

Microsoft®  
**Application Virtualization**  
for Remote Desktop Services



**Application Virtualization 4.6 for Windows Server  
2008 R2 Remote Desktop Services**

White Paper Summary

This whitepaper discusses the benefits, configurations and considerations when planning a Microsoft® Windows Server® Remote Desktop Services solution with Microsoft Application Virtualization (App-V®).



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## Overview

Microsoft Application Virtualization 4.6 (App-V) for Remote Desktop Services (RDS) allows organizations to realize the benefits of App-V for Windows Desktops on their Remote Desktop Session Host (RD Session Host) servers. In addition, the App-V 4.6 Windows Desktop<sup>\*</sup> client can be included on virtual desktops brokered by RDS to provide virtual applications to personalized or pooled virtual desktops. This document will explain the setup and configurations for implementing App-V for Remote Desktop Services.

Server sprawl can be a costly issue for organizations that rely on Remote Desktop Services. To avoid application conflicts, applications must undergo significant testing to determine which applications will conflict and, therefore, must be separated and run on different RD Session Host server silos—a time-consuming and costly process.

In some instances customers are required to run multiple separate RD Session Host servers for each application. This results in servers being underutilized because each one is locked into a specific configuration, capable of serving only a limited set of non-conflicting applications, in some instances using just 25 percent of capacity. Some customers are also using Virtual Desktop Infrastructure (VDI) instead as an alternate delivery mechanism to address this issue. Microsoft App-V for Remote Desktop Services completely changes this situation and allows customers to increase vertical scale and reduce TCO over VDI based solutions.

The session virtualization environment (many users sharing a single server or servers, but with individual desktops and applications), is different from a desktop environment (one user utilizing a single client OS resources and applications). However, the benefits of App-V translate into the session virtualization environment. These benefits include:

- **Consolidate Servers and End Server Siloing, Increasing Server Farm ROI:** App-V's application virtualization allows most applications to run alongside any other—even applications that

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<sup>\*</sup> **Note:** Usage rights for App-V for RDS are included with the RDS Client Access License (RDS CAL). However, the App-V Windows Desktop client, which is installed on physical and virtual Windows desktops, is licensed through the Microsoft Desktop Optimization Pack (MDOP). MDOP is available as a subscription for Software Assurance customers.

For more information on the new RDS CAL, please see:

<http://www.microsoft.com/windowsserver2008/en/us/rds-product-licensing.aspx>

For more information on MDOP licensing, please see:

<http://www.microsoft.com/windows/enterprise/products/mdop/default.aspx>

normally conflict, multiple versions of the same application, and many applications that previously could not run under Remote Desktop Services. This eliminates the need for server silos and significantly improves server utilization. As a result, the number of servers needed is much lower, operational costs for managing the remaining servers are reduced, and the server farm ROI is increased.

- **End Application Conflicts and Regression Testing:** By eliminating the need to permanently install applications on servers, and shielding the operating system and applications from changes created when installed applications run, Microsoft App-V for RDS prevents problems that hinder deployments. The need to perform lengthy regression testing is also significantly reduced.
- **Accelerate Application Deployment:** Applications that use App-V typically only need to be packaged once for desktop or Remote Desktop Services platforms. However, the packages should be tested on all target platforms to ensure compatibility. This reduces the need for "double packaging" or creating two different processes and packages when providing the choice of running an application on a desktop or via a RD Session Host server.
- **Reduce Deployment Risk:** Installing a new application on a RD Session Host server was traditionally a risky process; first you had to ensure all users were logged off, then you had to change the mode of the RD Session Host server and, often, you then had to reboot. Software updates and uninstalls introduce even great complexity and risk. With Microsoft App-V, applications can be deployed and updated on demand to users without having to reboot or log users off.
- **Simplify Profile Management:** Microsoft App-V allows application settings and data to be stored in a single network location. This ensures a user's application settings are available no matter what RD Session Host server is used—without the need for roaming profiles. Additionally, this feature makes mandatory profiles a viable option for session virtualization scenarios—operating system settings remain locked within the mandatory profile while per-application settings can still be modified by the user. This dramatically simplifies the complexities of managing profile data.

