



Switch to Parallels Remote Application Server and Save 60% Compared to Citrix Virtual Apps and Desktops

White Paper | Parallels Remote Application Server

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Executive Summary

In this white paper, we explain how a Citrix Virtual Apps and Desktops setup costs 60% more than Parallels® Remote Application Server (RAS) per year. In a 500-user setup, the difference is \$74,885. This amount is more than enough to cover both the hardware and licensing costs of running Parallels RAS.

Apart from the cost of software, in this comparison we also examine how nontangible criteria (such as the solution's ease of use) can also be a cost-affecting factor. We explain how switching to Parallels RAS saves your business money and can be more efficient.

IMPORTANT: The prices in this paper are based on figures that are publicly available, which are typically on the lower side. There have been many use cases (which you can read about on the Internet) that show large businesses being charged hundreds of thousands of dollars by Citrix to keep their software up to date.

Introduction

A few years ago, Citrix had two separate products for its virtualization solutions: XenApp and XenDesktop. In 2016, Citrix merged them into a single product, XenDesktop 7. The change was not well received by Citrix customers, and Citrix split them again into XenApp and XenDesktop from version 7.5 onward.

Following continuous rebranding changes, in 2018, Citrix renamed the products and replaced the versions' and products' editions naming. Virtual Apps (formerly XenApp) and Virtual Apps and Desktops (formerly XenDesktop) offer three different editions—Standard, Advanced and Premium—and have introduced the year/month reference in their versioning system. The major difference between these two products is the type of virtual desktop delivered to the user. Virtual Apps and Desktops includes all Virtual Apps features and also has a virtual desktop infrastructure (VDI) solution. From this point on, we will use the Virtual Apps and Desktops term in this document to refer to the Citrix virtualization solution: published applications and virtual desktop infrastructure.

Although Virtual Apps and Desktops is the most popular solution in the industry, it has several shortcomings coupled with a very expensive price tag. Due to migration from Independent Management Architecture (IMA) to Flexcast Management Architecture (FMA), there is no option in place to upgrade to Virtual Apps and Desktops 7.x from previous versions of XenApp (5 or 6.X). In addition, Citrix latest version—Citrix Virtual Apps and Desktops 7 1906—only supports Windows 10 for desktop operating system (OS) and Windows 2012 R2 or later for server OS. This may complicate the virtualization process for some businesses due to their legacy applications' requirements.

Therefore, now is the right time to jump ship. In this white paper, we examine how migrating to Parallels RAS can reduce the cost of an application and virtual desktop delivery solution by more than 60%.

Parallels RAS is an easy-to-use, scalable application and desktop delivery solution which has the lowest total cost of ownership (TCO) amongst its competitors. Considered an industry underdog by many, Parallels RAS has been in the industry since 2005, and many Citrix customers have already made the switch.

Who Should Read This Guide

Existing Citrix solutions users who need an application and virtual desktop delivery solution that is easy to use, low cost and can easily scale up to meet their business requirements.

Methodology

To highlight the differences between Citrix Virtual Apps and Desktops and Parallels RAS, we will compare the costs of setting up, managing and scaling up the following two setups:

- Setup A – Application and virtual desktop delivery solution for 150 users
- Setup B – Application and virtual desktop delivery solution for 500 users

In addition, we will discuss the following advantages of switching from Citrix Virtual Apps to Parallels RAS:

