



Migration from Citrix

White Paper | Parallels Remote Application Server

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Introduction

This guide explains how to migrate your Citrix XenApp application and virtual delivery solution to Parallels® Remote Application Server (RAS). This guide is written in an easy-to-follow, step-by-step format.

Why Should You Migrate from Citrix to Parallels RAS?

There are several reasons why you should migrate from Citrix XenApp to Parallels RAS, each of which may have a white paper written on it. While that is beyond the scope of this migration guide, below are just a few highlights on why you should decide to migrate:

- Spend less and deliver more. XenApp licensing and pricing is complex. Businesses must first decide which product edition best fits their needs. All Parallels RAS features—such as load balancing capabilities, high availability and publishing of applications or VDI—are available in one edition. This eliminates the complexity of evaluating which license best suits your business needs and provides enterprise features to all, no matter the size, out of the box at an affordable price. Parallels RAS can be licensed via subscriptions, or pay as you go via the Service Provider License Agreement (SPLA) for managed service providers (MSPs) and independent software vendors (ISVs).
- Easier to maintain and scale up. A complete XenApp virtualization solution requires multiple and complex components. The installation and configuration takes much longer because each component must be configured individually. Overall a XenApp site requires many more servers to run that need to be managed. Parallels RAS provides a complete out-of-the-box solution; enterprise features such as load balancing, high availability, provisioning of RD session hosts and VDIs, reports, and more are all included and managed centrally. A Parallels RAS setup can be easily scaled up with a few mouse clicks from a central configuration, and all required components are included in the license. Parallels RAS is also much easier to address and manage—no dedicated staff is required.
- Excellent mobile experience. Parallels RAS provides access to desktop applications as if they were native applications on iOS and Android devices. With Parallels RAS unique Applification™ technology, users can use the native touch gestures of mobile devices—such as wipe, drag, tap to click, or zoom—with additional proprietary features, like the magnifying glass to interact with any remote Windows application on any mobile hardware.
- Longer product life cycle and backward compatibility. Full migration is needed to upgrade from XenApp 5.x or 6.x to XenApp 7.x because of the change in architecture: Independent Management Architecture (IMA) to FlexCast Management Architecture (FMA). Due to this architectural change, in-place upgrades are not available; to upgrade your Citrix setup, you still must do a complete migration. Parallels RAS always had a stable upgrade path, and the whole infrastructure can be upgraded within just a few minutes with the click of a button. By running Parallels, you can also keep using all your Windows 2003 SP1 and newer servers since you can run the Parallels RAS farm using a mixed environment.
- Parallels RAS Citrix XenApp Migration Tool. Migrating to Parallels RAS is easier than ever before with the free migration tool. It extracts configuration settings of the servers, applications, worker groups, and zones from your XenApp 6.0 or XenApp 6.5 farm and imports them into the Parallels RAS Console. The migration tool is available on Github.

