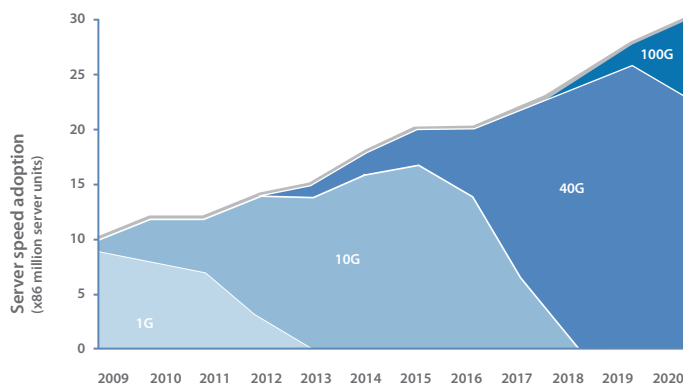


Emerging Information & Communication Technologies: Changing Data Cable Physical Layer Needs

Changing enterprise business requirements ultimately drives network market shift. We are entering into a very exciting time of new applications need and related data cable business opportunities. Emerging applications demands higher bandwidth and these bandwidth intensive applications requires speed beyond 1 Gb/s in existing Local Area Network (LAN) infrastructures. Data centers are required to manage huge amounts of data traffic providing faster connectivity to avoid congestion and ensure that users avoid delays in streaming and updates. Network backbone speeds in the data center are migrating to 25, 40 and even 100 Gb/s speeds.

Server Speed Adoption Roadmap



Source: TE Connectivity Esbmetes

need of higher bandwidth and speed requirements .Telecommunication Industry association (TIA) recently released TIA 568-C.2-1 Balanced twisted- pair Telecommunication cabling component standards announce addendum on minimum requirement for Category 8 four pair shielded balanced twisted pair copper cabling up to two connectors and will support up to 30 meters only. This will be addressing need of data center cabling providing 25G/ 40G speed Data Center for server to server connection and endofrow or middleofrow design.

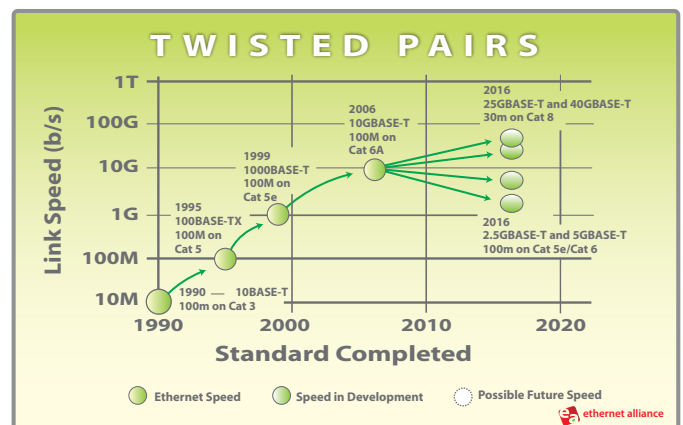
Release of 2016 Ethernet roadmap provides complete view on Ethernet speed over twisted pair. There are many applications driving

devices in the future is Category 6A

HD BaseT: Technology enables transmitting uncompressed full HD video, audio, Ethernet, control and power up to 100 m over balanced twisted-pair cabling with modular RJ-45 connectors

4-Pair PoE: Power of Ethernet will be going to be one of the major key business drivers for data cabling along with other new applications. Power over Ethernet is a growing Ethernet application that delivers power and data over Category cabling.

The IEEE 802.3bt task group is currently developing the next-generation Power-over Ethernet standard to deliver



Source: Ethernet Alliance

Accordingly enhanced horizontal LAN cabling infrastructure required to avoid productivity loss due to network bottleneck. Industry is moving towards Cat6a cables complaint to 500 MHz bandwidth and 10G speed as minimum specification for all new enterprise LAN horizontal cabling networks installations. Twisted pair data cabling has been continuously evolving addressing the

physical layer network infrastructure change need includes:

New Generation Wi-Fi: The next-generation IEEE 802.11ac having Wave 2 devices will require data rates close to 2 Gb/s in the immediate future, and 4 Gb/s in the next few years. For new installations, the best viable solution to support Wave 2 802.11ac wireless devices and higher speed 802.11ax

power more efficiently using all four pairs in a cable. Impact of higher Power PoE++ on twisted-pair structured cabling results in more insertion loss at higher temperature de-rates maximum channel lengths .TSB-184-A recommends to install Category 6A to achieve best thermal performance supports 10GBASE-T.

