The Evolution of Ethernet

It's been more than 30 years since the first Ethernet standard was approved. Explore where Ethernet has been, where it is today and where its backers believe it will be in the years to come.

1983

10 MBPS: The first iteration of Ethernet, 10Base5, is released, three years after the IEEE first commissioned the project 802.3 working group to design the standard. In 1985, thin coaxial cable, or thinnet, was also approved, and the group made other changes to the specification in 1987, 1990 and 1993.

1995

100 MBPS: So-called Fast Ethernet is introduced. Introduction of autonegotiation, enabling two connected devices to transmit data through shared communication parameters, such as speed and duplex mode.

2002

10 GBPS: Ethernet hit the 10 Gbps milestone for fiber transmission; twinaxial support came two years later while 10 Gbps over unshielded twisted pair became a reality in 2006.

1998

1 GBPS: 1 Gbps over fiber optic cable made its debut; the IEEE approved 1 Gbps over twisted pair one year later.

2016

2.5 GBPS, 5 GBPS, 25 GBPS: The 25 Gbps specification won ratification in mid-2016. Aimed at data centers, it enabled single-lane 25 Gbps throughput via multimode optical fiber, twinaxial cable or printed circuit backplanes. It offered greater efficiency than 10 Gbps, at lower cost than 40 Gbps. Also in 2016, the IEEE approved 2.5 and 5 Gbps Ethernet—engineered to run over Cat 5e and Cat 6 twisted-pair cables and serve as a steppingstone for enterprises migrating to higher-speed wireless technologies.

2010

40/100 GBPS: Based on meshing multiple lanes of 10 Gbps technology to create higher speeds, the 802.3a standard supported transmission over multiple physical layer specifications.

2017

200/400 GBPS: The IEEE ratified 200 and 400 GbE -- both based on 50 Gbps single lanes grouped together -- in late 2017. Of enormous interest in the fast-growing data center interconnect and cloud market, 400 GbE is four times faster than its predecessor, 100 GbE.

2021 and beyond

800 GBPS, 1 TBPS, 1.6 TBPS, 6.4 TBPS, 10 TBPS: Terabit speeds will depend on the development of single lanes that can be modulated at 100 Gbps. These lanes, grouped together, will serve as a foundation for multiterabit throughput, but require significant investment before they are economically viable.