COMMSCOPE®

Structured Cabling Systems: the Fact File

Contents

SCS: Structured Cabling Systems – omnipresent but unknown

Imagine getting a new desk lamp for your home office. You are anxious to try it out, but instead of simply plugging it into a nearby power outlet, you have to run an extension cord all the way down to the basement to the breaker panel. And then you have to do the same thing for a new printer or any other device requiring power.

Watch video: Reliable Networks for Smart Buildings

Early IT/OT networks were connected much the same way – with patch cords – before structured cabling and its complementary standards were developed. Simply put, structured cabling is a cabling infrastructure that provides an organized approach to cabling that enables simple changes to an IT/OT network.

In addition to fixed connection points, like the fixed power cabling that runs to power outlets, the structured cabling standards define a series of subsystems which facilitate design, installation, operations, and maintenance of IT/OT networks.

Each of the major cabling standards groups, namely ISO/IEC, TIA and CENELEC established standards for structured cabling in commercial offices, data centers, campuses and more. These standards help specify the types of cabling and components used in these environments, including:

- Copper cabling and the categories
- Fiber optic cabling
- Modular connectors[1]

The standardization of connectors, copper and fiber cabling performance categories and design guidelines have greatly simplified the planning and implementation of IT networks.

The structured cabling concept has become so successful that other non-IT applications, such as Building Automation Services, security and high-definition audiovisual have also incorporated the same concept to ensure that end devices can be upgraded or changed out without having to change out the entire cabling infrastructure.

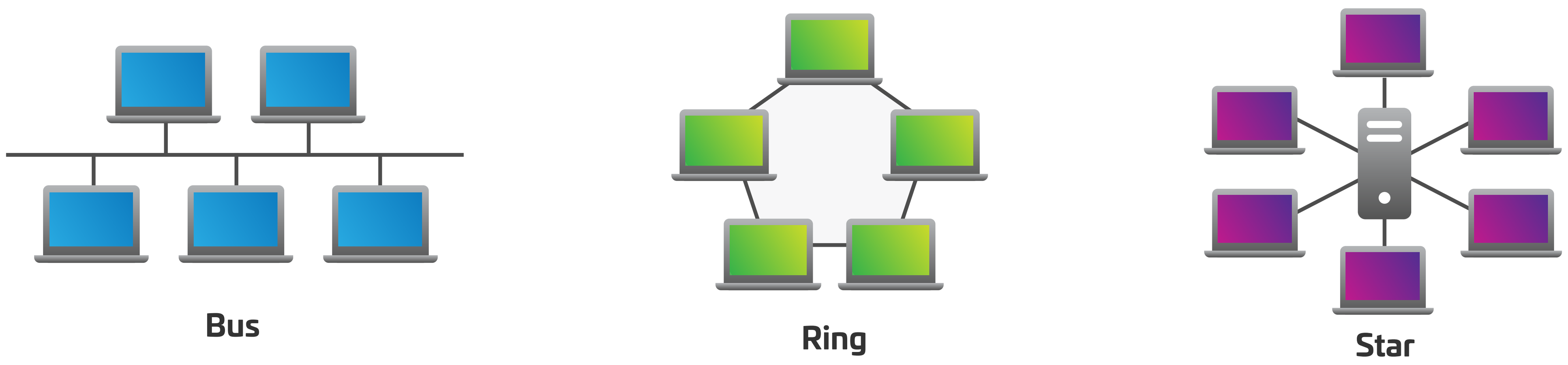
[1]Modular connector - Wikipedia

History and principles of structured cabling

What did we use before structured cabling?

In order to better understand the benefits that SCS brought to this industry, we need to properly understand how the premises networks were constructed and deployed prior to the SCS concept.

First, there were different network topologies. We will consider just three for the sake of simplicity: bus, ring and star.



In a bus topology, terminals are connected sequentially at different points of a linear network cable. Even Ethernet was initially supported over a bus network.

The ring topology can be considered a version of the bus topology where the line is closed, forming a loop.

These two topologies seem to make sense when trying to optimize the total length of cable but imagine how difficult and cumbersome it could be to alter the layout of the network in a real-life building, or simply to add a new terminal.

Many of the computer systems more commonly used in the 80s and 90s (IBM Systems 34/36/38 and AS400, IBM 3170/3270, Token Ring, Wang…) used specific transmission media (Type 1, Twinax, coaxial) with its own connector types (not the current and omnipresent RJ-45) and topologies that were not interoperable with other networks. That is, if you changed your computer vendor, most likely you would need to deploy a new cable into your building, often without removing the old one.

Twinax connector

UNSTRUCTURED FACILITIES IN A BUILDING

If several applications coexisted in the same premise, you would see several parallel types of cabling irradiating through your building. The telephones were wired via a specific network, building management systems used a different cabling (one per system) and, as we have seen, computer networks needed their own. A confused approach that prevented efficiency and ease of management.

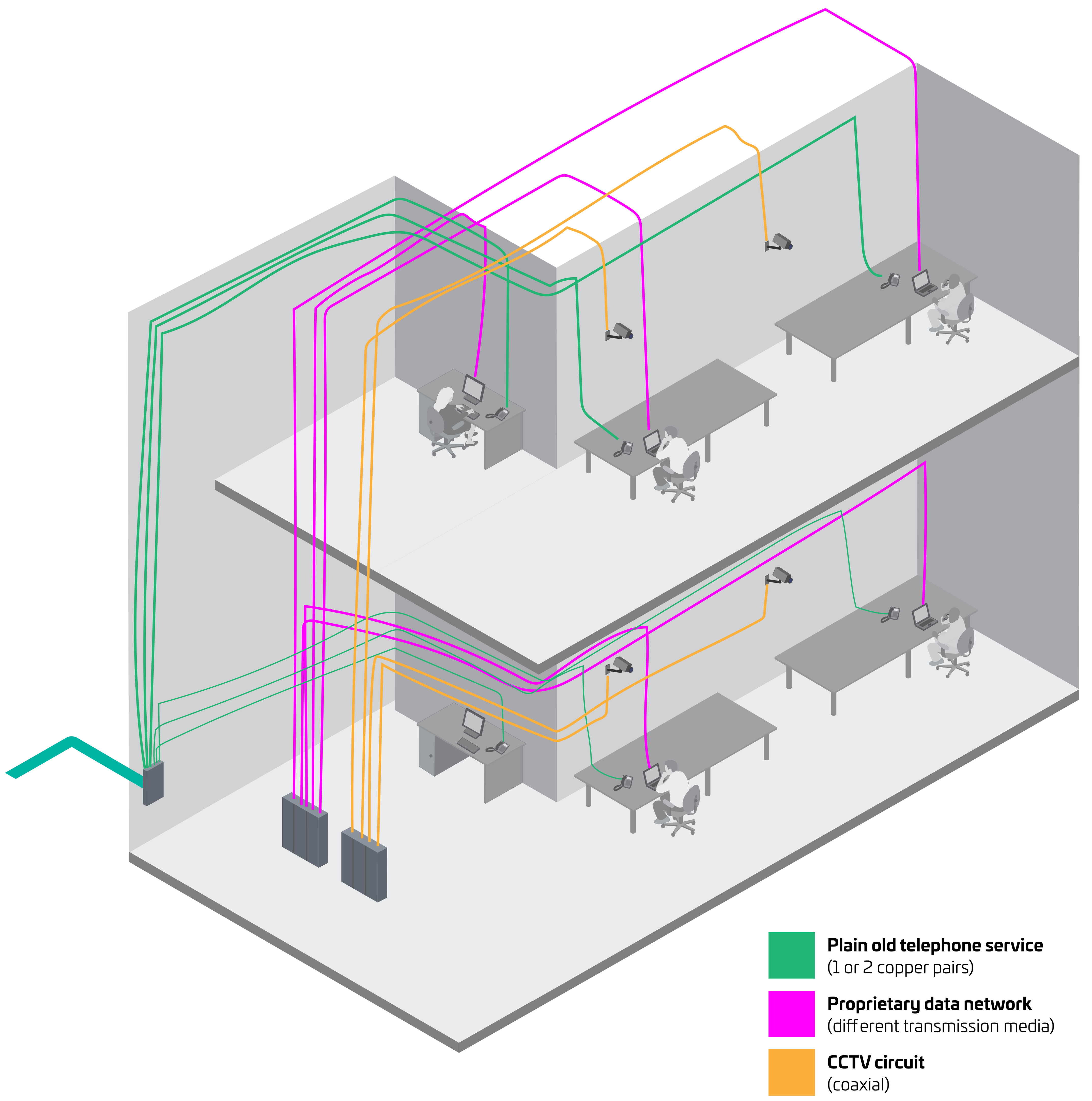
Structured cabling came to the rescue with a common sense approach that provided an infrastructure that could support all of the aforementioned systems and many more.

What did structured cabling bring?

