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VMware Special Edition

Desktop as a Service (DaaS)

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Simplify IT desktop management

Improve security and compliance

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Lawrence Miller, CISSP

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Introduction

Physical desktop computers with locally installed operating systems and applications no longer make sense for the business world. They're expensive, insecure, and maintenance-intensive, and they can't effectively support the rapidly changing business landscape. Modern business and IT trends such as the ever-growing virtual workforce, ubiquity of mobile devices, and demand for bring your own device (BYOD) support, groundswell of Windows 10 migrations, and tighter IT budgets, all point to the need to reevaluate business desktop strategies.

By virtualizing desktops and applications and moving to the cloud, organizations can realize all the benefits of virtualization and the cloud — centralized and simplified management and orchestration, greater business agility, improved security and compliance, and reduced IT capital expenditures (CAPEX) and total cost of ownership (TCO) — across their entire IT infrastructure portfolio, from servers, storage, and networking to desktops and applications.

Desktop as a Service (DaaS) is the delivery of a virtual desktop offered as a hosted service by a service provider. DaaS has the potential to radically change the way desktops are purchased and managed. However, as is typical with disruptive technologies, there is a good deal of confusion about DaaS. This book explains how businesses can deliver high-performing desktops to users on any device in minutes, easing IT management burdens and reducing the total cost of desktop ownership, by consuming virtual desktops as a cloud-hosted service.

About This Book

Desktop as a Service (DaaS) For Dummies, VMware Special Edition, consists of six short chapters that explore how today's workforce has evolved and what it means for desktop computing and businesses (Chapter 1), how to deploy DaaS for your organization (Chapter 2), how to avoid common DaaS pitfalls (Chapter 3), which business use cases make the most sense for DaaS (Chapter 4), why common misconceptions about DaaS are wrong (Chapter 5), and the benefits your organization can realize when you deploy your desktops and apps to the cloud (Chapter 6).

Foolish Assumptions

I assume that you're an IT manager or decision influencer with at least a basic understanding of desktop management, virtualization technologies, and cloud computing. As such, this book is written primarily for somewhat technical readers.

Icons Used in This Book

Throughout this book, I occasionally use special icons to call attention to important information. Here's what to expect:


REMEMBER

This icon points out information you should commit to your nonvolatile memory, your gray matter, or your noggin — along with anniversaries and birthdays!


TECHNICAL STUFF

You won't find a map of the human genome here, but if you seek to attain the seventh level of NERD-vana, perk up! This icon explains the jargon beneath the jargon!


TIP

Tips are appreciated, never expected — and we sure hope you'll appreciate these tips! This icon points out useful nuggets of information.


WARNING

These alerts point out the stuff your mother warned you about. Well, probably not, but they do offer practical advice to help you avoid potentially costly or frustrating mistakes.

Beyond the Book

There's only so much I can cover in 48 short pages, so if you find yourself at the end of this book, thinking, "Gosh, this is a great book — where can I learn more?" just go to `www.vmware.com`.

IN THIS CHAPTER

- Supporting a mobile workforce
- Empowering the modern worker
- Understanding the digital workspace
- Improving security and regulatory compliance
- Simplifying and centralizing desktop management
- Lowering desktop costs

Chapter 1
Recognizing the Changing Workforce

In this chapter, I dig into current trends that are shaping the modern workforce and how these trends affect the desktop computing needs of businesses.

Shifting Toward Mobility

At the risk of stating the obvious, we live in a mobile world. The June 2016 Ericsson Mobility Report estimated that there were approximately 7.4 billion mobile subscriptions worldwide and predicted that number would grow to 9 billion by 2021. The ubiquity of mobile devices has transformed the modern world and created an "always on" connected workplace in which anywhere, anytime access from every conceivable device has become a basic business requirement. Workers demand access to the same tools — including applications and data — that are available to them on their desktop PCs in the office.

A recent Global Workplace Analytics study found that Fortune 1000 companies around the globe are entirely revamping their workspace around the fact that employees are not at their desk 50 percent to 60 percent of the time. Mobile and remote employees increasingly do more of their work outside of the office, and require the same level of access — to online resources, corporate data, and applications — as when they're in the office (see Figure 1-1).

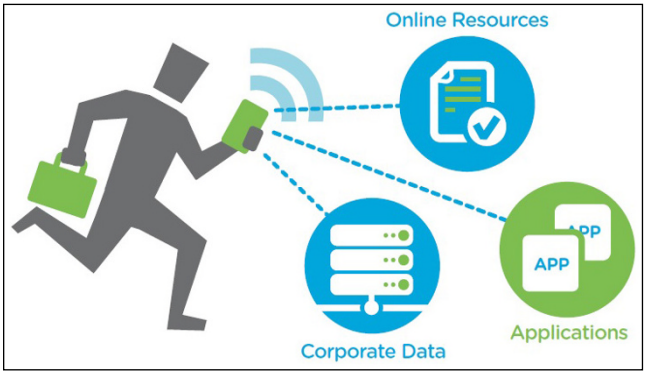

FIGURE 1-1: Employees need access to corporate data, applications, and online resources on the move.


TIP

IDC estimates that 1 billion workers are mobile at least part of the time or remote from their firms' main locations. These workers will be accessing business applications and services from a variety of devices, including tablets and smartphones. Companies need a way to enable anywhere, anytime access for their users.

451 Research estimates that the number of U.S. workers that have access to a mobile device is approaching 100 percent. As more workers gain access to mobile devices as their primary or secondary computing device, the population of PC-only employees will tend to disappear.

For today's IT teams, managing workplace mobility while minimizing security risks and maintaining compliance requirements is a delicate balancing act. Outages and security threats are increasingly costly to businesses (see Figure 1-2).

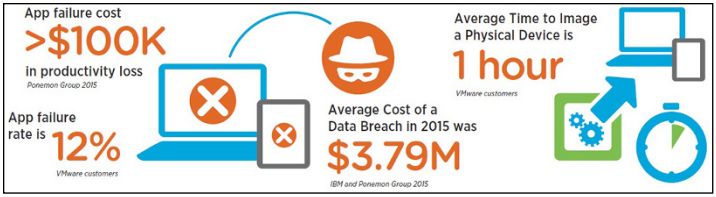

FIGURE 1-2: Supporting desktops and apps is challenging.

Business mobility helps organizations compete more effectively, empowering employees and deepening customer engagement. The digital workspace (discussed later in this chapter) enables enterprises to target key areas of improvement, shifting core business processes and operations to a mobile model. This transformation has the potential to make an organization more competitive and, thus, more successful.

Working Like a Millennial

As the earliest of the Baby Boomer generation begins to retire, today's diverse workforce is increasingly comprised of Generation Xers and Millennials. Not surprisingly, workers from different generations tend to have different work styles and preferences.

For example, Gen Xers in the workplace generally

- Focus on productivity.
- Are efficient.
- Prefer independence.
- Value work/life balance — work and personal life are separate but often overlap.

Millennials in the workplace generally

- Focus on contribution.
- Are collaborative.
- Prefer team-oriented activities.
- Value flexibility to work anytime, anyplace — results matter, not how or where you get it done.

PWC predicts that half of the global workforce will consist of Millennials by 2020. Millennial workers tend to be tech-savvy, having grown up in a mobile, always-connected world. Thus, the workplace is quickly evolving and increasingly accommodating the more autonomous and mobile work style of Millennials.

