Ascend

Rocky Mountain Internet, Inc.

User Profile

Wide Range of Internet Access Service

Today's dynamic Internet environment is opening up an exciting world of opportunities for Internet Service Providers (ISPs). As more and more consumers use Internet services, World Wide Web sites are becoming a primary marketing tool in every industry. Internet-generated sales continue to grow and even entire new business sectors are appearing. More and more corporations are adopting intranets based on Web and TCP/IP technology. Businesses are seeking high-speed connections to the Internet and looking for new data services.

But these opportunities are accompanied by formidable challenges. To remain competitive, ISPs must respond to increasing user demand, maintain and improve performance as traffic increases and identify and offer value-added services such as intranets and other commercial applications. That's why ISP Rocky Mountain Internet, Inc. (RMI) made the decision to move from a purely router-based network to a switched network backbone that supports IP applications and meets the stringent performance requirements of a public Wide Area Network (WAN). To meet this challenge, RMI depended on Ascend Communications, Inc. multiservice switches to anchor their network.

Roy Dimoff, RMI's president and chief executive officer, has a concise explanation for the success of his company. "We leverage our local presence, meet directly with business clients, thoroughly understand their needs, deliver value-added services and set new standards in the Internet industry for after-sales support."

Scalable Internet Infrastructure for Growth

Using routers, terminal servers and modem banks, RMI's TCP/IP network has evolved over the last several years, keeping in step with available technologies and customer demands.

"This network was a reliable performer," said Nancy P. Phillips, senior vice president of operations. "Still, not even the most advanced router-based network can deliver the same level of reliability and performance that business clients routinely expect from their leased-line communications networks.

Regional ISP Focuses on Corporate Accounts, Plans Expansion, and Gears Up to Add New Service Offerings

Headquartered in Denver, Colorado, Rocky Mountain Internet, Inc. (RMI) provides turnkey Internet solutions, including Internet access, Web development and hosting, consulting, and co-location services. RMI's combination of Frame Relay switching and direct T-3 fiber connections to the Internet backbone ensures flexible network configurations, maximum reliability, and high-speed performance. Founded in 1993, RMI originally provided bulletin board services to the Colorado Springs area. Today, the company offers a wide range of Internet access and Web production services to businesses and individuals across Colorado. RMI's long-range strategy is to focus on corporate accounts and eventually expand throughout the Rocky Mountain region.

ASCEND

To compete successfully in the corporate access arena, we needed a scalable Internet infrastructure that would accommodate our growing business needs."

