Six Trends Driving Changes in the Building and Campus Migration to Cat 6A Cables

When you look at the skyline of a bustling city, it's easy to assume those buildings have the same infrastructure needs. But from hospitals and medical centers to college campuses to technology and financial institutions, these buildings all exist for different users with different needs. However, there are six trends driving the changes in infrastructure requirements regardless of who is occupying the building.

1. Mobility

As more mobile devices have been introduced to the market over the years, users' expectations of wireless network connectivity have changed. Over 80 percent of all mobile sessions are now indoors—meaning that, when someone is at a hotel, in a doctor's office, or shopping for groceries, they get impatient if there isn't a wireless network available. Likewise, at a concert or sporting event, attendees expect to have connectivity even if there are 60,000-70,000 people in the stands.

The bottom line is that customers don't care HOW they are connected wirelessly—they just WANT connectivity.

The main reason for these raised expectations is the evolution of wireless technologies to our current standard of Wi-Fi 6 and 5G. It doesn't matter whether licensed or unlicensed, cellular or Wi-Fi, these technologies will both raise the bar of expectations once again by increasing throughput and decreasing latency.

When it comes to Wi-Fi 6, it isn't just what the access points are enabling, but also what is being required of the infrastructure behind it. Wi-Fi 6E will take advantage of the 6 GHz spectrum to increase bandwidth and lower latencies. And just as we prepare for Wi-Fi 6, Wi-Fi 7 is already being discussed, focusing on 4K video, which means increased bandwidth and lower latency.

5G is another way to have increased bandwidth and lowered latency, both inside and outside of the building. A user who has a 5G experience outside and then moves inside will expect that 5G experience no matter where they are. To support that 5G experience, we need to talk about things like DAS, small cell, or even CBRS working in concert with Wi-Fi.

With raised expectations of what users get from these technologies, there needs to be more support from the deployed infrastructure. Not just the Wi-Fi access points or the active cellular systems, but also the structured cabling system behind them.

2. Bandwidth

An advantage of Wi-Fi 6 is that it's one of the first truly multi-gig applications. When we first started talking about Cat 6A, there was 1G and 10G. A few years ago, 2.5G and 5G

were introduced to support the quick advancements of Wi-Fi without re-cabling to fully support the newer access points. This is how NBASE-T was created—a group of people came together to define and provide guidelines on how multi-gig could be supported by older cabling systems. This has driven the use of 2.5G and 5G in the market, so the discussion is not just about 1G or 10G; it is now truly about multi-gig. Even the NBASE-T organization that defined how you could use older systems to support multi-gig recommended using Cat 6A if you are building something new.

This will result not only in more throughput and lower latency but also lower range. If you're going to get the same coverage from Wi-Fi 4 to 5 to 6 to 6E, you will need more access points—and that means more cable drops to support them.

3. Power

Power is becoming more relevant in our space, and it's directly tied to the power over Ethernet (PoE) standard. We started at 15 watts and now are up to 90 watts. At the same time, the number of devices that can be supported by PoE has also increased accordingly. These devices have also become more power-efficient. What we have now is a growing market of devices that use PoE. In addition, PoE itself is able to provide more power for high-power applications.

Previously, we built networks with a concern only for bandwidth. Now there is more and more consideration for bandwidth and power. There are even some cases where power is the deciding factor—such as places where they could not get to using traditional structured cabling like parking lots, parking garages, or open campus areas where there isn't a telecommunications closet.