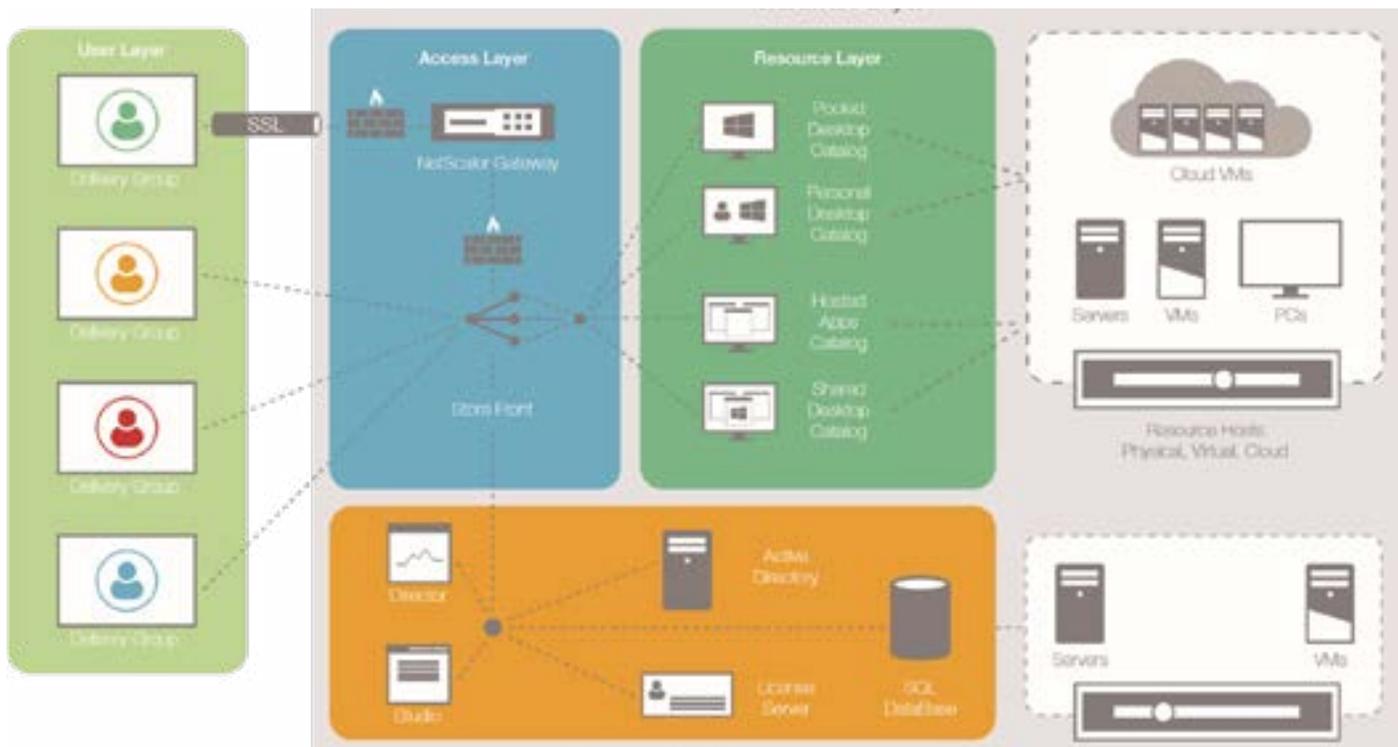
- Ease of use
- Cost-effectiveness
- Enhanced administration
- Better mobile experience

Licensing, Subscription and Hardware Expenses

Software licenses, maintenance agreements (or subscriptions) and hardware account for the majority of an IT budget. Accordingly, we begin our comparison of Citrix Virtual Apps and Desktops and Parallels RAS by examining the initial and running costs of both systems.

Understanding the Setup – Listing All Components

Before we discuss software and hardware requirements, we must understand all the components that make up a Citrix Virtual Apps and Desktops and a Parallels RAS setup. The two lists below highlight the basic components of a typical setup.



Citrix Virtual Apps Components List

Citrix Workspace App™: This endpoint component provides users access to all their Software as a Service (SaaS) and web applications, files, mobile apps and Citrix Virtual Apps and Desktops from the Citrix Workspace interface or from the Citrix Workspace or StoreFront web portal.

Citrix Workspace: Citrix Workspace integrates cloud (SaaS), mobile, virtual and web application accesses under the same access portal.

Citrix StoreFront®: StoreFront enables you to create enterprise app stores that aggregate resources from Virtual Apps and Desktops 7.x Sites, XenApp 6.x Farms or Citrix Endpoint Management (formerly XenMobile®).

Citrix Studio: Studio enables you to configure and manage Virtual Apps and Virtual Apps and Desktops deployments. Studio provides various wizards to guide you through the process of setting up your environment, creating machine catalogs and delivery groups, configuring policies and publishing applications or desktops.

