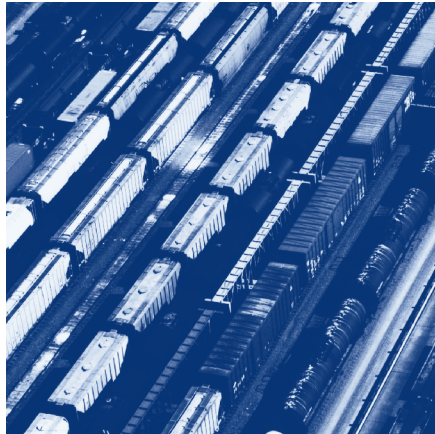




## VMware ACE Solves Training Headaches for TSI Terminal Systems

### Canadian Shipping Terminal Company Deploys ACE for Training Exercises, Uncovers Boatload of Other Benefits



#### KEY HIGHLIGHTS

INDUSTRY: SHIPPING

#### CHALLENGE

TSI needed a way to integrate a new ERP system and train 1,200 users, on a set schedule, without expanding IT headcount.

#### SOLUTION

VMware ACE solved hardware-dependent testing issues and made training workstations run smoothly without IT involvement.

#### RESULTS

- Saved \$450,000 in bug fix delays and foregone QA staff
- Two-day average savings per bug fix reported to ERP vendor
- \$750,000 saved on staff, facility rental and equipment setup costs for training centers
- Isolated ACE images within shared workstations prevent fault spillover while increasing asset intensity
- Granular rights management controls help desk tickets

*“ACE allowed us to completely lock down our workstations. We wanted to optimize our QA lab and transform our training centers to nearly ‘self-run’ by using locked down images. The goal was to get to a place where we wouldn’t have to worry about roll-back and workstation re-imaging, and ACE was the best, easiest way to do that.”*

Michel Labelle  
Network and Terminal Support Manager, TSI

### TSI Terminals: Canada’s Gateway to the World Market Handles \$500 Million in Goods Daily

TSI Terminal Systems (TSI) is Canada’s largest shipping terminal operator. The company operates two terminals at the Port of Vancouver—Vanterm and Deltaport—on behalf of the Vancouver Port Authority. Eighty percent of the Port of Vancouver’s container traffic flows through those two terminals, which, in 2006, totaled approximately 1.2 million containers. The Port of Vancouver itself handles about 35 percent of all West Coast container trade, which trade averages between \$1.4 billion and \$1.6 billion per day. TSI does all this with 180 permanent staff while subcontracting about 1,200 longshoremen in day-to-day operations.

The role TSI plays at the Port of Vancouver is atypical to most North American shipping terminals in that TSI not only handles such a large proportion of the port’s total containerized shipping, but also handles containers from a wide variety of shipping companies. “In many ports,” says Michel Labelle, TSI’s network and terminal support manager, “the terminal may only handle the containers for a single shipping line. The terminal operators get one or two vessels a week, completely unload it, completely reload it, and then send the vessel off.”

This couldn’t be further from the truth for TSI, which stands as a primary gateway in a massive value chain of incoming shipping companies, freight handlers and forwarders and outgoing trucking companies. “We get six or seven vessels a week and do loading and unloading for nearly every shipping company that calls at the Port of Vancouver,” says Labelle. “In the course of running the terminal, we deal with 450 trucking companies, 15 or so steamship lines and the Port Authority administration. We have quite complex logistics operation here, and it’s all brought together by IT.”

---

## New ERP Rollout Primes TSI for the Future

Efficiency gains through IT innovation are central to TSI's business. "We have a set amount of money that we're paid per container moved," points out Labelle, "So we have to make our money by driving down the costs of moving those containers, and moving more of them faster. Information technology is a big piece of achieving that, which is why, of our 180 permanent staff, fully 22 are IT personnel—a big proportion for any enterprise."

To make this system hum, TSI uses a specialized ERP system designed for logistics, known in the shipping industry as a Terminal Operating System or "TOS." Currently, TSI had been running its own internally developed TOS. But two years ago, in the pursuit of efficiency and better operations, TSI embarked on a project to roll out the gold standard of marine terminal ERP software, Navis.

As with any big software integration project, there were bound to be challenges. Firstly, the Navis software had to be sculpted to fit TSI's unique business processes. This meant substantial back and forth between Navis' developers and TSI's IT staff testing the implementation on site. And when offsite developers try to reproduce bugs on hardware environments that differ from the customers' production machines, problems inevitably arise. Furthermore, multiple hardware environments at both TSI and its partner organizations meant TSI's own QA engineers had to test against multiple hardware configurations.

And even after the Navis TOS has been tested, approved, and is ready to go live, TSI will need to train all 1,200 longshoremen and a host of third-party users from trucking companies and steamship lines. To ensure optimum information retention, all this training will happen in a period of 10 weeks just prior to launch. The training itself will happen around the clock at eleven separate facilities for TSI's internal users, in addition to a host of customer sites.