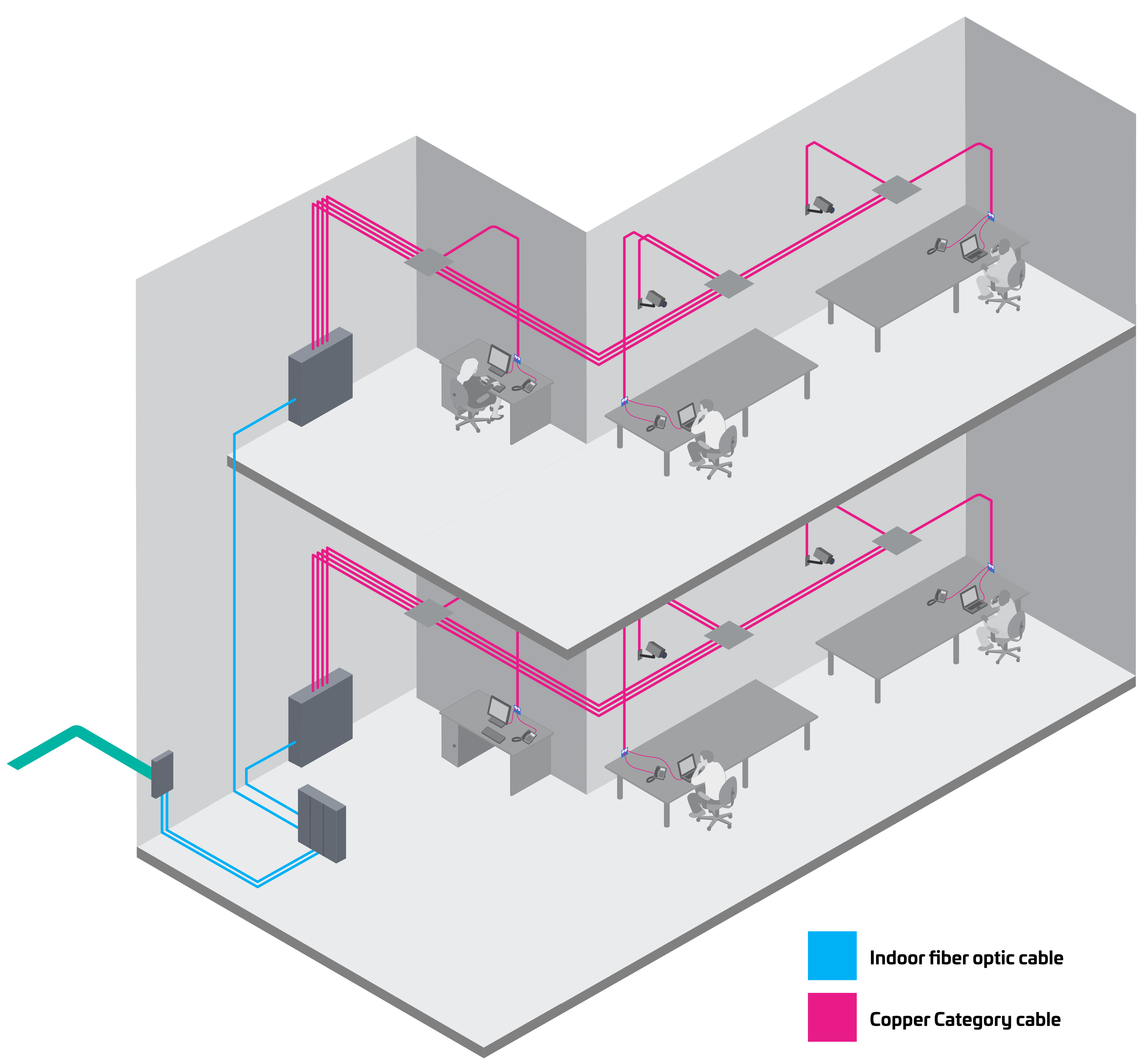
SCS is a cohesive way of organizing an infrastructure:

- It uses standardized media and layout for both backbone and horizontal cabling.
- It uses standard connection interfaces for the physical connection of equipment.
- It supports equipment and applications of many vendors — not just a single vendor.
- The cabling system became independent of the vendor's equipment, and thus, more flexible. This is also known as "Open Architecture."
- It has a consistent and uniform design. It follows a system plan and basic design principles.
- It is designed and installed as a total system, removing the need to install cabling on an as-needed basis.

Structured cabling systems include all the cables, wire, and associated equipment and apparatus necessary to provide service from the network interface to the information outlet at the work location, or to any communication device within the customer premise.

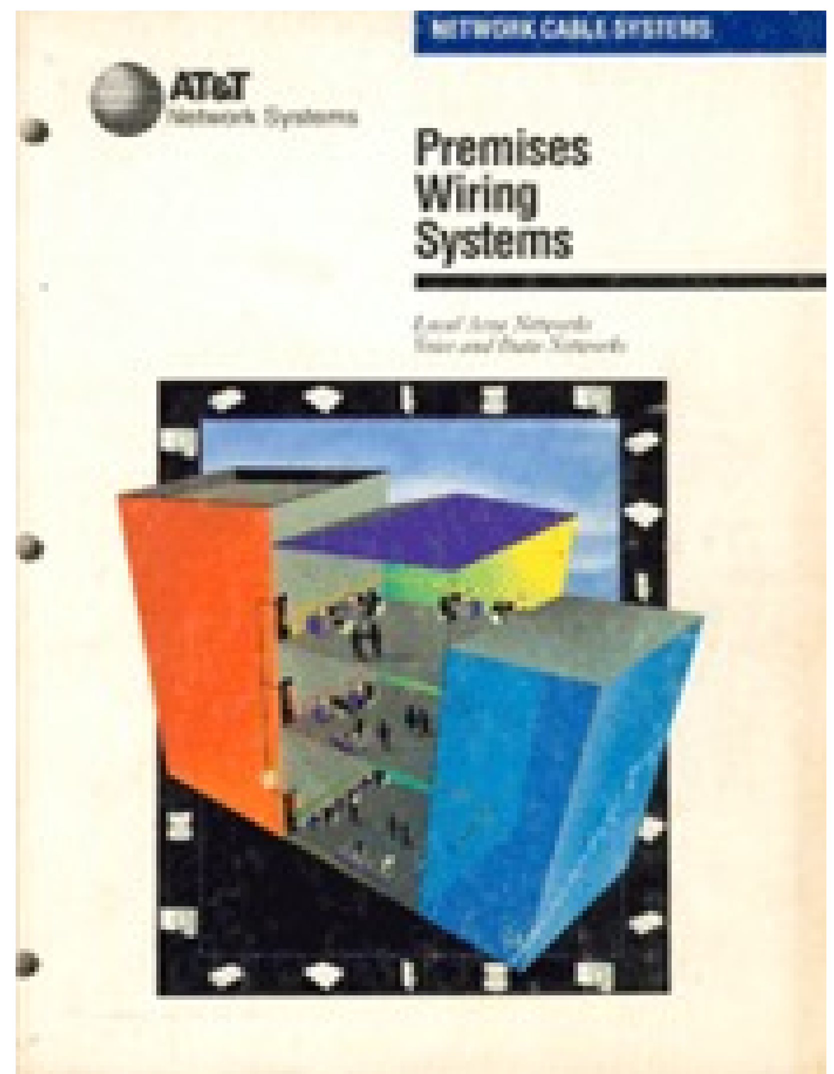


STRUCTURED CABLING IN A BUILDING



How structured cabling was born

In 1983, Bell Laboratories developed the first structured cabling system, which it called a Premises Distribution System (PDS) - an efficient, controlled architecture providing connectivity for voice, data, video and related applications. It was a star-wired configuration that included all of the cables, wire, and associated equipment to provide service from the network interface to communication devices within the customer premises. The PDS typically serves a building or group of buildings, but does not include the telephone PBX or the equipment connected to the PDS.



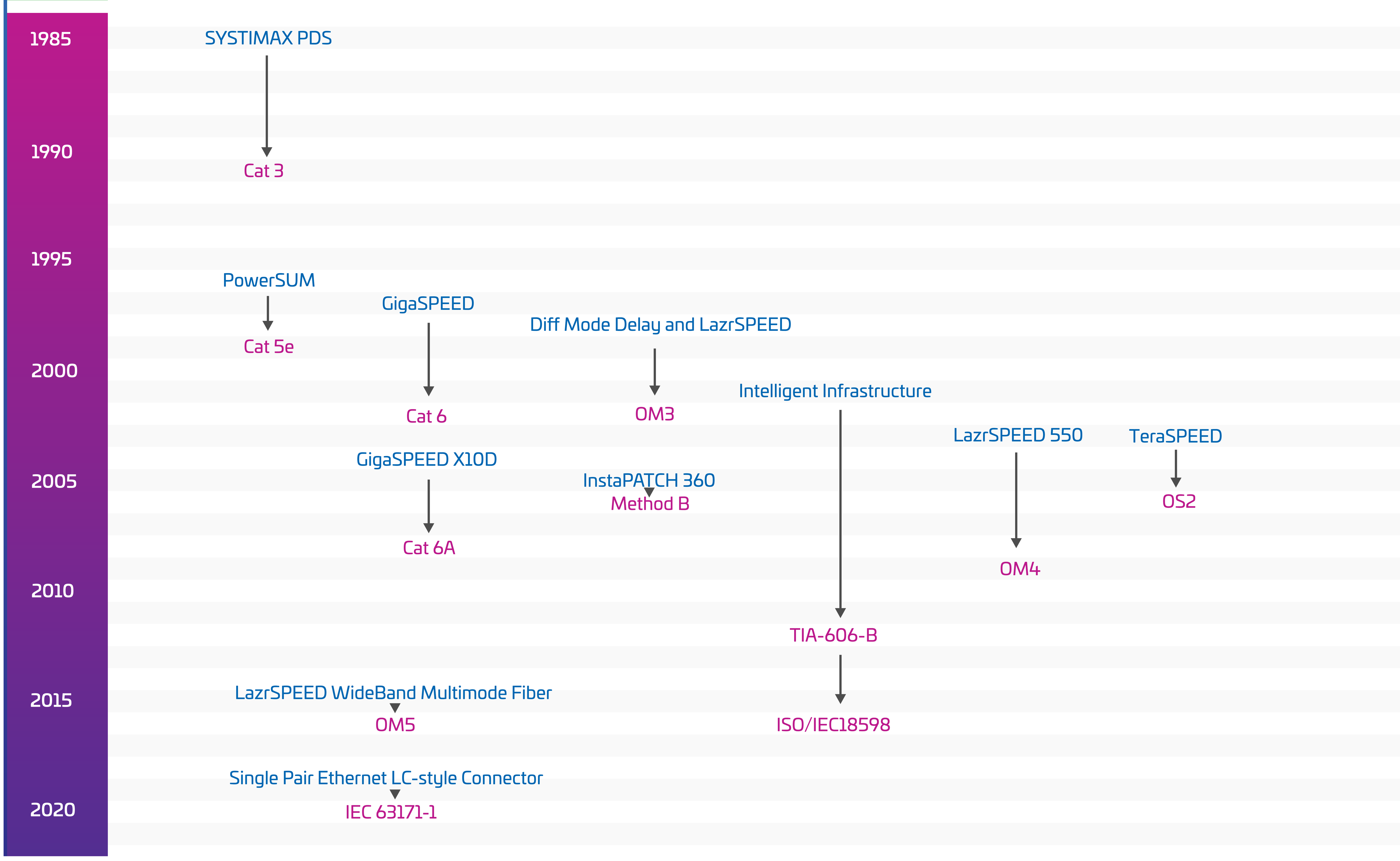
Rebranded as SYSTIMAX SCS in 1989, it became known as a single, modular, integrated system to support data, voice, graphics, and video communications, across both copper and fiber. The SYSTIMAX division was divested by AT&T into Lucent Technologies, then divested further into Avaya, and ultimately acquired by CommScope in 2004.

PDS and SYSTIMAX SCS were the first systematic approach to communications cabling in a building, enabling the early Ethernet LANs with Category 3 cable (Cat 3), and has since evolved to support today's ultra-high speeds and complex network architectures for the intelligent building, the campus, and the data center.

