Application & Desktop Delivery

Parallels Special Edition

by Lawrence C. Miller
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Introduction

Applications are essential to the businesses and organizations of all sizes and in all industries. End-users need to have continuous and reliable access to their applications whether working in the office or remotely, at any time of the day or night, and from any device.

With the advent of cloud computing, office desktops with installed applications (that had to be constantly updated) have become a thing of the past — application streaming, virtual desktop infrastructure (VDI), and hosted applications are the future (and the present, for that matter).

Application virtualization is an easy way to manage, distribute, and maintain business applications. Virtualized applications run on a server, while end-users view and interact with their applications over a network via a remote display protocol. Remote applications can be completely integrated with the user’s desktop so that they appear and behave like local applications.

Today, you can dynamically publish applications to remote users in several ways. The server-based operating system (OS) instances that run remote applications can be shared with other users (a terminal services desktop), or the application can be running on its own OS instance on the server (a VDI desktop).
About This Book

In this book, you learn how solutions, such as Parallels Remote Application Server (RAS), replace traditional application deployment with on-demand application delivery and why it’s right for your organization.

*Application & Desktop Delivery For Dummies, Parallels Special Edition,* explains remote application and desktop delivery in four short chapters that cover the following:

- What remote application and desktop delivery are and when to use them (Chapter 1)
- How to choose the right application delivery deployment model for your needs (Chapter 2)
- Which applications and use cases are appropriate for remote application and desktop delivery (Chapter 3)
- Advantages of the Parallels RAS solution for application delivery (Chapter 4)

Foolish Assumptions

It’s been said that most assumptions have outlived their uselessness, but I assume a few things nonetheless. I assume you work as a CIO or IT manager, and you’re
responsible for the end-user computing environment (such as applications, desktop PCs, and mobile devices) in your organization.

I also assume that you have some familiarity with virtualization technologies, such as VMware ESXi and Microsoft Hyper-V, but you’re perhaps not as familiar with Microsoft Remote Desktop Services (RDS).

If any of these assumptions describe you, then this book is for you!

**Icons Used in This Book**

Throughout this book, I occasionally use icons to call out important information. Here’s what to expect.

![Remember Icon]

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 Icon]

You won’t find a map of the human genome or the secret to cold fusion here, but if you seek to attain the seventh level of NERD-vana, perk up! This icon explains the jargon beneath the jargon.
Tips are always appreciated, never expected — and I sure hope you appreciate these tips! This icon points out helpful suggestions and useful nuggets of information.

This icon points out the stuff your mother warned you about (well, probably not). But these helpful alerts do offer practical advice to help you avoid potentially costly and frustrating mistakes.

**Beyond the Book**

There’s only so much I can cover in 32 short pages, so if you find yourself at the end of this book thinking “Gosh, this is an amazing book; where can I learn more?” just go to www.parallels.com.

**Where to Go from Here**

With my apologies to Lewis Carroll, Alice, and the Cheshire cat:

“Would you tell me, please, which way I ought to go from here?”

“That depends a good deal on where you want to get to,” said the Cat — err, the Dummies Man.
“I don’t much care where . . . ,” said Alice.

“Then it doesn’t matter which way you go!”

That’s certainly true of Application & Desktop Delivery For Dummies, which, like Alice in Wonderland, is also destined to become a timeless classic!

If you don’t know where you’re going, any chapter will get you there — but Chapter 1 might be a good place to start! However, if you see a topic that piques your interest, feel free to jump ahead to that chapter. Each chapter is written to stand on its own, so start reading anywhere. I promise you won’t get lost falling down the rabbit hole!
Chapter 1

What is Remote Application and Desktop Delivery?

In this chapter, you find out about the (re-)rise of virtualization technology, as well as application and desktop delivery considerations, challenges, and business benefits.
Back to the Future: A Brief History of Desktop Computing

The evolution of desktop computing, from mainframes and client-server computing to application and desktop virtualization, has an interesting history that makes what was old — virtualization technology — new again. Call it “Back to the Future,” the “Circle of (computing) Life,” or déjà vu all over again.

Mainframe

In the 1960s, large and expensive mainframes dominated the computing landscape. Mainframe operators submitted batch jobs to the mainframe for processing, and users interacted with the mainframe via dumb (not “Dum-mies”) terminals that were little more than terminal emulators, with no significant hardware or software resources installed on them. Mainframe environments were very tightly controlled, and all was right with the world.

Client-server

In 1981, IBM introduced the desktop PC which, along with mini- and micro-computers (servers), ushered in the client-server era. Core business applications and
databases were installed on servers and accessed by client software that was installed on increasingly powerful desktop PCs.