Lastly, once the initial training project is completed and the software rolled out and in production, new versions of software will need to be continually deployed, which will require robust version control to ensure the hundreds of PCs accessing the system have consistent versions.

TSI had a big list of challenges to address, and an IT staff that had plenty of day-to-day responsibilities already. As Labelle puts it, "The biggest challenge for us was limited resources. Even with 22 IT staff, those folks still have their regular duties, too. They have to keep the existing terminal running. We needed a way to be as efficient as possible with our current IT headcount. We needed something that would allow our staff to do more at once, to do things from different locations, and to be more versatile."

## TSI Pulls VMware's ACE from its Sleeve to Ease ERP Integration

Labelle was familiar with the benefits of virtualization from a previous engagement at a municipality in British Columbia. "We first looked at VMware Workstation as a way to address our needs," says Labelle. "And Workstation is great, but ACE allowed us to completely lock down our PCs. We wanted to optimize our QA lab and transform

**VMWARE ACE AT WORK**

- VMware ACE on 3.0G GHz Dell GX620s with 1GB RAM, Wyse WT9544XL with 512MB of RAM
- Host operating systems include: Windows XP and Windows XP embedded
- Guest operating systems include: Windows XP and Windows XP embedded
- Applications running on ACE include: Oracle Forms, Navis ERP clients, TerraTerm, Citrix ICA Clients, MS Office, Nortel IPSEC VPN, NetMotion Wireless, IT administration tools

our training centers to nearly 'self-run' by using locked down desktop environments. The goal was to get to a place where we wouldn't have to worry about roll-back and PC re-imaging, and ACE was the best, easiest way to do that."

While TSI initially rolled out their ACE implementation to solve their training issues, they quickly found a myriad of other valuable uses for the technology. Benefits so far have been:

- **\$450,000 in foregone testing costs.** The TOS integration process of bug discovery, reporting, reproduction and correction was proving to be a large time sink. "We found that quite a few of the bugs we were reporting to the Navis team weren't reproducible in their physical test environment," says Labelle. "Rather than wasting time finger pointing, we realized that instead of pushing a bug report to the Navis team and hoping that it would reproduce on their hardware, we could just snapshot the ACE desktop the software was running in, and send them that whole ACE desktop. They just open the hardware-independent ACE desktop on their end, immediately reproduce the bug, and spend time fixing the bug, rather than trying to diagnose our hardware."

Further, this virtualization-based methodology enabled Navis to send ACE desktops from development center to development center around the world as the work day ends at one place, allowing them to work on a given bug 24 hours a day, without worrying about new hardware configurations at each development site. "The fact that they could ride the clock like that without worrying about the hardware has been integral in them getting bug fixes back to us on time and on budget," says Labelle. TSI estimates that this VMware/ACE methodology saved them \$450,000 in bug fixing delays and foregone QA staff.

This benefit of leveraging ACE to eliminate hardware conflicts in the testing process has Labelle looking to do the same with the shipping and trucking organizations who dial in to TSI's Navis system. "We're looking at potentially getting those third parties to implement ACE on their PCs that run the TOS client for connecting in to our servers," says Labelle. "It will go a long way to avoiding compatibility issues with their hardware environments that we have no control over. It will also be a big help in rolling out new versions of the Navis client in a pre-tested, known-good ACE desktop configurations."

- **\$750,000 in training center administration savings.** The initial use that TSI had sought with ACE was the ability for their training centers to be run by mildly tech-savvy "super users," leaving the IT staff to focus on high-value work. "We wanted to avoid the risk of a training user mucking with the environment, and derailing the class," says Labelle. "Our IT staff can make a known-good ACE desktop configuration, lock it down, and roll it out automatically to all the training PCs at eight different facilities. Then, when a class is over, and it's time for the next shift to come in, the trainers can take the machines back to their initial state with some mouse clicks. This, instead of an IT guy doing an hour-long physical disk re-image for all the PCs at the end of each class, three times a day." Labelle estimates TSI has saved greater than \$750,000 on staff, facility rental and equipment setup costs as compared to implementing their training program without a virtualization strategy.

---

- **Locked down machines prevent trouble while providing the right resources.** The Virtual Rights Management (VRM) controls ACE provides have helped TSI create precisely the kind of ACE desktop configurations they need for various uses. “With ACE, my IT staff can build an image that has just enough functionality to get the job done, but blocks any unnecessary functionality that would only open that machine up to trouble. Like, for example, they can disable USB support, so data can’t be pulled off with a USB keychain, or Web browsing, so the trainee can’t go and download a virus by mistake.”