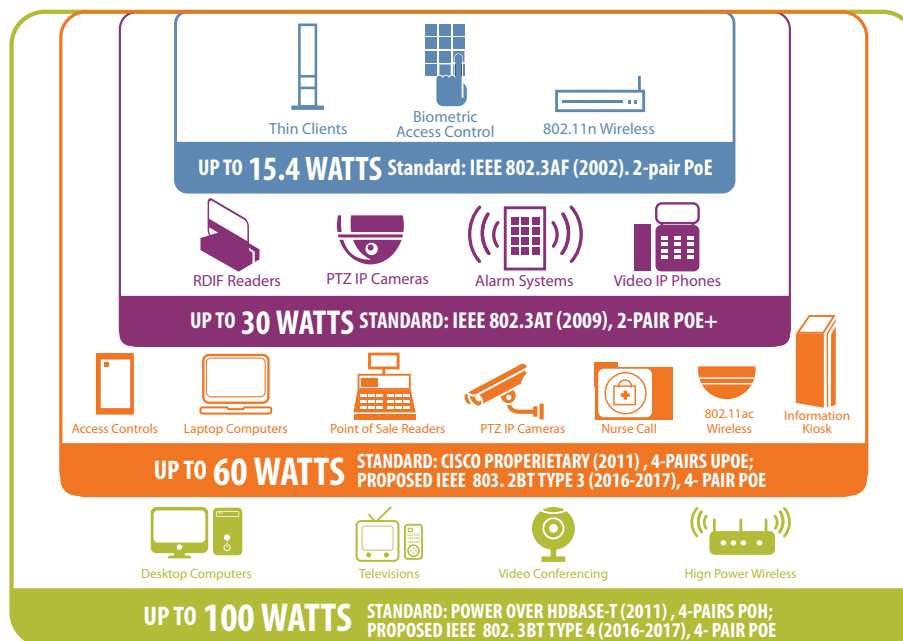
PoE Standards Overview:

Type	standards	Maximum Current	Number of Energized Pairs	Power at Source	Power at Device	Maximum Data Rate	Standard Ratified
PoE	IEEE 802.3af (802.3at Type 1)	350 mA	2	15.4 W	13W	1000BASE-T	2003
PoE+	IEEE 802.3at Type 2	600 mA	2	30 W	25.5 W	1000BASE-T	2009
PoE++ (4PPoE)	Proposed IEEE 802.3bt Type 3	600 mA	4	60 W	15 W	10GBASE-T	Expected 2016-2017
	Proposed IEEE 802.3bt Type 4	960 mA		90 W	71.3 W		
No IEEE standard	Cisco UPOE HDBaseT (www.hdbaset.org)	600 mA >1000 mA	4	60 W >100W	51 W >100W	Varies	Exists today - no official ratification

→ New PoE standard is significantly beyond the older PoE and PoE+ standards

Source:-BICSI

PoE Application Overview



Source:-BICSI

Referring some of the case studies published on web on PoE includes:

Philips which introduced Power-over-Ethernet (PoE)-based LED lighting system in the new Watt Family Innovation Center at Clemson University in Clemson, SC. Web Published reference: January 26, 2016 By Maury Wright Editor in Chief, LEDs Magazine. The solid-state lighting (SSL) project is projected to deliver 70% energy savings relative to similar buildings that have legacy lighting while also allowing network controls of the lighting and data gathering via sensors integrated in the luminaries. Like other smart lighting systems, it would presumably let building

occupants turn lights on and off via computers and gadgets, which they could also use to brighten or dim.

Philips and Cisco form global strategic alliance to address EUR 1 billion office lighting market. Philips (NYSE: PHG, AEX: PHIA), the global leader in lighting and Cisco (NASDAQ: CSCO), the worldwide leader in IT, today announce a global strategic alliance that will create new value in energy savings, building efficiency and employee productivity, made possible by the Internet of Things (IoT) in modern offices.

Belden Inc.—REVConnect, which stands for “Reliable, Easy-to-use, and Versatile,” enables an installer to learn just one process, and use just one tool,

to perform any connectorization from Category 5e to Category 6A shielded or unshielded jacks, as well as Category 6A field-mountable plugs. REVConnect has been shown to support 100W Power over Ethernet devices such as LCD monitors and pan/tilt/zoom security cameras.

Superior Essex—Power Wise Category 5e+ 4PPoE cable was installed at Launch Fishers, a 52,000-square-foot building whose occupants use co-working office space. Specifically, 10,000 feet of the 22-AWG cable were used to connect from Cisco 3850 switches to LED lights. PowerWise Cat 5e+ delivers the 60W of power necessary to support LED lights with 98-percent power efficiency while also supporting 1-Gbit/sec speeds.

The Smarter Enterprise Connectivity enabling business efficiency and resiliency through an optimized and intelligently managed cabling and connectivity infrastructure.

From an interconnected infrastructure perspective, it’s an alignment with the converged cabling connectivity infrastructure approach that we are seeing out in the environment today. It’s really a convergence of the traditional IT systems being video, voice, and data, along with the building systems being access and monitoring, lighting, HVAC systems, and so on. The whole notion is to really converge those IP addressable systems into one infrastructure versus multiple infrastructures, enabling the optimization not only from a CapEx perspective, but from an OpEx perspective as well. It also supports Leadership in Energy and Environmental Design (LEED) rating in these buildings and many customers are looking for LEED points as they’re designing their new buildings and facilities.

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