### **App-V, RDS and Virtual Desktop Infrastructure**

In addition to traditional session virtualization, RDS also provides a platform for a Virtual Desktop infrastructure (VDI). With RDS, administrators have a unified experience for setting up user access to session-based applications and desktops as well as virtual machine based isolated desktops in the data center. Leveraging App-V in a VDI environment provides similar benefits to the traditional desktop environment but also addresses some unique issues. These benefits include:

- **Simplify base images with dynamic application provisioning to clients:** Users connecting to virtual machines will access provisioned applications on demand. This allows for smaller and more flexible master images as the application layer is assembled on top of the virtual machine. In addition, App-V reduces the network overhead by only delivering the requested portions of the applications. These portions remain in the cache for subsequent use.

- **Minimize application duplication:** One cost of dynamic provisioning is that applications need to be streamed into cache. This increases the launch time and requires additional disk space as each virtual machine that uses the application will have its own copy. To avoid this, you can configure the App-V client to use a shared cache. With a shared cache, the applications are precached as a single instance on shared storage and each virtual machine accesses their provisioned applications from that same cache. The on disk footprint is reduced and the application is ready to run in advance of the user's request. For more information on configuring and maintain a shared cache, see the article *How to Configure a Read-only Cache on the App-V Client* <http://technet.microsoft.com/en-us/library/ee956915.aspx> .

**Note: The App-V shared cache feature is not supported at this time for use in RD Session Host farms.**

## Assumptions

The content in this guide assumes that the reader is familiar with Remote Desktop Services technology and Microsoft App-V, and is planning or evaluating the use of App-V on Remote Desktop Services.

## App-V and Remote Desktop Services

Combining App-V and Remote Desktop Services provides great benefits for organizations that either currently use Remote Desktop Services or are looking at implementing Remote Desktop Services. Using App-V provides a cost-effective solution as it eliminates many deployment and maintenance costs. App-V 4.6 also provides increased scalability with support for 64-bit operating systems.

This section will explain the steps for installing and configuring App-V on Remote Desktop Services to ensure a supportable working environment. Installation and configuration of Remote Desktop Services where it is not specific to App-V will be referenced separately in additional documentation.

### App-V Setup on Remote Desktop Session Host Server

Installing the App-V for Remote Desktop Services Client is no different than installing other local applications on a RD Session Host server. Installing non-virtualized applications on a RD Session Host server requires using *install mode* for the RD Session Host server.

#### Remote Desktop Services Install Mode

As mentioned above, installing an application locally on a RD Session Host server requires placing it into install mode. In Windows Server 2008 R2, Windows Server 2008 and Windows Server 2003 the following command will switch the RD Session Host server or terminal server into install mode.

From a Command Prompt on the RD Session Host server with no users logged in, execute:

- Prior to installation: **change user /install**
- Upon completion of install: **change user /execute**
- Query the current mode of RD Session Host server: **change user /query**

The corresponding GUI can be used to properly install applications on a RD Session Host server or terminal server.

#### Windows Server 2008 R2

On Windows Server 2008 R2 an application can be installed on a RD Session Host server by going to **Control Panel (Category View) | Programs** and choosing **Install Application on Remote Desktop Server**. Then follow the wizard to install the App-V Client.

#### Windows Server 2008

On Windows Server 2008 an application can be installed on a terminal server by going to **Control Panel (Non-Classic View) | Programs** and choosing **Install Application on a Terminal Server**. Then follow the wizard to install the App-V Client.

#### Windows Server 2003

On Windows Server 2003 an application can be installed on a terminal server by going to **Control Panel | Add or Remove Programs | Add New Programs** and select **CD or Floppy**.

## App-V 4.6 for Remote Desktop Services Client Considerations

Installing the App-V 4.6 for Remote Desktop Services (App-V for RDS) client requires planning of the client configuration. This is not any different than the App-V Windows® Desktop Client, but some of the settings require additional consideration for deployment on a RD Session Host server. The following settings should be carefully considered when planning an App-V for RDS client install. Additional information is available in the *App-V Application Publishing and Client Interaction Whitepaper* located at: <http://go.microsoft.com/fwlink/?LinkId=127120> and the *App-V Planning and Deployment Guide* at: <http://go.microsoft.com/fwlink/?LinkId=122063>.

