

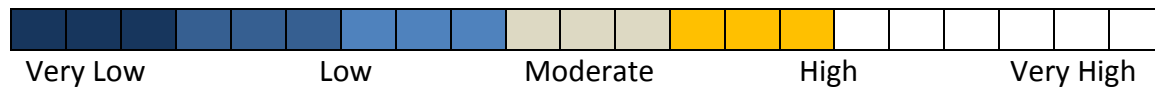
Title: Ericsson's Redback Networks Announces New Carrier Ethernet Switch Product Line: introduces the SM 480

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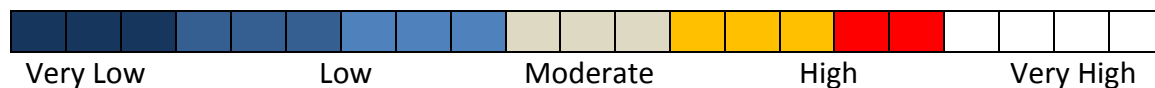
Topic: Ericsson's Redback Networks announces a new product line of Carrier Ethernet switches, targeted at converged Ethernet/IP metro needs of fixed/mobile operators.

Relevance to Market Requirements



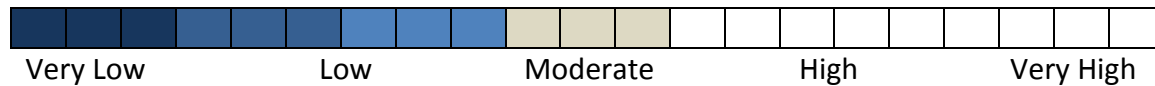
High relevance to the market requirements of fixed/mobile operators in particular, where converged networks running Ethernet/IP on multiservice routers may have a particularly strong business case. Redback's announcements address the unification of fixed and mobile networks, driven by IPTV and made more feasible thanks to strong interest in using Carrier Ethernet transport in wireless backhaul equipments. The SM series is designed to simplify network architectures, lower carrier costs thanks to the convergence of fixed and mobile networks, and provide scalability, service provisioning capabilities and policy management.

Importance to Ericsson - Redback



High/Very High Importance to Ericsson's Redback Networks: The company needs to expand its addressable market and widen its revenue base, and the SM 480 fills Ericsson's **portfolio gap** by addressing the Layer 2 needs of the metro access and aggregation networks that was previously filled with the capable but not Layer 2-optimized SmartEdge series of multi-service edge routers. Ericsson very much needs to show that it can leverage the Redback acquisition and related IP/Ethernet expertise in its installed base of accounts, and needed a strong announcement of future Ethernet switch/routers and plans for future scalability to gain mindshare in the market before letting Alcatel-Lucent gain too much momentum.

Competitive Impact



Moderate competitive impact on the market: Redback's Ethernet switching solution comes to the market somewhat late compared to some of its major competitors, and has to play catch up. Vendors such as Alcatel-Lucent, Juniper, Cisco, Foundry, Huawei, and ECI have already added high-capacity Layer 2 service-aware devices to their portfolios, and Ericsson previously competed in this space with the SmartEdge multiservice router, but without the cost-effectiveness of the SM 480. The product presents Layer 2 subscriber management services and tunneling protocols, which could give the service provider flexibility to implement an efficient transport-oriented access/aggregation network.

What Ericsson's Redback Networks Announced:

Redback introduced the **SM line** of smart Ethernet switches, which it has designed to **accelerate the unification of fixed and mobile networks**. The smart Ethernet switch will be the first in a family of carrier Ethernet products from Redback and Ericsson that will deliver **future Terabit switching capacity for metro access and core networks**.

The **SM 480** is the first model announced as part of the new SM series, and is scheduled for commercial availability during the **third quarter of this year**. Targeted at metro aggregation and transport networks, the SM 480 is a 15 RU system with 480 Gbps of backplane capacity and featuring 12 slots for line cards and another 2 slots for 1:1 redundant route processor modules. The SM 480 has a fully meshed backplane, eliminating the need to consume slots with switch fabric cards.

The Redback Networks SM 480 scales to support 1.5 million MAC addresses, 256,000 VLANs, and 8,000 VPLS instances. Designed for NEBS III and RoHS compliance, it is managed by the SmartEdge Operating System (SEOS), and provides a range of MPLS, VLAN and tunneling support features.

The SM 480 supports the following Ethernet interface modules, supporting access/edge to core metro requirements:

- a) 10-port and 20-port GbE modules
- b) 1-port and 4-port GbE modules
- c) A 60-port Fast Ethernet / 2-port GbE module

This announcement is quite important for the overall IP Services Platform market segment. Redback states that the SM series is designed to simplify network architectures, **lower carrier costs**, and unify networks for fixed and mobile carriers, and highlighted in its announcement that it “develops IP-based routers and switches for 75% of the world’s largest telephone carriers.” That does not necessarily mean it has an active presence in 15 operators with this class of system; in the “fine print” of the announcement, it was pointed out that Redback has sold over 107 million broadband subscriber licenses to 75 percent of the top 20 carriers worldwide... and it is probably sale of IP broadband routers that Redback was referring to.

