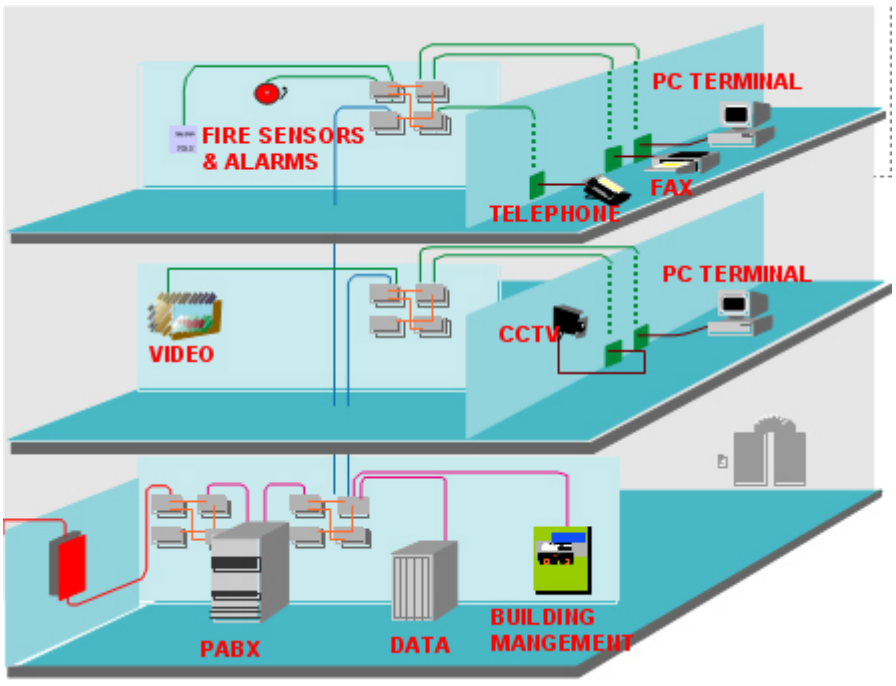
TECHNOLOGY TRENDS IN STRUCTURED CABLING

THE CABLING BACK BONE FOR SECURITY SYSTEMS

Structured Cabling using both UTP and Fibre optic cables is, today, the accepted cabling backbone of any building complex, office installation or manufacturing plant. It is the 'super expressway' that supports the fast and uninterrupted transmission of IP traffic.

The trend towards IP based video surveillance systems is firmly established. IMS research forecast that in 2013, global network video surveillance equipment sales will overtake analog video surveillance equipment sales. The trend is away from analog-based video systems that run over coaxial-cabling systems and toward IP-based systems running over twisted-pair and/or fibre-optic cabling systems. **This acceleration in the transition from Analog to IP video surveillance is also true for other end points like Telephones, Access Control Systems, Sensors and Intelligent Building Management Systems.** The massive amount of data that is collected, transformed, and delivered across the network requires a state-of-art network cabling solution. Not only does the system need to support current data requirement, but it must also accommodate the future volumes of data as the organization grows.



10 Gigabits per second support over UTP.

The growing need for faster data transmission and stable performance across a wider frequency range has given rise to Cat 6a and Cat 7. Both can support speeds of up to 10 Gigabits per second on copper. Advanced copper cables are being demanded and Cat 6a cables particularly have high acceptance levels in the Data Centre segment. **Cat 6 cable has outsold Cat 5e for the past three years.**

The increase in network bandwidth requirement is driving 10 Gb/s Ethernet products that will work over structured copper cabling. The cabling industry believes that UTP cabling systems for category 6 will support 10Gb/s applications over 100 m.

Category 7 systems utilizing S/FTP cabling exhibits superior overall transmission performance. Lower levels of signal loss and alien crosstalk suppression allow for a higher signal to noise ratio. As a result, an S/FTP cabling system can easily support maximum channel length requirements of 100m.

Power over Ethernet (PoE).