Citrix Director: This web-based tool enables IT support and helpdesk teams to monitor Virtual Apps and Virtual Apps and Desktop environments, troubleshoot issues before they become system-critical and perform support tasks for end users.

Delivery Controller: The Delivery Controller is responsible for distributing applications and desktops, managing user access and optimizing connections to applications. One or more delivery controllers make up a single site.

Server OS Machines: These virtual or physical machines based on the Windows Server operating system are used for delivering Virtual Apps–based applications and Virtual Apps–based desktops to users.

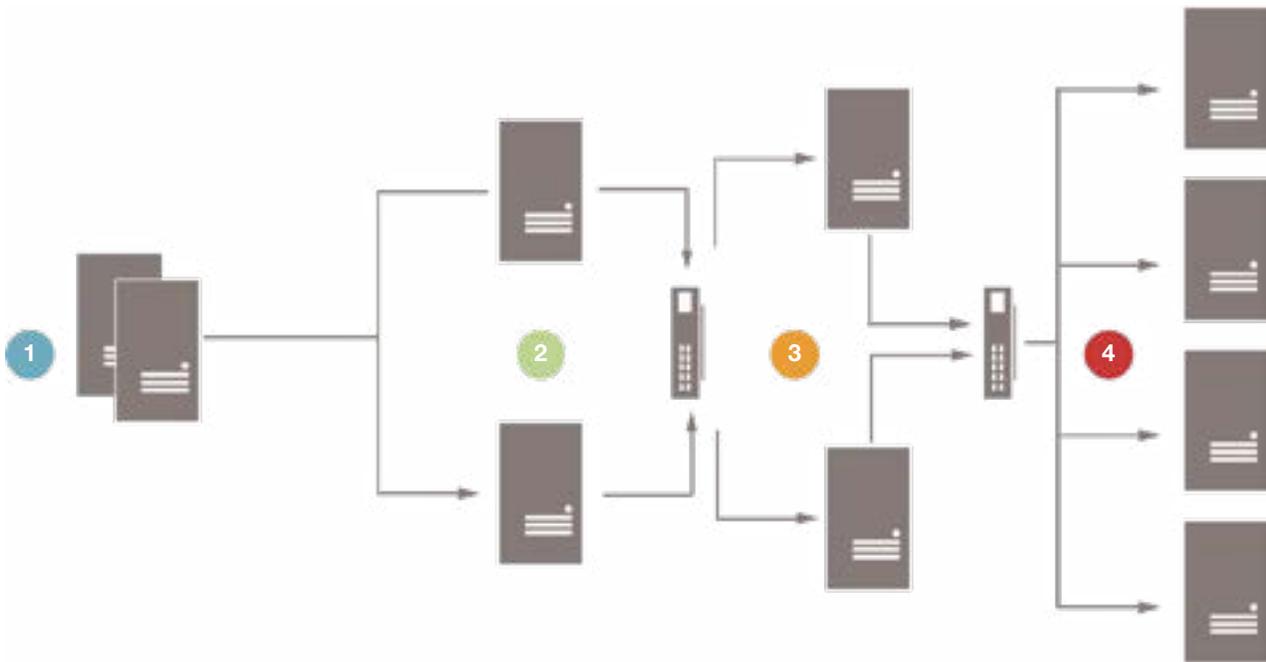
Desktop OS Machines: These virtual or physical machines are used for delivering the full VDI to users based on Windows desktop operating systems. This guide does not cover desktop OS machines.

Virtual Delivery Agent (VDA): The agent, which is installed on the virtual or physical machines hosting applications to be delivered to users, enables these machines to register with the delivery controllers. It also manages the HDX connection between the hosted applications and Citrix Receiver.

Microsoft® SQL Server: A Citrix Virtual Apps and Desktops site uses three SQL Server databases: Site Configuration, Configuration Logging and Monitoring. These databases should be set up on a Microsoft SQL Server. For a high-availability setup, one of the following configurations is recommended, with at least two servers: AlwaysOn Availability Groups, SQL Server database mirroring or SQL clustering.

Citrix ADC VPX: These virtual appliances usually run in pairs to provide a high-availability solution and load balance incoming connections between the storefront servers. Citrix ADC VPXs can also be used as SSL offloaders.

