Company Advisor

Redback

Carrier Infrastructure - Global

By J. Ogle

Contents

Current Analysis

Redback

Analysts: J. Ogle
Report Date: Mar 13, 2006
Markets: Carrier Infrastructure - Global

Company Description

Redback Networks (NASDAQ: RBAK) was founded in 1996, with headquarters in San Jose, California, and is a provider of networking solutions that enable carriers, cable operators, and service providers to deploy broadband access and services from the DSLAM to the core. At the end of Q4 2005, the company had 505 employees, including approximately 290 employees involved in research and development, and has over 500 carrier and service provider customers, including 15 of the top twenty DSL carriers in the world. The company's product lines, consisting of the Subscriber Management System (SMS) and SmartEdge (SE) series, combine networking hardware with services software. Together, these product families enable customers to create end-to-end IP networks that support major broadband access technologies, as well as the new services that these high-speed connections enable. Redback's products connect and manage large numbers of subscribers using any of the major high-speed access technologies including digital subscriber line, cable, wireless, and powerline. Redback is headed by Kevin DeNuccio, President and Chief Executive Officer since August 2001.

Redback completed Q4 2005 with revenues of $48 million, an increase of 32% from Q3 2005 and a 50% increase over Q4 2004. Redback's net revenue for the fiscal year (FY) was $153.3 million compared to $115.6 million in FY 2004. This quarter's performance was also a milestone in that it was the company's first quarter of profitability since Q4 1999, generating $300k in net earnings. Revenue for the company's next-generation SmartEdge product line was $91.8 million and represented 72% of product sales. Year over year, SmartEdge sales grew by 104%, establishing the product line as the future growth engine of the company. For manufacturing, Redback's operations consist primarily of prototype development, materials planning, and procurement for an outsourced order fulfillment model where Jabil Circuit Inc. performs all product production, including final assembly and testing.

Redback's revenue mix for the year was 86% from product sales and 14% derived from services. Geographic break down of revenues for the quarter was Americas 55.4%, APAC 18.3%, and EMEA 26.3%. Redback also improved its gross margins to 60% for FY 2005. The company expects margins to settle in at a sustainable 60% range. The top customers (in terms of revenue) for the past quarter were BellSouth, AT&T (SBC), Verizon, Korean Telecom, and Belgacom, a recently announced win (BellSouth and AT&T each also represented greater than 10% of revenue). Alcatel is also a distribution partner that sometimes falls into the 10% category. Redback indicates that it added 13 new SmartEdge customers for Q4 2005 alone, bringing the year to date total to 60. Redback touts 11 of the top 20 DSL networks are deploying SmartEdge, with four in full deployment.

For the carrier infrastructure market, Redback focuses on helping service providers build consolidated IP edge networks. Redback's product lines, the SMS broadband aggregation services family and the SmartEdge family, enable customers to create end-to-end regional networks that support applications such as edge routing, Ethernet aggregation, subscriber management, DSL aggregation, ATM/frame relay, and leased lines, as well as new services such as VoD, IPTV, and mass-scale gaming. Redback developed its NetOp Policy Manager, a server-based provisioning and customization platform that manages both product families. The SMS and SmartEdge Service Gateway products connect and manage large numbers of subscribers using any of the major high-speed access technologies including digital subscriber line, cable, WiFi, and wireless. The SmartEdge

Router (without BRAS) supports leased line aggregation, IP edge routing, and VPLS/MPLS Layer 2 and Layer 3 VPNs. Its virtual routing capabilities scale beyond 3,000 virtual routers per system, enabling service providers to offer fully manageable, scalable, and secure VPNs to their enterprise customers. Redback has added strong Ethernet aggregation support as well as VPLS support to the SmartEdge platform and has targeted this as an emerging growth area for the company – driven by customers such as BellSouth.

On March 13, 2006, Redback extended the SmartEdge family by the introduction of the SmartEdge 100. The SmartEdge 100 delivers the full strength of the larger SmartEdge 400 and 800 in a two RU form factor, extending the reach of SmartEdge to virtually all network segments and environments.

Current Perspective

We are taking a positive stance on Redback Networks in the carrier infrastructure space. The company has completed two consecutive years of revenue growth, has effectively completed the transition of its SMS product portfolio to the SmartEdge (which now represents over 70% of product revenues), has achieved product margins of 60% for the year, and continues to introduce new products and attract new customers.

