

The State Of VDI, 2021

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Summary

Enterprises have historically invested in on-premises virtual desktop infrastructure (VDI). With the surge in remote working in 2020, organizations have increasingly looked toward cloud-hosted desktops, desktop as a service (DaaS), and hybrid models to deliver virtual computing in multiple forms. With all flavors of virtualization growing, from on-prem to hybrid and cloud, enterprises must take a use case-specific approach to maximize their client virtualization strategy. This report lays out the major use cases for client virtualization and provides best practices for enterprises to improve user experience, simplify management, and maximize ROI.

The COVID-19 Pandemic Increased Enterprise VDI Adoption

Forty-two percent of infrastructure technology decision-makers who have adopted or are adopting desktop as a service have computing devices primarily run in a hosted or virtual environment. This is up from 36% just two years ago and nearly 15 years after the release of the first VDI solution. While physical PCs remain the primary enterprise employee computing experience, client virtualization received a lift amid the global health pandemic in 2020 as companies sought solutions for employees at home.

Enterprises looked to virtualization for three reasons:

- **Faster procurement than traditional hardware.** Laptop delivery was much slower than usual in 2020 due to delays in chip manufacturing supply chains. As organizations rushed to move employees from the office to the home, they needed something to enable employees to work. The solution? Access to virtual desktops and apps. David Stauffacher, chief platform engineer for Direct Supply, said that the company's investment in VDI — specifically the Amazon Workspaces solution — “allowed us to move more than half of our employees to work from home in a matter of hours without having to invest in any additional hardware or bandwidth.”
- **Improved security for personally owned endpoints.** In cases where organizations did not have thin clients to enable VDI access, they often allowed personally owned devices to access enterprise information. To preserve separation of work and personal data and to ensure that malicious software on personally owned devices can't siphon enterprise data, organizations looked to VDI to provide a supplemental layer of security to BYOD deployments for workers at home. For one major European bank, VDI provides a key enabler for their remote workforce; before they were able to get laptops for all employees, they used VDI as the basis for a BYOD strategy, allowing them to keep working despite lack of officially issued devices. According to a digital transformation leader, going forward, they'll continue using a mix of corporate-issued devices and VDI to double down on security and empower employees wherever they are.
- **Improved management through centralized patching.** For many organizations that sent employees home with laptops in the early stage of the pandemic, they quickly went from five to 10 offices to supporting sometimes hundreds of thousands of branch offices (i.e., the home). The process of distributing updates, apps, and patches to physical PCs remains difficult for such heterogeneous computing

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environments. But for organizations relying on VDI, they could easily push out patches to a master golden image located in a data center or cloud and feel confident that employees could receive the updates without impacts to their local network connectivity. According to a VP of enterprise IT at one large government contractor, “VDI allows us to provide a more flexible and user-focused environment, to meet the diverse needs of our customers, as well as their employees’ expectations with device support. It’s not a one size fits all, but VDI allows us to easier transition users between devices, and keep things centrally located to ease management and enhance security.”

Virtualization Is Growing Across All Delivery Models: Cloud, Hybrid, And On-Premises

VDI is in a state of flux; new deployment models, a rise in remote working, and a need to improve computing manageability have all accelerated its adoption in the enterprise (see Figure 1). Of all these, the 2020 remote-work shift drove the biggest impact.

We’ve observed the following three major trends by delivery model:

- **Cloud desktops and desktop as a service are growing fastest.** In 2020, we saw a [shift in IT priorities among infrastructure and technology decision-makers](#) with 20+ employees, with consolidation and virtualization rising to the top — especially when it came to VDI. With many new customers seeking VDI to assist with remote work, they turned to cloud VDI and DaaS solutions; in particular Microsoft’s AVD has grown significantly over the past 24 months as a direct result of this. According to [Microsoft](#), during the onset of the pandemic, usage of the service [tripled in one month](#) alone. For organizations new to virtualization, cloud and DaaS offerings are often a no-brainer, significantly reducing the upfront costs and management requirements while still providing needed flexibility in providing both full desktop virtualization as well as application specific streaming.
- **Hybrid is increasingly popular to supplement on-prem VDI investments.** After cloud desktops, hybrid virtualizations are the second fastest growing delivery model as customers connect on-prem environments to the cloud for greater scalability and visibility over resources. Existing VDI users with on-premises deployments felt new pressures for greater scalability with the onset of remote work. There was new need to “burst” on-prem VDI deployments into the cloud. Hybrid also has the advantage of simplifying management in a single cloud-hosted console while keeping on-prem server investments intact.
- **Moderate on-prem VDI growth continues with hyperconverged infrastructure (HCI).** Despite the rapid growth of cloud-based VDI/DaaS offerings, many