But Redback is putting \$300 million into R&D this year, and is in hot pursuit of its lofty but stated goal of becoming the number 2 player in routing. Now that it has Ericsson’s “deep pockets” and a strong desire from Ericsson to ramp up additional IP and Ethernet expertise behind it, it will be interesting to see what Redback can do in terms of ramping up market share.

The SM 480 product launch demonstrates a joint development effort that integrates Ericsson’s extensive mobile networks knowledge and Redback’s carrier edge switch/routing expertise. This includes taking advantage of Ericsson/Redback joint activities in areas such as PRAN (Packet Radio Access Network), SAE-GW (System Architecture Evolution - Gateway), M-PBN (Mobile Packet Backbone Network) and SASN (Service Aware Support Node) applications.

The company also has created upgrades that will enable its entire family of SmartEdge routers (and the new carrier Ethernet switch family) to use a single operating system, the SEOS. Operators will also be able to update and maintain the devices without taking them out of service -- a capability Redback’s been working on for three years.

Positioning:

The SM 480 fills Ericsson’s **portfolio gap** that addresses the Layer 2 needs of the metro access and aggregation network that was previously filled with the capable but not Layer 2-optimized SmartEdge series multi-service edge router.

The SM 480 leverages the technology base of the SmartEdge but adds enhanced Layer 2 support, which is necessary to extend subscriber management capabilities and high-scale Ethernet capacity to the metro network. This is the **first major new product** since the Ericsson acquisition and underline to the importance of the Redback technology as the cornerstone to fulfill the corporate-wide all-IP vision in particular now that the **Juniper** relationship has been terminated.

Target Customers:

Ericsson targets a wide range of customers: CLECs/ILECs, ISPs, Mobile Wireless Operators and MSOs by addressing in particular the **cost pressures** and rapidly raising **scale requirements** in the access and aggregation layers of the metro.

The new Ethernet switch offers extensive Layer 2 subscriber management services and tunneling protocols, which gives the service provider considerable flexibility to implement an efficient transport-oriented access/aggregation network. Ericsson's full service broadband strategy draws upon its extensive experience with mobile networks and Redback's wireline multiservice routing and subscriber management experience to facilitate the next step in network consolidation.

One of the goals of the platform is to facilitate the migration of service providers' separate wireline and wireless networks onto a single IP network. For service providers running separate networks, the savings in CapEx and OpEx could be significant. With growth in the metro market, service providers are also seeking relief from overly complex protocols and configurations and the advanced Layer 2 capabilities of the SM 480 are well suited. Service providers can instrument a Layer 2 network for the access and aggregation layers and reserve full Layer 3 routing for the edge nodes. To better support this transport-oriented approach, the SM 480 supports various tunnel mechanisms such as MPLS, PW and L2TP. The latter can be used to establish service-aware tunnels without the need to introduce MPLS into the metro layers.

Redback had targeted the Ethernet service edge router market and the multiservice edge router market with its SmartEdge router, and it has continued to make investments in the platform. It recently announced a major capacity upgrade with the introduction of the SmartEdge 1200, which brought a fourfold increase in performance and port density over the previous generation.

The SM 480 is the first model in a series of Layer 2-focused Ethernet switches that leverage, converge and preserve the field-hardened capabilities offered by the SmartEdge including features such as the SE OS (Smart Edge Operating System) and subscriber management support.

Differentiating Technical Features:

The product is primarily marketed to address the unified fixed and mobile networks, and the principal features pointed out by Ericsson to succeed in this market are the scalability, the provisioning capabilities and the policy management.

The SM 480 provides interesting throughput and performance with a **12-slot chassis** (15 RU, 3 chassis per 7' rack) and can be expanded to handle **48*10 Gigabit Ethernet ports**.

For class comparisons based on a fully loaded rack with 48 RU of mounting space, excluding power considerations, the Alcatel-Lucent 7450 ESS-12 delivers a slightly higher total port density of up to 150 non-blocking 10 GigE ports per rack and a much higher 1 GigE port densities, for which the 7450 ESS-12 supports up to 1,200 non-blocking ports per rack.

The Juniper MX960 delivers a total port density of up to 96 non-blocking 10 GigE ports per rack. For 1 GigE port densities, it supports up to 960 non-blocking ports per rack.

Ericsson claims the support of **256,000 VLANs, 1.5 million MAC addresses and 8,000 VPLS instances** that can be turned into the supports of thousands of revenue generating Ethernet VPNs, ELine, ETree and ELAN services with advanced traffic management tailored to guarantee service level agreements

The ability to handle protocols from **PPP/DHCP to VPLS/VLL tunneling** and granular Layer 2 subscriber management provides service providers with flexibility and granular control of their Layer 2 services.