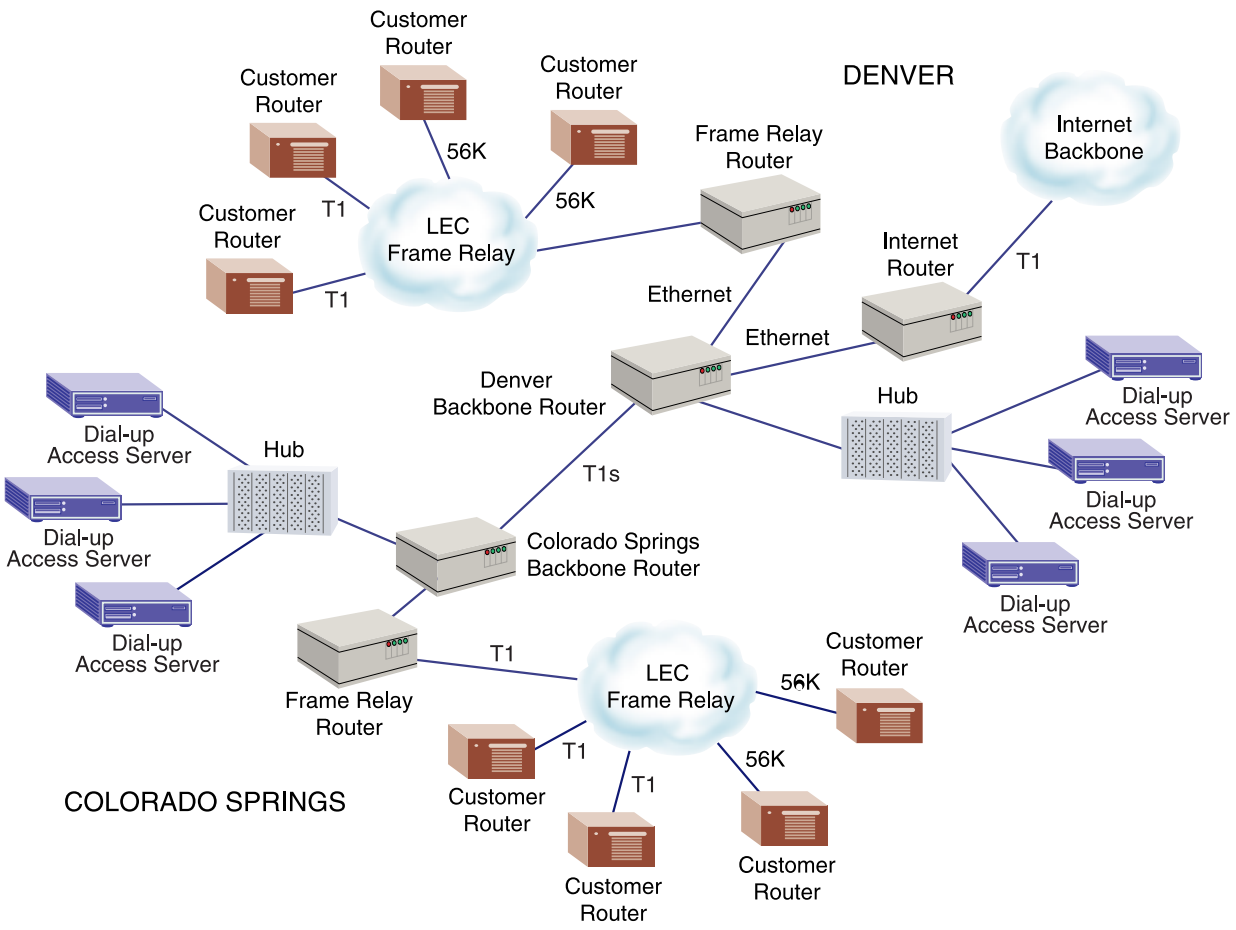
Accordingly, RMI built a high-capacity Frame Relay Internet backbone to provide the company with the switched backbone and leased-line access it required. RMI anchored the backbone with broadband WAN multiservice switches from Ascend enabling them to support access speeds from dial-up to 56K, fractional T1, T1 and T3. Today, routing continues to be performed at the edge of the network, while Ascend B-STDX 9000 switches—strategically positioned throughout Denver, Boulder and Colorado Springs—make up its core, managing the bandwidth that constitutes the backbone.

Most Flexibility and Growth at Best Entry Price

"Innovative new Internet applications and new Internet services are appearing at a fast rate. To keep pace, RMI needs scalability and flexibility throughout the network," Dimoff said. "Network design is critical to our operation. It determines what services we can offer our customers and how well the network operates on a day-to-day basis."

"It also determines how effectively we can expand into new cities, how easily we can implement backbone bandwidth upgrades and how rapidly we can respond to customer requests for connection upgrades," he continued. "These are all a function of the design of our network. Ascend switches offer us the highest degree of flexibility and growth at the most affordable entry price."

The Ascend B-STDX family is the industry's first high-speed, multiservice WAN switch to simultaneously support Frame Relay, Switched Multimegabit Data Services (SMDS), Integrated Services Digital Network (ISDN) and Asynchronous Transfer Mode (ATM) on a single platform. The B-STDX 9000 is a high-capacity, 16-slot switch designed to accommodate large networks with high-bandwidth requirements—capabilities that RMI will need as it continues to add corporate clients. Featuring the highest Frame Relay speeds in the industry, ranging from 9.6 Kbps to 45 Mbps, the B-STDX also provides the industry's highest port density and network capacity.



"Before" diagram of Rocky Mountain Internet router-based network

The Ascend Solution

RMI Adds Intranet, VPNs, Other Services

The advanced multiservice capabilities from Ascend have enabled RMI to supplement Internet access with other services, such as intranets, Virtual Private Networks (VPNs) and Application Specific Routes (ASRs). At the same time, RMI is now able to offer its customers the most cost-effective network protocols available, including ISDN, Frame Relay and ATM interworking services.

RMI's switched network has significantly reduced the time it takes to connect customers to high-speed lines. "In many cases, we don't have to connect through the local Regional Bell Operating Company (RBOC)" Phillips said. "So we reduce circuit implementation time from six to eight weeks to just a few days. That gives us a competitive advantage, which is particularly important in today's crowded ISP industry with its constant influx of new players."

