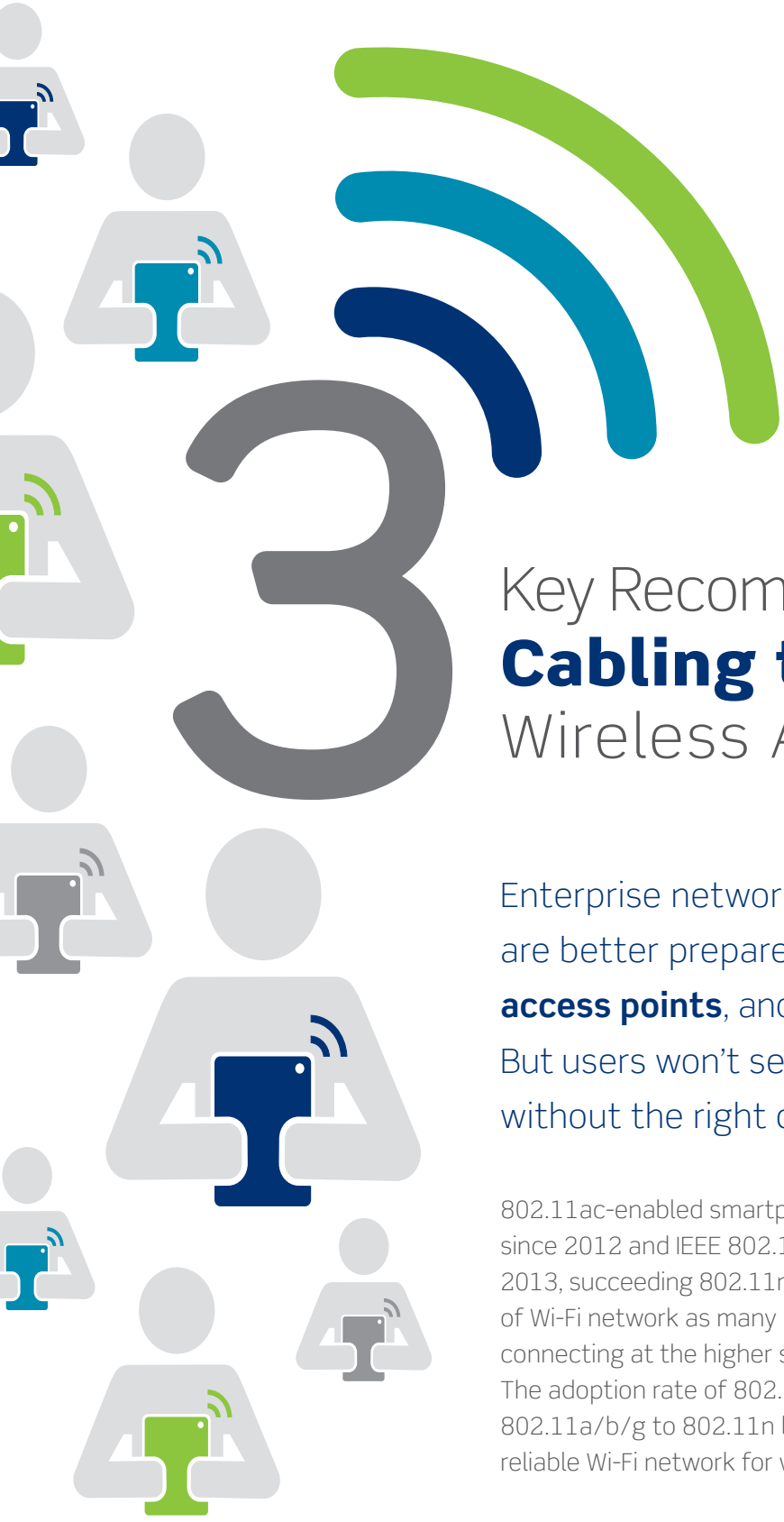

3 Key Recommendations for **Cabling to 802.11ac** Wireless Access Points

Enterprise networks using IEEE 802.11ac technology are better prepared for **more wireless devices**, **more access points**, and **faster speeds** in the workplace. But users won't see the true benefits of the standard without the right cabling infrastructure to support it.

802.11ac-enabled smartphones, routers, and laptops have been shipping since 2012 and IEEE 802.11ac (also known as Wi-Fi 5) was approved in late 2013, succeeding 802.11n. In the enterprise, 802.11ac made up a large percent of Wi-Fi network as many people are using phones and laptops capable of connecting at the higher speed and frequencies that Wi-Fi technology offers. The adoption rate of 802.11ac was significantly faster than the move from 802.11a/b/g to 802.11n because organizations rely heavily on faster and reliable Wi-Fi network for workspace efficiency.

