ZYXEL
NETWORKS

ISP Fiber Access Solutions & In-Building Switches

Zyxel Networks is a technology provider founded in 1989. Since our inception, we have been providing solutions to telecoms operators and then Internet Service Providers. Our current lineup of products for service providers includes CPE, switching, and wireless solutions. The focus of this solution guide is network switch solutions and XGS-PON and GPON solutions for Internet Service Providers. As of 2024, the largest Zyxel ISP switch customer in North America has deployed over 12,000 Zyxel switches on their network over the last 15 years. They call it a "boring network because it keeps working 24/7."

This guide is organized around three main solutions:

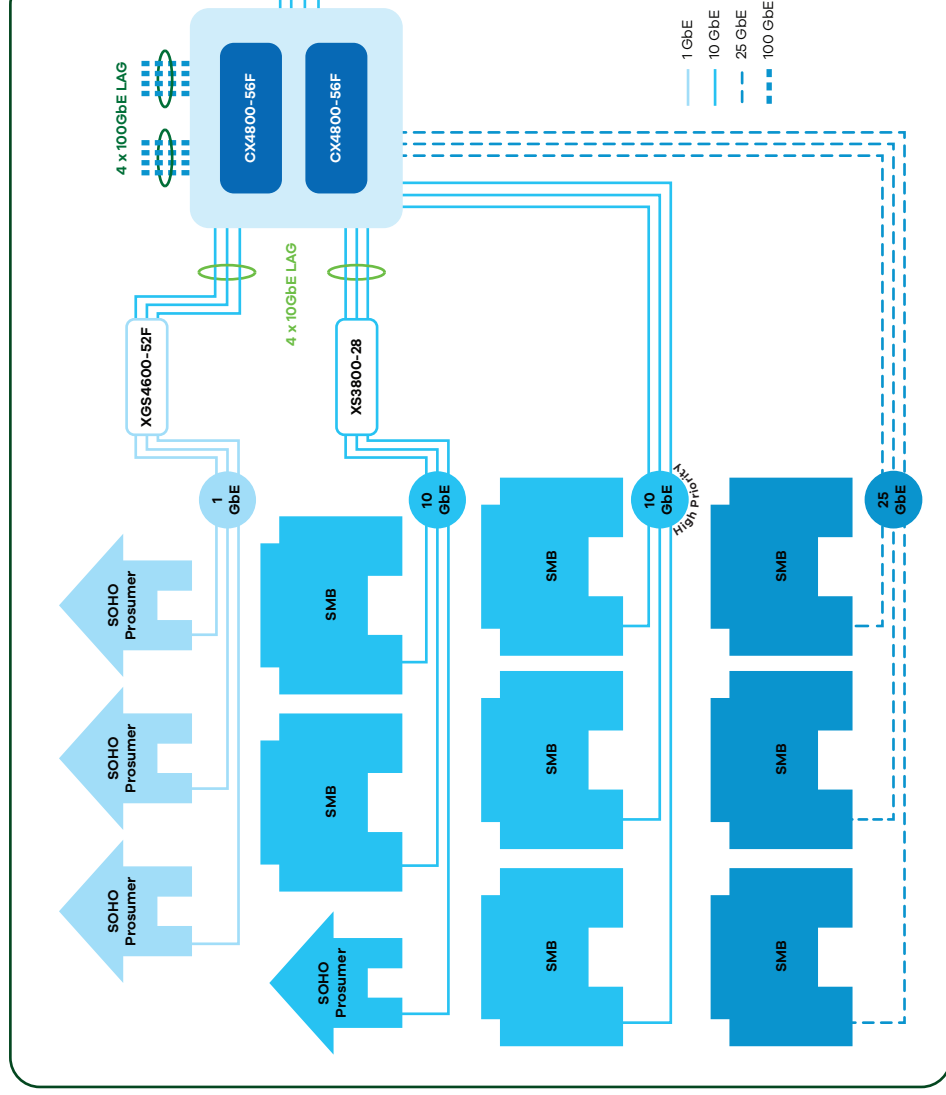1. Fiber Access Solutions
2. In-building Switches
3. Outdoor WiFi Solutions

