

INDUSTRY AWARDS CASE STUDY SERIES:

HOW BROADCOM'S MAX WIFI CHIPS ARE FUELING THE WI-FI 6 WORLD

BROADCOM

OUR STORY

Background:

We demand a lot from our Wi-Fi, both at home and when we're out and about. From uploading videos at concerts to connecting wireless thermostats, cameras and lightbulbs to your home network, Wi-Fi use is at an all time high. With the rise of the "Internet of Things" (IoT), homes are becoming "smarter" and "smarter," but this also means our Wi-Fi networks are more crowded than ever before. At home, a family of four is expected to have an average of 50 connected devices by 2022. On top of that, consumers spend an average of five hours per day on smartphones — four of those hours, users are connected through Wi-Fi. And we expect Wi-Fi to work hard in packed environments, like this year's Super Bowl where fans generated an astounding 24 Terabytes of data posting videos, updating statuses and streaming live from the stadium. But today's Wi-Fi — 802.11ac — wasn't designed to keep up with so many devices and increased data demand. This serious strain on Wi-Fi routers leads to a bottleneck of digital traffic, resulting in slowdowns, buffering, and less efficient networks. We needed a new Wi-Fi to ease this strain that was designed with today's consumer in mind.

Description:

Enter Broadcom's Max WiFi: the first total ecosystem available of chips using next generation 802.11ax, also known as Wi-Fi 6. This sixth generation of Wi-Fi offers significant improvements in wireless speed, capacity, range, and efficiency—a major upgrade for connected homes, for businesses, and for anyone with a smartphone. This innovative technology tackles digital traffic jams, improves user connectivity, and drives productivity in nearly every industry.

Broadcom's Max WiFi is the sixth generation of Wi-Fi and supports the delivery of simultaneous video, voice, data, and IoT services to an ever increasing number of wireless devices in both homes and enterprises. Max WiFi chips provide up to four times faster download speeds, six times faster upload

speeds, and four times better coverage than previous 802.11ac Wi-Fi technology. To date, Broadcom's Max WiFi chips fuel the Wi-Fi 6 connectivity in the three newest Samsung Galaxy S10 phones. They also power the Wi-Fi 6 technology in both residential and enterprise routers from Aruba, ASUS, Extreme Networks, Netgear and TP-Link and in AirTies' software. Broadcom's portfolio of Wi-Fi 6 chipsets are equipping the new ecosystem of Wi-Fi for faster, better, more secure Wi-Fi.

Learnings:

Deployment of a new standard requires close industry-wide collaboration. Broadcom worked closely with the Wi-Fi Alliance on the rollout of Wi-Fi 6 and of Broadcom Max WiFi chips to ensure smooth deployment.

THE SOLUTION

Unlike today's Wi-Fi 5, Max WiFi was built to support a large number of devices operating close together, even when using large amounts of data. The efficiency of Max WiFi not only improves consumer experiences in places like stadiums, airports and music venues, but it also brings consumers reliability when they need it the most: at hospitals, at work and on the go. Max WiFi can handle much more and allow more sharing, thanks in large part to a complete redesign of the standard and the addition of orthogonal frequency-division multiple access (OFDMA) and scheduling technologies like Target Wake Time (TWT). Max WiFi allows data from multiple devices to transmit simultaneously and allocates the correct amount of spectrum to each device. This efficiency enables Max WiFi to reliably transmit more data up to six times faster. It helps us do more of what we already do, but to do it more quickly and more efficiently.

With Max WiFi, users get more: more connectivity, more speed, and more battery. Not only does Max WiFi cover the entire gigabit home — both inside and out — but it also eliminates Wi-Fi dead zones. Outside of the home, Max WiFi offers connectivity even in a crowd by allowing more devices to connect to a given network at the same time. This means more real time video — everything from livestreaming on Facebook, Twitter, and Instagram to emerging augmented and virtual reality experiences and gaming. OFDMA handles massive amounts of upload traffic with ease. And in environments with fewer devices, MU-MIMO (Multi User - Multiple Input Multiple Output) technology also allows these same applications to upload and livestream much higher quality video.

Users can also use their devices for longer thanks to increased battery life. TWT and scheduling technology save devices' energy by letting them "rest" when they aren't needed. This helps extend device battery life up to seven times — allowing users to leave their chargers at home, work on the go

and use their devices longer. This reliable connection makes everyday consumer experiences swift, seamless and secure.

PARTNERSHIPS

To deploy an entire ecosystem of Wi-Fi 6, Broadcom has partnered with companies on the access point side as well as the carrier side.

