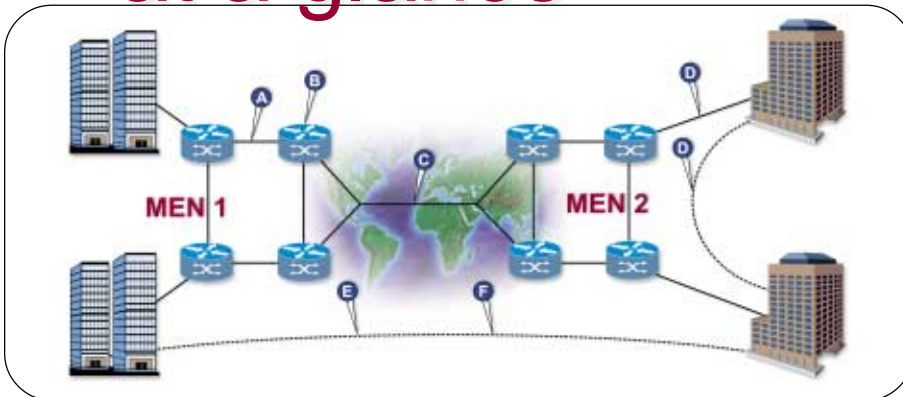




Accelerating the adoption of
optical Ethernet
as the technology of choice in
metro networks worldwide.

technology at a glance



A TYPICAL GLOBAL METRO ETHERNET NETWORK (MEN)

➤ ➤ ➤ ➤ A Metro Ethernet Network allows service providers to provide Ethernet connectivity and deliver Ethernet services to end-customers. Such services could include Internet access, Virtual Private Networks and Circuit Emulation Services.

Ethernet is a simple and cost-effective technology that provides rapid provision on demand, packet based operation, ubiquity and end-to-end transparency. The limitations of native Ethernet such as end-to-end QoS guarantees, network resilience and in-service performance monitoring are being addressed by the MEF Technical Committee.

- A** Links are primarily point-to-point, and can be either Fast Ethernet, GbE or 10GbE.
- B** Nodes can be either switches or routers, depending on
 - (a) Their location in the MEN
 - (b) The nature of services being provisioned and
 - (c) The level of service resilience / protection required.
 Nodes are meshed to whatever degree necessary to provide the desired connectivity, services and protection.
- C** WAN links connect MEN's together across large distances.
- D** Ethernet Services can be classified topologically into either point-to-point (as shown) or point-to-multi-point. Services are then further classified according to the bandwidth provisioned and used. This usage can be exclusive and/or shared across multiple users. Bandwidth is provisioned on demand from 1Mb/s to 1Gb/s, in increments as fine as 1Mbps.
- E** Network resilience. Hierarchically implemented using a combination of various techniques. Protection could be end-to-end (as shown) and/or node-to-node.
- F** Quality of Service. Realized using a combination of various techniques, providing both 'hard' and 'soft' bandwidth guarantees. Implemented on both an end-to-end (as shown) and node-to-node basis.

positioning statement

MISSION

The mission of the Forum is to accelerate the adoption of optical Ethernet as the technology of choice in metro networks worldwide.

OBJECTIVES

1. Build consensus and unite service providers, equipment vendors and end-customers on Ethernet service definition, technical specifications and interoperability.
2. Facilitate implementation of existing and new standards, Ethernet service definition, test procedures and technical specifications of the MEF to allow delivery of Ethernet services and make Ethernet-based metro networks carrier-class.
3. Enhance worldwide awareness of the benefits of Ethernet services and Ethernet-based metro transport networks.

"Our mission is to accelerate the adoption of optical Ethernet as the technology of choice in metro networks worldwide."

PRIORITIES AND SCOPE

1. The primary priorities of the MEF are to define:
 - a. *Ethernet Services* for metro transport networks
 - 1) Such services shall be delivered over native Ethernet-based Metro networks and could also be supported by other transport technologies
 - b. *Carrier-class Ethernet-based metro transport technologies* by:
 - 1) Specifying *architecture, protocols and management* for Ethernet-based metro transport networks
 - 2) Supporting such Ethernet Services
2. The secondary priorities of the MEF are (when deemed necessary) to define:
 - a. Work to be done by other organizations on other transport technologies
 - b. Non-Ethernet interfaces, if not defined by other organizations

DELIVERABLES

1. Implementation Agreements on existing standards
2. Test Procedures for interoperability
3. Position Statements to propose new standards to existing standards bodies
4. Technical Specifications of new standards in the MEF
5. Marketing evangelism and collateral material

frequently asked questions...

➤ **Is the MEF a standards definition body?**

The goal of the MEF is to create implementation agreements that leverage *existing* standards rather than creating new standards. Where necessary, the MEF will:

1. Make recommendations to existing standards bodies, e.g., the IETF or IEEE.
2. As a last resort, create standards that are not being developed (or fall within the scope) by other standards bodies.

