Meeting Subscribers Wireless Demands

Broadband Communities

ZYXEL
Agenda

• Whole Home Wireless & MESH
• Benefits of Wi-Fi 6 & 6E
• Multi-Gig Solutions
• Remote and Cloud Management Solutions
• Q&A Session
A survey by Stanford found that only 65% of Americans had internet fast enough to handle video calls. With 42% of Americans working from home and 26% working at their employer’s physical location.
Wi-Fi is the Internet
It needs to be Fast
Wi-Fi is Not an Exact Science

There can be many factors associated with Wi-Fi.

Setting the right expectations on what the subscriber could experience with Wi-Fi in their home is key.

Wi-Fi networks have a range that's limited by the transmission power, antenna type, the location they're used in, and the environment.
Wi-Fi Then and Now

The modern day connected home has evolved in the last 20 years

15 years ago, most subscribers had about 2 to 3 Wi-Fi enable devices in the home

Nowadays, we can see triple the amount of Wi-Fi enabled connected devices in our homes
Challenges with Coverage

- 100%
- 50%
- 25%
What is Mesh

Adopted out of the consumer retail market
Wi-Fi Router or Just an Extender?
What a Wi-Fi Router Offers

Wi-Fi Router

It’s connection to the Internet

Shares the Internet with all your connected devices

Connects directly to Cable, DSL, Fiber or Satellite services

Includes protection with built-in firewall

Wi-Fi Access Point built-in to the Router

Most current Wi-Fi Router have two wireless bands 5GHz and 2.4GHz

Works with most current Wi-Fi devices – 11N and 11AC, as well as 11AX

Wi-Fi Protected Setup with a push of a button
What a Wi-Fi Extender Delivers

Wi-Fi Extenders

Bridge the gap between the wired and Wi-Fi world

Extends the coverage and distance, helps with “Dead Spots”

Current Extender have two wireless bands 5GHz and 2.4GHz

Connect with a Wi-Fi Router with or without Wi-Fi

Does not share the Internet connection, the Extender needs a Router

Extenders do not have any firewall security protection
Wi-Fi Mesh uses a controller to manage the network, which consists of the controller plus additional APs, called agents.

- Increased network capacity
- Wi-Fi 6 Flexible design
- Easy Setup - Wi-Fi Mesh
- Network intelligence
- Service prioritization
- Scalability
Managed Wi-Fi with Mesh

One Single Network for All Your Devices

Mesh Wi-Fi System

From room to room, 100% seamless connection:
What is Wi-Fi 6?

Wi-Fi 6, also known as IEEE 802.11ax, is the newest Wi-Fi specification standard, coming after Wi-Fi 5 (IEEE 802.11ac).

It promises greater speeds and better connectivity, as well as increased support for multiple, high-bandwidth devices.
What Wi-Fi 6 Delivers

- **Increased Wi-Fi Bandwidth**
  - 4 x times faster speed

- **Connected device capacity**
  - 4 x the amount of connected devices

- **Lower latency for time sensitivity applications**
  - Airtime techniques to improve the Wi-Fi 6 performance

- **Improved battery life for mobile connected devices**
  - Target Wakeup Time to ensure best use of mobile transmission times
Faster Wi-Fi, the Better

Wi-Fi 6 is reportedly up to 30% to 40% faster than Wi-Fi 5.

The maximum wireless data transfer rate is derived from IEEE Standard 802.11 specifications. Actual data transfer rate will vary from network environment including: distance, network traffic, building site materials/construction, interference from other wireless devices, and other adverse conditions.

Maximum speed is around four times faster than current speeds of Wi-Fi 5 standard.
More Connected Devices with Wi-Fi 6

Wi-Fi 6 improves over crowded Wi-Fi with an additional technologies with more radios and antennas to improve the overall Wi-Fi experience.
Connecting the New and the Legacy Wi-Fi

Wi-Fi 6 Routers are designed to handle existing Wi-Fi 4/5 Client devices at the same time as Wi-Fi 6 Client devices
Aggregation of the Wi-Fi Clients

Wi-Fi 6 improves over crowding in Wi-Fi home network by utilizing all connected clients push communication like a giant hive.
Wi-Fi is a constant communication that constantly drawing power from the battery.

Target Wakeup Time in Wi-Fi 6 communicates when to wake up a client device, reduced contention between the client device and Wi-Fi 6 Router.

