Manufacturer Optimizes Virtual Machine Load Balancing and SAN Performance

Customer Case Study

The Krones Group improves uptime, performance, and scalability for the future with Cisco® MDS

EXECUTIVE SUMMARY

Customer Name: KRONES AG
Location: Neutraubling, Germany

Business Challenge:
- Replace end-of-life SAN switches
- Improve virtual machine load balancing and performance
- Reduce downtime due to high error rates and broken links
- Gain SAN management self-sufficiency

Network Solution:
- Cisco MDS 9706 Multilayer Directors
- Cisco MDS 9148 Multilayer Fabric Switch
- Cisco Prime™ Data Center Network Manager

Business Results:
- Gained significantly improved performance and uptime with 16-Gbps capacity across all nonblocking ports
- Eliminated downtime due to broken cables or links through stateful failover
- Gained visibility into the SAN environment and simplified management with a common operating system and Cisco Prime Data Center Network Manager

Business Challenge

KRONES AG, headquartered in Neutraubling, Germany, plans, develops, and builds manufacturing plants and machinery for companies that require advanced process, bottling, and packaging technology. The company produces the machines that make millions of bottles, cans, and specialty containers daily for producers of beer, soft drinks, wine, sparkling wine, spirits, chemicals, pharmaceuticals, and cosmetics while accelerating mass production. It also provides logistics and IT solutions for its customers.

Krones' manufacturing and services rely on three data centers to support business-critical production systems, including SAP, databases, Microsoft Exchange, EMC storage, and VMware virtualization. Two data centers are deployed in an active-active configuration, and the third is used for control and backup and recovery. All three data centers connect over a Fibre Channel fabric. Krones has 1200 virtual machines and 200 physical servers, including Cisco UCS® servers in conjunction with EMC VPLEX virtualized, EMC VMAX, and EMC VNX hybrid flash storage. During a typical day, the three facilities handle 3.5 petabytes of data and serve up to 13,000 users.

"Our previous SAN switches had reached end-of-life status," said Gerd Neuland, head of IM data center services at KRONES AG. "We needed to replace them, and at the same time, we wanted a solution that would simplify manageability, enable the use of 16 Gbps nonblocking ports, and give us the option to upgrade to 32 Gbps in the future."

The old SAN switching environment was managed by the storage vendor, which prevented the Krones team from making changes or tuning systems. This time, the Krones team wanted SAN switches that they could manage themselves. The previous environment also experienced error codes and downtime due to congestion and poor load balancing. High uptime is a priority at Krones, which is why they wanted new switches to deliver 16-Gbps nonblocking port capabilities.

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> "We no longer experience errors or unbalanced links. Every link to the SAN fabric carries the same bandwidth, and all deliver outstanding performance."
>
> Michael Wein
> System Administrator, KRONES AG

"We already had Cisco data center and access switches, routers, and Cisco UCS servers," said Neuland. "It made sense to make the environment consistent with a common operating system and management features. These synergies would enable us to optimize daily operations."

Network Solution

After comparing SAN switching solutions from two vendors, Krones chose Cisco MDS 9706 Multilayer Directors and Cisco MDS 9148 Multilayer Fabric Switches for its SAN. The Cisco MDS 9706 Multilayer Director addresses the stringent requirements of large virtualized data center storage environments. A combination of 16-Gbps Fibre Channel switching modules and Fabric-1 crossbar switching modules enables up to 1.5 Tbps of bidirectional Fibre Channel throughput between modules for each of four payload slots—twice the bandwidth needed to support a 48-port 16-Gbps Fibre Channel module at full line rate. The ports enable 16-Gbps line-rate, nonblocking, predictable performance across all traffic conditions.

Krones uses Cisco MDS 9148s Multilayer Fabric Switches at the SAN edge as a high-performance, flexible Fibre Channel switch platform. It offers high density, with up to 48 line-rate 16-Gbps ports in just one rack unit (1RU) and the industry's lowest power consumption. It also scales easily to accommodate virtualized server environments through N-Port ID Virtualization (NPIV) and virtual SAN (VSAN) technology. Its wide range of intelligent storage networking capabilities include PortChannels with load balancing, quality of service (QoS), plus extensive security, diagnostics, statistics, and APIs for optimizing management. Fabric-port PortChannel technology increases availability by avoiding host relogin in the event of link failure. The Cisco MDS solutions run on Cisco MDS 9000 NX-OS Software, providing a consistent software platform with superior reliability, performance, and scalability as well as self-healing, fault isolation, and corrupted-data-handling features.

Business Results

"We easily integrated the Fibre Channel environment between the Cisco MDS, Cisco UCS, and our existing Cisco Nexus Series switches on the LAN," said Neuland. "We also gained a consistent Cisco operating system across the environment."

Switch mode on Cisco UCS servers enables the fabric interconnects to be connected to the Cisco MDS 9706 as regular Fibre Channel switches. Common NX-OS software operating system and management tools enable the Krones IT team to use the same skills across computing, SAN, and LAN environments.

Krones dramatically improved failure handling with the new solutions. In the rare event that a supervisor module is reset, the active and standby Cisco MDS 9700 Series Supervisor Modules are synchronized, helping ensure stateful failover with no traffic disruption. The Supervisor Modules also automatically restart failed processes.

Nonblocking 16-Gbps ports are fully utilized for high scalability, and Krones looks forward to upgrading to 32-Gbps line cards for all ports in the future. In addition, one of the most significant benefits of the MDS 9706 and MDS 9148 is the ability to aggregate links and optimize bandwidth utilization.

PortChannel technology built into the Cisco MDS family can aggregate up to 16 physical Inter-Switch Links (ISLs) into a single logical bundle. The bundle can consist of any speed-matched ports from any module in the chassis, helping ensure that it remains active even if a module fails.

PRODUCT LIST

· Cisco MDS 9706 Multilayer Directors
· Cisco MDS 9148 Multilayer Fabric Switch
· Cisco Prime Data Center Network Manager

The Cisco MDS 9000 Family switch architecture helps ensure that frames can never be reordered within a switch, which enabled Krones to significantly improve load balancing. Now when virtual machines and workloads move across the fabric, there is no dramatic impact on CPU utilization or network links.

"We no longer experience errors or unbalanced links," said Michael Wein, System Administrator, KRONES AG. "Every link to the SAN fabric carries the same bandwidth, and all deliver outstanding performance."

With Cisco Prime Data Center Network Manager, Krones also has enhanced visibility into the SAN to identify and remedy bottlenecks, enhance link utilization, and analyze events weekly to optimize performance.

Next Steps

Neuland says that the entire changeover process to the Cisco MDS solutions went smoothly without disruption. The only difference users noticed was improved performance. As Krones moves forward with its new SAN switches, it is ready to handle the most demanding virtual environments and production-critical applications.

For More Information

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

For more information about The Krones Group, visit http://www.krones.com/en/index.php.

This customer story is based on information provided by The Krones Group and describes how that particular organization benefits from the deployment of Cisco products. Many factors may have contributed to the results and benefits described; Cisco does not guarantee comparable results elsewhere.

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