



# How Parallels Remote Application Server Enhances Microsoft RDS

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## Introduction

In 2001, Microsoft® introduced the RDP protocol, a proprietary protocol that allowed users to access an operating system's desktop remotely. Since then, Microsoft has come a long way, developing Remote Desktop Services to facilitate remote desktop access. Formerly known as Terminal Services, RDS consists of a number of tools and services that allow businesses to build an application and virtual desktop delivery solution that their users can access remotely.

However, the Microsoft RDS solution leaves a lot to be desired. This white paper looks at the pain points of Microsoft RDS solutions, and how systems administrators can use Parallels® Remote Application Server to enhance their RDS infrastructure and provide the functionality their businesses need to give their users the flexibility they need to be more productive.

## Overview of Microsoft Remote Desktop Services

Depending on the environment and the business requirements, RDS can be set up either as Session Host, which is commonly used for publishing applications (RemoteApp), or as a Virtualization Host, commonly used for publishing desktops (VDI). Microsoft RDS can also be set up as a combination of both.

Since the launch of Windows Server® 2008 and until the currently Windows Server 2016, the offerings under the Microsoft Remote Desktop Services (RDS) banner have been made up of a suite of different server role services, mainly consisting of the following:

- Remote Desktop Session Host: The server that hosts Windows-based programs or the full Windows® desktop for Remote Desktop Services clients. Users can connect to an RD Session Host server to run programs, save files, and even use network resources. Users can access an RD Session Host server from within a corporate network or from the Internet by using Remote Desktop Connection or by using RemoteApp.
- Remote Desktop Virtualization Host: An RD Virtualization Host integrates with Hyper-V® to provide virtual machines (VMs) by using RemoteApp and Desktop Connection. An RD Virtualization Host can be configured so that each user in your organization is assigned a unique VM, or so that users are redirected to a shared VM pool where a VM is dynamically assigned.
- Remote Desktop Licensing: This server manages the Remote Desktop Services client access licenses that are required for each device or user that connects to a Remote Desktop Session Host server.
- Remote Desktop Connection Broker: This role service allows users to reconnect to their existing sessions in a load-balanced RD Session Host server farm. This prevents a user with a disconnected session from being connected to a different RD Session Host server in the farm and starting a new session. It also enables systems administrators to evenly distribute the session load among RD Session Hosts.
- Remote Desktop Web Access: This server enables users to access the RemoteApp and Desktop Connection features through the Start menu on a computer that is running Windows 7, or through a web browser. RemoteApp and Desktop Connection provides a customized view of RemoteApp programs and virtual desktops to users. RD Web Access also includes Remote Desktop Web Connection, which enables users to connect remotely from a web browser to the desktop of any computer to which they have Remote Desktop access.
- Remote Desktop Gateway: This server enables authorized remote users to connect to resources on an internal corporate network, from any Internet-connected compatible device. Typically it is placed at the edge of a corporate network to analyze incoming requests with filters defined in a Network Policy Server.

## Setting Up an Application and Virtual Desktop Delivery Solution with RDS

On its own, the Remote Desktop Session Host only allows users to connect to the server remotely and access its desktop and installed applications. To set up a connection broker infrastructure with RDS systems, administrators must install and micromanage all of the roles mentioned above.

## Microsoft RDS Pain Points

**Server (TS) Load Balancing:** In order to deliver remote desktops and applications, it is necessary to have at least two session groups (more servers). The Remote Desktop connection broker manages the distribution between the different servers in the farm. Unfortunately, it has limited capability, only allowing the distribution of the connections based on session count and server weight. RDS Brokers redirect incoming user requests to the server with the least user session count in that moment, regardless of the server load. This user brokering criteria could cause degradation of user experience due to lack of hardware resources such as CPU power and memory.

**Gateway Load Balancing:** Network Load Balancing (NLB) or DNS Round Robin can be used to load balance the network traffic among multiple gateways. Both are very simple and none of them track the health of the gateway service. If a gateway fails, NLB or DNS Round Robin cannot detect the failure and will still route requests to that gateway which degrades the user access service. To achieve true load balancing Azure Load Balancer or any other third-party solution is required.

