PALFINGER Structural Inspection
edits massive 3D models on Google Cloud as if they were local, with Teradici Cloud Access Software

STRUC INSPECT
INNOVATED BY PALFINGER VCE ANGST

Vienna-based PALFINGER Structural Inspection GmbH (StrucInspect) is transforming safety inspection of bridges and other infrastructure using drones, 3D modeling, and artificial intelligence. The service accelerates inspections, makes them more cost-effective, and avoids the need to close structures to traffic. Launched in 2019, the company is a joint venture of PALFINGER, Vienna Consulting Engineers (VCE), and the Angst Group.

Challenges

- Gain the agility to quickly move into new office space and provide exactly the right number of workstations
- Deliver outstanding color accuracy and interactivity on Wacom pen-interface tablets
- Reduce workspace noise
- Stay compliant with industry security requirements
- Protect creative content and clients' trust with "defense-in-depth" security strategy

Solutions

- Virtualized artist workstations and housed them securely in a centralized data center
- Provided high-performance access to virtual workstations using Teradici Cloud Access Software and PCoIP Zero Clients
- Continued using existing hardware and peripherals, including Wacom tablets
- Automated management of zero client endpoints with Teradici PCoIP Management Console

Results

- Provisioned virtual workstations for 200 artists in new studio in record time
- Matched or exceeded performance of physical graphics workstations
- Covered the cost of Teradici software and zero client endpoints with savings from sharing server and storage resources among artists
- Increased security and complied with industry regulations by moving creative content off workstations

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Regular inspections of road bridges and railway bridges—65,000 in Austria and Germany alone—are vital for public safety but also costly and disruptive. "Typically, municipalities or private companies send out a large team of inspectors and need to close certain sections of the bridges to traffic," says Michael Diener, engineering manager at StrucInspect "And some areas are hard or impossible for a human inspector to reach, creating the risk that a defect might go unnoticed."

StrucInspect overcomes these challenges with an innovative service based on 3D modeling and artificial intelligence. The company captures thousands of images from drones and terrestrial cameras to create a precise 3D replica of the structure's exterior and interior—including hard-to-reach places. Then customers receive a full report, including a textured, 3D mesh model that they can turn and zoom with ½-millimeter precision.

Building textured 3D mesh models from thousands of high-res images requires powerful processors and graphics processing units (GPUs). So does editing the models, which contain hundreds of gigabytes, to remove extraneous details like piles of leaves or snowdrifts. Rather than paying upwards of €15,000 for physical workstations that would be idle much of the time, StrucInspect decided to provision workstations in the cloud, taking advantage of usage-based billing and the latest hardware. "To work in the cloud we needed a 'native' workstation experience—no lag or latency," says Diener.

StrucInspect found its solution in Teradici Cloud Access Software on Google Cloud Platform (GCP). StrucInspect chose GCP because of its AI platform, Python compatibility, and NVIDIA GPU options, including the Tesla P100.

Before discovering the Teradici solution the company had tried open-source Virtual Network Computing (VNC) for a few months. But VNC is not designed for visualization or to support USB devices like mouses. The company's photogrammetrists (photographic measurement specialists) were frustrated by seconds of lag whenever they tried to open, manipulate, or edit a model. In contrast, Teradici Cloud Access Software, powered by the PCoIP protocol, is highly responsive even for full frame-rate 3D graphics.

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StrucInspect configures its remote workstations on GCP with NVIDIA Tesla P100 Core GPUs, significantly accelerating the creation and manipulation of 3D models.

"Even on a supercomputer, processing hundreds of gigabytes of images would take 5–6 days," Diener says.

"On GCP it takes less than 24 hours." Teradici Cloud Access Software is tightly integrated with NVIDIA GPUs to send 3D models over the network to any device without lag."

"Using Teradici Cloud Access Software with GCP and NVIDIA GPUs is literally like working on a local workstation," Diener says. "Files open immediately—not several seconds later as they did with VNC—saving up to 30 minutes on a typical 8-hour project. We can turn the 3D models left, right, and upside down and peer into little crevasses with the same experience we'd have on a local workstation."

"Working in collaboration with providers like Teradici, we aim to bring high-performance, remote workstations to our shared customers," says Venkat Gattamneni, product manager, Google Cloud. "Our goal is to power a wide range of use cases, operating systems and applications to meet customers where they are."

Customers' sensitive data and StrucInspect proprietary AI software remain secure in GCP. No information ever leaves the cloud because only encrypted pixels travel over the network to the laptop display, where they're decoded. And StrucInspect now has the flexibility to switch from Linux to Windows remote workstations as needed because Cloud Access Software supports both operating systems.

Installing Teradici Cloud Access Software on GCP took just 30 minutes. Now it's automatically included in new virtual workstations that StrucInspect spins up. "Teradici quickly resolved a minor issue," Diener says. "Good support is something I value highly in a partner."

Diener concludes, "For our business, Teradici Cloud Access Software on GCP is increasing efficiency, productivity, and work satisfaction. Our users couldn't believe they could work in the cloud with a native experience. It's a world of difference."

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