



# REMOTE WORK SOLUTIONS FOR HEALTHCARE





## REMOTE WORK CHALLENGES IN HEALTHCARE

From telemedicine to virtual patient monitoring, healthcare institutions are turning to technology that enables remote work to expand their reach of care outside the traditional walls of clinics and hospitals. IT in healthcare is also leveraging this same infrastructure to let their data science and development teams do their best work from anywhere. Those who work in genomics, medical imaging, pathology, microscopy, and drug discovery also can be powered to work remotely.

But remote healthcare comes at a time when facilities are struggling to balance an increase in demand for routine patient care with high operating costs and data-intensive systems. Strict budgets coupled with legacy IT systems and the need to support a diverse set of applications and ecosystems result in a high total cost of ownership (TCO).

Additionally, the technology that supports remote work needs increasing compute—from AI solutions, which require building 3D annotated datasets to train AI models or processing complex algorithms for radiotherapy or other treatment planning to virtual desktop infrastructure (VDI), which can give clinicians on-the-go access to patient records but is difficult to scale and can create a frustrating user experience without accelerated compute. And with all of these solutions, preserving patient data privacy is of the utmost importance.



# NVIDIA SOLUTIONS: PERFORMANCE FROM ANYWHERE

NVIDIA's remote work solutions power AI capabilities on laptops, in the cloud, in servers, and in workstations to enable deep learning, data science, virtualization, and portability for dynamic working environments. Technology such as virtual GPU and GPU-powered laptops ensure mobility across the healthcare spectrum:

- > To healthcare workers on the frontlines of care where they need patient information in real time
- > To clinical departments like radiology where remote consultation and reading of imaging studies is essential
- > To departments like IT, accounting, and medical records
- > To companies developing healthcare solutions in fields like genomics and drug discovery

NVIDIA virtual GPU (vGPU) enhances the user experience and accelerates VDI performance. It boosts productivity, heightens accuracy, improves quality of care, and ensures uncompromised security.

NVIDIA's GPU-powered laptops combine portability with large memory capacity and robust AI, deep learning, and visual computing capabilities to deliver desktop-level performance on the go.

Radiologists can now remotely interact with their clinical software, like picture archiving and communication systems (PACS) and advanced visualization. Data scientists and researchers can now virtually leverage AI-based applications to view medical images, analyze DNA sequences, and conduct experiments for drug discovery. And physicians, nurses, and staff can now harness the combination of virtualized electronic medical records (EMRs) and standard office productivity applications to provide seamless telehealth experiences for their patients.



# COMMON QUESTIONS, ANSWERED

Remote work technology can unlock unprecedented, far-reaching opportunities for healthcare institutions. When developing their technology roadmap, organizations have to assess their current infrastructure needs, goals, and how to best utilize cloud and virtualization technology. Here are a few high-level questions that can help guide that journey.

## > What are some cost considerations to keep in mind?

NVIDIA GPUs can often lower total cost of ownership in a variety of ways, resulting in both hard and soft cost savings. By offloading CPU cycles to the GPU, users can have a better experience, resulting in fewer IT help desk tickets. When users aren't tethered to their workstations and can work from anywhere, productivity, mobility, and collaboration increases. Finally, when all devices can be managed from a central location, IT efficiency improves.

## > Has the improvement in user experience been quantified?

After implementing NVIDIA vGPU solutions, Netherlands' Ziekenhuisgroep Twente, which provides general medical and surgical hospital services, found that 250,000 radiographic examinations per year can be read remotely, securely, and without image-quality loss. Ohio-based Metro Health System witnessed doctors and nurses saving 30–50 minutes per day through fast-roaming access.

## > I already do virtualization. Why do I need GPUs?

GPU-accelerated virtualization delivers better performance on graphics-intensive apps, ensures all apps can be virtualized and run at full functionality, increases user density, and lowers TCO.

## > What are best practices for creating remote AI solutions?

Remote data science in healthcare is not unlike being local to the devices, but there are a couple of specific considerations to keep in mind. First, maintaining patient privacy and confidentiality is crucial, through anonymization and secured networking channels. Second, ensuring that laptops, remote workstations, and cloud solutions are sized appropriately for the data being processed is important, with enough compute and disk space for clinical datasets.

# REMOTE WORK WITH NVIDIA: SOLUTIONS OVERVIEW

## > NVIDIA RTX Laptops

With powerful visual computing capabilities, large memory capacity, and the latest NVIDIA RTX technology—including real-time ray tracing, advanced shading, and AI-enhanced tools—these laptops place local, advanced visualization in the hands of analysts.

Powered by NVIDIA® Quadro® GPUs, data scientists can use these laptops to download NVIDIA data science software to easily train and deploy AI models.

## > NVIDIA Quadro Virtual Data Center Workstation (Quadro vDWS)

From aerospace and munitions to geospatial analysis and imagery, government employees must be able to access 3D data from any location, at any time, and on a variety of devices. NVIDIA Quadro vDWS provides GPU-accelerated virtual desktops and applications that untether the government workforce from physical workstations, providing a native experience on any device.



Auto image courtesy of Epic Games and Porsche

With NVIDIA Quadro vDWS software, the same NVIDIA Quadro RTX™-powered workstation experience can be achieved securely from the data center. Users can bring real-time ray tracing, AI, and advanced graphics to design energy-efficient buildings and extract insights from rich visual graphics.

## > NVIDIA Virtual Compute (vComputeServer)

NVIDIA vCompute Server enables data scientists and analysts to accelerate compute-intensive workloads with virtualized GPUs, including AI, deep learning, and high-performance computing (HPC).