Parallels RAS Components List



- 1** A pair of HALB virtual appliances being used as SSL offloaders and high availability solutions. They are also load balancing incoming user connections between the gateways (the next hop).
- 2** The two gateways. Incoming connections will be load balanced between these two gateways by the previous hop, the HALB virtual appliances.
- 3** The two Parallels Remote Application Servers where the publishing agent is also installed. They are operating in an active/passive mode.
- 4** The farm of RD Session Hosts, where the shared applications are installed. Incoming connections are load balanced among all the servers by the load balancer running on the Parallels Remote Application Server install.

Parallels RAS Console: Installed automatically, this is a central location where everything in the setup is configured.

Publishing Agent: The Publishing Agent is automatically installed on the same server where Parallels RAS provides load balancing of published applications and desktops. It also checks the permissions of incoming user's connections.

Remote Desktop (RD) Session Host: A Microsoft Windows® server with Parallels RD Session Host Agent installed where the published applications are installed.

RD Session Host Agent: The agent that is installed on the RD Session Host that makes the publishing of applications possible. The agent is also used to enable communication between the Publishing Agent and the RD Session Host.

Gateway: The gateway component is where users connect to access the published resources.
HALB Appliances: These virtual appliances run in pairs to provide a high availability solution and load balance incoming connections between all the gateways. The High Availability Load Balancers can also be used as SSL offloaders.

Licensing Costs

Citrix Virtual Apps and Desktops

Citrix has defined two different methods for Virtual Apps and Virtual Apps and Desktops licensing. While XenApp is licensed by concurrent user, Virtual Apps and Desktops can be licensed either by concurrent user or by user/device (not concurrent—each user or device owns a license). After Virtual Apps and Desktops 7.8, many clients have decided to buy Virtual Apps licenses and provide “VDI solutions,” publishing server-OS desktops with OS desktops look and feel, thereby reducing hardware expenses. However, many still prefer buying Virtual Apps and Desktops licenses to provide their virtualization solutions (VDI and/or published applications).

Dovetailing with its products rebranding, Citrix has changed its license terms and models. A different application and/or desktop virtualization solution can be provided, combining different products and editions. Since Parallels RAS is a true RDS/VDI solution, we have chosen Virtual Apps and Desktops for this comparison.

Virtual Apps and Desktops Perpetual License Term

Citrix only offers the Perpetual License term. Licenses have no time limit, restricted duration or expiration. These licenses must be purchased with Subscription Advantage or Software Maintenance for a minimum of one year from delivery (except if received as a component of Workspace Suite). Provided services, which also imply additional costs, must be agreed between the companies and Citrix depending on their business needs: [citrix.com/content/dam/citrix/en_us/documents/support/citrix-software-maintenance-fact-sheet.pdf](https://www.citrix.com/content/dam/citrix/en_us/documents/support/citrix-software-maintenance-fact-sheet.pdf)

This feature is usually included in the initial purchase price of the license. Renewal fees are typically a smaller portion of the total initial purchase price.

They are also divided by license model:

User – License is assigned to a specific user authorized to use the service or product from any device, whether they are actively using it or not.

Device – License is assigned to a specific device regardless of the user account that is authenticated to the product or service on that device.

Concurrent – License is assigned to active sessions utilizing the service or product. When purchasing, consider the total number of active sessions needed to support the user population (the maximum number of users that will be connected at any given time).

And also by product edition:

Citrix has divided both Virtual Apps and Virtual Apps and Desktops in three different editions: Standard, Advanced and Premium. Parallels RAS uses concurrent user licensing per year, so to make a fair comparison for this exercise, we will use Virtual Apps and Desktops Advanced Edition Concurrent User License. This edition is the least expensive we can choose to build a complete virtualization solution. However, it has limited features; extra “components” like SSL VPN access licenses for Citrix Gateway, Intelligent Session Recording, SmartAccess policies or SCOM

Management Pack are not included. All features included with each edition can be reviewed at citrix.com/products/citrix-virtual-apps-and-desktops/feature-matrix.html. Each Citrix client must analyze their business requirements and decide which Citrix edition best fits their needs.