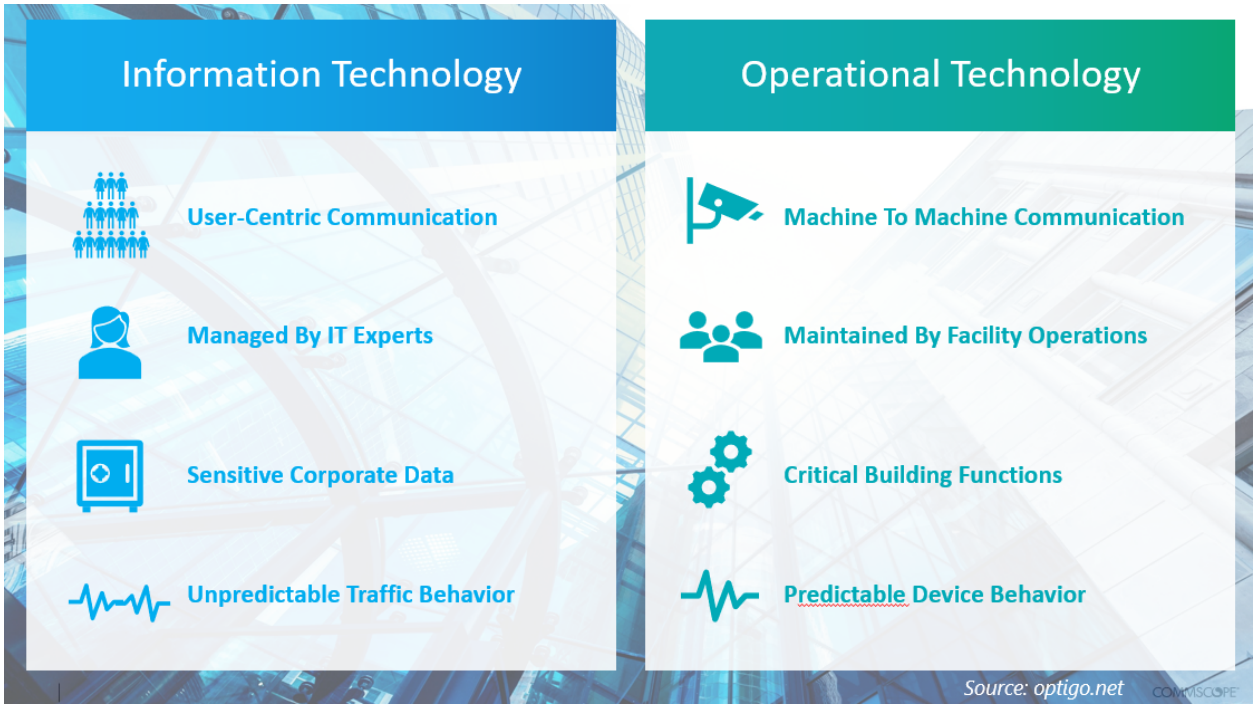
4. Network convergence

Network convergence is the coming together of information technology (IT) applications and operational technology (OT) like HVAC, lighting, and security—which were previously on separate networks—onto one network. Network convergence is found primarily in large buildings and campuses where mobile and internet connections are regulated behind the same firewalls or log-on credentials.

Things really get interesting when you start talking about the convergence of:

- IT, which refers to everything a business uses—computers, storage, networking devices, other physical devices, and infrastructure—in their day-to-day processes, and
- OT, which refers to the practice of using hardware and software to control industrial equipment. OT environments supervise physical processes in industries such as manufacturing, energy, medicine, building management, and more.

In short, IT networks deal primarily with user-centric information and data, whereas OT networks mainly facilitate machine-to-machine communication and data gathering.



The challenge comes with the convergence of the two distinct networks and the sharing of data that each collects and distributes.

Rather than trying to resolve the conflict of IT versus OT, we should change the conversation to an AND situation: IT and OT, engineering and facilities, power and bandwidth, and wall and ceiling.

5. Move to the ceiling
A lot of the new devices are moving above the ceiling. These are not traditionally structured cabling users and are more on the OT side of things: HVAC, access control, Wi-Fi access points, sensors, building automation, etc.

The move to the ceiling drives a need for field termination. The space isn't terribly craft-friendly; it's dark and difficult to get to. However, this is where a lot of connectivity is now being terminated. As such, the standards have evolved to allow for something called MPTL (modular plug terminated link) or, more commonly, a field-terminated plug. When looking for solutions to use for above-ceiling terminations, look for solutions that are craft-friendly or allow for the use of your standard termination tools.

6. Design adaptability
Even as we begin to return to the office, the way we use and occupy space has fundamentally changed in many areas. So the ability to design your networks to be as flexible and adaptable as possible has become even more necessary.

This is where a distributed network architecture, with connectivity in the ceiling, can be effectively used. By supporting not only IT systems but OT systems on a well-planned,

converged network design, workspaces can be quickly re-purposed from focused workspaces to shared workspaces. This network design can also support wireless and wired connectivity, not only to users but to building systems as well throughout the workspace.

These are the major trends driving the most change in the market today. Collectively, they point to Category 6A to support the new application and device delivery not only with bandwidth but also power. More and more non-IT devices continue to move to IP or structured cabling architectures converging both IT and OT systems to coexist on the same network. Many of these devices live above the ceiling line, so having easy-to-use and craft-friendly termination solutions and tools is a must. Finally, as the world changes how it views work both inside and outside of the office, we need to be able to be just as flexible and adaptable with our network designs and topologies.

In the years ahead, nothing less than Category 6A will do and, with Vextra, you can count on quality, affordability, and reliability.