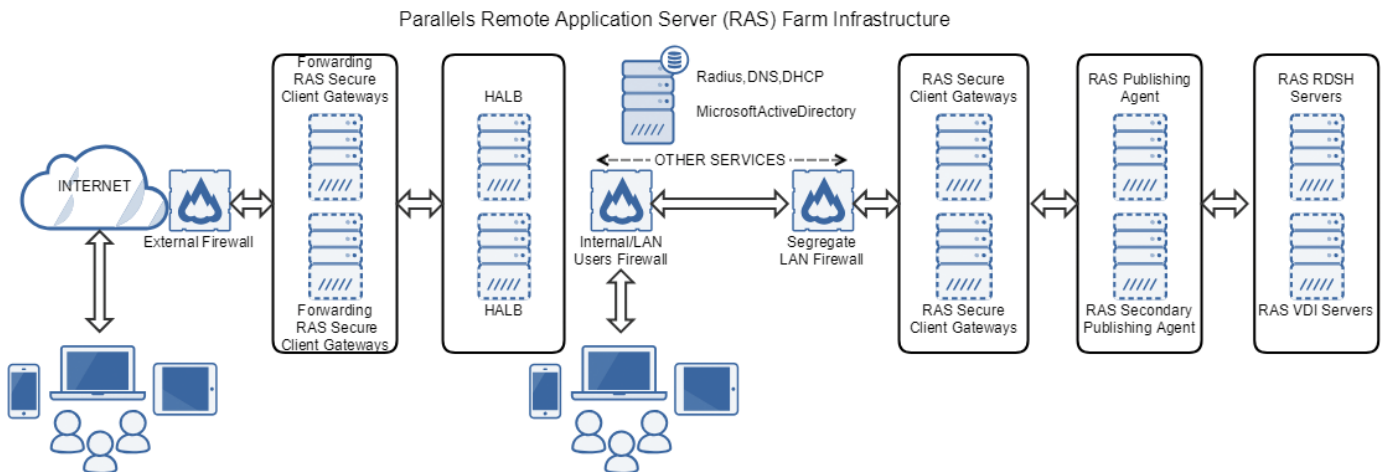
Migrating from Citrix to Parallels RAS

This guide documents the migration process of a high availability infrastructure from XenApp (either IMA or FMA) to Parallels RAS. In this migration process, we will assume that:

- The setups are high availability setups with redundant infrastructure roles.
- The number of servers running users' sessions (Remote Desktop Session Hosts) will be the same for all the scenarios. In Citrix terms, these are XenApp Workers or VDAs.

Parallels RAS Components

This guide documents the migration process of a high availability infrastructure from XenApp (either IMA or FMA) to Parallels RAS. In this migration process, we will assume that:



Below is a list of the components that make up a Parallels RAS infrastructure. This list will help you understand which Parallels components will replace the existing Citrix ones.

Parallels Remote Application Server (RAS): This is the main server installation from where the site(s) and farm can be centrally managed.

RAS Publishing Agent: The RAS Publishing Agent is a component installed on the main Parallels RAS server mentioned above. It is responsible for the distribution of published objects and users' access. To ensure users do not experience any interruption of the service due to a failure of the RAS primary Publishing Agent, a secondary Publishing Agent may be configured in a Parallels RAS farm.

RAS RDSH Servers: The RDSH servers are the Windows Servers where the published applications are hosted. The Remote Desktop (RD) Session Host agent which is installed on them is used by the Parallels RAS to monitor the server and manage connections.

RAS Secure Gateway: The gateway is the point of entry for users. The gateway also hosts the HTML5 client-less portal, which users can use to access published objects without requiring client software.

Parallels HALB Virtual Appliances: These virtual appliances are used for SSL offloading and to load balance incoming connections between multiple gateways.

Additional Servers: Optional servers for reporting and/or monitoring can be added to the setup. Parallels RAS can be plugged into Microsoft Reporting Services. It provides predefined templates on user activity, server groups, devices being used, server health, and application usage.

