FTTR Technology and Application for MSME scenarios

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Big Market in micro, small and medium-sized enterprises

I. Commercial buildings

Small and micro business office (10~300 employees)

- Big concurrent Internet flow
- VIP experience, online behavior management
- Secure Internet access, multi-line backup

Live broadcasting of small, medium and micro enterprises

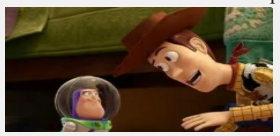
The whole process has no lag and no dropping, and the interactive operation is smooth

Sit/go play

Live streaming e-commerce

Animation design

Upload large files quickly, and cloud interaction and video playback operate smoothly



Anime video game design

Industrial Advertising Design

Educational training

- Large concurrent Internet access
- Staff/student/visitor network isolation

2. Medium and large stores

Restaurants and restaurants

- Smooth Internet access for A large number of customers
- Fast Mobile payments and orders
- Brush short videos and upload short
- …

Entertainment

A large number of customers surf the Internet smoothly, video monitoring, safety audit, equipment does not affect the decoration

KTV+ bar

Teahouse/cafe

Chain stores

Beautiful wiring, passenger flow statistics, advertising, video monitoring, cash register network security

4S store

Chain stores

Cluster market

Public affairs

- Big concurrent Internet flow
- Wired and wireless integration
- Audit

Park dormitories

Large concurrent network smooth, wired and wireless integration, ultra-wide coverage, easy operation and maintenance management

Park Office Building

Industrial Park Dormitory

Campus dormitory

Large concurrent access to the Internet smoothly, free of secondary authentication, wired and wireless integration

Vocational college dormitory

Primary and secondary school classrooms

Hotels

Low-star hotel public areas

Hotel Homestay Inn Villa

Typical Business Scenarios and Technical Requirements

Scenario classification	Segmented scenarios	Key requirements
Commercial buildings	ALL	1. Employees have fast Internet access, good signal coverage, and good roaming experience 2. Good network stability, and the Internet is still smooth during peak hours 3. Some customers have multi-channel fixed phone demand 4. Good network security, For example, automatically block employees from accessing malicious websites or malicious emails, prevent virus trojans from causing company losses 5. Can manage employees' online behavior, improve work efficiency 6. Beautiful line, beautiful equipment installation, and decoration environment integration
Stores along the street	Catering restaurants / leisure and entertainment	1. fast Internet access for customers, good signal coverage 2. good network stability, smooth Internet access during peak periods, cashier network can not be broken 3. generally no fixed-line or 1-way fixed-line 4. security audit 5. beautiful installation of equipment, and the integration of the decoration environment
	Chain stores	1. centralized authentication access 2. passenger flow data statistics 3. headquarters branch interconnection
Cluster Market	Campus Dormitory / Campus Dormitory	1. fast internet access for students/staff, good signal coverage, good roaming experience 2. good network stability, internet access is still smooth at night during peak hours 3. equipment installed in the building, remote power extraction is required 4. one person and one account for Portal authentication access
	Hotel public area	1. centralized authentication access 2. seamless roaming between guest room network and public area network 3. wide coverage with many points 4. High network stability and concurrent access to conference halls and banquet halls