Timeline of SCS evolution

1881 - 1985

- 1881: Alexander Graham Bell invents the twisted pair copper cable
- 1958: Bell Labs invents the laser
- 1976: Bell Labs demonstrates the first fiber optic transmission system for voice and data
- 1983: Precursor of structured cabling, Premises Distribution System or PDS is introduced by the Bell Labs
- 1985: Category 1 cable for voice applications. Category 2 as an improvement (data up to 4 Mbps)



Legend: CommScope SYSTIMAX release
Becomes Industry Standard

The key characteristics of an SCS

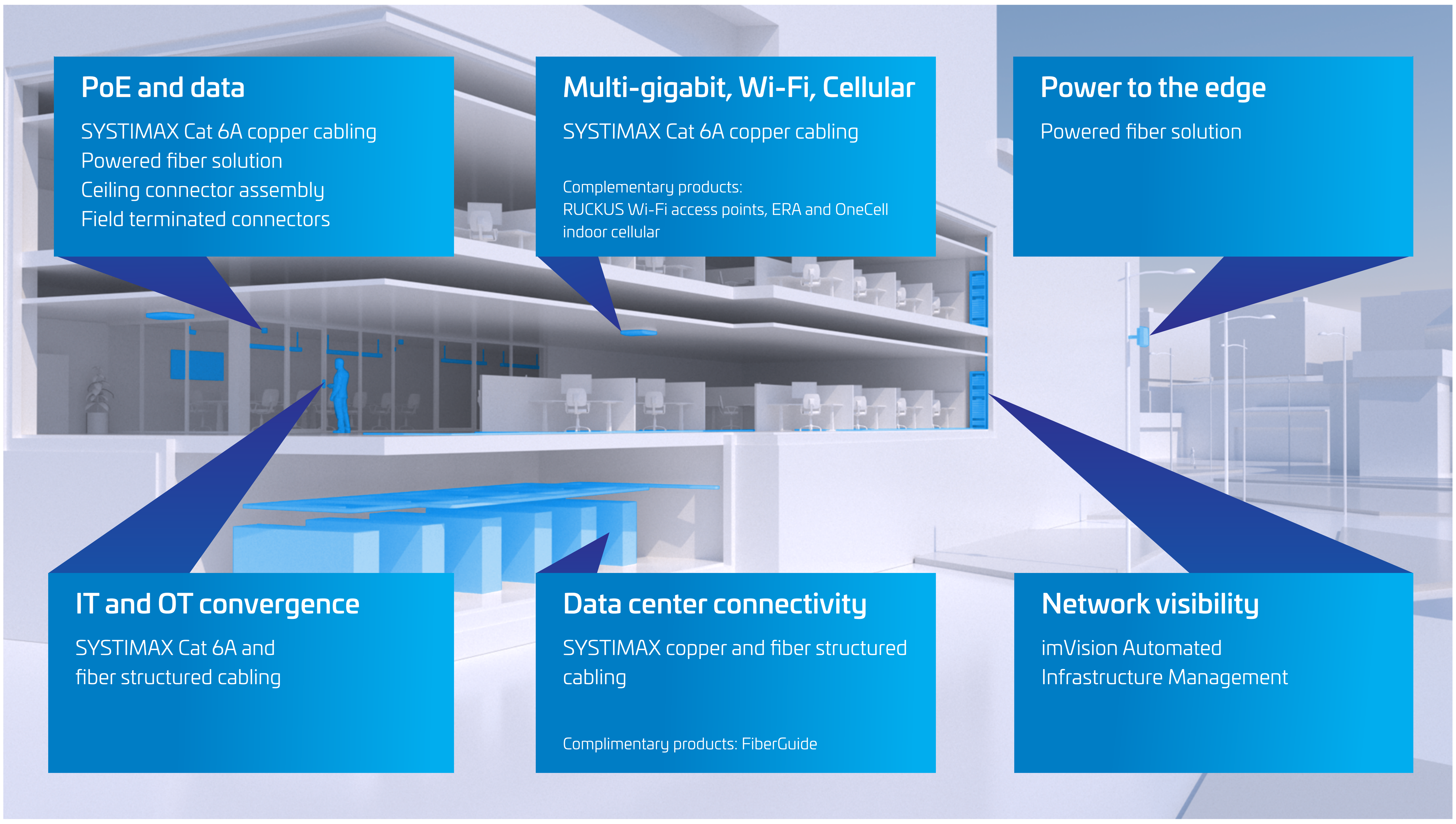
A structured cabling system unifies different connectivity systems, including the following:

Wired

- Four-pair ethernet cabling
- Single-pair ethernet cabling (the new standard for IoT and BAS cabling)
- Power cabling via PoE or other DC power solutions to support network devices
- Legacy building/OT/AV and security cabling
- Fiber cabling

Wireless

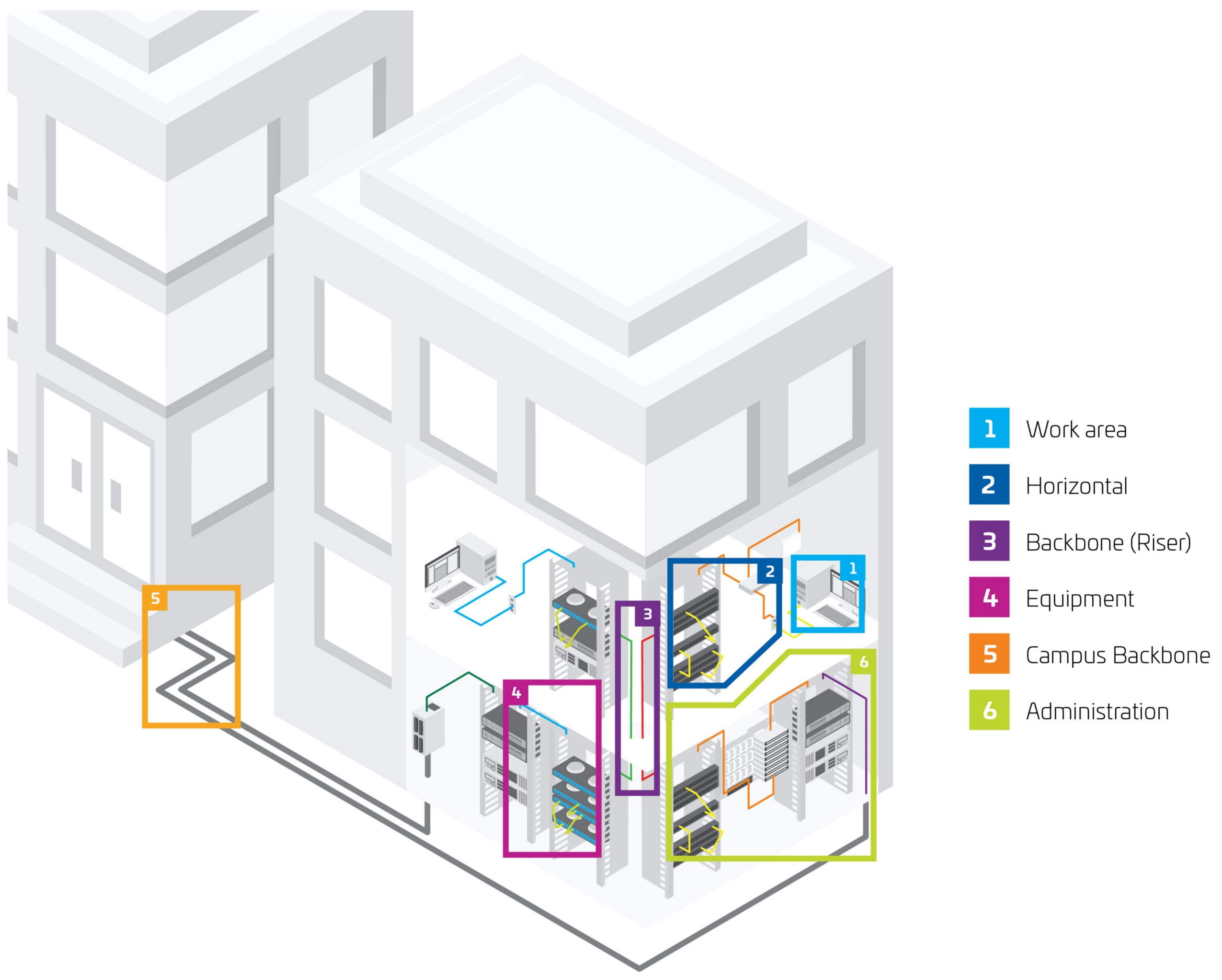
- Cellular wireless: for public safety (3G, 4G LTE and 5G)
- CBRS private cellular network: public licensed and private unlicensed versions
- Wi-Fi
- Li-Fi
- Short range wireless
- LPWAN- NB-IoT, LoRa, Sigfox and LTE-M



The elements of an SCS

The complete structured connectivity solution can be divided into six discrete subsystems. Each subsystem provides modularity and flexibility; changes and rearrangements usually take place in just two of the subsystems. Configurations for different types of connectivity, for new applications or for new standards may also involve just a few subsystems. When linked together, the following six subsystems provide a complete, integrated connectivity system:

1. Work Area Subsystem
2. Horizontal Subsystem
3. Backbone (Riser) Subsystem
4. Equipment Subsystem
5. Campus Backbone Subsystem
6. Administration Subsystem