Defining the Digital Workspace

Two decades ago, enterprises introduced client-server computing into their workplaces. Companies hoped to increase individual productivity by providing every knowledge worker with a laptop or personal computer (PC) running Microsoft Windows.

Fast-forward to today. Technologies and work styles have changed dramatically. The digital workspace is emerging as the new end-user computing platform. Unlike the desktop PC of the client-server era, the digital workspace is not defined by a single image. It's the aggregation of all devices and the apps and services required by users, securely managed and unified by common access and identity.

Today's increasingly mobile workers rely on a variety of devices and applications to accomplish tasks — via desktops, smartphones, tablets, or Internet of Things (IoT) devices. They regularly use various applications — including legacy, desktop, mobile, Software as a Service (SaaS), and cloud —depending on the opportunity, the style of interaction, or the best set of tools for the task at hand. It's up to the enterprise to meet these needs and embrace digital transformation.

Ensuring Better Security and Compliance

In addition to the security benefits of desktop and application virtualization described in the previous section, organizations can reap other benefits.

For example, running a virtualized application enables organizations to effectively run that application in an isolated container on any device. This means that any vulnerabilities that may exist on the endpoint device (such as a virus) will not affect the application.

TIP

Organizations that may be delaying a desktop upgrade (for example, from Windows XP) because they're still running incompatible legacy applications can improve their overall security posture with application virtualization. By running the legacy application as a virtualized application on a server, they can isolate the application from the desktop environment, enabling them to upgrade their desktop operating systems.

Desktop and application virtualization also enables centralized management (discussed in the next section) of the entire desktop environment. This means that organizations only need to apply security patches to a few "golden" images of their virtualized desktops and applications on servers in the data center, rather than on hundreds or thousands of individual physical desktop and laptop PCs. In this way, organizations can be confident that security updates are quickly, consistently, and completely deployed throughout their desktop computing environment.

TIP

Because security and software updates only need to be installed on a few virtualized desktop and application images on servers in the data center — rather than hundreds or thousands of geographically dispersed, individual physical desktop and laptop PCs — organizations can use desktop and application virtualization to quickly reduce their exposure to zero-day vulnerabilities, such as newly discovered malware or application exploits.

Achieving, maintaining, and auditing regulatory compliance is also greatly simplified with desktop and application virtualization. Instead of continually installing, updating, and verifying security patches and anti-malware signatures on hundreds or thousands of individual endpoints — as required by many regulations and security standards, such as the Health Insurance Portability and Accountability Act (HIPAA) and the Payment Card Industry Data Security Standards (PCI DSS) — organizations only need to update and maintain a few virtualized desktop and application images on their servers.

Another compliance benefit of desktop and application virtualization is that data is not stored or processed on local endpoint devices. Therefore, if an endpoint device is compromised, no data breach occurs. Because the endpoint devices in a virtualized desktop and application environment are essentially display terminals, organizations can greatly reduce the scope (and cost) of their regulatory compliance efforts. Also, if a laptop or mobile

device is lost or stolen, because no sensitive data is locally stored or processed, no data breach occurs so the organization may not be subject to breach disclosure laws, as well as legal consequences and brand reputation damage.

Simplifying Desktop Management

As described in the previous section, organizations can achieve huge operational efficiencies through centralized management of their virtualized desktop and application environments. However, these benefits are not limited to security and compliance.

Desktop support teams spend much of their time installing, configuring, testing, packaging, deploying, and verifying new software and software updates across their desktop environments. This process must often be repeated for countless variables, including

- Desktop and laptop hardware models
- Operating systems and patch levels
- Operating system images
- Peripheral devices (such as printers and scanners) and drivers

Desktop and application virtualization abstracts the desktop environment from the endpoint hardware, operating system, and attached devices, enabling desktop support teams to focus their desktop management tasks on maintaining relatively few desktop and application images.

Desktop and application virtualization also enables IT Service Management (ITSM) best practices for incident management by reducing mean time to resolution (MTTR) for many desktop issues. A simple refresh of the virtualized image restores the desktop environment to its original state and, in many cases, resolves the user issue. That's right: Desktop and application virtualization brings back the power of the almighty reboot!

Reducing Total Cost of Ownership

Desktop and application virtualization can produce significant cost savings for organizations, and taking these technologies to the cloud can produce even more dramatic savings. Desktop as a Service (DaaS) drives down operational costs for organizations, on average, 63 percent for desktops, 75 percent for laptops, and 52 percent for traditional virtual desktop infrastructure (VDI).

These operational savings can be achieved through the operational efficiencies that organizations gain through centralized management of their desktop environment.

Further cost savings benefits can be achieved through reductions in capital expenditures (CAPEX) with DaaS. Organizations can extend the useful life of their existing desktop and laptop hardware with DaaS and defer costly upgrades because the desktop and application virtualization technology of DaaS abstracts the endpoint hardware from the desktop environment.

Most organizations apply generally accepted accounting principles (GAAP) rules regarding depreciation schedules (typically five years) to their desktop and laptop hardware. However, as with all things technology related, running a desktop or laptop PC for five years is an interminably long time — typically, such torture is only reserved for your favorite users! For example, many organizations migrating to Windows 10 are finding it necessary to upgrade desktop and laptop hardware that is only two to three years old!

REMEMBER

PCs can consume 7 percent to 10 percent of IT budgets, yet provide no competitive advantage. With continued economic volatility, businesses are keeping a tighter rein on IT expenditures. Wholesale PC refreshes and Windows 10 upgrades are no longer feasible, and the cost of supporting an increasingly dispersed user base needs to be reduced.

IN THIS CHAPTER

- Understanding the basics of desktop and application virtualization
- Choosing between VDI and the cloud
- Making the journey to the cloud with DaaS

Chapter 2
Getting the Most Out of Your Desktops and Apps in the Cloud

In this chapter, you find out about desktop and application virtualization, as well as some of the challenges of deploying on-premises virtual desktop infrastructure (VDI) and why Desktop as a Service (DaaS) may be the right answer for your organization's desktop computing needs.

Desktop and App Virtualization Basics

With desktop and application virtualization, end-user desktop environments (operating systems and applications) are virtualized and run as virtual machines (VMs) on servers in the data center. End users run desktops on the hypervisor, just like virtualized servers. The end-user VM contains the user's operating system (OS), applications, and customizations (see Figure 2-1).

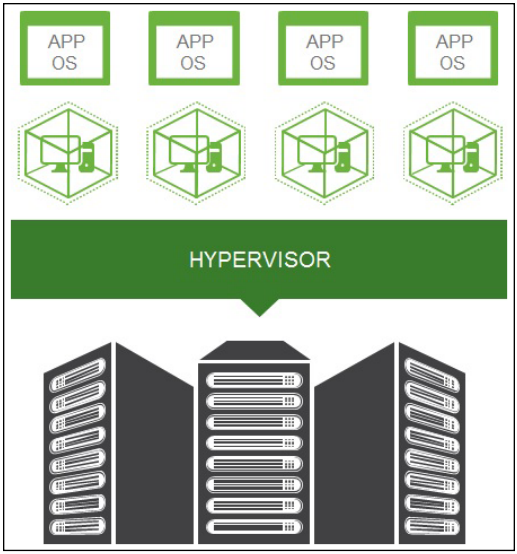

FIGURE 2-1: Desktop virtualization runs the end user's desktop environment (OS and applications) on a hypervisor installed on a server.

TECHNICAL STUFF

A *hypervisor* is software that abstracts the underlying hardware of a host machine (such as a server) from its host OS. The hypervisor creates, runs, and manages VMs on the host machine.