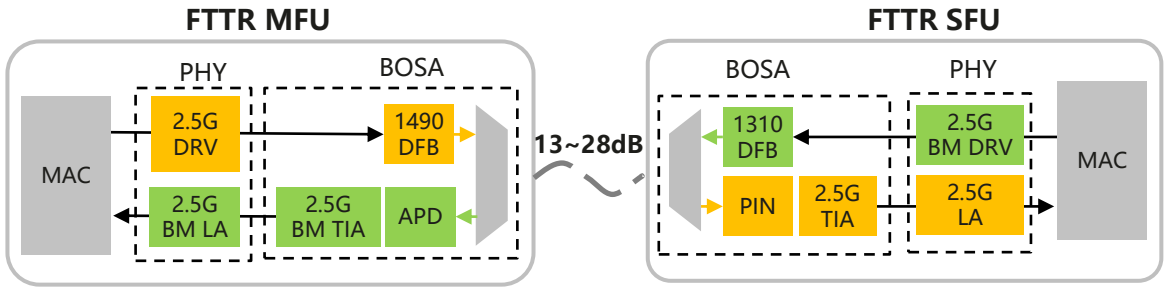
Different business development models

Business Scenarios	Broadband Type
Package model (business buildings / stores along the street)	Enterprise Broadband
	Business Express / Business Enterprise Line

Business Scenarios	Broadband Type
Pre-coverage model (clustered market)	Office Building for public affairs
	Dormitory Building
	Hospital public area
	Hotel public area
	Industrial Manufacturing

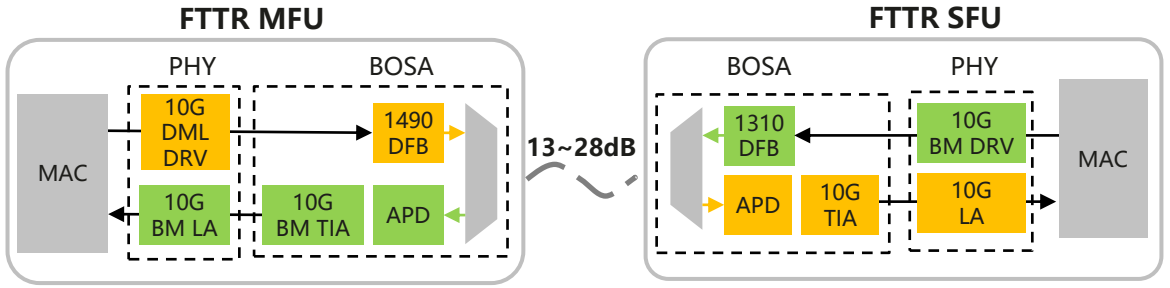
Typical Network Architecture

2.5G & 10G optical layer networking architecture



Symmetric 2.5G PON Architecture

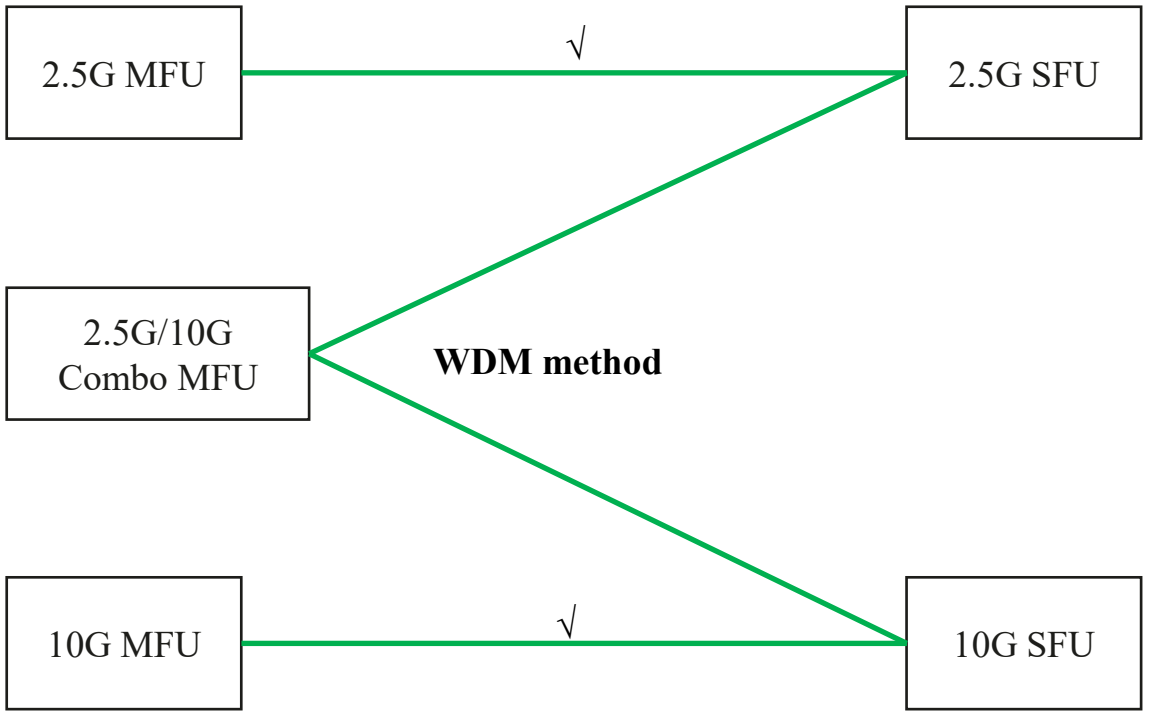
- 2.5G symmetric rate Rb level, sharing GPON industry chain
- MFU receiving with APD scheme;
- MFU/SFU PHY industry have mature solutions.



