

NEW PROCESS STEEL GAINS RELIABILITY AND EASY MANAGEABILITY WITH CISCO AND EMC-BASED STORAGE AREA NETWORK

EXECUTIVE SUMMARY

CUSTOMER NAME

- New Process Steel

INDUSTRY

- Manufacturing

BUSINESS CHALLENGE

- Growth of online business internally and with customers escalates storage needs
- Greater reliance on electronic data heightens availability concerns
- Existing direct-attached storage (DAS) can't scale and lacks high availability

NETWORK SOLUTION

- Install the Cisco MDS 9216 Multilayer Fabric Switch and EMC Clarion CX400
- Configure the switch with sixteen 1 or 2 Gbps autosensing fibre channel ports
- Use Cisco Fabric Manager to easily expand RAID storage

BUSINESS VALUE

- If servers fail, online spare servers are operational within minutes, rather than days
- Scaling storage is now as easy as point and click
- Future proofing of MDS 9216 will allow migration to low-cost iSCSI

Since its inception in 1906 as a small sheet metal shop in Dallas, Texas, New Process Steel (NPS) has become a world leader in flat-rolled steel distribution, processing, and manufacturing. Now headquartered in Houston, Texas, NPS has plants in Birmingham, Alabama; Butler, Indiana; Chicago, Illinois; and Monterrey, Mexico. NPS provides specialty metal products used in heating, ventilating, and air conditioning systems, overhead doors, refrigerator units, trailers, office furniture, computer chassis, and various types of stamped parts.

BUSINESS CHALLENGE

In the late 1990s, NPS began to experience dramatic growth of its online business as customers chose to conduct transactions through its e-commerce site. Internal communications across its LAN and WAN infrastructure increased as NPS workers began using Lotus Notes extensively to track sales processes, generate customer quotations, and search inventory. NPS recognized the need for greater storage capacity. In the span of a few months, for example, the NPS Lotus Notes server alone grew from 20 gigabytes to 80 gigabytes.

In addition, NPS began moving much of its warehouse operations from its IBM AS/400 system to PC/server technology based on TCP/IP networking. Applications, such as Customer Management System, Vendor Evaluation, Work Order Delay System, Plant Purchase Order Maintenance, and Payroll/HR, were moved to several Microsoft Structured Query Language (SQL) 2000 servers rather than the IBM AS/400. Although databases continued to be maintained on the IBM AS/400, throughout the day data was pulled from the IBM AS/400 to the MS SQL2000 servers. As these server-based databases grew, "storage began getting out of control really fast," says James Taylor, systems networking engineer at NPS. "We started having problems on our SQL boxes because we were pulling data every hour from the AS/400, causing server crashes from low disk space. We needed to create backup SQL databases, but we didn't know where to store all the data."

Direct-attached storage (DAS) on each of the NPS 10 servers in its data center hindered NPS's growth. DAS was hard to scale, because it required that NPS dismantle the entire existing storage array on a Compaq/HP server and rebuild it to add more disk space to the server. (NPS had maximized the number of drives they could hold in their servers, making DAS storage unmanageable.) As the need for capacity continued to grow, this challenged NPS IT management, which ran a lean IT shop and devoted only one full-time professional to network management. Finally, the increased reliance on electronic data heightened the issue of security and availability, because server malfunctions meant days of downtime and lost data.

“DAS didn’t provide the availability we needed,” says Taylor. “On one occasion, multiple drives on our internal Web server failed and we lost all of our internal Website data. It took us three days to restore the data. If we had a storage area network, this wouldn’t have happened. Because the data would have been safely backed up to another LUN in the SAN, we could have used EMC’s SNAPview and cloning software to go back in time and restore the data in minutes instead of days.”

The turning point was the appointment of a new IT director, whose vision included greater use of server technology and who promised management that the IT department would deliver 99.99 percent uptime.

NETWORK SOLUTION

Storage Area Network Setup

After reviewing various storage vendors, NPS selected an EMC solution that included the EMC Clarion CX400 storage array with dual service processors. On each of its application and print servers, NPS installed QLogic 2-gigabit fibre channel host bus adapters (HBAs). NPS also installed EMC PowerPath Multipathing Redundancy software that provided dual connectivity to each server processor in the CX400.

At the time, EMC had a working relationship with an existing storage area network (SAN) switch vendor, and NPS installed the vendor’s Fibre Channel Director. But the option did not last long. After only a few days of operation, the entire Fibre Channel Director crashed.

