Mainfreight Turns to Virtualization to Reduce Complexity of Disaster Recovery Processes and Minimize Maintenance Load on IT Team

Mainfreight Faces 15-Hour DR Tests Every Three Months

Founded in 1978, Mainfreight provides logistics and supply-chain services through 165 branches in New Zealand, Australia, Asia and the United States. The company listed on the New Zealand Stock Exchange in 1996 and today has more than 3,200 employees supporting over 20,000 customers worldwide. It turns over more than a billion dollars a year.

Mainfreight operates a production datacenter in one of its logistics facilities in Auckland and runs infrastructure in a secondary hosted datacenter in the city’s central business district. The purpose-built production datacenter runs critical applications such as a web-based consignment tracking system and an inventory management system. The secondary datacenter provides monitoring and backups, and incorporates the infrastructure required to support full failover in the event of a disaster.

Until late 2009, Mainfreight ran a hybrid infrastructure comprising 60 physical servers and several virtual machines running on 10 hosts. The virtualized infrastructure was based on VMware® Infrastructure 3 and the VMware ESX™ 3.5 hypervisor. However, as demand from the business grew, the host servers and associated storage devices were reaching capacity. “We could have reprovisioned our existing hardware to support virtualization, but our three-year server leasing arrangement was due to expire at the end of 2009,” said David Hall, IT Infrastructure Manager, Mainfreight. “This gave us the chance to implement full virtualization on physical servers optimized for the task.”

Mainfreight’s primary goal in deploying a new infrastructure was to reduce the complexity of its disaster recovery processes. The organization had required four or five team members to work for up to 15 hours to complete disaster recovery tests every three months. “We conducted these tests this frequently due to the complexity of the process and the need to regularly update our documentation and scripts,” said Hall. “We had a 35-page manual that set out in detail the steps our team had to take when failing systems over to our disaster recovery infrastructure and switching them back to our production environment. We typically took about four to six hours to complete a disaster recovery test if the process ran smoothly—but there were times when we started testing at 5pm and only got home at 8am the next day.”

However, conducting these tests is non-negotiable, as Mainfreight estimates it loses NZ$10,000 for every hour its systems are down. The IT infrastructure team is keenly aware of the importance of these tasks and operates to a mantra of ‘disaster

“VMware has provided us with a flexible, reliable IT platform to support the business and deliver IT services in more responsive and cost-effective ways.”

— Kevin Drinkwater
Global Chief Information Officer
Mainfreight

KEY HIGHLIGHTS

Results
• Reduced disaster recovery test times from up to 15 hours to one hour
• Cut number of team for disaster recovery from four to one
• Minimized downtime costs—estimated at NZ$10,000 per hour
• Cut incident resolution times from up to four hours to 15 minutes
• Achieved 99.999% availability
• Gained ability to provision services or capacity in minutes or hours as opposed to days or weeks

Mainfreight
VMware vSphere 4 and VMware vCenter Site Recovery Manager Ensure Robust Disaster Recovery and Drive Efficiencies in IT Infrastructure Provision
Mainfreight Turns to Virtualization to Deliver Benefits

Starting in December 2009, Mainfreight deployed a new production infrastructure comprising VMware vSphere 4 running on HP servers and storage hardware. “We deployed VMware virtualization as it was proven and the market leader,” said Hall. “It also had modules such as VMware VMotion and High Availability that were not fully developed in rival products.

“We also implemented VMware vCenter Site Recovery Manager as it was the only product that could automate disaster recovery across VMware software and HP hardware.”

This infrastructure comprises about 140 virtual machines running on 10 host HP ProLiant BL685c G6 blade servers in HP Blade System C7000 enclosures linked to an HP StorageWorks EVA 8400 storage array. Its disaster recovery infrastructure comprises six HP ProLiant BL685c G6 servers in HP Blade System C7000 enclosures linked to another HP EVA 8400 array. The company replicates data and undertakes disaster recovery testing between its production and disaster recovery sites over a 2GB-capacity dedicated fiber link.

Mainfreight used its own internal team and consulting company Part Two to successfully implement the virtualized environment. “We swapped out our disaster recovery hardware and installed the new infrastructure in December, allowing us to fail our systems across while we migrated the hardware out at the production site,” said Hall. “After installing the new production infrastructure in January, we were able to swap our systems back.” The organization is planning to virtualize its entire datacenter infrastructure, excluding a couple of legacy EDI servers, by the end of 2010.