Each Virtual Apps and Desktops On-Premises license unit price* is shown in the following table (note that this is a subscription license):

Virtual Apps and Desktops On-Premises	Standard Edition	Advanced Edition	Premium Edition
Concurrent User	\$102	\$240	\$375

*store.citrix.com

At \$240 per concurrent user, building an application and virtual desktop delivery solution with Virtual Apps and Desktops will cost you:

- 150 concurrent users: \$36,000 per year
- 500 concurrent users: \$120,000 per year

Note: The price per user may vary should you opt to sign up to the Citrix Virtual Apps and Desktops User/ Device License Agreement. Also, if your company has lots of floating users or devices, the named user/device license just doesn't work for such a setup.

The 500-user setup we are building should be a high-availability solution. Hence, we should also include two Citrix ADC VPX to run as a high-availability pair and load balance incoming user connections. Citrix ADC VPX is also available in three editions and each edition's price** varies, depending on the throughput bandwidth that is allowed, as shown in the below screenshot:

Citrix ADC VPX	Standard Edition	Advanced Edition	Premium Edition
10 Mbps	\$2,440	\$6,100	\$9,760
200 Mbps	\$6,100	\$12,200	\$18,300
1000 Mbps	\$18,300	\$27,450	\$36,600
3000 Mbps	\$25,620	\$34,160	\$43,920

**store.citrix.com

In this case, we will use the Standard with a 10 Mbps throughput. This is the least expensive edition. Since each Citrix ADC VPX costs \$2,440, you need to add an additional \$4,880 to the total licensing cost.

Parallels RAS Licensing

There is only one edition of Parallels RAS, and it includes all the enterprise features such as reporting, load balancing, high-availability tools and more. Parallels RAS licensing depends only on

the number of concurrent users connecting to the environment. Therefore, at \$99.99 per user*** per year, the yearly licensing costs of Parallels RAS are:

- 150 users: \$14,998
- 500 users: \$49,995

***parallels.com/products/ras/buy/

Hardware Cost

Hardware is another big expense a business should consider when setting up its application and virtual desktop delivery solution. (Though it is important to note that the hardware requirements for an application delivery and desktop virtualization solution vary a lot.)

There are many criteria to consider when planning the hardware requirements. It depends on the type of applications and desktops that will be published, the number of users who will be connecting and using the system, the types of desktops used (for example, pool or dedicated) and more factors such as your business's infrastructure solution. Parallels RAS also supports VDI provisioning and management on Scale Computing HC3 hyperconverged infrastructure solution.

Therefore, from a technical point of view, it is very difficult (and inaccurate) to make a comparison of the hardware required for both setups. It is worth mentioning that even in its most simplistic installation, the Citrix solution requires more hardware and resources than Parallels RAS, so the more you scale up, the higher the hardware expense will be when running Citrix.

Easy-to-Use Solution

By comparing software licenses, you can already see that setting up and running a Citrix Virtual Apps and Desktops solution is far more expensive than Parallels RAS. Now let's look at another factor that also has a big impact on cost: ease of use.

An easy-to-use solution means IT professionals can deliver business requirements in a shorter time without needing any training. Let's compare the process of getting started with both Parallels RAS and Citrix Virtual Apps and Desktops.

Getting Started with Virtual Apps and Desktops

Getting started with Citrix is not easy. As we have seen in this article, the licensing model of Virtual Apps and Desktops alone is very complex. Therefore, you first have to figure out which product and which edition you need. For this section, we will use a simple Virtual Apps and Desktops installation.

Installing Virtual Apps and Desktops and Setting up the Site

Once you've dealt with the licensing issue, installing the Virtual Apps and Desktops setup is a relatively lengthy process:

1. Run the installation to install the Licensing Server, Studio, Director, Delivery Controller and StoreFront server.
2. Once the installation is ready, you have to create a new Virtual Apps and Desktops Site. To do this, you have to configure an SQL configuration database (hosted in a previously installed Microsoft SQL Server) and the Licensing Server connection.

3. Install the Virtual Delivery Agent (VDA) on all the application servers. To install the agent, you have to login to every server, run the installation and configure the connection with the Delivery Controller by specifying the server's IP address or FQDN. If you have a software distribution tool in your environment (for example, Microsoft System Center Configuration Manager), you can also use it for this initial VDA installation.

