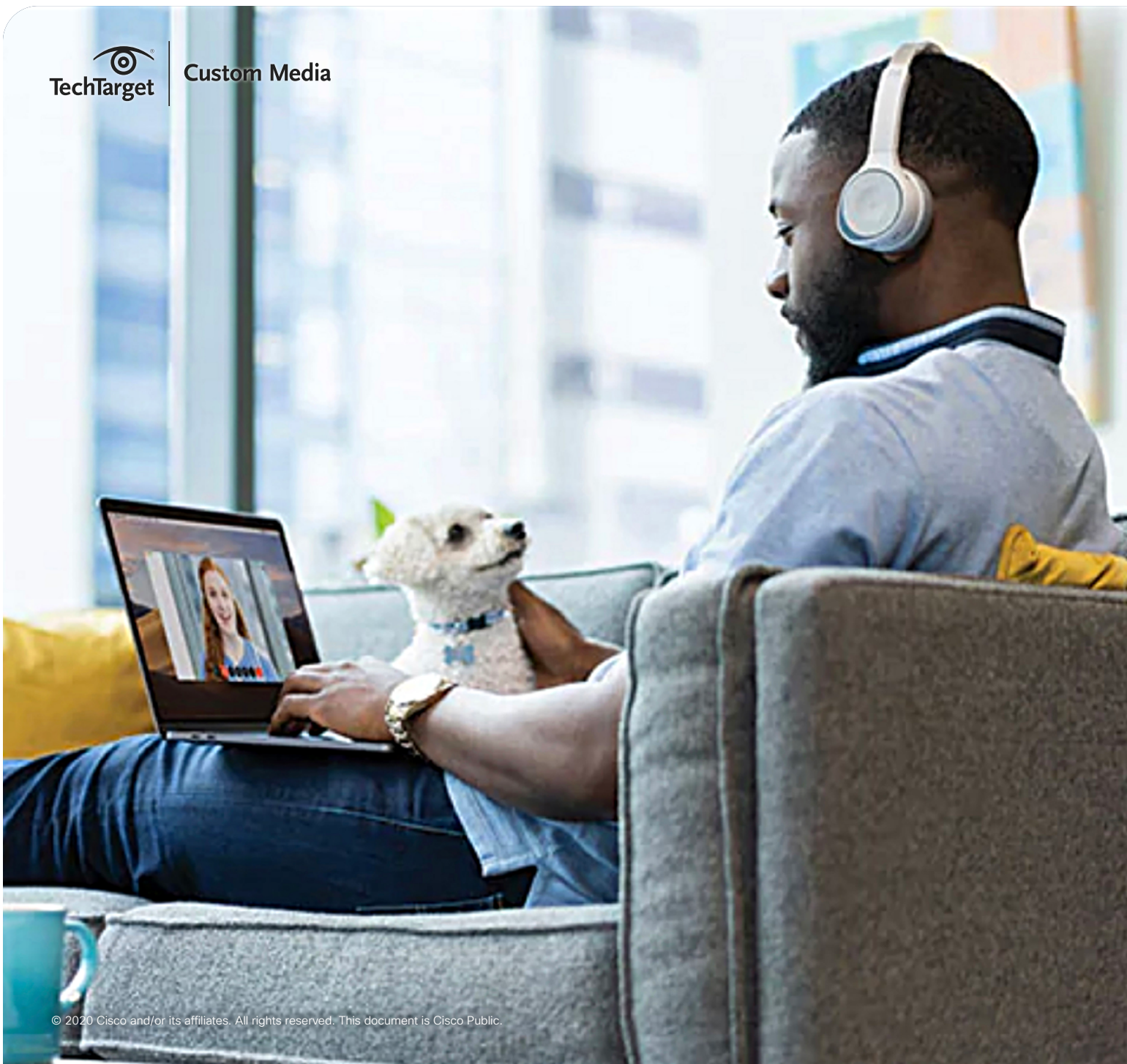


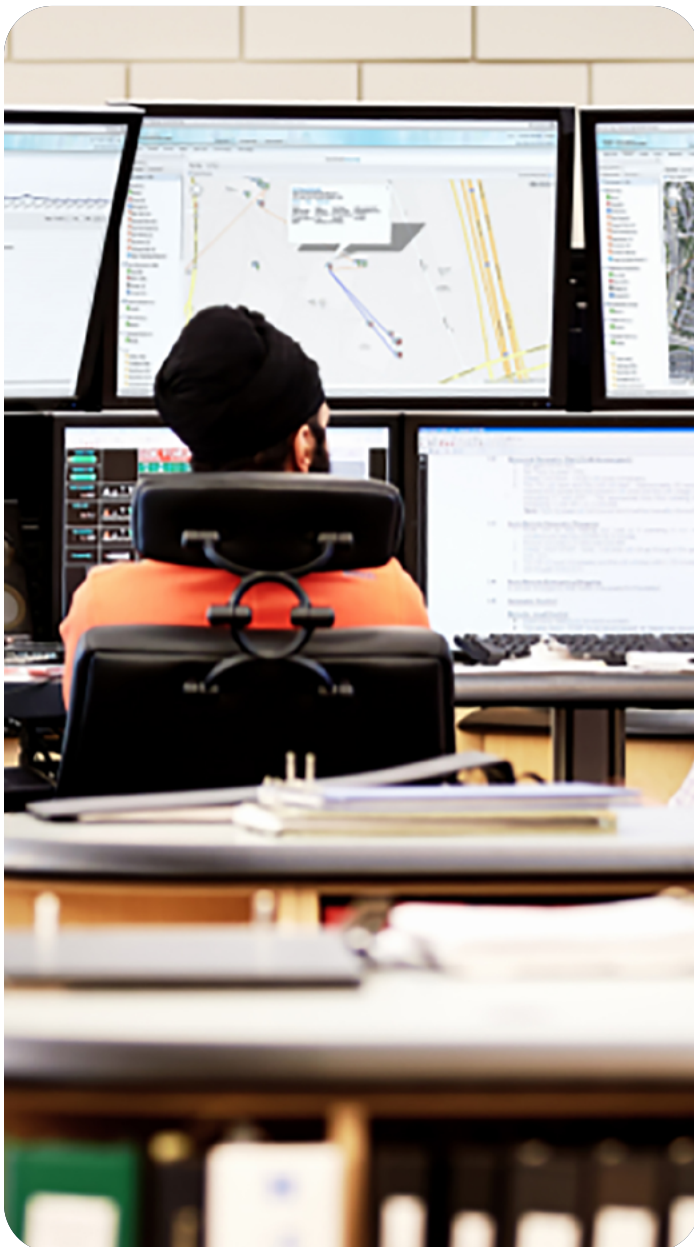
Meeting New Remote Work Demands That Enable Any Application, Anywhere



Custom Media



Remote and virtual work have undergone a trial by fire. Employees have had to adapt to working from home, or anywhere outside a traditional office setting, on a scale never seen before. Recent research from Gallup shows that the number of full-time employees working from home has increased from 33% to 61% in a two-month period.¹ But the unprecedented swing to remote work has surfaced numerous shortcomings and limitations in IT infrastructure to support the trend.



Enterprises have run into application performance issues in attempting to support mission-critical applications for their remote and virtual workforces. As more and more employees attempt to gain access to applications, data, and services from remote locations, problems have arisen. Additionally, data security, scalability and responsiveness challenges have tested existing infrastructure, robbing organizations of employee productivity and degrading the user experience.

Some of these challenges were felt at previous levels of remote work, but the recent surge in adoption has only exacerbated the problems. Even more important is the fact that remote work isn't expected to subside to previous levels—this is now likely to be the new normal.

That means solutions like virtual desktop infrastructure (VDI) will need to be supported with next-generation platforms such as integrated systems and hyper-converged infrastructure (HCI), which are more efficient and flexible than legacy infrastructure. Those architectures will be deployed, in large part, as data center-based solutions, ensuring that operational issues such as resiliency, availability, and latency are adequately addressed, while also quelling business executives' ongoing concerns about control and security.

This white paper details the challenges resulting from the sea change IT organizations are confronting. Further, it offers pragmatic advice on how modern Microsoft Windows 10 virtual desktops, accelerated by virtual GPUs (vGPUs), can provide the answers to those challenges and deliver an uncompromised user experience to every worker.

