



Deploying multi-gigabit wireless in underserved, economically disadvantaged communities

ABQgig is a pioneering community broadband working group consisting of tech industry, academic institutions, research labs, local governments, businesses, start-ups and residents working together to improve the deployment of high-speed broadband infrastructure and service. Their recent participation in Mozilla's WINS challenge, which aims to discover innovative and cost-effective solutions to connect the unconnected in the U.S., was recognized and awarded with a prize that will be used to fuel future expansion.

Challenges

The Barelás neighborhood was formally established in 1662, making it one of the oldest in New Mexico. Today it is a dense neighborhood with about 3700 residents. It has historically been one of poorest neighborhoods in the city, with nearly half of its residents having incomes below the poverty line. This large neighborhood is lacking the reliable and fast internet connectivity that fuels growth and development for students, businesses and residents. Deploying fiber to the home is a too expensive and time-consuming process, which is why the latest wireless technologies were sought to solve this problem using the 60GHz mmwave frequency.



Solution

Understanding this challenging task, ABQgig selected IgniteNet's MetroLinq 60GHz mmwave platform in order to provide backhaul, last-mile, as well as Wi-Fi access connectivity for the Barelás community. IgniteNet is the company that first disrupted the fixed wireless market with its innovative products in the 60GHz band with a focus on performance and affordability, which was not possible before. MetroLinq radios can be deployed in point-to-point (PTP) and point-to-multipoint (PTMP) fixed wireless scenarios to deliver multi-gigabit fixed wireless connections. Dual and triple radio options allow network operators to build universal wireless networks with secure failover mechanisms all in a compact package. 14 GHz of open frequency spectrum within the 60GHz band in the USA make it ideal for building future proof networks with a connectivity range of up to 1.5km (1mi) in a PTP scenario and a coverage radius of up to 0.7km (.43mi) in a PTMP scenario with today's technology. Also, the 60GHz frequency is well absorbed by oxygen which ensures security of the connections since it does not travel far beyond the receiving point while at the same time allowing extreme frequency reuse to provide connectivity in dense urban environments. Multiple model options offered by IgniteNet ensure flexibility when deploying multi-gigabit networks in terms of distance, capacity and cost and such a broad selection of devices is not available anywhere else in the market.

Network rollout

A group of volunteers teamed up to prove that multi-gigabit connectivity can be delivered to the underserved Barelás community quickly and cost-effectively using IgniteNet's 60 GHz MetroLinq product. bigbyte.cc datacenter provided a dedicated synchronous 1Gbps fiber line to demonstrate the prototype of the network. The Sidetrack Brewing Company provided the tower space required to mount one of the MetroLinq 2.5G PTP radios, used to feed 2.5Gbps of capacity to end users connected on the 60GHz, 5GHz, and 2.4GHz bands of a MetroLinq 10G Omni.

All of the climbing labor was donated by Broken Arrow Communications and used to mount the radios on the rooftops and towers. A representative from IgniteNet was present to help design the network and ensure smooth setup of the network.

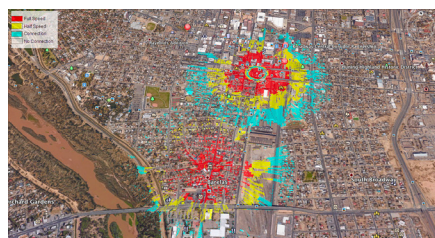
Two point to point links, 0.48km (0.3mi) and 1.127 km (0.7mi), were deployed using MetroLinq 2.5G – 35 products and provided a multi-gigabit backhaul with fiber-like wireless reliability. The MetroLinq 10G Omni radio was deployed in the heart of the Barelás neighborhood and delivered 360° of gigabit coverage within a 700m radius around the base-station. Further fixed wireless connections can be provided on the 5 GHz band, and best effort WiFi can be provided directly to end-user devices on the 2.4GHz band.

All installations were also accompanied by an outdoor switch from IgniteNet, called the MeshLinq, used to distribute data and provide power. These MeshLinq switches also provide the expansion and redundancy capabilities of the network using the Trill protocol – a field proven datacenter technology and will allow the network to be easily expanded in the future to connect more of the unconnected.

Network diagram



Base station coverage maps



ML-60-19



ML-60-35



ML-60-LW

● 2.5Gbps ● 1Gbps min ● 300Mbps min

Summary

The deployment in Barelas (BarelasGig) is proving the economics of IgniteNet mmwave equipment as a perfect solution to fixed wireless access applications. It easily extends fiber networks in a hard to reach areas, saving time and cost, in addition to enabling quick access to new revenue streams by providing high quality and competitive internet connectivity at affordable prices. A combination of unlicensed bands simplifies the build out of universal networks and can also be expanded to security and smart city applications.

Stable and reliable internet connectivity provides many benefits for the Barelas community as well. For example, modern high-speed internet service in the community increases safety and is an economic asset that will strengthen existing businesses and attract new ones. The BarelasGig deployment will provide gigabit connectivity to many parts of the community, including residential, education, business, tourist, police, emergency responders, tele-medicine services and future Smart City needs. MetroLinq 10G Omni can support 300+ subscribers on 60, 5 and 2.4 GHz frequencies, from dedicated 60 GHz clients to lower speed 5 GHz clients, and even Wi-Fi clients on the 2.4 GHz band, it's part of a perfect solution in building future-proof multi-gigabit networks.