Publishing Applications and Desktops with Virtual Apps and Desktops

Once the setup is complete, to publish applications or desktops with Virtual Apps and Desktops you have to:

1. Login to the Virtual Apps and Desktops Studio console and create a new machine catalog, which is a list of all servers/machines available to deliver applications or desktops.
2. Create a delivery group from previously created machine catalog(s).
3. Add a new published application through the "New Published Application" Wizard, from which you select the application name and installation path on the server.
4. Limit visibility to the delivery group and assign users to each published application. The combination of delivery group visibility and published application user assignment will determine the real access allowance to the application.
5. Add the Virtual Apps and Desktops Site to the StoreFront server configuration (by adding all configured delivery controllers one by one) to allow users access to the applications via a web interface.

Citrix Studio (Virtual Apps and Desktops Management Console) is not intuitive, so to complete the above process you need to know several things. For example, you have to create a machine catalog before creating a delivery group, and you have two permission levels (delivery group and application) to manage application user access rights. IT admins can only learn about these things through research or training.

Getting Started with Parallels RAS

Parallels only has one solution for application and virtual desktop delivery: Parallels Remote Application Server (RAS). Enterprise features such as load balancing, high-availability components, reports and more are all included, and the license only depends on how many users will be connecting to the environment.

Installing Parallels RAS and Setting up the Site

Installing Parallels RAS and preparing the whole setup is straightforward. The Parallels RAS core installation is a single MSI file (Performance Monitor and Reporting Service are offered separately). Once you are logged in to the server, you can:

1. Run the installation and login to the Parallels RAS Console.
2. Add the Remote Desktop Session Hosts to the site by launching the wizard in the console and specifying their IP address. The RDS role will be installed and, if required, machine local firewall will be configured. Everything happens remotely and automatically, so you do not need to login to every RD Session Host.

Publishing Applications with Parallels RAS

Once the setup is complete, to publish applications with Remote Application Server simply:

1. Launch the Publish Application wizard and specify the application name which needs to be published. Note: While the wizard contains several configuration parameters, the defaults apply for most setups.
2. Once your farm is fully operational, you can invite users through the “Invite Users” wizard.

Ease of Use as a Cost Factor

Citrix and several other companies offer a vast range of training programs to help users better understand, install and maintain Citrix software. While there is nothing wrong with the training itself, working with Citrix is complicated and expensive. Citrix uses such a locked-down strategy to ensure a long-term income stream from all of its customers.

On the other hand, setting up an application delivery solution with Parallels RAS is a straightforward process. The software is intuitive; in fact, even junior IT personnel can build a Parallels RAS setup within a few minutes—without any training.

Cost-Effectiveness

Earlier in this white paper, we concluded that a Citrix Virtual Apps and Desktops setup costs as much as 400% more than Parallels RAS. Does Citrix Virtual Apps and Desktops really give you 400% more value than Parallels RAS? Let’s look at some of the features both solutions offer in an out-of-the-box solution.

Comparing the Default Features

Application and Virtual Desktop Publishing

Application and virtual desktop publishing are available in both Parallels RAS and Citrix Virtual Apps and Desktops.

VDI Solution

VDI support and management is available in Parallels RAS at no additional cost, and you can build VDI solutions using Microsoft, VMWare and Citrix hypervisors. The Parallels RAS VDI solution allows administrators to easily manage and secure access to published desktops. Apart from a complete and centralized user session management and template-based desktop pool provisioning, remote access user permissions can be dynamically granted or revoked preventing undesired accesses to virtual desktops outside the use of RAS Client.

Load Balancing

Load balancing is a crucial feature to guarantee a great user experience in large environments. If connections are not load balanced, some users will experience a bad connection and will not be able to do their job.

