CASE STUDY | BELL HELICOPTER

ELEVATING THE DESIGN AND MANUFACTURE OF WORLD-CLASS HELICOPTERS

VDI with NVIDIA GRID™ is boosting graphics performance, improving employee mobility and productivity, and helping protect sensitive 3D engineering data at Bell Helicopter.

NVIDIA

VDI with NVIDIA GRID delivers superb graphics performance while running intensive 3D engineering applications.

AT A GLANCE

CUSTOMER PROFILE

Company: Bell Helicopter

Industry: Aerospace

Headquarters: Fort Worth, Texas

Size: 2,500 3D application users

SUMMARY

- Globally recognized helicopter design/manufacturing business.
- Slow model load times, data security, and restricted mobility drove a search for virtualized solutions to replace individual workstations.
- Successfully deployed VDI using NVIDIA GRID K2 technology based in the Fort Worth datacenter.
- Planning to roll out to all 2,500 Bell 3D application users and to additional users across various Textron enterprises.

SOFTWARE

Hypervisor: Citrix XenServer

Desktop and Application Remoting: Citrix XenDesktop

Key applications: Multiple 3D design and analysis applications that require GPU performance

HARDWARE

GRID boards: K2

Servers: Lenovo NX 360 M4

Clients: Various desktop, laptop, and mobile devices.

Bell Helicopter (a division of Textron) was founded in 1935 as Bell Aircraft Corporation. The company initially specialized in designing and producing famous fighter aircraft, such as the P-39 Airacobra, P-59 Airacomet, and P-63 Kingcobra. The company's first helicopter lifted off on December 29, 1942. Today, Bell Helicopter is an industry leader with global name recognition that has delivered over 35,000 aircraft to customers around the world. Headquartered in Fort Worth, Texas, Bell Helicopter has additional plants in Amarillo, Texas, and Mirabel, Canada, and logistics and service centers in North America, Europe, and Asia.

CHALLENGE

Bell Helicopter team members use a number of graphics-intensive applications to design and manufacture helicopters. The sheer size of the 3D models required for this work combined with workstation performance and network limitations meant that loading times were excessive at remote locations.

"The workstations themselves performed well, but this workflow prevented users from working remotely, either in the same facility or across different facilities," said Chris Savage, Manager of Infrastructure Operations at Bell Helicopter. "Data security is another pressing concern because workstations and laptops require local copies of sensitive 3D files to function. Before virtualization, we issued company laptops to external contractors—with all of the risks associated with that model. Storing data in our datacenter would alleviate that concern while also helping us improve our disaster recovery capabilities."

"We were already using NVIDIA cards in our workstations and were excited by the potential of using NVIDIA GRID technology to push graphics performance even higher while helping secure our data and enhance user mobility," added John Waggoner, Director of Infrastructure at Bell Helicopter. "We tried some non-GPU virtualization deployments with poor results, and looked to GRID to deliver the final piece of the puzzle."

REASONS FOR GRID

1. Much faster model load times.
2. Overall 30%-50% performance improvement.
3. Improved user mobility and flexibility.
4. Centralized data storage improves security and facilitates disaster recovery.
5. Scalable to thousands of users.

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Chris Savage
Infrastructure Operations Mgr.
Bell Helicopter

SOLUTION

The Bell Helicopter NVIDIA GRID-enabled VDI project began with presenting a business case to the Textron leadership council in 2014 and receiving approval to proceed with a pilot deployment in 2015 that is gradually rolling out to 375 of the 2,500 Bell Helicopter 3D application users. This deployment uses Lenovo NX 360 M4 blade servers equipped with NVIDIA GRID K2 cards and local SSDs for faster write caching. Bell Helicopter deploys pooled virtual desktops using Citrix XenServer and XenDesktop, with RAM allocations and GRID vGPU™ profiles ranging from K220Q to K280Q that replicate or exceed each user's pre-GRID workstation specifications. Of these, the K240Q and K260Q profiles given to engineering and quality assurance users are the most common, while the K280Q profile is reserved for analysis users because of their extreme graphics requirements. The 3D models reside in the company's datacenter in Fort Worth, 399 miles from the manufacturing facility where most of the pilot users are located.

"We selected a handful of users for an initial 30-day test using pre-production equipment and default settings with very little tuning," continued Savage. "Any skepticism those users had vanished once they saw what the GRID-enabled VDI could do. Migrating to our production environment on the Lenovo servers markedly improved performance compared to the initial test setup, and they couldn't be happier. We continue to receive very positive feedback as the pilot expands, and overall confidence in the new system is growing."

RESULTS

Bell Helicopter is expanding the pilot to all 375 approved users in 2015, with potential expansion to all 2,500 in the future. Other divisions of Textron, such as Textron Aviation, Beechcraft, Hawker, and Textron Systems, are leveraging lessons learned from Bell Helicopter's pilot deployment to greatly speed up their own proofs of concept. The

ultimate goal is to transition all of the 4,600 3D application users who require high-end graphics performance plus an additional 9,000 users across Textron to virtual desktops delivered by multiple GRID-enabled VDI deployments across several company datacenters.

"Model load times are significantly reduced, are now consistent across multiple remote locations, and overall GRID VDI performance is 30%-50% faster than users' previous workstations," said Savage. "Even better, users can access applications and data with full performance and display fidelity from any location—even remote facilities—on any laptop computer or mobile device with the Citrix client. During extreme inclement weather, several Bell Helicopter facilities reported that some users were able to log in and keep working from home with full workstation performance using company-issued laptops."

"We see this project as cost-neutral compared to replacing individual workstations, but this unprecedented level of power and flexibility is greatly improving employee productivity, mobility, and morale," Waggoner continued. "We also have a solid foundation for improving our disaster recovery capabilities. Centralizing data in the datacenter also means that end users receive nothing but pixels. External parties who need access to our sensitive 3D data will use their own devices to access the GRID VDI environment without actually receiving a byte of that data."

"Right now, we're looking at ways to get the greatest possible server density while providing adequate power and cooling," concluded Savage. "We're also looking into capacity management to go beyond our current 1:1 user to desktop ratio and doing a lot of tuning and tweaking to further optimize performance. This is keeping us pretty busy for now, but things will settle down as we move forward. Meanwhile, user reception has been overwhelmingly positive; those who participated in the initial pilot don't want to return to using workstations, and other employees who aren't currently part of the VDI pilot are clamoring to be included in future phases. It is no exaggeration to say that NVIDIA GRID technology has had a major positive impact on how we conduct our business."

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Director of Infrastructure
Bell Helicopter

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