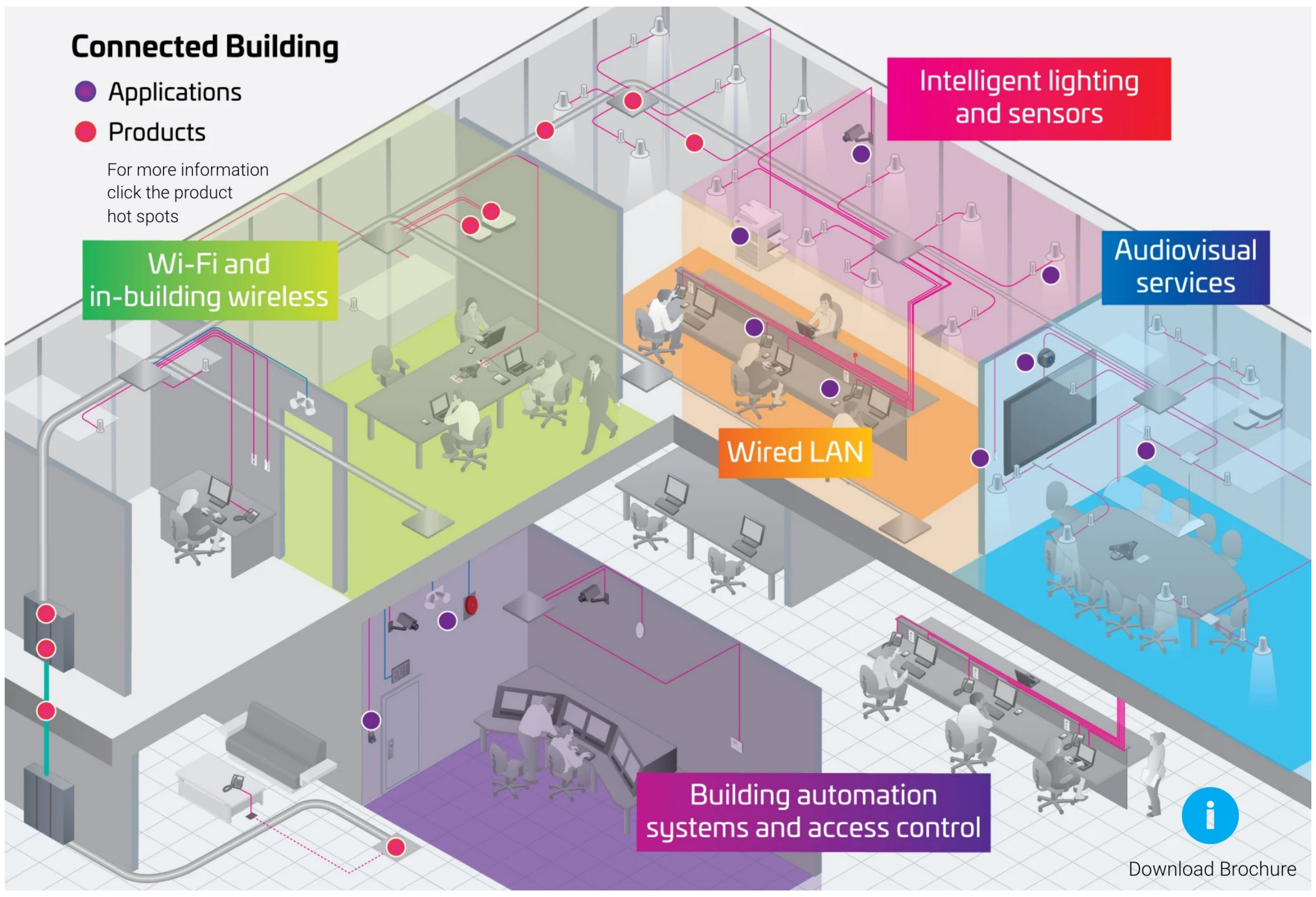


Designing a structured cabling system is complex, expert task, for which specific training courses are recommended (such as CommScope's own training modules) but there are a few fundamental principles of design to remember:

- IT rooms should be big enough to accommodate racks for cabling and equipment, with space for growth and equipped with the right facilities such as security, lightning, HVAC, etc.
- The backbone/riser between telecom rooms should be properly dimensioned, with space to accommodate growth. It's very common to use fiber on the backbone to ensure the support of high-speed future applications or to create links over 90m.
- All copper outlets should be at a cable length of 90m or less from the Telecom closet
- Information outlets should be available in all the possible rooms. Even a storeroom may be converted in the future into an office, and since you don't want to rewire because of that, it's advisable to install information outlets in such spaces as well, as you would do with the power outlets.
- All copper elements should be of the same category, given that the system performance will be matched up with the lowest category element.

Open our interactive tool to find out more about the different applications and connectivity products used in a modern connected building.

Click to launch the interactive tool >



Applications of structured cabling

Applications in commercial smart buildings

Intelligent buildings bear that label for more than one reason. On a literal level, the networked connectivity between a building's systems make it possible for the enterprise within to automatically regulate security, environmental conditions, lighting, communications, and other factors—helping maintain a welcoming atmosphere conducive to the work performed there. These networks of systems have become more critical to the efficiency, effectiveness, and economy of an enterprise's operations. Using a broader definition, intelligent buildings are also an effective means for an enterprise to increase efficiency, reduce costs and streamline operations. This is a "smart" approach to reducing operational expenses and facilitating a flexible growth model.

As enterprises embrace the efficiencies of intelligent buildings, three key needs are emerging:

1. The need for mobile connectivity within the enterprise, as fewer employees are bound to desks but need ubiquitous wireless coverage
2. The need to lay a future-ready infrastructure foundation for the still-evolving, ever-growing internet of things (IoT)
3. The need to converge many disparate or proprietary networks onto a single, unified IP over Ethernet physical network layer

Learn more about smart buildings in our eBook: Smart Building Connectivity

Smart building connectivity ebook

The intelligence of today's smart buildings is in the integrated communications infrastructure that powers and connects. Learn the strategies and best practices of creating the network infrastructure needed to realize your smart building's potential.

Download

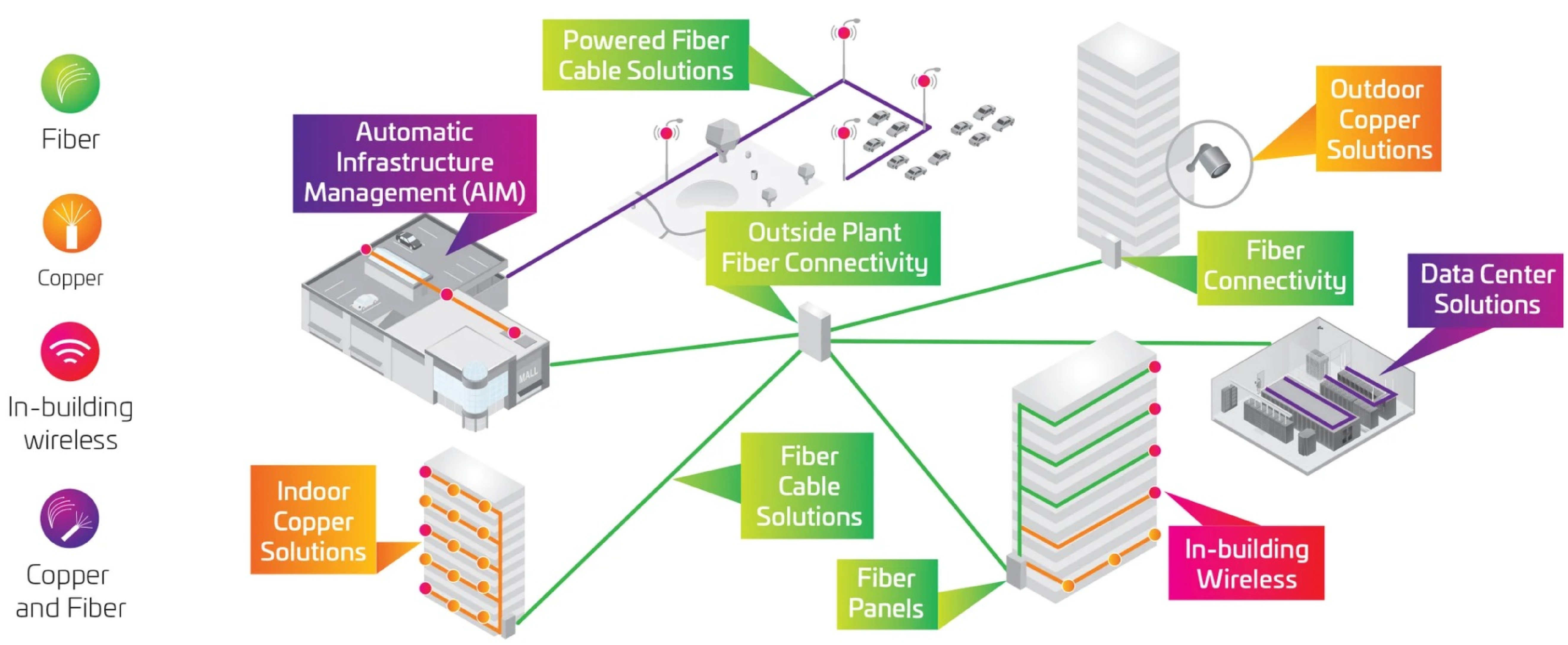
Applications in smart campuses

As we see exponential growth in connected devices, wireless technologies and the internet of things (IoT), campus networks are forced to grow and evolve to keep up with the demand. Today's campus networks need to be able to quickly ramp up to speeds as fast as 40 Gbps, 100 Gbps and beyond to stay ahead of these technological advancements.

A campus relies on indoor and outdoor backbones to transfer data in and out of buildings and connect all who live, work or educate inside.
It requires fiber, copper and wireless infrastructure to work seamlessly together today in a system that is structured enough to bring efficiency and reliability, but which is also flexible enough to grow and adapt with changing demands in the future. [Open our interactive tool to see the elements of a campus network](#).

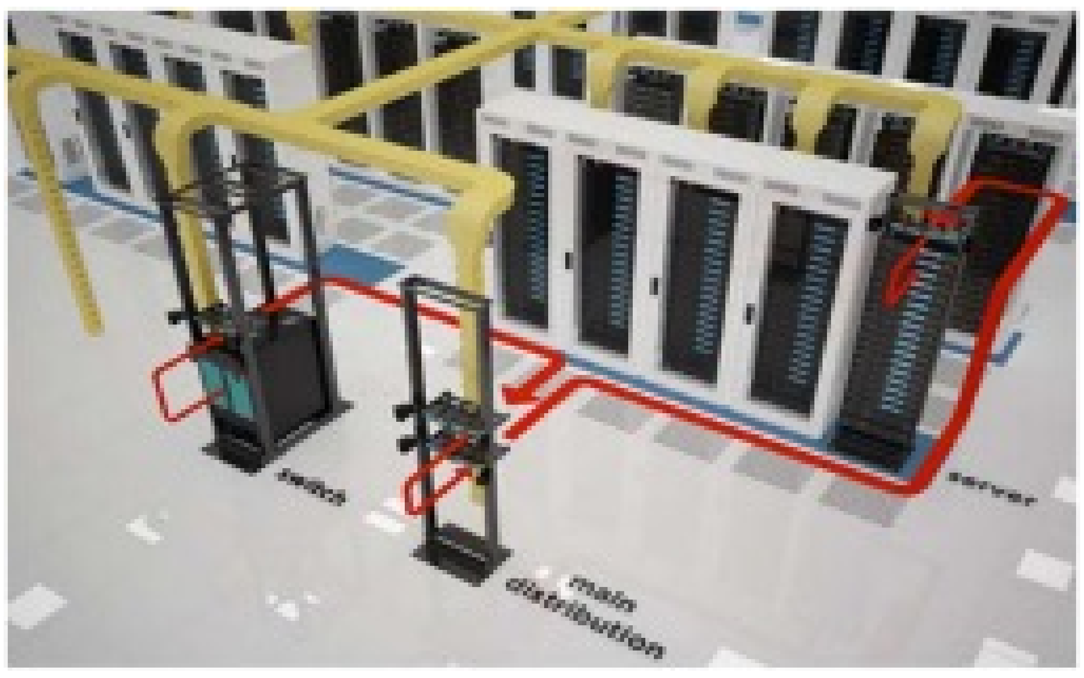
Watch video: Smart Campus solutions from CommScope

Click to launch the interactive tool >



Applications in the datacenter

Data centers are one of the most complex environments where a structured cabling can be most helpful and even indispensable. Given the many pieces of active equipment that need to be interconnected, a point-to-point methodology for linking those elements quickly becomes unmanageable.