Decentralized computing — and an accompanying loss of control (relative to the mainframe era) — was a key characteristic of the client-server era. Perhaps fittingly, the first IBM PC was the Model 5150 (which is also a California law enforcement code for a Van Halen fan suspected of having a mental disorder).

**Application and desktop virtualization**

The roots of virtualization technology are found in the IBM CP-40 operating system — the first to successfully implement virtualization, by running multiple instances of client operating systems on the IBM System/360 Model 40. Fast forward 50 years, and virtualization has come a long way, baby.

The hypervisor is a nod to the mainframe beginnings of virtualization technology. In mainframes, the hardware kernel was known as the supervisor. The hypervisor abstracts a computer’s hardware kernel from its operating system and applications.

The rapid proliferation of server virtualization in the 2000s led to further innovations, including application and desktop virtualization. Virtualization, a key enabling
technology for the cloud, enables organizations to take back control of their computing infrastructure and enjoy significant economies of scale.

Application and Desktop Delivery — Why or Why Not?

Remote delivery of virtualized applications and desktops addresses many traditional desktop management challenges (discussed in the next section) and provides clear business benefits (discussed later in this chapter). Thus, the question for businesses today isn’t “why or why not?”, but “where, how, and how much?”

On-premises, public cloud, and hybrid deployment models (discussed in Chapter 2) provide businesses and organizations of all sizes with flexible options.

Recognizing Application Delivery Challenges

Application delivery is more vital than ever — and it is also very challenging. End-users want consistent performance with a seamless experience, while IT is focused on efficient management and effective security at a
reasonable cost. Some specific application delivery challenges include

» **Performance:** Delivering reliable application availability and fast responsiveness over a variety of network connections, including

- **Local area networks (LANs):** Typically, fast Ethernet or Gigabit Ethernet at speeds of 100 and 1000 Megabits/sec (Mbps), respectively

- **Wide area networks (WANs):** For example, dedicated circuits (10 and 100 Mbps are common) or Multi-Protocol Label Switching (MPLS) networks

- **Internet:** Such as broadband cable and Digital Subscriber Line (DSL) providing asynchronous, “best effort” connectivity with highly variable download/upload speeds

» **Bring your own device (BYOD):** Allowing users to securely access applications and data from anywhere, at any time, on any device, including

- Apple iPhones and iPads
- Android phones and tablets
- Desktop and laptop PCs and Macs
- Raspberry Pi, Chromebooks, and netbooks

» **Legacy and modern applications:** Centrally managing and delivering legacy and modern applications simultaneously on the same device
Security and compliance: Ensuring application and data security on devices that remotely access virtual resources, while maintaining regulatory compliance and privacy

Getting the Most Out of Application and Desktop Delivery

Remote application and desktop delivery provides many tangible business benefits, including

- Improve performance and reduce downtime. Application delivery controllers can efficiently route traffic between multiple routers, servers, firewalls, and other network resources to improve application performance and reduce downtime.

  Look for a solution that not only checks for available servers but also identifies available gateways and current loads to ensure that the end-user connects to a server that offers the best possible performance.

- Simplify management: Application delivery offers a centralized management system that enables you
to effectively monitor and manage the entire infrastructure from a single dashboard. With reduced hardware, fewer people are needed to manage it. You don’t have to deal with updates, patches, and other maintenance problems. This simplified IT infrastructure makes your job easier.

» **Deliver any Windows application to any device.** Another benefit of application delivery is that you can deliver any Windows application to any remote device. For instance, MS Office can be remotely published to an iPhone, Android phone, or even Chromebooks. It provides a seamless and consistent end-user experience across all devices.

» **Reduce costs.** As applications are installed on the application delivery server and remotely published to client devices, businesses can save significant amounts on hardware and software purchases, as well as licensing and operational costs.
In this chapter, you discover some basic application and desktop delivery components and different deployment models to suit your organization’s unique requirements for application and desktop delivery.
Understanding Application and Desktop Delivery Components

Application and desktop delivery can be achieved in different ways. The most common way is hosting the software on a server and then publishing virtual resources dynamically on the network. With the progression of innovation, application and desktop delivery gets new options. You can create a Virtual Desktop Infrastructure (VDI) or use Microsoft Remote Desktop Session Host (RDSH) to centrally host applications.

A connection broker is software that establishes a link between the host and the end-users. A connection broker performs many tasks that vary from broker to broker. At its most basic level, a connection broker is a traffic cop; it directs incoming connection requests to an available hosted resource.

