

ConnectEast Drives Motorway Excellence with an HP Infrastructure

HP Integrity servers bring reliability, scalability, and performance to EastLink tolling operations



“The HP solution with Integrity servers offered the best option to meet the rigorous requirements for our tolling operations.”

—Anthony Snell, manager of business information services, ConnectEast Pty Ltd.



Objective

Build a technology infrastructure to support 24x7 tolling operations and reliable customer service

Approach

Implement and host the entire tolling system on an HP fault-tolerant, disaster-tolerant infrastructure backed by HP support services

Business technology improvements

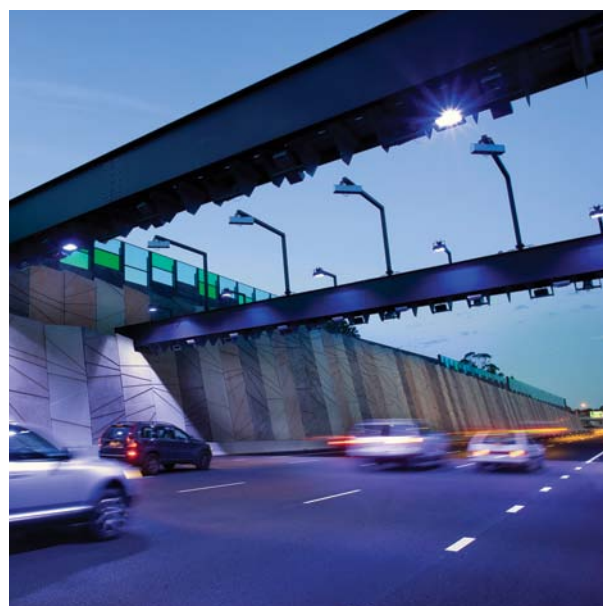
- Superior availability
- Optimal use of development and quality assurance resources via virtualization
- Automatic failover capabilities and application/data protection
- Throughput capable of handling 5.4+ million transactions

Business outcomes

- Enables tolling business model and 24x7 revenue stream
- Completed the Tolling System implementation ahead of time and on budget
- Provides capacity to manage information from thousands of vehicles at 26 tolling points
- Promotes compliance with the Victorian Government's service agreement and customer billing requirements

HP customer case study: HP Integrity servers, HP-UX 11i, HP software, HP Serviceguard solutions, HP Services, and HP StorageWorks go the distance in highway tolling

Industry: transportation/public sector



The best technology route

Transport infrastructure developer ConnectEast Pty Ltd. financed, built, and now maintains and operates the \$3.8 billion AUD (\$2.78 billion USD) EastLink project, one of the busiest highways in Melbourne, Victoria, in Australia. In return for its investment, ConnectEast (www.connecteast.com.au) acquired the right to collect tolls on the 39-kilometer freeway until 2043. Opened in June 2008, the fully electronic EastLink tollway ties Melbourne's Eastern Freeway to the Frankston Freeway in the south. In its first 12 months, travelers chose EastLink for more than 50 million trips because it offers a safe, fast, and convenient route to their destinations.

“There’s no doubt about it: HP Serviceguard Solutions for disaster recovery work, and they work effectively.”

—Anthony Snell, manager of business information services, ConnectEast Pty Ltd.

Publicly held ConnectEast (Australian Securities Exchange: CEU) accumulates revenue 24x7, so technology is the vital enabler. “With a multi-lane, free-flow tolling system, we are reliant on technology to gather revenue and also to provide a high level of customer service,” says Anthony Snell, manager of business information services for ConnectEast.

To foster a compelling experience for which commuters will pay, ConnectEast opened the EastLink Tolling Operating System (TOS) subsystem on fault-tolerant HP Integrity server/HP Serviceguard clusters with Intel® Itanium® processors and HP-UX 11i, an HP Virtual Server Environment for development and quality assurance activities, and HP StorageWorks 8000 Enterprise Virtual Array-based SANs. Developed by Sociedad Ibérica de Construcciones Eléctricas, S.A. (SICE), headquartered in Madrid, Spain, the TOS is integral in the EastLink’s entire operations. The subsystem records vehicle/tag passages and translates those transactions into toll charges for the Customer Service System (CSS), which operates on the SAP enterprise resource planning system and Oracle Database 10g.