Data center cabling standards provide more detail around the physical media and define the channel that supports the applications. There are three main cabling standard bodies: TIA, EN and ISO.

Each of these groups has a general standard which defines structured cabling, as well as a standard specifically for data center applications to reflect the need for higher speeds, increased density and an array of architectures. While there are differences between these standards, there is agreement around the minimum recommended cabling categories and connector types.

	TIA®	CENELEC	ISO/IEC
Data Center Standard	TIA-942-B	EN 50173-5	ISO-IEC 11801-5
Fiber	OM4 OS1a	OM3 OS2	OM3 OS2
Connectors		LC (≤ 2 fibers) MPO (≥ 2 fibers)	

In addition to EN50173-5, CENELEC has also developed the EN 50600-2-4 standard "Telecommunication Cabling Infrastructure". It focuses primarily on design requirements for the different DC availability classes with strong emphasis on migration and growth.

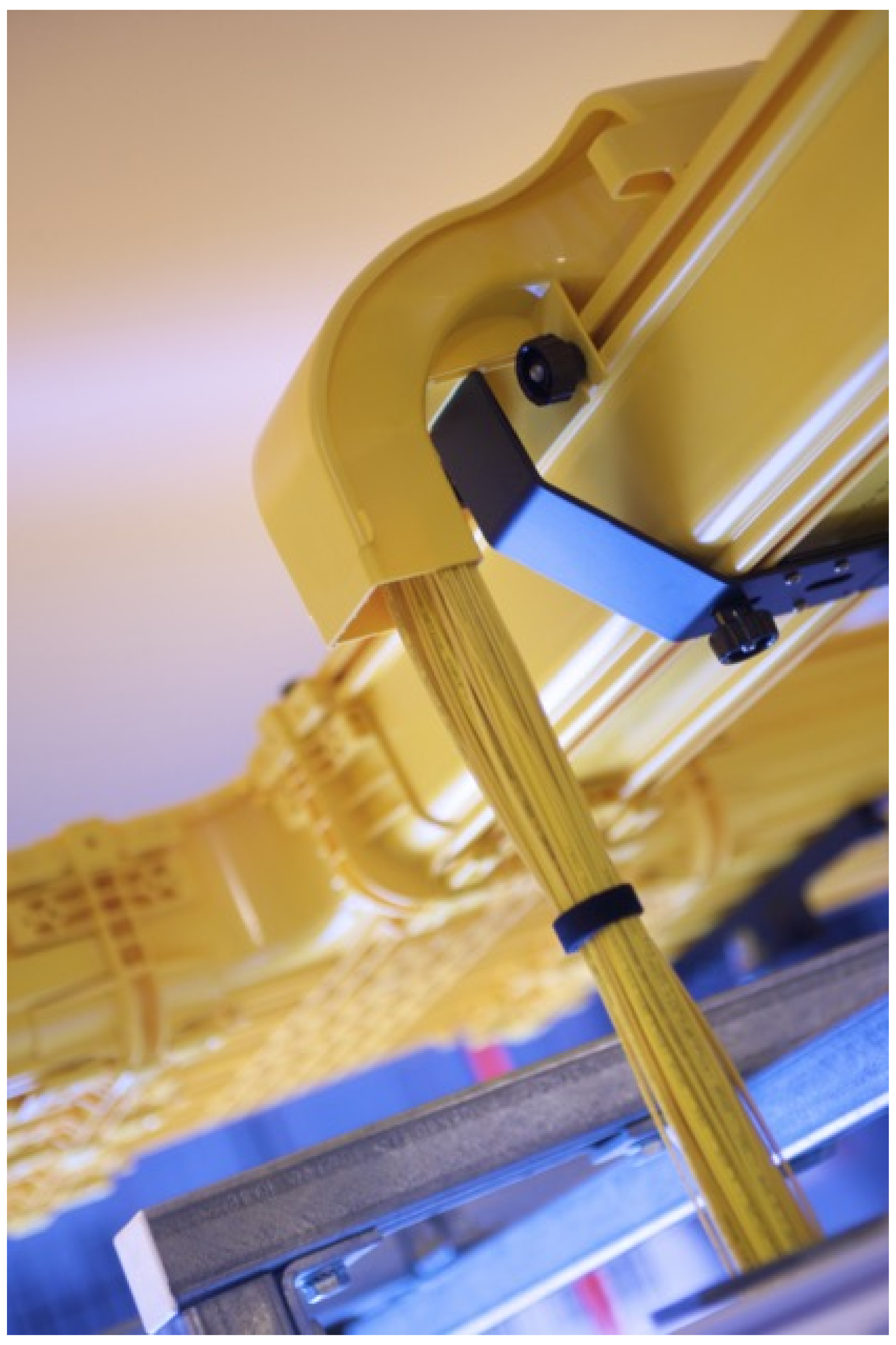
Fiber pathways

Since the data center may need thousands of fiber connections between the different areas, it's important to properly route all of those fiber cables.

Fiber raceway systems, have revolutionized the protection and routing of fiber. The main objectives are to gain flexibility, reduce the installation time and maintain the proper fiber bend radius.

The requirements for such a raceway would be:

- All components to provide maximum fiber protection
- Maintain a minimum of 2-inch bend radius throughout
- To offer a wide variety of components for system flexibility
- Scalability, ideally to supports systems of 400 to 25,000 patch cords
- Not all datacenters are equal, so a variety of sizes is desirable: 2x2, 2x6, 4x4, 4x6, 4x12, 4x24
- Variety of exit styles and sizes
- Vertical and on-demand fiber management systems
- Availability of a configuration tool that allows users to import layouts into a web-based tool, design desired raceways in a 3D format, and export detailed drawings and BOMs used for easy installation and ordering

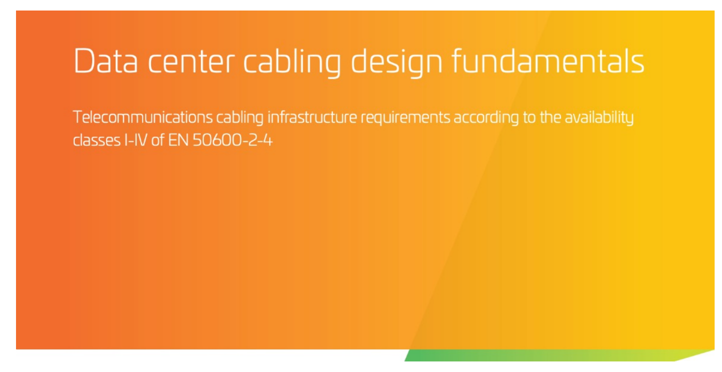


Further information on data center cabling:

Multimode Fiber: the Fact File

Singlemode Fiber: the Fact File

Data Center Best Practices



White Paper: Data Center Cabling Design Fundamentals

Raceways | CommScope

Point-to-Point versus Structured Cabling: Which Option is Best for You?

High Speed Migration – Bandwidth without boundaries

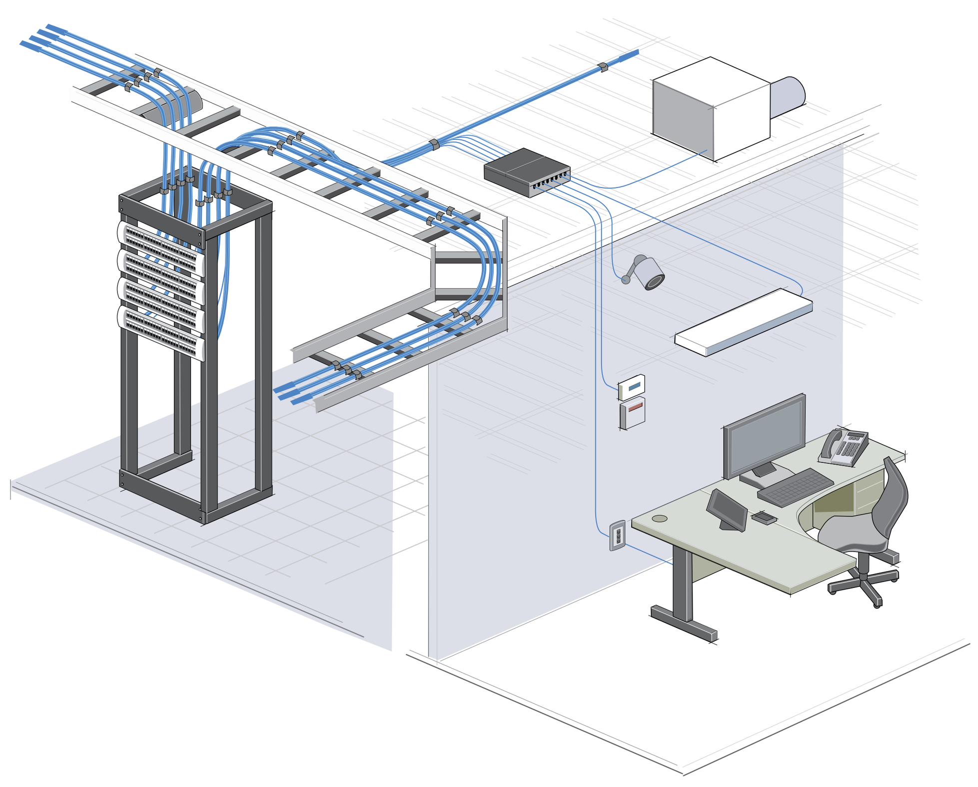
Beyond data: power feeding

With the Ethernet's overwhelming success in the networking world, Power over Ethernet (PoE) has emerged as a preferred technology for delivering remote power to connected devices.

As more networked devices—such as IP security cameras, Wi-Fi access points, in-building wireless, building management systems, and LED lighting—begin using remote powering, the opportunity to save on infrastructure costs by powering them over existing structured cabling continues to grow.