Max WiFi chips fuel the Wi-Fi 6 capability in the world's first Wi-Fi 6 phone, the Samsung Galaxy S10 phones. Introduced at the UNPACKED event, the Galaxy S10 phones will be first smartphones to support the faster speeds and lower latency that Wi-Fi 6 provides. These phones are not only future-proof and ready to connect to Wi-Fi 6 routers as the ecosystem evolves, but they are also backwards compatible with previous generations of Wi-Fi, guaranteeing connectivity wherever it's available.

Today, Max WiFi chips also power several commercially available access points, including:

- Aruba – Aruba's 510 Series access points, its first Wi-Fi 6 products, which are equipped with Broadcom's Max WiFi chips.
- ASUS – Max Wi-Fi fuels the Wi-Fi 6 in the company's RT-AX88U router, introduced late last year. It is available for purchase today from Amazon and Best Buy.
- Extreme Networks – Max WiFi provides stadium-caliber Wi-Fi 6 for Extreme Network's newest enterprise access points, designed for use in NFL stadiums nationwide.
- NETGEAR – Broadcom's chips supply the Wi-Fi 6 technology in NETGEAR's Nighthawk gaming routers.
- TP-Link – Six of TP-Link's new products – five routers and one extender – use Max WiFi technology, including two cutting edge gaming routers. We're thrilled to be a part of their first Wi-Fi 6 products.

We have also partnered with AirTies on a smart Wi-Fi software and a Wi-Fi cloud manager, both of which take full advantage of Wi-Fi 6's superior features.

This is only the beginning of the Wi-Fi 6 ecosystem. We will continue to partner with other companies in order to deploy the full benefits of this technology, making the user experience much better.

NETWORK PROVIDERS, ENTERPRISE & CITY OFFICIALS

Network Providers: Wi-Fi 6 works in tandem with internet providers, as Wi-Fi continues to be the way that consumers experience their networks. Wi-Fi 6 requires the backing of strong networks to amplify this connectivity throughout a home or business. In order for consumers to take advantage of Wi-Fi 6, network providers need to continue to deploy fast, reliable wired networks.

Enterprises: Enterprises should upgrade their routers to Wi-Fi 6 in order to give employees and customers the full security, speed, and reliability that this new standard provides. Wi-Fi 6, and Max WiFi in particular, will support the connected devices that businesses and homes continue to use. Upgrading to the new standard allows for the IoT to flourish in a variety of areas, from precision agriculture to hospitals to POS systems. The next-generation of Wi-Fi is designed to support these data-intensive applications.

City Officials: Smart cities need fast, reliable Wi-Fi networks to connect people and to enable a host of smart city applications. The cities of the future will have highly connected infrastructure — everything from street lamps to traffic lights to sensors that monitor air quality. Reliable, future-proof networks will be necessary to support these innovations, so Wi-Fi 6 will form the backbone. Top-tier Wi-Fi will also allow new ways of conducting daily government business. For instance, with high-speed connectivity, video-enabled government service centers could connect more remote residents with government offices, officials and services. With Wi-Fi 6, the possibilities for innovation are endless.

Likewise, city officials should explore opportunities to bring Wi-Fi 6 to more people their communities. In today's digital economy, Wi-Fi access is key to economic, healthcare, and educational opportunities, so providing this as a utility to communities is absolutely crucial. A community Wi-Fi network with Wi-Fi 6 technology would enable next-generation connectivity at a relatively low cost.

BUSINESS/SOCIAL IMPACT

Wi-Fi is a key productivity tool. By simultaneously increasing speeds and strengthening connections, Max WiFi dramatically increases efficiency. With applications in healthcare, banking, education, transportation and more, Wi-Fi 6 has the potential to revolutionize the way that we work.

In fact, in some deployments, Max WiFi has the potential for ten times the benefit for businesses and users when compared to 802.11ac.

1. **In the office:** Max WiFi outperforms current Wi-Fi standards with higher speeds; this better quality of service supports employee needs and increases productivity.
2. **In K-12 schools and universities:** Max WiFi brings academics improved connectivity and speed.
3. **In the hospital and medical facilities:** Max WiFi supports telehealth and telemedicine tools, as well as the 15-20 networked devices that rely on Wi-Fi.
4. **In coffee shops and pubs:** Consumers benefit from swift and seamless web experiences.

5. When mobile banking and shopping online: Consumers can depend on secure, seamless transactions.

Max WiFi is the newest and best iteration of Wi-Fi to date. It overcomes the overload and delays that come with the current standard of Wi-Fi and helps users stay connected. Whether a consumer is at work or at a favorite musician's concert, the connection is faster, easier, and safer with Max WiFi. In our increasingly connected world, Max WiFi is the Wi-Fi standard we need to move us closer together and help us do what we do best.