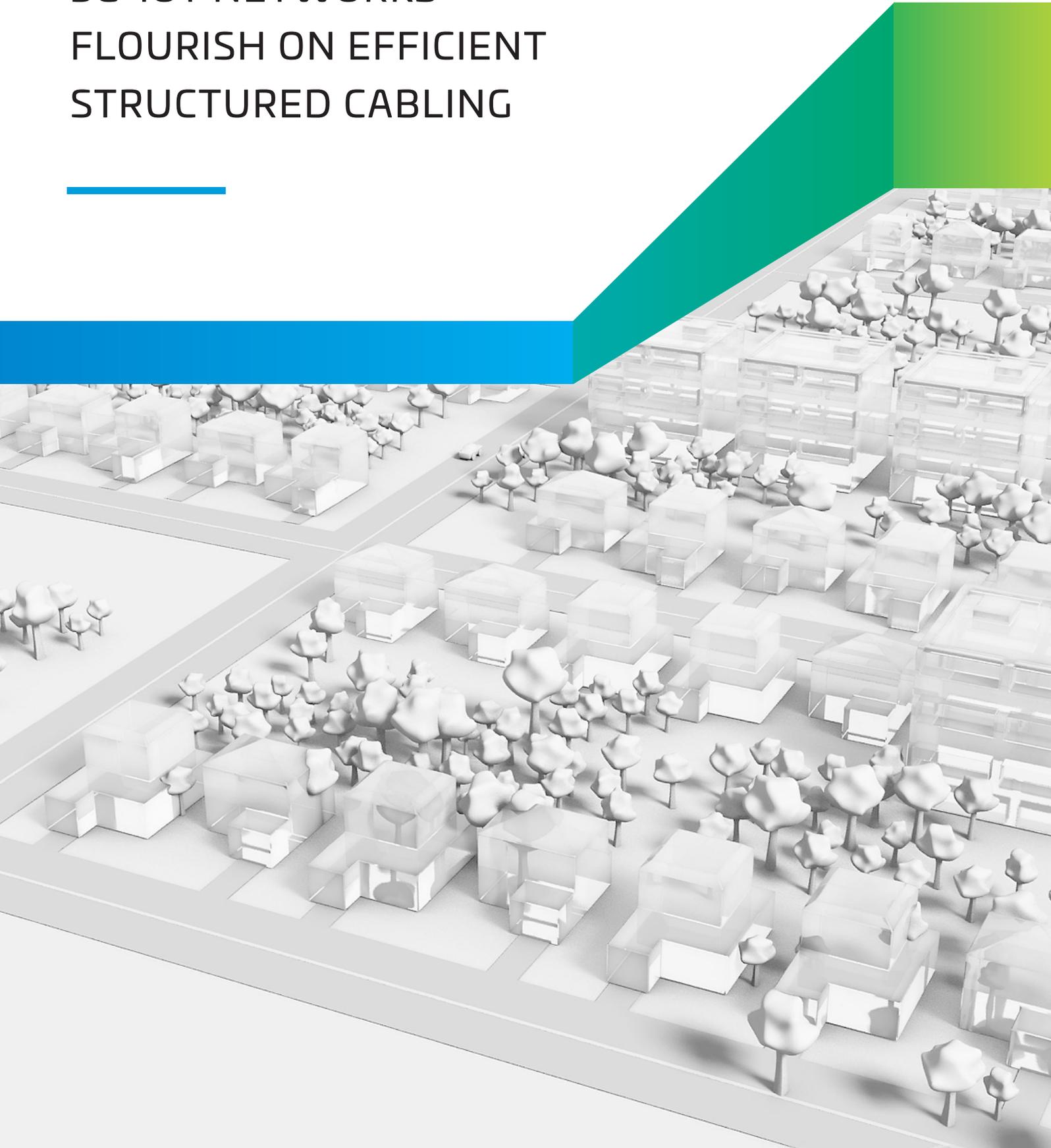# CHAPTER 2

5G-IOT NETWORKS FLOURISH ON EFFICIENT STRUCTURED CABLING

> Enterprises must be mindful that deploying individual networks for myriad IoT and cloud services not only adds complexity and cost but also may impact network performance.

Faced with the impact of emerging IoT and 5G applications, IT network managers must seriously consider infrastructural efficiency. Key challenges include network densification for more usable floor space; cabling system performance to meet future bandwidth demands; and important connectivity drivers such as Wi-Fi; PoE-enabled devices; and in-building wireless (IBW) systems.

OPTIMIZING SPACE UTILIZATION FOR NETWORK DENSIFICATION

The relatively high cost of real estate across many large metro areas is driving renewed focus on cabling for efficiency and performance, especially as the enterprise network supports more IoT and 5G devices as well as applications and use cases.

CommScope's Universal Connectivity Grid (UCG) aims to optimize space utilization by dividing floor space into evenly sized areas. By deploying consolidation points in the ceiling of each area, connections to the core network and access to other wired and wireless networks are made easy.

Indeed, more connected devices are being deployed in the ceilings with facilities and

IT networks converging onto IP/Ethernet. The Ceiling Connector Assembly (CCA) high-quality cable interconnection, which is available as a standalone unit or pre-terminated to an RJ45 plug, simplifies installation of these devices.