- **Global Data Location:** This location is the default store of the sftfs.fsd file or client cache, along with other App-V files. The App-V file system cache can be moved independently of the global data location. Because the cache file can be quite large, consider placing it in an alternate location from the default (c:\Documents and Settings\All Users\Documents on Microsoft Windows XP® and Windows Server 2003 and c:\users\public\public documents on Microsoft Windows Vista® and Windows Server 2008).

In VDI environments, you may choose to configure the App-V 4.6 Windows Desktop client (licensed with MDOP for Software Assurance) to use a shared read-only cache to minimize the disk footprint. You will add registry keys to the App-V client in the master image to configure each virtual desktop to use a shared cache located on a SAN. In addition, you will need to develop a plan for the initial preparation and deployment of the shared cache file and for the on-going management of application updates. See the link mentioned earlier for *How to Configure a Read-only Cache on the App-V Client*.

- **Preferred Drive Letter:** This setting determines the drive letter that will be used by the App-V Client to mount the virtual file system. If the drive letter is changed from the default (Q:), then it should be set consistently on all App-V Clients and should match the drive letter that is assigned to the second disk partition on a sequencing workstation (e.g., S:).
- **User-specific Data location:** This setting determines where the App-V Client stores user-specific changes to virtual application packages (e.g., usrvol\_sftfs\_v1.pkg). By default, the App-V for RDS Client will place the user-specific data in the AppData folder of the user's profile. If mandatory RDS profiles are used, then the AppData folder of RDS user profiles should be redirected to a network location (e.g., a subdirectory within the user's RDS home directory).
- **Cache Size Settings:** The App-V Client (Windows Desktop or Remote Desktop Services) allows the cache (sftfs.fsd file) to be configured in one of two ways:
  - **Use maximum cache size:** Sets the cache to an absolute maximum size.
  - **Use free disk space threshold:** Sets the cache to grow as long as there is available disk space on the RD Session Host server.

The settings above should be considered for all RD Session Host server client installations. It is recommended to carefully plan and standardize on as many of these settings as possible to ensure the most cost-effective support for RD Session Host servers.

## Remote Desktop Services Profiles

A Remote Desktop Services user may have both a standard user profile for his or her desktop on the Windows Server 2008 server and a Remote Desktop Services profile. This allows the user to maintain different settings for logon from the Windows desktop and to the RD Session Host server. There are two options when planning a storage location of App-V user data.

The first option is to redirect the App-V user data to a separate network location outside of the user's profile. This is achieved by configuring the App-V Client to store user data to a network location. This can be done during the setup of the Client using the GUI installer or with the installation command-line parameter (SWIUSERDATA). Additional information on configuring installation command-line parameters is available at: <http://technet.microsoft.com/en-us/library/cc843737.aspx>.

This option eliminates the complexity and additional considerations for configuring the App-V data in user profiles. However, it does add an additional location that needs to be maintained and made available to all RD Session Host servers in the farm to enable a consistent user experience.

The other option is to store the App-V user data with the user's profile. There are specific configurations that are required to ensure proper App-V operation. The details of configuring profiles are presented in the following section.

There are three choices when planning a profile solution for the Remote Desktop Services environment. Each has benefits and drawbacks that must be considered in order to develop the most appropriate solution for the environment.

### Profile Types

The information provided in this section provides an overview of planning profiles for RD Session Host servers. Detailed steps and additional considerations are available at:

[http://technet.microsoft.com/hu-hu/library/cc766489\(en-us\).aspx](http://technet.microsoft.com/hu-hu/library/cc766489(en-us).aspx).

#### **Local Profiles**

Local profiles store the user-specific settings and data only on the RD Session Host server where the user logs in. This situation would be acceptable if there is only one RD Session Host server. However, as more users log on and create profiles on the RD Session Host server the disk space consumed could become a burden without using folder redirection, which will be discussed later in this section.

#### **Roaming Profiles**

Roaming profiles allow for the user's profile to be stored on a network location. This solution works well in an environment where users need to make changes to their profile and retain them in subsequent logons. Also, it is beneficial when users log on to multiple computers (e.g., RD Session Host server farm) where the expected user experience is to retain any changes made to their profile settings and data.

