

Structured Cabling: Copper Still the King

Copper cables are dominant in India while fiber has a long way to go

Data explosion presently demands higher bandwidth and 78% of network related issues are because of faulty and obsolete cabling infrastructure. The world of digitization and the information traffic like voice, data, video, and even big complex building management systems crave for zero downtime and maximum uptime.

Industry stalwarts opine that it is a bad idea to forgo structured cabling and invest in a network switch. Structured cabling investments have a life span of at least 3 or 4 times the life of network hardware, therefore it is crucial to build a structured cabling system that supports any and all existing technologies and hopefully build in growth. The system should have option for different topologies and tier structures. It is recommended to have a combination of copper and fiber to maximize flexibility and minimize cost. In addition to investment protection, structured cabling also provides administrative and management.



Copper Categories

Copper cabling would never take a back seat because setting up network wholly on fiber is highly expensive which is not worth or a requirement. Installation of copper cable is much simpler and easier when compared to fiber cables.

Copper cabling standards are designated as Category 5, Category 5e, Category 6, Augmented Category 6 (Cat 6A), Category 7, Category 7A (augmented). Electronic Industry Association/Telecommunication Industry Association (EIA/TIA) 568A standard defines multiple categories or upgrading of structure cabling system performance while the category 6, 6A, and 7 are the highest currently standardized at present.

Category 5 is having a natural death. It is a very old standard. Most of the cabling vendors have quit cat 5 manufacturing.

Category 5e was ratified in 1999 which has superceded cat 5. The frequency range of 5e is at 100 MHz. It has improved durability and signal capabilities. It has less electronic interference over Cat 5. This copper cabling is widely installed across India currently than any other cabling infrastructure. It is well suitable for horizontal cabling requirements. It is also an affordable technology. Cat 5e has been adopted more for large horizontal cabling requirements for higher bandwidth in commercial networks, software firms, educational institutions, and high rises.

Category 6 cabling operates at 250 MHz frequency. It is the best performance specification for UTP and shielded category twisted pair (ScTP). Cat 6 demands more stringent requirements than Cat 5 and 5e for instance installers ought to maintain half an inch or less of untwist at the termination, proper bend radius and avoid short links less than 15 meters. It utilizes RJ-45

connectors and they are backward compatible to Cat 5e. The prominent USP of Cat 6 is that it is an interoperable standard.

Category 6a operates at a frequency of 550 MHz. It is backward compatible with the existing standards, this technology is suitable for industry sectors utilizing high-performance computing platforms to support very high bandwidth-intensive applications. 10G/Cat 6a applications would initially be deployed in server farms, storage area networks, data centers, and riser backbones. It supports 10G.

Category 7 provides 600 MHz of data transfer rates. It is an expensive and cumbersome medium. It can be replaced by fiber at practically the same cost or even less. Shajan George, technical director at R&M India says, “Cat 7 is likely to have a natural death because it is unadaptable. There are installation issues, cables ought to be repulled.”

Category 7a is known to operate at 1,000 MHz but it is yet to be ratified. It is at a very nascent stage.

Advanced cabling systems are now being demanded in India, newer technologies are being adopted in India. Cat-7A is catching up well across the verticals. While commenting on the advantages of cat 6 and 7, Deepak Jagtiani, regional sales director, MPN-India & ASEAN, Molex Premises Networks pointed out that there is not much difference between cat 6a and 7 in terms of performance but there is difference in pricing. Investment while upgrading from Cat 6 to Cat 6a installations would increase by 25% and from cat 6a to 7 would rise to 40%.” He added, “There is a huge acceptance of Cat 6A deployments which meet higher bandwidth needs in data centers as well as at work stations.”

Copper/Fiber

The fiber-versus-copper battle for structured cabling systems is rambling. Copper cables are dominant in India and fiber has a long way to go. Copper and optic fiber cables both have unique characteristics. The rapid development of broadband, technological innovation and ethernet makes a great deal for fiber optic adoption. Fiber cables are being used for long distance installations.

Prominent Cabling Products	
Cabling Vendors	Products/Solutions
TE Connectivity	MPO, MPOOptimate, MRJ21, AMP Signalink
	Hi-density Cable Management Platforms
	Intelligent Infrastructure Management Systems
Belden	IBDN 10GX System
	IBDN 4800LX
	FiberExpress Field-installable Connectors
Molex	Single Mode and Multimode Fiber Solutions
	Category 6A Shielded Solutions
	Intelligent Infrastructure Management
3M	NPC (No Polish Connector)
	VIIMS (Voltage Intelligent Management System)
	Tool-less Information Outlet
Dax Networks	CAT5e, CAT 6, and CAT6A in copper category
	Multimode (50/125, 62.5/125um) OM1, OM2 & OM3, Single mode (9/125um) in fiber category
	Field installable fiber connectors, ADSL cables
R&M	Security System
	E-2000 Fiber Connector
	Cat. 6A RJ45 Module
Digilink + Schneider Electric	Collapsible Angular Shuttered Keystone Jacks
	LED based intelligent physical layer solution
	Intelligent Media Panels
Commscope	Node A universal multi-band, multi-service, software-based repeater platform,
	BrightPath fiber-to-the-home
Seimon	XLR8 Pre-Polished Fiber Connectors
	MTP based fiber Plug-and-Play solutions
	MapIT G2 next-generation intelligent infrastructure management
Nexans	EMAC
	Copper MPO solution

Subhashini Prabhakar, chief technology manager, Dax Networks mentions, “Bandwidth delivered via fiber cable is high when compared to copper. Optical fiber cables are not affected by electro-magnetic interference and hence the flow of data is much faster without any loss.” Fiber transmits data much faster over longer distances than copper. Because light is transmitted at a much higher frequency, fiber optic data cabling offers greater signal capacity. Fiber optic cabling uses less power and provides less signal degradation than copper cables. Fiber cables are generally non-flammable, virtually unable to be tapped. Fiber cable is also smaller diameter and weighs less than its copper counterpart, making it ideal for a variety of cabling solutions. “The losses in fiber media are far lower hence the power required in transmission is far less as compared to copper. There are no EMI issues in fiber media as there is no electric current passing, instead there is pulse of infra-red light signal,” says Milind Tamhane, director, offer management, network connectivity, lifespace business unit, Schneider Electric India.

Copper is restricted for installations within 100 meters. Copper is prone to get affected due to EMI resulting in data loss. Installation of copper cable is much simpler and easier when compared to fiber cables. Increase in copper prices is always a concern. Customers plan their budgets and typically execution of a building project could take a year and significant changes in cable cost can upset planned budget. Copper has almost doubled over the past 1 year.