Wi-Fi Eating Up Battery Life
Wi-Fi 6E, also known as Wi-Fi 6 Extended Wi-Fi, is the newest Wi-Fi specification standard, building off of Wi-Fi 6.

It expands into the 6GHz spectrum to help eliminate congestion and offer more channels to maximize throughput.
### What’s the difference?

<table>
<thead>
<tr>
<th>WiFi 6</th>
<th>WiFi 6E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two 160 MHz channels</td>
<td>Seven additional 160 MHz channels</td>
</tr>
<tr>
<td>24 available channels</td>
<td>Hundreds of available channels</td>
</tr>
<tr>
<td>Data Bands: 2.4 GHz, 5 GHz</td>
<td>Data Bands: 2.4 GHz, 5 GHz, 6 GHz</td>
</tr>
<tr>
<td>Number of 160-MHz-wide channels available: 1 in 5 GHz band</td>
<td>Number of 160-MHz-wide channels available: 8 (1 in 5 GHz, 7 in 6 GHz bands)</td>
</tr>
<tr>
<td>WiFi 6 is backward-compatible with earlier WiFi standards</td>
<td>WiFi 6E is not backward-compatible with earlier WiFi standards</td>
</tr>
<tr>
<td>Compatible with WiFi 5 and older WiFi devices</td>
<td>WiFi 6E's support only WiFi 6E devices</td>
</tr>
</tbody>
</table>
Why Just Stop at 1Gigabit Broadband?

PON technologies like XGS-PON are built upon existing GPON technology.

When planning for your next Greenfield or looking to upgrade an existing brownfield fiber network 10G XGS-PON can co-exist on the same Fiber Optics.

The 10G investment cost has been coming down over the recent years making it ideal for selecting electronics that have support for higher bandwidths.

10G Broadband allows for Service Providers to offer a variety of different service tier package with 2 Gigabit, 5 Gigabit, and 10 Gigabit Internet access.

Meet today’s high demanding Broadband needs with technologies that deliver upon faster speed and overall performance.
Why Multi-Gig Broadband?

- Increase demand for higher bandwidths
- Improved capacity for more connected devices
- Expanding your service tier offering with 2 and 10G

Residential and Multi-Dwelling applications:
- Great for media streaming and online gaming

Ideal for pairing with the latest Wi-Fi solutions
Why 2 Gbps Gateway?

Why we need a 2 Gbps Gateway:

- Auto sensing bandwidth up to 2.5 Gigabit Broadband speeds
- Pairs well with Wi-Fi 6 for faster speeds and improved coverage around the home network
- Ability for offer tiered service offering packages with more performance
- Share high-speed 2 Gig Broadband with all the in-home connected devices
2 Gigabit WAN for Multi-Services

- Fiber To The Home
- Active Ethernet
- Cable Broadband
2.5 Gbps Broadband Advantage

2 Gigabit Ethernet Routers offers a variety of Internet access options to expand your Broadband services.

Up to 2.5 Gig Internet WAN

WAN (1Gig)
Multi-Gigabit Multi-Performance Infrastructure

28-port 10GbE L2+ Managed Switch

- IEEE 802.3z 1000BASE-X*
- IEEE 802.3ab 1000BASE-T Ethernet*
- IEEE 802.3an 10G BASE-T Ethernet*
- IEEE 802.3ae 10 Gbit/s Ethernet over fiber*
- IEEE 802.3bz 2.5G/5GBase-T Ethernet*

Multi-Gigabit RJ-45 ports support:
- 50Mbps
- 100Mbps
- 200Mbps
- 500Mbps
- 1Gbps
- 2.5Gbps
Easy to Deploy and Upgrade

2.5 Gbps
Where Is My 2 Gigs I’m Paying For?
Current Hardware Architecture

- Wireline Connection 2 Gbps
- WLAN Connection from 150 ~ 1500Mbps
- Wired LAN Connection 1 Gbps
What’s in store for the Future with 2.5 Gbps

2 Gig Internet WAN and 2 Gig LAN
Going Beyond 1 Gig
What is XGS-PON?

XGS-PON is next-generation standard and enables Service Providers to deliver 10 Gbps symmetrical speeds.
Why XGS-PON?

