

FTTR will benefit from the FTTH technology and mature industry chain

ZTE中兴

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FTTR market is explosive growing in china, CAGR is larger than 200%



it is Covered 80% china' s population

Operators	2021	2022	2023(Note)	23Q1	CAGR
CUC	0.124	1.39	3.30	1.77	199%
CTC	0.022	0.42	2.50	1.02	384%
CMCC	0.025	0.35	2.00	0.28	331%
Sum	0.171	2.16	7.80	3.07	257%

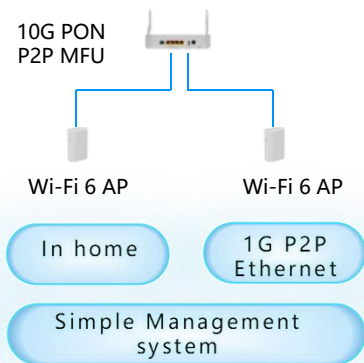
Unit: Million sets

Date info: <https://www.zhaobiao.cn>, etc.

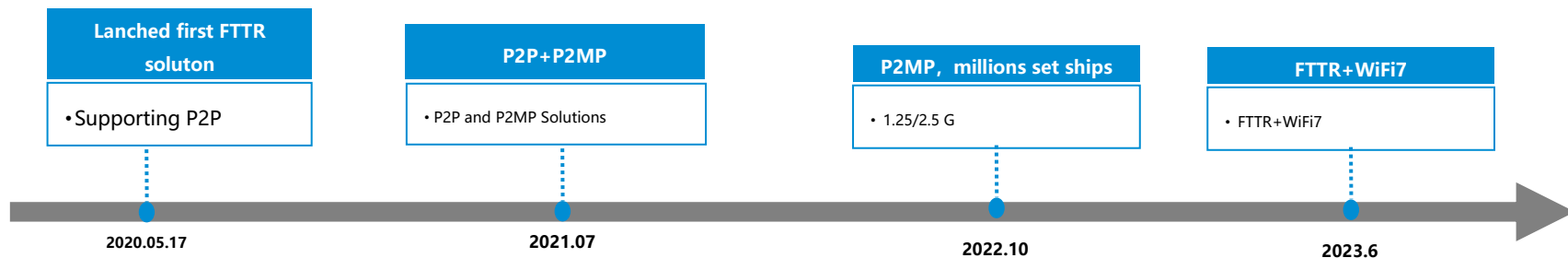
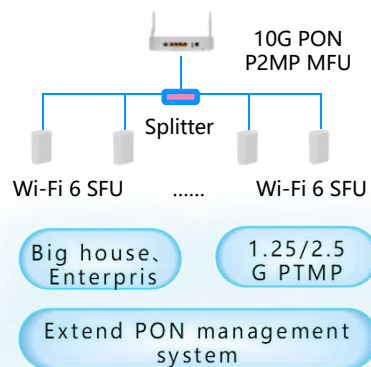
Note: data for 2023 is predicted.