Frame Relay is a multiplexed, data networking technology supporting data transmission at rates up to 45 Mbps over a connection-oriented path and providing high throughput and low delay. Unlike older-generation X.25 WAN networks designed for unreliable analog lines and older terminal protocols, Frame Relay takes advantage of fiber-optic and other reliable digital data transmission lines.

Scalability for New Opportunities, Less Downtime

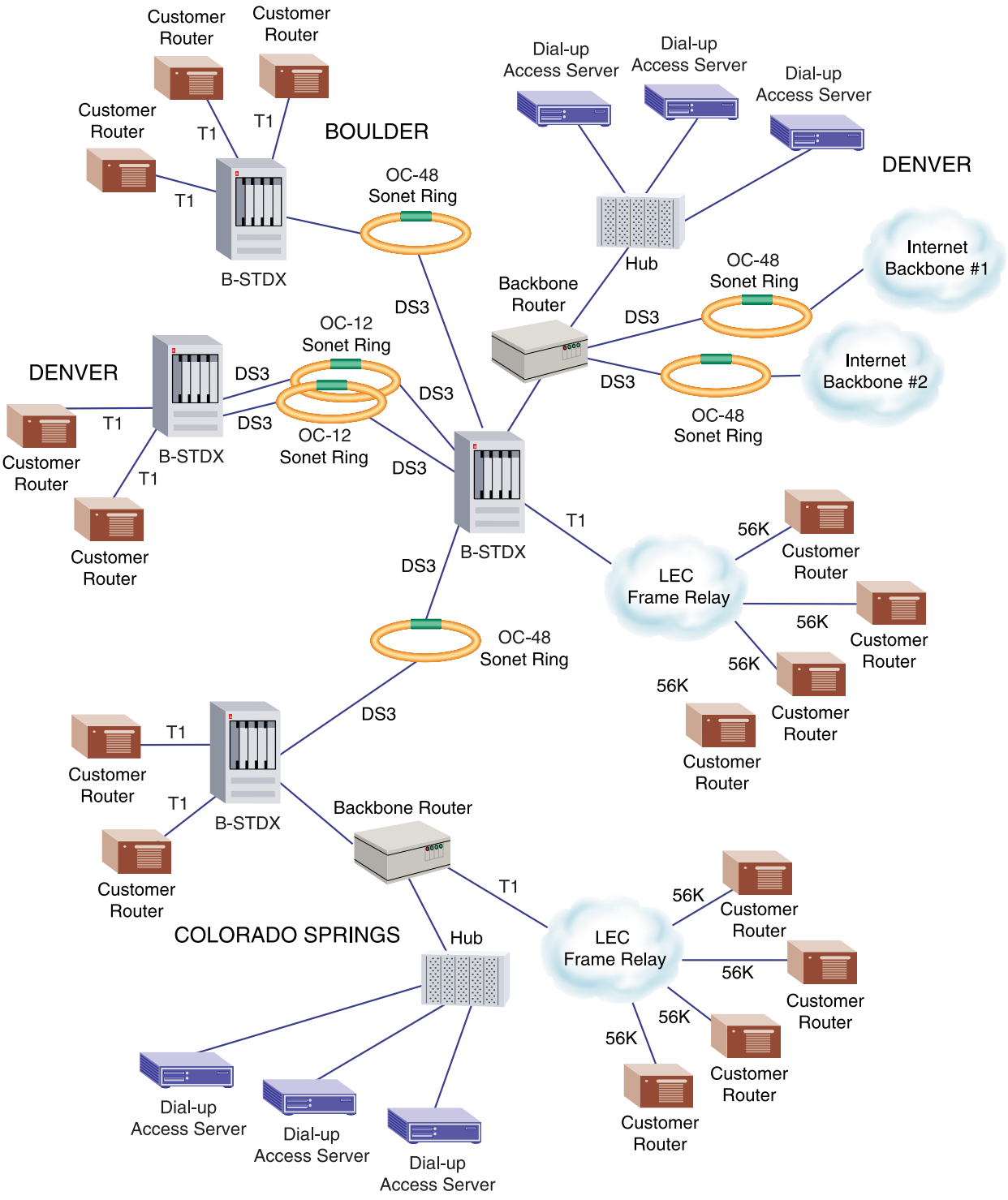
Scalability is essential to ISPs like RMI who must be poised to respond quickly to new market opportunities. At the same time, ISPs need to minimize the likelihood of downtime from periodic brownouts and gridlock as Internet traffic continues to explode. Using Ascend switches, RMI has built a network that will continue to maintain performance as it grows. By optimally managing bandwidth utilization, Ascend enables RMI to use every bit of capacity on its trunks—even using managed oversubscription, which cannot be implemented on router trunks.