Symmetric 10G PON Architecture

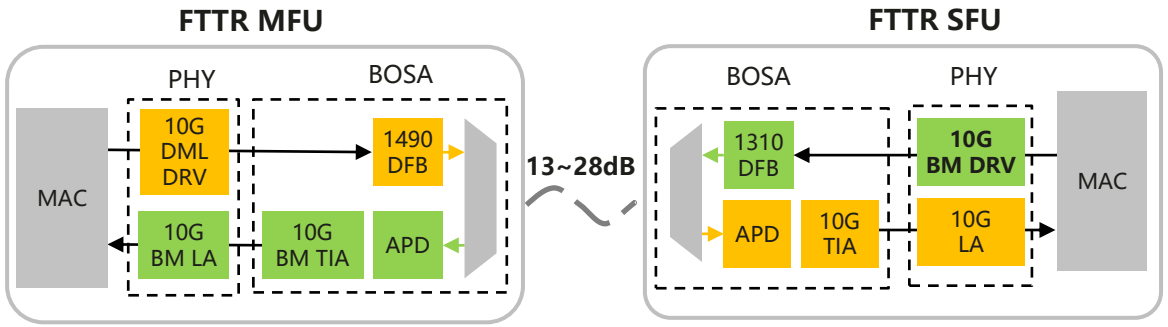
- 10G symmetric rate Rb grade, sharing XGSPON mature industry chain
- MFU PHY industry in development, SFU PHY has mature solutions

Symmetric 2.5G and symmetric 10G coexist

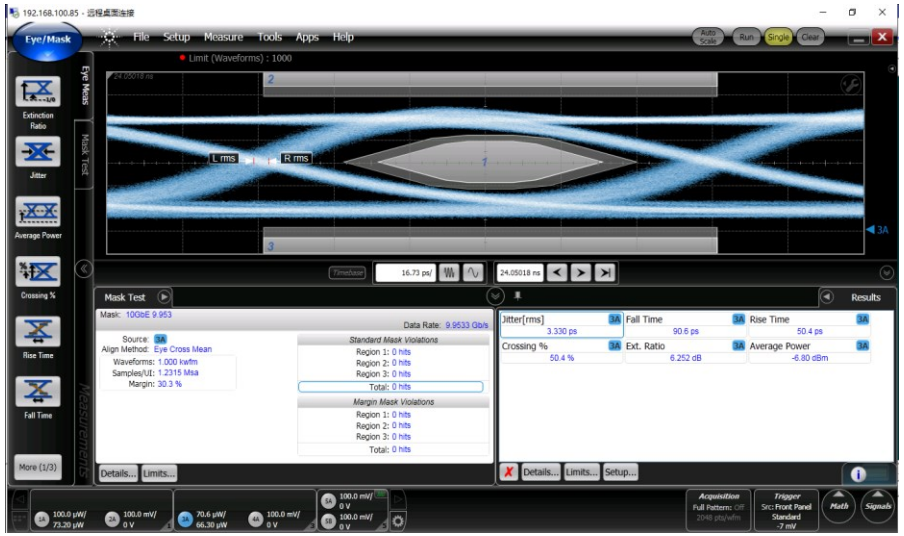


- For full compatibility and coexistence between the two generations, Combo downlink support is required at the MFU

