



15-Minute Guide:

Work anytime, anywhere
with VDI

Abstract

Today, the way we work—and especially where we work—is in a state of flux. Virtual desktop infrastructure (VDI) delivers the digital transformation you need to empower your remote workforce, enabling them to collaborate and innovate from nearly anywhere.

However, VDI solutions need to be carefully planned and executed to deliver high-quality user experiences that don't compromise on security or add to IT complexity.

In this guide we share the Dell Technologies approach to empowering your remote workforce with secure, high-quality end-user experiences while streamlining how you deliver, protect and manage your VDI environment from edge to core to cloud.

November 2021

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Remote Work Adds Value.



Innovation comes from more places.



Remote workers are **more productive**.



Organizations save significant costs.

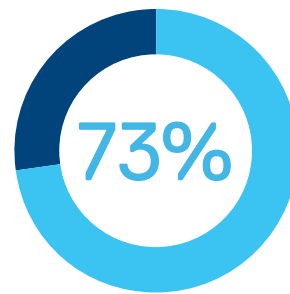
Transform your workplace with VDI.

Streamline delivery of secure, high-performance digital workplaces.

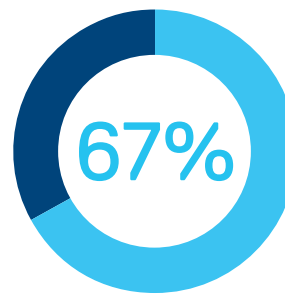
Remote work is not a new concept, but it is becoming increasingly pervasive. People in a wide range of roles and organizations are now operating remotely—about 40% of them. That's twice as many as before the massive shift to remote work in early 2020.¹

Where people work in the future will become even more fluid, as organizations seek to build on the advantages of enabling remote work, such as enhanced innovation, increased productivity and lower costs. In just three years, analysts predict that remote work will become even more commonplace, with up to 50% of employees working away from the office.¹

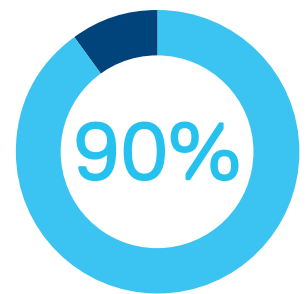
New opportunities to innovate and collaborate



of organizations report that innovation is coming from more places after enabling remote work.



of organizations say remote work options have increased productivity.



of organizations anticipate significant cost savings as a result of remote work.

Source: Based on a recent study commissioned by VMware and Dell Technologies. Results based on a global survey of 5,700 IT, HR and business decision-makers, conducted by Vanson Bourne, between June and July 2020. Actual results will vary.²

However, reaping these benefits will require VDI solutions designed to support collaboration, maintain security and provide multiple ways for users to access compute and storage resources.

Dell Technologies is committed to helping you successfully adapt to the new normal, with solutions that deliver high-quality user experiences and simplify how you deliver, protect and manage VDI.

¹ Dell Technologies, [Pre and Post CV19: Dell User Group Pulse Survey](#), March 2020.

² Dell Technologies and VMware, [The New Remote Work Era: Trends in the Distributed Workforce](#), December 2020.

70%

of companies say that a blend of in-person and remote work will be the new normal.³

70%+

of workers want flexible remote work options to continue.⁴

50%

of employees are predicted to be working away from the office by 2024.¹

Empower your remote workforce.

Provide exceptional experiences anywhere.

While VDI has long been used to provide the flexibility for remote work, the need to enable work-from-anywhere productivity has intensified. Workers are now choosing where to spend their time most productively, moving fluidly between the office and their preferred remote locations.

To stay productive, remote users need desktop-like experiences, no matter where they log on. A recent survey found that 70% of all workers expect to be productive from anywhere,³ while 54% expect to use the same device for both business and personal tasks.⁴

However, organizations looking to adopt or expand VDI have typically faced a number of hurdles. These include including long planning and procurement cycles, significant upfront infrastructure investments, and difficulty delivering a consistent user experience across locations and devices. These hurdles have hindered VDI adoption, despite its many security and productivity advantages.