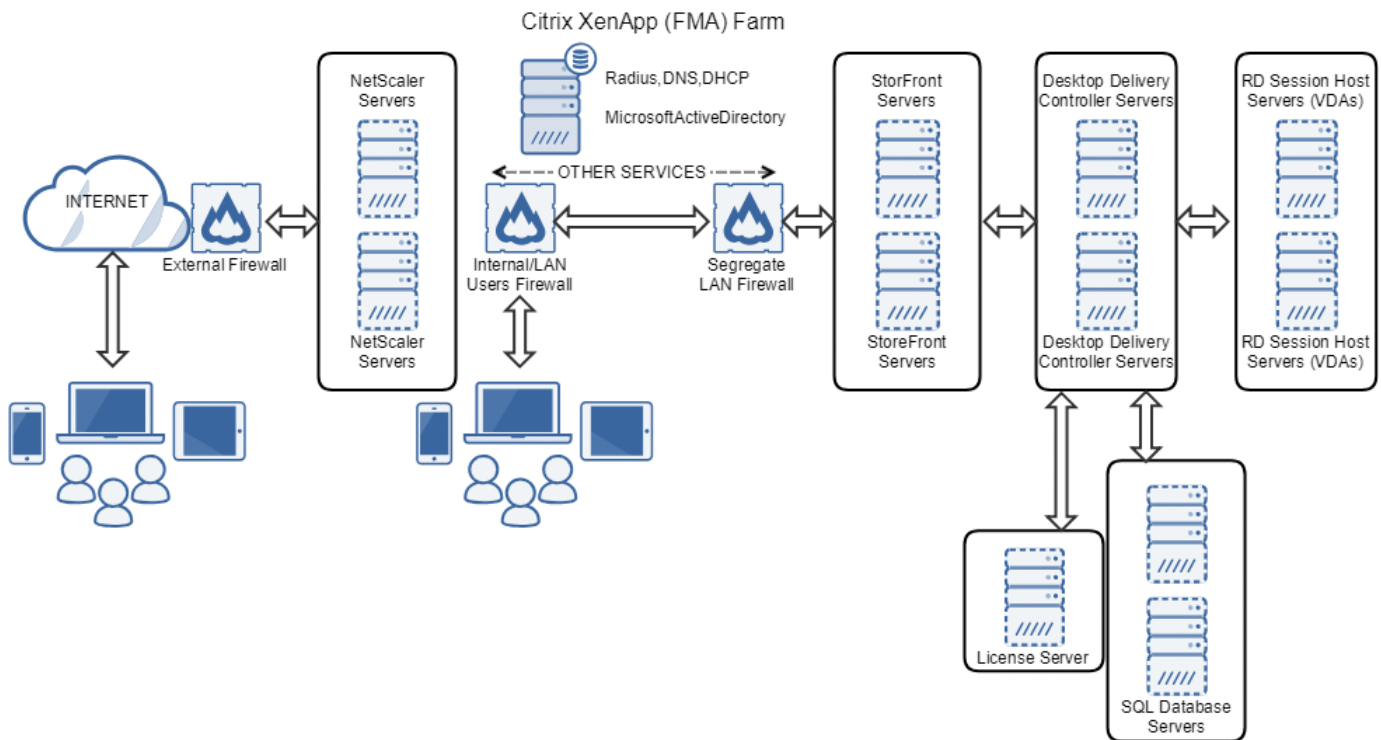
Migrating an Existing IMA Citrix XenApp Setup to Parallels RAS

For the migration of a Citrix XenApp 6.x setup to Parallels RAS, the migration tool will be used.

The tool is a standalone software (set of PowerShell scripts) that can be executed on a separate management server. The migration tool allows administrators to migrate the following settings from the XenApp 6.x farm to the Parallels RAS farm:

- Servers and applications
- Worker groups
- Zones

The following diagram shows the IMA XenApp setup used in this migration. It is composed of the following servers and components.



Zone Data Collectors: These keep track of the zone's dynamic data, such as session and server load information. Therefore, they are also responsible for load balancing XenApp worker servers in a farm.

XML Brokers: The brokers handle user credentials for Web Interface, retrieve the applications for which a user has access permissions, and returns the address or FQDN of the server serving the required resource. Up to XenApp 6.0, any XenApp server could be an XML broker on a XenApp farm. With XenApp 6.5, only servers that are controllers can be XML Brokers.

Licensing Server: The licensing server is required in a XenApp infrastructure to manage all Citrix licenses.

Database Servers: The two database servers store the XenApp infrastructure configuration on a Microsoft SQL server database. Since a high availability solution (mirrored database) is needed, two Microsoft SQL servers are being used.

XenApp Servers (worker role): These are the servers that host the published applications and run end users' sessions.

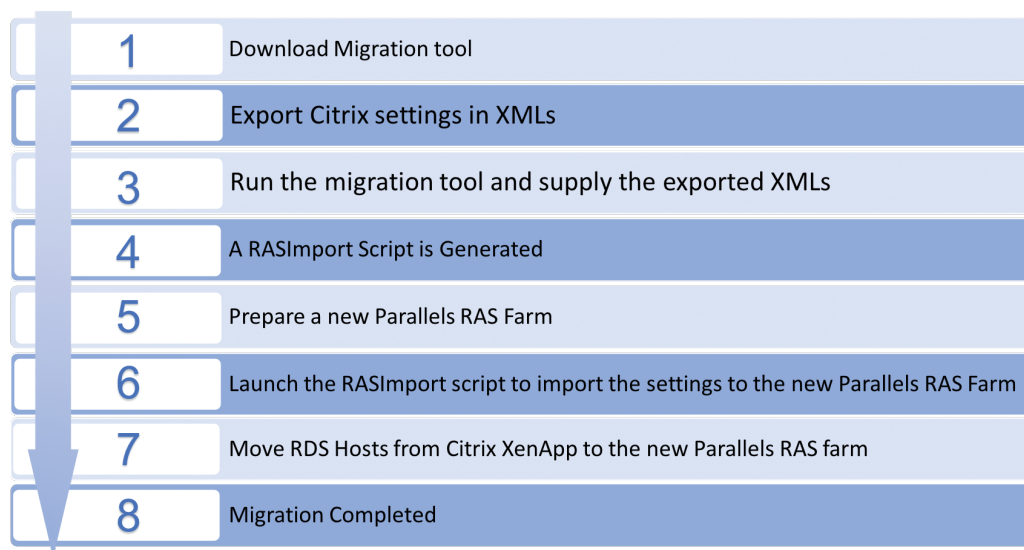
Web Interface Servers: These servers host the web interface which users use to access the published applications.

