



VMware Increases Overhead Storage for TQ3Navigant

VMware Frees Up 80 Percent More Space; Provides Easier Trip to Managing and Delivering New Systems

Results

- Reclaimed real estate, reduced datacenter server footprint to 1/5 of the original space
- Reduced hardware costs
- CPU utilization increased, from less than 25 percent to 80-90 percent
- VirtualCenter enables centralized management, and remote management capabilities, for all virtual machines on the network
- Decreased deployment cycle times for new application servers from weeks to 15 minutes
- Increased system security by eliminating physical accessibility to servers

TQ3Navigant Checks in on VMware

Navigant International, Inc., doing business as TQ3Navigant, is the second largest provider of corporate travel management services in the United States based on airline tickets sold. TQ3Navigant currently employs approximately 5,200 Associates and has operations in approximately 1,000 locations in 23 countries and U.S. territories.

TQ3Navigant's products include corporate airline, hotel and rental car bookings; travel pattern analysis and dynamic reporting tools; travel policy development; travel management consulting; meeting and convention planning; and leisure travel products.

TQ3Navigant Systems Engineer Mark Chandler works on an IT engineering team of 10 people who handle requests and development for new IT products from all 5,200 Associates. The team finds or develops the solution and rolls it out before turning the ongoing support function over to another team.

Dropping off Excess Baggage

TQ3Navigant's data center housed more than 200 standalone Cubix blade servers, each server with its own network card, on five racks. This number was growing rather consistently and the IT engineering team was running out of room. "Our data center was only built four years ago and we were nearly out of space," states Chandler.

"We knew we had less than a year before the original boxes were going to come off lease," Chandler explains. "We had to start thinking about what we were going to do. We had some space available, but to keep up with company growth, we needed to figure out how we could replace all of the systems in less space."

VMware Test Pilot Flew Solo Earlier Than Expected

An IBM reseller suggested VMware software to TQ3Navigant as a possible solution. "We also looked at the possibility of using other hardware, but still using VMware ESX Server," explains Chandler.

The IT engineering team started with an evaluation IBM BladeCenter, stocked with three blades running VMware ESX Server. They built test machines to test functionality, and the project accelerated from there.

"We could see that it was going to work and we didn't want to keep buying more of the old solution," says Chandler. "We were out of space and needed to put new systems somewhere. So, we just started putting systems on the VMware virtual machines and ended up running production applications in them even before we were done testing."

TQ3Navigant started by deploying the Web interface for virtual machine management, and then immediately added VMware VirtualCenter. "There was little time between the two," Chandler says. "We knew we were going to do this, we just didn't have it set up at the time," adds Chandler.

"Aside from the incredible space savings, it's nice that I can do builds from home, travel or wherever. I've gotten calls at home when I would have previously had to come into the office in the middle of the night to rebuild a machine or even evaluate whether someone could function without it temporarily. Now I can easily rebuild a server from home in just a few minutes."

*Mark Chandler
Systems Engineer, TQ3Navigant*



VMWARE VIRTUAL INFRASTRUCTURE AT WORK

- VirtualCenter on HP DL580
- GSX Server on HP DL380
- ESX Server on IBM Blade Center on a 2-CPU Dual SCSI
- VMware Workstation for test
- Guest operating systems: Microsoft® Windows® 2000 and 2003
- Applications running in production on virtual machines include: Aqua, a travel industry application, is on 450 VMware ESX Server virtual machines, running on 35 blade servers
- Other types of applications running in virtual machines: Web site testing and quality assurance, engineering and testing for new applications or servers, and Active Directory updates

VMware Gets TQ3Navigant to Its Final Destination

The IT engineering team took a year to transfer its datacenter to a VMware virtual infrastructure.

"There were so many physical systems that we just did it a handful at a time," explains Chandler. "We'd put them on VMware software and turn off the physical machines."

TQ3Navigant moved the BladeCenter onto a new rack and filled it in with more blades and VMware ESX Server licenses. As requirements continued to grow, TQ3Navigant bought more BladeCenters and VMware ESX server licenses. The team started building replacement machines for the ones that were in production and the ones that weren't in use were turned off.

First Class Benefits With VMware Software

The VMware virtual infrastructure yielded a number of benefits for TQ3Navigant, including:

- **Server consolidation: reduced baggage.** "We cut the footprint for the project to a fifth of the size," says Chandler. "That was our biggest goal. What was taking up five racks full of Cubix blades is now on one IBM rack that still has room for another BladeCenter, possibly two."
- **Cost savings.** TQ3Navigant compared the cost of acquiring physical hardware (not counting power savings, networks savings, and other incidental costs) to the cost of implementing the VMware virtual infrastructure and discovered that it cost less money while using only a fifth of the space. In addition, the cost of upkeep and power is lower because of the consolidation of power and network cables, which previously had to be run to every box individually.

- **Increased capacity: more seats, full flights.** TQ3Navigant runs an average of 15 virtual machines on each blade. If someone requests 10 new servers, the team can provide the resources and has somewhere put them. "It's nice to see we're not wasting CPU power," says Chandler. "Each machine was probably running at 20 percent utilization before using VMware software. Now everything runs at 80 to 90 percent all of the time."
- **Speedier deployment.** "If I have space available, rolling out a new server or application is a much easier process compared to what it was with physical machines," says Chandler. Instead of having to find or buy hardware, TQ3Navigant has built virtual machine templates that are cloned to create new servers. It only takes about 15 minutes to clone a system.
- **Remote management: increased travel.** With VMware VirtualCenter, the IT engineering team can deploy virtual machines from anywhere; previously, engineers would have to go to the physical server location and manually boot up a disk to pull the image down from the server. The engineer simply makes a clone of the machine, boots it up, and it's ready to go.
- **Decreased downtime.** With its virtual infrastructure, TQ3Navigant can move virtual machines to different physical servers to eliminate planned downtime. "We can move everything off quite easily and it's easier for us to plan maintenance," says Chandler. "We can shut down one machine at a time instead of having to take the whole system down. For rebuilds, I can just clean off one host and rebuild that host. And, I can do it from anywhere."
- **Added security.** An unexpected bonus was additional system security. Before, someone in the data center might have been able to access the corporate network by using a physical machine. Now, there is no physical interface, and access rights must be given through VMware VirtualCenter.



Future Destinations

Chandler explains that although he was skeptical at first, he now considers virtual infrastructure an integral part of the company's IT strategy. "We had some reservations about the whole idea behind the virtual machines – putting software on top of software," explains Chandler. "I wasn't against it, but it was something we hadn't done so I was a little worried about how it would work, performance and so on. The evaluation showed us there was nothing to worry about. I was pretty surprised."

TQ3Navigant plans to continue moving applications onto virtual machines, starting next with applications that don't require the power of a whole server. TQ3Navigant is also considering VMware ACE for secure desktop environments, and plans to expand use of VMware Workstation on its development lab desktop computers.

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