



Ports of Auckland Virtualized Storage Infrastructure

“Performance has been nothing short of phenomenal.”

About Ports of Auckland

Ports of Auckland is New Zealand’s leading port company, serving the country’s vital international trade with a broad range of cargo handling and logistics services on a 24x7, 365-day-a-year basis. Ports of Auckland is responsible for running two maritime ports and an inland port in the Auckland region. In 2010, the ports handled cargo equivalent to 13 percent of the country’s total GDP, twice as much as any other New Zealand port. Its east-coast Auckland seaport accounts for 37 percent of New Zealand’s total container trade. Ports of Auckland connects New Zealand’s importers and exporters with more than 165 international ports in nearly 70 countries.

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“With SANsymphony, we have seen the benefits first-hand of improved uptime and being able to do operational maintenance without affecting the business. We’re getting better utilization out of our storage hardware, and need less of it to get the same performance. Lastly, we have peace of mind. We know we don’t have to throw away any functionality intelligence because we get to keep using SANsymphony software even as the hardware underneath changes.”

- Craig Beetlestone, Lead Systems Engineer at Ports of Auckland

The IT infrastructure at Ports of Auckland is extensively virtualized, but its aging Storage Area Network (SAN) was limiting critical application performance, required too much downtime for physical maintenance or upgrades, and could not furnish the high availability demanded by port operations. By deploying DataCore SANsymphony storage virtualization software, the IT team was able to guarantee a failover time of mere minutes, increase storage performance and utilization, and greatly reduce their storage infrastructure costs and management burden.

IT is a Cornerstone to Port Operations

Like the international trade it supports, Ports of Auckland is a 24x7, 365-day-a-year operation, which places a tremendous responsibility on the company’s IT team to keep critical systems available and performing up to expectations at all times. Two applications in particular are critical to port operations. The SPARCS container-handling application is a just-in-time logistics system that manages the actual movement of containers around the port. Without it, port operations come to a standstill. The company’s Microsoft Exchange email system is also mission-critical, since it carries the Electronic Data Interchange (EDI) communications, instructions from shipping lines and other customers, and other time-sensitive information required for port operations. The company also makes heavy use of Microsoft SQL Analysis Services and SQL Reporting Services for business analysis and Microsoft SharePoint for collaboration.

Other applications support harbor control oversight (Ports of Auckland serves as a marine traffic controller for the ports), terminal control, management, and planning, port security, administration (finance, IT, sales and marketing), and the engineering team that keeps all the container handling equipment, plant and machinery operating 24x7.

All of these functions are heavily dependent on the Ports’ SAN infrastructure, which is also tasked with storing many images and videos for training and incident management, and will shortly be required to support a new terminal management system based on Oracle WebLogic.

Faster response and performance

DataCore SANsymphony dramatically improves disk read and write performance by enabling most of the traffic to run within RAM memory speeds versus slower mechanical disk speeds. The impact on Ports of Auckland applications was immediately noticeable. The system has been able to take on a much larger proportion of the total IT application load than had been planned. “We’ve been able to support far more virtual machines and far more I/O requests than the IT team had originally expected.”

Embracing End-to-End Virtualization

Ports of Auckland was an early adopter of server virtualization and today 95 percent of its server infrastructure is virtualized: 130+ production and 60 development virtual machines running on 14 VMware hosts. But the company was running into the problem that every virtualization pioneer eventually encounters: its aging SAN infrastructure, primarily two EMC CLARiiON CX500 SAN units using MirrorView for replication, couldn't keep up with the demands of a highly-virtualized environment. "We were seeing a degradation of performance across all the virtual machines attached to either one of the CLARiiON units," says Lead Systems Engineer Craig Beetlestone.

Equally problematic was the necessity of scheduling downtime for major maintenance or upgrades—in an environment where the only window of opportunity for such work is the 15 minutes between shifts every eight hours. Beetlestone and his team needed flexibility to do system maintenance without having to actually turn the systems off. The IT team looked at the flexibility and superior manageability they'd already achieved through their virtualization efforts, and asked themselves a question. "If we could virtualize our servers—the CPU and the memory—then why couldn't we virtualize our storage?" says Beetlestone. "We wanted to be able to make the storage at both our primary and secondary sites look like one SAN to the VMware farm."

Making the Right Choice: DataCore and Xitech

For Beetlestone and his team, the choice came down to two options: a SAN based on the IBM SAN Volume Controller (SVC), a block storage virtualization appliance, and one based on the DataCore SANsymphony storage virtualization software that was storage device independent.

"The SANsymphony solution seemed to fit what we had in mind as a true stretch cluster better than the IBM SVC product did," says Beetlestone. He also notes that SANsymphony was lower cost both in terms of capital expenditure and operational costs. Plus, SANsymphony runs on Windows, just like most of the Ports of Auckland IT infrastructure.

At Ports of Auckland, the DataCore SANsymphony storage virtualization software runs on a pair of IBM x3650 servers with Xitech Storage Blades attached to the back end. The new storage infrastructure delivers several benefits for Ports of Auckland: "no-panic" business continuity and seamless maintenance, better performance and storage utilization, and long term cost savings and peace of mind.

"No-Panic" Business Continuity and Seamless Maintenance

Because SANsymphony manages all the storage at both sites as a single pool of virtual disks, automatically routing I/O requests to the appropriate hardware regardless of where it is, Beetlestone's IT team no longer has to worry about site failure. "The ports run 24/7, but IT can't afford to," he says. "We rely on staffers on call for full-time coverage, so our mantra for new systems has long been: *design out the panic*. Now we can suffer a complete SAN array failure at one site and have the systems carry on running without any manual intervention, which is a huge benefit for us. Our return to operation in a complete site failure is literally only minutes."

Ports of Auckland deployed SANsymphony in late 2010. Although no failover has been necessary since the system has been in full operation, the IT team has done several tests to check the outcome of a failure. "In each case, everything continued on and nobody noticed any disruption — business operations just continued unaffected and performance continued to be the same," notes Beetlestone.

Before the DataCore deployment, the IT team had to fail over the system to the secondary site to allow for a scheduled SAN outage, which had an unacceptable impact on port operations. "The ability of DataCore's SANsymphony storage virtualization software to provide seamless, 'zero-downtime' maintenance was a major factor in the purchase decision.

This enabled the team to do operational maintenance without affecting the business at all," says Beetlestone.

Better Performance and Utilization

"Performance has been nothing short of phenomenal," declares Beetlestone. "On the new DataCore SANsymphony/Xitech setup, even with SQL servers that use a significant amount of disk I/O we barely see any impact at all because the effective disk latency stays extremely low – even when we throw a large amount of I/O through to the controllers." In addition, just as server virtualization can improve CPU utilization, SANsymphony storage virtualization improves storage utilization through thin provisioning. Administrators can create new disks from the storage pool in a matter of seconds, so there is no need to overprovision storage.

Freedom and Savings with a Virtualized Infrastructure

Perhaps the biggest benefit the Ports of Auckland has seen from deploying DataCore SANsymphony storage virtualization software is the confidence it gives the company and the IT team that they're now in control of their storage future. "One of the things that drew me personally to SANsymphony was that it is software," states Beetlestone. "With hardware, when you go to replace it you are forced to replace all of the software features too. With SANsymphony, we buy it once. We own it. And we can swap out the box that it runs on at will. That's a big bonus. It can easily save us more than \$100,000 when we go to the next generation of hardware."