10Gbps - 10 x 1Gbps

Symmetric bandwidth downstream and upstream

Great technology for FTTB applications

Can be deployed to other PON technologies

Property owners can update their buildings with fast reliable fiber
10G Bandwidth Down and Up

Symmetric Bandwidth in both directions

XGS-PON
Lower Latency

Lower latency is better because latency is essentially a delay between when you take an action and when you see the result—high latency is when it takes longer to see the results. The less delay, the better.

XGS-PON offers great lower latency with time sensitive applications.
10G builds upon today’s highly Scalable Networks

The same Fiber optics that have been used for 1G GPON can be used to deliver 10G XGS-PON
XGS-PON and GPON over the Same Network

XGS-PON can work over your exiting Fiber GPON Network

GPON and XGS-PON make it ideal for offering a Fiber network with no interference from each other of the different Wavelengths uses
Bandwidth and Service Tiers

XGS-PON to serving 2 Gbps, 5 Gbps or 10 Gbps subscribers
Integration of 10-Gig and Wi-Fi 6
10G and Wi-Fi 6 Benefits

10G Symmetrical Broadband Access

10G Single Family Unit

10G access for Multi-Dwelling Unit

Improved Broadband access in Small Office Home Office

Wi-Fi 6 provides up to 10G access

Fast Wi-Fi access beyond 1G speed in the home

Wi-Fi 6 leverages the 10G Broadband access can benefit the entire Apartment

Small businesses can take advantage of the High-Speed access with faster Wi-Fi
Single Port XGS-PON ONT
Single – Port XGS-PON ONT

Provider’s Optical Distribution Network (XGS-PON)

Subscriber’s Home Network (Ethernet Multi-Gig WAN Port)

Wi-Fi 6
XGS-PON ONT SFP Transceiver

- 10G Deployment Applications
- Flexible Installations Options
- SFP+ form-factor design
- XGS-PON symmetric bandwidth
- Fully manageable with OMCI G.988

SC/APC Connector

Bridge Mode

Multi-Source Agreement (M SA)

OMCI G.988
XGS-PON SFP Transceiver: Transforming your Solutions

Any of these solutions can be converted into a functioning XGS-PON ONT

- Fiber Media Convertor
- Ethernet Router/Gateways with SFP Cage interface
- Any Web or Layer 2 Managed Switch with SFP uplink Interface
Bridging the Gap Between Technologies

- SFP+ ONT Transceiver
- Media Converter
- 2.5G Internet Home Wi-Fi Router
Apartment 10G Broadband Access

Prosperity Owners can offer 10G Broadband

- In-apartment Single-Port or Integrated XGS-PON ONT
- Shared connectivity with multiple occupants
- Prosperity Owners can offer 10G Broadband
- Works great for over-the-top media streaming
- Optional voice services over a digital network
Multi-Dwell Multi-Port Application – ONT SFP+
10G Small Business Broadband Enhancements

10G Office
Symmetric Bandwidth
Latency
Cloud Services
Single and Multi-Dwelling Family Application

- Single Family
- Apartment MDU

- Broadband
- Home Automation
- Security
- Entertainment
- eLearning
- Remote Working

- 2.5 Gbps
- XGS-PON
Easy Deployment with Multi-Gig Gateway

Bridge Mode

Two Box XGS-PON ONT Bridge Solution

Subscribers
Will Any Old Router Do?

Home Wi-Fi Routers do have a lot of features built-in to enhance your online experience. However, enabling these features is a manual process which does require a level on knowledge to enable.

Basic Wi-Fi Router lacks the intelligence to fully manage the connected Wi-Fi clients.

No End-User App to provide a connection between the Wi-Fi Router and the user.
## Remote Capabilities

<table>
<thead>
<tr>
<th>Service</th>
<th>LAN/WLAN</th>
<th>WAN</th>
<th>Trust Domain</th>
<th>Port</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTTP</td>
<td>Enable</td>
<td></td>
<td>Enable</td>
<td>80</td>
</tr>
<tr>
<td>HTTPS</td>
<td>Enable</td>
<td></td>
<td>Enable</td>
<td>443</td>
</tr>
<tr>
<td>FTP</td>
<td>Enable</td>
<td></td>
<td>Enable</td>
<td>21</td>
</tr>
<tr>
<td>TELNET</td>
<td>Enable</td>
<td></td>
<td>Enable</td>
<td>23</td>
</tr>
<tr>
<td>SSH</td>
<td>Enable</td>
<td></td>
<td>Enable</td>
<td>22</td>
</tr>
<tr>
<td>SNMP</td>
<td>Enable</td>
<td></td>
<td>Enable</td>
<td>161</td>
</tr>
<tr>
<td>PING</td>
<td>Enable</td>
<td>Enable</td>
<td>Enable</td>
<td></td>
</tr>
</tbody>
</table>

Almost all Routers have some sort of Remote Management features.