With our North American headquarters and local technical support center located in Anaheim, California and our worldwide headquarters located in the heart of Taiwan's Hsinchu Science Park, Zyxel is well positioned to deliver leading technology solutions. We hope that you find this solution guide useful and that we may serve you in delivering fast and reliable internet access to your customers.
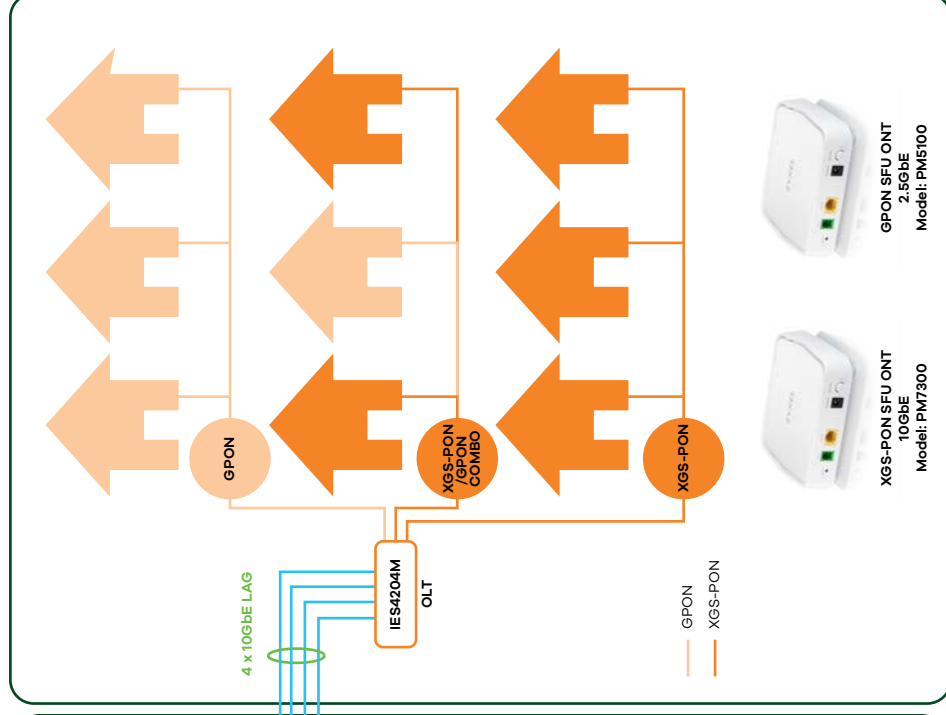
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FIBER ACCESS SOLUTIONS

Zyxel Networks offers a range of fiber access solutions with XGS-PON and GPON solutions and 25, 10, and 1 Gigabit/sec switches to deliver reliable high-performance last mile connectivity.

XGS-PON/GPON

GPON SFU ONT
2.5GbE
Model: PM5100

XGS-PON SFU ONT
10GbE
Model: PM7300

GPON

XGS-PON
/GPON
COMBO

XGS-PON

4 x 10GbE LAG

IES4204M
OLT

GPON
XGS-PON

ACTIVE FIBER

4 x 100GbE LAG

CX4800-56F

CX4800-56F

1 GbE
10 GbE
25 GbE
100 GbE

XGS4600-52F

XS3800-28

4 x 10GbE LAG

4 x 10GbE LAG

SOHO
Prosumer

SOHO
Prosumer

SOHO
Prosumer

SOHO
Prosumer

SMB

SMB

SMB

SMB

SMB

SMB

SMB

SMB

SMB

1 GbE

10 GbE

10 GbE

25 GbE

High Priority

XGS-PON AND GPON CHASSIS PLATFORM

Zyxel Networks' new XGS-PON and GPON modular chassis platform provides a high density of up to 32 XGS-PON ports and up to 8 SFP+ 10GbE uplink ports in a 2U formfactor with the capability of providing full redundancy with dual-power sources and two management cards with uplink aggregation.

XGSPON / GPON CHASSIS

XGS-PON 10 Gigabit Fiber Chassis OLT - IES4204M OLT

• High Density up to 32 XGS-PON Ports and 8 SFP+ 10 GbE Uplink Ports
• 2U Chassis
• 2 Line Card Slots
• Redundant Power Supply
• Redundant Management Cards

XGS-PON LINE CARD

XGS-PON Line Card - OLC3816-IA for Chassis IES4204M

• 16 Ports XGS-PON Symmetrical 10 Gigabit
• 1:256 Splitter Ratio for XGS-PON
• 1:128 Splitter Ratio for GPON
• For use with IES4204M Chassis

GPON LINE CARD

GPON Line Card – OLC3416B-IA for Chassis IES4204M

• 16 Ports GPON (2.5Gbps down/1.25Gbps Up)
• 1:128 Splitter Ratio for GPON
• For use with IES4204M Chassis