**Non-Windows client:** Microsoft RDS does not have a Linux® client by itself that could deliver applications and desktops to Linux OS-based workstations or thin clients. It's true that many Linux RDP clients can be found but none of them include complete RDS access features. Nowadays, the only option for IT administrators looking for wider client support is to look for third-party solutions on top of RDS. As such, businesses looking to move toward the adoption of a multi- platform approach can do so by delivering resources through HTML5-compatible browsers that can be immediately accessed from any device.

**Lack of administrative automation:** Remote application servers are unlike most servers in the datacenter in that regular users are given direct access. For this reason, remote application servers require extra administrative attention if they are to successfully deliver virtual desktops and applications. Such attention warrants automation, particularly as the size and complexity increases. In order to offer the native feeling of locally installed applications, the application delivered needs to have automatically configured features such as session prelaunch automation.

**Difficult to install, update and set up:** The process of installing and setting up a virtual desktop and application delivery solution with Microsoft RDS is lengthy and complex. It requires systems administrators to install and configure several different servers and server roles, and to install additional software to support the setup. Because of the complexity this process, systems administrators have to be very well versed in this technology:

- A VDI setup and a RemoteApp setup require different installation service roles -Remote Desktop Virtualization Host (RDVH) and Remote Desktop Session Host (RDSH)-. In addition, RDVH is only compatible with Microsoft Hyper-V, and due to this limitation, many IT organizations are looking for a more comprehensive approach that includes VDI delivery from other hypervisors. For businesses requiring wider application and desktop deployment, RDS is not able to offer a single point of reference that can adequately service the IT requirements of the organization.
- Each RDS component should be installed separately. Microsoft offers the “Quick Start” option in the RDS installation wizard but it is not a suitable option for real-world setups: It installs the three main RDS roles (Broker, Web and Session Host) on a single server and automatically builds basic application collection for the host server.
- Some of the roles need to be reinstalled in an upgrade process. There is no direct in-place migration from some OS versions with RDS installed. For instance, upgrades to Windows Server 2016 are supported only from Windows Server 2012 R2 and Windows Server 2016 TP5.
- Although RDS is “cloud ready”, Microsoft has discontinued Azure Remote App in favor of Citrix virtualization technologies – Citrix Essentials.

**Difficult to manage:** A Microsoft RDS solution is made up of several different software components. IT administrators have to individually configure every component via different management consoles, and by logging in to different servers. Thus, managing the whole setup can be a daunting process because:

- The Microsoft RDS solution does not have centralized logging or client management solutions, so it is difficult for systems administrators to troubleshoot non-user-related problems or have complete control of the end user terminal and what the users can access.
- A client manager tool is not available. Third-party solutions have to be acquired, configured, and maintained.
- Microsoft RDS does not include an application publishing verification tool or a server group scheduler for maintenance operations. This does not allow IT administrator to ensure robustness of the virtualization solution during user access.
- RemoteApp published applications or published desktops can be only be filtered by user or group. RDS does not include any built-in solution if additional filtering criteria is needed (client source IP, coming from gateway...).
- Microsoft does not include a centrally managed backup solution for a RDS environment. Separate procedures need to be followed in order to back up all different installed role services and databases if are used for high availability.

**Difficult to scale up:** To scale up a Microsoft RDS infrastructure or configure load balancing and high availability features, systems administrators need to install and configure additional software components such as the Microsoft NLB, Microsoft Failover Cluster and Microsoft SQL Server and have to incur additional license cost. If a high availability solution is required for the Remote Desktop Connection Broker (RDCB) an SQL Server should be installed (clustered instance or always on). In addition, if three or more connection brokers are required, these servers must be installed in Windows 2016 Server Edition. Prior server versions only support up to two connection brokers.

**Version Interoperability:** One of the biggest problems of Microsoft RDS is the compatibility issues among their different role services. Details of the most important ones can be found below:

- Windows Server 2016 is backward compatible for WebAccess, Gateway, Connection Broker and License Server. This means that for instance, a Windows 2012 R2 Session Host can connect to a Windows 2016 Connection Broker, but not vice versa.
- All Session Hosts in a collection need to be at the same Operating System (OS) level. Different OS version servers require different session hosts collections.
- In a high availability setup, all Connection Brokers should be at the same OS level.
- License Server must be at least at the same OS level as RD Session Host. A License Server can process CALs from all previous versions of Windows Server but it can't for newer versions.