Dell Technologies offers a wide selection of validated and optimized VDI solutions that provide data and application security while allowing IT to get started quickly and optimize end-user performance.

Make a plan to transform with VDI.

Dell Technologies recently commissioned Forrester Consulting to outline an implementation guide for adopting digital workplace solutions, which recommends the following steps to transformation:⁵

- 1. Pre-planning.** Build a broad timeline and identify key digital workplace goals and how they map to financial outcomes. Consider employee needs, stakeholder goals and change management plans.
- 2. Modern management readiness assessment.** Make an honest assessment of your environment. Of the organizations surveyed, 51% are somewhere in between and utilize a mix of on-premises and cloud-based management.
- 3. Infrastructure and business integration assessment.** Proper integration of IT capabilities and business needs is key to success. Organizations with a virtualization strategy in place can likely adopt the digital workplace quicker than those with no strategy.
- 4. Roadmap development.** Based on the assessments above, develop a roadmap to determine immediate first steps, as well as the biggest challenges and the time length for each phase of the roadmap.
- 5. Implementation and process automation.** Three key steps include modern management migration, process automation and digital workplace delivery and optimization. Then, you can begin to optimize the digital workplace with end-user experience management.

³ CNBC, [The latest numbers on how many workers will be returning to offices, and how often](#), July 2021.

⁴ Microsoft Work Trend Index, [The Next Great Disruption Is Hybrid Work—Are We Ready?](#), March 2021.

⁵ Forrester Consulting, [A Technical Brief Framework for Dell Technologies' Unified Workspace](#), March 2020.



VDI for Schools

Granting all students equitable remote access to school resources and technology is a top challenge for schools in both K-12 and higher education. Dell Technologies VDI solutions deliver the right mix of flexibility and scalability needed to provide uninterrupted learning. Whether remote, hybrid or on campus, students gain anywhere, anytime access to vital applications and resources while educators are equipped with the tools needed to deliver new methods of teaching designed to maintain learning continuity and promote student success.

VDI use cases

How does your organization plan to leverage VDI? Dell Technologies has proven expertise in building, deploying and supporting VDI solutions across a number of verticals. The following are just a few examples.

Academic research

To make discoveries faster, academic and research institutions must move quickly from raw data to actionable insights, collecting and processing massive amounts of data to simulate complex systems. High performance computing (HPC) and artificial intelligence (AI), often accelerated with GPUs, are powerful tools for scientists, students and researchers, speeding workloads and improving time to results. When working offsite, these users need to be able to access their high-powered resources with onsite responsiveness and resolution to continue their groundbreaking work.

Typical research use cases include:

- Genomics
- Molecular dynamics
- Astronomy
- Climate and weather modeling
- Geosciences

Computer-aided engineering and simulations

Product designers and engineers rely on powerful systems that leverage GPUs to run computer-aided engineering (CAE) workloads such as structural analysis, computational fluid dynamics and other virtual testing faster and with fewer errors. This type of modeling and simulation enables early evaluation, fast testing of design modifications and more iterations on designs. VDI access to simulation and 3D modeling solutions enables greater design freedom and flexibility. Powerful HPC systems can be used to support remote visualization for multiple users on a single, virtualized server running a variety of CAE applications. However, security and fast system performance is critical to maintain productivity.

Typical CAE workloads include:

- Structural analysis
- Computational fluid dynamics (CFD)
- Noise, vibration and harshness (NVH)

Financial services

Financial services institutions (FSIs) are driven by intense competition to make smarter, faster decisions that reduce risks and increase rewards. However, FSIs face unique challenges when implementing VDI. Power traders and financial analysts rely on compute and graphics intensive and network heavy applications that often run across several monitors. Providing GPU-powered performance that can scale as needed for these power users is critical. In addition, FSIs are subject to stringent security and compliance requirements designed to protect sensitive financial information.

Typical FSI use cases include:

- Risk assessment
- Trading
- Pricing
- Fraud protection

“While growing the number of simultaneous users above 670, we reduced deskside support staffing from two to one.”