NetScaler VPX (optional): These are configured in a high availability mode and are the main point of entry to remote users. NetScalers are typically used for SSL offloading and to load balance incoming connections to the Web Interface and XMLBroker servers.

Citrix Secure Gateway (optional): Enables secure access to the company's networked computers running Citrix XenApp, as well as providing a secure Internet gateway between Citrix XenApp and user devices. Secure Gateway encrypts and authenticates all user connections.

Citrix XenApp 6.x Components	Parallels RAS Components
Farm	Farm
Zones	Sites
Data Collector/XML broker	Publishing Agent
Secure Gateway/Access Gateway/Web Interface	Secure Client Gateway
NetScaler (Load Balancing)	HALB
License Server	Not Applicable – Master Publishing Agent handles licensing
Database Server	Not Applicable – Parallels RAS uses config files synched between all Publishing Agents
EdgeSight Monitoring	Parallels RAS Monitoring and Reporting Server
XenApp Server/Session Host	RD Session Hosts
Delivery Services Console/App Center	Parallels RAS Console
Worker Group	Server Groups
Citrix Policies	Parallels RAS Policies
Citrix Receiver	Parallels RAS Client (Native or HTML5)

Here is a high-level workflow of the migration procedure.



Step 1: Install Parallels RAS Infrastructure Servers

Install the Parallels Remote Application Server. This server will be the central point of operations for the RAS farm, from where you will be managing the farm's configuration and scaling it up.

Tip: Ideally, you should use a new server, but if resources are limited and you must use one of the Citrix XenApp Infrastructure servers, install Parallels RAS on the least-used servers, such as the licensing server. You can leave the Citrix licensing running while running Parallels RAS until the migration is complete.

Installing Parallels RAS

The process of installing Parallels RAS is very straightforward, as explained in this installation guide. During a customer installation, you can choose what Parallels RAS components can be installed, such as the Publishing Agent, Secure Client Gateway, RD Session Host, and more.

Tip: If you want to use one of the Citrix XenApp infrastructure servers, a Web Interface server or a Citrix Secure Gateway server (if available) can be replaced with a RAS Secure Gateway Server, and an XML Broker can be replaced with a Publishing Agent.

The clientless HTML5 portal is installed automatically with the Parallels Secure Client Gateway, using a self-signed SSL/TLS certificate. If you want to use your own certificates, you can purchase SSL/TLS certificates from a trusted authority. If you want to use certificates from your own CA, add the Root CA's certificate to all the endpoint clients.

Note: An out-of-the-box installation of Parallels RAS will include the secure gateways and all the other required components to run the application delivery solution from a single server.

Step 2: Export the XenApp Settings

The migration tool requires four XML settings files to operate—applications, zones, servers, and worker groups—and it must be executed in a Citrix server with the following components installed (prerequisites):

- Citrix XenApp 6.x
- Citrix XenApp SDK 6.x
- PowerShell v2

Configuration files will be obtained by running the following commands in the selected Citrix Server:

```
Add-PSSnapin citrix.xenapp.commands # load Citrix PowerShell Cmdlets
```

```
# Export all application settings
```

```
Get-XAApplicationReport * | Export-Clixml "./applications.xml"
```

```
# Export all zone settings
```

```
Get-XAZone | Export-Clixml "./zones.xml"
```

```
# Export all server settings
```

```
Get-XAServer * | Export-Clixml "./servers.xml"
```

```
# Export all workergroup settings
```

```
Get-XAWorkerGroup | Export-Clixml "./workergroups.xml"
```