STRUCTURED CABLING PERFORMANCE FIT FOR 5G, WI-FI 6

The 5G networks of the future herald sophisticated connectivity to myriad smart edge IoT devices. These high-speed networks will meet bandwidth, efficiency and latency requirements of more machine-to-machine connections.

Within the enterprise, category 6A cabling delivers high bandwidth and remote power to support a common connectivity platform for wired LAN and wireless technologies, occupancy sensors, intelligent lighting,

audiovisual services, building automation, and access control to enable the IoT.

Meanwhile, early implementations of 400G fiber uplinks and backbones are happening, even as migration to 100/200G from 40G continues.

Building backbones have traditionally been designed to exceed the horizontal requirements by a factor of 10. With upcoming Wi-Fi 6 (802.11ax) APs offering theoretical speeds of up to 10 Gbps and more efficiently serving multiple devices, any new or retrofitted backbone infrastructure should be specified to support backhaul bandwidth of 100 Gbps.

The fiber-optic infrastructure capable of this speed is OM5 wideband multimode fiber. CommScope's SYSTIMAX structured cabling, featuring single mode, multimode and OM5 wideband multimode fiber, is certified to meet or exceed industry standards.

As the number of switches and assets to support 5G-IoT requirements grows, CommScope's structured cabling approach ensures scalability and standardizes implementations of complex networks in intelligent buildings, campuses and data centers. This approach, which adheres to established standards for deploying cabling within a building or a group of buildings, delivers very low latencies and improves

overall network efficiency to reduce CapEx and OpEx in the long run.

IOT CONNECTIVITY DRIVERS

CommScope's structured cabling is also designed to power connected IoT devices and sensor-driven technologies.

With the advent of the IoT, managing PoE-enabled links has become increasingly difficult. The latest IEEE 802.3bt PoE standard, also referred to as 4PPoE, enables the remote powering of a broader range of connected devices.

To this end, CommScope is contributing to new cabling standards based on bundle size recommendations and building physical cable bundles subject to a variety of power and environmental conditions. CommScope also offers a powered fiber cable system to connect and power devices that are located more than 100 meters from the PoE switch.

To help manage CommScope's SYSTIMAX structured cabling portfolio of UCGs, fiber optic backbones and PoE solutions, the imVision automated infrastructure management (AIM) system provides network administrators a holistic view of the network from which to optimize the allocation and use of resources.

SUCCESS STORY: DALLAS COWBOYS, TEXAS, U.S.A.

DALLAS COWBOYS HQ FUTURE-PROOFED WITH SMART STRUCTURED CABLING

The Ford Center at The Star is the Dallas Cowboys' headquarters and training facility in Frisco, Texas. Boasting retail, entertainment and office space, including two outdoor practice fields and the Cowboys Club, The Ford Center features a 12,000-seat indoor stadium and multi-use event center to host Cowboys training as well as local high school football games.

Ensuring visitors can text, email, make calls, and send pictures and videos seamlessly within the 25-acre complex requires a network with the flexibility to adapt to wide traffic swings. The network must be able to power the team's day-to-day operations while minimizing strain on its data server; reduce energy consumption and promote the Cowboys' sustainability efforts; and build scalability and redundancy into all systems.

CommScope and AT&T installed solutions that include an optical distribution system. This solution was designed to be scalable and to provide maximum performance while reducing total cost of ownership.

SOLUTION

The Ford Center at The Star includes the indoor training stadium and outdoor practice fields, 5,000-person-capacity Cowboys world headquarters building, an underground parking garage, and an open plaza connecting the buildings. The complex also includes the 16-story Omni Hotel, office and commercial space and medical buildings.

Along with 683 miles of CommScope fiber and copper cabling, an optical distribution solution for The Star's facilities can transmit frequencies from 800 to 2500 MHz, enabling

SUCCESS STORY: DALLAS COWBOYS, TEXAS, U.S.A.

them to rapidly adapt to shifting network traffic levels as fans and visitors upload and download data from any mobile device.

BENEFITS

The Star's Wi-Fi network utilized CommScope's GigaSPEED X10D Cat 6A cabling for all wireless APs, which provides up to 10GB Ethernet performance and PoE support for the facility's dynamic environment. To support remote powering technology, the recommended cabling design is a minimum of two Cat 6A cabling links to each AP.

This addresses the challenge of Wi-Fi 5 (802.11ac), Wi-Fi 6 (802.11ax) and future wireless technologies exceeding the connection performance of Gigabit Ethernet (GbE) switch ports. CommScope's optimized wired and wireless multi-gigabit solutions deliver 10 GbE access capacity over existing cable plant, alleviating costly forklift upgrades and disruptions. These include APs and switches optimized for 2.5/5/10 GbE connections.

Additionally, rollouts of 5G and Wi-Fi 6 (802.11ax) wireless technologies enable new IoT applications that require greater bandwidth and lower latencies. These technologies are designed for high-density wireless deployments in locations such as stadiums and convention centers. Data has

to be sent from the edge APs to central data storage or processing centers.

Smart network cabling is poised to complement these initiatives to deliver exceptional user experience to high concentrations of people and smart devices. It will also ready The Star to meet evolving connectivity needs.