—*Cofounder and Managing Director, Hudson River CIO Advisors*

“We saved \$800,000 in recurring hardware-refresh costs for our police cars by making our VMware® Horizon VDI a mobile solution supported by VxRail.”

—*Richard Gagnon, CIO, City of Amarillo, Texas*

Real-world VDI success

Dell Technologies is ready to enable your VDI use cases. Our portfolio of products and solutions is designed to fit the needs of businesses and institutions of all sizes so that more people can harness the power of data to make the world a better place.

McLaren® Racing enables 4,000 employees to work from anywhere.

When a world-class race team needs to connect and collaborate across the globe, they rely on Dell Technologies to power all 4,000 employees to work from anywhere with the right tools as they pursue their next victory. Watch the [video](#).

Ebb³ redefines digital workplaces.

This provider of managed digital workplace and VDI solutions to automotive, construction, engineering, education and manufacturing companies partners with Dell Technologies, using HPC to deliver secure virtual desktops and high-performance applications to any location and any device. Read the [case study](#).

Texas city government saves \$800,000 with VDI.

The City of Amarillo deployed Dell EMC VxRail for VDI, improving departmental performance, employee productivity and citizen services delivery — and saving \$800,000 in recurring hardware-refresh costs. Read the [case study](#).

VDI allows research to continue despite campus closure.

Aalto University partnered with Dell Technologies to enable students and researchers to continue using specialist applications during the COVID-19 lockdown. Read the [case study](#).

Food manufacturer and supplier reduces storage footprint.

Noble Foods reduced their storage footprint, compute costs and environmental cost with a VDI solution based on Dell EMC VxRail. Read the [case study](#).

Dental college revolutionizes medical education.

The Touro College of Dental Medicine relies on a Dell Technologies VDI solution to empower students to run 3D CAD/CAM modeling applications for more than 670 concurrent users. Read the [case study](#).

The journey to VDI

Adopting or expanding VDI requires a commitment to ongoing digital transformation and the expert partnerships to help you get there.



Enhance your user, data, application and endpoint security.

Empowering your remote workforce means placing more devices and data out of direct IT control, increasing your vulnerability to data theft and cyberattacks. Dell Technologies solutions for VDI help you maintain security without sacrificing productivity. VDI enhances security because files and data don't leave the data center and all communications between the client and infrastructure are encrypted. By centrally storing data and applications in the data center, users can remain productive while data and applications stay safely behind the corporate firewall. In addition, Dell Technologies builds in security from the data center all the way to the endpoint and through the entire data lifecycle to protect you against cyberthreats.

Deliver high-performance user experiences.

Users have high expectations for performance and availability no matter where they're working. IT is challenged to make sure resources match increasing demands for fast delivery, predictable scale and high performance. However, dynamic and unpredictable resource demands make capacity planning and resource allocation difficult. VDI solutions require the ability to scale up and down according to demand. Dell Technologies VDI solutions deliver desktop-like performance in a reliable environment, reducing downtime and enabling anytime, anywhere digital workplaces. Support for NVIDIA® GPUs enables IT to provide beyond workstation-level performance for graphics-intensive workloads for power users wherever they are.

Streamline IT resources and improve productivity.

Workforce productivity increases when employees can securely access their desktops and applications from their preferred devices at the times and places they choose to work. However, IT is challenged to increase the speed and quality of service while reducing costs, including maintaining staffing levels. VDI solutions need to be simple to acquire, deploy and operate while demonstrating long-term cost-effectiveness. Dell Technologies solutions for VDI enable IT to dynamically allocate resources to respond faster to users and business demands so workers can access the resources and tools they need to do their jobs. Plus, IT can centrally manage the virtual desktop from the data center and save time and money by troubleshooting personal computers remotely instead of physically visiting each one. Wherever a desktop is deployed, it is up to date and patched while also appropriately configured to secure resources.

Dell Technologies solutions strategy

Dell Technologies has what you need.