“The HP solution was the best option for our tolling operations,” Snell says. Before selecting hardware for the TOS platform, the company had adopted the HP BladeSystem and VMware for a separate corporate environment to leverage the solution’s scalability and modularity.

Fast-track implementation

HP reseller SICE (www.sice.com), which specializes in intelligent transport and environmental control solutions, secured the contract to provide integrating technologies for EastLink. Although SICE recommended HP technologies and ConnectEast saw the benefit of keeping the same technology vendor that supports its corporate environment, SICE’s proposal still went through extensive appraisals to confirm the hardware’s robustness, functionality, availability, redundancy, and resilience. The evaluations were necessary because the TOS subsystem is the most challenging in terms of hardware sizing. It must receive, rate, and assign toll charges on up to 5.4 million vehicle passages per day.

Moreover, ConnectEast agrees in its concession deed with the State of Victoria to bill transactions to customer accounts within two business days; therefore, it can’t sustain system outages that would jeopardize revenue and its agreement terms. That is why ConnectEast insisted on optimal performance, precise sizing, and high availability for the system.

To satisfy the demanding requirements, SICE and HP conducted TOS throughput simulations and many other tests. “The testing gave us a degree of confidence that we would have enough capacity,” Snell explains.

SICE worked with HP solution architects in Spain and system engineers in Spain and Australia to design, deliver, and install the servers. EastLink’s TOS now runs on HP Integrity rx6600 Servers in conjunction with the rest of the entire Tolling System comprising all roadside equipment, the CSS, the Web portal, and the contact center.

As a result of HP and SICE’s strong collaboration and commitment to ConnectEast, the Tolling System implementation was completed several months ahead of time and on budget. “The design, delivery and installation of the systems were achieved quite seamlessly by HP Services,” Snell says. “The TOS application created by SICE on the architecture designed by HP is very reliable and functional. Our HP Integrity and ProLiant servers are performing well.”

In addition to the TOS used by up to 300 concurrent users daily, HP Integrity rx6600 clusters run the SAP Web portal. Mixed Serviceguard clusters of Integrity rx6600 and rx7640 Servers also host the license recognition application, image processing, SAP Customer Relationship Management (CRM), Customer Care and Service (ISU/CCS), and Business Warehouse (BW) applications. In addition, HP ProLiant BL465c server blades running Microsoft® Windows® 2003 Enterprise facilitate TOS reporting.

Veering toward virtualization

The Integrity architecture enables an HP Virtual Server Environment (VSE) for ConnectEast's development and quality assurance (QA) activities. SICE configured HP Integrity rx7640 Servers with HP Integrity Virtual Machines, hard (nPars) and virtual partitions (vPars), and HP Serviceguard to create virtual servers. The arrangement enables the use of resources to their fullest extent and saves administration time. Using HP Ignite-UX, the staff can easily maintain the operating system configurations on the virtual servers and restore the environment quickly. Seeing the potential to cut expenses, Snell is taking a long-term view of HP virtualization technology.

"We are looking at a virtualization option on some of our production environments so that we can better use some of the capacity in the systems," Snell explains. "Virtualization will be used in any new platform installed here."

High-octane availability and disaster tolerance

ConnectEast put a lot of stock in high availability and disaster tolerance when it required an infrastructure with no single points of failure and myriad redundancies. HP Services configured a separate disaster recovery site, which replicates the production environment. In addition, HP system engineers installed HP Serviceguard Metrocluster software to safeguard the SAP environment and HP Serviceguard Cluster File System (CFS) to protect the servers and enable concurrent data access from multiple servers across the SANs.

"HP gave us a high availability package for the entire tolling environment so if there is an outage, we have automatic failover capabilities and it's quite seamless. Metrocluster for RAC meets our strict high availability requirements, and Serviceguard CFS is integral in making sure we don't lose any critical data. When a failure occurred in the past, we recovered the SAN data without any issues," Snell notes.

