## 2015 ETHERNET ROADMAP

1 Tb/s

As shown on the long and winding road, Ethernet could have 12 speeds before 2020 with 6 new speeds introduced in the next 5 years. The progression of speeds is not in chronological order because 40GbE and 100GbE were primarily based on multiple lanes of 10Gb/s technology that was available before



10 Tb/

6.4 Tb/s

>>2020

Ethernet Speed

1.6 Tb/s

>2020

#### **MEDIA AND MODULES**

Ethernet is wired technology and supports a variety of media including backplanes, twisted pair, twinax, multimode fiber and single-mode fiber. Most people know Ethernet by the twisted pair or Cat "x" cabling with RJ45 connectors because close to a billion ports a year are sold. Cat 8 is the latest generation of twisted pair cabling that will be used in 25GBASE-T and 40GBASE-T.

Another popular copper interface is Twinax copper cables that are also known as direct attach cables (DAC)s. DACs may be passive or active and provide very low cost connectivity to servers. Passive DACs are limited to 25 meters or less while active optical cables can go hundreds of meters.



### ETHERNET ECOSYSYTEM

Represented as a city, the Ethernet Ecosystem is divided into four quadrants that are interconnected by multiple MANs that are typically not Ethernet. While each quadrant has overlapping technologies and requirements, this map organizes the environments with a broad brush. Specific implementations may vary considerably.

The top half of the map represents applications where cost and connectivity are driving concerns. In the home, small office and car, link distances are less than 100 meters and speeds are typically under 10Gb/s, so copper cabling and wireless are ideal. As enterprises scale in size and requirements, they shift towards fiber and 10Gb/s speeds and beyond.

Wiring Closet

Equipment

The lower half of the map captures applications that consistently push the bounds of Ethernet and require higher speeds and massive scalability. For example, service providers and hyperscale data centers will be the early adopters of 400GbE. These users may deploy hundreds of thousands of servers in data centers that span multiple football fields and consume hundreds of megawatts of power.

#### ENTERPRISE AND CAMPUS

Enterprises consume more Ethernet ports than the other environments by connecting desktop computers, devices and Voice over IP (VoIP) phones. The wired Ethernet networks are supplemented with wireless access points (WAPs) that are connected to Ethernet cables. 802.11ac WAPs are driving the need for 2.5 and 5GBASE-T and eventually 10GBASE-T. Most enterprise data centers are less than 10,000 sq ft and use Cat "x" cabling to connect to servers.

Ethernet or WAN connectivity using Ethernet Passive Optica letworks (EPON) leased lines

# Work Area

#### **RESIDENTIAL AND CONSUMER**

Ethernet Passive Optical Networking (EPON) delivers Internet service to millions of residential customers around the world. Regardless of how the Internet reaches the home, residents may wire their home with Ethernet or use wireless connectivity to connect devices. From cameras to cars, Ethernet provides the network to enable sharing resources and content.