¹ ["How Leaders Are Responding to COVID-19 Workplace Disruption,"](#)
Gallup, April 7, 2020

The challenges of modern remote work

Short- and long-term changes from increased levels of remote work have created several challenges for organizations. IT leaders and their teams will be responsible for identifying and deploying the optimal remote work solution. To do this, they need to understand and address several important requirements. These include:

- **Support for all applications, especially performance-intensive workloads.** In some cases, remote workers now use demanding applications, such as design, engineering, analytics, big data, streaming video, high-resolution and multiple monitor support, and interactive media. As more employees work from home, application performance problems will become increasingly common. Poor application performance in remote-work scenarios is not only frustrating, but also a major productivity drag.
- **Intensified security and data protection.** Workers need access to critical information and essential files, yet much of this data contains sensitive, confidential, or private information that needs to be protected. The challenge is not only securing the data for remote usage, but also meeting compliance mandates and enforcing data sovereignty rules. As remote work broadens exponentially, ensuring security, data protection, and governance has dramatic technical implications in terms of infrastructure choices and operational processes.
- **Greater scalability and flexibility.** Remote work places a premium on fast response to user demands. IT must respond at the speed of business or risk falling behind the competition. Infrastructure scalability and flexibility are essential, but IT must also ensure that policies governing security, operational demand, and even sustainability are accommodated.
- **Alignment with tighter IT budget realities.** IT needs to enhance and upgrade the remote work platform cost efficiently. Accomplishing that will require higher levels of infrastructure optimization, broader use of virtualization, and faster deployment. Small inefficiencies at lower usage



levels are far less noticeable, but when remote access spikes, these cost issues are dramatically magnified.

- **Improved support for collaboration.** In a scenario where most, if not all, employees are working remotely, collaboration is the linchpin of operational efficiency. Providing access to tools like WebEx® for video conferencing and WebEx Teams™ for group collaborations is a starting point. There is also a need to better support group efforts around analytics, design, visualization of data, engineering collaboration, and other tasks that require much more underlying power in the platform.

The challenges in meeting these requirements are not inconsequential, and the ability to address them will directly impact organizational success. That is why many leading enterprises are deploying next-generation VDI solutions in their data centers. The technology is designed to solve these problems and enable the organization to deliver an optimal remote work environment.

Meeting the challenges of ubiquitous remote work

Data center-based VDI is a critical technology and an important IT priority. Computer Weekly's 2020 IT Priorities survey found that VDI is the second most important project.² Within the same study, the need to support remote applications and remote desktop services was among the six most important VDI priorities. Considering the current and likely future demand, the urgency to support a greater volume of remote work is only going to increase.

Many factors need to be considered when choosing to deploy enhanced VDI technology in-house. That includes understanding end-user requirements, correctly designing and sizing VDI for optimal performance, ensuring high availability, delivering robust security, and meeting data sovereignty needs. Typically, the totality of these demands will favor on-premises rather than public cloud deployments.

New on-site HCI or a fully integrated data center platform combining compute, storage, and networking, coupled with vGPUs when needed, solves problems such as poor application performance and delivers the experience workers need in a new era of remote work. At the heart of this new approach is dramatically improved performance: More than 60 percent of enterprise employees worldwide access at least one graphics-intensive application. And Windows 10 is 32 percent more graphics-intensive than Windows 7, according to Lakeside Software.³

Best-in-class data center-based VDI has the underlying performance necessary for demanding applications, with the flexibility to allocate resources to ensure that demanding applications perform as well remotely as they do in the office. And deploying this infrastructure in

the data center addresses the many tradeoffs of supporting remote work while also protecting data.

In addition, as massive numbers of employees use remote work platforms, adherence to data sovereignty and governance rules have sometimes slipped. Having employees at home loading potentially sensitive data sets on their possibly unsecured personal systems is fraught with problems. It also introduces the potential for data breaches through malware infestations and other cyberthreats to these personal devices. With a VDI solution deployed in the company's data center, data remains safely inside the data center where multilevel protection is in place. Employees have the access they need without creating a higher potential for data loss.

Improved management and operational tools reduce the resource demands to run these systems, meaning IT efficiency is also increased. System utilization and optimization are hallmarks of the latest VDI solutions, making it possible to optimize hardware deployments to reduce costs.