Another benefit for RMI is Quality of Service (QoS) provided by Ascend. QoS can be implemented on the Ascend backbone network for two reasons—first, because Frame Relay and ATM allow discrete partitions of bandwidth to be addressed at network ingress and second, because end-to-end virtual circuits can be set up based on trunk capacity, utilization and other backbone information.

Routers cannot deliver QoS guarantees because they are not able to assign traffic descriptors at network ingress. In addition, their connectionless, hop-by-hop nature prevents them from viewing the whole network with an understanding of end-to-end QoS, including delay characteristics and available bandwidth.

Having evaluated various options, RMI was impressed that, over a very short period of time, the B-STDX switch has become the industry standard for Frame Relay technology. Approximately 70 percent of all backbone Internet traffic passes through an Ascend switch at some point in its journey.

"We soon saw that, by combining Ascend's Frame Relay switching capability with our fiber interconnection, we could attain new levels of flexibility and scalability," Phillips said. "This," she added, "enabled us to offer our customers an exceptionally reliable level of service."



"After" diagram demonstrates how Rocky Mountain Internet uses a switched network backbone that supports IP applictions and meets the demanding requirement of the public WAN.

Easier User Access and Provisioning, Lower Operating Costs

As customer access rates continue to increase, the switched network will significantly ease RMI's user access and provisioning burden. First, the Ascend high port density, along with integrated Channel Service Units (CSUs) and Data Service Units (DSUs), means lower price per port and lower Point-Of-Presence (POP) real-estate costs, enabling RMI to add more users in a smaller space. With fewer chassis and central processors to install and support and less real estate required, RMI can reduce its installation costs, engineer hours and salary expenditures.

For RMI, Ascend is not only a vendor but also a partner, offering sales and support programs that specifically address the business and network operational concerns of service providers. Ascend programs help define new and future services, helping ISPs keep pace with trends in their competitive business.

In addition, Ascend is committed to ensuring the ongoing smooth operation and scalability of RMI's network. The company offers programs that include round-the-clock support, educational services and other services such as performance analysis, technology management consulting and custom application development.

Keeping a Tight Lid on Operating Costs

Dimoff believes that the need for top-quality customer service is accompanied by an equally pressing need for internal cost control. "We have to be lean and mean," he said. "This means not only holding installation and configuration costs to a minimum, but also keeping a tight rein on ongoing maintenance as well. The Ascend switches are easy to install and configure and they offer the high reliability we need. They enable us to provide end-to-end network resiliency, ensuring maximum uptime."

"With our new switched network from Ascend, we'll be able to increase revenues and decrease costs," he added. "At the same time, we're building on a platform that lets us enhance our value-added service offerings. Continued customer satisfaction will be a top priority with us as the Internet and all data services become increasingly important in our day-to-day business."

"We're confident that, with the B-STDX switching technology, RMI will be uniquely positioned for leadership in the ISP marketplace."

©1998 Ascend Communications, Inc.
Ascend and the Ascend logo are registered trademarks and all Ascend product names are trademarks of Ascend Communications, Inc. Other brand and product names are trademarks of their respective holders.

Worldwide and North American Headquarters
One Ascend Plaza
1701 Harbor Bay Parkway
Alameda, CA 94502,
United States
Tel: 510.769.6001
Fax: 510.747.2300
E-mail: info@ascend.com
Toll Free: 800.621.9578
Fax Server: 415.688.4343
Web Site:
http://www.ascend.com

European Headquarters
Aspen House
Barley Way
Ancells Business Park
Fleet
Hampshire GU13 8UT,
United Kingdom
Tel: +44 1252.360000
Fax: +44 1252.360001

Japan Headquarters
Level 19 Shinjuku
Daiichi-Seimei Bldg.
2-7-1 Nishi-Shinjuku
Shinjuku-ku, Tokyo 163-07,
Japan
Tel: +81.3.5325.7397
Fax: +81.3.5325.7399
Web Site:
http://www.ascend.co.jp

Asia-Pacific Headquarters
Suite 1908,
Bank of America Tower
12 Harcourt Road
Hong Kong
Tel: +852.2844.7600
Fax: +852.2810.0298

Latin, South America and the Caribbean Headquarters
One Ascend Plaza
1701 Harbor Bay Parkway
Alameda, CA 94502,
United States
Tel: 510.769.6001
Fax: 510.747.2669

02-18
1/98