To ensure consistent PoE performance, in 2003 the Institute of Electrical and Electronics Engineers (IEEE) set a standard of 15.4 watts to be supplied from the power source. Today, as enterprises demand more from PoE technology, work was completed to create a new standard (IEEE 802.3bt) that supplies up to 90 watts from the power source. This standard, also referred to as 4-Pair PoE or simply 4PPoE, enables the remote powering of a broader range of connected devices. It will also increase the effects of cable heating as power is dissipated from bundled cabling.

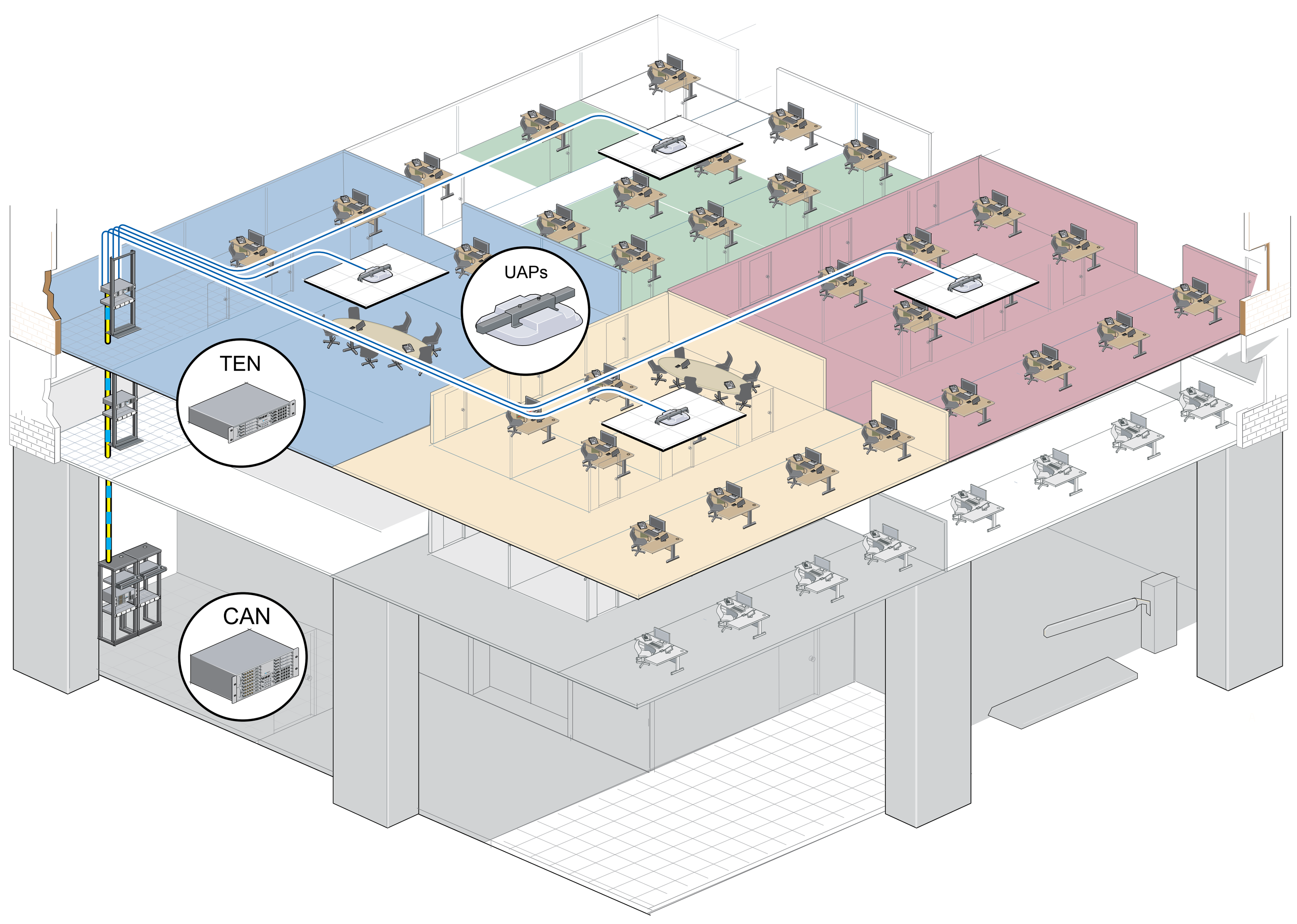
To learn more about how the structure cabling leverages the PoE capabilities, you can visit this page or read our fact file on Power Over Ethernet.



Typical cabling topology

Cabling for wireless

Network infrastructure, specifically cabling, is often not publicly recognized for its value because it remains hidden: out of sight, out of mind and out of the way. Most industry talk today is of wireless and its increasing ubiquity. By its very name, wireless suggests "using less wire." But the **main advantage of wireless** is not to save money by replacing wire. **There is still a lot of wire in wireless.**



In fact, there will be a need to "**wire more to wireless,**" as wireless networks transform to smaller and smaller cells to achieve the **capacity and coverage** users and devices require. And with the much heralded advent of the **Internet of Things**, the number of connections required will only increase.

Regardless of the talk of a future wireless world, such a place will still be highly dependent on a network infrastructure based on cables, albeit a large part of it being optical fiber rather than wire. As such, all **infrastructure considerations** must begin with a structured approach to cabling. Structured cabling is the accepted way of dealing with the proliferation of interlinked electronic devices. Because a single type of copper and/or optical fiber cable is able to meet a variety of communications needs, the wide adoption of structured cabling will continue as applications **expand from voice, data and video** to include **building automation systems, security systems and other control networks**. However, different cabling types have restrictions on their applications and specific capabilities. Design teams will need to evaluate the choice carefully with the **building use and longevity** in mind.

Hopefully very few building developers today would dream of specifying a new office without adequate vertical ducts, generous floor-to-ceiling heights or access floors. Also, simpler design strategies for rehabilitating older buildings are becoming routine. Designers are finding ways to achieve simpler, cheaper and neater architectural solutions to problems associated with accommodating networks. Also, it is now far more common for clients, IT specialists, facilities managers, and all of the many and varied members of building design teams to "be on same page" during the design and building process.

The process of diffusing networks throughout organizations is not – nor ever will be – complete. Wherever, whenever and however connections arrive, there always will be trouble and change. There is no doubt, however, that organizations are increasingly dependent on communication networks and, therefore the relationship between networks and building design is simply far too important to the survival of many organizations ever to be forgotten or ignored.

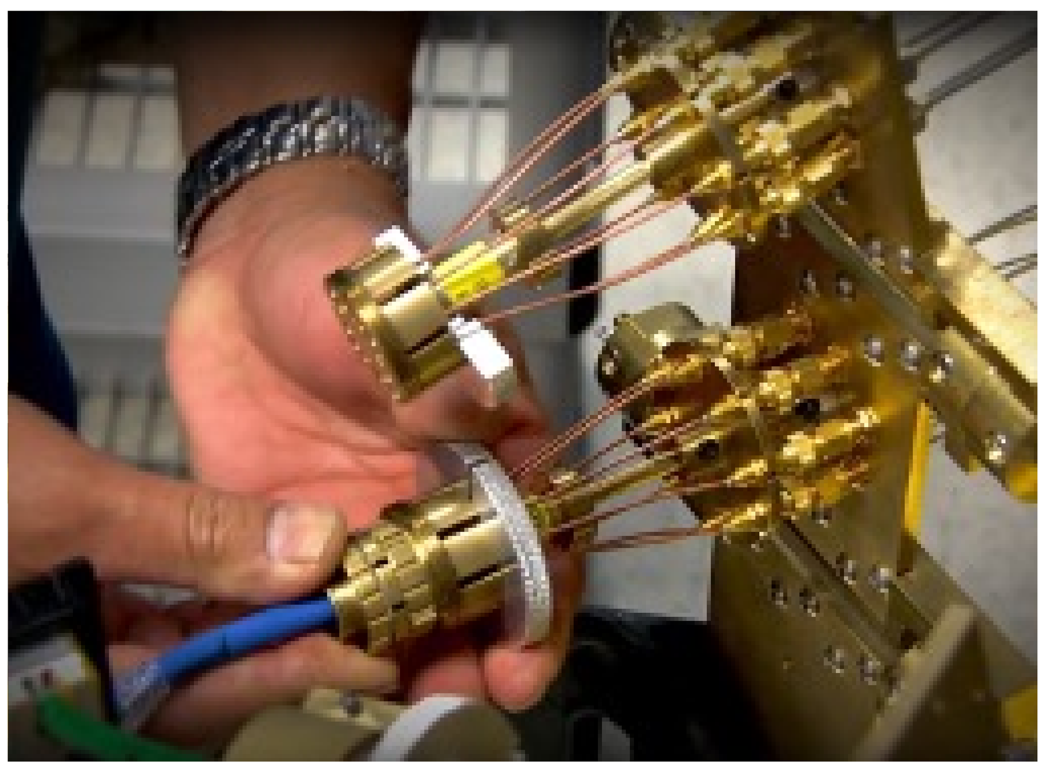
Find out more about the importance of wired infrastructure behind wireless in our fact file on In-Building Cellular networks.

The technology behind structured cabling

Technical innovations we're not aware of

In the 1990s, local area networks (LANs) were booming, but future application demands were driving the need for more bandwidth than Category 5e copper twisted pair systems could provide. Crosstalk in the ubiquitous RJ45 modular connector was a key electrical impairment that held back increases in usable bandwidth. The development of Cat 6 connectors, matched with complementary Cat 6 cables and cords, solved this problem.

Additionally, in 1997, SYSTIMAX introduced improved twisted-pair connectors which incorporated breakthrough technology called multi-stage compensation. This new compensation technique enabled connectors with drastically reduced crosstalk levels which, when coupled with improved cables and cords, doubled the usable bandwidth of the cabling system. The structured cabling industry later standardized these improved levels of performance as Category 6, Class E systems in US, European, and international standards.



Key to the breakthrough is placing multiple stages of compensating crosstalk in precisely controlled locations to substantially overcome the negative impact of offending crosstalk. These further enhancements led to even higher performance levels introduced to the market in 2004 and later standardized by the industry as Category 6A, Class EA. CommScope obtained patents on the noted compensation methods and lead frame designs.

Multi-stage compensation facilitated the realization of Cat 6A cabling, and a whole family of related patents on compensation methods, jack design and lead frames arose from this initial innovation. To enable industry growth, CommScope licensed its patented technology to others in the industry.

Category 6 systems enabled modern LANs with robust support for network speeds of 1 Gigabit/sec. Category 6A systems enabled ten times that speed – up to 10 Gigabits/second. Category 6 and Category 6A are the most commonly used cabling solutions in the market today.