Agencies can run containerized applications for machine learning and deep learning in a virtualized environment to isolate workloads and securely support multiple users. By running compute-intensive workflows on the same GPU-accelerated system that runs VDI, agencies can maximize utilization.



# REMOTE WORK WITH NVIDIA: SOLUTIONS OVERVIEW

## > NVIDIA GRID Virtual PC (GRID vPC) and Virtual Applications (GRID vApps)

To deliver seamless VDI, the user experience needs to be nearly indistinguishable from a native PC. With NVIDIA GRID® vPC and vApps, users can multitask across channels with virtualized access to online training, teleconferencing, Skype, and other graphics-intensive applications. Most industry work requires multiple, high-resolution monitors, and users can scale for increased productivity.



## > NVIDIA Quadro Virtual Workstations (Quadro vWS) in the Cloud

Even without access to local compute resources, or with limited access, organizations can still provide users with the resources they need to be productive. Many applications can be accessed from the cloud, and these solutions can be leveraged to provide compute cycles for specific initiatives. For example, data scientists, when running limited or time-bound experiments, can use the cloud to get their work done. Quadro vWS in the cloud also supports the latest RTX-enabled applications with an NVIDIA T4 Tensor Core GPU instance available from many cloud service providers.



# REMOTE WORK SUCCESS WITH NVIDIA TECHNOLOGY



## > Hospital Group Twente Helps Radiologists Do Their Best Work

Hospital Group Twente (ZGT) is a conglomerate of hospitals with over 3,420 staff and around 182,000 patients every year. ZGT sought to virtualize their radiology department, which performs nearly 250,000 radiographic examinations per year, and enable the flexibility of remote diagnosis. By leveraging VMware and NVIDIA virtual GPUs, ZGT was able to meet the performance and quality needs of the radiologist, while adhering to strict international healthcare quality standards and security regulations.



## > The Polyclinic Speeds Up Its VDI Environment

The Polyclinic is one of the largest multispecialty clinics in Washington's Puget Sound region, with 1,200 employees at 15 locations. As the organization expanded, IT needed to update their infrastructure to accommodate growing staff numbers. Historically slow performance of thin clients made staff reluctant to transition to another virtual desktop environment.

A VDI solution with NVIDIA M10 GPUs and GRID vPC delivered secure, mobile access, while supporting bring-your-own-device (BYOD) and remote work. Upgrading to NVIDIA vGPUs helped achieve 2X the user density at two-thirds of the cost, as well as a consistently great virtual desktop experience.



## > Nebraska Medicine Improves Diagnostic Accuracy and Quality of Care

Nebraska Medicine is the state's largest healthcare organization with more than 8,000 employees and physicians. Deploying hyperconverged infrastructure provided an opportunity to upgrade their VDI. Intense IT workloads and maintenance needs made the radiology department an ideal internal test candidate for vGPU-enabled VDI.

Nebraska Medicine deployed Dell PowerEdge R740 servers with NVIDIA Quadro vDWS and M10 GPUs. Over 100 radiology stations will be using vGPU-enabled VDI, and the organization is well-positioned for widespread VDI rollout.



## > Touro Dental College Revolutionizes Digital Dentistry Education

Touro College of Dental Medicine (TCDM) is a teaching and research institution focused on digital dentistry. The organization needed a high-performance, cost-effective IT system capable of delivering graphics-intensive 3D dental software. TCDM deployed VDI on hyperconverged infrastructure powered by Quadro vDWS.

Today, faculty and students can tap into virtualized desktops as they treat patients in the clinic or work in the simulation lab, x-ray rooms, or imaging facilities and can even migrate their VDI sessions to any thin client. A two-person IT support team manages a school of 300–600 users with little to no issues.



# REMOTE WORK SUCCESS WITH NVIDIA TECHNOLOGY



## > Subtle Medical Achieves Faster, Smarter Medical Imaging

MRIs and PET scans are critical to providing care to patients with life-threatening conditions like cancer and Alzheimer's, but they require patients to stay still for over 30 minutes for image capture and are expensive. Subtle Medical, a startup in the NVIDIA Inception program, built a complex AI system to improve images from 0.5 percent of regular capture time, improving the patient experience, reducing cost, and giving more patients access to MRI and PET scanners. To allow different types of hospitals of different types and with different levels of IT expertise to adopt their solution, they deployed it on AWS NVIDIA GPU instances. This enables real-time results and is a much easier experience for hospitals who can now skip the headache and cost of managing additional infrastructure on their premises. Hospitals in the United States, Asia, and Europe are benefitting from Subtle Medical solutions.



## > Netherlands Cancer Institute Uses Virtualization to Enhance Patient Care and Advance Cancer Research

The Netherlands Cancer Institute, rated one of the top 10 comprehensive cancer centers in the world, upgraded to a state-of-the-art, software-defined infrastructure using NVIDIA vGPU technology powered by NVIDIA T4 Tensor Core GPUs and HPE DL380 Gen10 servers.

During the day, this virtual desktop infrastructure provides healthcare professionals with fast, flexible, and secure access to patient data. At night, researchers use the same VDI platform to run computationally intensive GPU workloads.

With this high-performance yet flexible IT infrastructure, healthcare professionals can spend more time focusing on patients, while researchers can advance breakthroughs in cancer treatment.







## WORK FROM ANYWHERE WITH NVIDIA

The potential of greater access, better quality of care, and reduced costs, while securing patient privacy, makes remote technology an essential component of modern day healthcare institutions.

Explore virtual solutions at:

<https://www.nvidia.com/en-us/remote-work/>

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