WARNING

Not all applications can be virtualized. Applications requiring device drivers, 16-bit applications, anti-malware programs, and applications that require heavy OS integration can be difficult to virtualize. Also, license management can be a challenge with some virtualized applications.

The end-user virtual desktops are accessed over the network using a remote access protocol, such as the following:

- Remote Desktop Protocol (RDP)
- Blast Extreme
- PC over Internet Protocol (PCoIP)

Unlike server virtualization, desktop virtualization uses a specialized piece of software — known as a connection broker (see Figure 2-2) — to control which users or devices will access which virtual desktops (or pools of virtual desktops).

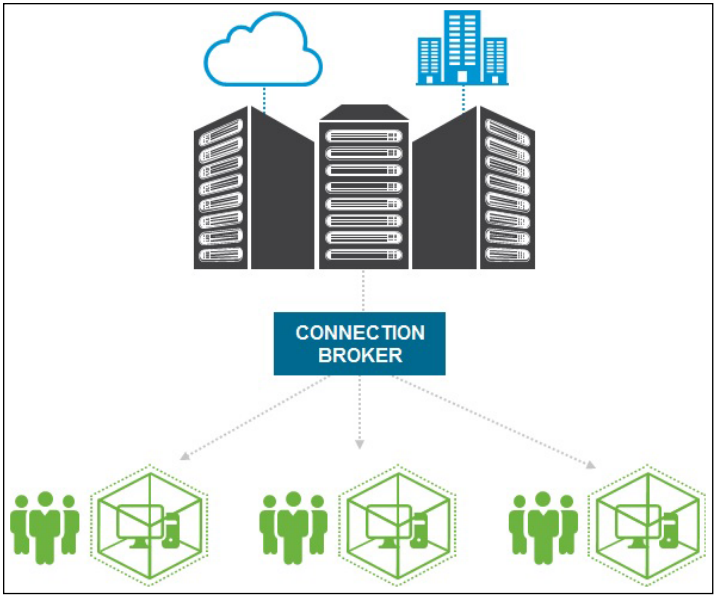

FIGURE 2-2: In desktop virtualization, a connection broker controls which users and devices access which virtual desktops (or virtual desktop pools).

Desktop, laptop, or zero/thin client devices — as well as mobile devices — can all be used to access virtual desktops from anywhere in the world across the Internet, a virtual private network (VPN), or a private wide area network (WAN).

Comparing On-Premises VDI and DaaS

The need to reevaluate desktop strategies is driving many companies to consider VDI. VDI solves many traditional challenges of physical desktops. For example, because virtual desktops are centralized onto VMs that run on corporate data center servers, VDI makes day-to-day tasks such as deploying new desktops and applications and supporting distributed workers much easier and less labor intensive. Users access their virtual desktops via PC remoting technology, making it possible for IT to finely control the movement of data into and out of the data center. Finally, because data is not stored on the local device, companies are at much less risk if PCs or mobile devices are lost or stolen.

Even with all these benefits however, there are some important considerations to take into account before moving forward with VDI:

- **Costs:** In a recent TechTarget survey, more than 32 percent of IT professionals said that implementing VDI in-house is too expensive. Although VDI is less expensive than replacing entire fleets of physical desktop computers, it's important to consider the upfront capital expenditure (CAPEX) investment required to start a VDI deployment. When looking at the upfront costs of a VDI deployment, you must take into account the compute, networking, and storage requirements for the design, along with the data center power, cooling, and floor space needed.
- **Complexity:** The same survey has 21 percent of IT professionals blaming complexity for stalled VDI projects. The technologies needed for VDI (including servers, storage, networking, thin clients, and virtualization software) are provided by many different vendors, causing considerable confusion among IT staff about which technologies to adopt. Additionally, VDI technologies are often managed by different internal IT groups, which can make coordinating virtual desktop initiatives challenging. With VDI, organizations also need to ensure they have the right IT skills and experts to manage their virtualization infrastructure.
- **Ramp up:** Although deploying virtual desktops is much easier than deploying physical desktops, IT must have capacity to deploy them. In the TechTarget survey, 23 percent of IT workers said their existing servers can't support deploying desktops as VMs. This makes it particularly difficult when companies need to scale up quickly to support employees or consultants on time-sensitive or temporary projects. And, because of latency issues, performance is best when users are located near the data centers. However, most companies don't have multiple geographically dispersed data centers to ensure optimal, or even adequate, performance.
- **Strategic or not:** With VDI, companies still need to build and manage infrastructure to support desktops, and most IT departments do not want to be in the business of desktop management.

WARNING

Internal VMware testing has found that on-premises VDI takes up to 70 percent longer to deploy than cloud-hosted desktops and apps.

By moving desktops and applications to the cloud, rather than an internally deployed and managed data center, businesses can realize all the promised benefits of VDI — centralized management, improved data security, and simplified deployment — while avoiding significant costs, limitations, and hassles.

DaaS gives organizations the benefits of VDI without the cost and hassle of managing your own infrastructure, including reduced costs, simplified management, device and location independence, and improved flexibility. Specific benefits of DaaS include the following:

- **For end users:**
  - Work how, where, and when you want.
  - Choose your favorite device.
  - Stop juggling multiple devices.
- **For IT departments:**
  - Eliminate upfront capital and IT labor costs.
  - Simplify desktop provisioning, configuration, and patch management.
  - Integrate fully with corporate infrastructure.
- **For businesses:**
  - Free up financial resources for innovation.
  - Shift IT spend from CAPEX to operating expenses (OPEX).
  - Drive higher employee productivity and morale.

Making the Move to Desktop and App Virtualization in the Cloud

The PC industry is undergoing a dramatic upheaval: Sales of traditional desktop and laptop computers have declined precipitously during the past several years. Still, organizations need to upgrade their users' client systems for a variety of reasons,

including aging PC inventories and requirements for more computing horsepower to run operating systems such as Windows 10. However, organizations of all sizes have been dealing with the harsh economic reality of tighter IT budgets and financial executives' commitment to lower capital expenses for end-user computing infrastructure.

Many organizations have turned to VDI to deliver enhanced desktop functionality without making large investments in desktop hardware. The move to VDI, however, can be tricky for some companies, requiring specialized IT skills that not every company has in-house, as well as a significant upfront capital investment for server and storage infrastructure.

Organizations that need to upgrade or replace their existing desktop PCs are increasingly looking at DaaS as a viable alternative to traditional desktop hardware or VDI deployments.

Many organizations are quickly realizing the benefits of DaaS, including increasing workforce productivity with anywhere, anytime access, improving security and compliance, reducing IT management complexity, and cutting costs.

Deploying on-premises VDI is costly and complex, often requiring IT employees with specialized VDI expertise. Common pain points associated with on-premises VDI deployments include the following:

- Significant upfront capital investments in server and storage infrastructure are often required to build out the VDI environment.
- On-premises VDI customers can't pay for capacity only when they need it. Instead, they must often plan for growth and purchase future capacity well in advance of the actual need.
- On-premises VDI deployments are difficult to quickly scale up and down.
- Building and maintaining on-premises VDI environments can be complex and time consuming.

- Maintaining enterprise service-level agreements (SLAs) can often be challenging, due to variable demand (such as boot storms) and different workload requirements.
- Remote workers often experience poor performance due to lack of proximity to the data center.

