

# Unleashing Ultrahigh-Capacity Wireless Broadband With Cambium Networks' 60 GHz Solution

Cambium Networks' 60 GHz technology provides a cost-effective solution that is well positioned to help communications service providers to mitigate the technical and business challenges while consistently satisfying end customers.



## Overview

**WHILE THE WORLD WILL EVENTUALLY RECOVER** from the COVID-19 pandemic, the demand for internet capacity continues to explode. Internet service providers (ISP), in addition to catering the needs for regular internet access service, such as web surfing, online shopping and video downloading, now have to provide additional capacity for business applications such as virtual office, video conferencing and online collaboration. Customers that are usually happy with a network capacity of 10 Mbps downlink speed and 5 Mbps uplink speed may find that they need double the capacity for an acceptable experience quality. Furthermore, customers need symmetrical link performance with uplink and downlink speeds that support videoconferencing applications.

As residential users are looking for reliable and affordable ultrahigh capacity broadband services, the huge demand for internet bandwidth poses both a challenge and an opportunity for communications service providers. On one hand, fiber rollout may not be feasible as trenching to install the cable could be costly and time consuming while wireless broadband service can be rolled out much faster. On the other hand, if the network bandwidth provided cannot meet the demand, the customers are likely to switch to other operators. The service provider's objective is to deliver enough capacity to satisfy the needs of the customers, generate more revenue from each customer and attract even more customers. With the proper technology, they would be able to roll out additional network capacity much quicker than wireline-based operators due to the inherent ease of deployment of wireless technology.

The service provider needs to find cost-effective wireless broadband technology that:

1. Can provide ultrahigh capacity
2. Is easy to deploy with flexibility and allows rapid expansion

## The Cambium Networks 60 GHz Solution

**THE 60 GHz PRODUCT LINE** recently introduced by Cambium Networks is an attractive solution to solve this capacity problem.

Key features include:

- Pre-802.11ay technology, TDMA channel access and TDD network synchronization
- Supports 57 to 66 GHz bands with a channel bandwidth of 2.16 GHz in a single SKU
- Up to 7.5 Gbps (L2) total capacity
- Terragraph-certified, embedded Terragraph (Facebook) Mesh Support
- Easy installation with beamforming
- Hardware ready for channel bonding with the option to double the capacity with a software license key
- Built-in GPS receiver for synchronization to reduce self-interference
- 1 x 10GbE with PoE IN, 1 x GE with PoE OUT and 1 x SFP+ cage, ensuring optimal performance with lowest latency

Three models are available. The V5000 are typically used as distribution nodes (DN) to form the mesh network and provide coverage. The client nodes (CN) are available in two options for range and capacity: V1000 or V3000.



V5000



V1000



V3000

## Ultrahigh Capacity

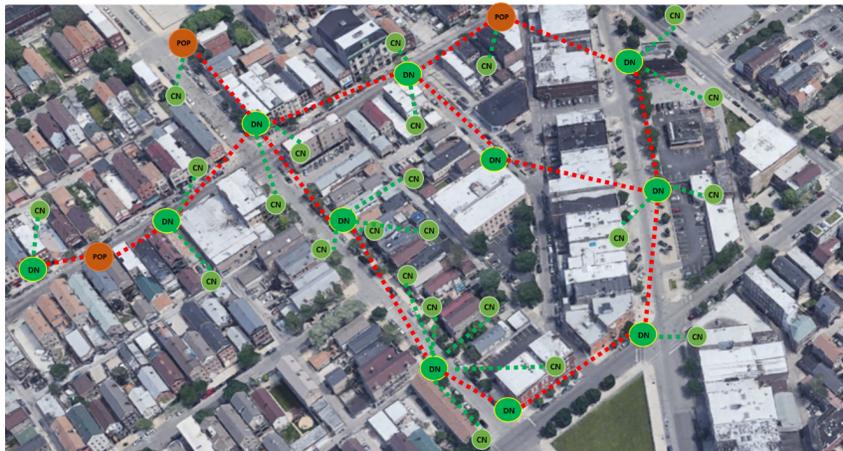
**EACH V5000 DN** has two sectors and can provide an aggregate L2 capacity of 7.5 Gbps. If channel bonding is used, each V5000 DN can provide 15 Gbps throughput.

## Ease and Flexibility to Deploy Allows Rapid Expansion

**ONE BIG CHALLENGE** for deploying a 60 GHz wireless network is that it has very short range and requires clear line of sight (LOS) which makes it very challenging to provide cost-effective wireless coverage. With meshing technology, a 60 GHz network from Cambium Networks can mitigate the non-line-of-sight (NLOS) problem by converting NLOS connections into multiple short LOS hops. Thus, it makes a cost-effective solution possible by significantly reducing the point of presence (PoP) sites where backhaul is provided.

Unlike Wi-Fi-based meshing, a 60 GHz solution does not lose capacity when traffic traverses through multiple hops. This is because with Wi-Fi meshing, all nodes in the mesh network will be able to communicate with each other given the RF characteristic. Also, Wi-Fi standards mandate “listen before talk” protocol, meaning that Wi-Fi allows only one signal to transmit at a time. This results in very high noise floor and, even worse, many times only one node in the meshing network would be able to transmit at a time. In a 60 GHz meshing network, the signal degrades so quickly within a short distance that it allows multiple nodes in the mesh network to transmit/receive at the same time.

As the operators add new users, they can easily extend coverage by adding new DNs. The total network capacity is completely determined by the total backhaul capacity. As the network grows, the operator can introduce additional PoP sites to increase total network capacity.



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## Conclusion

**THE EXPLOSIVE RESIDENTIAL DEMAND** in ultrahigh broadband internet capacity brings both challenges and opportunities to the wireless internet service provider. Cambium Networks' 60 GHz technology provides a cost-effective solution that is well positioned to help communications service providers to mitigate the technical and business challenges while consistently satisfying end customers.