COMMSCOPE®

Smart building connectivity

Powering the Present - Empowering the Future

In response to changing business needs, enterprise spaces are evolving faster than ever. The secure, fast and dependable flow of information—in all its forms and for all its purposes—has become critical to commercial enterprises. Successful enterprise spaces are under pressure to provide the infrastructure needed to support advanced connectivity. This infrastructure must support the latest generation of wired and wireless technology— not only for employees, customers, visitors and partners, but also for the vast array of IP-connected devices proliferating across modern enterprises.

The ever-expanding Internet of Things (IoT) offers enterprises new ways to help employees work more efficiently, achieve sustainability goals and attract the best talent to their teams—if those enterprises are willing to put the requisite cabling infrastructure in place. In this regard, the most successful enterprises will be those that take an integrated approach to planning and deploying their IT infrastructure.

Connectivity is redefining the places we work, shop and play

Technology has proven to be a transformative and liberating force in shaping the modern workspace—opening the door for more efficient, adaptive and productive practices like remote working, hot-desking and hoteling, which do not tie individual contributors to specific locations or floorspace requirements, but do increase the need for universal connectivity—particularly wireless connectivity.

Technology has likewise transformed the retail side of the enterprise, as guests may check in or receive relevant coupons or promotions with a mobile device at a hotel, movie theater, salon or other destination—allowing the retailer to offer a more customized, more ubiquitous relationship in the course of doing business.

In non-retail public places like hospitals, airports, stadiums and the like, total connectivity freedom enhances the visitor's experience and increases the utility of time spent there. In all circumstances, however, customers, visitors and users of all kinds have an expectation of connectivity while on the premises.

In all enterprise settings, increased connectivity also offers building owners or managers an opportunity to realize greater efficiency and revenue. Agile workplaces improve employee productivity—and more engaged customers provide better return on your investment. The challenge lies in creating an integrated suite of connectivity solutions without adding layers of complexity that would diminish the business advantages.

Devices with Sensors   Network Connection

Data Center
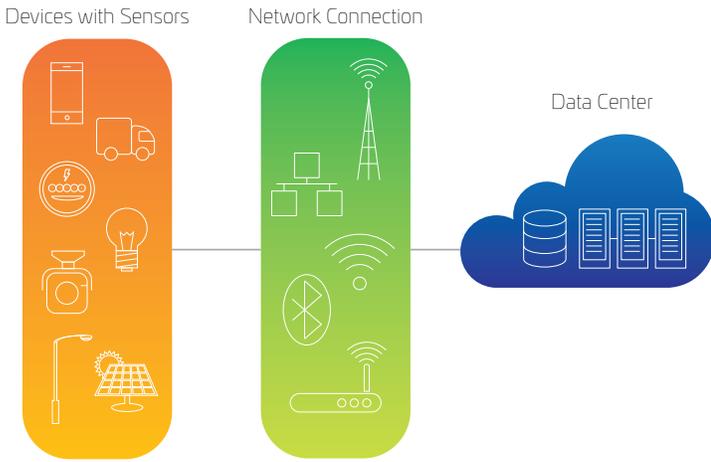
An integrated view on tomorrow's smart buildings

For any enterprise environment, the key to efficient connectivity depends on an informed strategy and an integrated deployment approach. The temptation is to regard enterprise connectivity as a series of related but distinct challenges, such as Power over Ethernet (PoE), wireless indoor coverage, physical infrastructure connectivity and integration into the data center. However, dealing with these challenges individually invites complexity, where vital efficiency gains can be diminished—or even reversed—by dealing with multiple solutions providers, a lack of asset optimization and even redundant layers of infrastructure.

To be effective, an integrated connectivity strategy should be:

Comprehensive. The strategy must emphasize both wired and wireless connectivity needs, including Wi-Fi as well as distributed antenna systems (DAS) or small cells. It must also account for external considerations such as support for public safety communications.

Simple. Complexity is a hidden-but-enduring cost for a piecemeal connectivity execution. Done well, a deployment will take advantage of time- and
cost-saving opportunities like modular design, preterminated cables and the capacity to share multiple services across a single physical infrastructure.