Parallels RAS has a built-in enterprise-level load balancer that is suitable for most setups. Basically, before allowing a new connection, it checks to see how many users each server has, as well as

the status of its free resources, and assigns the new connection to the server that is least busy. On the other hand, incoming connections in Virtual Apps and Desktops are only balanced between the servers in a specific delivery group; hence, scaling up will overcomplicate the configuration. Furthermore, if you want to load balance incoming connections using the same advanced criteria used by Parallels RAS, you have to write your own scripts and configuration policies. This is because Citrix removed the Load Evaluators, which were used to load balance incoming user connections, from the latest version of Virtual Apps and Desktops.

Scalability

Scaling up is something you should definitely look into. You need a system that is easy and inexpensive to scale up. Let's assume you need to scale up for 1,000 users. How easy is it, and how much will it cost you?

Scaling Up Parallels RAS

Parallels RAS has a highly scalable architecture that allows you to scale up the setup within just a few minutes. When scaling up, you only have to pay for additional user licenses (\$99.99 per user) and hardware. All the other software components used to scale up the setup, such as gateways and HALB virtual appliances, are not limited by any licensing.

Therefore, once the hardware is setup, you can install the new terminal servers and gateways agents remotely from the central Parallels Remote Application Server Console. Then add the new gateways in the HALBs so they are included in the load balancing of incoming connections, and all is done.

Citrix Virtual Apps and Desktops

In theory, scaling up a Citrix Virtual Apps and Desktops setup is similar to scaling up a Parallels RAS setup: you add more servers. But in practice, it is very different because it will cost you more. You need additional higher-spec servers because Citrix software is more resource-hungry.

It will also take more man hours to complete. If you don't have any software distribution tool in your company, new components have to be added manually. For each server you will be adding, you have to login to the server, run the installation for the component you want to run on it, and configure it.

Mobility and User Experience

Both Parallels and Citrix have their own end-user client software, which can be installed on today's most popular operating systems and mobile devices such as Android™ and iPhone®. Both solutions can also be accessed via an HTML5 clientless portal, which is available in an out-of-the-box installation of Parallels RAS but not by default in Citrix Virtual Apps and Desktops. To have an HTML5 clientless portal in Citrix Virtual Apps and Desktops, you'll have to configure it in a new virtual server in your Citrix ADC VPX. If you haven't purchased this product for load balancing, it means additional licensing.

Parallels RAS also includes the session pre-launch feature, which uses machine learning techniques based on user habits to significantly reduce application launch time and users' login time, providing clients with a better user experience.

Enhanced Administrator Experience

Parallels RAS Console includes instant access to a predefined set of management tools such as network utilities, Windows Service Management Console, power management commands and much more. Administrators can include custom tools to be run on any server in the RAS farm, optimizing maintenance and troubleshooting procedures.

Director is the web tool provided by Citrix for managing user sessions and generating reports. Compared with Citrix Director which offers a limited number of reports, Parallels RAS offers a complete set of predefined out-of-the-box reports, plus the chance to create custom reports to provide administrators with a complete view of their Parallels RAS environment health and usage. Parallels RAS also includes a web-based management console to manage client connections, which may be used to reliably delegate certain helpdesk tasks.

Moving Forward: Switch to Parallels RAS

Switching from one software vendor to another might be concerning. However, if you want to run a low-cost system that is easy to use and scale, it is time to switch to Parallels RAS. This white paper clearly shows that Parallels RAS:

- Is easier to use and scale up
- Has a lower total cost of ownership (TCO)
- Requires much less management and maintenance
- Optimizes the user experience

Don't let the process of migrating from Citrix Virtual Apps and Desktops to Parallels RAS stop you from making the switch and realizing huge cost savings. It is important to remember that you cannot upgrade from a XenApp 6.X solution to Virtual Apps and Desktops 7.X. Citrix does not have an easy upgrade solution in place because of the big architectural differences between the solutions. As a result, a full migration is required—and if you're upgrading to Citrix Virtual Apps and Desktops 7.X, this will also require buying even more hardware.

On the other hand, you can use the same hardware to migrate to Parallels RAS, since it requires fewer resources and can share existing Virtual Apps and Desktops infrastructure. In addition, Parallels RAS can automatically push the agents on the same RDS (Terminal Servers) that were used with Virtual Apps and Desktops, so you can immediately publish the same applications without any additional configuration. To make it even easier, Parallels also has a resource that documents the migration process, and its support team will be more than willing to help you with the switch.