More mileage from scalable storage

The HP SANs—comprising HP StorageWorks EVA8000 systems, ESL322e Tape Libraries, and storage software—build on the same tenets of high availability found in the server platform. The SANs enable the company to maintain up to six months of online transactional data and ready access to license plate image files.

"For every toll, we execute a transaction, photograph the vehicle, and store those pictures where a tag is not present. We chose HP StorageWorks SANs to give us the disk space memory and storage capacity we required," Snell says.

Not only do the SANs excel in performance and capacity, but they also work seamlessly with HP servers—and HP software products, which integrate and supply one centralized tool for management ease. "We preferred an end-to-end solution, because generally it is better from a cost and maintenance standpoint to deal with a single supplier," Snell comments.

ConnectEast contracted for a range of HP support services to keep the environment functional. And the staff counts on HP Proactive 24 Services and a dedicated HP technical manager to assist with issues and answer questions.

"Having that direct, one-on-one contact with our technical account manager has been beneficial. No matter what time of the day or night, HP is here when we call them. HP's support has been impressive," Snell comments.

Customer solution at a glance

Robust, disaster tolerant infrastructure for 24x7 mission-critical tolling operations

Primary applications

- Tolling Operating System; SAP R/3 Industry Utilities system: Customer Relationship Management, Customer Care and Service (ISU/CCS), Business Warehouse (BW), SAP NetWeaver Portal, Solution Manager

Primary hardware

- 8 HP Integrity rx6600 Servers (production: 4 processors/8 cores; QA: 2 processors/4 cores)
- 2 HP Integrity rx7640 Servers
- HP BladeSystem: HP ProLiant BL465c G5 and BL25p and HP Integrity BL60p server blades
- HP BladeSystem c7000 Enclosures
- 4 HP StorageWorks 8000 Enterprise Virtual Arrays (EVA8000)
- 2 HP StorageWorks ESL322e Tape Libraries
- 2 HP StorageWorks 4/64 SAN Switches

Primary software

- HP-UX 11i v2 operating system
- HP Virtual Server Environment: virtual partitions (vPars), hard partitions (nPars), Integrity Virtual Machines (Integrity VM)
- HP Ignite-UX
- HP Serviceguard Metrocluster for RAC

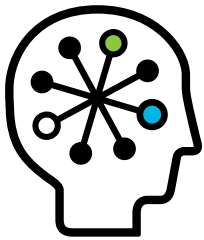
- HP Serviceguard Cluster File System (CFS)
- HP Systems Insight Manager
- HP Data Protector software
- HP Storage Essentials software
- HP StorageWorks Command View EVA software
- HP StorageWorks Continuous Access EVA software
- HP StorageWorks Business Copy EVA software
- HP Operations Manager software
- HP Network Node Manager
- HP ProCurve switches (backbone)
- Nokia Checkpoint and Fortinet Firewalls
- Microsoft Windows 2003 Enterprise Server
- Oracle Database 10g

Services from HP

- HP Consulting Services for project management and solution design, including networking, firewalls, HP-UX 11i infrastructure, data protection, and full infrastructure central monitoring
- HP Proactive 24 Services
- Server planning and deployment
- Storage architecture and design
- SAN installation and deployment
- Care Pack (Six-Hour Call-to-Repair Hardware Support)

Backed by excellent support, the turbo-charged infrastructure implemented by SICE and HP has given ConnectEast the capacity to manage information obtained from thousands of vehicles every hour at 26 tolling points along 78 kilometers (48 miles) of motorway (including both carriageways). In September 2009 when EastLink marked its highest monthly average daily trips to date, an average of 163,345 trips per day, the technology kept up with the pace. Consequently, Snell believes EastLink is adequately prepared for the long haul as usage increases.

"An unknown element in tolling operations is the number of transactions, so for us the entire HP solution is about reliability, supportability, and scalability. HP protects our investment in this business because we don't worry about whether the infrastructure is up to the task. HP hardware is rock-solid and reliable," Snell concludes.



Technology for better business outcomes

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