Roaming profiles are stored on a server, but are copied locally when the user logs on to a computer. Upon logoff the user's profile changes are copied back to the roaming profile location. This can increase the user logon and logoff times. One option would be to use Group Policy to configure

profile quota settings (per user) and the overall size of the roaming profile cache on a RD Session Host\*. This can mitigate the risk of having the profile data consuming disk space. Another important consideration is that profiles aren't granular and stored as a flat file. If multiple copies of a user's profile are open, the settings in the copy that were saved and closed last will be the ones reflected in the network-based roaming profile.

\* The overall size limit is configured with the setting **Limit the size of the entire roaming user profile cache** in the following registry key:

Computer Configuration\Policies\Administrative Templates\Windows Components\Remote Desktop Services\Remote Desktop Session Host\Profiles

### **Mandatory Profiles**

Mandatory profiles differ from roaming profiles in that users can edit them, but the changes that are made are not saved to the profile. One drawback to mandatory profiles is that a user can save data to a profile based data location, but it will not be saved as part of the profile when the user logs off. Changes are not copied back to the network location. Using folder redirection in combination with mandatory profiles is imperative to allow users to save files to their personal folders that are part of the profile.

Mandatory profiles give administrators more control over the user environment by ensuring that any user changes that were made will not be saved and those changes cannot cause support incidents for the help desk. Mandatory profiles also speed up logoff times as no data is being saved to the network.

### Folder Redirection

The reasons for folder redirection are different for mandatory and roaming profiles, but they should be considered when planning a Remote Desktop Services solution with or without App-V.

As mentioned previously, mandatory profiles allow users to edit the profile settings and data, but those changes are not saved for subsequent use. This can be problematic and generate many support calls if the user saves a file to a data location that is part of the profile and then logs off. The file will not be saved and upon the next logon the data file which is not part of the mandatory profile will be lost. The use of Group Policies with folder redirection can be used to redirect data locations to separate network locations to which the user can save data.

With roaming profiles a user can make changes to settings and data stored in the profile, but the data and settings have to be copied back to the network location during logoff and copied back to the local profile upon logon. This can increase the size of profile storage on a local RD Session Host server and the network location, and slow down the logon and logoff process for users. Group Policies with folder redirection can be used to redirect data locations that can increase the size of the profile and increase the logon and logoff times. For roaming users, these profiles should be stored on a fault tolerant file server.

With the addition of an App-V for Remote Desktop Services client, user-specific data is presented to support virtual applications. This user-specific data (usrvol\_sftfs\_v1.pkg) is stored by default in the

user's profile in the **AppData/Roaming** folder (Windows Server 2008) or **Application Data** folder (for Windows Server 2003). It contains user-specific changes to virtual applications. This can include changes the user makes to the UI (toolbars) or modifications to configuration of a virtual application (Outlook Profile). This data needs to be available to provide App-V with the data to preserve users' application customizations and settings as they move to different servers on a Remote Desktop Services farm. For more information about how user-specific data is stored and its usage, read the *App-V Application Publishing and Client Interaction* document located at: <http://go.microsoft.com/fwlink/?LinkId=127120>.

This data can be redirected from the profile by using Group Policies to redirect the application data out of the user profile to a user-accessible location for proper configuration of virtual applications. These settings can enable central RD Session Host server user profiles location and reduce the size of data stored on the RD Session Host server locally for long-term support benefits.

Please see the following resources for additional guidance on configuring profiles for both Remote Desktop Services and Windows desktops:

Technet -

<http://technet.microsoft.com/en-us/library/cc766489.aspx>

MS Press book *Windows Server 2008 Remote Desktop Services Resource Kit* -

<http://www.microsoft.com/learning/en/us/Books/12716.aspx>.

Remote Desktop Services Team Blog -

<http://blogs.msdn.com/rds/archive/2009/06/02/user-profiles-on-windows-server-2008-r2-remote-desktop-services.aspx>.