Virtualization Transforms Disaster Recovery

By deploying VMware vCenter Site Recovery Manager, Mainfreight has eliminated the uncertainty and scope for error posed by manual disaster recovery processes.

“The riskier steps of the previous process involved changing storage groups from one storage area network to another,” said Brandon Potter, Infrastructure Architect, Part Two. “Under the pressure of a disaster, an administrator undertaking a manual process might inadvertently fail over in the wrong direction or select the wrong storage unit. As a result, data could be lost irretrievably.”

Now, an administrator only needs to click a mouse once—on site or from a remote location—to initiate the failover process. The hundreds of steps detailed in Mainfreight’s 35-page document are fully automated.

If a disaster strikes and the production datacenter is still operating, VMware vCenter Site Recovery Manager shuts down all of the 140 virtual machines in a specific order. “The software shuts down the virtual machines running front-end systems first, then the Microsoft SQL Server machines, the file servers, the web servers and then the infrastructure servers,” said Potter. “It then assumes control of the storage system and fails across all the storage units required for the virtual machines. The storage units are then presented to the virtualization host servers at the secondary datacenter. The servers will then add the storage units and re-start the virtual machines in a set order.” If the production datacenter is not available, VMware vCenter Site Recovery Manager simply starts the machines directly at the secondary site.
Mainfreight has also used the functionality of VMware vCenter Site Recovery Manager to test its disaster recovery performance without interfering with its production systems. “This ‘test in a bubble’ capability has allowed the business to fine-tune its failover capabilities to ensure processes occurred in the right order and the timings were correct,” said Potter. “This enabled it to complete a recent full disaster recovery test in just under an hour.”

A Forward-thinking Approach

By deploying an infrastructure with greater performance, flexibility and reliability, Mainfreight has reduced the ‘fire-fighting’ component of IT team duties. Instead, the technology team are contributing more to project development and ensuring the business can achieve its goals. The company has further reduced its troubleshooting load by managing its entire virtualized environment from a single interface. “The company can now drill down easily to find out which virtualization host, virtual machine, or disk may be causing a problem,” said Potter. “When it had a purely physical infrastructure, it was quite cumbersome and painful to isolate an issue. An incident can now be resolved in 15 minutes rather than three to four hours.” The business is now looking to use virtualization to reduce its Microsoft licensing costs and simplify its auditing requirements. This is particularly timely as it is planning an upgrade to Microsoft SQL Server 2008 R2. “Mainfreight has enough licenses on a per-CPU basis to meet all of its production Microsoft requirements,” said Hall. “It can also easily track the 140 copies of Microsoft Windows Server 2003 R2 it has running in its virtual machines.”

The virtualized infrastructure has enabled Mainfreight to end regular outages plaguing its Microsoft Terminal Server environment. This was used to deliver its international freight forwarding application as a service to about 700 users in the Asia-Pacific region. After rebuilding the servers as virtual machines, the organization ensured those users would not lose important documents or be forced to log on to a different Terminal Server. Overall, Mainfreight is approaching 99.999 per cent availability, giving users and senior management confidence in the ability of IT to ensure business continuity. Mainfreight has also cut boot-up times, lowering frustration levels within the IT team. “It reboots its Microsoft Windows Server 2003 Terminal Servers at regular intervals and Microsoft SQL Servers less frequently,” said Potter. “The Windows Terminal servers used to take three or four minutes to boot up, while the SQL servers took five to 10 minutes. Now, the equivalent virtual servers boot up in less than a minute.” Using VMware virtualization has also enabled Mainfreight to ‘de-cluster’ its Microsoft Exchange and Microsoft SQL environments, simplifying its infrastructure. “Microsoft clustering was reliable, but required a specific set of skills to administer,” said Potter. “So now that Mainfreight has de-clustered, it has made those environments easier to support and we can continue to deliver service level agreements that meet the requirements of the business. We can also recruit IT administration team members more easily.”

Mainfreight also used VMware Storage vMotion during its migration process to move data between its old and new storage arrays without impacting the business. This enabled a seamless transition to the new infrastructure.

“Deploying VMware has enabled us to move forward as a business secure in the knowledge that we have a robust, dynamic infrastructure that can support our requirements,” said Hall.