IoT and PoE

Power over Ethernet (PoE) drives a large number of IP-connected peripherals that comprise the Internet of Things (IoT). These devices include wireless access points, security cameras and video monitors, with new ones emerging almost daily.

PoE allows these devices to connect and be managed intelligently through a single twisted-pair cable. For example, Category 6A copper cabling provides up to 10 Gb network speed and supports the emerging four-pair PoE standard.

Flexible. While each enterprise deployment is unique, all will need the flexibility to run the services they need. Infrastructure should support Wi-Fi, HDBASE-T, DAS, 10G speeds and the headroom to migrate to 40G and 100G later on. The inclusion of an in-building cellular solution should support 2G, 3G and LTE on multiple operator networks.

Dependably supported. Most enterprises are not equipped with the expertise to deploy their own infrastructure and must therefore rely on a dependable network of connectivity solution distributors, installers and integrators, each trained and certified by the solutions manufacturer itself.

Wi-Fi and in-building wireless

According to the EPA, Americans spend up to 98 percent of their time indoors or in transit. This is why 80 percent of mobile calls originat indoors—where macro cellular networks can't reliably reach. The addition of an in-building wireless (IBW) solution becomes a more pressing priority for enterprises.

New IBW solutions, including DAS and small cell, can share existing IT cabling infrastructure used by Wi-Fi networks for better efficiency.

Flattening complexity with shared infrastructure

Perhaps the best reasons for applying an integrated approach to enterprise connectivity are the recent advances made in solutions that can share a single physical infrastructure of Category 6A copper cabling and power fiber-optic cabling.

Beyond simplifying the physical network, these infrastructure solutions also come with the potential to support and implement emerging technologies with faster speeds and increased bandwidths, as well as emerging IoT connectivity opportunities and the associated increases in PoE requirements.

Wiring for the future— managing for the present

Taking a long-term, strategic view, more and more enterprises are investing in their IT infrastructure with a focus on future needs as much as on current ones.
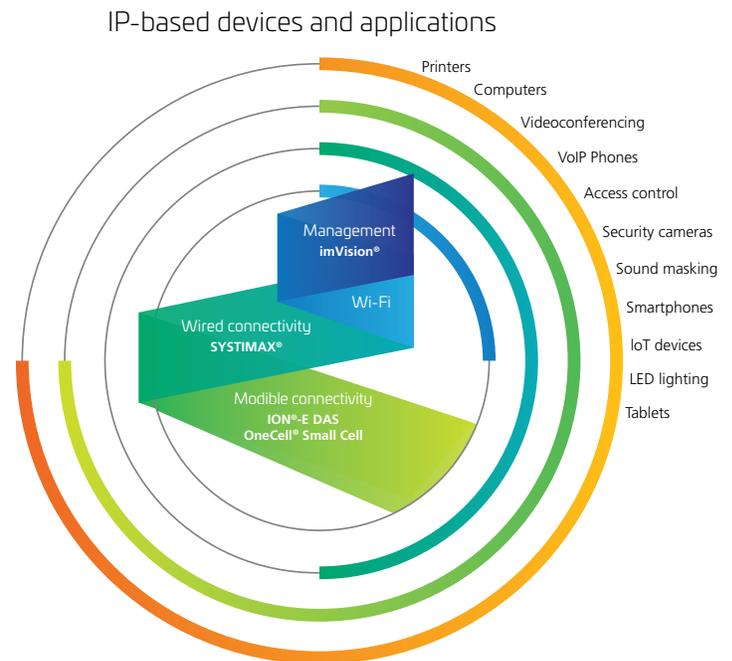
Planning for connectivity that is increasingly being deployed in the ceiling space is critical—and tools such as the universal connectivity grid can help.

Because Category 6A copper and fiber-optic cabling solutions are relatively cost-effective and easy to procure and install, the cost premium for this forward-thinking strategy is quite small. Ceiling deployments arranged in a comprehensive grid can ensure total connectivity in the space for LAN work stations, telecom or connected devices such as

Wi-Fi or in-building wireless access points, security cameras, intelligent building sensors or remote video screens. While incurring an incremental cost at the deployment stage, a grid-based deployment can pay vast dividends in the future—particularly for enterprise spaces where tenants frequently reorganize their workspaces or move.

