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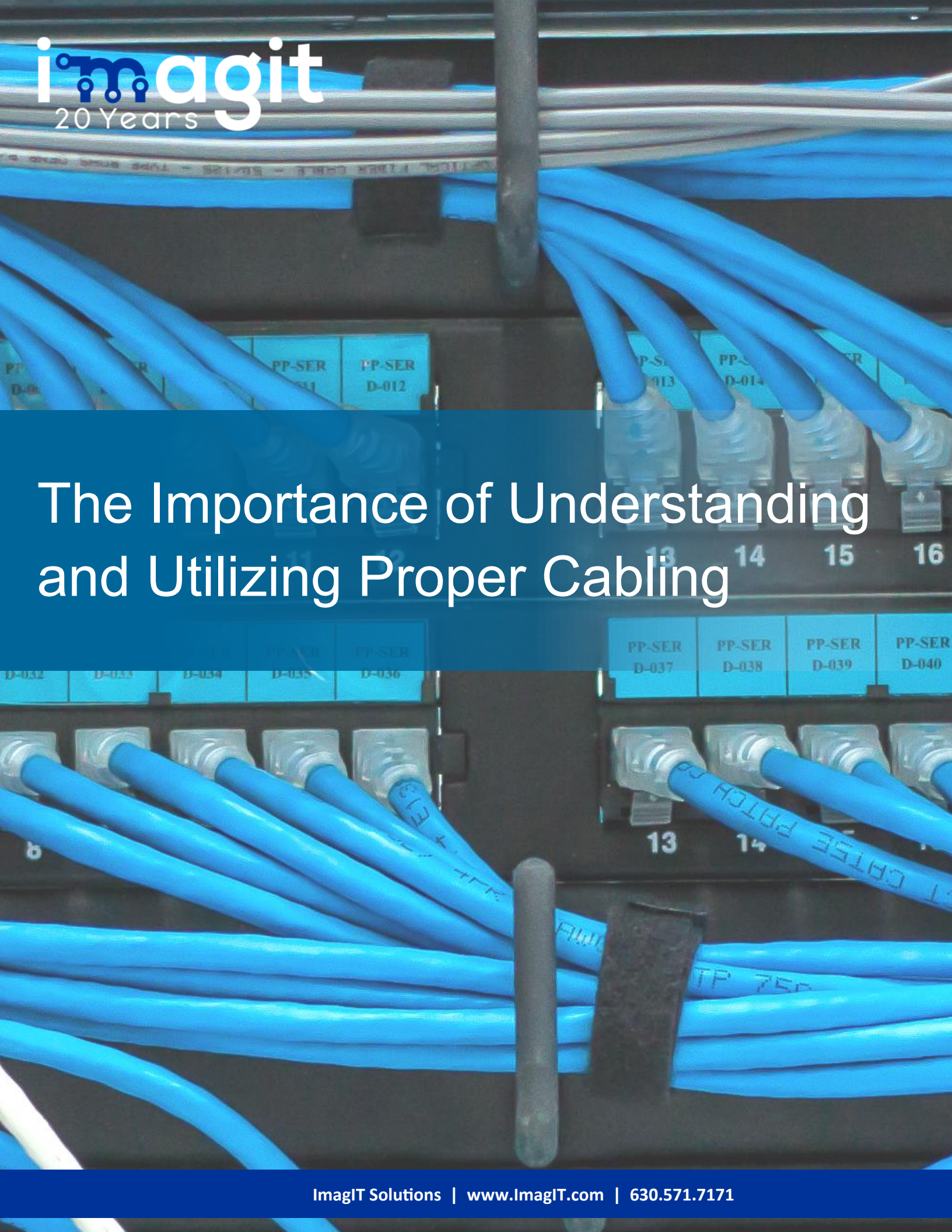
20 Years



The Importance of Understanding and Utilizing Proper Cabling

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Introduction

Businesses today are enjoying greater data capacity and processing power than ever before thanks to rapid advances in technology. This is revolutionizing the way that we do business and companies of all sizes are benefiting from the efficiency and productivity gains that are necessary for success in an increasingly competitive environment.

Your IT network is the foundation of your organization, keeping communications running and keeping your business connected to partners and clients. Without a strong network, your employees experience a lag in productivity and increase in downtime every day. To maximize performance, companies must carefully consider their network cabling infrastructure. The cabling you choose dictates how fast your network can be. You can buy the newest fastest servers and switches but if your cable is only rated for 100 Mbps, then that is how fast your network will be. As the data in your business networks increase, you need to have adequate cabling in place to meet these growing data requirements.

Structured cabling services are available to help businesses improve their IT infrastructure. These services allow businesses to increase the overall efficiency of their technology, making it a valuable investment with high ROI potential.