Power over Ethernet (PoE) is a technology for wired Ethernet LANs (local area networks) that enable the electrical current, required for the operation of 'IP end points', to be carried by the data cables rather than by a separate power cable. This reduces the number of wires that must be installed. The result is lower cost, less downtime, easier maintenance, and greater installation flexibility than with traditional wiring.

The electrical current is fed to the data cable at the power-supply end and comes out at the device end (the IP end point), in such a way that the current is kept separate from the data signal so that neither interferes with the other. The current enters the cable by means of a component called an injector. This uses two twisted pairs in a standard TIA-568B CAT5/6 RJ-45 Ethernet cable connection to carry DC power to a PoE-enabled device. Pins 1-2 (pair #2 in T568B wiring) form one side of the 48 V (+) DC supply, and pins 3-6 (pair #3 in T568B) provide the 48V (-) return. **These are the same two pairs used for data transmission in 10Base-T and 100BASE-TX**. Both power and data are transported over only two pairs. Sometimes pins 4-5 (pair #1 in both T568A and T568B) form one side of the DC supply and pins 7-8 (pair #4 in both T568A and T568B) provide the return. These are "spare" pairs in 10BASE-T and 100BASE-TX.

PoE is a safe and reliable way to transmit power to the IP end points such as phones, cameras, monitors, access points and other IP devices.

Fibre to the home (FTTH)

Residential complexes in urban areas across the country are driving the demand for FTTH. This trend is likely to see a further increase. Both the rapid spread of broadband as also innovation in technology will drive the adoption of fibre optic cabling. One of the key advantages of installing fibre optic cables is that they can be laid out for long distances and are not affected by electro-magnetic interference, thus ensuring faster and smoother flow of data.

HD video, high-quality voice and data services and remote access of applications are expected to gain momentum and this would further drive the demand for fibre-optic cabling solutions.

Optical-fibre cable is immune to all signal noise, short circuits, and power surges. Fibre is therefore a preferred medium when a video surveillance system is being installed in a high frequency environment, such as an airport or hospital. Fibre should also be considered whenever the surveillance system runs outdoors as fibre is nonconductive, and will therefore not damage the 'end points' in the event of a lightning strike. Conductive coax and UTP cable could potentially transport the surge and cause damage to expensive equipment. Fibre is also recommended in harsh environments like an oil refinery, as the probability of fibre creating a spark is zero. **However, fibre cannot be used to provide power, and a separate power source would be required for cameras and equipment.**

Data Centres

The **movement toward the construction of new data centres** in specific geographies is one of the most significant trends affecting structured cabling. There is increased focus, not just on the logical network, but on the physical network design as well.

The **optimization of network infrastructure** is another trend that impacts structured cabling, since network connectivity of servers, storage, desktops, applications, etc., all rely on cabling.

Cloud initiatives are impacting the approach to network cabling as well. An organization may prefer to deploy the physical network infrastructure before actual usage is needed in an attempt to deliver rapid scalability. Therefore, a well thought out physical layer design that allows for a phased

implementation approach is crucial. Organizations can take advantage of these opportunities by establishing a structured cabling infrastructure that will support the business well into the future.

Integration of I.T. Components

Integration of IT components from virtualization/convergence initiatives would require a re-thinking in the cable density. Examples:

- Fibre optic cabling to all server racks and storage arrays (to handle increased density while reducing cable pathways and improving airflow)
- Top-of-rack input/output convergence to simplify data centre cabling and improve flexibility
- The need for high-density connectivity (e.g. special patch panels and enclosures for increased port/fibre/switch density) and high-capacity cable management (to optimize performance and protect network cabling infrastructure)

Summary

- UTP cabling systems will support 10Gb/s applications over 100 m.
- PoE is a safe and reliable way to transmit power to the IP end points such as phones, cameras, monitors, access and other end points.
- Fibre to the desk and fibre to the home. HD video, high-quality voice and data services and remote access of applications are expected to gain momentum and this would further drive the demand for fibre-optic cabling solutions.
- There is increased focus, not just on the logical network, but on the physical network design as well.
- A well thought out physical layer design that allows for a phased implementation approach is crucial.
- Integration of IT components from virtualization/convergence initiatives would require a review of the cable density.