CASE STUDY

NORAD

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NORAD Command Center, Cheyenne Mountain, Colorado I WikiCommons Public Domain

KEEPING NATIONAL AIRSPACE SECURE

Located 2,000 feet beneath a mountain in Colorado Springs, the Cheyenne Mountain Air Force Station (CMAFS) is the command center for the North American Aerospace Defense Command (NORAD).

This ultra-secure facility collects information for a worldwide system of satellites, radars and sensors that provide early warning of missile, air or space threats to North America. Because of its space constraints, CMAFS found traditional box PCs very limiting. “We’re under a mountain, so we don’t have the option of expanding the building,” says network chief Garland Garcia.

The CMAFS also has massive processing requirements, meaning that power and heating costs were major issues. The center’s IT staff was under pressure to reduce these costs while still providing efficient support and increasing asset security.

With these objectives in mind, the IT staff began evaluating alternatives to the traditional box PC arrangement.

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THE CHALLENGE

Increase workspace inside a mountainside command center while decreasing support costs and providing users with powerful and ultra-secure computing tools.

THE BENEFIT

Smaller space requirements peruser, hardened system security and a 30% decrease in unplanned user downtime.

THE SOLUTION

Replace the existing box PC infrastructure with ClearCube PC Blade hardware and management software.

CLEARCUBE EXPANDS THE MOUNTAIN

ClearCube Technology's approach to computing is simple: remove the PC from the user's desk, condense it into an Intel powered PC Blade and rack-mount it in one secure location. Only the peripherals and a small connection device called a User Port remain at the user's desk.

CMAFS was immediately attracted to this architecture because it could reduce the use of hardware and minimize support costs. The IT staff researched several other blade vendors, but according to Garcia, "the other blades didn't even come close to the performance of the ClearCube Blades, which essentially offer the same level of performance you can find on conventional PCs. Clear-Cube seems, more than the other blade vendors, to keep up with technology as it evolves."

A user in the station's command center may be required to operate as many as five different PC networks and go through both classified and unclassified communication lines. Having five box PCs at every work area was hot, noisy and uncomfortable for users. It also led to frequent accidents involving equipment. "If

a user can touch it, there is a possibility they can break it," says Garcia.

CMAFS was able to increase user workspace by removing all CPUs from the desk. Instead of squeezing between five box PCs, users now work with five small User Ports. The connection devices can safely be stacked on top of each other like VHS tapes because they contain no data. As long as a user's PC Blades are kept separate in the data center, CMAFS' networks remain secure.

In addition to reducing crowding at the desk, the centralized PC Blades also ensure that CMAFS equipment is not inadvertently bumped or kicked. Furthermore, because User Ports have no moving parts, the noise and temperature in the center dropped considerably. In a potential high threat situation, operators in the center will now be able to talk in normal voices to technicians across the room and be heard without interference from associated equipment noise.

"In addition to reductions in heat, noise and clutter, the PC Blades help improve security and reliability in the user environments."

Garland Garcia — Network Chief NORAD Cheyenne Mountain Air Force Station

PC BLADES BOOST SECURITY, UPTIME, MANAGEABILITY

Operations at the mountain base are so secretive that users would have to spend about fifteen minutes to lock up their hard drives after using them. It would then take additional time to make sure network connectivity was in place once a hard drive was put back at a user station.

"With ClearCube, we don't have to secure the machines when they are not being used because they are now always secure," says Garcia. "We do not have to worry about the equipment (and information inside) growing legs.

Having the Blades in a central location away from the floor where top secret information is being processed also negates the need for as many top secret-cleared technicians."

CMAFS found that ClearCube PC Blades are also more reliable and easier to repair than traditional PCs. In the event of a hardware or soft- ware failure, IT administrators can switch a user to a spare Blade in a matter of minutes. This “hot swapping” capability vaults PC availability to an unprecedented 99.9%.

“To get a user up and running after a downtime event took hours on average with traditional machines,” says Garcia. “With the Blade solution, about 30% of unplanned user downtime has gone away.”

Furthermore, PC Blades have boosted user and IT productivity. Previously, IT would focus approximately five hours per PC on software installs and upgrades; with the ClearCube solution, the staff only devotes about an hour-and-a-half to each Blade.

Hardware and software asset management also requires less time. “It’s easier to operate and manage the IT infrastructure because when the technician needs to service a machine, they don’t have to interfere with the operations of the organization. The floor could be operating at a peak level, and we don’t have to interrupt the operation,” says Garcia.

> “I see Blade technology as the direction the entire mountain will achieve in the next four to five years.”
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> **Garland Garcia — Network Chief NORAD Cheyenne Mountain**
>
> **Air Force Station**

Whereas IT technicians could previously support about two hundred computers each, the deployment of ClearCube PC Blades has boosted that number to over five hundred computers.

“Because of ClearCube, we will not have to hire additional IT staff when we add networks and applications and increase the complexity of the applications,” says Garcia. “We’ll probably be growing the number of different types of missions by two-thirds, but we’ll have the same number of people, more than likely.”

CMAFS PLANS FOR THE FUTURE

The higher reliability, hardened security and simpler management of PC Blade technology has significantly reduced CMAFS' desktop support costs. Through an annual investment of a little under $800 per user, CMAFS has experienced annual savings and productivity benefits of $3,100 per user.

ClearCube PC Blades presently represent only a fraction of the total computing devices at NORAD Cheyenne Air Force Station, but the share is increasing as the organization realizes the long term cost savings and user productivity benefits of PC Blades.

"We've been really happy with the ClearCube implementation," says Garcia. "We're not using it everywhere yet, but we'll continue to deploy ClearCube as closets are outfitted with A/C and power."

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