Find out more about copper cabling technology
Find out more about fiber cabling technology

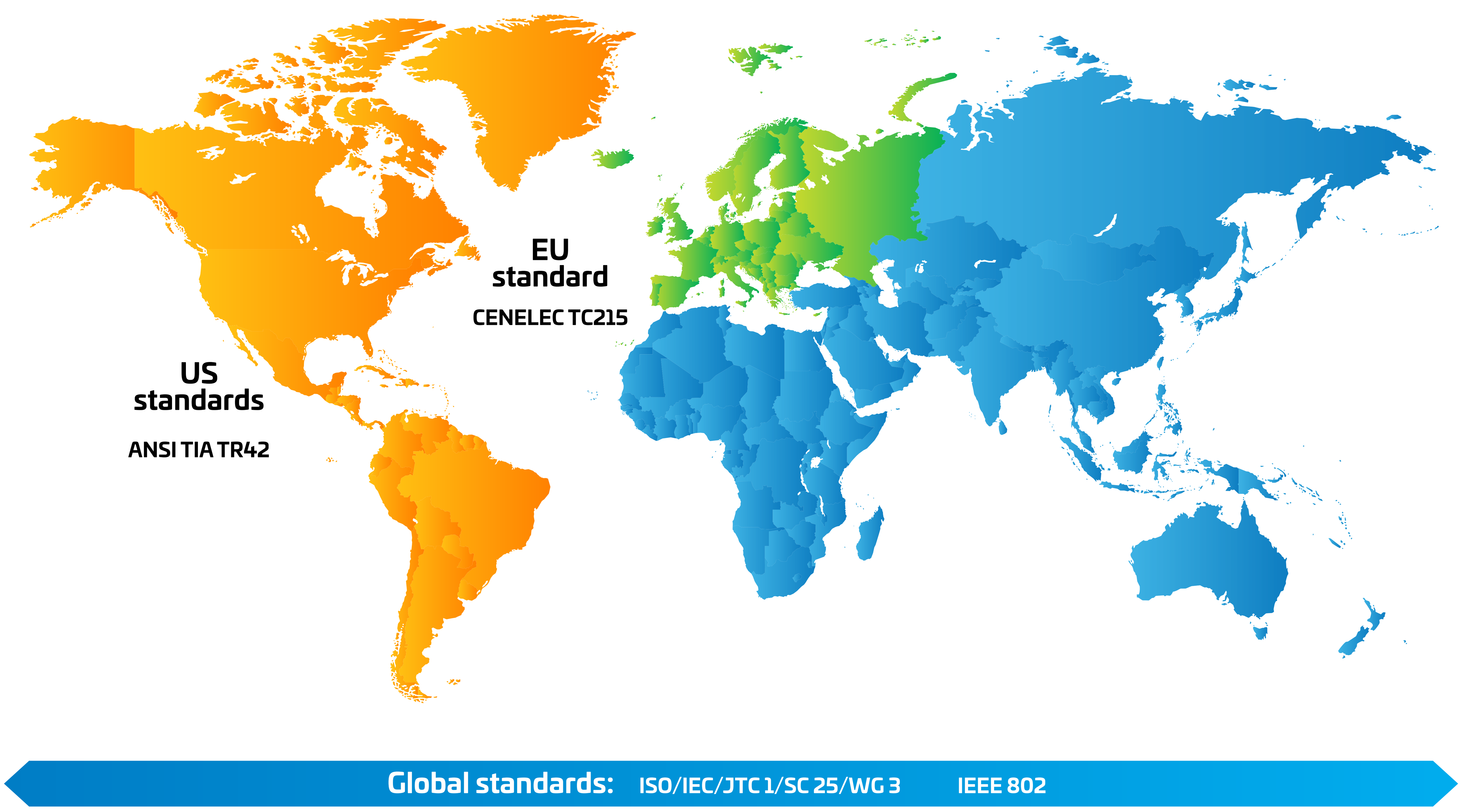
In order to get best use from SCSs, standards need to be ratified and observed. The IT industry has recognized the important role structured cabling provides and has developed standards that encompass the capabilities and functions of these solutions, including the following:

In the telecom, intelligent building and cabling industries, standards development organizations demonstrate considerable cooperation by providing viable solutions for growing communication needs. There are always numerous new and updated standards in development. For example, the International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) recently published the first international standard for Automated Infrastructure Management (AIM).

CommScope is very active in standards organizations and currently has employees chairing committees, providing technical expertise and helping progress standards to successful publication and deployment. Several CommScope associates have even been recognized with awards for their service to the IEC, Institute of Electrical and Electronics Engineers (IEEE) and Telecommunications Industry Association (TIA). It is important for our customers that we stay on the cutting-edge of network technology evolution.

In the Connected and Efficient Buildings e-book, CommScope gives an overview of the organizations most involved in cabling and connectivity standards for intelligent buildings. Here's a summary of them and some recent developments:

STRUCTURED CABLING STANDARDS BY TERRITORY



US

ANSI TIA TR42

ANSI TIA TR42 was the first organizations to establish a "hierarchical star" wired networking topology in the TIA-568 standard for buildings back in 1990, creating a unified network topology to support voice, data, and video communications over the same network. Since then TIA TR42 has continued to be the leading forum to create a wide range of related standards including TIA-569 for pathways and spaces, TIA-606 for administration, TIA-607 for bonding and grounding, and TIA-5017 for physical network security.

Global

IEEE 802

IEEE 802 is responsible for standards related to copper and fiber "Ethernet" applications ranging from 10 Mb/s to 400 Gb/s. These standards help enable the exponential growth of data traffic across different elements of communications networks in enterprises, data centers and metropolitan areas—touching most aspects of the way we work, play and live.

ISO/IEC 18598:

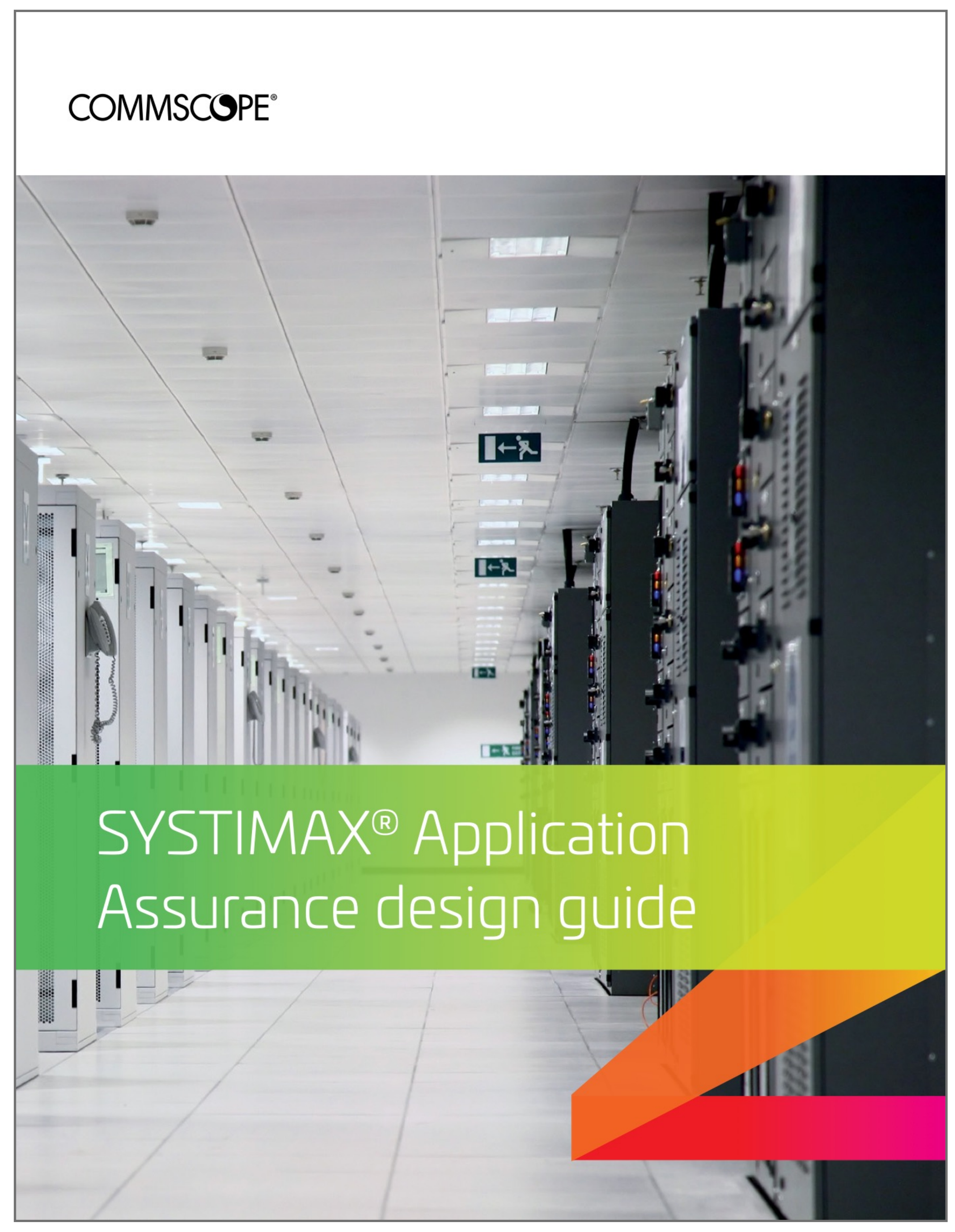
ISO/IEC/JTC 1/SC 25/WG 3 and Related IEC Component Committees are active in developing cabling standards that support the IEEE 802 networking applications. This committee created the "structured cabling" paradigm that enabled many different applications to work over the same cabling topology and media types.

Europe

CENELEC TC215:

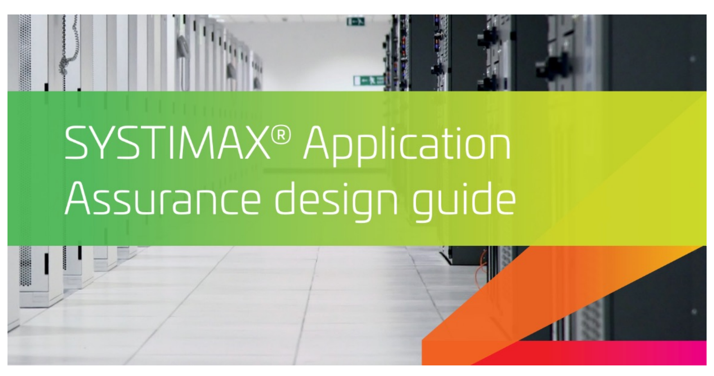
CENELEC TC215 standards generally follow the ISO WG3 standards and are widely adopted in most European Union (EU) countries and beyond. CENELEC has played a leading role in development of cabling requirements in support of remote powering applications such as Power over Ethernet (PoE).

