

Professional Network Provider Gains Scalability to Outpace Growth

Customer Case Study



LinkedIn deploys Cisco MDS 9710 Multilayer Directors to reliably connect world's professionals

EXECUTIVE SUMMARY

Customer Name:

LinkedIn

Headquarters: Mountain View, CA
United States

Employees: Over 4800

Business Challenge:

- SAN switching requirements outpacing capacity
- Anticipated growth exceeded switch capacity
- Move to pay-as-you-go hosting environment required

Network Solution:

- Cisco MDS 9710 and 9513 Multilayer Directors
- Cisco MDS 9148 Fabric Switches
- Cisco Unified Computing Systems

Business Results:

- Gained 16-Gbps line-rate, nonblocking, predictable performance and high capacity
- Simplified cabling structure and management to gain flexibility
- Reduced power costs

Business Challenge

With more than 259 million registered members, LinkedIn is connecting the world's professionals to make them more productive and successful. Since the company was founded, it has enjoyed steady growth in members and revenues. In fact, based on LinkedIn's calculations, LinkedIn adds more than two new members per second. This means that the company's storage needs and storage area network (SAN) are growing fast, and its SAN switches need to keep pace.

LinkedIn had built its SAN with a collapsed core using Cisco® MDS 9513 Multilayer Directors. Over time, LinkedIn had upgraded the Directors to 256-Gbps blades to meet growing performance demands. Approximately six petabytes of Oracle database data is currently switched on LinkedIn's SAN infrastructures. In addition, the company's data backup procedures demand flawless, high-capacity switching for all of its data. Even after upgrading the chassis blades, LinkedIn was in danger of oversubscribing its existing SAN design.

With rapid growth, SAN cabling in the data center had become complex because servers and storage had proliferated. The growing number of devices also required more data center space, power, and cooling. LinkedIn wanted to redesign its architecture to minimize cabling and management costs.

When LinkedIn decided to build a new data center, the company knew that it had to expand its SAN switching capacity in port count and distances by three to four times. At the same time, the new data center was implemented as a wholesale hosting arrangement, which means that LinkedIn pays for space, power, and cooling as they are used. LinkedIn's goal was to increase its storage switching capacity and deployment flexibility while minimizing cabling, space, power, and cooling requirements.



“A solution that gives us 16-Gbps non-blocking line-rate performance eliminates any possibility of performance issues and link oversubscription. We now have a clear path to 32 Gbps and beyond with high reliability and availability, without having to replace chassis.”

Christopher King
Manager, Storage Operations



Network Solution

“We wanted to move to a core-edge architecture to reduce cabling cost and complexity,” says Christopher King, manager of storage operations for LinkedIn. “We also wanted to deploy smaller, more capable solutions with 16-Gbps capability to prepare for the growth that’s coming.”

The team evaluated several possible solutions but decided to stay with Cisco and chose Cisco MDS 9710 Multilayer Directors for several reasons. The Cisco MDS 9710 Director layers a comprehensive set of intelligent features onto a high-performance, protocol-independent switch foundation. Because it shares the same operating system and management interface with other Cisco data center switches, the Cisco MDS 9710 enables LinkedIn to create an easy-to-manage network with high-performance Fibre Channel connectivity. LinkedIn also deployed Cisco MDS 9148 Fabric Switches at the SAN edge. These switches, as well as LinkedIn’s Cisco Unified Computing System™ (UCS®), are used in N-Port virtualization (NPV) mode. The NPV mode greatly simplifies LinkedIn’s management footprint while providing the needed scalability.

The Cisco MDS 9710 provides 16-Gbps line-rate, nonblocking, predictable performance across all traffic conditions for every port in the chassis. Although LinkedIn is using 8-Gbps of throughput today, it will likely need twice that capacity soon. The new systems can deliver up to 24 Tbps of Fibre Channel switching bandwidth. In addition, LinkedIn saw value in deploying a SAN solution that would enable it to migrate to a mixed Fibre Channel and Fibre Channel over Ethernet environment or to a multihop Fibre Channel over Ethernet architecture using the same chassis.

The new systems enable redundancy on all major components to help LinkedIn avoid downtime. Redundancy is combined with nondisruptive software upgrades and stateful process restart and failover to maximize system availability.

Business Results

“A solution that gives us 16-Gbps non-blocking line-rate performance eliminates any possibility of performance issues and link oversubscription for the foreseeable future,” says King. “We now have a clear path to 32 Gbps and beyond, with high reliability and availability, without having to replace chassis.”

LinkedIn’s team was already comfortable with Cisco equipment and management tools, so learning the capabilities of the new systems was easy for the IT team. The team was particularly excited about one of the new features, Smart Zoning. Smart zones and NPV mode allow LinkedIn to keep the features that it needs in the SAN core and minimize features at the edge. It simplifies change management and administration and eliminates repeated manual tasks.

With Smart Zoning, Cisco MDS 9710 system fabrics efficiently provision the hardware access control entries specified by the zone. By avoiding extra Access Control List (ACL) entries, LinkedIn’s IT team can create larger zones with multiple initiators and multiple targets with minimal switch configuration. Smart zones can correspond to applications, application clusters, hypervisor clusters, or other data center entities. As a result, the IT team saves time that it used to spend creating multiple small zones, and the team can automate zoning tasks to save even more time.

The compact footprint of the Cisco MDS 9710 has practical implications for a pay-as-you-go wholesale data center environment. The systems require less rack space for providing high capacity and offer greater cabling flexibility. For LinkedIn, this flexibility enables new systems to be added to the top of a rack or at the end of a row easily.

PRODUCT LIST

- Cisco MDS 9710 Multilayer Directors
- Cisco MDS 9513 Multilayer Directors
- Cisco MDS 9148 Fabric Switches
- Cisco Unified Computing Systems

“We are already seeing significant cost savings because of the smaller power supplies in the Cisco MDS 9710 systems,” says King. “Therefore, we don’t need as many power distribution units (PDUs). We can use the PDUs that are already in the rack instead of dropping additional cables.”

Next Steps

LinkedIn expects to scale services over the next few years by deploying more systems to share loads and connections. In the face of a rapidly growing number of servers, the SAN infrastructure is ready.

“We believe without a doubt that the Cisco MDS 9710 is the platform to go forward with,” says King. “We expect it to last at least three years, like our previous Cisco SAN switches.”

For More Information

To find out more about Cisco Multilayer Director Switches, visit www.cisco.com/en/US/products/ps5990/index.html.

To learn more about LinkedIn, visit www.linkedin.com/company/linkedin.

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