It's also possible to efficiently manage and maintain this infrastructure through the use of automated infrastructure management (AIM) solutions. A good AIM solution provides clear visibility into the network for enterprise IT managers— showing the connectivity of each and every device, right down to the port level. AIM can also reveal potential trouble spots, security breaches and underutilized assets that could threaten to undermine your business goals. Many modern AIM solutions provide real-time alarm reporting and automated documentation of moves, adds and changes, as well as automated work tickets to further increase operational efficiency and management of PoE connectivity and powered devices. A good integrated solutions provider will help an enterprise deploy such a system quickly by providing preterminated copper and fiber-optic infrastructure solutions and the skill set to integrate and optimize them.

IP-based devices and applications

Printers
Computers
Videoconferencing
VoIP Phones
Access control
Security cameras
Sound masking
Smartphones
IoT devices
LED lighting
Tablets

Management
imVision®

Wi-Fi

Wired connectivity
SYSTIMAX®

Modible connectivity
ION®-E DAS
OneCell® Small Cell

Adding wireless connectivity to the mix

A grid-based wired infrastructure also provides the ideal foundation for an effective in-building wireless (IBW) solution. Operating as a complement to Wi-Fi connectivity, cellular coverage indoors can be a vital part of enhancing both employee productivity and customer satisfaction. As mobile technology advances to 5G, expectations for reliable high-speed wireless service everywhere will become the norm.

As IBW solutions have become more advanced, they have also become simpler and more cost-effective. They are now a viable option for many enterprise environments. A particularly attractive feature is their ability to share existing Category 6A and fiber-optic infrastructure that many enterprises already own—rather than more expensive and difficult-to-handle RF infrastructure such as coaxial cabling.

IBW is a fast-evolving set of solutions, but there are two main types that should be part of any comprehensive connectivity strategy.

DAS and small cells.

- **DAS solutions** integrate with wireless operator networks to transport indoor wireless traffic on and off core cellular networks. Modern DAS solutions not only share IT cabling with other services, but can also dynamically transport capacity from one access point to another in response to network demand—all in software rather than by reconfiguring patches at the headend. Modern DAS solutions are technology- and network-agnostic, so they can support 2G, 3G and LTE across any number of wireless operator networks.

- **Small cell solutions** are literally miniature base stations sized and powered for indoor use. When many small cells are densely deployed across a large indoor space, they can create cell border interference that reduces data speeds and voice clarity. Newer cloud radio access network (C-RAN) small cell architectures solve this prob-

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lem by aggregating multiple access points throughout the enterprise into a single, virtualized "super cell" that eliminates interference and poor voice quality.

- **High-bandwidth** wired backbone infrastructure for Wi-Fi is critical as 802.11ac is being deployed. Category 6A cabling is recommended for all new builds as a guarantee that 2.5G and 5GBASE-T backhaul can be deployed at maximum speeds without the risk of auto-negotiating down to lower speeds.

Since universal, ubiquitous mobile connectivity has become the standard customer expectation, more enterprises are looking at these two solutions to enhance the value of their spaces—making it necessary to improve employee productivity and provide superior experiences. Operating on the same IT cabling infrastructure reduces complexity and cost to the point where an IBW solution helps make this necessity a viable reality.

Dynamic networks for an increasingly dynamic enterprise space

A more mobile workforce, a more flexible workspace, more connected customers—they all expect much more from their connectivity. Recent advances in wireless and wired communications have symbiotically fueled new technologies designed to leverage greater operational efficiencies and more fruitful revenue opportunities.

Successful enterprises will take an integrated approach that embraces the economies of shared IT cabling infrastructure. Smarter, faster, bandwidth-free services will keep enterprise spaces vital and competitive in the short term while enabling them to evolve, scale and grow in the long term. For many business owners, leveraging this comprehensive approach to its greatest advantage begins with a comprehensive solutions partner supported by a trained, certified network of distributors, installers and integrators.

For more information about intelligent buildings and the solutions that help enterprises manage them better, visit www.commscope.com.

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