**Limited Guest Operating Systems:** In a VDI deployment through Remote Desktop Virtualization Hosts, not all guest operating systems are supported. A Windows Server 2016 RD Virtualization Host server just support the following guest OSs: Windows 10 Enterprise, Windows 8.1 Enterprise, Windows 8 Enterprise and Windows 7 SP1 Enterprise. RDS does not support integrated Remote PC, therefore it is not possible to publish applications from a machine running a client operating system.

## **How Parallels Remote Application Server Enhances Your Microsoft RDS Infrastructure**

Parallels Remote Application Server is an application and virtual desktop delivery solution that allows systems administrators to create a private cloud from which they can centrally manage the delivery of applications, virtual desktops, and business-critical data.

Parallels Remote Application server is well known for its ease of use, low license costs, and feature list. This section highlights some of the enhancements Parallels Remote Application Server offers when used in conjunction with the Microsoft RDS solution.

## **Parallels Remote Application Server Enhances the Process of Installing & Setting Up Your RDS Environment**

Even in the early stages of planning, Parallels Remote Application Server has a lot to offer. Parallels Remote Application Server allows businesses to set up an application and virtual desktop delivery solution in just a few minutes, thanks to the following features:

**Straightforward licenses:** Parallels Remote Application Server licensing is priced per concurrent user. All the components needed to build a scalable and high-availability application and virtual desktop solution are included in the license, thus one does not have to buy additional licenses for additional components, like when building a solution with Microsoft RDS.

**Simple Wizard-based installation:** Parallels Remote Application Server is installed through a standard MSI file, and the user is guided through a wizard that greatly simplifies the installation process. Any additional components that need to be installed can be installed from the same installation file.

**Centralized configuration console:** To manage, monitor, and scale up the Parallels Remote Application Server farm systems administrators only have to use a single interface, the Parallels Remote Application Server configuration console. Even when installing new components or configuring a multisite environment, systems administrators do not need to log in to other remote servers. The ability to manage everything from a central location gives systems administrators more control over the farm.

**Auto-configuration of Terminal Servers:** Systems administrators do not have to install and configure any server roles. Parallels Remote Application Server automatically installs the server roles that are needed, such as the Remote Desktop Session Host on the servers from where applications and desktops are published.

**Easy management of Remote Desktop Session Hosts (RDSH) and Sessions:** In Parallels RAS, administrators can use the scheduler to specify when to reboot or temporarily disable a server or a group of servers, making it much easier to maintain the servers or upgrade applications. Also, the Session Management in the RAS Console collects information about user sessions' running processes, allowing administrators to supervise users and even remotely kill a specific process or processes, for instance to unfreeze a user session.

**Requires less hardware resources:** Parallels Remote Application Server is a very low-resource application and virtual desktop delivery solution, meaning that it can be installed and run on a single server. No database servers are required for a high availability solution which also means no extra license costs.

## **Parallels Remote Application Server Enhances Application Publishing and Delivery**

- Parallels Remote Application Server uses Microsoft's own Remote Desktop Protocol and RDS role to publish applications. Parallels Remote Application Server enhances these features through its own set of application publishing features and management tools, which allows systems administrators to provide a better experience for their users. With Parallels Remote Application Server systems administrators can:
- Publish applications which are installed in different paths on different servers, allowing them to publish any type of application, even if it is custom or legacy. The access to published applications can be verified prior to making the applications available to the end user, ensuring resources are available in the specified path.
- Monitor the usage of published applications and limit the number of instances, or when it can be launched by users. This allows administrators to control the infrastructure's resources, all while ensuring that all software licenses are respected and controlled so that users can access resources without the risk of violating laws or the applications not being functional.
- Easily implement filtering rules to restrict access to published applications using a variety of criteria. Systems administrators can restrict access to an application by user or group, MAC or IP address, client software, gateway, and more, for a segregated and secure stream.
- Publish legacy applications from desktop operating systems. Many businesses, big or small, use certain legacy applications that only run on Windows proprietary desktop computers such as Windows 7, 8, and 10. With Parallels Remote Application Server, administrators can easily publish legacy and any other type of application from desktop operating systems.

