Multi-Gigabit Fixed Wireless Backhaul for Wi-Fi

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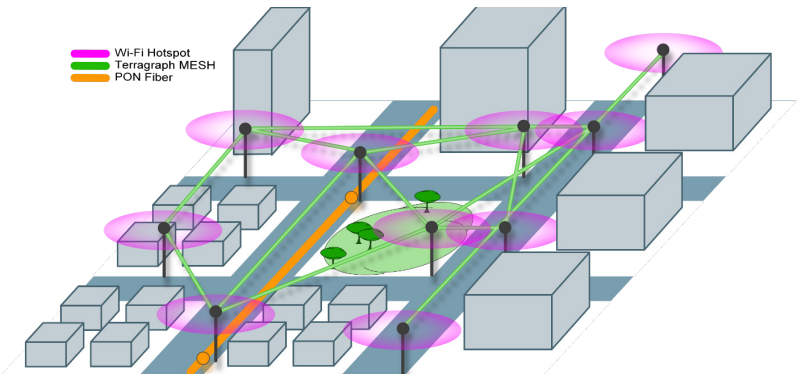
IN YOUR LIFE AND COMMUNITY, DO YOU ALREADY USE PUBLIC WI-FI HOTSPOTS? if you already do, then you will be glad to hear that more Wi-Fi hotspots are expected in your community and around the globe. The Cisco VNI (Visual Networking Index) predicts that Wi-Fi hotspots will exceed 600 million sites by 2023, up 4x from 2018. According to analyst Matthew Ball at Canalys, "Canalys estimates investment in outdoor Wi-Fi access points (AP) will reach US$646 million in 2024, representing a CAGR of 9% over a four-year period." While the growth rate and need are beyond question, the essential network infrastructure questions remain the same: how do I rapidly deliver the necessary broadband and deploy the infrastructure to minimize costs and maximize value?

What Will It Cost and How Fast Will It Be?

PON (PASSIVE OPTICAL NETWORK) FIBER NETWORKS ARE FAST, delivering an aggregate 2.5 Gbps broadband, but they get extremely expensive in urban zones as cost of access and labor increases. The U.S. DOT (Department of Transportation) website records the true cost for municipalities around the United States. According to the U.S. DOT, the cost (cabling, termination, splice cases, optical splitters, labor) can range from $6,600 USD to $118,000 USD per mile ($73,000 USD per kilometer). If we take out the top five in the U.S. DOT report, the average is still a significant $19,000 USD per mile ($12,000 USD per kilometer).

Fixed wireless broadband offers a fast and predictable installation routine and low per node cost, often costing a few hundred dollars (USD) per client node. Fast deployment equates to rapid access to revenue. But what about performance? New technology in fixed wireless broadband is now delivering 7.6 Gbps of aggregate network throughput and packet latency measured in microseconds, not milliseconds. Cambium Networks' 60 GHz cnWave™ solution is engineered to deliver higher value at lower cost than a pure PON fiber network. cnWave is 802.11ay based and Terragraph certified. With mesh support, cnWave forms a distributed multi-gigabit backhaul layer to Wi-Fi APs. Powered by cnMaestro™, a single pane of network management can be used for both cnWave mesh network and Wi-Fi hotspots.

Fixed wireless broadband using 60 GHz enables any service provider or municipality, large or small, to design, deploy and manage very high-speed public and community Wi-Fi networks. When 60 GHz fixed wireless is used to extend the reach of the fiber network, cost for the last 1,500 feet (450 meters) is dramatically reduced while delivering multi-gigabit speed and low latency.



Do We Really Need This Much Speed and Capacity?

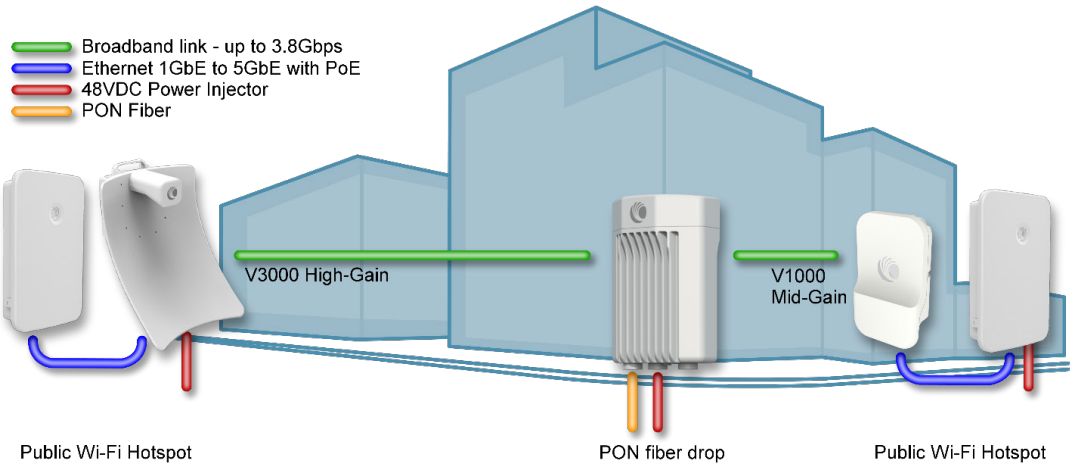
SIMPLY STATED, YES. Capacity is the ability of a network to connect multiple devices while still delivering the same quality of experience. When the network capacity is exceeded, the experience suffers. As more devices connect and applications require more bitrate, the capacity of the network must scale to accommodate the need. In your life and community, are you seeing more devices connected this year than last, while streaming more video and doing more things? Yes.

Speed has a close cousin: latency. Speed and latency help to define the network capacity and its ability to support applications. 4k video (aka UHD) requires a constant data stream between 15 Mbps and 18 Mbps, often over two to three hours. What applications are common in your life and community? Do you attend back-to-back video conferences? Do you share a desktop screen with co-workers? Are the kids in your community doing remote learning? Underlying these real-time video applications is WebRTC. This core technology is used by telehealth, education and enterprise markets and common named products such as Google Meet, Facebook Messenger, Zoom, Microsoft Teams and Cisco WebEx. The future of B2B, B2C and enterprise applications will be built on internet protocols to transmit real-time voice, video and data.

At the network edge, a Wi-Fi AP provides the capacity and common radios needed to support public and community Wi-Fi networks that connect any smartphone, tablet or laptop.

Connect the Wi-Fi Hotspot Over Fixed Wireless 60 GHz

EACH WI-FI HOTSPOT WILL NEED TWO COMPONENTS: a Wi-Fi AP for public access and a broadband 60 GHz client node. These two components can be interconnected with data and power to simplify the deployment. For example, Cambium Networks' cnWave v1000 (Mid-Gain Client Node) can be powered by a Cambium cnPilot™ e700, e500, 501S, 502S and Wi-Fi 6 outdoor Wi-Fi AP (coming soon). Conversely, any Cambium Networks Wi-Fi AP can be powered by cnWave v5000 (Distribution Node) or v3000 (high-gain Client Node).



References

Number of Hotspots by 2023 prediction: https://www.cisco.com/c/en/us/solutions/collateral/executive-perspectives/annual-internet-report/white-paper-c11-741490.html

US DOT ITS website with real-world cost data: https://www.itscosts.its.dot.gov/its/benecost.nsf/DisplayRUCByUnitCostElementUnadjusted?ReadForm&UnitCostElement=Fiber+Optic+Installation+&Subsystem=Roadside+Telecommunications+