Cloud computing has been gaining a tremendous amount of attention because of the flexibility and cost savings it can deliver. Just as virtualization started on the server side and then, once proven, began moving to the desktop, the cloud is now ready for desktop virtualization. The advantages of DaaS include the following:

- **Reduced desktop costs:** Because the physical infrastructure powering virtual desktops is essentially outsourced, organizations are immediately able to achieve a positive return on investment (ROI). Not only does DaaS eliminate VDI's upfront CAPEX outlay, but businesses also convert desktop computing CAPEX into OPEX. Virtual desktops and apps can be subscribed to at a set monthly rate, and businesses only pay for the virtual desktops that they use. This translates into reduced total cost of ownership (TCO) for desktop computing, achieved at the beginning of a cloud-hosted desktop deployment — as opposed to a goal that is 18 to 24 months out. Companies can now budget for a set monthly fee without any hidden costs or surprises.
- **Ease of manageability and one-touch support:** The complexities associated with designing, implementing, and supporting virtual desktops are gone. Cloud-hosted virtual desktops are easy to buy and implement. The physical infrastructure is already available from the provider, and companies outsource all deployment and operations. This also saves money that was traditionally spent on physical desktop maintenance, while minimizing the technical expertise businesses need to leverage virtual desktops. Additionally, because desktops are delivered by a provider over a secure network and supported by a SLA, end users can expect better availability of their desktops than can be delivered with physical PCs, which often require a desk-side visit when things go wrong.

- **Device and location independence:** Businesses can embrace mobile workers by providing device and location independence. End users can work and access corporate applications and data from any device, and because providers have multiple locations, proximity to the data center challenges are eliminated. Users can work from anywhere — such as from home, the office, or a coffee shop.
- **Flexibility:** IT no longer needs to worry about which virtual desktop-related technologies to select, implementing technologies that may become obsolete, or being restricted to a particular vendor's road map.
- **Fast ramp up and down:** Businesses can quickly scale up or down by adding or removing virtual desktops and apps to the monthly subscription in minutes. This allows IT to support challenging projects (both short and long term), such as scaling up desktop environments for seasonal work or quickly deploying desktops for offices in new geographic markets.
- **Geographic agility:** Corporate data center footprints won't constrain virtual desktop deployments. Cloud-hosted desktops can be deployed on a global scale. This allows users to gain access to their virtual desktops from just about anywhere, and businesses to expand the regions where they source talent, because they're no longer limited to corporate offices and internal infrastructure reach.
- **Easy to try and buy:** Because there is no infrastructure or software to deploy, businesses can quickly and easily try cloud-hosted virtual desktops before buying.

REMEMBER

VDI will continue to be an attractive solution for organizations wanting to move from physical to virtual desktops, but DaaS is a great fit for organizations that lack internal VDI technical skills or may not be able to commit to VDI's upfront capital investments.

IN THIS CHAPTER

- Working with your users through the planning, assessment, and pilot phases
- Understanding user requirements for different use cases
- Optimizing performance across the entire computing environment
- Planning for application virtualization and deployment

Chapter 3
Avoiding Common DaaS Pitfalls

A well-designed Desktop as a Service (DaaS) environment can provide users with much of the same functionality and performance of desktop operating systems and applications, along with higher availability and a lower risk of hardware failure.

In this chapter, I explain how you can achieve these benefits in your environment by recognizing and avoiding some of the common pitfalls of DaaS projects.

Getting Users Involved

From the outset of a DaaS project, end-user involvement is essential to properly understand how workers perform their day-to-day jobs. This is one of the keys to ensuring that you've gathered the full range of user and business requirements and you have a clear definition of the problem you're solving.

For example, a DaaS project that is focused on reducing costs will have very different requirements and priorities than a project that is aimed at enhancing functionality, like increased data security or disaster recovery capabilities. Instead of diving straight into technical requirements, begin by exploring user needs, business drivers, and special requirements. These special requirements might include compliance issues, disaster recovery plans, or even the need for the business to rapidly onboard large numbers of new users due to mergers or acquisitions.


TIP

Involve users throughout the life of the project. Interview representatives from business units to understand their requirements and what they perceive as the current shortcomings of the existing desktop environment. During rollout, provide users with a questionnaire to give them the opportunity to express their opinions of the DaaS deployment.

User involvement throughout the process is also one of the keys to managing expectations and, ultimately, gaining acceptance of the DaaS solution. Even the most technically well-executed DaaS project can fail if enough users have the perception that it doesn't meet their needs or expectations.


REMEMBER

Users who have input into the design of the environment are more likely to be supportive of the result. Users are key stakeholders in a DaaS project, and they should be treated as such, because their acceptance and use of DaaS will be the ultimate key performance indicator on which the success of the project is judged.

Conducting a Pre-Assessment

The desktop and application pre-assessment helps you gain an understanding of the workloads that will run in the virtualized client environment and their associated technical requirements. The information gathered in this phase of a project is critically important to the design of the DaaS solution. Without a pre-assessment, assumptions will be used to design the solution, which adds risk to the project.

The pre-assessment considers the applications your workers are using, how long it takes to launch them on a physical desktop, and how they perform on a physical desktop. The pre-assessment

can be useful to determine how many users are actually running specific applications (and when), which may impact the way the applications are delivered to the users or the license requirements for the applications.

Many vendors provide desktop and application pre-assessment software. These products typically use an agent installed on the local desktop that feeds metrics into a central reporting server. Reports can be generated from the administrative console to provide a detailed analysis of the current desktop environment. The reports generated by the pre-assessment software give you key metrics about the performance of your existing environment, so a DaaS environment can be properly designed to meet the performance and latency requirements of your end users.

Managing a Pilot Project

Organizations that skip the pilot phase, or run a pilot that doesn't produce a clear outcome, risk failure when an environment goes into production or never moves out of the pilot phase. The pilot should have clearly defined objectives and a specified time frame. Objectives of the pilot may include validating performance data and surveying end users.

A properly managed pilot should engage real users from various use cases to pilot the environment and generate meaningful load data. Although IT administrators are often the first to want to use the DaaS environment, they aren't a good group to base the pilot on, because they aren't representative of your entire organization's user base.

If the goal is to include an executive user in the pilot, make sure that the environment has been thoroughly tested and the support processes are in place to provide the service level this user would require. In general, the pilot should also engage the desktop support teams to provide end-user support to prevent the project team from attempting to provide 24x7 support to users.

Defining DaaS Use Cases

DaaS use cases are built on types of workers and their job requirements, the applications and devices they use, their requirements for storage and multimedia performance, and their network connectivity restraints.

In defining use cases, it's important to consider the culture of the organization and its attitudes toward the use of infrastructure. Does the organization allow multimedia streaming? Does it have teleworkers who watch high-definition video? The answers to questions like these should be factored into use cases.

For example, if users had no business requirement to stream video, but the practice was allowed in the work environment and frequently done, then taking away this capability with the rollout of DaaS could lead the users to have a negative view of the solution, despite fulfilling the needs of their job descriptions. The use case should then assume users will stream video. In designing the DaaS solution, you'll want to consider the impact of video streaming. Traditional desktops typically provide an abundance of resources to users and saturation of a resource doesn't affect other users. But with DaaS, resources are shared and utilization of resources is designed to be more efficient.

The goal is to ensure that users receive the resources and system performance appropriate for the work they do and the way they currently perform their tasks.

WARNING

In developing use cases, take care to not oversimplify, such as lumping lots of workers into a generic category called "office workers." In practice, different users within the same office setting likely run different applications and have varying performance requirements.