Embracing the digitalization of the enterprise is a competitive imperative. Modern applications are evolving quickly to take advantage of a wide array of services and new technologies that promise quicker time to value for new applications, and scale and scope to serve your customers whenever and wherever they connect with your business. New design tools are required to speed the design and planning phase—and to keep pace with the capacity and performance demands while delivering optimal infrastructure ROI.



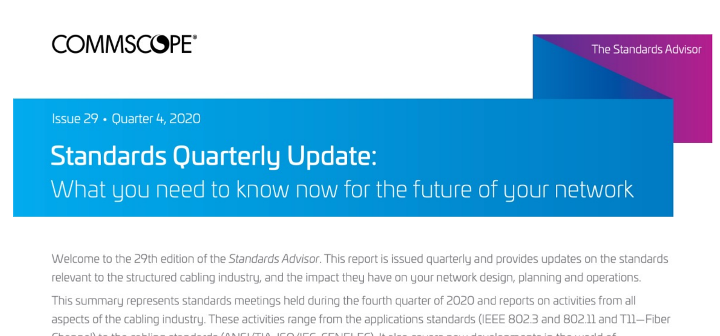
To address these challenges, CommScope offers a suite of tools that simplify the design, deployment and ongoing expansion to support the high-speed migration of fiber connectivity. For example, the SYSTIMAX® Performance Specifications define channel topology limits specific to SYSTIMAX cabling solutions for a wide range of applications. Additionally, the SYSTIMAX Fiber Performance Calculator provides the attenuation requirements for a proposed cabling channel while simultaneously determining which applications the channel will support. CommScope stands behind the Performance Specification and the Fiber Performance Calculator analysis with warranty* assurance for all the supported applications. Not only do these tools allow rapid design exploration, they form the basis of our unique SYSTIMAX Application Assurance. Under the terms of CommScope's 25 Year Extended Product Warranty and Application Assurance, CommScope guarantees the cabling will meet specification and that the applications will operate in accordance with the Performance Specifications. In many cases, beyond the distances and channel complexities specified in the standards. The System Warranty provides the details of the terms and conditions of our Application Assurance.

See our application guide below for an overview of these tools, along with practical examples that illustrate how they can be used to plan application performance over a specified channel using SYSTIMAX fiber cabling. The result is verified application support, validated installation performance and an end-to-end Application Assurance backed by CommScope and its extensive PartnerPro® Network of certified installation partners.



SYSTIMAX® Application Assurance design guide

25 Year Extended Product and Application Warranty



Structured Cabling Standards | CommScope

Using SCS to reduce costs and energy

The benefits of using a structured network infrastructure include lower material and labor costs, a single installation force for cabling, a single point of contact for systems integration, reduction in physical space requirements, lower relocation expenses, reduced maintenance and administration costs, and the ability to migrate to new technologies with greater ease, less risk and lower costs.

The ideal structured network infrastructure is not just the use of particular category of cabling product (Category 5e, 6, 6A etc) in the building. In fact, an infrastructure could have a **mixture of twisted pair and fiber optic cabling**, but also important is the design, installation and ongoing management. The concept is to **wire once**.

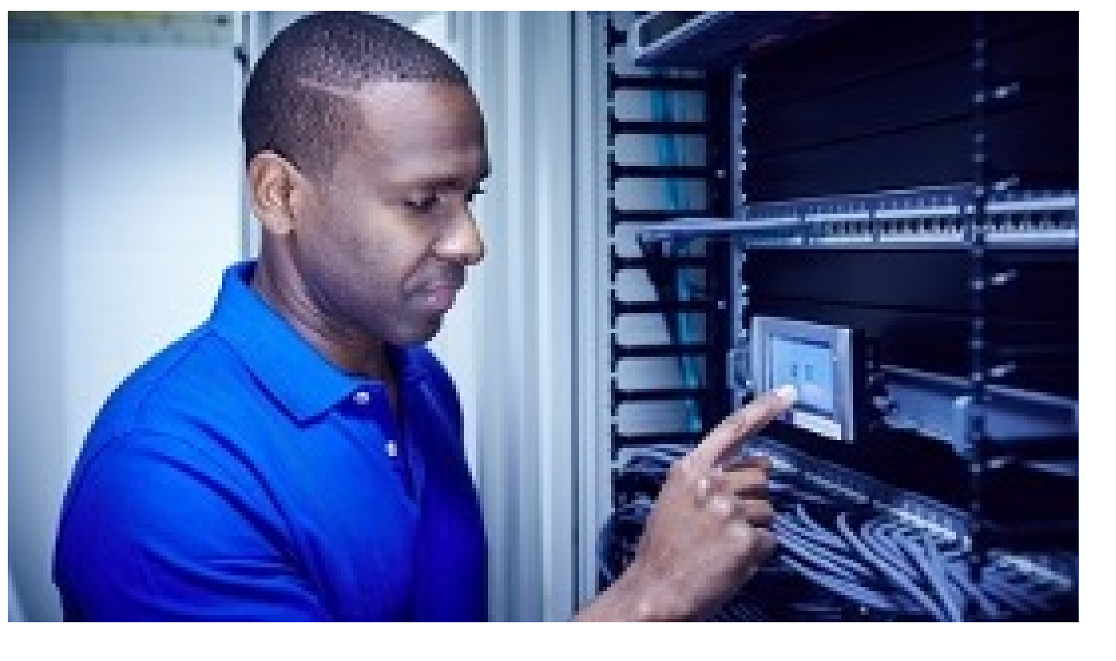
The extra material cost and labor expense incurred in implementing a true structured network infrastructure is minimal compared to the higher labor expense involved in upgrading and re-cabling at a later date.

Today, **energy conservation** is a global priority. Energy consumption is increasing at an alarming rate, oil prices are rising, which lead to increases in the price of electricity. Government programs are being instituted and laws enacted to improve the energy efficiency of buildings. While fuel prices continue to fluctuate, there is a worldwide quest to protect the environment and conserve energy, demand for healthy work environment, and the need to minimize expense during difficult economic times. With a true structured network infrastructure, the merging of telephones, computers, wireless devices and building management controls onto one centralized IP network is enabled as the technology evolves, as well as improving the building's carbon footprint. The structured network infrastructure becomes the **'fourth utility' of a building**.

The key to this is **early planning, long term thinking and avoiding 'living for today' investment,** which is as applicable to IT as it is in all walks of life.

Automated Infrastructure management

The business and technology world is continuously evolving. We have to connect more people using more devices than ever before—which means constantly developing the power and capacity of the networking infrastructure we use.



Delivering the performance is one thing, but managing it is an enormous challenge because modern networks are increasingly complex. Heavily meshed leaf-spine architecture and point-to-multipoint connections make the orderly management and supervision of these networks difficult.

We have other challenges too with space increasingly at a premium, giving us higher densities of ports on shelves, and an increase in the chance of human error. And the people themselves are under increasing pressure – and often fewer in decreasing numbers.

The network management technology that has come to the rescue is known as AIM (Automated Infrastructure Management). By automating the detection, supervision and management of all connections across the network—both fiber and copper, and regardless of location—enterprises are able not only to keep track of devices but also to optimize the network to squeeze the best possible performance and deliver the best possible IT experience to enterprise users.

Further information

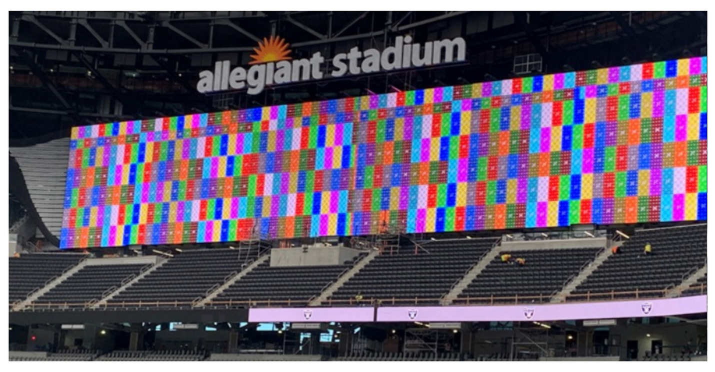
Case studies

Madrid

CommScope harnesses the power of PoE in Madrid

SAHMRI

SAHMRI selects CommScope network infrastructure solutions to support world-class medical research



Allegiant Stadium

CommScope fiber is the backbone of Allegiant Stadium

Why choose SYSTIMAX?

SYSTIMAX created the SCS concept 40 years ago and has led the market since then.

Breakthrough solutions that become mainstream years later

Guaranteed performance, always exceeding standards specifications

End-to-end solution

Trained and qualified technical support in 150 countries

SYSTIMAX solutions precede the standards and set the footprint

PartnerPro network: hundreds of trained and qualified companies with expertise on SCS design and deployment

Best warranty in the industry, covering not just products, but also applications

Training courses

SYSTIMAX Design and Engineering [3321]

The firm focus is generic best design practices and aspects of design specific to the large range of SYSTIMAX cabling products such as: GigaSPEED® UTP and FTP, VisiPatch™, modular copper and fiber terminated solutions, imVision® hardware. Design to both standards and extended SYSTIMAX standards are included together with testing and warranty requirements.

SYSTIMAX Installation and Maintenance [3361]

This online course covers installation, termination and testing practices specific to the SYSTIMAX cabling solution. Upon completion, the course allows students to register projects for the extended SYSTIMAX warranty from an installation perspective, providing their company is an approved SYSTIMAX Installer Partner.

Pre-Terminated Data Center Solutions [8850]

The objective of this course is to help students understand Data Center infrastructure technology and design. Many different services need to be incorporated to provide a resilient solution. This course discusses the latest in pre-terminated cabling solutions for both copper and fiber that increase installation speed in addition to providing ready upgrade paths without major re-cabling.

The benefit of structure: remembering life before SCS

We consider the many benefits brought by the shift away from multi-cable chaos to a more structured approach.

Read

CommScope pushes the boundaries of communications technology with game-changing ideas and ground-breaking discoveries that spark profound human achievement. We collaborate with our customers and partners to design, create and build the world's most advanced networks. It is our passion and commitment to identify the next opportunity and realize a better tomorrow. Discover more at commscope.com

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Visit our website or contact your local CommScope representative for more information.

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