Continued...

802.11ac offers several major improvements over 802.11n:

Capacity to Support More Users
While 802.11n supports up to three antennas and three streams at the same time, 802.11ac goes a step further by allowing Multi User multiple-input multiple-output (MU-MIMO), which creates the capacity to transmit and receive from multiple users simultaneously, at full channel data rate. Also, 802.11ac works over a 5 GHz spectrum band. This frequency offers five times the capacity of 2.4 GHz, the frequency for 802.11n.

Better Link Reliability
802.11ac takes advantage of beamforming, a technique that transmits a concentrated signal directly to devices instead of broadcasting the signal out to a wide area. Beamforming not only improves bandwidth utilization, it can increase the range of the wireless network. The 802.11ac standard clearly details how to implement beamforming, and does so in such a way that if any Wi-Fi adapters don't support beamforming, they will still communicate with the Wi-Fi router.

Faster Data Rates
802.11ac allows for up to 8 spatial streams for parallel data transfers, at 80 MHz per channel. This translates into as much as 1.3 Gbps per radio data-rate capability for first generation 802.11ac technology. This goes well beyond 802.11n, which defined up to 4 spatial streams for parallel data transfers and 40 MHz wide channels. Second generations of 802.11ac products allow for 160 MHz channel bandwidth for up to 6.7 Gbps.

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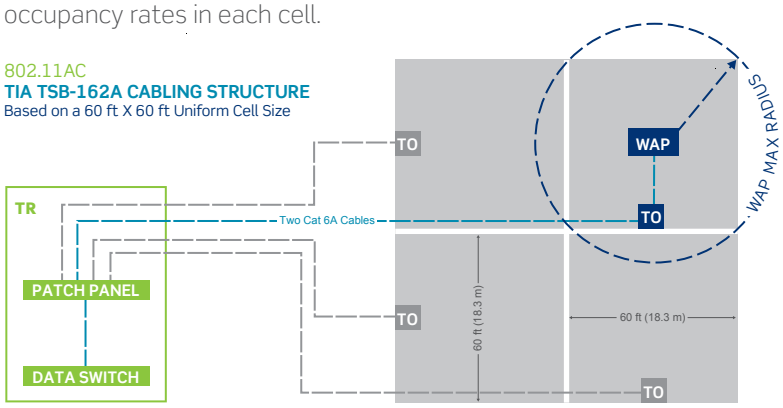
Key Recommendations for Cabling Infrastructure

Enterprise wireless access points (WAPs) and backbone cabling infrastructure will need to be upgraded to see the real benefits of 802.11ac. Standards have already been revised to support access point upgrades. In late 2013, TIA published TSB-162-A, Telecommunications Cabling Guidelines for Wireless Access Points, which revises recommendations for mounting and routing cable between LAN equipment and WAPs.

Install twisted-pair Cat 6A for horizontal cabling to WAPs. These high-bandwidth solutions can prepare wireless networks for the next waves of 802.11ac devices, as data rates support up to 6.93 Gbps. By using a Cat 6A RJ-45 interface and twisted-pair structured cabling system, users get the added benefit of backwards compatibility and connection from the horizontal cabling all the way to the backbone and active gear.

Use grid-based zone cabling architectures, with each cell in the grid no greater than 60 feet (18.3 meters) wide. Many designs will likely use smaller grid cells — and in turn require additional WAPs — to improve data rates and allow for greater occupancy rates in each cell.



Run at least two Cat 6A cable runs to each cell in the grid architecture. As 802.11ac WAPs allow for Power over Ethernet (PoE), it is recommended to run two Cat 6A cables to each WAP for backup power capabilities in case one power source isn't working. Two cable runs will also prepare the infrastructure for future expansion and data requirements. Leviton also suggests installing shielded cabling for these PoE applications, as it reduces heat buildup in cable bundles that may contribute to performance issues.

In 2021, IEEE 802.11ax (Wi-Fi 6) was released, which supports Wi-Fi speeds of 10Gbps and offers greater network capacity. To learn about IEEE 802.11ax (Wi-Fi 6 and Wi-Fi 6E), visit Leviton.com/wireless.

Learn about Levtion's plenum-rated connectivity for wireless access points at Leviton.com/plenum