➤ **How is the MEF positioned relative to other standards organizations and other technologies?**

The MEF's priorities are to (1) Define Ethernet services for metro networks that shall be delivered over native Ethernet transport, but could also be based on other transport technologies, and (2) Define carrier-class Ethernet-based metro transport technologies.

These primary priorities will be realized by defining the implementation agreements and standards necessary to make native Ethernet a carrier class transport technology.

Ultimately, a combination of economics, operational and logistical attributes will mandate the viability and adoption of various transport technologies. The MEF's work, and that of other strategic alliances, will then let service providers select or combine various technologies as they deploy their metro networks.

With regard to specific industry bodies/technologies:

> **RPR Alliance**

The RPR Alliance is promoting a new Link Layer standard, IEEE 802.17 (Resilient Packet Ring) for bringing packet efficiency and resiliency specifically to ring-based transport networks that carry Ethernet as well as other services.

The Metro Ethernet Forum and IEEE802.17/RPRA are complementary. For example, the MEF defined Ethernet Services, capable of being carried over Ethernet-based transport, may also be carried over other transport technologies, such as standard RPR transport to be defined by IEEE802.17. In addition, the MEF may deem necessary to define work to be done by other organizations on other transport technologies.

> **10 Gigabit Ethernet Alliance**

The 10GEA was founded to facilitate the timely completion of the standard by sponsoring technical events and discussions in support of the IEEE 802.3ae committee.

The purpose of the MEF is to define Ethernet Services for IEEE802.3 based networks, as well as for other transport networks, and to define carrier-class IEEE802.3 based transport technologies by specifying Layer 2-7 management, protocols and architecture.

In contrast, the 10GEA is concerned with 10GbE transport and interoperability with existing legacy networks and demonstrations of conforming products at the MAC layer and below.

> **SONET/SDH transport**

As a secondary focus, the MEF recognizes SONET/SDH as a broadly deployed alternative transport that can deliver Ethernet services. The MEF-defined Ethernet Services, capable of being carried over Ethernet-based transport, may also be carried over SONET/SDH networks. Using individual criteria, service providers will select the transport technology (or combination of technologies) that deliver these Ethernet services in a manner that is consistent with their own individual business models.

➤ **Is the Metro Ethernet Forum meant to expire following the completion of specific deliverables or after a certain time?**

The Metro Ethernet Forum has no set expiration date—its work will be done when Ethernet becomes the consensus-standard for metro networking.

➤ **How does a company become a member of the Metro Ethernet Forum?**

Those companies interested in becoming a member should visit the web site where they can complete an application. The Metro Ethernet Forum application is located on our web site, www.MetroEthernetForum.org

➤ Why Ethernet in the Metro?

Deploying Gigabit Ethernet in the metropolitan areas is a compelling and commercially proven approach to breaking the 'metro bandwidth bottleneck' for the following reasons:

> Cost Effectiveness

Infrastructure equipment costs for Ethernet are significantly less than legacy solution costs. This is partly due to economies-of-scale of Ethernet (ubiquitous adoption) and partly due to the relative technical simplicity of Ethernet.

Provisioning costs (mainly operational and planning related) are also significantly less than for TDM approaches.

Less-obvious benefits include being easy-to-learn compared to the complexities of SONET/SDH and ATM, which impacts employee hiring capability and availability.

> Flexible and Rapid Provisioning on Demand

Service velocity is a key competitive differentiator for xSP's. The present lack of customer-centric flexibility, and the coarseness of bandwidth granularity of legacy systems can be impediments to providing promising new revenue generating services.

Ethernet services offers a wide range of speeds, from 1Mb/s to 1Gb/s, in increments as fine as 1Mbps, which can be rapidly provisioned on-demand—possibly even by the customer through a web-based tool.

> Ease of Interworking

Removing inter-working issues between different platforms and environments makes service provisioning and activation simpler. In other words, a layer of protocol interworking complexity is removed from the WAN access. This reduces configuration requirements and enables a simple migration path from low to high speeds. Consequently, it is relatively simple to integrate and interface end-customer IT systems with Ethernet metro service.

➤ How Large is the Metro Ethernet Market?

Recent reports from respected industry analysts, including Yankee Group and RHK, estimate that the market for metro Ethernet services in the *United States* will exceed \$4 billion by 2006, an increase of 4000 percent over 2002 figures.

Other analysts are even more bullish on the *world* market: Pioneer Consulting estimates that global Ethernet service revenues will reach \$14 billion by 2005, and Gartner Group estimates a value far in excess of that.

A wide range of estimates is common in a nascent industry. Irrespective of the exact number, analysts agree that strong customer demand for faster, flexible and affordable Ethernet services exists for the foreseeable future.

The Metro Ethernet Forum is a non-profit organization chartered to accelerate the adoption of optical Ethernet as the technology of choice in metro networks worldwide.

The Forum is comprised of leading service providers, major incumbent local exchange carriers, top network equipment vendors and other prominent networking companies that share an interest in metro Ethernet.

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