Expertise and guidance

The work-from-anywhere movement is evolving quickly, so your team may not have the resources to design, deploy and manage solutions optimized for VDI. While VDI is rapidly becoming mission-critical technology, Dell Technologies has been a leader in VDI for decades, with proven products, solutions and expertise. Dell Technologies has a team of VDI experts who are ready to help you keep pace with this constantly evolving landscape.

Dell Technologies Validated Designs for VDI

The advantage in today's marketplace goes to the enterprise with an empowered remote workforce. For many organizations, VDI is — or is becoming — an important means for driving workforce transformation by giving users high-quality experiences while streamlining IT resources and management, all without compromising security. Dell Technologies Validated Designs for VDI simplifies design, configuration and ordering of solutions that are optimized for VDI.

Solutions customized for your environment

Dell Technologies is uniquely positioned to provide complete edge-to-core-to-cloud VDI solutions from one vendor. With years of experience and an ecosystem of curated technology and service partners, Dell Technologies provides innovative solutions, workstations, servers, networking, storage and services that reduce complexity and enable your employees to work from virtually anywhere.

Understanding worker profiles

When VDI solution is configured, delivering adequate performance for the work at hand is imperative. VDI solution performance is driven by RAM, CPU and storage sizing, which in turn is dependent on the types of workers who will be using the virtual desktop resources. Workers are generally categorized into three main types:

- **Task workers**, also called administrative workers, typically perform repetitive tasks within a small set of applications, which are not as CPU- and memory-intensive as the applications used by knowledge workers. Examples of task workers include call center representatives, healthcare administrators, retail employees and warehouse workers.
- **Knowledge workers** access the internet, use email and create complex documents such as presentations and spreadsheets on a daily basis. Knowledge workers can include accountants, sales managers and research analysts.
- **Power users** typically use two to four monitors for graphics-intensive applications. Examples of power users include engineers, application developers, motion picture artists and financial traders.

Solutions portfolio

Hyperconverged infrastructure

[Dell Technologies HCI systems](#) align to your preferred operating model, with flexible deployment options; simplified, powerful infrastructure; and leading support and services.

- Designed exclusively by Dell Technologies and VMware, [Dell EMC VxRail](#) is the easiest and fastest way to implement a high-performance VDI solution. VxRail is ideal for a range of VDI environments, including those that start small and grow, or require GPU acceleration. Flexible configuration options include all-flash nodes that feature enterprise data efficiency services and nodes that deliver purpose-built GPU hardware for graphics-intensive virtual desktops. Powered by Dell EMC PowerEdge servers, VxRail HCI systems simplify deployment of your software-defined data center, enhance the VDI user experience and reduce the cost of managing hardware.
- Built on Dell EMC PowerEdge servers, [Dell EMC vSAN Ready Nodes](#) enable easy deployment with factory installed, pre-configured and pre-tested configurations which can add up to a solution that scales quickly to meet growing needs. With over 250 configurations available — spanning all-flash, hybrid rack, and kinetic infrastructure models — modernize your infrastructure from the core to the edge to the cloud with maximum flexibility for VDI environments.

Servers

[Dell EMC PowerEdge servers](#) are engineered to deliver unmatched performance and versatile configurations, including flash storage, the latest processors, Boot Optimized Storage Solution (BOSS) option, greater memory bandwidth and flexible local storage — via new NVMe™ drives — to meet the demands of VDI.

- The [Dell EMC PowerEdge R750](#), powered by Intel® Xeon® Scalable processors, is built for application performance and acceleration for a wide range of workloads including VDI, analytics, HPC and AI/ML environments that require performance, extensive storage and GPU support.
- The [Dell EMC PowerEdge R750xa](#) is designed to address emerging and highly-intensive GPU workloads, boosting acceleration performance across the widest range of needs. With one platform that supports all of the PCIe GPUs in the PowerEdge portfolio, the PowerEdge R750xa is an ideal server for VDI along with emerging workloads such as AI/ML/deep learning (DL) training and inferencing, HPC and virtualization.

GPUs

GPUs are designed to accelerate compute performance by offloading certain tasks from the CPU. Originally designed to quickly render high-resolution images and videos, GPUs are now commonly used for many parallel processing tasks, including MRI scans, seismic processing, data analysis and visualization, and modeling and simulation. GPUs play a leading role in VDI as well as HPC and AI. Read the [white paper](#).

