

Rackspace



EXECUTIVE SUMMARY

Challenge

Upgrade its SAN infrastructure to better utilize physical facilities, keep pace with growing customer demand, and minimize data center and management complexity.

Solution

- Brocade DCX 8510 Backbones to maximize port utilization and support managed cloud, backup, and storage services.
- Brocade Fabric Vision to emulate performance at line rate and network integrity prior to deployment.
- Brocade vRouter deployed for Rackspace Open Cloud Environment.

Results

- Dramatically simplified SAN architecture while optimizing density and utilization.
- Managed services more efficiently and cost-effectively with Brocade Fabric Vision technology.
- Gained visibility to prevent potentially service-affecting outages.
- Significantly improved power efficiency and reduced data center footprint.
- Migrated to Gen 5 Fibre Channel technology without disruption.

Scaling to Maintain Great Customer Services Powered by Fanatical Support®

Rackspace is the leading managed-cloud company and the founder of OpenStack, the open-source operating system for the cloud. The company, headquartered in San Antonio, Texas, serves more than 300,000 business customers from data centers on four continents and is known globally for its Fanatical Support®. Rackspace's philosophy is that one size does not fit all, and it gives each customer the best fit for its unique needs. As a result, the company owns and manages some of the world's highest-demand and most intensive data center and SAN environments.

The Connectivity of Choice

Rackspace data centers must handle high data volumes with high performance and zero downtime—as efficiently and cost-effectively as possible. Rackspace relies on Brocade® Fibre Channel technology as the core of its storage connectivity solutions.

"Fibre Channel, based on Brocade directors, is an advantage for Rackspace," said Chris Wetzel, Director of Enterprise Storage Products at Rackspace. "We can deliver the performance, well above what customers need, at a cost that you can't touch with a dedicated device. And it just works. Fibre Channel is the best way for us to meet our performance requirements for our use cases."

Scaling to Next-Gen Connectivity

In the past, Rackspace connected SAN directors to server hosts, with smaller fixed-port switches connected to storage devices to maximize director ports. However, this required servers and storage to be located in the same area of a data center. When additional storage and servers were connected to handle new customer demands, the data center ended up with unbalanced growth and islands of unused storage and SAN ports.

Rackspace wanted to simplify the architecture so that switches, hosts, or storage platforms could be plugged in anywhere—regardless of their physical locations. At the same time, this new architecture had to be able to scale virtual workloads quickly.

WHY BROCADE

“Rapid customer growth and the need for supporting highly virtualized environments required an upgrade to our global SAN infrastructure. We worked with Brocade and EMC Corporation to design a SAN fabric that was easy to grow and manage, while providing the flexibility to allow our data center technicians to connect any device to any switch in the fabric.”

— Sean Wedige, Chief Technology Officer of Enterprise Solutions at Rackspace

At the end of 2014, Rackspace had grown to manage more than 112,000 servers and has every expectation that demand will continue to increase for managed cloud services. In addition, customers are increasingly virtualizing their workloads. So a simpler architecture had to be built on highly scalable, highly available platforms that easily handle virtualization.

“Rapid customer growth and the need for supporting highly virtualized environments required an upgrade to our global SAN infrastructure,” said Sean Wedige, Chief Technology Officer of Enterprise Solutions at Rackspace. “We worked with Brocade and EMC Corporation to design a SAN fabric that was easy to grow and manage, while providing the flexibility to allow our data center technicians to connect any device to any switch in the fabric.”

Maximize Port utilization and Simplify Deployment

Rackspace deployed Brocade DCX® 8510 Backbones with Gen 5 Fibre Channel technology—the industry’s most reliable, scalable, and high-performance infrastructure for mission-critical storage—across its global data center network. The Brocade DCX 8510 Backbone is designed to enable a simplified, scale-out network design. With Brocade UltraScale chassis connectivity, 32 64-Gbps optical Fibre Channel cables provide up to 2.1 Tbps connectivity between each Brocade 8510 Backbone director. Rackspace connects multiple Brocade DCX 8510 Backbones using optical Inter-Chassis Links (ICLs) over distances up to 100 meters. The use of ICLs offers a flatter, faster, and simpler fabric. UltraScale ICLs enable scalable core-edge and active-active mesh chassis topologies that reduce inter-switch cabling by 75 percent.