In Q4 2005, Redback actually achieved profitability, a pattern that it expects to continue throughout 2006. Redback's products and marketing messages are focused on building smart broadband networks that deliver a wide variety of IP services to business and residential customers integrated in a single platform. The SmartEdge product family is available as a carrier edge router, and was significantly enhanced by adding broadband aggregation functionality (Subscriber Management/BRAS) and Ethernet aggregation services. The SmartEdge product family is targeted at IP dedicated access services, hosting and network-based storage, VPLS/MPLS VPNs, and carrier edge routing applications. Redback's melding of the BRAS, edge routing functionality, and Ethernet aggregation has allowed it to lead rivals Juniper and Cisco at the service provider edge, where it has a special appeal for service providers that wish to collapse multiple infrastructures into a single network layer. The SmartEdge Service Gateway has proven to enable service providers to deliver all services in a single platform, and can satisfy customers experiencing high growth in DSL adoption needing higher bandwidth capacity. Redback has added new hardware and software to the SmartEdge in the form of a new 10 GbE and multiport GbE cards that increase performance by four times and provide leading GbE rack densities – the evolutionary approach enables carriers to upgrade to the latest generation without a chassis replacement. Redback's proposed solution eliminates the need for a separate Ethernet aggregation layer (a separate Layer 2 switch), which has dramatic effects on both CapEx and OpEx since the network contains one less layer and so is less complex to manage. Redback continues to launch innovative products and recently announced the availability of the SmartEdge 100 platform based on its latest ASIC technology. The full programmability of the hardware and the modular operating system enable Redback to have a unique offering for extended network segments. The SmartEdge 100 addresses smaller service provider PoP requirements with the same service profile as the larger SmartEdge 800/400.

In terms of competitive challenges, Redback remains somewhat vulnerable on the financial front and with regard to the diversity of its technology offering, as it is somewhat of a niche player. Competitors can point out that the company lacks the corporate/financial stability to remain a contender in the overall service provider edge market given the unpredictable nature of service provider spending patterns – such as a major order slipping by a quarter. While this concern is not unique to Redback, the company could prove a bit more vulnerable to such market conditions as its in-house portfolio lacks diversity in areas such as softswitch/VoIP, wireless, optical switching

and transport, and broadband access technologies. On the other hand, Redback has been able to maintain one of the highest R&D investment levels in the industry while running cash flow positive operations for the past eight quarters. Also, by adding Ethernet aggregation to its edge routing and subscriber management capabilities, Redback's addressable market continues to grow. Redback possesses a large customer base, but there is no guarantee that success in the broadband aggregation arena (e.g., DSL and cable access with the SmartEdge Gateway) will bolster success in the IP edge routing and Ethernet aggregation segments, which are dominated by competitors such as Cisco, Juniper, and Alcatel. Redback has a competitive edge solution that integrates all required edge functions (Ethernet aggregation, IP edge routing, and subscriber management) onto a single platform, which reduces the number of platforms required to deliver multiple services. Its main competitors need at least two different systems to accomplish the same.

Market/Sales Strategy

Redback's products are used by many of the largest carriers and service providers worldwide. Today, 15 of the top 20 broadband carriers in the world have deployed Redback products in their networks, including BellSouth, British Telecom (BT), Belgacom, China Netcom, France Telecom, Hanaro Telecom (Korea's second-largest DSL provider), KT Corp. (formerly Korea Telecom), ChungHwa Telecom (Taiwan), KPN (Netherlands), TeliaSonera, AT&T, and Verizon Communications (which recently certified Redback as a "Verizon Testing Partner" based on the performance of the SMS platforms in Verizon's network). Historically, these have been among its largest customers in terms of revenues. Other announced customers include Bezeq (Israel), Megapath, Golden Belt TA, Scarlet (Belgium), Neuf Telecom (France), Completel (France), Bosnia Herzegovina Telecom, MGTS (Russia), Arcor (Germany, part of Vodafone group), Hutchinson/PowerCom Network Hong Kong Ltd. (a broadband over power line provider), Tunisia Telecom, Turk Telecom, TT&T (Thailand), Shanghai Telecom, and China Netcom's Liaoning Communications Corporation. Furthermore, 11 of the top 20 DSL carriers have selected Redback's SmartEdge family for next-generation IP service delivery.

Redback has in place a global direct sales organization, with regional sales and support headquarters in North America, Europe, and Asia. The direct force is complemented with channel partners for its carrier sales efforts, especially for local or regional customer reach in Europe and Asia. As a result, Redback has captured over 500 carrier and service provider customers, including incumbent local exchange carriers (ILECs), interexchange carriers (IXCs), Internet service providers (ISPs), international post, telephone, and telegraph operators (PTTs), and cable multiple services operators (MSOs).

