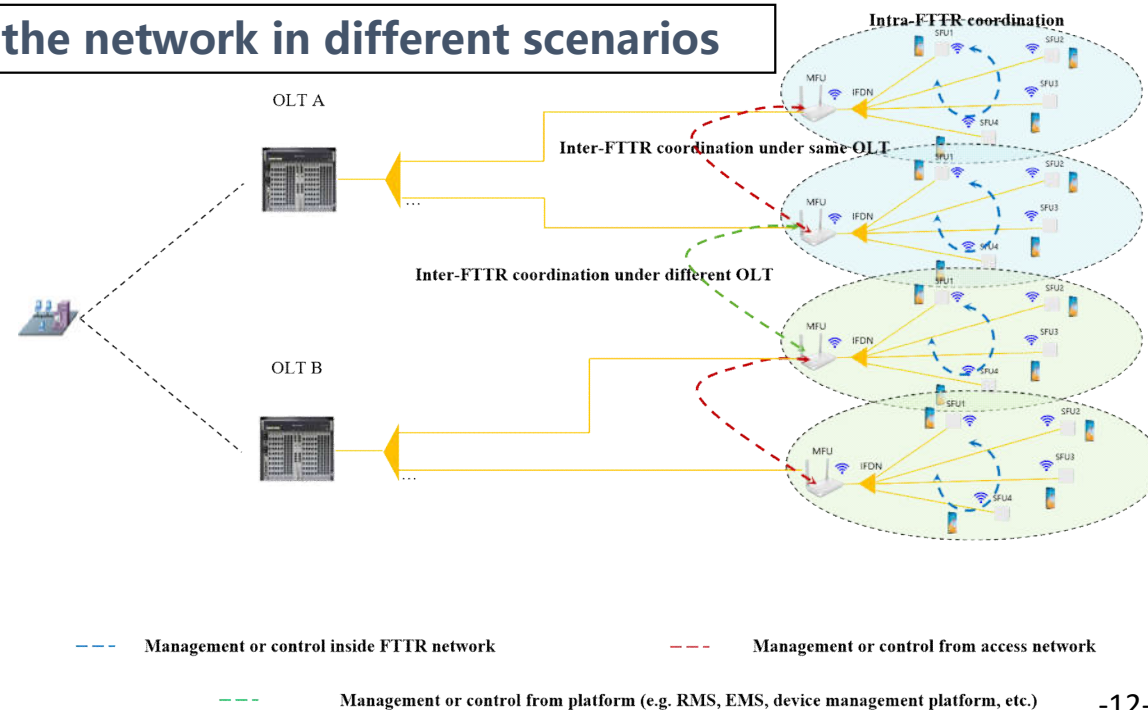


# Exploration: FTTR advance computing collaboration in PON network, new ETSI international standards

- China Unicom has started the standard work of "Computing Collaboration in PON Network" in ETSI F5G , focusing on the computing power of PON access networks and the computing collaboration between various network elements. FTTR and related services are important components and application scenarios of computing collaboration in access networks.

## Coordination function for FTTR across the network in different scenarios

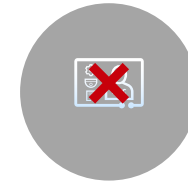
- With individual FTTR system, MFU maintains coordination function over fiber and Wi-Fi.
- Neighbor Wi-Fi coordination can be done between FTTR systems, located in same OLT. This requires a cross-network coordination function within a single OLT based on OLT's computing power.
- Neighbor Wi-Fi coordination can be done between FTTR systems, located in different OLT. This requires a cross-network coordination function within a platform based on its computing power.



# Scenario: Small and micro enterprises are moving towards digitization, with huge potential for FTTR2B

## User Requirement

## Key points for enterprises



More and more small and medium-sized enterprises accelerate ICT investment

online office, annual demand for AP: 10 million units

Bad experience of Wi-Fi

Insufficient concurrency

No dedicated O&M staff

**FTTR2B provide more powerful capabilities and match the requirements.**

**Thanks!**