What Are the Hindrances of Inadequate Cabling?

Although cabling usually only accounts for a small portion of network deployment costs, studies indicate that up to 70% of network problems are caused by poor cabling practices or components. Inadequate cabling leads to lower performance, increased maintenance, an unreliable network, and less productivity. Since the average life-span for a cable system is 10 years, it is very important to ensure that the initial cable deployment is done properly and with reliable equipment. Some issues that can affect the quality of your cabling include: not following industry standards, poor design, installation by non-professionals, and missing or badly written documentation.

As your business grows and your network infrastructure evolves, you may discover that it's time for a cabling upgrade. Oftentimes networks experience haphazard growth as business owners add pieces of network hardware – of varying quality and from differing manufacturers – one at a time. This causes network performance to slowly degrade as each new device is patched into the system.

At some point, the network will no longer support the traffic your users generate, despite the "upgrades" you've made. If you are finding that your network infrastructure is no longer able to meet your business needs, your IT partner can help you implement a carefully planned cabling upgrade.

Why Businesses Should Use Structured Cabling

In today's information and communication driven world, technology infrastructure is more important than ever. Cabling is the backbone of your network and its reliability, efficiency, and organization is key to your network's dependability. Structured cabling is a type of infrastructure that utilizes best-practices for design and construction to support peak performance. It provides a reliable, versatile, and cost-effective solution to a wide range of communication requirements and we recommend it for most types of businesses.

Prior to the existence of structured cabling, businesses used point-to-point cabling which directly connected one component of a network directly to another component using a cable. However, as businesses grow this would cause problems as the network expands in size and complexity, requiring these cables to span larger distances, connect more devices, and transfer information quicker. Maintaining these older point-to-point cabling systems, along with the thousands of cords necessary to operate them, places a big strain on a company's IT resources.

To alleviate this strain, many companies have switched to a structured cabling system. Instead of connecting each individual component of a network directly to another, a structured cabling system connects the servers and storage units directly to a communication backbone. Local cabling panels are installed throughout the office and connected to the communication backbone with a single cable. Users can then connect devices to the entire network by simply plugging a cable into the closest panel.

The Benefits of Structured Cabling

Structured cabling is an investment in your business that offers many advantages. Some of the greatest benefits include future-proofing your investment, the simplicity and flexibly offered, and a reduction in downtime.

Future Proof Investment

With the constant advances in technology, it is important to have a system that is adaptable and scalable. When you switch to a structured cabling system, you're helping to future-proof your network. You can rest assured that your network infrastructure won't become outdated and will support new devices as your business grows. Structured cabling's scalable and highly flexible network provides a continuous flow of information and can cope with the high demands that today's organizations demand. This in turn will boost productivity across the board.

Structured cabling solutions enable your business to make updates easily with minimal risk to the infrastructure. This makes structured cabling a worthwhile investment when it comes to preparing for the future. The system also reduces power (thus utility) and maintenance costs driving long-term value.

The Benefits of Structured Cabling

Simplicity and Flexibility

Structured network cabling brings greater simplicity and flexibility to your infrastructure, making maintenance of any kind much quicker and easier. Moves, additions, and changes can be implemented quickly without disorganized wires getting in the way, dramatically reducing installation time and ensuring optimum adaptability to any network infrastructure changes. The odds of human error decrease which allows for IT funds and company time to be better allocated. If a problem occurs, it is far easier to identify the issue and solve it with structured cabling. This means less time and money lost in the long term. In addition to these benefits, the flexibility also makes the system easy to take apart and move to a new location.

Reduced Downtime

There is a high risk of human error and mistakes being made with multiple, unorganized cabling structures, which can cause workflow disruptions and network downtime. Since a structured cabling system is segregated into a group of devices connected to a single local cabling panel, it's easier to troubleshoot and resolve issues quickly. An additional benefit is that users' work won't be disrupted if their devices aren't connected to the specific cabling panel being serviced.

A well-structured telecommunications infrastructure allows for redundancy within the cabling. This improves the overall dependability and accessibility of the system, especially during maintenance. If one cable is compromised, the easily implemented redundant wiring can keep communications going while repairs are made resulting in less downtime.

What Are the Benefits of a Cabling Upgrade?

Modern businesses run on telecommunications and your cabling network provides the backbone for your entire infrastructure. A cabling upgrade can deliver a return on your investment through productivity and efficiency gains, and will ultimately result in reduced business costs. Upgrading to structured cabling allows you to stay ahead of technological developments, so that you have the infrastructure in place to support new technologies as they emerge.

Problems that can be addressed by replacing or upgrading old copper cables include crosstalk, transfer impedance, insertion loss, propagation delay, and return loss.

