# Engineers Run Multi-terabyte

## 3D Simulations from Zero Clients and Laptops—with PCoIP Technology and Teradici Cloud Access Software

Bell is an industry-leading producer of commercial and military vertical-lift aircraft and the pioneer of the revolutionary tiltrotor aircraft. Headquartered in Ft. Worth, Texas, the company serves customers in more than 120 countries. Among its distinctions:being the first to break the sound barrier, being the first to certify a commercial helicopter, and sending a vehicle aboard NASA's first lunar mission.

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**BILL SMITH**
IT ARCHITECT, BELL

## Challenges

- Provide powerful workstations for analysts to run complex 3D simulations with outstanding image fidelity
- Give analysts the flexibility to work from either a zero client or laptop
- Comply with U.S. Department of Defense data security requirements

## Solutions

- Replaced under-the-desk workstations with rack workstations using Teradici Cloud Access Software or PCoIP Remote Workstation Cards
- Gave analysts the flexibility to access their remote workstations from any device: PCoIP Zero Clients or laptops

## Results

- Replicated local workstation experience, including fidelity, model responsiveness and support for cut-and-paste and USB peripherals
- Accelerated testing—from hours to 30 minutes for a typical simulation
- Reduced test failure rate due to server outages
- Strengthened security because data never leaves the data center
- Improved job satisfaction by providing option to work on laptops

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## About Bell

Thinking above and beyond is what we do. For more than 80 years, we've been reimagining the experience of flight—and where it can take us.

We are pioneers. We were the first to break the sound barrier and to certify a commercial helicopter. We were aboard NASA's first lunar mission and brought advanced tiltrotor systems to market. Today, we're defining the future of on-demand mobility.

Headquartered in Fort Worth, Texas—as a wholly-owned subsidiary of Textron Inc.—we have strategic locations around the globe. And with nearly one quarter of our workforce having served, helping our military achieve their missions is a passion of ours.

Above all, our breakthrough innovations deliver exceptional experiences to our customers. Efficiently. Reliably. And always, with safety at the forefront.

The nearly 60 analysts work with demanding applications like ANSYS Workbench, MATLAB, and MSC Nastran. As models grew to over 1 TB, Bell could no longer lease under-the-desk workstations with sufficient CPU and GPU power. The company decided instead to deploy powerful rack workstations in the data center, which analysts would access from their desks.

**Stress simulations require exacting image fidelity and ultra-high performance.** Bell's 3D models are very intricate—think simulating the movement of multiple meshed gears inside a transmission. "To measure wear, analysts need exceptionally high-quality graphics," Smith says. "They can't tolerate lag or 'lossy' images that slowly sharpen over time." In addition to exceptional image fidelity, Bell needed a solution that met stringent U.S. Department of Defense security requirements and supported the USB 3DConnexion SpaceMouse that analysts use to navigate through their models.

**Bell found its solution in Teradici PCoIP technology and Cloud Access Software.** Initially, all stress engineers used PCoIP Zero Clients by Dell Wyse to access Dell Precision workstations containing PCoIP Remote Workstation Cards and NVIDIA GPUs in the data center. The PCoIP Remote Workstation Cards support high-resolution, full-frame rate 3D graphics and USB peripherals like the SpaceMouse. "The experience with PCoIP is indistinguishable from being in front of a local workstation," Smith says. "Image loading feels instantaneous and 3D models don't go fuzzy when you spin them. Compared to other protocols we've tried, the PCoIP protocol lets us see finer details and zoom in better—for example, to look for wear."

**Analysts who want to access their workstations from a laptop can do so, with Teradici Cloud Access Software.** Smith simply installs Cloud Access Software on the laptop and workstation. Then analysts can access their workstation from any device with an experience identical to working on a PCoIP Zero Client—including cutting and pasting and using the SpaceMouse. So far about 15% of stress analysts work on laptops. "They really like it," Smith says. "And it's convenient for me because if we hire a new analyst in another facility, I don't have to procure a new zero client and make a trip to install it."

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Bell's complex 3D simulations require speed and ultra-high resolution—and NVIDIA Quadro GPUs deliver. Equally important to the user experience is sending images over the network to the zero client without lag or loss. Bell found its solution in Teradici Cloud Access Software, which is tightly integrated with NVIDIA GPUs to deliver a zero client user experience that's indistinguishable from a workstation experience.

" *The compute and graphics intensive software tools that the CAE analysts at Bell Helicopter work with demand extremely high levels of performance. The Teradici solution in conjunction with NVIDIA GPUs delivers significant benefits to Bell's IT department and their engineers can really count on a smooth, high fidelity experience with their virtual workstations.*

**ANDREW RINK**
HEAD OF MANUFACTURING INDUSTRY MARKETING STRATEGY, NVIDIA

**PCoIP technology complies with stringent data security requirements for U.S. Department of Defense contractors.** No actual data travels over the network from the rack workstations in the data center to the PCoIP Zero Clients or laptops—only pixels. The pixels are encrypted with AES-256, an algorithm approved by the U.S. government National Institute of Standards and Technology (NIST).

**Bell's stress analysts can now conduct more tests in the same time.** When they worked on local workstations, very large data sets had to travel over the Gigabit Ethernet network to high-performance compute (HPC) clusters in the data center. Some uploads took hours. Now that the workstations are in the data center, they can connect to the HPC clusters over 10 Gigabit Ethernet. "Simulations that used to take hours now complete in 30 minutes," Smith says.

What's more, large simulations that run over the weekend are less likely to be interrupted because the data center servers have redundant uninterruptible power supplies with backup generators.

**The IT team spends no time supporting Teradici solutions.** Smith concludes, "I'm happy to say that I can't comment on Teradici's support—because we've never needed it. Teradici PCoIP and Cloud Access Software just work." The company's Montreal facility has since implemented the same Teradici PCoIP solution used in Ft. Worth, deploying a dozen Dell rack workstations with PCoIP Remote Workstation Cards.

**In the future, Bell can deploy additional virtual workstations on AWS GovCloud** if needs change, because Teradici Cloud Access Software works in private data centers, public clouds, and hybrid environments. GovCloud is approved by the U.S. federal government for hosting sensitive Controlled Unclassified Information. Although Smith has no immediate plans to move to GovCloud, he likes having the option.

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