Step 3: Run the Citrix-RAS Migration Tool

1. Download the Parallels RAS Citrix Migration Tool.
2. Move the four exported XML settings files into the same directory.
3. Launch PowerShell and change current path to the tool's directory.
4. In the PowerShell console window, execute Run.ps1 script as shown below:

```
.  
\Run.ps1 -XmlPathWorkgroups ./workergroups.xml -XmlPathZones ./zones.xml  
-XmlPathServers ./servers.xml -XmlPathApplications ./applications.xml  
-XmlPathFarm ./farm.xml
```

The following table describes migrated components match between Citrix XenApp and Parallels RAS.

Citrix XenApp	Parallels RAS
Zones	Sites (Partial)
Servers	RDS Hosts
Worker Groups	RDS Groups
Applications	Published Applications

Running this script will generate the MigrationScript.ps1 script along with the exported icons in the icons folder. MigrationScript.ps1 can then be modified to meet your requirements. If this script is going to be executed on a different machine, the icons folder must be moved, too.

Note: Once the MigrationScript.ps1 script is created, it can be run immediately or saved to be executed later, when the Parallels RAS farm is ready to import configurations.

Step 4: Migrate RDS Host Servers to Parallels RAS

Once the MigrationScript.ps1 script has been executed, configuration has been imported to our Parallels RAS Console, but servers are still not in production. At this stage, you can start moving RD Session Hosts to your RAS farm and start testing published applications.

Test Published Applications and Migrate Test Users

At this stage, we have to decide to install new RAS RD Session Hosts or to use Citrix Workers.

If you decide to use new servers, just spin up new servers and install the RAS RD Session Agent from the Parallels RAS Console. Once new servers are available, install all software required to be published based on the migrated applications. Once finished, these servers will be ready to host your test users' sessions.

If you decide to use the older Citrix XenApp Workers, choose from the set of servers imported by the migration tool and replace the installed Citrix XenApp worker software with the RAS RD Session Host Agent. To do so, deploy the RAS agents by following the below procedure:

- Open the Parallels RAS Console.
- Click "Farm category" and choose "Add RD Session hosts."
- Select the host or hosts you want to push the agent to; click OK to start the installation.

When the RAS RD Session Hosts Agent is installed on the servers, their status is verified and they are ready to host RAS connections. At this point, IT administrators are ready to make all required tests with imported published applications.

When testing is successful, you can migrate the first users to the RAS farm. You can do so by sending your users email invitations.

Install RAS Infrastructure Servers for High Availability

To have a high availability setup on Parallels RAS, you must duplicate the infrastructure servers. If the machines are running in a virtual environment, just spin up two new server images. Then install and configure the Parallels Secure Client Gateway and the Publishing Agent on them. If you are using physical servers, you need to decommission a Citrix server.

Tip: Since you are migrating away from the Citrix environment, you can decommission some of the high availability servers or one of the RD Session Hosts while the users are offline, temporally distributing its predefined load among the rest of RD Session Hosts.

Migrate All Users

At this stage, you should be able to move all users from XenApp to the RAS farm. Just schedule your migration depending on the number of RD Session Hosts that have to be updated. From the Parallels RAS Console:

- Check and verify all published applications are imported from the migration tool.
- Check user access filtering.
- Scale out and add other RD Session hosts as required.
- Use the Invite by Email feature to invite the remaining users.

Note that when inviting remote workers, you must specify the external/public IP address of the RAS farm.

Decommission the Rest of the Citrix Setup

Once all users have been moved, you can decommission all pending XenApp servers: License Server, Store-Front Servers, Desktop Deliver Controllers, and Database Servers.