Designing a cabling system that only complies with today's standards can result in an infrastructure that may be outdated in two or three years. Because the system will only be as strong as the weakest link, it is important to use quality cabling, components, and hardware. Structured cabling gives your business the greatest flexibility in handling any future needs.

Problems Addressed by a Cabling Upgrade

- ✓ Crosstalk - Interference from other cables and devices in your network
- ✓ Transfer Impedance - interference from external signals (outside the cable)
- ✓ Insertion Loss (previously called attenuation) - The amount of energy that a signal loses as it travels along a cable
- ✓ Propagation Delay - the delay between when a signal is transmitted and when it is received
- ✓ Return Loss - the loss of power in the signal returned/reflected by a break in continuity

What Are the Differences in Cable Types?

Businesses choosing network cabling today need to think about tomorrow's needs too. Advances in technology mean that demands for data capacity and processing power will inevitably increase. This means that if you're working with an older type of cabling now, you should consider upgrading to a more modern option to remain competitive and keep your business at peak performance.

There are two primary types of cabling, fiber and copper. Copper cables use twisted pairs of copper wires and transmit signal using electrical currents. Copper is a cheaper option that is sufficient for many applications but can only carry data a short distance and has some other drawbacks as we have already discussed. Fiber optic cables contain strands of glass fibers and transmit data using pulses of light generated by small lasers or light-emitting diodes (LEDs). As the most advanced cabling material, optical fiber can deliver the fastest speed, is the most durable, and can go the longest distance. Fiber is the best option for a business with high bandwidth needs, however it is a greater expense than copper.

For some time, Cat5 copper cabling was sufficient for most business needs. However, with growing data demands we now recommend that companies upgrade to no less than Cat6 cabling. Many businesses choose to use a blend of fiber optic cabling and copper cabling to maximize connectivity while staying within budget. To understand these options better, lets discuss the differences in cable types

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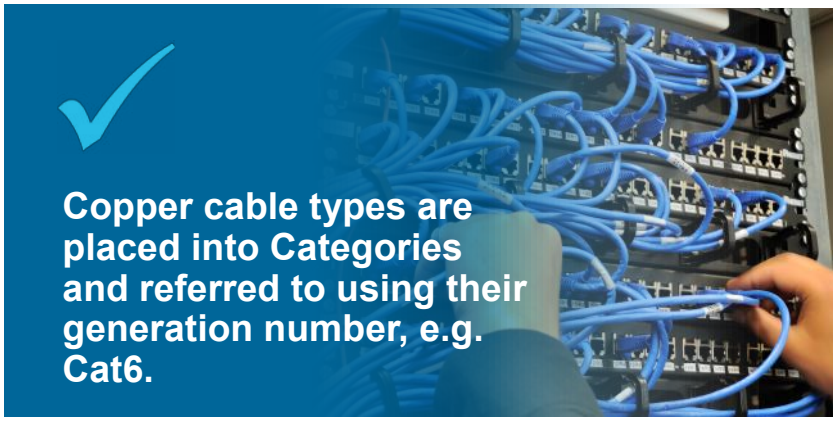

What Are the Differences in Cable Types?

Cat5 and Cat5e

Cat5 is a type of twisted pair cable that was invented in the 1990s. It is now obsolete, yet remains in use by many businesses. If your business uses Cat5 cabling it is highly recommended that you upgrade to reach maximum performance.

Cat5e is similar to Cat5 in appearance but Cat5e uses four pairs of copper wire rather than the two that Cat5 relies on. In addition, the wire pairs are twisted more tightly and are sheathed in heavy-duty shielding to reduce crosstalk. Cat5e is not recommended for new installations but is still supported.

Cat6 and Cat6A

With Cat6 cabling, you can enjoy a more consistent and reliable network performance, with less chance of signal degradation. The broader bandwidth and faster speeds are far superior to previous Categories and offer high video transmission and better LAN performance. It is very commonly used today and is a good choice for many smaller businesses, especially since it is backwards compatible with Cat5/Cat5e cabling that many businesses still have in some areas. Cat6 is the minimum recommended category of cabling for a new installation.

Cat6a is the minimum level of cabling for data centers with a bandwidth speed up to 500MHz. Cat6a is even less susceptible to interference and crosstalk thanks to an exceptionally thick plastic casing. The improved specification and shielding allows Cat6a to provide more consistently reliable speeds in difficult environments. Cat6A is a great choice for businesses in terms of future-proofing.

Cat7 and Cat7A

Cat7 is used for Gigabit Ethernet communication. Shields are over each pair and overall so it deflects interference.