More advanced solutions offer an extra layer of security encapsulating the Remote Desktop Protocol (RDP) traffic inside a Secure Sockets Layer/Transport Layer Security (SSL/TLS) encrypted virtual private network (VPN) tunnel, with multifactor authentication, high availability, and workload load balancing.
An efficient connection broker should enable employees to work virtually from anywhere and support any device or operating system. Many solutions also allow access to corporate applications through an HTML5-compatible browser.

To guarantee consistent end-user experience across different devices, the software should allow employees to use local peripherals such as printers, scanners, and drives while working in the virtual environment.

With an efficient peripheral redirection, a print job, for example, is launched on the application hosted on the server and is redirected via the network to a local printer. Likewise, to guarantee a solid user experience, audio, drives, keyboard, and mouse devices must run smoothly on the hosted applications and locally.

On-premises

An on-premises deployment makes sense for many organizations that already have a significant investment in Remote Desktop Session Host (RDSH) and Virtual Desktop Infrastructure (VDI), as well as experienced IT staff available to manage the infrastructure. This is particularly true for large organizations that require tight control of their computing environment.
Figure 2–1 shows a typical on–premises deployment consisting of the following components:

- RAS and Publishing Agent Console
- RAS Secure Client Gateway
- RAS High Availability/Load Balancer

![Diagram of a typical on-premises deployment]

**FIGURE 2-1:** A typical on-premises deployment.

## Public Cloud

A public cloud deployment is architecturally the same as an on–premises deployment, but all the components are deployed in a public cloud, such as Amazon Web Services (AWS) or Microsoft Azure.
A public cloud deployment makes sense for any organization that has fully embraced the cloud with a “cloud first” strategy, as well as for smaller organizations that don’t necessarily have the in-house IT expertise to maintain a virtualized infrastructure (including RDSH and VDI), and are focused on minimizing the need for capital investments in server infrastructure.

Specific advantages of a public cloud deployment over an on-premises deployment include massive scalability, rapid on-demand resource provisioning, high availability, and broad support for geographically dispersed remote workers.

Hybrid

A hybrid deployment provides organizations with all the benefits of both an on-premises and public cloud deployment model. Organizations can maintain complete control of their primary desktop computing environment in an on-premises data center or private cloud and enjoy the benefits of the public cloud. This can be particularly useful for healthcare facilities and educational institutions that must provide resource capacity during “boot storms,” for example, during a crisis or disaster, or at the beginning of the school day.
A hybrid cloud deployment consists of the same components as an on-premises deployment (see the section “On-Premises” earlier in the chapter), except that the RAS publishing agents and consoles, high-availability load balancers, and secure client gateways are hosted in the cloud (see Figure 2-2).

**FIGURE 2-2:** A typical hybrid cloud deployment.
Chapter 3

Considering Applications and Verticals Use Cases

In this chapter, you find out about application and industry use cases for application and desktop delivery solutions, as well as a few real-world customer success stories.
Microsoft Productivity and Other Apps

The Microsoft Office productivity suite comprises a core set of business productivity applications for most businesses today. These include Word, Excel, Outlook, and PowerPoint, among others.

In 2011, Microsoft introduced Office 365, a subscription-based software-as-a-service (SaaS) offering that has greatly simplified desktop management — particularly software updates and licensing — for these core productivity applications. Similar SaaS offerings are available from Google (including Google Docs, Sheets, Slides, and more), Adobe (including Adobe Photoshop, Illustrator, Acrobat, and more), and others.

Although the SaaS model is popular, many organizations still prefer perpetual-based licensing models and/or require complete control of their applications (for example, when and how software updates are installed). For these organizations, locally installed applications are still the norm, but an application and desktop delivery solution can deliver many of the same benefits of an SaaS-based model.
Enterprise Resource Planning

Enterprise resource planning (ERP) software for many organizations is a mission-critical business application. These monolithic systems are typically built on traditional 3-tier server architectures with thick software clients (not web- or mobile-optimized) and robust SQL or Oracle database (or, in some cases, proprietary databases such as Progress DB) backends. Additionally, many organizations have developed complex and costly customizations for these systems to suit their unique business requirements over the years.

For these reasons, many corporate ERP systems haven’t yet moved to the cloud and may never migrate to the cloud. Instead, these systems will need to be built from the ground up as cloud-native systems in the future. This will potentially take time, and customer adoption may be slow. Therefore, IT needs to manage locally installed ERP systems and client software for many years to come. Application and delivery solutions are an ideal solution for these systems, particularly because many legacy ERP systems in the past used Microsoft Remote Desktop Protocol (RDP, now Remote Desktop Services or RDS) to provide user access.
Customer Relationship Management

When most people think of customer relationship (CRM), one word comes to mind: Salesforce.com (okay, technically “Salesforce-dot-com” is three words). Salesforce has revolutionized CRM and largely pioneered the SaaS delivery model. As a result, Salesforce dominates the CRM market today.

