

Gigabit home Wi-Fi coverage is on the horizon

With Gigabit Wi-Fi bundled into new FTTH services, broadband operators know how important Wi-Fi quality is for revenues.



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Home Wi-Fi: A cash cow

In 2014, global shipments of Wi-Fi-enabled devices hit 5.5 billion units, with 70 percent penetration expected by the end of 2017.

However, Wi-Fi speed is the issue that affects user experience, and is also the problem that hit the Google Fiber Gigabit broadband project. As the access and control point for home broadband, optical modems can increase user and service stickiness, reducing churn and boosting ARPU. This is vital as more carriers integrate Wi-Fi into FTTH services and create new business models for smart home services, including 4K video, video surveillance, smart controls, and home network management – all these services depend on Wi-Fi-capable smart optical



modems. China Telecom and China Unicom are two providers that offer smart home services through such devices.

Below are some examples of new Wi-Fi business models that are driving operator growth.

Wi-Fi boosts IPTV

When it rolled out its IPTV service, China Telecom Shaanxi (CTS) was able to offer the service to 98 percent of its subscribers thanks to 100 percent broadband Wi-Fi penetration – a feat that would have been impossible with wired connections. CTS has been pushing a home broadband package with bundled Wi-Fi since 2012, in part because the yearly growth of IPTV service users averages 14 percent.

China Telecom Sichuan quickly rolled out a 4K IPTV service, quickly attracting 1 million users after aggressively promoting a 100 Mbps FTTH package with bundled Wi-Fi. China Unicom Tianjin also quickly increased user numbers with a bundled Wi-Fi package, including its WO TV Home service, which features multi-screen and multi-media sharing services.

Wi-Fi boosts ARPU

Scenarios where multiple users concurrently access broadband in communal accommodation like university dorms require Wi-Fi's flexibility, and solutions such as Portal authentication that allow operators to bill users individually. This can push the total broadband package ARPU in communal halls to three to five times that of home package customers.

Wi-Fi boosts sales

The increasing adoption of home Wi-Fi drives the sale of wireless routers, Wi-Fi repeaters, Power Line Communication (PLC)

adapters, and set-top boxes. Wi-Fi's also good for pushing online payments, indoor networking, telephone relocation, and home wireless network commissioning, with operators able to sell service packages for optimizing home Wi-Fi that include these elements. The Hong Kong operator PCCW markets one such package under its Smart Living brand for HK\$8,800.

Say hi to Gigabit Wi-Fi

Infonetics reveals that 40 percent of service providers plan to offer 1 Gbps broadband in 2017, up from 15 percent in 2015. Leading operators already provide high-speed FTTH Wi-Fi services; for example, the US firm Comcast Xfinity launched a FTTH service with Wi-Fi speeds of up to 725 Mbps, and its biggest competitor, Verizon Fios, has introduced America's fastest home Wi-Fi package with speeds as high as 800 Mbps. In the UK, Virgin Media, BT, and Sky have all launched Wi-Fi services that claim to be the UK's fastest. A number of Japanese operators are providing Gigabit Ethernet to their users, with So-net even offering a 2 Gigabit package.

Gigabit broadband rates enable ultra-high-speed services such as HD movie downloads, interactive HD VR games, and multi-angle 4K live sport broadcasts. China Telecom Shanghai trialed the world's first Gigabit FTTH broadband on May 17, 2015, with services including three-way 4K TV, one-way HD IPTV, three-way video conferencing, Global Eye five-way HD home video surveillance, and smart home services. The service offers download speeds of 700 Mbps for multiple applications in concurrent use.

With the rise of 4K and 8K video streaming, VR video, massively multiplayer online gaming, video calls, home video surveillance, and home automation gain traction, FTTH services with

bundled Gigabit Wi-Fi will mean new revenue for high-end operators.

Gigabit Wi-Fi optical modems

Today, bandwidth speeds on optical modems are too slow. Most use a 2x2 MIMO Wi-Fi interface based on the 802.11n standard. This supports maximum air interface speeds of 300 Mbps and actual Ethernet throughput of approximately 140 Mbps.

3X3 MIMO Wi-Fi products based on 802.11n can attain air interface speeds of 450 Mbps, but are too expensive to adopt widely. The successor of the 802.11n standard – 802.11ac – works in the 5 GHz band and supports up to 8X8 MIMO, providing theoretical air interface rates up to 6.9 Gbps. The 5 GHz and 2.4 GHz dual frequency bands that 802.11ac devices work on have advantages such as more optional channels, greater anti-interference, higher speeds, and less delay than the 802.11n 2.4 GHz band. They can also offer better HD video and other high-speed wireless services.

Most 802.11ac optical modem products provide 2.4 GHz 2X2 MIMO and 5 GHz 2X2 MIMO or 2.4 GHz 3X3 MIMO and 5 GHz 3X3 MIMO dual-band air interfaces, with air interface speeds of between 1,166 Mbps and 1,750 Mbps. The industry chain for these products is mature, and equipment manufacturers have begun supplying carriers in bulk. Huawei's Gigabit Wi-Fi-ready 802.11ac optical modems

Smart Optical Network Terminals (ONT) are now used in more homes and businesses. With Huawei's smart ONTs, high-speed Gigabit Wi-Fi is truly a user-oriented service.

feature a dual-core dedicated chip, with one core exclusively handling Wi-Fi flow. The Wi-Fi Ethernet throughput here is close to 1 Gbps.

The 802.11ac standard will bring beamforming antenna technology into commercial application for the first time. Beamforming enables directivity and gain enhancement on Wi-Fi signals through accurate sensor array calculations, boosting Wi-Fi transmission speeds by at least 60 percent in specific locations and over specific distances.

Automatic channel adjustment is a new function of Huawei's optical modem that automatically calculates interference on all channels, and connects with the user's device on the channel with least interference, which boosts Wi-Fi speeds.

Huawei's Giga Wi-Fi Anywhere is a complete indoor distributed Wi-Fi solution equipped with PLC and Wi-Fi repeaters. The PLC repeaters are designed based on the ITU-T's G.hn standard, and achieve up to 1 Gbps Ethernet relay capability through power lines. The solution also enables seamless roaming for the user device between the optical modem and Wi-Fi repeaters by automatically configuring Universal Plug and Play (UPnP) on

the PLC and Wi-Fi repeaters, giving users an unprecedented Gigabit Wi-Fi experience.

Smart Optical Network Terminals (ONT) are now used in more homes and businesses. With Huawei's smart ONTs, high-speed Gigabit Wi-Fi is truly a user-oriented service. The devices can be managed via a mobile app, giving users full control of their Wi-Fi service. The app includes the following powerful features:

Simple and flexible service provision: quickly provisions Wi-Fi services using XML profiles without changing the OSS side.

Proactive experience management: enables operators to remotely detect home Wi-Fi strength in all directions from the ONT, and push the results to subscribers' mobile phones. Operators can also push Huawei's Wi-Fi solution for enhanced coverage to subscribers.

Health mode: sets timers on the ONT to provide Wi-Fi at certain times only, which reduces exposure to Wi-Fi signals and cuts emissions.

Guest network management: sets up Wi-Fi networks for guest users with specific passwords and time limits for added security on home wireless networks. **H**