Delivering what remote workers need and the security teams require

Selecting the right technology partner for VDI infrastructure is essential to delivering best-in-class remote work capabilities. Partners should be evaluated based on their technology leadership, long-range product roadmap, availability of world-class tools and services, global service and support capabilities, and partner ecosystem to enhance their core offerings.

Cisco UCS® and Cisco HyperFlex™ offer a better approach to industry-standard computing and provide the core for data center infrastructure to deliver desktop virtualization. Cisco UCS integrates compute, networking, and storage resources to increase efficiency and deliver centralized management. UCS products are designed and configured to work together effectively. Cisco UCS provides many benefits, including:

- A drastic reduction in the number of servers and their accompanying cable plant
- Rapid deployment or repurposing of servers through Cisco UCS service profiles, allowing the data center to deliver the same benefits as public cloud services
- More control and cost certainty

² ["IT Priorities 2020: Data Centers Remain Mainstay of Enterprise IT, Despite Continued Cloud Creep,"](#) ComputerWeekly.com, March 12, 2020

³ ["Elevating User Experience Through GPU Acceleration,"](#) Lakeside Software

- Independent scaling of compute and storage to ensure optimization and utilization
- The ability to scale up or out at speed, ensuring that remote work demands can be met as they occur

These features reduce the load on the IT team, cutting out many system administration and management tasks.

Thousands of desktops can be provisioned in minutes with Cisco HyperFlex and Cisco storage partners' storage-based cloning. This approach accelerates the time to productivity for end users, improves business agility, and allows IT resources to be allocated to other tasks.

The Cisco® solution for data center-based VDI delivers higher virtual machine density. It is a key advantage, as it makes it possible to support more workers and workloads in the same footprint. The UCS and HyperFlex servers offer industry-leading GPU density in blade servers, a key capability for supporting demanding applications used remotely via VDI. Cisco servers support the broadest range of NVIDIA data center GPUs to provide customers with the broadest choice to support their workloads.

These new on-premises infrastructure options substantially reduce the time necessary for deployment and utilization. When the entire hardware and software stack is bundled, IT teams can stand up more capacity in the data center in just hours. With this level of flexibility, infrastructure optimization is now possible, along with far higher levels of resource utilization. This enables the flexibility necessary for adding new users and new workloads at the speed of business.

Keeping infrastructure in the data center allows IT teams to leverage standards and policies for compliance and data sovereignty that have already been designed and deployed in the existing on-premises infrastructure. They can be easily ported over and updated with a single action. Current data protection policies and standards can also be easily integrated with new on-site VDI infrastructure.



Meeting the remote-application performance challenge with the Cisco and NVIDIA GPU-accelerated data center

Next-generation on-site VDI infrastructure has new features and capabilities that build upon the strengths of previous versions of the technology. The most impactful of these is the integration of GPU technology into Cisco UCS infrastructure. The NVIDIA vGPU software creates virtual GPUs that enable any VM to share a physical GPU installed on the server or allocate multiple GPUs to a single VM to power the most demanding workloads. Adding vGPUs to today's most powerful servers, coupled with Cisco UCS and HyperFlex, is a game changer for VDI high-performance applications. Use cases include design, video, high-resolution, and multiple monitor support, interactive media including WebGL, and more. With this integrated infrastructure, the organization will be prepared as the use of demanding applications goes mainstream.

Poor application performance in remote-work scenarios is not only frustrating, but also a major productivity drag. When in-house VDI is enhanced with NVIDIA vGPU software, it delivers performance well beyond what CPU-only VDI implementations can deliver. When the problem impacted only technical or engineering professionals, treating it as an exception was acceptable. But that is no longer a workable approach. The broad and growing use of resource-intensive applications by nearly all workers requires a more holistic

approach to improving VDI performance. For some companies, the best and most effective path to better performance is data center infrastructure combining Cisco compute infrastructure with vGPUs.

Deploying vGPU-accelerated VDI on premises allows IT teams to deliver service-level agreements that meet employee demand for all applications. In the short term, combining virtual GPU and VDI technology in the data center immediately eliminates poor application performance for demanding applications. In the future, this infrastructure option will support the use of even more demanding applications that use augmented and virtual reality, massive data sets, or data science workloads.