XGS-PON AND GPON CHASSIS PLATFORM

MANAGEMENT CARD & SFP+ UPLINKS

Management Card for Chassis IES4204M – MSC1240QA

- Adds Management Capability to OLT Chassis IES4204M
- 4 Integrated SFP+ 10GbE Uplink Ports
- Use Two for Redundancy
- 1 RJ11 Console port and 1 RJ45 Out of Band Management Port

Passive Fiber PON Transceivers

Model	Standards	Max. Downstream	Max. Upstream	Tx Power	Receive Sensitivity
POMC1SFP-H1	XGS-PON XG-PON	9.95 Gbps	9.95 Gbps	4-7 dBm	-28 dBm (XGS) -29.5 dBm (XG)
POMG5SFP-H1	GPON	2.48 Gbps	1.24 Gbps	3-7 dBm	-32 dBm

Active Fiber Switch Transceivers

Model	Speed	Connector	Wavelength	Max. Distance	DDMI
SFP10G-T	10-Gigabit SFP+	RJ-45	–	0.03 km (32.8 yd)	Yes
SFP10G-SR	10-Gigabit SFP+	Duplex LC	850 nm	0.3 km (328 yd)	Yes
SFP10G-LR	10-Gigabit SFP+	Duplex LC	1310 nm	10 km (10936 yd)	Yes
SFP-1000T	Gigabit	RJ-45	–	0.1 km (109 yd)	–
SFP-SX-D	Gigabit	Duplex LC	850 nm	0.55 km (601 yd)	Yes
SFP-LX-10-D	Gigabit	Duplex LC	1310 nm	10 km (10936 yd)	Yes
SFP-LHX1310-40-D	Gigabit	Duplex LC	1310 nm	40 km (43744 yd)	Yes
SFP-ZX-80-D	Gigabit	Duplex LC	1550 nm	80 km (87488 yd)	Yes
SFP-BX1310-10-D	Gigabit	Single LC	1310 nm (Tx); 1490 nm (Rx)	10 km (10936 yd)	Yes
SFP-BX1490-10-D	Gigabit	Single LC	1490 nm (Tx); 1310 nm (Rx)	10 km (10936 yd)	Yes

ACTIVE FIBER ACCESS SWITCHES

25-GIGABIT

Zyxel CX4800-56F Switch

- 48 x 25/10 Gigabit Ethernet SFP28 Ports
- 8 x 100 Gigabit Ethernet QSFP28 Uplink Ports
- Dual Redundant Hot Swappable Power Supplies
- Hot Swappable Cooling Fans

10-GIGABIT

Zyxel XS3800-28 Switch

- 6 x 10 Gigabit Ethernet SFP+ Fiber
- 8 x 10 Gigabit Ethernet Combo Ports – either Ethernet RJ45 or SFP+ Fiber
- 4 x 10 Gigabit Ethernet RJ45 Ports
- Dual Power Supplies

GIGABIT

Zyxel XGS4600-52F Switch

- 48 x Gigabit Ethernet SFP Fiber
- 4 x 10 Gigabit Ethernet SFP+ Fiber
- Dual Power Supplies

IN-BUILDING SWITCHES FOR LARGE BUILDINGS OR APARTMENT COMPLEXES

CORE SWITCH FOR LARGE BUILDINGS OR BUILDING COMPLEXES

Zyxel XS3800-28 Switch

- 6 x 10 Gigabit Ethernet SFP+ Fiber
- 8 x 10 Gigabit Ethernet Combo Ports – either Ethernet RJ45 or SFP+ Fiber
- 4 x 10 Gigabit Ethernet RJ45 Ports
- Dual Power Supplies

Zyxel XS1930-12F + L3 Perpetual License

- 10 x 10 Gigabit Ethernet SFP+ Ports
- 2 x 10 Gigabit Ethernet RJ45 Ports
- Optional L3 Perpetual License

10 GIGABIT / MULTI GIGABIT SERVICE SWITCHES / FUTUREPROOFING TO 10G

Zyxel XS1930-10 + L3 Perpetual License

- 2 x 10 Gigabit Ethernet SFP+ Uplink Ports
- 8 x 10 Gigabit Ethernet RJ45 Ports to Individual Apartments
- Optional L3 Perpetual License

IN-BUILDING SWITCHES FOR LARGE BUILDINGS OR APARTMENT COMPLEXES

2.5 GIGABIT SERVICE SWITCHES

Zyxel XMG1930-30 + L3 Perpetual License

- 2 x 10 Gigabit Ethernet SFP+ Uplink Ports
- 4 x 10 Gigabit Ethernet RJ45 Ports to Individual Apartments
- 24 x 2.5 Gigabit Ethernet RJ45 Ports to Individual Apartments
- Optional L3 Perpetual License