## **Application Containerization, Turbo.net repository**

Some applications may not be designed for multi-session environments and fail to launch if there is another instance of the application already running on the server. With the integration of the Turbo.net repository, Parallels Remote Application Server prevents such limitations because applications run in an isolated virtual environment called container, eliminating installation procedures, conflicts and dependencies.



Completely transparent to the administrator and without any extra configurations requirements, applications in the Turbo.net repository are available for delivery in the Parallels RAS console like any other application already installed in the farm. As soon as a user requests first-time access to a published application Parallels RAS automatically installs and configures Turbo.net runtime and the application on the RDSH server that receives the user session.

### **Parallels Remote Application Server Enhances End User Software Deployment**

End user software deployment is one of the most problematic tasks for systems administrators when setting up an application delivery and virtual desktop solution. This is because of the number of variables of the different hardware and operating systems the solution has to work on. This is another area which Parallels Remote Application Server addresses, making it much easier for systems administrators to manage.

### **Support for a Wider Variety of Operating Systems and Mobile Devices**

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### **Support for a Wider Variety of Operating Systems and Mobile Devices**

Your users will appreciate that Parallels client software can be installed on popular operating systems such as Windows, Mac®, and Linux. It can also be installed on virtually any type of mobile device, such as the popular Android™ and iOS phones and pad computers, and Raspberry Pi devices.

By supporting almost any type of operating system and device, Parallels Remote Application Server gives systems administrators the flexibility they need, allowing them to easily and effectively implement BYOD policies to manage end user equipment while still meeting their budgetary requirements.

With the latest version of Remote Application Server, Parallels has improved the user experience on mobile devices by allowing administrators to create personalized keystroke shortcuts and by using a SwiftPoint mouse, which is able to transform an iPad® or iPhone® device into a workstation on the fly. It also has improved security enabling the use of Touch ID® and passcodes to further secure the access to apps, desktops, and data.

### **Automating the Deployment**

Parallels Remote Application Server has a simple solution to the deployment problem: it allows system administrators to automatically deploy and configure end user clients. Administrators can send an email to all users with the client's download links from the Parallels RAS Console. These deployment emails also include auto-configure links, which once clicked the Parallels client is automatically configured on the user's device. Hence, to use a delivered application, users only need to launch the client and double-click the icon of the application they would like to use.

### **Multisite Support**

Parallels Remote Application Server allows systems administrators to centrally manage interconnected farms in different physical locations. This gives system administrators in a multisite environment the flexibility they need to better utilize all available resources, because users from one site can access published applications and virtual desktops on another site.

### **Different Client and Server Operating Systems Support**

Legacy applications have a lot of limitations, for example they just run under old operating systems such as Windows 2003. Therefore, if you are using RDS you might not be able to run some of your legacy applications because Microsoft requires all servers in a setup to run the same operating system version. So, if for example your setup is running on Windows 2008, which is the earliest version of Windows that supports RDS you cannot run legacy applications that require Windows 2003.

On the other hand, the Parallels Remote Application Server provides a wide range of Microsoft Windows Server Operating System support: from 2003SP1 to 2016, and all of these different server operating systems can run together in the same farm.

From the VDI side, Parallels RAS supports templates created with the following versions of Windows as a guest OS: Windows XP SP3, Windows Vista, Windows 7, Windows 8, Windows 8.1, Windows 10.

In addition, if required, Parallels Remote Application Server provides ability to publish desktop/applications from any Windows Client guest including Wake-on-LAN, integrated security, and remote access.

### **Parallels HTML5 Client**

Parallels Remote Application Server also has a clientless HTML5 Client. Users can access the published applications and virtual desktops via the HTML5 Client by using an HTML5-compatible browser, such as Google Chrome™, Firefox®, or Internet Explorer®.

The HTML5 Client gives users the freedom to use any type of device and work from any location they want as long as they have a HTML5 browser. The HTML5 Client is based on the HTML5 Gateway which provides Themes Support. This means, businesses can easily personalize the access website by adding logos or colors which best fit their brand image.

