Carrier Ethernet Refutes the Recession

The TIA is predicting a 3.1% decline in telecommunications revenues for 2009, a first in 20 years. However, Carrier Ethernet is on a roll. Equipment sales are set to decline slightly due to increased competition and a weak US dollar, but Insight Research is projecting a 14% growth in service revenues this year, rising to 32% by 2012.

By Bob Emmerson

Carrier-class Ethernet ticks all the price/performance boxes. Traditional Ethernet limitations have gone; Gigabit interfaces are widely deployed; data rates are moving up to 100 Gbps; and a global standard has driven prices down and facilitated innovation.

The Metro Ethernet Forum (see sidebar) has driven and continues to drive the development of Carrier Ethernet (CE) technology. There is a certification program that consists of a series of thorough tests that provides evidence for end-users, service providers and manufacturers alike, that products and services are compliant with published MEF specifications. Iometrix (www.iometrix.com) is the forum's official certification laboratory.

In May the forum announced details of the MEF 21 certification program that provides telecom equipment vendors with validation for their Link Operations Administration Operation and Maintenance (OAM) implementations.

Link OAM defines automated OAM mechanisms to replace existing manual monitoring and management functions, so equipment certified to MEF 21 will significantly reduce the provider's OPEX by eliminating costly truck rolls, on-site diagnostics and troubleshooting.

Nan Chen, MEF President: "*The explosive growth of Carrier Ethernet services is outpacing the providers' ability to manage manual links, and MEF 21 addresses their requirement for an Ethernet equivalent to SONET/SDH and ATM OAM capabilities – so this is a very timely addition to our MEF Certification program*."

LIVE DEMOS AT ETHERNET EXPO

Iometrix staged the industry's first Global Interconnect demo at Ethernet Expo Europe 2009, held in London from May 13th to 14th. It combined a live services demo of globally interconnected CE services and a vendor showcase. Supported by the MEF, this event allowed service providers to demonstrate interconnected CE services to large enterprise customers.

Figure 1. A live circuit ran from the Conference Centre to a London data exchange, then to Frankfurt, back to London, and back to the Conference Centre, running ongoing videoconferencing services with service quality checks performed in real time. A second circuit went from London to Los Angeles to Singapore to Chemai in India and back to London. Tata VSNL provided this circuit.

Videoconferencing is not only a highly demanding interactive application in terms of bandwidth and performance, it is also very challenging as a demonstration because poor quality of experience is immediately visible to the viewer.

The Metro Ethernet Forum (MEF)

The MEF (http://metroethernetforum.org) is a global industry alliance comprising more than 145 organizations including telecommunications service providers, cable operators, MSOs, network equipment, test vendors, labs and software manufacturers, semiconductors vendors and testing organizations.

The MEF develops technical specifications and implementation agreements in order to promote interoperability and deployment of Carrier Ethernet worldwide. Its "mission" is to accelerate the worldwide adoption of Carrier-class Ethernet networks and services.

The demo was the first time that live, globally interconnected Carrier Ethernet circuits were demonstrated in public. The two circuits, a global one provided by Tata and a pan European one provided by cooperation between COLT and ntl:Telewest busness, demonstrated the feasibility of the Ethernet Network to Network Interface (E-NNI). The NNI is currently one of the most important projects that is being worked on by the MEF technical committee. The NNI Technical Specification will simplify the task of combining multiple network "hops" together from a variety of providers to create an end to end Carrier Ethernet connection for a subscriber.

The demo also employed Optical Burst Switching (OBS) in order to simplify the provisioning of Ethernet services on an optical DWDM transport network. The Matisse EtherBurst Ring OBS network switches individual packets rather than entire wavelengths and uses the Ethernet control plane to make the switching decisions, eliminating the complex management control protocols like G-MPLS and ASON.

All the demo participants were connected to the global and pan-European live feeds, as well as having a number of end-to-end connections that were used to showcase individual demonstrations of applications like Ethernet based IP Video (Spirent), Circuit Emulation over Carrier Ethernet (Alcatel-Lucent) and OAM demonstrations (ADVA, Cisco and Omnitron).

PARTICIPATING VENDORS

Iometrix had certified that the products of the six vendors shown in figure 1 met the MEF 9 and 14 specifications. But the proof of the pudding came in the Global Interconnect demo, which supported several major initiatives including:

- A showcase by service providers around the globe of interconnected carrier Ethernet;
- A look at multiple core and access switch vendors working together on interoperable next-generation implementations of stateful application protocols and services;
- A network utilizing interconnected circuits located at the Expo and other sites with service quality checks performed in real time.

Alcatel-Lucent: This vendor deployed its 7210 Service Access Switch, which is a new family of small footprint, customer edge devices that are owned and managed by the service provider. When networked with the Service Router portfolio, the 7210 provides seamless access to application-aware VPN services, which use protocol signatures to guarantee performance. Alcatel-Lucent products are also used by ntl:Telewest business to deliver Ethernet services similar to those used in the interconnect demo.

ANDA: deployed its EtherReach 1006, which is the top-end member of a family of network termination equipment products. They deliver Ethernet services with advanced SLA management and OAM capabilities, while providing intelligent demarcation between provider and the subscriber networks. In addition the EtherProbe products were used in order to highlight live reports of actual results realized over the Global Interconnect network.

Cisco: partnered with Tata VSNL to deliver a global service that went from London to

Los Angeles, Los Angeles to Singapore, Singapore to Chennai, and back to London. Cisco also provided its ME 3400E Ethernet Access switches to demonstrate Business Ethernet services across the local Metro network. These are next-generation customer-located equipment designed for triple play Layer 2 and Layer 3 VPN services.

Matisse: Matisse Networks provided the backbone network that connected all demo participants to the live circuits. The Matisse EtherBurst Ring Optical Burst Switch network consisted of two PX-1000 nodes and two SX-1000 Ethernet Service nodes. All the demo applications and traffic was transported over the Matisse EtherBurst network using optical burst switching, which maps Ethernet packets to DWDM wavelengths.

Omnitron: two iConverter GM3 Network Interface Devices (NIDs) represented customer locations and provided Ethernet demarcation between the Metro Ethernet Network and the User Network Interfaces (UNI). Ethernet Service Multiplexing were also demonstrated via Ethernet Private Line (EPL), Ethernet Virtual Private Line (EVPL), and Ethernet LAN (ELAN) services.

Spirent: the demo employed the Spirent Avalanche and Spirent TestCenter VQA. Avalanche is an application network layer testing product that was used to generate video traffic. The TestCenter VQA assessed more than one hundred metrics relevant to delivering high quality video.

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