However, there are still plenty of other CRM software products on the market, and many aren’t available as SaaS offerings. This is particularly true of CRM client software that’s integrated with older business phone systems, for example, in large call centers.

Application and desktop delivery solutions can be used to deliver CRM applications for a variety of use cases. For example, in a large call center where customer service representatives may work in cubicles where the desktop image needs to be refreshed at the end of every shift. Alternatively, many customer service representatives (CSRs) now work from home offices. In both situations, centralized application and desktop delivery solutions can provide CSRs with a standardized, up-to-date suite of core applications and secure access to customer information.

Another common CRM use case requires sales or account representatives to travel frequently and work remotely,
often from a mobile device. With an application and delivery solution, remote workers always have access to the most current information, and no sensitive customer data is ever stored on the local device — so a lost or stolen device doesn’t result in a potentially costly data breach.

**Vertical Specialized**

Many industry verticals have specialized or custom-developed software that can be installed and managed using an application and desktop delivery solution. These include AutoCAD, medical imaging and diagnostics, animation and 3D graphics rendering, and big data analytics applications, among others. In all these cases, application and desktop delivery solutions can help organizations efficiently and cost-effectively manage these critical business applications.

**Education**

Modern educational institutions depend on connectivity and collaboration to create the most effective learning experience for their students. Educational institutions need an application and desktop delivery solution that maximizes the efficient use of IT resources within limited budgets, ensures the security and privacy of
confidential and sensitive information, and enables the following capabilities:

» **Personalized learning experiences:** Provide rich learning experiences by offering students anytime, anywhere access to personalized virtual desktops and a collaborative learning environment.

» **Open, yet secure, computing environments:** Educational institutions often have liberal policies regarding what students can do on school computers and where they can go on the Internet. Remediation of unauthorized changes and malware infections simply require rebooting the virtual desktop or application to restore its original state.

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**PARALLELS RAS EMPOWERS STUDENTS AND TEACHERS AT ESLA**

Enterprise South Liverpool Academy (ESLA) is a Catholic academy in Garston, Liverpool, that teaches over 1,000 students from ages 11 to 18. The academy faced a challenge and needed a solution to deliver learning applications to students on their personal devices and virtual desktops to teachers at home. Not all its students
could count on access to a desktop computer at home because they came from low-resource backgrounds, so ESLA needed a mobile-optimized virtual application delivery solution that students could use to access applications from any device, including smartphones and tablets.

The academy chose Parallels Remote Application Server (RAS) as its solution. Both the server- and client-side installations were very simple, straightforward, and quick. Within three hours, the academy had tested everything, and one week later it rolled it out to its users’ devices.

What was the outcome? Parallels RAS provided ESLA with a powerful, comprehensive virtual desktop infrastructure (VDI) solution at an affordable price point. Students and staff enjoyed more flexible virtual learning environments. Even in low connectivity environments, Parallels RAS provided a stable platform that the school can rely on to empower its mission to provide the best learning experience possible for its students and staff.
Manufacturing

Manufacturing production lines aren’t ideal environments for computers, where excessive heat and dust is typical and lead to frequent hardware issues and costly lost productivity. Manufacturing businesses need an application and desktop delivery solution that provides remote access to line-of-business (LOB) software, while maintaining full control of the IT infrastructure, and maximizing workplace productivity. Other unique manufacturing challenges include

- **Limited physical access:** Most LOB software used to operate machinery is typically installed locally on a computer near the machine. Physical access to a computer on the manufacturing floor is often limited and dangerous, making it difficult for IT technicians to troubleshoot issues.

- **Support for peripheral devices:** Specialized manufacturing tools and devices (including printers, scanners, and calibration equipment, among others) may be directly connected to desktop PCs on the manufacturing floor, which may require custom drivers or a legacy desktop operating system.

- **Extended hardware refresh cycles:** Desktop PCs in manufacturing areas get a lot of wear and tear and often stay in service well beyond three- and even five-year refresh cycles. Shifting compute-intensive
applications from legacy PCs to centralized servers can extend the useful life of PCs.

**Healthcare**

The role of IT in healthcare is evolving fast. Increasing scrutiny and demand pose new challenges, and patients and healthcare professionals can’t be slowed by an inferior user experience. Healthcare organizations need an application and desktop delivery solution that provides the flexibility and mobility necessary to deliver optimal patient care, and ensures the following:

» **Predictable and reliable performance:** Fast and responsive access to potentially life-saving applications and access to critical data must be available to healthcare professionals 24/7/365.