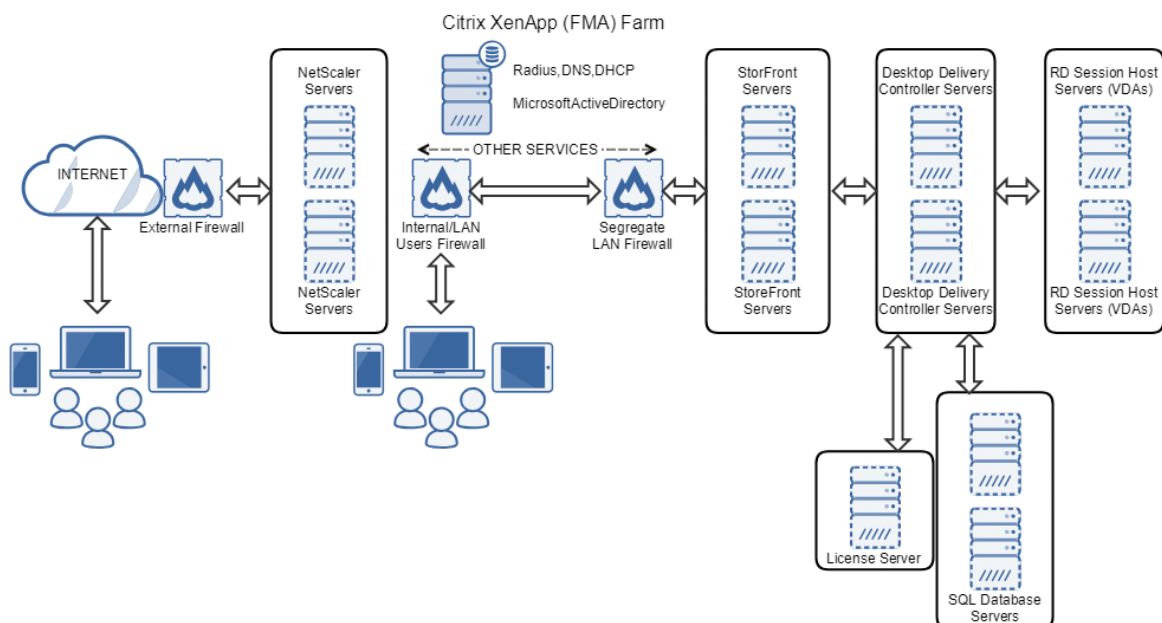
Step 5: (Optional) Install the Parallels HALB Virtual Appliances

The Parallels HALB virtual appliances can be used as SSL offloading or Passthrough to load balance incoming connections to the Parallels Secure Gateways.

Note: Parallels HALB virtual appliances can be used to replace Citrix NetScalers if these are used to load balance incoming connections to the XenApp farm. Alternatively, Citrix Netscalers can be also be used to load balance secure traffic between the Parallels Client and the Secure Client Gateway.

Migrating from Citrix to Parallels Existing FMA Citrix XenApp Setup

With the release of Citrix XenApp/XenDesktop 7, Independent Management Architecture was replaced by FlexCast Management Architecture. The following diagram shows the FMA Citrix XenApp setup used in this migration. It is composed of the following servers and components.



Delivery Controller: These servers are responsible for distributing applications and desktops, managing user access, and optimizing connections.

Licensing Server: This server is required in a XenApp infrastructure to manage licenses.

Database Servers: These servers store the XenApp infrastructure configuration in a Microsoft SQL server database. Since a high availability solution (Clustered Instances, AlwaysOn Availability Groups, or Mirroring) is needed, two servers are being used.

Remote Desktop Session Host Servers with Virtual Delivery Agent (VDA): These servers host the published applications and desktops.

StoreFront servers: These servers load balance incoming connections to the XenApp desktop delivery controllers, and also provide a web-based interface to the users.

NetScaler VPX (optional): These appliances are configured in high availability mode and are the main point of entry to remote users. NetScalers are typically used for SSL offloading and to load balance incoming connections to the StoreFront and Delivery Controller servers.

Citrix XenApp 7.x Components	Parallels RAS Components
Site	Farm
Zones (as of version 7.7)	Sites
Delivery Controller	Publishing Agent
Web Interface/Storefront/NetScaler Gateway	Secure Client Gateway
NetScaler (Load Balancing)	HALB
License Server	Not Applicable – Master Publishing Agent handles licensing
Database Server	Not Applicable – Parallels RAS uses config files synched between all Publishing Agents
Virtual Desktop Agent (VDA)	RD Session Hosts
Citrix Studio and Director	Parallels RAS Console
Machine Catalogs/Delivery Groups	Server Groups
Citrix Policies	Parallels RAS Policies
Citrix Receiver	Parallels RAS Client (Native or HTML5)

Proposed steps for migrations from Citrix XenApp 7.x to Parallels RAS are listed below.