Optimizing the Desktop Image

A common pitfall is to not properly optimize the desktop image or Standard Operating Environment (SOE) for DaaS. This skipped step might stem from a requirement to manage virtual desktops the same way existing physical desktops are managed. But virtual desktops are quite different from physical desktops, in part

because they live in a world of shared resources, and they should be optimized accordingly.

Optimizations include disabling unused Windows services, streamlining the Windows user experience, and ensuring that the optimal virtual hardware is selected. When applied across an environment, optimizations of the desktop image can save precious resources, such as network bandwidth and storage capacity, while enabling a better user experience.

WARNING

There is also a risk of over-optimizing the desktop image. You can over-optimize to the point of affecting system usability by disabling services that the users or applications may need or expect.

To avoid this pitfall, work with your users by conducting surveys or workshops with business unit representatives to understand the impact of optimizations. For example, while it may reduce bandwidth consumption, how will users react if you disable their desktop themes? And although it may help reduce disk growth, what will happen if you disable the recycling bin in the desktop image? Will users accidentally delete files? You want to understand the answers to such questions before you move down the optimization path.

Understanding Impacts to the Performance of Other Systems

In a traditional desktop environment, each user has full access to a disk, and occasionally slow networks could generally be tolerated. When moving to DaaS, it's important to understand the full range of performance impacts stemming from network bandwidth and display protocols, among others.

Ideally, performance impacts should be fully explored through engagement with users. Your users can help you generate realistic proof-of-concept or pilot workloads to validate their requirements for graphic bandwidth, storage, I/O, and more.

TIP

Network bandwidth is an especially important consideration on wide area network (WAN) links. If your WAN links can't provide the bandwidth for a DaaS environment or the latency is too high, then you might want to consider local deployments.

Developing an Application Deployment Strategy

An organization with several thousand employees may have users on a couple hundred different applications, including specialty applications for specific job functions. The organization may have existing application deployment strategies for commonly used applications, but specialty applications may have been overlooked because it was easier to simply install these applications for the small number of users who required them.

Cases like these underscore the need for a deployment strategy for all applications. The application deployment strategy will have a direct impact on the way the virtual desktop environment is designed. If applications are installed on user login, this limits the design choices, but a DaaS environment can still be properly designed to meet this constraint.

Before rolling out a DaaS environment, you need a clear understanding of how you'll deploy, update, and manage applications that are common across the user base, that are used only by certain user groups, and that are used by just one or two users.

Consider how applications will be packaged and the impact on performance if updates need to be pushed out to a large number of desktops in a short amount of time. Application virtualization may be challenging for some applications, but it could provide management benefits that outweigh the costs to package the applications.

IN THIS CHAPTER

- Going to the cloud for all your organization's computing needs
- Making the most of your IT resources with DaaS
- Extending desktop services to remote users everywhere
- Ramping up virtual desktops to meet temporary demand
- Deferring desktop hardware upgrades for Windows 10
- Preparing for disaster recovery

Chapter 4
Exploring Cloud Desktop and Apps Use Cases

Businesses can realize a substantial impact on their operations by leveraging Desktop as a Service (DaaS) for key use case scenarios. In this chapter, I outline some ideal use cases for virtualized desktops and apps in the cloud.

Enabling a "Cloud First" Strategy

The cloud is an integral part of business strategies today as companies of all sizes in all industries seek competitive advantage by leveraging agility and innovation in the cloud. Many businesses are now adopting a "cloud first" strategy, including Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS), as their preferred "go-to" model over traditional on-premises data center deployments. For these organizations, DaaS is the next logical evolution in their cloud-first strategies.

Maximizing Limited IT Resources in Small and Medium Businesses

Desktop and application virtualization isn't just for large enterprises. Small and medium businesses that have little or no organic IT resources can enjoy the benefits of desktop and application virtualization with DaaS. Just as IaaS, PaaS, and SaaS cloud offerings obviate the need for businesses to invest in costly server, storage, and networking infrastructure and specialized IT skills, DaaS obviates the need to invest in costly virtual desktop infrastructure (VDI) and specialized IT skills.

Securely Supporting Remote Workers

Whether they're telecommuting, working offshore, or contracting, remote workers represent an ever-increasing proportion of the workforce. With DaaS, businesses can support geographically dispersed workers in a cost-effective and secure manner. Contractors can easily access the corporate environment from their personal devices, and employees can access their desktops and apps whether they're at home or on the road — even when they don't have their own computers. Overseas workers can be granted access to the corporate network without concern that sensitive data will be at risk from loss or theft because it isn't stored or processed locally — it's only displayed.

SEVENTY SEVEN ENERGY GOES 100 PERCENT CLOUD IN ONLY FOUR MONTHS

Seventy Seven Energy (77NRG) is a diversified oilfield services company providing a wide range of services and equipment to U.S. land-based exploration and production customers. Through its affiliate network, the company provides comprehensive upstream services, including drilling, pressure pumping, and oilfield rental tools.

77NRG needed a virtualization solution that could scale quickly to support thousands of users under a tight deadline. With a small

IT staff and limited resources, the company wanted a complete cloud-hosted solution. With a combined VMware Horizon Air, VMware vCloud Air, and AirWatch Enterprise Mobility Management solution, 77NRG successfully delivered virtualized resources to 2,500 employees in just four months.

The challenge

77NRG employees are often at oil wells and pumping locations to support customer drilling activities. These employees use laptops and mobile devices to access information. However, most devices lacked easy access to important productivity applications and enterprise resources in the field. This slowed down productivity and made it difficult for field employees to complete tasks without requiring a trip to the office. Another challenge was the lack of a centralized management platform for the small 77NRG IT department to consistently configure employees' devices and applications efficiently.

77NRG also faced a pending divestiture from a major stakeholder in its business. The company had a short timeline to equip its more than 2,500 users with a usable solution without interrupting business. Working within the volatile oil and gas industry, the company needed a way to quickly scale its deployments up or down based on acquisition/divestiture cycles and to meet market demand.

The solution

In just four short months from planning to execution, 77NRG fully deployed VMware and AirWatch solutions to establish a cloud-based, centrally managed infrastructure for its more than 2,500 field employees. The company leverages VMware vCloud Air to bring its directory services, applications, and internal resources to the cloud and simplify management for its IT team.

The company delivers virtualized desktops to employees using VMware Horizon Air. Employees get a familiar desktop experience across devices and can easily access important productivity applications for their jobs from anywhere. 77NRG also employs AirWatch Enterprise Mobility Management to deliver security and streamline application deployment to corporate and employee-owned mobile devices.

Business results and benefits

VMware and AirWatch bring cloud-based virtualization, hosting, and scalability to 77NRG. Field employees at oil drilling or fulfillment

(continued)

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sites can now access crucial desktops, applications, and resources from anywhere, increasing their productivity and effectiveness with customers.

77NRG employees work more efficiently while onsite with customers. These employees carry AirWatch-managed mobile devices or laptops in the field to access important enterprise resource planning (ERP) applications through Horizon Air. This makes it simpler for employees to use a single device for all work activities.

With fully connected mobile devices, 77NRG employees can stay in the field longer. If employees don't have the applications they need, the company can now deliver those applications remotely. If a device is lost or broken, employees can quickly get a new one and enroll it in AirWatch to receive applications and enterprise resources. Users can continue working with little interruption.