On the indirect sales front, Redback has distribution relationships with Alcatel, Nokia, Huawei, Telindus, and ZTE, as part of its PowerPartners program. Redback also has a Solutions Alliance Partners program, which consists of the IBM/Redback alliance, in video (Orca), security (iPolicy, Servgate, and Fortinet), traffic management (Sandvine and Allot), video conferencing (RADVision), WiFi (Aruba), and OSS (Visionael, Portal, Spirent Communications, Micromuse, Concord Communications, Quallaby, Narus, and XACCT).

Strengths

• For Redback, the BellSouth customer win provides additional validation for the company's SmartEdge Service Gateway (SG) platform and is the third major, Tier 1 deployment of the SmartEdge. BellSouth represented greater than 10% of revenue for Redback in Q4 2005. BellSouth utilizes the SmartEdge platform to perform three

critical functionalities: 1) edge routing, 2) Ethernet aggregation – critical for video service implementation – and 3) broadband aggregation/subscriber and session management. Additional announcements of SmartEdge success at Tier 1 carriers for video and integrated services include China Telecom, China Netcom, KPN, and Belgacom.

• The recent selection for deployment at the Metro Node of the prestigious British Telecom BT21CN project further validates the platform. Redback joins a host of prestigious vendors to deliver a key portion of BT's massive new converged IP network.

• Redback's new Broadband IP Engine powers the new 10 GigE and 10- and 20-port GigE I/O cards that enable the SmartEdge to address the evolving multi-service edge routing (MSER) needs of carriers. The SmartEdge flexibly combines Ethernet aggregation, IP routing, and subscriber and session management on a common platform. The new hardware also provides 240 Gbps of addressable bandwidth – yielding a four times capacity gain over the previous generation. Redback also recently introduced the in-service upgradeability of its ASICs as well as its OS, which addresses issues related to non-stop service. The new ASICs provide the power and flexibility to support future requirements by simply programming them in hardware, instead of forcing customers to migrate to new hardware.

• Redback has added BRAS functionality to the SmartEdge Router through a software upgrade. The move was designed to address carriers' growing needs for a high-performance subscriber management system that can apply specific traffic-handling parameters to thousands of simultaneous connections over increasingly faster connections. Redback now supports simultaneous scaling in three directions without sacrifice: number of users, bandwidth per user, and number of services.

• Redback has been successful in achieving one of its primary corporate/strategic goals: transitioning its customers from the SMS to the SmartEdge platform while maintaining revenue growth. For Q4 2005, Redback's top five customers (in terms of revenue) were BellSouth, AT&T (SBC), Verizon, Korean Telecom (KT), and Belgacom, with the first two being 10% or greater customers.

• Redback's recent introduction of the Broadband IP Engine ASICs enables the SmartEdge to offer leading Ethernet densities of up to 480 wire-speed routed Gigabit Ethernet ports per standard seven foot rack (120 ports per chassis, four chassis per rack), each port supporting hierarchical QoS. The SmartEdge's metrics and advanced IP service capabilities position it as a very compelling edge router solution that, when combined with BRAS and Ethernet aggregation, strengthens its market appeal to carriers looking to converge multiple overlay networks.

Weaknesses

• Redback has historically not achieved profitability on a yearly basis, although EBITDA for 2005 is positive for each individual quarter and up $18.6 million over 2004, showing Redback's solid operations. The net income loss is declining year over year and 2006 could prove to be the turnaround year for Redback.

• Redback's major rivals such as Cisco and Juniper continue to represent a long-term competitive threat to Redback due to their respective product and service offerings. Likewise, an expanding array of IP edge aggregation and multi-service edge routing (MSER) rivals – Alcatel, ECI/Laurel, and Tellabs – will likely crowd Redback's ongoing market penetration efforts in each of the market sectors Redback is targeting, even though Redback asserts they are missing the critical subscriber management functionality and depth as well as the

integration capabilities.

• Redback has entered a new market segment with its high density Ethernet support, and this is a highly contested market segment that has historically been dominated by cost-driven Layer 2 Ethernet switches from vendors such as Extreme and Foundry. Vendors such as Telco Systems and Hammerhead/Fujitsu are also contenders with their new T-Metro and HSX 6000 Ethernet aggregators. To achieve success, Redback will need to compete on overall system level value propositions and not just on price.

Recommended Competitor Actions

• Cisco needs to point to its leadership in the service provider edge router market, as well as leverage its installed base of routers in the core, edge, access, and enterprise market segments. Cisco can also point to its recent enhancements, such as the XR 12000 for high availability edge applications and the new 7604 platform which is right-sized for aggregation chores including edge routing and high density Ethernet aggregation.

