

Navy Marine Corps Intranet

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— Greg Burke
Director of Network Operations
Center Services

KEY HIGHLIGHTS

Challenge

Make the Navy and Marine Corps’ vast intranet far more energy efficient—saving money, power and space

Solution

Deploy VMware technology to make the military’s vast network greener and leaner

Navy Marine Corps Intranet

The Navy Marine Corp Intranet (NMCI) is the largest intranet in the world. It has more than 700,000 active users and includes four network operations centers, four enterprise service desks, nearly 50 classified and unclassified server farms, and about 5,200 servers all over the globe. An intranet that extensive—and vital—needs top-notch management, which is why the Department of the Navy and the Marine Corps decided in 2001 to team up with a leading provider of IT outsourcing: Plano, Texas-based EDS. Today, EDS employees work alongside military personnel and key vendors on the NMCI account.

To borrow a recruiting slogan from another branch of the military, the task of the team overseeing the NMCI is to make sure the intranet is all that it can be. VMware technology is a big part of that effort, allowing the NMCI to do considerably more with considerably fewer physical servers and saving money, manpower and energy in the process. “The virtualization of an environment as large and complex as the NMCI has never been attempted before,” says Greg Burke, director of network operations center services. “We are working hand in hand with VMware to ensure it’s a success.”

Before it was fortified by virtualization technology, there was an unacceptable level of service outages on the NMCI, and remote servers were hard to manage and dependent on onsite personnel. Furthermore, every individual server function at every server farm required its own piece of physical hardware. “Low-utilization hardware required almost the same power and cooling as the most heavily utilized servers,” Burke explains. “That wasn’t an efficient way to run things, and we knew virtualization would help us do better.”

The NMCI went with VMware Infrastructure because it offered a scalable, high-availability solution that would save energy while greatly reducing the number and length of outages, as well as the need to take services offline for maintenance. In addition, VMware software would allow the NMCI to refresh old hardware without having to do a one-for-one replacement or build new servers from scratch.

“One of the drivers for virtualizing with VMware is the hardware consolidation you can get when you run several virtual servers on each physical host,” explains Harvey Warren, an infrastructure analyst working on the NMCI. “If you come up with a TCO that consider factors like rack space, heating and cooling, electrical requirements and real-estate costs, virtualization makes a whole lot of sense.” To reap those savings, the NMCI now has a VMware-first policy. All new solutions are deployed on VMware Infrastructure unless there is a compelling reason to deploy on a physical server.

As of mid-2009, the implementation includes 40 VMware ESX 3.5 clusters deployed across 28 server farms. About 2,000 servers have been consolidated onto roughly 300 physical hosts. The average consolidation ratio is 9:1, a figure that’s expected to rise to about 12:1 when the project is complete.

VMWARE AT WORK

VMware Infrastructure 3.5 Enterprise, featuring:

- VMware ESX 3.5 with VMFS
- VMware vCenter 2.02
- VMware VMotion
- VMware High Availability (HA)
- VMware Converter 3.0
- VMware Distributed Resource Scheduler (DRS)

DEPLOYMENT ENVIRONMENT

- ESX 3.5 running on HP DL360, DL380, DL580, and DL580ESX with NetApp Storage FAS 3000 and 6000 series filers, as well as on and Dell 2950, 6950 and R900 servers attached to EMC Symmetrix DMX-2000 and DMX-3 storage
- Guest operating systems: Windows Server 2000 and 2003 (Enterprise and Standard)
- Mission-critical applications running in production in virtual machines: Microsoft Exchange Server, Microsoft Internet Information Services (IIS), Microsoft Office SharePoint Server, print servers, Citrix, Domain Name System (DNS), Distributed File System (DFS), Symantec Antivirus

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That consolidation translates into serious savings. “Say over the next year something like 1,500 physical servers will need to be replaced or upgraded,” Burke explains. “At an average price of \$8,000 per server, that upgrade would cost about \$12 million. But with VMware technology, that \$12 million can be put into deploying a virtual environment that will have the capability of holding more than 2,500 servers.”

The NMCI's virtualized infrastructure doesn't just mean a leaner network with more capabilities than a larger traditional one, it means a substantial cut in energy costs. “We've realized about a 65 percent reduction in both power and cooling costs by deploying fewer physical servers,” Burke says. “By the end of 2009, we expect to save about \$1.6 million annually.”

VMware Infrastructure helps the NMCI save energy in other ways besides server consolidation. Tools like VMotion, Distributed Resource Scheduler (DRS) and Distributed Power Management (DPM) lets the NMCI power down underutilized servers, so it isn't just running fewer servers, it's running them smarter.

As the NMCI continues to expand its VMware-virtualized infrastructure and cut back on the number of physical servers, it is saving space in data centers and remote sites. Once the project is complete, the NMCI expects a 40 to 70 percent reduction in server-farm floor space.

Best of all, besides being good for the bottom line, the leaner virtualized infrastructure is very good for the planet. So far it has reduced the NMCI's carbon emissions by roughly 6,800 tons, the equivalent of taking 2,550 cars off the road. When the project is complete, that number will likely rise to 7,466 tons of CO₂.

“The U.S. military views green IT as an extremely important initiative,” Burke says. “If you compare the power and cooling requirements for a traditional environment with a virtualized one, you see that virtualization is the only way to truly become a green IT organization. That's why we're running so much of the NMCI on VMware Infrastructure today—and why we'll run even more in the future.”

Results

- About 2,000 servers consolidated onto roughly 300 physical hosts
- Current consolidation ratio of 9:1, a figure that's expected to rise to 12:1
- Replacement of physical servers will save about \$1.6 million annually on power and cooling
- Tools like High Availability, VMotion and vCenter increase availability and simplify management in a huge network that includes thousands of remote sites
- Downtime cut by 50 percent, improving user satisfaction
- A 40 to 70 percent savings in server-farm floor space is expected once the project's complete