» **Robust security and compliance:** Secure access to sensitive patient information must be adequately safeguarded and compliant with government mandates and other regulatory requirements regarding electronic health records (EHR) and protected health information (PHI).

» **Lower costs:** Reducing overhead costs and maximizing the efficient use of available resources are important requirements in the highly scrutinized and cost-sensitive healthcare industry.
Abilene Diagnostic Clinic, a leading Texas healthcare facility offering complete lab services, faced the challenge of ensuring fast data delivery to physicians. Abilene Diagnostic Clinic was unable to efficiently balance application demands with available server resources, resulting in inefficient application delivery, slow network speeds, and an inability to meet the clinic’s high-quality standards.

Abilene Diagnostic Clinic chose Parallels RAS for its solution and can now quickly and securely deliver high-performance, full-featured applications to over 300 users — all while guaranteeing patient privacy.

What was the outcome? The clinic fully replaced its old service with Parallels RAS, enabling the virtual delivery of Electronic Medical Record Allscripts HER Pro and other applications, as well as greatly reducing IT costs and improving quality of care.
Retail

The retail industry must deliver an exceptional omni-channel customer experience to remain competitive, while maintaining compliance with Payment Card Industry (PCI) security standards and operating on tight margins. Retailers need an application and desktop delivery solution that maximizes the efficient use of IT resources within limited budgets, ensures the security of customer data (including financial information), and enables the following capabilities:

» **Support for mobile and peripheral devices:** Mobile scanners and payment card readers (such as Square and PayPal Here), as well as point-of-sale (POS) terminals with directly attached barcode scanners, payment card readers, scales, receipt printers, and cash drawers must be seamlessly supported.

» **Easy-to-use functionality:** Employee turnover in the retail industry is typically high, which means that new employees must be able to quickly learn how to use the systems and applications they need to perform their jobs. Employees that are frustrated by a poor user experience will deliver a poor customer experience.
Robust security and compliance: Retail desktop PCs often lack basic security controls, such as individual logins, and are often used for multiple functions in addition to POS transactions (such as surfing the Internet, checking social media, sending and reading emails, updating inventory information, creating employee schedules, and more), which can lead to malware infections, software exploits, and compromised data.
In this chapter, you get ten (okay, eight) great reasons to choose Parallels Remote Application Server (RAS) for your application delivery needs. Those reasons are

**HTML5 client:** Parallels RAS has a clientless portal so users can access published applications and virtual desktops using any HTML5-compatible
browser, such as Chrome, Firefox, Internet Explorer (and Edge), or Safari.

» **Publish legacy applications:** Sysadmins can easily publish legacy applications that only run on Windows proprietary desktops, such as Windows 7 and 8, as well as Windows 10.

» **Hypervisor support:** Parallels RAS supports Citrix, VMware, and Microsoft Hyper-V, so sysadmins can build a virtual desktop infrastructure (VDI) solution, using a wide range of technologies to suit organizations’ technology and cost requirements.

» **Simple wizard-based installation:** Parallels RAS is installed through a standard MSI (Windows Installer) file, and the user is guided through a wizard that greatly simplifies the installation process. Any additional components can be installed from the same MSI file.

» **Auto-configuration of server roles:** Parallels RAS automatically installs the server roles that are needed, so sysadmins don’t have to install or configure any server roles — such as the Remote Desktop Session Host (RDSH) on servers where applications and desktops are published.

» **Central management console:** To manage, monitor, and scale up the Parallels RAS farm, sysadmins only need a single interface. Even when installing new components or configuring a
multisite environment, there’s no need to log in to other remote servers. Managing everything centrally gives IT more control over the farm.

» **Straightforward licensing:** Forget confusing licensing packages — Parallels RAS is licensed per user, and all features and components needed to build out and scale up the farm are included.

» **Less hardware:** Parallels RAS requires minimal resources, so you can install and run it on a single server and scale your farm appropriately as your organization grows or your needs change.
Understand remote application and desktop delivery

Application & Desktop Delivery For Dummies, Parallels Special Edition, covers what remote application and desktop delivery are and when to use them. You discover how to choose the right application delivery deployment model for your needs and which applications and use cases are appropriate for remote application and desktop delivery. You learn the advantages of the Parallels RAS solution for application and desktop delivery.

Inside...

• Discover the potential of application delivery
• Application delivery in the cloud
• Access line of business (LOB) apps
• Why choose Parallels RAS for application and desktop delivery

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