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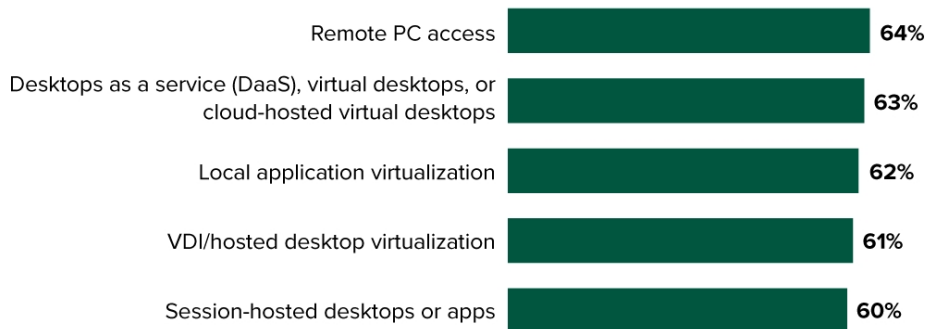
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organizations with mature on-prem deployments are still relying on the on-prem deployment model to provide for their organization's VDI needs. Some sectors, like the financial sector or European companies, lean on hyperconverged servers rather than cloud-based options. Hyperconverged adopters have found the servers ease management and result in better user experience through network, storage, and compute pooling — 29% of enterprise infrastructure technology decision-makers report currently running VDI on hyperconverged systems.

Figure 1

VDI Adoption Grew Across All Categories

“What are your firm’s plans to adopt the following alternative client PC technologies?”
(4, 5, or 6 on a scale of 1 [Not interested] to 6 [Implementing and currently expanding])



Base: 852 infrastructure technology decision-makers at companies with 20 or more employees
Source: Forrester Analytics Business Technographics® Infrastructure Survey, 2020

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Enterprises Use Virtualization For A Variety Of Use Cases

Forty-one percent of enterprise infrastructure decision-makers say that implementing or expanding use of client virtualization is a top hardware/IT infrastructure and IT operations priorities over the next 12 months, in the top five of IT priorities. While some organizations don’t intend to use virtualization in their end-user computing environment, most organizations do have multiple use cases in which they could benefit from VDI’s scalability, manageability, and flexibility. Some use cases are a better fit for cloud than on-prem, or vice versa. These include:

- **Seasonal worker enablement.** The ability to spin up desktops quickly in the cloud makes cloud desktops an excellent fit for employees who need temporary access to a desktop, especially if the organization can’t manage the person’s physical PC. One large home goods company with a sizable contractor workforce uses Amazon Workspaces for on-demand capacity, enabling it to spin up Windows 10 instances whenever it hires a new contractor as well as reduce the number of devices that

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contractors carry from two to one.

- **Secure access for third-party partners.** For contractors and consultants, VDI still remains a cost-effective solution to provide temporary access while securing unmanaged devices. This use case also lends itself well to nonpersistent VDI instances, allowing for more-effective resource allocation. This use case can also include outsourced help desks. According to one Fortune 100 insurer, “VDI plays a pivotal role going forward for support of different personas and use cases ... and third party, partners, and vendors — VDI is a huge play here. VDI allows us to provide remote secure access to our systems [for these third-party collaborators] and on top of that, no Fortune 500 wants to be shipping devices all over the world. VDI is an effective way around this.”
- **Legacy application distribution.** Compatibility will always be a challenge with workplace applications — funding, time, and other priorities constantly force edge end-user computing (EUC) modernization efforts to take a back seat. VDI allows adopters to control for the variables of physical device OS or configurations, ensuring consistent access to legacy applications. A VP of IT at a medical device company noted that VDI was especially relevant for healthcare, where “devices/applications don’t change too often.” While not able to use full desktops due to latency concerns, “VDI has helped us package applications and send them out without worrying about reengineering the endpoint.”
- **Static terminals for enterprise campuses, higher ed, or call centers.** Although less common during the pandemic, static fixed terminals remain a common application for virtualized environments. Popular on campuses, in libraries, and acting as a point of sale, VDI — often combined with thin clients — significantly simplifies management of these static points of presence. According to one CIO at a retail chain, VDI changed how they provide both for warehouses and retail shops. In the warehouse, VDI terminals reduced the complexity of device management and improved their reliability, allowing redundancy and even protecting critical data when accidents occurred and a device was damaged. In-store, VDI has significantly reduced the on-site technology management requirements, allowing nontechnical on-site staff to set up devices themselves, and allowing the company to optimize compute consumption during lesser traveled times of day or on intermittently used terminals.
- **Fast dev/test environments.** When developers need a machine or environment to rapidly test out new capabilities or experiences, VDI provides an easy way to provide the temporary machines needed for any OS. According to the [CTO of Ring](#),

“EC2 Mac instances will allow us to migrate our Apple build infrastructure to AWS, unlocking the scalability, reliability, security, and capabilities of AWS for all our Apple developers. These EC2 Mac instances will also let us quickly scale up our Mac build fleet whenever we need it.”