Business benefits of optimized Cisco and NVIDIA VDI solutions

Cisco and NVIDIA integrated VDI infrastructure in your data center not only solves technical issues but also delivers tangible business benefits. It is the foundation for competitive advantage and a better solution for employees, management, and IT. The solution provides six primary business benefits:

- 1. Enhanced employee experience.** Enhancing the employee experience is a management priority. The digital experience drives the employee experience, and great technology enhances job satisfaction. Conversely, if employees are frustrated and believe technology is a roadblock, problems arise. A survey from New Zealand found that employees frustrated with workplace technology are 450 percent more likely to leave.⁴ The Cisco and NVIDIA solution delivers a vastly better employee experience, with a 36 percent improvement in application performance and 94 percent less downtime, according to an IDC study.⁵ Consistency is central to an optimal employee experience. A modern data center that delivers VDI with integrated vGPU technology provides a consistent employee experience for any application, on any device, anywhere. New on-premises VDI infrastructure delivers one of the most requested and important employee experience capabilities for remote work: the ability to use non-PC devices effectively. This may be one of the major differentiators between existing VDI deployments and more modern ones. Employees can use any device for their daily work activities.
- 2. Improved security and compliance.** This solution uses a single, centrally managed platform to secure and control all data used remotely. That simplifies the process of implementing mandated compliance policies and security standards across all remote users and applications. Security updates and changes to policies can be implemented in minutes. It is no longer necessary to ensure cybersecurity one user device at a time. VDI in the organization's data center keeps data physically located in the data center to reduce risk, dramatically decreasing the potential for data loss. It also reduces the complexities IT must manage, because endpoint security and management are simplified.





3. Enhanced remote application performance.

Cisco on-premises VDI platforms with NVIDIA vGPUs provide industry-leading performance. As the use of video, large data sets, and more intense computational and graphic models expands to workers of all types, providing a remote work environment that is equal to or better than what is possible in the office is critical. These demanding applications and functions are going mainstream in remote work and will be used by virtually all employees. Cisco's solution can also power other aspects of next-generation remote work, including video calls and conferencing, support for multiple high-resolution monitors, dynamic browsers, and improved collaboration.

4. Increased speed of business. A less complex and more flexible platform speeds up deployment of resources and eliminates IT lag, which slows down businesses. Employees can get more done and collaboration is more effective, making business faster. Providing a consistent platform for work is essential for organizations that have multiple locations or offices by ensuring every worker has the same resources. Because this technology eliminates

the differences between working remotely and in the office, all employees can work at the same speed.

5. Higher productivity. For many workers, the speed and performance of their devices dictates their productivity. Improving application performance is one part of improved productivity, but real improvement requires faster file uploads and downloads and the ability to use visual and graphic analytic tools and multiple or very high-resolution monitors. In addition, support for demanding applications on smaller devices such as tablets and smartphones is essential to how workers get things done and improves productivity by allowing workers to use any application on any device.

6. Greater ability to deliver any new application at the speed of business. The ability to quickly roll out new applications that enable new digital business processes is a critical advantage. Using this enhanced on-site VDI solution eliminates the need to build infrastructure or deploy new devices to workers to use the new application. Now, as soon as the new code is stable, it can be rolled out to the organization without any disruption to the user.

⁴ ["How to Champion a Frictionless Digital Employee Experience,"](#) HR Technologist, Jan. 7, 2020

⁵ ["NVIDIA Is Helping Organizations Provide Optimized Virtual Client Computing for Graphics and End-User Computing,"](#) IDC, May 2019



For more information

To learn more about how your organization can take remote work to the next level, please go to: Cisco.com/go/vdi

Key takeaways

The next generation of remote work goes well beyond the basics. Organizations will demand remote work environments that not only provide the applications and data users need today, but the ability to scale for what they will need tomorrow. The best option to enable remote work is VDI in a virtualized data center, delivered by Cisco and enhanced with NVIDIA vGPU technology.

Using this on-premises approach solves many of the security, compliance, and scalability challenges that next-generation remote work styles create.

Cisco delivers an edge-to-core solution that has best-in-class management and operational tools. When coupled with NVIDIA's vGPU technology for demanding applications, it is truly a game changer. It is now the optimal solution for ensuring organizations have a best-in-class remote work environment, taking the risk out of remote work and supporting both short- and long-term demands from workers and the organization. For IT teams, it is a simpler path to any application, anywhere, on any device.

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