- **Many isolated virtual machines per workstation enable IT asset efficiency, while preventing spillover in the case of problems.** Because TSI operates their cargo terminals 24/7, to get the most out of their computing assets, they have many of their employees “hot desk.” “Every shift, someone else is sitting at a given workstation,” says Labelle. TSI runs three shifts a day, and the employees work four days on and four days off, so they have up to eight separate individuals working on a single physical workstation. Labelle continues, “Before ACE, this had been an ongoing problem for my support team because invariably, you end with something being installed on those workstations that causes a problem, and they have to be re-imaged, which takes down a workstation for an hour or two.”

ACE’s ability to host completely isolated desktop environments as virtual machines within a single physical PC solves this problem. “If you’re running ACE and one of the staff messes their virtual machine up,” continues Labelle, “it doesn’t affect the other staff using that physical machine during the other shifts. Also, fixing the bugged up virtual machine is as easy as deploying a known-good ACE package to replace the bugged up one.”

- **Work-from-home disaster recovery enabled by ACE portability.** During the Severe Acute Respiratory Syndrome (SARS) outbreak in November 2002, TSI became quite aware of the necessity for disaster recovery planning in the case of epidemic. “Our parent company operated out of Hong Kong,” says Labelle. “So we were right at the two epicenters of SARS.”

ACE’s ability to run environments on employees’ home machines, regardless of their hardware setup, seriously eases the pain TSI would encounter if another disaster forced their workers to work from home. “We can just put a central ACE desktop configuration on our FTP or Web server and staff members can download and run the image from home in the case of a disaster.”

- **ACE helps solve mobile worker and “one user, many machines” problems.** Because TSI’s parent company owns operations around the world, traveling executives can pose an IT challenge. “Rather than forcing our executives to carry a laptop wherever they go,” says Labelle, “we can just deploy an ACE package ahead of time to where that executive is heading, and when he gets there, he’s ready to work.” ACE helps with the “one user, many machines” problem as well. “If that executive’s preferred work environment has been captured in an ACE desktop configuration,” continues Labelle, “any

machine he sits down at can host his custom environment and files, and any changes to that environment and files is stored on that ACE package, rather than worrying about synching three or more different physical machines—for example a desktop machine at home, a portable PC and a desktop PC at the office.”

- **True machine portability untethers users.** Beyond the ability for traveling executives to carry their customized computing environment in an ACE image on a USB key or iPod, machine portability solves a lot of other common problems. “A big one is our on-call IT guys,” says Labelle. “We have a 24-hour on-call policy with a rotating pager amongst our techs. What that means, is that if you’re on-call, you have to have a wireless-equipped laptop with you, and cell tower access wherever you go, so you can do support remotely. Right now, this involves VPNing into a hosted virtual machine, and working from there. But that’s not as comfortable as working on your own PC, with your own tools and so forth.”

There are performance considerations, as well. “You’re going to see a big performance difference between RDPing into a network-based machine through a slow DSL line, cellular wireless card, or what have you, versus having an ACE running natively on the box you’re sitting in front of,” says Labelle. “We’re looking forward to when our guys can have their personal workstation ACE image on a USB keychain or iPod, and be able to use any Internet-connected machine in the world to solve the immediate problem they were paged about.”

## TSI Looks over the Horizon to Continued Virtualization Benefits with VMware ACE

As previously mentioned, TSI is looking forward to future benefits of ACE as it progresses in its integration. “Patch management and new version rollout of Navis to the client machines in the terminal yard will be a snap with our provisioning system and ACE,” says Labelle. The other big benefit Labelle is looking forward to beyond the current project is the replicability of the ACE-enabled integration strategy he has devised. “Our parent company has operations all over the world,” says Labelle. “After we are done with this install, we get to go and do it all over again.”

The hard work that TSI has put into making a replicable, unitized architecture enabled by virtualization, is readily reusable. “We won’t have to go up this learning curve twice,” says Labelle. “It’ll be a question of getting the hardware ready for virtualization, and then taking what we have going in Vancouver and replicating it elsewhere. It should be as easy as installing VMware software on the hardware at the next sites, and changing over some IP addresses.”

**VMware, Inc. 3401 Hillview Ave Palo Alto CA  
94304 USA Tel 877-486-9273 Fax 650-427-5001**

© 1998-2007 VMware, Inc. All rights reserved. Protected by one or more U.S. Patents Nos. 6,397,242, 6,496,847, 6,704,925, 6,711,672, 6,725,289, 6,735,601, 6,785,886, 6,789,156, 6,795,966, 6,880,022, 6,944,699, 6,961,806, 6,961,941, 7,069,413, 7,082,598, 7,089,377, 7,111,086, 7,111,145, 7,117,481, 7,149, 843 and 7,155,558; patents pending. VMware, the VMware “boxes” logo and design, Virtual SMP and VMotion are registered trademarks or trademarks of VMware, Inc. in the United States and/or other jurisdictions. All other marks and names mentioned herein may be trademarks of their respective companies.