



ethernet alliance

# THE ETHERNET ECOSYSTEM

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## executive summary

Ethernet has become increasingly important to everyone that uses technology. Up until just a few years ago, the typical user of Ethernet was an IT professional supporting an enterprise network. Today, Ethernet is the grand unifying technology that enables communication of multiple forms of content - voice, video and data - via the Internet and other networks using Internet Protocol (IP). Because of this, Ethernet is a part of many people's lives, including casual home users who may not even realize they are using Ethernet. Today's content and applications, which are IP-friendly, are passed seamlessly through a complex Ethernet ecosystem between carrier networks, enterprise networks, and consumers. From its origin more than 30 years ago, Ethernet has evolved to meet the increasing demands of IP packet-switched networks. Due to Ethernet's proven low implementation cost, its known reliability, and relative simplicity of installation and maintenance, its popularity has grown to the point that today nearly all traffic on the Internet starts or ends on an Ethernet connection.

## brief history of ethernet

In 1973, researchers at Xerox's Palo Alto Research Center (PARC), principally Robert Metcalfe and David Boggs, developed Ethernet as a technology for interconnecting the lab's Xerox Altos, early graphical personal computers also developed at PARC. Metcalfe also postulated a theorem about the growing importance of networks. Now known as "Metcalfe's Law," he predicted that the value of the network expands exponentially as the number of users increases. Not only was he correct about technological networks, his "law" has since also been successfully applied to the field of economics.

The original speed of Metcalfe's Ethernet was 2.94 Megabit per second. It was soon increased to 10 Megabit per second. Successive generations have been built around the creed of "10 times the speed at 3 times the cost" and pushed Ethernet to 100 Megabit per second, then 1 Gigabit per second, and most recently to 10 Gigabit per second. Driven by Moore's Law and manufacturing economies of scale, the price of Ethernet technology is continually falling.

Metcalfe's law says that the value of a communications network is proportional to the square of the number of users. This prediction has become a self-fulfilling prophecy, as the number of users presents an attractive market for applications to be introduced, which then further increases the number of potential users. This has



## brief history of ethernet (continued)

also led to Ethernet growing beyond Local Area Networks (LAN) into metro area networks (MAN), wide area networks (WAN), and access (via Ethernet First Mile - EFM) networks.

## the ethernet ecosystem

With today's Internet, there is a very strong push to provide "Triple Play" IP services (data, voice and video) in the home, in the office and throughout the networked world. Ultimately, this is the content that will go from carrier to consumer, and it is all IP-friendly. All of this content is communicated across an Ethernet link, making Ethernet the underlying unifying network from carrier to consumer.

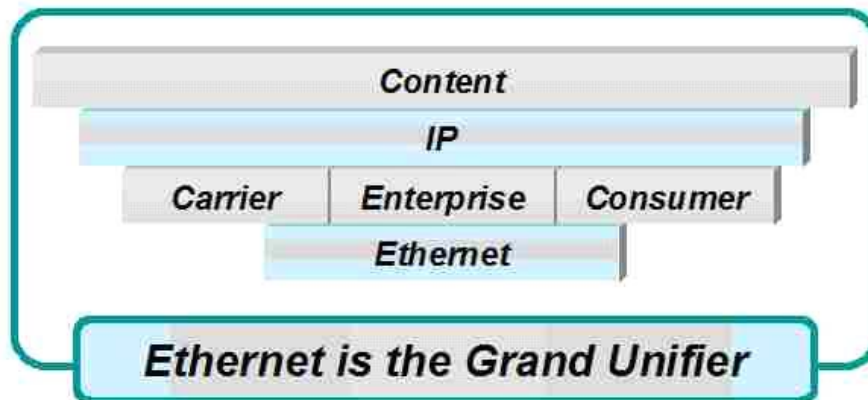


Figure 1 - The Ethernet Ecosystem

For service providers migrating to an IP infrastructure, Ethernet will help to reduce the cost of existing services, while also allowing the delivery of new services in a cost effective manner. Continuing IEEE 802 Ethernet efforts will expand upon this vision to deliver a solution that is faster and more reliable at a lower cost. This is already exemplified in the enterprise, where Ethernet, because of its lower total cost of ownership and better return on investment, has become the de-facto LAN technology.

These same qualities are driving Ethernet past traditional home networking applications into new frontiers of home entertainment and digital media. In the consumer realm, where cost and ease-of-use are key, the true plug-and-play of Ethernet is making it the ubiquitous digital connection of choice for consumer electronic products.