• Juniper can highlight its new E320 platform, which can address more directly the scaling and aggregation challenges faced by carriers targeting emerging triple play and home networking applications, especially in the area of IPTV/video multicasting. Juniper will need to brace for rivals pointing out that the E320 platform possesses less than one-third of the highly required Gigabit Ethernet capacity per seven foot rack (e.g., 144 ports for the E320 vs. 480 ports for the Redback SmartEdge 800) and will not have 10 GigE interfaces until Q3 2006. Also, the lack of ASIC programmability and a modular OS raises questions about the long-term future of this platform.

• Alcatel should show the depth of its solution sets with its recently introduced, purpose-built, next-generation platforms, the 7750 Service Router and the 7450 Ethernet Services Switch, which are optimized for high density Ethernet aggregation. Both platforms are integrated under the 5620 Service Aware Manager (SAM) network management system. Alcatel can also highlight its recent completion of additional service assurance capabilities for its IP portfolio as critical to service provider success. The 7x50 family needs multiple systems, whereas the SmartEdge is able to offer full functions in a single system, thus creating a single service control point. The 7x50 family does not offer PPPoE support for Broadband Remote Access Server (BRAS), eliminating the ATM to Ethernet migration capabilities SmartEdge is able to offer. To overcome this, it can interwork with traditional BRAS systems and can leverage its relationship with Redback to address this requirement.

• ECI Telecom should continue pointing out that the acquisition of Laurel Networks expands ECI's product portfolio into the increasingly critical service provider edge market, where carriers are looking to deploy edge platforms that support their pending quantum leap from supporting basic high-speed Internet services (~1.5 Mbps DSL) to far more bandwidth-intensive triple-play service packages which require carrier-class reliability (i.e., "five nines"), high availability, and wire-speed throughput. ECI can also highlight the "drop-in" IP video router solution and related ST series enhancements as providing carriers with the requisite scalability, routing intelligence, and QoS capabilities for implementing large-scale IP TV/video service deployments.

Recommended End User/Customer Actions

• Service providers looking to fulfill specific edge routing needs should evaluate market-proven platforms such as

the Cisco 7600 series including the newest member, the 7640; Juniper's M- and E-series (specifically the E320); Alcatel's 7X50 series; and Laurel's ST 200/50; in addition to the SmartEdge series, to determine their best course of action based on their specific service deployment requirements.

• Service providers seeking a platform to perform multiple functions at their service edge should consider the SmartEdge's enhanced GbE and 10 GbE capabilities. The SmartEdge now supports carrier grade Ethernet aggregation that previously would have been performed with a separate Layer 2 class aggregator.

• All service providers should evaluate the strength and flexibility of the SmartEdge Service Gateway and competing subscriber management functionality since the needs of applications such as voice and video require significantly more service and subscriber awareness than basic Internet traffic has required in the past. IP applications, such as video, voice, gaming, and data will access the IP network simultaneously, making strict subscriber control a must have. Current Redback SMS customers that are looking to expand their IP and broadband services via one converged network need to consider the SmartEdge Service Gateway products to gain support for additional functionality such as triple play and higher-capacity services.

• Current SMS customers should press Redback for an end-of-life roadmap and trade-up offers for the SMS product line so they can plan future network expansions using the more capable SmartEdge platform. Redback has already transitioned nearly two-thirds of the customer base, indicating that the company is providing various levels of support and incentives for customers to migrate and not move to competitive solutions, not to mention a high degree of customer satisfaction with the company and its solutions.

• Incumbent service providers looking to deploy or expand their broadband services should also consider the high-density/scalability proposition of the SmartEdge 800 platform. With support for 13,440 DS1 subscriber ports per seven-foot telco rack, the SmartEdge 400/800 router is near the top in terms of edge router platforms. The new 10 GbE and 10/20 port GbE provide over four times the performance and Ethernet aggregation capabilities of the earlier generation of SmartEdge. Carriers should realize that they can upgrade with new cards and not be required to do a chassis swap to achieve the new hardware and associated new software features. The newly introduced SmartEdge 100 builds on these advantages.

• Next-generation service providers, such as greenfield carriers building out new networks, would also find it prudent to evaluate the SmartEdge 100, 400, and 800 router's IP edge service delivery proposition, specifically in terms of its high subscriber port aggregation capabilities as well as its high availability features and packet processing capabilities.

Analysts: J. Ogle
Report Date: Mar 13, 2006
Markets: Carrier Infrastructure - Global

Market	Current Perspective	Market Tier	Market Status	Momentum	Vision
Aggregate Ratings	Positive	2nd Tier	Established	Neutral	Positive
Carrier Edge Switch/Routing	Positive	2nd Tier	Established	Neutral	Positive