



Carrier Ethernet Featured Article

October 13, 2008

Extreme Networks Raises the Gigabit Ethernet Switching Bar



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Let's start with Carrier Ethernet: why do we need it? We need it because traffic over IP networks is set to rise between 25- and 100-fold in around six years. Nobody knows the exact figure but it's going to be huge. By that time around 5 billion people will have access to the Net, which will be used for a wide array of services such as voice, video, retail and social networking applications. The challenge for carriers is build network that can support this increased demand for bandwidth and at the same time slash costs dramatically.

Carrier Ethernet (CE) service standards have been defined by the Metro Ethernet Forum ([News - Alert](#)) (MEF), a global standards and certification body. The MEF has defined a rich set of Ethernet based user network interfaces modeled after the very successful Frame Relay (FR) service definitions but at much higher data rates: CE starts at 10Mbps whereas FR typically starts at 56Kbps. However, the MEF does not define how these services are to be transported across the Carrier's metro network and this has given rise to a plethora of confusing acronyms and broad division into two camps: PBB (Provider Backbone Transport) and MPLS (Multiprotocol Label Switching). I'm ignoring the variants.

There was a lot of excitement around PBB because the concept came from BT ([News - Alert](#)) and all the major vendors wanted a slice of the carrier's 21st Century Network, but earlier this year the UK carrier backed away. However, if we put protocols aside, the key transportation requirements are the same. The metro network must transport packets at high speed, low cost and provide carrier-grade functionality, e.g. have the characteristics of a circuit-switched connection.

So, where does Extreme Networks ([News - Alert](#)) come into the picture? The company's BlackDiamond 20808 switch is a purpose-built, Metro Ethernet transport switch. On the speed front the numbers are awesome but they are needed to support the forecasted demand for both residential and business traffic. It's a fifth generation Ethernet switching system and delivers 120 Gbps per slot in an 8-slot system resulting in 2 Tbps of switching capacity. Positioned for the metro core where high density 10 GE (Gigabit Ethernet) is critical, the BlackDiamond 20808 provides up to 64 10 GE ports per chassis and 192 10 GE ports per rack. This provides capacity for future high-density, line-rate 40 GE and 100 GE line-card upgrades.

On the cost front the US\$5,800 cost of a 10GE port is about half that of the nearest competitor and a quarter or more of the other leading vendors. And, unlike router-based metro architectures, which require complex provisioning by trained engineers, operational expenses are reduced due to the operational simplicity of Layer 2 solutions: that's part of Extreme's PBB pitch. However, the company also supports MPLS.

And the winner is ...

I spent a lot of time wrestling with this subject and their confusing acronyms, e.g. T-MPLS (T for Transport) has recently morphed into MPLS-TP (Transport Profile). This is the one that has the look of a winner but the specification is still at the draft stage. MPLS was designed to provide a unified data-carrying service for both circuit-based clients and packet-switching clients and it can be used to carry many different kinds of traffic, including IP packets and Ethernet frames. MPLS-TP will be a connection-oriented packet-switched technology with the OAM features demanded by carriers. It will also offer a standard and interoperable MPLS based implementation and has the support of the all the key players in the industry.

Carrier Ethernet: A Carrier's Perspective

Right now carriers are faced with a plethora of options. They have made massive investments in MPLS networks, which are not going to go away anything soon. Recent research and standardization efforts have focused on boosting Ethernet line-rates to 100 Gbps. This rate will allow Carrier Ethernet technology to complement or replace parts of today's SDH metro and scale the IP/MPLS-based core networks.

Ethernet services will play the leading role in the transportation of bandwidth-hungry services such as Video on Demand and IPTV. In addition, Carrier Ethernet will facilitate the delivery of end-to-end VPN business services (E-Line and E-LAN), thereby generating more traffic and revenue for network providers. Alcatel-Lucent ([News - Alert](#)) believes that service providers are converging multiple services onto a single IP/MPLS network. The company also points to a deployment base of over 200 service providers with MPLS service router based IPTV, Business VPN and mobile backhaul Carrier Ethernet networks. However, NSN predicts that towards the middle of the next decade that the metro and access parts of today's networks will converge into a single network and an aggregation layer will collect traffic from different sources and transfer it to a photonic or MPLS core. These views are complementary, not contradictory.