

802.11ay Emerges as the New Standard for 60 GHz Wi-Fi



802.11ay promises access to more channels, higher capacity, better channel access, mesh support and more subscribers supported compared to the previous 802.11ad standard.



802.11ay EMERGES as the new IEEE 802.11 standard for 60 GHz, replacing 802.11ad. This standard is designed with a throughput capacity of over 10 Gbps data rate over distances of 200 to 500 meters. 802.11ay will include features such as Channel Bonding and Synchronization. 802.11ay is scheduled for release in 2020. Cambium Networks has 60 GHz products which are based on the pre-802.11ay standard and will fully support 802.11ay when the standards are completed. Here are the key reasons why 802.11ay will outperform 802.11ad:

Up to Six Channels Supported: The 60 GHz band supports six channels. 802.11ad is supported Channels 2 & 3, whereas 802.11ay supports Channels 1 through 4 and Channels 5 & 6 will be added in the future. Network operators using 802.11ay standards will have many more channels to deploy a reliable, high-capacity network and many more reusability channels

100% Increase in Capacity: 802.11ay supports Channel Bonding which allows two contiguous channels to be merged into a single wideband channel, thereby doubling the capacity to 4.32 Gbps. 802.11ad does not support Channel Bonding and is limited to a single radio. Hence 802.11ay will always outperform 802.11ad. Figure 2 (right) showcases why an 802.11ay-based solution using Channel Bonding outperforms 802.11ad.

Deterministic Channel Access: 802.11ad is based on CSMA (Carrier Sense Multiple Access) technology, which is based on collision detection and avoidance. This protocol does not translate well for outdoor fixed wireless solutions because of the inherent time allocation. 802.11ay is based on TDMA which allows timeslots between access points (AP) and clients, guaranteeing fixed throughput between the AP and clients. Additionally, 802.11ad does not support synchronization whereas 802.11ay, which is based on TDMA, supports synchronization.

88% Increase in the Number of Client Nodes Supported: 802.11ad supports 8 Client Nodes per sector, and 802.11ay supports 15 Client Nodes per sector. This number alone determines business cases and deployment strategies.

Mesh Support: Cambium Networks' 60 GHz solution incorporates Terragraph meshing technology to provide a highly reliable and flexible Layer 3 architecture to facilitate network design and deployment. 802.11 ad does not support meshing, limiting network design options.

Key advantages of Terragraph Support are:

1. Better connectivity through better links in case of interference
2. Capacity sharing & load balancing
3. RF link are self-healing via re-routing
4. No user intervention required

Channel	Center (GHz)	802.11ad	802.11ay
1	58.32	Not Supported	Supported
2	60.48	Supported	Supported
3	62.64	Supported	Supported
4	64.80	Not Supported	Supported
5	66.96	Not Supported	Supported (future)
6	69.12	Not Supported	Supported (future)

Figure 1: Channels supported by 802.11ad compared to 802.11ay

Distance (PTP Mode)	802.11ad-Based Solution	802.11ay-Based Solution With Channel Bonding
200m	2.5 Gbps	4.5 Gbps
350m	1.5 Gbps	2.5 Gbps

Figure 2: Capacity supported by 802.11ad-based solutions compared to 802.11ay-based solutions