Planning for Next-Gen Wi-Fi 6E

On April 23rd, the FCC released 1,200MHz (1.2GHz) of spectrum for unlicensed use in the 6Ghz band, greatly extending the amount of bandwidth for Wi-Fi and other unlicensed technologies.

This epic release of spectrum, the largest in 20 years, accelerates the growth of IoT. Additional spectrum means less interference and lower latency, which will ultimately offer wireless networks higher performance and faster speeds. Wi-Fi has typically been operating in 600MHz bandwidth at 2.4GHz and 5GHz bands.

The added spectrum of 1.2GHz will provide a significant improvement in the performance of your Wi-Fi network once the Wi-Fi 6E devices are available. Devices are expected to be available at the end of this year; however, the Wi-Fi Alliance will offer certification programs for Wi-Fi 6E compliance in Q1 2021. With all the additional bandwidth, there's potentially more flexibility for channel

bonding and less interference. Today, 4G LTE mobile carriers encourage the offload to current Wi-Fi infrastructures, and we will undoubtedly experience 5G mobile offload to Wi-Fi 6E.

As Wi-Fi 6E becomes the dominant choice in years to come, it is imperative to prepare your wireless infrastructure today for the next generation of Wi-Fi access points.

Consider the cabling infrastructure. Continuing to use Cat 5e and Cat 6 cabling will not be adequate for the support of next-generation high-speed Wi-Fi technologies. Best practice is the installation of two Cat 6a cables for each wireless access point for future technology requirements. For example, ANSI/BICSI 004-2018 Wireless Local Area Network WLAN) Systems Design and Implementation Best Practices states, "If balanced twisted-pair cabling is used, the

cabling shall, at a minimum, meet Category 6A/Class EA performance." Additionally, "two horizontal links are recommended for each AP." Similarly, current TSB-162-A Telecommunications Cabling Guidelines for Wireless Access Points recommend Cat 6A/Class EA performance, adding to follow the performance testing outlined in the most current TIA-568.C. Other documents are subsequently recommending the same arrangement, two Cat 6a cables to each Wi-Fi access point.

Modernize your wireless physical installation methods to prepare for the future

The constant evolution of wireless technologies and the significant number of devices required to enable a robust infrastructure have clearly shifted the industry to require new and improved methods of installing wireless equipment. As technology evolves, It is clear that installation methods must evolve as well. Traditional methods have changed little over recent decades. There is undeniably a need to provide installation methods for seamless deployment and adequate functionality for the areas in which they serve. Designers, architects, contractors and building owners are seeking new ways to deploy wireless equipment in the ceiling space with critical operational support and aesthetics suitable to architecturally sensitive areas.

Selecting an Installation Method: Considerations

- Eliminate the need for holes and gaps in the ceiling tiles for cable egress.

- Simplify installation while concealing and protecting wireless equipment and cabling components without compromising performance of the wireless network.

- Provide full access to wireless equipment and associated cabling and components for maintenance and serviceability without the need to enter the ceiling space.

- Provide an installation that offers a built-in, easy migration path to future wireless access points. The need will arise when your current wireless equipment is exchanged for newer advanced equipment.

- Choose a lockable installation method for the prevention of tampering.

- Simplify hospital ICRA procedures with a ceiling installation method permitting access to the installed equipment without opening the above-ceiling space. Use a ceiling enclosure in the critical environments requiring a barrier between the work space and the above-ceiling space.

- Ceiling enclosures should be UL listed with a UL label stating "Ceiling Mounted ITC equipment," acceptable in ALL jurisdictions.

- Consider an installation method with room to stow excess cable service loop and associated components while providing quick and easy access to all components.

- Select an installation method with better aesthetics, blending into the environment.

- Provide consistency in the look and function throughout the facility as well as ease of operational support.

Updated recommendations for addressing the critical requirements of contemporary networks

- "The wireless access point infrastructure physical design should consider consistency, compatibility, and ease of operational support while lowering overall cost."[1] Ease of operational support includes the ability to quickly and safely access the equipment and cabling components without disruption to the surrounding area.