At the same time, UltraScale ICLs free up to 33 percent of ports for server and storage by eliminating the need for Inter-Switch Links (ISLs). UltraScale ICLs help maximize port utilization and greatly simplify deployment, fulfilling Rackspace’s need for “plug-anywhere” capabilities. Now Rackspace has exceptionally fast and reliable connectivity between each switch, while maximizing port density in the lowest amount of rack space possible.

“Our upgrade paths have been driven by our need to scale,” said James Howard, Senior Storage Architect at Rackspace. “Each time a new generation comes we can get bigger and bigger with our environment.”

High Density and High Utilization Improve Productivity

Brocade DCX 8510 Backbones support 16 Gbps Fibre Channel with low latency and high IOPS performance. This allows a denser environment with more ports per square foot of data center space. With maximum utilization of high-density ports, Rackspace boosted its connectivity capacity by a factor of three. Having more ports per square foot utilizes data center space more effectively.

“Unlike an enterprise IT data center, we monetize our SAN,” said Wedige. “So we have to ensure service performance and availability. Better densities and utilization of the SAN fabric work better for Rackspace.”

Being Green Pays Off

In addition, the new Brocade Gen 5 Fibre Channel solutions deliver significant power savings. The Brocade DCX 8510 consumes 70 percent less power compared to similar solutions. Lower power consumption also decreases heat output, which reduces cooling costs. With its new Brocade SAN fabric, Rackspace

can better support green initiatives, while simultaneously delivering better utilization of physical facilities.

"The power consumption of Brocade directors and switches has always been excellent, and it always seems to be improving," said Chad Smykay, Storage Engineer at Rackspace. "In our last migration, power consumption dropped by more than 50 percent. When you have thousands of storage and backup clients, even a dollar a day savings per device can quickly add up."

Simplifying Delivery of Great Services and Fanatical Support®

Rackspace also implemented Brocade Fabric Vision™ technology to gain comprehensive visibility and insight into SAN health and performance. Its powerful built-in monitoring, management, and diagnostic tools give Rackspace unprecedented visibility across its storage network. Brocade Fabric Vision Technology includes Flow Vision, which is used as a traffic generator to simulate traffic before going into a production environment. This helps Rackspace validate network integrity and ensure that it can achieve maximum performance. To ensure optical and signal integrity of the new Gen 5 Fibre Channel infrastructure, Rackspace turned to Brocade ClearLink Diagnostics to validate the optics network, cables, ports, and ISLs. The combination of the two technologies enabled Rackspace to identify potential problems and avoid network issues ahead of production, greatly reducing overall deployment time.

"Our success depends on harnessing technologies that help us sustain our customer service levels," said Smykay. "Brocade provides us with the expandable



SAN solutions we need to manage our services more efficiently and cost-effectively as we grow."

By using the "at-a-glance dashboard" feature of Fabric Vision technology, Rackspace creates customized health and performance views that provide all critical information on one screen. This information helps minimize service disruptions by allowing storage administrators to address problems before they affect operations.

"We were motivated by the advent of the proactive troubleshooting tools in Gen 5 technology," said James Howard, Senior Storage Architect at Rackspace. "Now we can use the gear in the middle to get a better picture of how things are going from end to end. And we're leveraging that capability more and more."

An Invisible Upgrade

Rackspace has been able to continually grow its SAN without customers even noticing. Seamless scalability and the ability to connect any switch to any server or host enabled Rackspace to deploy

Gen 5 Fibre Channel technology almost invisibly to customers. And Brocade Fabric Vision capabilities streamline SAN management, reduce operational costs, and offer customers more reliable access to data.

"We can continually grow our SAN and we're not bumping up against limits or having customers call with concerns," said Chris Wetzel, Director Enterprise Storage at Rackspace. "We leapfrogged a generation to the latest hardware, and are delivering that same consistent experience. And customers didn't even know."

A Strong Relationship

Rackspace also offers a portfolio of security and network offerings based on the Brocade vRouter software network appliance, which delivers increased security, network address translation, and routing. These solutions make it easier for Rackspace to continue building high-performance on-demand solutions for their customers.

Looking Forward to Gen 6

Rackspace continuously evaluates new technologies and is keenly interested in improvements expected in Gen 6 Fibre Channel technology—speeds to 32 Gbps with technology that also enables speeds of 128 Gbps, as well as further improving energy efficiency, reliability, and disaster recovery capabilities. When Rackspace is ready, Brocade will be with them, helping ensure that they successfully maintain their reputation for fanatical customer support.

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