### **How Parallels Remote Application Server Enhances Virtual Desktop Publishing and VDI Solutions**

Like Microsoft RDS, Parallels Remote Application Server is a connection broker solution. This means that it relies on other hypervisor solutions to deliver a VDI solution. Parallels Remote Application Server has been designed in line with the features businesses need to manage and automate most VDI processes, including support for a wide variety of hypervisors.

### **Parallels Remote Application Server Supports Different Hypervisors**

Parallels Remote Application Server supports hypervisors from Citrix®, VMware®, Microsoft's own Hyper-V and Nutanix Acropolis and Kernel-based Virtual Machine (KVM). This means that systems administrators can build a VDI solution using a wide range of technologies, thus ensuring that businesses have the best, most personalized setup that utilizes the best technology yet allows them to keep their costs within their budgetary requirements. Virtual machines can be delivered simultaneously from different platforms, offering administrators an extended flexibility when deploying VDI solutions.

### **Automating and Enhancing the VDI Solution**

When using Parallels Remote Application Server systems administrators can automate the creation, startup, and deletion of virtual desktops. Such automation ensures that users do not have to wait for their machine to be created and booted up for them to start working, thus resulting in the least possible downtime.

Systems administrators can use Parallels' customized version of Microsoft SysPrep—RASprep—to automatically prepare and configure the virtual desktops. Compared to Sysprep, RASprep is faster because it modifies a lower number of configurable parameters, thus allowing a quicker deployment of the VDI desktops. Using linked clones, each deployed virtual machine shares virtual disks with the parent virtual machine in an ongoing manner. This allows multiple virtual machines to use the same software installation, also saving disk space and provisioning time.

Parallels Remote Application Server also allows systems administrators to configure the automated deletion of unused VMs, so that no resources are wasted and there is always enough hard disk space available to cater for new machines.



## **Parallels Remote Application Server Enhances Client Management & Helpdesk Support**

If there is one thing that system administrators agree on, it is that they hate providing helpdesk support. Helpdesk support takes a lot of time, which ideally should be spent on maintaining and improving the IT infrastructure. Moreover, the lack of tools reduces troubleshooting and helpdesk support to a type of guess work. Therefore, when you have a large and complex infrastructure such as an application delivery and virtual desktop solution, it is important that it also has the right tools to simplify client management and helpdesk support.

### **Client Management**

Parallels Remote Application Server provides a comprehensive client management solution for Windows XP, 7, 8.1, and 10. Parallels Remote Application Server allows systems administrators to shadow their users' sessions, remotely start, shutdown, and restart end user terminals. It is also possible to configure users' policies such as disabling the use of removable drives or print screen, deploy firewall rules and set device up in kiosk mode, which means transforming a personal computer into a thin client. For client management, Microsoft recommends its own solution: System Center Configuration Manager (SCCM), which requires its own license, meaning it is available at an additional cost.

Local applications can also be added with the published applications for a complete synergy between local and virtual applications.

### **Helpdesk Support**

Parallels Remote Application Server has its own centralized logging system, which is separate from that of the operating systems'. This separate authentication system allows systems administrators to easily identify any issues that may be impacting the user connection or the published resources. It also helps them easily correlate existing problems with infrastructure changes, thus making troubleshooting much easier and resulting in less users' disruptions.

User endpoint lockdown: By locking down the users' endpoint, systems administrators can limit the applications the users can use. In a Microsoft RDS setup, it is possible to partially lock down user terminals; however, this requires a lot of manual work. On the other hand, in a Parallels Remote Application Server environment, administrators can lock down and convert traditional Windows based PCs into thin client-like endpoints, where an alternative desktop is used to simplify access to available published resources with just a mouse click.

### **Reports**

Reports are vital to businesses. They allow management to keep track of employees' productivity, and also allow administrators to monitor the infrastructure usage, enabling them to plan ahead and ensure that they always have enough resources to cater for user needs. Once configured, systems administrators can use Parallels Remote Application Server reporting to generate a wide variety of reports including user session activity, devices used, session activity on the server, server health reports, and many more.