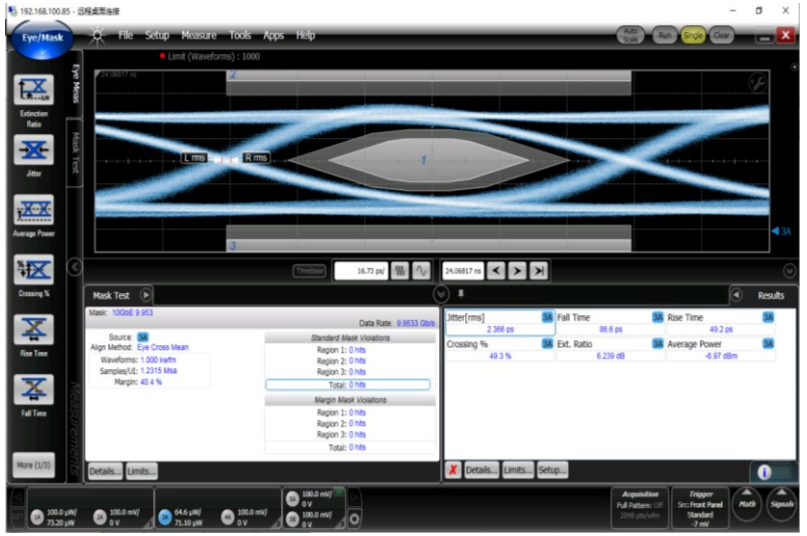
Technology Exploration: GPON Optical Chip → 10G



- 2.5G BOSA analog overclocking hardware changes: 1490/1310 2.5G TX unchanged, receive replaced with 10G ROSA
- 1490/1310 2.5G TX overclocked 10G feasible, MFU/SFU APD receiver supports 13~28dB
- Verification results:
  - DL TX 4dBm, triple-temperature sensitivity ~ -24dBm@1e-3, overload ~-8dBm
  - UL TX 2dBm, triple-temperature sensitivity ~ -30dBm@1e-3, overload ~-8dBm



1490nm 10G eye diagram, ER~6dB, margin 30%



1310nm 10G eye diagram, ER~6dB, margin 40%

Long time BER test

Example - optimization case for Direct selling Mall

Customer scenarios and needs

Scene description:

- Jade live selling, 1200 square meters, 40+ islands, 200+ stall stores
- need to build Wi-Fi to achieve regional roaming walk live, for sales of jade bracelets,
- live 18 hours a day, 60 anchors at peak, 400+ terminal access

Requirements

- High-speed Internet access for anchors + helpers + the public
- Good and fast Wi-Fi signal in the whole area, with seamless roaming
- > 400 concurrent users, without lagging
- Multi-SSID VLAN isolation, QoS guaranteed
- Stable and smooth during live broadcast; no long-time screen lag

Optimizations

- **Channel optimization:** staggered channels and tuning of co-channel to achieve inverted triangle placement
- **Interference control:** precise calculation of height and width according to the site layout, control of AP power and coverage, and reduction of inter-AP interference
- **Increasing density:** increasing from the initial 16 APs to 26 to achieve seamless coverage
- **Intelligent roaming:** targeted optimization for roaming jams of live cell phones such as iPhone to improve the accuracy of roaming timing
- **Multi-user scheduling algorithm:** Realize fairness scheduling by algorithm to achieve multi-user service guarantee under single AP

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Thanks!