Only Communications Service Providers Routers or Carrier Grade offer remote management with TR-069 options.
Cloud Connect? Not Really

Router with integrated Wi-Fi
Can connect to the Internet but, not so easy to remote manage by the Provider.
Wi-Fi and Managing your Subscribers
Wi-Fi Routine Maintenance

Manage and Maintain the Subscriber’s Home

Monitor the connected Wi-Fi Client devices

Update the Wi-Fi Password

Add guest Wi-Fi networks

Add a new device

Instant Troubleshooting

Wi-Fi Parental Controls
Remote Management with Wi-Fi

- Instant Customer Care
- Routine Maintenance
- Saving Cost

- Login: Username
  Password: ********
- Update

- Speed
- Efficiency
- Quality
- Costs
Zero-Touch Configuration

No need for anyone to access the Gateway

Configurations and troubleshooting can be performed remotely over the Service Provider’s network

HTTPS://ISP.Com/AC

TR-069

FW
TR-369 or USP (User Services Platform) is a standardized protocol for managing, monitoring, upgrading, and controlling connected devices.
Locally Hosted ACS Challenge

Investment into TR-069

Remote Management Considerations

CUSTOMER PORTAL

Vertical Scaling
ACS in the Cloud

TR-069

Lumen® Cloud Application Manager

- Monitoring
- Consulting
- Patching
- Advanced Managed Services
- Managed Provider Support
- Optimization & Analytics
- Application Lifecycle Management
- Physical Servers

Technical Account Manager
Cloud Hosted Remote Management

Managed Mesh Wi-Fi has opened the door for Service Provider to service offer their Subscribers a premium Broadband experience

Similar to TR-069’s process, the cloud managed mesh solution does allow for the remote management system to be hosted in the cloud and saving the Provider’s resources
What Cloud Managed Wi-Fi Delivers

- Enables new services to be deployed quickly
- Reporting on vital statistics from the Subscriber’s network
- Works with multiple vendors and on multiple levels for open interoperations
- Scalable and ready for new services that often require only Cloud Management
Overall Home Network View
Detailed Client Devices Stats
Home Network Health Check

Network Status and Performance

- SSID: KumarFamily
- Gateway: Plume Offline
- Extender: Plume Offline
- Devices: Z941401X
- Gateway: Plume SuperFest
- Alphabet: Kumar

Overall score: 87

Network Connection

- Internet Connection: Online
- WiFi Network: Online
- Signal Strength: Good
Network Usage Analytic Data

Risk Activity

Risk Map

United States

Malware
Anomaly
Proxy avoidance & anonymizers
Spam, spyware and adware
Phishing & other frauds
Botnets
Customer Facing Portal

Mobile app allows the Subscriber to be involved in the support process.
Sponsored by Zyxel Communications and Walker

Zyxel Communications delivers technological innovations and has connected the world to the internet for more than 30 years. At Zyxel, we offer a comprehensive and flexible portfolio of products that’s right for worldwide leading service providers and their subscribers. Backed by local logistic and engineering support, Zyxel delivers an unrivaled broadband experience.

Walker is the nation’s premier value-added distributor of network products for broadband providers including wireline, wireless, CATV, government and enterprise network operators. Walker’s reach strengthened in July 2021, when it was acquired by USTC Corp, the leading one-stop shop for all materials, distribution, and supply chain management solutions for telecommunications, HFC, FTTH, FTTx, wireless, and data center technologies. Additionally, USTC has also acquired Comstar Supply and Multicom, and together the combined companies are redefining what a telecommunications materials distributor and value-added services provider can do for customers. The combined companies have 13 logistics and distribution locations across the U.S, with a comprehensive portfolio of 55,000+ state-of-the-art products from nearly 1,000 industry leading manufacturers.
Questions and Answers
Meeting Subscribers Wireless Demands

Thank you!

Interested in learning more? Contact us

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