VMware solutions provide a highly scalable cloud-based deployment for 77NRG. By using vCloud Air to support its Horizon Air and AirWatch deployments, 77NRG stays agile in the market without incurring the additional costs or workloads associated with on-premises architecture. Its IT team has more time to help employees instead of maintaining and fixing physical servers.

Delivering Elastic and Flexible Demand for Desktops

Many organizations often need to quickly ramp up desktop computers to meet short-term needs. For example, developers may need multiple desktops to build and test new apps, a call center may hire additional seasonal employees during the holiday season, or an accounting firm may hire temporary employees to augment their staff during tax season.

DaaS provides these organizations with the ability to quickly deploy a fully functional desktop environment to new or temporary employees. The organization only pays for the desktops they use, and as soon as the need passes, the virtual desktops can be decommissioned.

ZEBRA TECHNOLOGIES RAPIDLY DELIVERS DIGITAL WORKSPACES POST-ACQUISITION

Founded in 1969, Zebra Technologies Corporation started out as a leader in barcode printers and readers, providing companies with real-time manufacturing and logistics. In 2013, Zebra added to its portfolio of tracking and visibility technology with the Internet of Things (IoT) platform, Zatar. In 2014, Zebra acquired the enterprise business unit of Motorola Solutions, Inc., and now more than 7,000 employees in more than 110 offices around the world support the development and sales of Zebra software and hardware solutions.

Zebra holds more than 4,200 asset management technology patents and employs more than 1,700 engineers. That commitment to innovation has landed Zebra on Fast Company's Most Innovative Companies of 2016. Today, Zebra's primary mission is helping its global customer base, including more than 95 percent of Fortune 500 companies, harness real-world data for actionable business intelligence.

The challenge

Zebra Technologies needed to provide a digital workspace that would allow both existing and newly acquired employees to access the company network from anywhere. IT was exploring a hybrid-cloud approach for desktops to provide that flexibility to remote developers.

Meanwhile, Zebra was merging the business units and employees it acquired from Motorola, as well as the legacy technology it was still paying Motorola to use. IT was tasked to quickly move thousands of newly acquired employees onto the Zebra virtual desktop infrastructure (VDI) while gaining access to the Motorola infrastructure (complicated by the sensitivity and presence of government-serving business units). IT had no time to trial multiple solutions. It just needed everything to work — and fast.

The solution

The company knew that virtual desktops were the most cost-effective solution for end users' long-term needs. A significant portion of

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Zebra's employees are developers who often need access to multiple desktop environments to test and write code for the devices and solutions in Zebra's expanding technology portfolio. Cloud-hosted virtual desktop solutions are easier to test for development, and they give IT the organizational agility and flexibility it needs to easily manage infrastructures post-acquisition.

Zebra's IT organization tested an instance of VMware Horizon Air in the vCloud Air data center, and to the surprise of IT, the new cloud-based VDI solution just worked. After the proof of concept, Zebra purchased hundreds of Horizon Air cloud-hosted virtual desktops and started migrating end users. Horizon Air delivered high-level desktop performance, particularly when it came to the display protocol. Because response time was a priority for Zebra's end users, Horizon Air's responsive, adaptive, bitmap-streaming capabilities proved invaluable. The PC over Internet Protocol (PCoIP) remote display protocol and the Horizon Client provide real-time delivery of rich desktop experiences, making this a great solution for end users.

Horizon Air also provided a better end-user experience from anywhere, with productivity-enhancing features like single sign-on (SSO), and with Horizon Air, Zebra's IT team could deploy desktops in hours — if not minutes.

Business results and benefits

Zebra's entire VMware rollout, including vCloud Air and VMware vSphere, helped IT serve the company's most pressing need: speed. With VMware technology, IT quickly delivered cloud-hosted solutions and moved Motorola employees off legacy technology that was costing Zebra more than 98 percent of their resources to use per day.

Cloud-hosted virtual desktops and applications, along with VMware vRealize Suite, will also help Zebra's IT organization drive IT as a Service at the right time and at the right cost. VMware manages the backend infrastructure as a fully managed enterprise service, freeing up IT resources from desktop administration tasks for transformation and innovation.

Looking ahead

The initial surge of virtual desktops for developers was just the start. The Zebra IT team is now moving forward with Horizon Air as its

primary virtual desktop solution and continuing to transition engineers and other lines of business off legacy technology.

Soon, IT will enable end users to self-provision virtual desktops and apps directly from a service catalog. ServiceNow, integrated with VMware vRealize Automation, will route requests through an automated workflow, further simplifying Horizon Air deployments.

Zebra's IT organization is also currently in the planning stages to deploy the VMware AirWatch Blue Management Suite to manage and secure 5,000 Android mobile devices. Horizon Air and AirWatch will enable the utmost flexibility and productivity by giving users access to any app on any device.

Migrating to Windows 10

Many organizations migrating to Windows 10 are unexpectedly forced to upgrade much of their desktop hardware to meet the minimum requirements for running Windows 10. The time and expense associated with purchasing and installing new desktop hardware can quickly derail a Windows 10 migration project.

Instead of replacing or upgrading desktop hardware to run Windows 10, businesses can use their existing desktop hardware to run a virtualized desktop hosted on servers in the cloud. Not only will businesses save money that would have been spent on near-term PC refreshes, but with DaaS they can extend the life of their existing desktops beyond what would have been possible. When they do decide to replace their desktops, they can do so with less costly and more power efficient thin client devices.

Providing Desktop Disaster Recovery Capabilities

Many companies invest heavily in business continuity and disaster recovery planning for their data center infrastructure, but largely overlook their desktops and applications. The cloud has enabled organizations to deploy geo-redundant server, storage, and networking infrastructure so that the business impact of even a large-scale disaster can be mitigated.

However, many of these business continuity and disaster recovery plans are contingent upon end users being able to access core business applications and data from their own home desktop computers or corporate laptops. But what if your employees' home computers can't run your corporate apps? Perhaps their home computers aren't powerful enough or are running an incompatible operating system (such as Windows XP or macOS). And what if they don't have all the desktop applications they need to be productive (such as Microsoft Office)? Worse yet, what if an employee's home PC is infected by a virus or some other malware? Your sensitive corporate data could be compromised during a disaster when your organization is most vulnerable. Even with a virtual private network (VPN) connection that provides secure access to your corporate network, a compromised endpoint can expose your network to a potential security breach.

Cloud-hosted virtual desktops provide a cost-effective desktop disaster recovery solution that can be implemented easily and rapidly to ensure all your employees can work productively outside the office — even in the event of a disaster.

IN THIS CHAPTER

- Taking it slow (or fast) with DaaS
- Assessing hardware and software costs
- Addressing user experience concerns
- Keeping desktops and data secure

Chapter 5
Ten Common Myths about DaaS

Here are ten common myths about Desktop as a Service (DaaS):

- **It's all DaaS or nothing.** Some organizations mistakenly believe that DaaS is an all-or-nothing proposition. The reality is that you can deploy DaaS for only certain users based on their work styles and needs, or you can "rip off the Band-Aid" and deploy it to your entire organization. As users become accustomed to DaaS and its benefits, word-of-mouth testimonials are likely to spread and user adoption will increase.

  You can roll out DaaS as quickly or as cautiously as your business needs dictate. Perhaps you'll choose to deploy DaaS to individual departments, or as part of a desktop hardware refresh or Windows 10 migration. Because DaaS is usage based, you can add users to your subscription as needed, as well as decommission or reprovision desktops as needed.