## **Parallels Remote Application Server Makes Load Balancing, High Availability, and Scalability Easy**

An application delivery and virtual desktop solution needs to be easily scalable so that it can cater for user demand and always be available. With such a solution, even a minimal amount of downtime can be crippling to productivity. However, this problem can be avoided with high availability and an easily scalable solution, which reduces downtime to a bare minimum through a system of backups for the server. Such an offering is not difficult to configure and maintain, and consequently does not drain company finances.

## **Load Balancing in Parallels Remote Application Server**

An out-of-the-box installation of Parallels Remote Application Server load balances all the incoming connections. Before redirecting an incoming connection to a server on the farm, Parallels Remote Application Server checks the CPU load and memory usage on each server, and also the number of concurrent user sessions each server has got. It then redirects the new incoming connection to the least busy server, ensuring an optimum user experience. The Parallels' load balancing system is also config free, therefore System administrators do not have to configure anything.

## **High Availability in Parallels Remote Application Server**

To build a high availability solution with Parallels Remote Application Server, systems administrators must Load-Balancers, Gateways, RD Servers and to some degree Publishing Agents. Though the process is very easy since all the components can be installed from the central Remote Application Server configuration console via an easy to follow wizard It means that administrators do not have to log in to the new servers to configure them one by one, greatly reducing setup time and the risk of human error.

## **Delivering Applications and Virtual Desktops in Different Physical Locations**

When building an application and virtual desktop delivery solution, it is important to think of scalability. Businesses grow, and so does their user base. With a scalable solution, systems administrators do not have to rethink and rebuild the farm each time they need to cater for more users.

Parallels Remote Application Server was designed with scalability in mind. Adding new components to the farm is very easy and most of the tasks can be done via a wizard from the central configuration console. Parallels Remote Application Server also supports multisite environments. A multisite environment can be setup within a single farm.

Systems administrators can set up different Remote Application Server sites in different physical locations and centrally manage all sites. In a multisite environment, users can also access published objects from sites to which they are not directly connected.

## **Parallels Remote Application Server Enhances the Security of Your RDS Infrastructure**

Even though it is often overlooked, the security of an IT infrastructure is vital to every business. IT security involves more than just protecting your business assets from malicious hackers and attacks; it also involves the ability of systems administrators to control employee access and keep track of everything that is happening on their IT infrastructure.

### **Authentication**

Parallels Remote Application Server provides systems administrators with a wide variety of authentication mechanisms. Administrators can integrate third-party authentication servers such as DeepNet, SafeNet, and RADIUS to authenticate users. Users can also use a smart card as a means of authentication when using both Windows and Linux.

By being able to support third-party authentication servers, systems administrators can segregate the different roles of the IT infrastructure, reinforcing its security.

### **Filtering Access to Published Applications and Virtual Desktops**

The larger the user environment is, the more important filtering is. In a typical organization, systems administrators need to have all the necessary tools to restrict user access.

When using Parallels Remote Application Server, systems administrators are not limited to filtering access only by Active Directory users and groups. They can filter incoming connections via IP address, gateway, client type, MAC address, and more. Systems administrators can also limit the number of concurrent sessions and the number of application that can run: this means a completely control of used licenses at any time (even optimizing licensing costs). Administrators can also schedule when users can access applications on each server or server group according to a predefined schedule optimizing the applications usage.

## **Central Administrative Logging**

All of the changes and actions of every Parallels Remote Application Server administrator are recorded in a central log. This audit trail can be used to ease the troubleshooting process and can also be used for security purposes by allowing administrators to track back any changes that were made to the Parallels Remote Application Server farm.

## **Use Parallels Remote Application Server to Enhance Your Microsoft RDS Infrastructure**

As this white paper highlights, Parallels Remote Application Server allows you to enhance your Microsoft Remote Desktop Services infrastructure, enabling you to offer a far better application and virtual desktop delivery solution with much less resources in much less time.

Parallels Remote Application Server, which is built around Microsoft's RDP protocol, allows systems administrators to do more in less time. Since it is much easier to implement and use, systems administrators can manage and easily scale up the Parallels Remote Application Server farm without requiring any specialized training, and because of its extensive feature list and multisite support, they can build solutions that meet the requirements of any enterprise, regardless of its size and scale.