Networking

[Dell EMC Networking solutions](#) are future-ready and based on open standards to help you improve network performance, lower networking costs and remain flexible to adopt new innovations.

- [Dell EMC SD-WAN](#) combines Dell Technologies network appliances with VMware SD-WAN software to provide advanced adaptive networking features, such as Dynamic Multi-Path Optimization, that reduce costs while improving application performance.

Storage

[Dell EMC Storage solutions](#) from high-performance all-flash arrays to hybrid flash and scale-out network-attached storage (NAS) help you efficiently store, protect and manage information so you can do more, move faster and perform better.

- [Dell EMC VxBlock System 1000](#) integrates powerful Dell EMC storage and data protection into a turnkey converged system supporting all your high-value, mission-critical workloads — from the core data center to the cloud.
- [Dell EMC PowerStore](#) storage natively integrates into VMware management frameworks, making it easy for VMware and Horizon administrators to manage desktops and storage while improving their efficiency.

Cloud

[APEX Cloud Services](#) offer integrated compute, storage, networking and virtualization resources that enable consistent, secure infrastructure and operations for your workloads across public and private clouds. With a simple way to order and manage cloud resources, you can now easily build the cloud of your choice with solutions tailored for your most pressing business needs.

APEX Custom Solutions let you create your own on-demand environment with infrastructure and services you customize to order. [APEX Flex on Demand](#) allows you to pay only for the technology you need, with payments that adjust up or down to match usage. [APEX Data Center Utility](#) is a highly customizable way to move data center operations into a pay-per-use model. It provides the Dell Technologies market-leading product portfolio coupled with professional services and support to fully manage your data center and its operations in a simple, single-invoice monthly payment based on your actual usage.

With APEX Infrastructure Services, you can benefit from resources that are owned and maintained by Dell Technologies, so you can focus on high-value priorities. Get the technology you need in a fraction of the time and scale resources on demand. As part of this service, [APEX Data Storage Services](#) is an as-a-Service portfolio of scalable and elastic storage resources built on our industry-leading technologies.

VDI on Dell Technologies APEX

[VDI on Dell Technologies APEX](#) allows you to pay for what you use and pay as you grow, rather than commit to a fixed set of infrastructure investments for extended periods of time. It's a simple, flexible, agile and streamlined approach to easy management and provisioning of additional capacity and disaster recovery.

Software

Dell Technologies partners with leading software providers to create validated solutions for VDI.

- **VMware vSphere® with VMware Horizon® and Horizon Apps** enable a digital workplace with the efficient delivery of virtual desktops and applications. VMware Horizon is based on VMware vSphere, with deep integration into the VMware technology ecosystem, offering an agile cloud-ready foundation, modern best-in-class management and end-to-end security.
- **Citrix® XenServer with Citrix Virtual Apps and Desktops™** addresses a broad range of use cases by delivering a full desktop or just applications based on an individual employee's role or device. A rich set of capabilities and a flexible design enable IT to be more agile in meeting the needs of a rapidly changing workplace.

Dell Technologies Validated Designs for VDI

Dell Technologies offers validated and optimized VDI solutions that provide data and application security while allowing IT to get started quickly and deliver optimized end-user performance. Dell Technologies Validated Designs for VDI provide a wide range of choices to meet a variety of needs and come with optional Dell Technologies endpoints and familiar management tools that allow you to get up and running faster and streamline your day-to-day operations.

Dell Technologies Validated Designs for VDI transform the workforce by enabling remote work, bring your own device (BYOD) and mobility to enhance user collaboration and productivity.

Complete your solution with Wyse thin clients.