  
  TIP

  Migrating users to DaaS is also easier than you may think, especially compared to replacing desktops or laptops. You can copy users' existing settings to a server to be applied to their DaaS desktops when they log in, and they can customize their desktops to look and feel exactly as they'd like. It's simple, fast, and requires little to no user training.

- **DaaS is too expensive.** A traditional virtual desktop infrastructure (VDI) requires large upfront capital expenditures for servers, networking, and storage. DaaS offers an alternative approach with no upfront capital expenditures and lower ongoing operating expenses, including support and maintenance costs. Rather than providing your own infrastructure, you're utilizing a DaaS service provider environment. And because you pay only for the resources you use, the costs associated with DaaS are predictable.

  DaaS also minimizes downtime and lost productivity because users don't have to wait for a desktop issue to be resolved. Repairing a virtual desktop is as easy as refreshing it with a new virtual machine (VM).

TIP

- **You can't do DaaS under Microsoft licensing.** Given the challenges imposed by Microsoft licensing, a common myth about DaaS is that it is neither technically viable nor cost-effective. False.

  For a dedicated Windows desktop, a DaaS service provider can run dedicated servers for each customer, and the end customer uses Microsoft virtual desktop access (VDA) licensing for the Windows desktops. If your organization has a Microsoft Enterprise Agreement with Software Assurance for your end-user devices, VDA licensing is included and allows you to access the virtual desktop. A multitenant DaaS platform can be leveraged for the management layer, reducing the costs of management, shared storage, and networking.

  For a shared or dedicated Windows Server operating system (OS), Windows Servers can be licensed using a service provider license agreement (SPLA). In this case, DaaS service providers can rent a Windows Server to a customer on a monthly subscription basis. The DaaS multitenant platform can provide the ability to partition a server and share it with multiple customers. This is done securely by providing separate datastores and virtual local area networks (VLANs) per customer, allowing the service provider to fully utilize available compute resources.

- **DaaS delivers poor user experience.** The truth is that the DaaS user experience can be as good as — if not better than — a rich client experience, and significantly better than a shared Terminal Services–based desktop.

DaaS enables rapid servicing of users who may be physically far away from the datacenter. By partnering with a DaaS provider, you can leverage global datacenters with world-class infrastructure that is close to your users, resulting in sub-20-millisecond latency. DaaS service providers also allow you to choose best-fit protocols for task workers, graphics and video needs, and mix-and-match services, depending on the specific use case.

- **DaaS requires lots of bandwidth.** This is a common misconception because people erroneously believe they'll be downloading a "desktop" every time they use DaaS. Typical residential digital subscriber line (DSL) Internet download speeds are more than sufficient for DaaS.

  When you connect to DaaS, the entire display is initially "painted." However, as you continue working, only the display pixels that change are sent from the DaaS provider to the endpoint. Thus, most of the bandwidth that is consumed in DaaS is downlink, which works well with DSL and broadband cable Internet service providers (ISPs), because they offer download speeds that are usually several orders of magnitude greater than upload speeds.

- **The disconnected use case is a deal breaker.** Cloud-hosted desktops, as well as traditional VDI, require the user's device to be connected. However, this is not a big issue for businesses. In fact, Wi-Fi and 3G/4G are so prevalent that there are few, if any instances, where an organization can't adopt DaaS and reap the substantial benefits of cloud-hosted desktops due to lack of connectivity.

  The reality is that most users have little or no use for a disconnected desktop. Without access to the Internet, a desktop or laptop computer today is like a car without tires! It's a nice expensive piece of hardware, but what good is it if you can't go anywhere?!

- **Only shared session-based desktops can be used for DaaS.** Many people believe that you can only use a shared desktop technology like Terminal Services to deliver DaaS. This is true for traditional VDI technology. However, VDI technology with true multitenancy can deliver full-featured VDI desktops.

  A dedicated virtual desktop delivers a user experience that surpasses that of Terminal Services, making the DaaS user experience consistently strong regardless of how many

WARNING

people concurrently access their desktops. A dedicated desktop allows users to work with their desktops in the same manner they work with their traditional physical desktops.

Even if only shared desktop technologies could be used for DaaS, they wouldn't necessarily be appropriate for all users. Commonly used online services, such as WebEx, Skype for Business, and Dropbox, could not be locally installed on a shared desktop, limiting the effectiveness of a shared desktop for many business use cases.

- **DaaS doesn't support BYOD.** Not only is bring your own device (BYOD) supported, but DaaS makes it much easier to implement and manage BYOD. Employees can get their Windows desktops on whatever device they choose, including iPads, MacBooks, Chromebooks, smartphones (tiny, but they work), and more.

  DaaS users can easily keep their work lives and personal lives separate, without having to carry two or more devices. Inside the virtual desktop, DaaS ensures secure, policy-controlled access to the corporate network while everything outside the corporate virtual desktop is managed by the users.

- **DaaS won't work with your onsite IT assets.** Wrong again. Just because your desktop is in the cloud, it doesn't mean you can't access IT assets located onsite. DaaS is designed to work securely and reliably with virtually any onsite IT asset, including the following:

  - Shared storage (such as mapped drives on network-attached storage [NAS] appliances)
  - Enterprise applications (installed on servers in your datacenter)
  - Networked printers, copiers, and multifunction devices
  - Cameras, scanners, and scales (for example, connected to a shipping terminal in a warehouse)

- **DaaS security is lacking.** Well, DaaS security *is* lacking . . . in complexity! With DaaS, all your data is stored in the cloud or in your corporate datacenter, rather than on the local hard drive of a physical desktop or laptop. If a physical device is lost or stolen, there's no data (not even an operating system and software, for that matter) to be compromised — no sensitive documents, customer information, saved

passwords, bookmarked websites, vacation photos, nothing (unless, of course, you taped a Post-it note with all your passwords on your laptop)!


TIP

DaaS can significantly reduce regulatory compliance, security breach, and legal costs. Because no data is stored or processed on a DaaS endpoint (it's essentially a display terminal), many DaaS user endpoints can be considered out of scope for regulatory compliance purposes. If a DaaS endpoint is lost or stolen, because there is no locally stored data on the device, there is no data breach to disclose — which means no remediation costs, brand reputation damage, or loss of customer confidence. Finally, if your organization is ever subject to legal discovery, the scope (and cost) can be greatly limited if none of your data is stored on local hard drives.

Enforcing desktop security settings (such as endpoint firewalls, malware protection, and local administrator permissions) is simpler with DaaS because these settings can be centrally configured and maintained on a few DaaS "golden" images built for your different worker personas, rather than on thousands of physical desktops and laptops. Likewise, security patches and software updates only need to be installed on the DaaS images, rather than on all your physical devices.

IN THIS CHAPTER

- Ensuring performance and productivity on any device
- Taking back control of your desktop environment
- Improving IT efficiencies and reducing costs

Chapter 6
Ten Key Benefits of DaaS

Here are ten benefits of Desktop as a Service (DaaS) for businesses of all sizes:

- **Support pervasive mobility.** The bring your own device (BYOD) movement is now a tidal wave throughout organizations, with users clamoring for mobile access to applications, data, and services via their own familiar personal devices.

  DaaS helps ensure a consistent user experience, regardless of device format or brand, while standardizing deployment, security, and support. In an era where telecommuting and remote office computing are increasingly the norm, DaaS is an ideal solution for geographically dispersed workforces. This is particularly the case in "always-on" global industries like financial services, retail, and hospitality.