Step 1: Install Parallels RAS.

Step 2: Publish the first application.

Step 3: Complete the high availability setup.

Step 4: Migrate the first users from Citrix to Parallels.

Step 5: Migrate all users and decommission Citrix servers.

Step 6 (Optional): Install the Parallels HALB virtual appliances.

Step 1: Install Parallels RAS

Install the Parallels Remote Application Server. This server will be the central point of operations for the RAS farm, from where you will be managing the farm's configuration and scaling it up.

Tip: Ideally you should install RAS on a new server. If resources are limited and you want to use one of the Citrix XenApp Infrastructure servers, it is recommended to use one of the least-used servers.

Installing Parallels RAS

The process is very straightforward, as explained in this installation guide.

During a customer installation, you can choose what Parallels RAS components can be installed, such as the Publishing Agent, Secure Client Gateway, RD Session Host, and more.

Tip: If you want to use one of the Citrix XenApp Infrastructure servers, a Web Interface server can be replaced with a RAS Secure Gateway Server and an XML Broker can be replaced with a Publishing Agent.

The clientless HTML5 portal is installed with the Parallels Secure Client Gateway, using a self-signed TLS certificate. If you want to use your own certificates, you can purchase TLS certificates from a trusted authority. If you want to use certificates from your own CA, add the Root CA's certificate to all the clients.

Note: An out-of-the-box installation of Parallels RAS will include the secure gateways and all the other required components to run the application delivery solution from a single server. In fact, during the first stages of this migration, you will be running the farm from a single server.

Step 2: Publish the First Application

This step can be completed while users are online and accessing the published applications, should you opt to install the Parallels Remote Desktop Session Host Agent on the same server where the Citrix Delivery Agent is installed.

However, to avoid manually configuring the agents to run on the same server, it is recommended to do the migration while users are offline. To do so, decommission a Citrix Virtual Delivery Agent and replace it with a Parallels RD Session Host Agent.

- Remove the Citrix server from Machine Catalog and Delivery Groups in the Citrix Studio console.
- Remove the Citrix Virtual Delivery Agent.
- Install the Parallels RAS Agent.

Replace just one or two RD Session Hosts to allow yourself to do all necessary tests before migrating users. Install the Parallels Client and confirm that you can access the published application on the RD Session Hosts.

Step 3: Complete the High Availability Setup

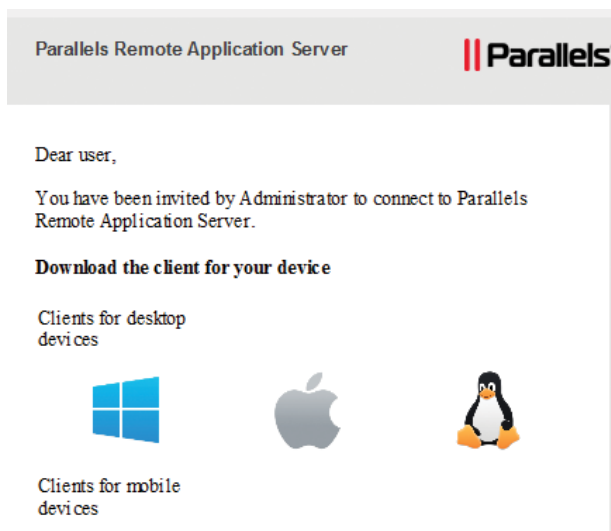
At this stage, all the Parallels RAS components are running on a single server. To scale up the farm and cater for more users, you need to install some of the components on dedicated servers, such as the Secure Client Gateway or the Publishing Agent.

If you are running a virtual environment, just spin up two new server images with 4 GB of RAM. On them, install and configure the Parallels Secure Client Gateway and the Publishing Agent. If you are using physical servers, decommission a Citrix server.

Tip: Since you are migrating away from the Citrix environment, decommission one of the high availability servers or a RD Session Hosts while the users are offline, distributing their users among the rest of RD Session Hosts.