Purpose-built for VDI environments to provide optimum security and performance, Wyse thin clients integrate easily into any virtualized or web-based infrastructure and deliver a high-quality computing experience.



| | | |
|--|--|---|
| | | |
| <p>3000 series</p> | <p>5000 series</p> | <p>All-in-one thin clients</p> |
| <p>For task workers and knowledge workers running a broad variety of business applications</p> | <p>For knowledge workers and power users requiring access to a wide variety of applications, including 3D graphics and HD multimedia</p> | <p>Secure all-in-one with an excellent virtual desktop experience with extreme ease of use and management</p> |

Wyse thin and zero clients maximize security and optimize management and efficiency by centralizing data, applications and resources. Designed to deliver flexible access to virtual desktops and virtualized applications, Wyse thin clients provide instant functionality and performance to meet the demands of processing-intensive applications.

Delivering premier desktop security, manageability and reliability, Wyse thin and zero clients are tested and validated to work with Citrix, Microsoft and VMware and allow increased productivity with a broad range of highly secure endpoints designed for both stationary and mobile users, from task workers to the most demanding power users.

Learn more about [Wyse thin clients](#).

VDI experience and capabilities

Dell Technologies offers a range of opportunities for you to engage with our experts to start empowering your remote workforce.

Customer Solution Centers

Our global network of dedicated [Dell Technologies Customer Solution Centers](#) are trusted environments where world class IT experts collaborate with you to share best practices, facilitate in depth discussions of effective business strategies, and help your business become more successful and competitive. Customer Solution Centers help reduce the risks associated with new technology investments and can help improve speed and ease of implementation.

Services and financing for VDI

Dell Technologies is with you every step of the way, linking people, processes and technology to accelerate innovation and enable optimal business outcomes.

[VDI Services](#) provide a complete solution for your virtual desktop migration. From assessment, system design and application delivery to desktop deployment, integration, security and systems management, our expertise helps you achieve success the first time.

[Deployment Services](#) help you streamline complexity and bring new IT investments online as quickly as possible. Leverage our 30-plus years of experience for efficient and reliable solution deployment to accelerate adoption and return on investment while freeing IT staff for more strategic work.

[Support Services](#) driven by AI and DL will change the way you think about support with smart, groundbreaking technology backed by experts to help you maximize productivity, uptime and convenience. Experience more than fast problem resolution — our AI engine proactively detects and prevents issues before they impact performance.

[Payment Solutions](#) from Dell Technologies Financial Services help you maximize your IT budget and get the technology you need today. Our portfolio includes traditional leasing and financing options, as well as advanced flexible consumption products.

[Dell Technologies APEX](#) offers a simple approach that gives you a wide range of consumption models, payment solutions and services so you can optimize for a variety of factors while realizing more predictable outcomes.

[Managed Services](#) can help reduce the cost, complexity and risk of managing IT so you can focus your resources on digital innovation and transformation while our experts help optimize your IT operations and investment.

[Residency Services](#) provide the expertise needed to drive effective IT transformation and keep IT infrastructure running at its peak. Resident experts work tirelessly to address challenges and requirements, with the ability to adjust as priorities shift.

Additional Resources and Information



Visit our solutions page:
delltechnologies.com/vdi.



Technical documents:
Visit the [Infohub](#).

Why Dell Technologies for VDI

We're committed to helping you succeed with VDI, and we've dedicated a great deal of resources toward that goal.

- Schedule an [executive briefing](#) and collaborate on ways to reach your business goals.
- [Dell Technologies Customer Solution Centers](#) are staffed with computer scientists, engineers and PhDs who are subject matter experts in a variety of disciplines.
- We are committed to [providing you with choice](#). We want you to get what you need and have a great experience working with us. If we don't have what you need, we'll tell you who does.
- Dell Technologies offers VDI solutions that reach from the data center to the endpoint, with specialized teams of experts focusing on desktop virtualization solutions.
- Because Dell Technologies offers such a wide selection of solutions, we can act as your trusted advisor without trying to sell you a one-size-fits-all approach to your problem. That range of solutions has also given us the expertise to understand a broad spectrum of challenges and how to address them.

Taking the next step

Don't wait to enable digital workplace transformation with optimized solutions designed from the ground up to enhance productivity with secure VDI solutions that are quick and easy to implement. Contact your Dell Technologies representative to find out more today.