## the ethernet ecosystem (continued)

The market acceptance of Ethernet has encouraged multiple industries to build and expand upon it. The development of assorted Ethernet-based interfaces and components has empowered a multitude of applications to be used in a variety of manners to deliver a wide array of content. These applications have grown from the traditional Local Area Network (LAN) to include Wide Area Networks (WANs), Metro Area Networks (MANs), Access networks and storage applications, as well as interfacing with WiFi®, WiMax, and SONET/SDH networks.

This broad assortment of interfaces, components, applications, and speeds of operation is the landscape and reality of the Ethernet ecosystem.

## ecosystem support

The Ethernet Alliance’s mission is to support the continued growth and expansion of the Ethernet Ecosystem. The Ethernet Alliance is part of an industry effort that interacts with the activities of the IEEE 802 Ethernet standards efforts and UNH-IOL’s interoperability certification efforts. Thus, the Ethernet Alliance serves as an industry resource for users, and assists its member companies by helping to reduce their time to market and increasing market acceptance of Ethernet products.



Figure 2 - The Ethernet Alliance Role



## ecosystem support (continued)

As discussed before, the Ethernet Ecosystem is extremely complex, consisting of multiple interfaces, components, speed rates, and applications. Therefore, the Ethernet Alliance intends to be a resource to other alliances to help benefit respective constituencies. Figure 3 provides a brief example of this industry cross-participation.

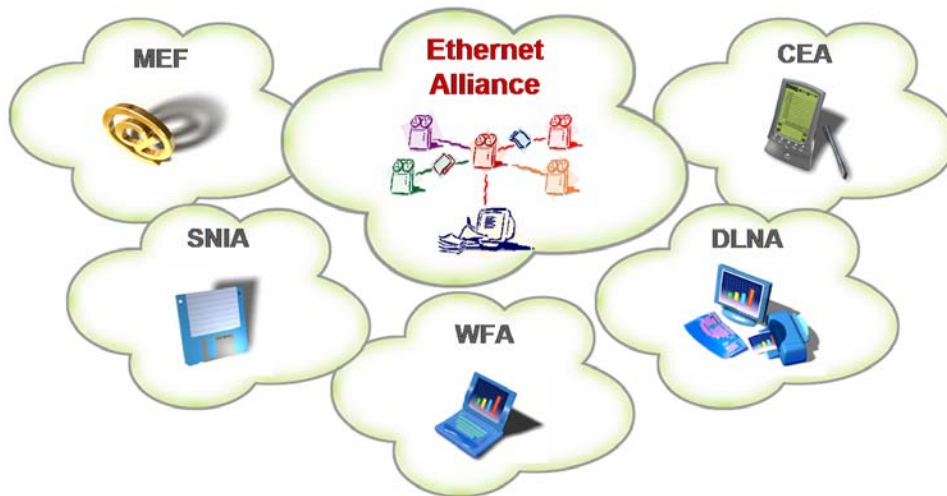


Figure 3 - An Environment of Co-Assistance

## conclusions

Ethernet is the grand unifying technology that enables communication via the universal language, Internet Protocol (IP). Today's content and applications, which are IP-friendly, are passed seamlessly through a complex Ethernet ecosystem between carrier networks, enterprise networks, and consumers. From its origin more than 30 years ago, Ethernet has evolved to meet the increasing demands of IP packet-switched networks. Due to its proven low implementation cost, its known reliability, and relative simplicity of installation and maintenance, its popularity has grown to the point that today nearly all traffic on the Internet starts or ends with an Ethernet connection.

Ethernet has evolved beyond just supporting faster network speeds in local area networks, and is now being used for access, storage, metro, and wide area networks. It is the technology behind switched packet networks, which are driving the triple play



## conclusions (continued)

convergence of voice, video, and data that carriers are using to introduce services to the end consumer in the home. And as Ethernet continues its evolution as the primary wired networking technology, other technologies, such as Wi-Fi and WiMAX, are ultimately bridging at some point to an Ethernet network.

This myriad of applications, services and content driven by a low-cost reliable technology has created the Ethernet ecosystem, which continues to grow and evolve, and is ultimately used to deliver content from the carrier to consumer.

## about the ethernet alliance

The Ethernet Alliance was formed by companies committed to the continued success and expansion of Ethernet technologies. By providing a cohesive, market-responsive, industry voice, the Ethernet Alliance helps accelerate industry adoption of existing and emerging IEEE 802 Ethernet standards. It serves as an industry resource for end users and focuses on establishing and demonstrating multi-vendor interoperability. As networks and content become further intertwined, the Ethernet Alliance works to foster collaboration between Ethernet and complimentary technologies to provide a totally seamless network environment.