Step 4: Migrate the First Users from Citrix to Parallels

At this stage, you are ready to migrate the first production users to the Parallels RAS farm. Once the SMTP server is configured, send the invitations to your users from the Parallels RAS Console. Users will receive an email like the below to download and configure the Parallels RAS Client.



Step 5: Migrate All Users and Decommission Citrix Servers

At this stage, you can move all users from the XenApp farm to the Parallels RAS farm. Just schedule your migration depending on the number of RD Session Hosts that have to be updated. Open the Parallels RAS Console to:

- Publish all applications.
- Grant user access filtering.
- Remove the Citrix Server from Machine Catalog and Delivery Group in Citrix Studio.
- Uninstall the Citrix Virtual Delivery Agents.
- Install the RAS Agents from the Parallels RAS Console.
- Check that all agents are verified.

As soon as the RAS RD Session Hosts Agent is installed on the target servers and its status is verified, the servers are ready to host RAS connections. Use the Invite by Email feature to invite the remaining users to the Parallels farm. Note that when inviting remote workers, you must specify the external/public IP of the RAS farm.

Once all users are moved, decommission the remaining XenApp servers: License Server, StoreFront Servers, Desktop Deliver Controllers, and Database Servers.

Step 6 (Optional): Install the Parallels HALB Virtual Appliances

The Parallels HALB Virtual Appliances can be used as SSL offloading and to load balance incoming connections for the Parallels Secure Gateways.

Note: Parallels HALB virtual appliances can be used to replace Citrix NetScalers if these are used to load balance incoming connections to the XenApp Farm. Alternatively, Citrix Netscalers can be also be used to load balance secure traffic between the Parallels Client and the Secure Client Gateway.

Moving Forward with Parallels RAS

This document highlights how easy the process is to migrate from Citrix XenApp to Parallels RAS. However, it is still very important to split the migration into stages and test every stage and change to ensure there is no disruption. Considering the ease of use of the Parallels RAS solution and how easy it is to scale it up, the migration can be completed within a few hours.

The Parallels RAS Migration Tool makes the migration procedure from XenApp 6.x farms even easier. Furthermore, the Parallels RAS Client is available for most popular operating systems and mobile devices. It is also available for HTML5-enabled browsers for a client-independent solution.

Finally, it is worth remembering that the Parallels RAS licensing model is based on the number of concurrent users connecting to the environment. The same license covers both published applications and a virtual desktop infrastructure (VDI) solution, which makes life easier for businesses.

Appendix

Uninstalling Citrix XenApp 6 or 6.5 from Windows Server 2008 R2

The strategy to uninstall Citrix software packages is a reversal of how they were installed and the removal of extra components.

1. Uninstall post-rollup updates from Add/Remove Programs, such as Citrix Hotfix XA650R06W2K8R2X64001, and reboot.

2. Uninstall rollup package from Add/Remove Programs, such as Citrix Hotfix Rollup Pack XA650W-3C8R2X64R06, and reboot.

Note: Always remove the latest post-rollup updates first, and then remove the rollup update. Rollup updates are cumulative packages; therefore, if you have HRP06 and fixes for it installed, remove all fixes post-HRP6 and then rollup pack 6.

3. Remove XenApp 5 from Add/Remove Programs, reboot the server, and check that the data store has been updated correctly. For XenApp 6 or 6.5, follow these instructions.

4. If they are installed, remove the following components. There is no need to restart the server when uninstalling the following:

- Citrix Single Sign-On Console
- Citrix XenApp Management
- Citrix XenApp Commands
- Citrix Common Commands
- Citrix Group Policy Client-Side Extension (x64)
- Citrix Group Policy Management (x64)
- Citrix XenApp Migration
- Citrix XenApp Server Configuration Tool
- Citrix XenApp Server Role Manager
- Citrix License Configuration Tool HDX
- Citrix MediaStream for Flash
- Citrix HDX WMI Provider

5. If installed, remove the Citrix Offline Plug-in and reboot when ready.

6. If installed, remove the Citrix Online Plug-in or Citrix Receiver and reboot when ready.

Note: If the server stops accepting RDP connections after removing XenApp, try to recreate the RDP listener by following this procedure.