The FTTR R&D progress of ZTE

P2P solution Based on Ethernet



P2MP solution based on PON



Main Gateway/MFU hardware blocks of P2P and P2MP

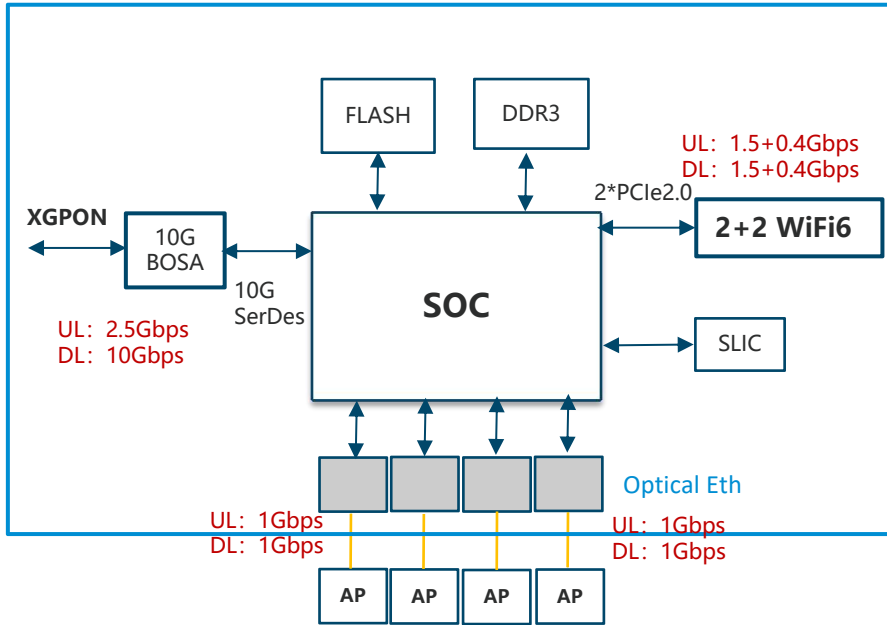


Fig1 P2P

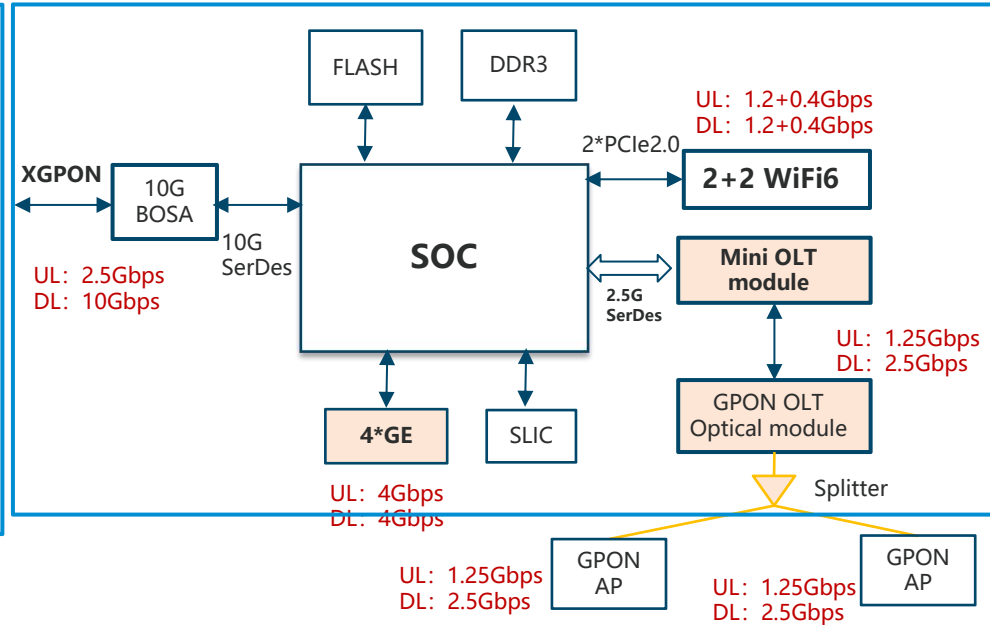


Fig2 P2MP

- P2P Gateway: 4*1G optical ETH module , P2MP MFU: Only one optical GPON optical module
- The cost of P2MP' s MFU is lower than cost of P2P in the case

Why P2MP?

ITEM		P2P	P2MP
cost	=4 SFUs	High	Midle
	> 4 SFUs	Higher	low
Security		No authentication	Authentication between MFU and SFU
Supply chain		Mature	Mature and deployed widely in operator' s network
Management		To be enhanced for carried class management	Mature
Magiration and coexistence		1G->10G Eth, Hard to auto-negotiation between 1G and 10G	2.5G->10G P2MP, coexistence scheme is supported according PON specification

■ P2MP benifit:

1. It is easy to extend for supporting more SFUs to fit the varied needs
2. Based on mature management of FTTH, easy to extend to support FTTR; it will guarantee the high performance and service experience of home network.

The benefit: FTTR networking technology reused FTTH industry

- FTTH Standard is matured
 - Mature industry chain
 - Widely deployed with clear migration path, 2.5G -> 10G -> 50G -> 200G...
- FTTR networking technology
 - Up to now, More than 10 Million FTTR users(Compatible with G.984.x standard)
 - Almost same topology\technology\management with FTTH, O&M will easily upgraded
- For further adaptation and simplification from FTTH to FTTR application
 - Shorter distance/Lower split ratio(Shorter quiet window\lower power budget etc)
 - Potential lower security requirement
 - etc.
- Finally, it is good for FTTR application that reused the FTTH technology and migration path
 - For MFU: Uplink interface(10G PON)+ Downlink(2.5G P2MP) -> Uplink interface(50G PON)+ Downlink(10G P2MP) -> Uplink interface(200G PON)+ Downlink(50G P2MP)
 - For SFU: Uplink interface(2.5G P2MP)+ WiFi6/WiFi7 -> Uplink interface(10G P2MP)+ WiFi7/WiFi8 -> Uplink interface(50G P2MP)+ WiFi8

FTTR Specification(G.FIN Serial) considerations

1. For optical module' s cost decreasing, it is suggest to use common optical module in Ra and Rb scenarios (for MFU or SFU) when define the parameters.
2. Coexistence methods should be defined for multiple line rate, for example 2.5G and 10G(wavelength division multiplex, time division multiplex)
3. The trend of services in cloud is clear, in this case, the asymmetric traffic are dominate, the asymmetric line rate(eg. 1.25/2.5G and 2.5/10G)should be taken into account, the cost will be more attractive compared with symmetric line rate.
4. Coordination among SDOs(ITU-T/ETSI/BBF/CCSA etc) will promote the FTTR application for better experience quickly.

Thanks!

5G 先锋