In fact, the SM 480 has important **service level management capabilities** for enterprise, residential or inter-provider Ethernet services including: Sub 50ms link and node failure protection via Fast Reroute, Fast asymmetric failure detection leveraging BFD protocol and RSVP-TE, Five levels of Layer 2 **H-QoS** to guarantee services within a VPN or VLAN, latency performance monitoring with ITUT Y.1731 for video, voice, and data services.

Granular Layer 2 H-QoS provides the ability to extend service control such as bandwidth, accounting, or lawful intercept, beyond the aggregate service model down to the individual service session.

The SM 480 can be managed by Redback's **NetOp management suite**, allowing to provision end-to-end VPNs, automate provisioning workflows, and monitor end-to-end services. Redback's NetOp Policy Manager is a subscriber and service aware management application that can be used to dynamically create customized policies for any type of access service. The application leverages standards based monitoring and troubleshooting such as IEEE 802.1ag. It also incorporates other diagnostic mechanisms including: Bidirectional Forwarding Detection (BFD), Virtual Circuit Connectivity Verification, MAC ping and traceroute, LSP ping and traceroute and CPE ping.

Concerns and Competition:

The SM 480 has an ongoing trial with a Tier 1 carrier with fixed and mobile operations, and it has been indicated that they will deploy the product in their live network during the third quarter this year when the product becomes commercially available.

Although the SM 480 provides substantial switching capacity and Ethernet port density, multiple competitive platforms provide the same or greater metrics than those announced by Redback, and although a 1 Tbps capacity together with a smaller version, possibly the SM 240 (240 Gbit/s of capacity), were mentioned, Redback did not provide any official roadmap details concerning the timeframe. It

is our feeling that the smaller version will be launched in 2009, and the bigger, terabit version after that.

Redback's Ethernet switching solution comes to the market somewhat later than some of its major competitors, and as a result, it will need to establish initial momentum in the Ethernet access and aggregation markets within a competitive environment. Vendors such as Alcatel-Lucent, Juniper, Cisco, Foundry, Huawei, and ECI, for example, have already added high-capacity Layer 2 service-aware devices in their portfolios.

Alcatel-Lucent recently launched its TPSDA 2.0, introducing new features and capabilities such as the new High Scale MDA, which supports 20K subscribers with eight queues per module, PPPoE termination which offers a smooth migration path to place legacy HSI services and corresponding revenues onto their next-generation networks, and 1 Tbps of switching capacity for its 7750SR and 7450 ESS platforms. TPSDA 2.0 also extends the ability to perform subscriber management functions for services on an application. This reduces Ericsson/Redback's ability to use support of PPPoE aggregation as a product differentiator against Alcatel-Lucent's overall carrier Ethernet product portfolio.

Juniper has good capabilities with its carrier Ethernet portfolio (MX-series), coupled with the strengths of its M-series multiservice edge router and with its E320/E120 to deliver complete solutions for multi-play applications. Juniper has also deep experience with subscriber management (SDX-300) and an open development approach for its partners to provide value-added services using its PSDP program.

Cisco on its side has made no major Carrier Ethernet product announcements in recent quarters and is not enhancing its flagship product, the Catalyst 6500 for new deals. Ciena has been shipping the LE-3300 for revenue in major accounts since the third quarter of 2007 and ECI plans a generally available release of its MEF-certified 9000 family in June 2008.

Conclusions:

Redback is subtracting from its SmartEdge line to create the SM family, leaving out Layer 3 VPNs, broadband remote access server (BRAS) capability, and features such as Deep Packet Inspection (DPI) and Session Initiation Protocol (SIP) support. It is positioning the SM 480 as a chance for carriers to finally start converging their wireline and wireless networks, arguing that the introduction of Ethernet into wireless backhaul makes it more feasible to join wireless and wireline nodes into single SmartEdge or SM boxes.

Redback also hopes to play a role as wireless operators move subscriber management -- currently the task of the gateway GPRS support node (GGSN) -- further to the edge of the network, as already happened on the wireline side.

While late on the market with respect to its competitors, it is our opinion that Carrier Ethernet switch/routers have still a five to seven-year life cycle in front of them, plus the timeframe needed to develop service attributes required by service providers to launch profitable next generation services. So there is still enough time for Redback to build a presence in this market, leveraging its presence with large and medium telcos by introducing its latest carrier Ethernet solutions into these environments that are familiar with the NetOp subscriber management system and SmartEdge portfolio.

The company will have to leverage its presence with telcos by introducing its carrier Ethernet solutions into these environments that are familiar with the NetOp subscriber management system and SmartEdge portfolio.