“We lost all connectivity to the switch,” says Taylor. “We couldn’t Telnet or Hyperterm to it with a serial connection or gain any type of administrative access. We were forced to take the entire SAN down and to reboot it. It took us half the day to get it back up running.”

After resolving this situation, other glitches in the SAN operation surfaced. As NPS struggled to resolve the problems, it found that it was not receiving the type of responsiveness that it needed from the switch vendor.

“I had to work my way through multiple levels of product responsibility, and it took weeks to get responses,” says Taylor. “And I still felt that I wasn’t getting the answers I needed. All I knew was that if I’d had any type of problem like this with a Cisco

box, by the next business day I would’ve had a new platform in my data center and it would’ve been up and working. Shortly after this, I told EMC I wanted our current switch out and wanted it replaced with the Cisco MDS 9216.”

Cisco MDS 9216 Multilayer Fabric Switch Is Reliable

NPS swapped out the existing platform and installed the Cisco MDS 9216 Multilayer Fabric Switch. Configured initially with sixteen 1or 2 Gbps auto-sensing fibre channel ports, the Cisco MDS 9216 is modular and designed for easy growth. The expansion slot on the switch allows for the addition of any Cisco MDS 9000 Series module up to 48 total ports.

NPS currently uses 12 of the ports to connect to the application and file/print servers over two Gbps fibre channel connections. Two separate fibre channel paths run between the MDS 9216 and the EMC Clarion CX400.

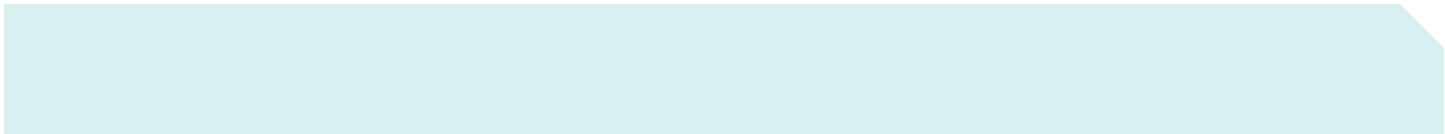
“We’ve had no problem with the 9216,” says Taylor. “I configured it through Notepad the same way I would a Cisco switch or router. I installed the configuration on the switch, verified access to both Service Processor A and Service Processor B on the CX400 for multipathing through Cisco Fabric Manager software located on the 9216 and began connecting my servers. We’ve had all servers fail over and we haven’t had any glitches on any of the boxes. It’s running flawlessly and it’s familiar to us like our other Cisco products. It’s like a regular LAN switch, except with Fibre Channel.”

NPS now maintains online spare application servers. If any processing servers fail, NPS installs a new HBA into the backup server and, using EMC’s Navisphere software, points the new server to the existing logical unit number (LUN) or storage space on the SAN. This allows the application to be operational within minutes, rather than days.

NPS is now using the SAN to store images of its servers in alternate locations on the SAN for testing and development lab work without affecting other end users.

When adding capacity, which has become frequent, NPS has seen a tremendous improvement with the SAN.

“Previously, we had to completely rebuild the RAID to add new drives,” says Taylor. “On the SAN, we can expand the RAID group by simply adding drives since we are not maxed out on drive bays.



We use Cisco Fabric Manager, with its GUI front end, to assign the new LUNs or expand LUNs to our different servers, depending on where we need extra capacity. It's almost as simple as point and click."

NPS has been impressed with the logical view of the SAN enabled with Cisco Fabric Manager software. Taylor now prints the SAN topology, which makes it easy to manage his host connection to the storage array and document any adds, moves, or changes that have occurred.

Multiprotocol Transport Points Way to Future

The multilayer architecture of the Cisco MDS 9216 Multilayer Fabric Switch enables a consistent feature set over a protocol-agnostic switch fabric. This is important, because it enables the switch to smoothly integrate Fibre Channel technology, Small Computer System Interface over IP (iSCSI) and Fibre Channel over IP (FCIP) in one system. Multiprotocol support provides a great opportunity for small and medium-sized businesses such as NPS, for whom Fibre Channel technology is costly and who are looking to use the dramatic cost benefits of iSCSI and Gigabit Ethernet network cards now and 10 Gigabit Ethernet in the future.