- **Sensitive data access.** When it comes to sensitive data, such as personally identifiable information (PII) or bank account numbers, virtualization provides an additional layer of security. Virtualization ensures that data physically stays in one place, and many solutions offer additional security features such as screenshot disabling. According to one defense contractor leveraging VDI, virtualization helps ensure client security through “ensuring no data ever leaves the data center.” Instead, access to sensitive information “can be tightly controlled with limited additional management requirements.”
- **Heavy compute users.** One of the newer capabilities that VDI can provide is an extension of native machine capabilities. For example, if a user needs a GPU or needs to access a CPU-heavy workload, temporarily creating powerful VDI machines can prove more cost effective than a specialized desktop tower. One architecture and design firm is using VDI for just that; instead of providing specialized laptops for things like interior rendering, they’re rendering applications live in a virtualized environment.

Understand Employee Needs To Deliver An Optimal Virtualized Experience

The success or failure of any virtualization deployment depends almost entirely upon the strength of the user experience it provides to the employee. Ideally, the experience of using a virtual desktop should be indistinguishable from physical hardware in terms of responsiveness and latency, but with the additional flexibility of secure access from any device and any location. Understanding the daily journey of the employee and how they interact with enterprise resources is key to determining how to leverage VDI in the best way. There are six key decisions you need to make to deliver the best user experience possible. They are:

- **Virtual or physical: How mobile are the employees?** While offline capabilities for VDI have improved over the years, virtualization typically does not work well with highly mobile users that may not have consistent access to a reliable internet connection. Syncing files, apps, and settings to cloud or on-prem resources is

notoriously finicky, and most of the time these users are better off using a fully loaded operating system running on traditional enterprise hardware. Trends like 5G could impact that in the future as faster and more resilient connectivity becomes more widely available, but for now, assume that robust connectivity is a must-have for successful VDI deployments.

- **Full desktop or app virtualization: What percentage of legacy apps do they use?**

Do they need to leverage multiple on-prem legacy apps, or just a few here and there? For instances where users need multiple applications interacting with one another (or where users want to use productivity features like copy and paste), full desktop can be preferred. However, for users only needing access to a single legacy app, app virtualization can allow for better UX.

- **Persistent or nonpersistent: How important is personalization to that user?** Are

they a power user with powerful computing needs? Do they need data to be consistent day by day, or can they save to the desktop? For workers who spend most of their day in a SaaS environment, nonpersistent instances can save the organization significant amounts of money without impacting the end-user experience.

- **GPU-enabled or not: What types of workloads are they running?** Which delivery

model will provide the best experience? Does your user have applications that require graphical processing such as an AutoCAD or design solution? Or does the user need additional compute to enjoy a better application experience? Increasingly, GPUs are being attached to environments by organizations trying to increase user experience of basic applications, but these aren't required.

- **On-prem or cloud: Where are users located?** Are there any key apps being used

that will not do well virtualized? Do you have an existing cloud strategy, or enterprisewide discounts that can be applied to your instances? Do the cloud providers have data centers near your workers? Can your data live in a cloud, or does it need to live in the walls of your organization? Physical proximity to data centers will change users' experience with VDI and may determine if a full desktop or just a virtualized application is more appropriate. For example, an organization with geographically distributed employees that needs to keep data in a single data center, and can't leverage a cloud-based solution, may find that app streaming to organizationally managed laptops may provide a better experience than streaming the entire OS.

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Self-managed or outsourced: What's your experience level with VDI? Can you manage and optimize a VDI environment using existing skills in your organization? Can you manage the same in a cloud environment? Can you manage a simplified DaaS environment? Do you need additional skills in your org to ensure your users have uninterrupted productive sessions? For organizations with fewer VDI skills, consider DaaS. For organizations used to managing VDI, a cloud VDI or on-prem deployment may save the organization money, as there is a direct correlation between ease of management and cost. However, in organizations where no skills already exist, this increased cost can be worth it to avoid additional headcount or ensure a better user experience.



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