- **Improve anytime, anywhere performance.** Today's end users expect to be able to work anytime, anywhere, on any device with access to the same capabilities, applications, and data as in the office. Desktop and application virtualization technologies enable the same user experience both in and out of the office, but deliver less than optimal performance when users are not near on-premises data centers. This unfortunately can cause user frustration and inhibit user adoption.

DaaS helps organizations deliver a seamless user experience anywhere in the world by leveraging world-class infrastructure in global data centers. Users automatically connect to the nearest data center to securely access their desktop environments, thereby reducing network latency and improving overall performance.

- **Drive greater user productivity.** When users can access their same desktops and applications from anywhere, at any time, and on any device, they're more productive. They don't lose time familiarizing themselves with a different desktop environment or customizing settings every time they log in.

  Protocols such as PC over Internet Protocol (PCoIP) and Blast Extreme in virtual desktop infrastructure (VDI) technology make the most efficient use of limited network bandwidth, by only sending the display pixels that change over the network, rather than redrawing an entire display. In this way, users can continue to work as productively as if they were on a physical desktop or laptop PC with a locally installed operating system and applications — no typing in data, then waiting several seconds for the display to refresh.

- **Enhance security and compliance.** Security breaches often take place at the edge of the network. So, DaaS is an attractive security option because data and applications reside in the cloud, rather than on vulnerable end-user devices. DaaS also helps alleviate another challenge associated with BYOD by enabling a consistent set of security controls across mobile devices, regardless of operating system or hardware.

  Finally, cloud service providers typically have far greater security resources available to them than in-house IT staff. Thus, DaaS customers can leverage the security expertise of their service providers to improve their security and compliance posture.


TIP

  You can find out more about the security advantages of DaaS in Chapter 5.

- **Maintain control and privacy.** A common misconception about cloud computing, in general, is that organizations give up some of their control and privacy in the cloud. But ironically, the cloud can actually enhance an organization's ability to control its computing environment and the privacy of sensitive data, particularly with respect to DaaS.

Organizations can create standard desktop images in the cloud, and deliver a desktop environment to their users on any device running any operating system. Virtualized desktops can be persistent (enabling users to save custom settings) or nonpersistent (no changes are saved after the user logs out) based on the organization's and individual user's needs.

Data privacy is ensured in DaaS because no data is ever downloaded, stored, or processed on the local device — it's only displayed on the device. The organization can store data in an on-premises data center or in a public cloud, and apply any appropriate security safeguards, such as encryption, anti-malware protection, data loss prevention, and access permissions, as needed.

- **Eliminate "shadow IT".** Shadow IT cultures often emerge when IT organizations are inflexible or unresponsive to end-user needs. This lack of flexibility and responsiveness, perceived or real, may be the result of the following:
  - Budgetary constraints that make it infeasible for users to always get the "latest and greatest" desktop or laptop PC, mobile device, or apps
  - Security and compliance restrictions that require a "locked-down" configuration that does not allow users to customize their desktops or install their own apps
  - Limited IT staff resources that are constantly absorbed in daily administration tasks or engaged in reactive "firefighting"

  DaaS can help organizations eliminate many of the causes of a shadow IT culture by enabling BYOD policies so that end users can use their own personal devices to get work done, without compromising on standards and security. DaaS also frees up IT staff by empowering end users with self-service tools, centralizing and simplifying desktop management (discussed later in this chapter), and accelerating mean time to resolution (MTTR) of desktop issues. (Many common issues simply require the user to reboot his virtual desktop to get a new image.)
- **Enable faster and easier deployments.** The quest for organizational agility and flexibility is a key driver in trends such as hiring temporary workers or consultants for short-term opportunities. Organizations can no longer tolerate

days- or weeks-long time frames for deploying desktops for new employees or "as-needed" personnel. DaaS gives organizations the ability to provide desktop resources — with all the necessary access and permissions — in a matter of hours or even minutes.

Another challenge that DaaS helps to address is the inevitable upheaval associated with managing disparate infrastructure resulting from corporate mergers and acquisitions. DaaS can eliminate a major headache for IT organizations, which often struggle to integrate new corporate systems and applications extremely quickly, then deploy them to desktops across the enterprise — without overhauling IT infrastructure.


TIP

Other rapid deployment DaaS use cases include the following:

- Eliminating costly downtime and lost user productivity due to desktop support issues that would otherwise require rebuilding an image or reinstalling software
- Enabling DevOps teams to quickly provision temporary environments for development and testing
- Mitigating deployment challenges during business continuity and disaster recovery and (BC/DR) events

- **Reduce costs.** One of the biggest challenges IT organizations face today is finishing — or, in some cases, even starting — a migration to Windows 10, which almost always requires upgrades to desktop hardware. Thus, many organizations are moving to DaaS to avoid potentially large capital expenditures (CAPEX). Removing or reducing a large CAPEX category like desktop hardware costs from the financial ledger, and replacing it with operating expenses (OPEX) like cloud-based subscription services, is advantageous for many businesses.

  At the same time, DaaS helps to control operating costs by reducing the need for IT deployment resources and in-house technical support, as well as having predictable, subscription-based costs that are less likely to throw a wrench into corporate financial planning.

- **Centralize and simplify desktop management.** Managing hundreds or thousands of desktop and laptop PCs is a daunting challenge for any IT organization. Even with remote

management tools that enable centralized deployment of packaged applications, security updates, and policy changes, desktop support teams struggle with issues such as bandwidth consumption, improper sequencing, failed updates, and compliance verification.

Desktop and application virtualization enables true centralized desktop management, while DaaS goes a step further by eliminating the need to manage the underlying VDI hardware and providing simple, intuitive self-service tools. Persistent and nonpersistent desktop "golden" images can be created for different work personas and updated in a single location, as necessary. For example, rather than pushing out an anti-malware signature update to hundreds or thousands of endpoints, a single image (or a few images for different work personas) can be updated with the new signature file. This approach not only reduces the consumption of network and processor resources, but also reduces the window of vulnerability against zero-day threats.

- **Leverage expertise across the cloud.** Server virtualization is a mature technology that is well understood and widely deployed in data centers everywhere. Desktop and application virtualization, by comparison, is relatively less well understood and often requires specialized IT skills to successfully deploy to an organization. Deploying an on-premises VDI can be a costly and complex undertaking (as explained in Chapter 3).

  Unfortunately, few IT organizations have the luxury of bigger and more specialized IT staff today than they did even a few years ago. So, leveraging expertise across the cloud is an important "force multiplier" for organizations planning to deploy desktop and/or application virtualization. DaaS doesn't require the same level of expertise and experience that VDI deployments require, which cuts down on deployment and support requirements for in-house staff. Time, money, and talent otherwise spent on transitions to virtual desktops can instead be allocated to transformative applications and other sources of IT-enabled innovation.

Empower mobile workers with Desktop as a Service (DaaS)

The desktop PC market is ripe for change. Windows 10 migrations, new flexible business models, the need to reduce desktop hardware costs, demand for mobile device support, and increasing adoption of cloud technologies are all driving organizations to re-evaluate their desktop environments. Desktop as a Service (DaaS) eradicates the barriers to virtual desktop adoption, such as large upfront capital costs and the need for specialized IT skills, delivering a complete desktop environment to end users from the cloud.

Inside...

- Simplify your Windows 10 migration
- Reduce the impact of zero-day threats
- Lower desktop operating expenses
- Extend the useful life of your endpoints
- Centralize IT desktop management
- Maximize limited IT resources
- Empower your users with self-service tools

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