"We are looking to implement iSCSI soon," says Taylor. "Most servers we buy now have dual Gigabit Ethernet ports that we can use for network booting (PXE Boot), and this is important as we boot from SAN now. iSCSI will provide a second path for failover without the high costs of installing another several ports in the switch as well as additional HBAs in each server, which is very expensive. And we don't have to do a forklift upgrade to get this capability; it's built into the Cisco MDS 9216.

"But what's also exciting is that Cisco is building support for 10 Gigabit Ethernet into its Gigabit Ethernet ports," continues Taylor. "This means that when Cisco releases a firmware update, my iSCSI will be running at ten Gbps, while my fibre channel connections will be running at only two Gbps."

Eventually, NPS expects iSCSI to become the primary and secondary paths for all server connectivity to its EMC SAN as the cost of Fibre Channel technology outweighs its usefulness. Taylor also sees NPS eventually using iSCSI across the WAN to mount and replicate data cost effectively to remote servers. Taylor anticipates that it will then take advantage of the Cisco MDS 9216 virtual SAN capability to segregate SAN traffic from LAN traffic on its infrastructure.

BUSINESS VALUE

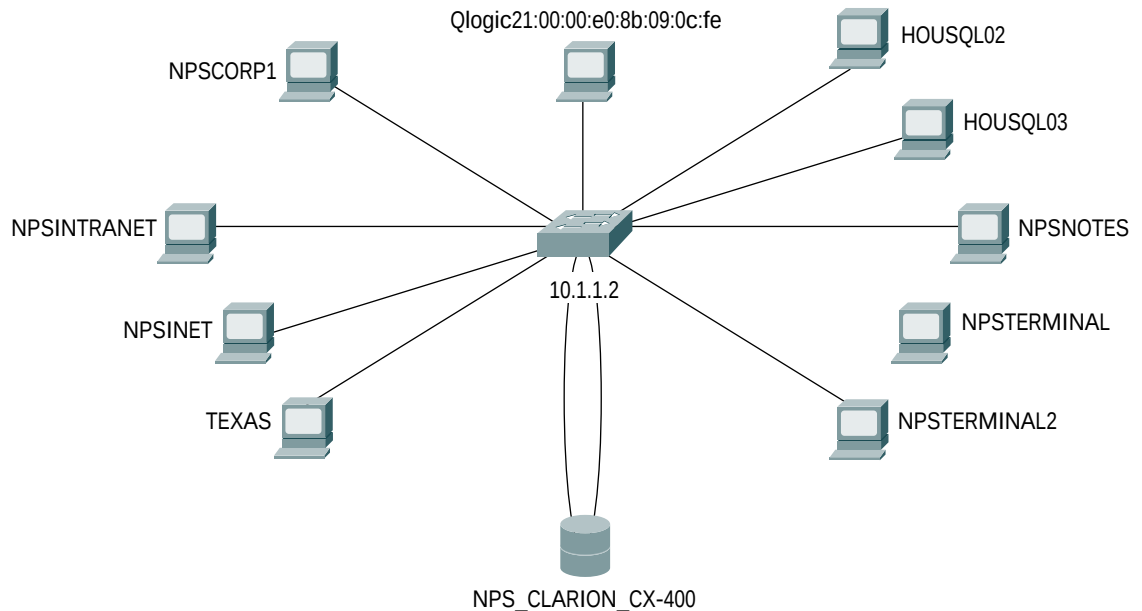
A Hands-Down Winner

The decision to implement an EMC and Cisco MDS 9216-based SAN is beneficial for NPS from both a business and strategic standpoint. When the company first did a cost and benefit analysis of the SAN deployment, it determined that the costs over three years just to purchase the new DAS-based servers and drives to keep pace with company

growth would equal 70 percent of the total SAN cost. After it factored in the soft costs, including time to backup the drives, to add new capacity, and other management tasks, the cost far transcended that of the SAN.

“And then we started looking at disaster recovery and that was it,” says Taylor. “We needed 99 percent uptime, and we realized all the things we could do with the SAN, including online spare servers and storing images of servers in alternate locations on the SAN. But to be honest, since we’ve installed the Cisco MDS 9216 we haven’t even needed the failover capability, it’s been that reliable.”

Figure 1
Logical View of NPS SAN Topology



NPS equips each of its application or file servers with 2-Gbps QLogic HBAs. Each server connects into the EMC SAN through the Cisco MDS 9216 Multilayer Fabric Switch, which provides access to each of two servers within the EMC Clarion SAN across two separate paths.



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