GIGABIT SERVICE SWITCHES

Zyxel XGS2220-30 Switch

- 4 x 10 Gigabit Ethernet SFP+ Uplink Ports
- 2 x 10 Gigabit Ethernet RJ45 Ports
- 24 Gigabit Ethernet RJ 45 Ports to Individual Apartments

Zyxel XGS2220-54 Switch

- 4 x 10 Gigabit Ethernet SFP+ Uplink Ports
- 2 x 10 Gigabit Ethernet RJ45 Ports
- 48 Gigabit Ethernet RJ 45 Ports to Individual Apartments

IN-HOME SWITCHES

Zyxel XS1930-10 Switch + L3 Perpetual License

- 2 x 10 Gigabit Ethernet SFP+ Fiber Uplink Ports
- 8 x 10 Gigabit Ethernet RJ45 Ports
- Optional L3 Perpetual License

GIGABIT

Zyxel GS2220-10 Switch

- 2 x Gigabit Ethernet Combo Ports – either Ethernet RJ45 or SFP Fiber
- 8 x Gigabit Ethernet RJ45 Ports

OUTDOOR METRO WIFI SOLUTION

Zyxel WAX655E Outdoor Access Point + ANT2105 External Antenna

- 802.11AX
- Spatial Streams: 4x4 + 2x2
- 2.5 Gigabit Ethernet
- 802.3at PoE Powered (25.5W)

Zyxel XMG1915-10EP Switch

- 2 x 10 Gigabit Ethernet SFP+ (one connected back to the Central Office)
- 8 x 2.5 Gigabit Ethernet RJ45 (one connected to and powering the AP)
- Power over Ethernet 802.3bt (up to 60W per port)
- Total Power Over Ethernet Capacity: 130W

Zyxel XMG-105HP – Alternative Lower Cost Unmanaged Switch

- 1 x 10 Gigabit Ethernet SFP+ (connected back to the Central Office)
- 5 x 2.5 Gigabit Ethernet RJ45 (one connected to and powering the AP)
- Power over Ethernet 802.3bt (up to 60W per port)
- Total Power Over Ethernet Capacity: 70W
- Unmanaged

US Internet

Zyxel Fiber Access Switches used to Establish Minneapolis as First Fully Fiber NFL City

Customer at a glance

Customer Name
US Internet

Industry
Internet Serivce

Country
USA

Customer Background

US Internet is a Minnesota company offering innovative, in-demand solutions including fast and reliable internet, networking, IT services, hosting and more since 1995. USI has provided wireless internet service to the city of Minneapolis since 2008, making it one of the first large cities to go wireless.

Zyxel and their people allow us to deploy a platform that I like to call boring. The network just runs 24/7, 365 days a year. People use the internet and they never really even think about it at all because it's just running.

Travis Carter, CEO
US Internet

Challenge

Travis Carter, CEO of US Internet, describes the challenge as follows: "It is our 14th season of building a fiber network in the city of Minneapolis with the ultimate mission of being the first NFL City, 100% covered by fiber." Since USI's first season of fiber back in 2009, they have been using Zyxel switches. High reliability, consistency of the command line interface and cost effectiveness are key requirements for scalability. Additionally, USI also runs a municipal WiFi network in Minneapolis.

Solutions

USI has standardized on two switches for the access layer of the network: model XS3800-28 for 10 Gigabit fiber, which is also used for multi-Gigabit customers, and XS4600-52F for Gigabit customers.

Distribution of internet services within MDUs, apartment complexes, and homes is achieved with a range of 10 Gigabit, 2.5 Gigabit, and Gigabit switches that have fiber uplinks back to the access layer and then use copper Ethernet to provide final connectivity to individual apartments and rooms. 10 Gigabit/ multi-Gigabit: XS1930-10. 2.5 Gigabit: XMG1930-30. Gigabit: XGS2220-30, XGS2220-54, GS2220-10.

The municipal Wi-Fi network runs on Zyxel outdoor access points with IP67 weatherproofing and the ability to operate reliably in extreme temperatures. More than 2,500 outdoor Zyxel access points are managed using Zyxel Nebula cloud-based management platform.

Results

Mr. Carter describes Zyxel equipment as "a platform that I like to call boring. And what I mean by that is it just runs 24/7 by 7, 365, people use the internet, and they never really even think about it, because it's just running." More than 12,000 Zyxel switches and 2,500 Zyxel Wi-Fi access points are used by USI to provide high performance, reliable, and cost-effective internet access.

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