Cat7A was first introduced in 2010. Cat7A is suitable for multiple applications including CATV (Cable TV).

What Are the Differences in Cable Types?

Cat8

Cat8 is the newest standard for twisted pair copper cables and is just now coming on to the market. Cat8 is capable of providing better frequency characteristics, therefore supporting higher speeds of data than previous categories. The physical appearance of Cat8 cable is similar to lower category cables

Fiber Optic

Fiber optic cabling uses light signals rather than electrical signals, and is excellent for computer networks, telephone, broadband and CCTV. It uses less power than the twisted pair copper cabling yet carries large amounts of digital data and is extremely reliable. It is also immune to environmental factors that affect copper cable and does not have problems such as electromagnetic interference, radio-frequency interference (EMI/RFI), crosstalk, or transfer impedance. Fiber is also secure against wiretapping, unlike copper.

Fiber typically costs less to maintain, has less downtime, and requires less networking hardware than copper cabling. In addition, advances in technology and the spread of existing fiber networks have reduced the cost of fiber installation.

Fiber optic cabling is available as single mode or multimode. Single mode is most often used but has lower distance limitations (300 meters). Multimode is the highest quality cabling available and can carry data up to 30 kilometers.

Two important measurements for cables are frequency (MHz) and speed (Mbps).

Here are the current category standards for copper cables:

✓	Cat3	1 MHz	10 Mbps (obsolete)	✓	Cat6A	500 MHz	10 Gbps (10,000 Mbps)
✓	Cat5	100 MHz	100 Mbps (obsolete)	✓	Cat7	600 MHz	10 Gbps (10,000 Mbps)
✓	Cat5e	100 MHz	100 Mbps (obsolete)	✓	Cat7a	1000 MHz	10 Gbps (10,000 Mbps)
✓	Cat6	250 MHz	1 Gbps (1,000 Mbps)	✓	Cat8	2000 MHz	25 Gbps (25,000 Mbps)

Choosing the Right Network Cabling

When it comes to network cabling, simply implementing cabling that meets current needs is not a business savvy approach. Cable infrastructure has the longest lifecycle and is less expensive than most network components; therefore, businesses should plan ahead by installing excess cables and selecting cables that are advanced enough to meet future needs. This will help ensure that your cabling infrastructure will be sufficient for the life of the cables and your business will not need to go through the trouble and expense of upgrading again for a long time.

The process of deciding on the most suitable cabling product will depend heavily on data capacity. When businesses find that they need to upgrade their cabling infrastructure, it is normally because their existing network has become slow and weighed down. Signs that indicate an office's cabling may be overwhelmed and need an upgrade include a noticeable increase in lag time and the appearance of more network errors. Furthermore, a company that has not upgraded its infrastructure in 10 years or more despite increasing voice and data traffic will also benefit from upgrading its cabling.

When weighing the available cabling options, your organization should consider several factors. First, it is important to assess your current data usage and compare it to what the projected network needs will be in five years. You should also consider the types of equipment utilized and where the equipment will be stored. Moreover, the current need for an upgrade should be viewed as an opportunity to plan for future cabling and equipment needs. While choosing cabling may seem straightforward, some companies may underestimate what their needs will be in the not-so-distant future. An experienced cabling partner can help your business determine a cabling infrastructure that can accommodate future growth that might otherwise lead to inefficiency and frustration.

Choosing an Installer for Your Cabling Project

When selecting an IT partner to implement your cabling upgrade, it is important to make sure that they are experienced and professional. Some things to look for when selecting a partner include:

1. Have you received a fair and detailed quote and price? Make sure to compare all aspects of the quotes that you receive, not just the bottom line. Many companies send quotes that do not include all needed work in order to make the quote appear lower, only to deliver an incomplete or inferior solution or future change orders.

2. Can your cabling partner design a cable infrastructure which will meet all current and future system needs? Your partner should discuss the processes that they will use to determine your needs, including a detailed site survey and have a full understanding of all departments future needs and projected usages.

3. Is your partner familiar with the different cable types available and able to determine which is best suited to your needs? Is your partner able to correctly install and terminate the cables?

4. Will the cable be installed to meet all standards and certifications, and will your partner provide you with test results to demonstrate that your new system meets category standards? Your cabling partner should evaluate your upgrade to ensure expectations are met and you are satisfied.

Next Steps

Many businesses can benefit from a cabling upgrade. Although the choices available to a business that is looking to upgrade can be overwhelming, these can be navigated with the help of a trusted IT partner. New cabling can transform an organization and provide a futureproof investment, greater simplicity and flexibility, and reduced downtime. If you think your business may be ready for a cabling upgrade or if you are looking to learn more about voice, video, or data systems cabling solutions, contact us today.

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