- Consider the maintenance and security of APs. "In areas where the physical security of the wireless access points is of concern, the use of and enclosure is recommended. The enclosure should provide a hinged door to enable installation and removal of the wireless access point, lockable, a low visual profile to provide aesthetic appearance, knockouts for cable egress, and there should be suitable brackets for wall or ceiling mounting. An in-the-grid ceiling mount option provides the needed functionality in an aesthetically pleasing installation."[2]

- "Design costs should consider both initial installation costs as well as operational costs. The installation should result in minimal operational cost during the life cycle of the horizontal cable system including cable, components, and associated hardware."[1]

- "Discrete antenna systems are unlicensed radio deployments, such as WLAN (IEEE 802.11) and smaller personal area networks (IEEE 802.15). Discrete antenna systems are commonly used to enable data transmission over a small, defined areas." The placement of equipment specifies that "Wireless antennas and access points should be placed within enclosures or 'surface' mounted in locations that provide access without disturbing the surrounding environment." [3]

- Implementation of wireless access points: "Below ceiling installation of Wi-Fi access points is a better alternative to above ceiling. They should be installed in a cabinet flush with or below the ceiling, or wall mounted."[4]

- "APs should be designed and installed so they are accessible for servicing and troubleshooting without need for infectious control protocols."[1]

- "Restrictions on removing ceiling tiles impacts adds, moves and changes, and adds significant cost when the need arises to access the ceiling."[5]
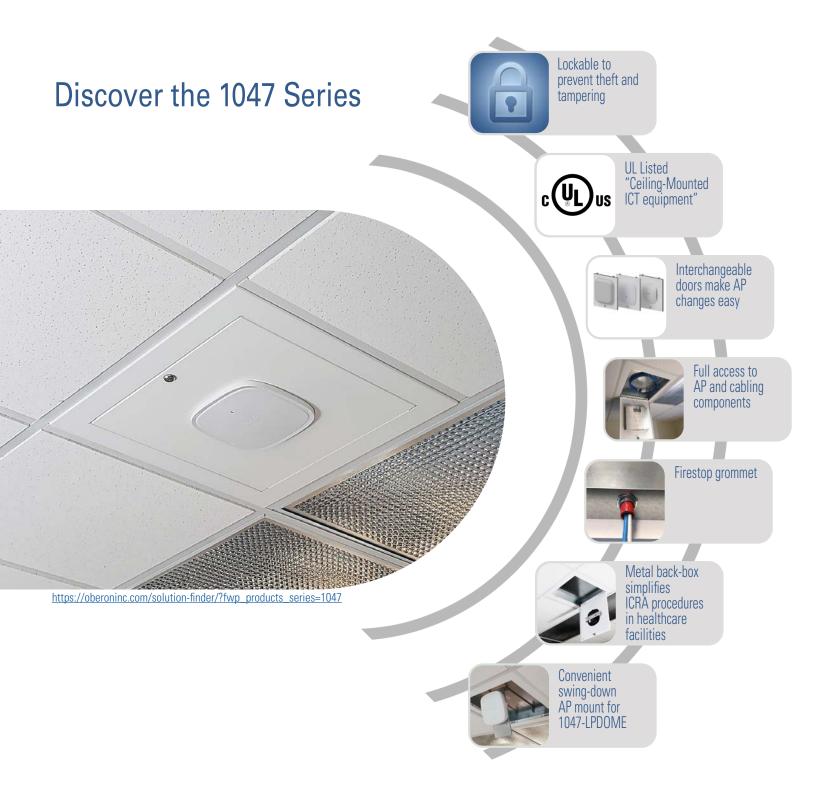
1 ANSI/BICSI 008-2018
2 TSB-162-A
3 ANSI/BICSI 004-2018
4 Guide to Medical Grade Wireless Utility
5 TIA-1179-A

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