## Virtual Application Deployment to Remote Desktop Servers

When planning a RD Session Host server deployments with App-V there are several options available to deliver the virtual application packages to the RD Session Host server. The following table lists the supported publishing options and recommended Remote Desktop Services features (Remote Desktop and RemoteApp) when used with different App-V deployment methods:

Deployment Method	Infrastructure Required	Supports User Publishing	Supports Computer Publishing	Upgrade Process	Preload App-V Cache Capability
Full Infrastructure w/ RTSP(s)	App-V Management Server   App-V Data Store (Microsoft SQL Server®)   App-V Management Service   IIS Server	Yes	No	<ul style="list-style-type: none"> <li>Version updated on App-V Management Server</li> <li>RD Session Host server placed in maintenance mode</li> <li>First open of package will upgrade</li> </ul>	No
Full Infrastructure w/ HTTP(s) or File Streaming	App-V Management Server   App-V Data Store (SQL)   App-V Management Service   IIS Server	Yes	No	<ul style="list-style-type: none"> <li>Version updated on App-V Management Server</li> <li>RD Session Host server placed in maintenance mode</li> <li>Publishing refresh</li> <li>First open of package will upgrade</li> </ul>	No
Stand Alone Client (MSI)	HTTP/File/RTSP Server if streaming	No	Yes	<ul style="list-style-type: none"> <li>RD Session Host server placed in maintenance mode</li> <li>New version of package MSI executed</li> </ul>	Yes <sup>2</sup>

Deployment Method	Infrastructure Required	Supports User Publishing	Supports Computer Publishing	Upgrade Process	Preload App-V Cache Capability
Microsoft System Center® Configuration Manager® 2007 R2*	Configuration Manager 2007 R2   IIS Server (Distribution Points)	No <sup>1</sup>	Yes	<ul style="list-style-type: none"> <li>RD Session Host server placed in maintenance mode</li> <li>Configuration Manager 2007 R2 advertisement executes</li> </ul>	No <sup>2</sup>
SFTMIME*	None required	Yes <sup>1</sup>	Yes	<ul style="list-style-type: none"> <li>RD Session Host server placed in maintenance mode</li> <li>Updated package published with SFTMIME</li> </ul>	Yes <sup>2</sup>

Table 1: Virtual Application Deployment to Remote Desktop Servers

**1: Using Configuration Manager 2007 R2 with RD Session Host servers only allows delivery to the console session for advertisements. This would eliminate the possibility of user-based targeting as the users will not log on to the console session and, therefore, will not run the advertisement. This is a Configuration Manager 2007 R2 limitation for both virtual and traditional applications. Also, using SFTMIME to deliver packages is only recommended if targeting the RD Session Host server computer and not users.**

**2: The use of MSI, Configuration Manager 2007 R2, and SFTMIME can be configured to preload the cache with different results. By default the MSI-based installation will load the package into the App-V cache, but can be configured for streaming. Configuration Manager 2007 R2 has two delivery options: streaming and download and execute. Neither of them preload the package into the App-V cache, however download and execute will place it locally on the RD Session Host server and will be loaded to the App-V cache on first use. SFTMIME can be configured to load the package and would be recommended for RD Session Host servers that use Full Infrastructure or manual publishing for preloading the App-V cache.**

The table above describes possible methods for deploying virtual application packages to RD Session Host servers and Windows desktops. When thinking about RD Session Host servers or Windows desktops and choosing the best deployment method, you must consider the type of use for the computer. Since RD Session Host servers are normally used by many users, deployment methods that deliver only to computers have some key drawbacks that must be evaluated. For additional

information about client settings, behavior and data locations, download and read the *App-V Application Publishing and Client Interaction Guide* at: <http://go.microsoft.com/fwlink/?LinkId=127120>.

RD Session Host servers often host applications for many users. In many cases, not all users should be able to run all applications on the RD Session Host server. With user-based publishing the applications will only appear for the users to which they were published. However, when computer-based publishing methods are used, any application that has been published to a computer would be available to all users of the RD Session Host server. This is often not the desired result and will need to be considered when planning a Remote Desktop Services environment with App-V.

Also, the active upgrade feature is a very compelling feature of App-V. However, on a RD Session Host server all users of an application package would have to close all applications in a package for the active upgrade feature to work. It may be required to implement a process for draining users from each farm member in turn to accomplish an Active upgrade. On a Windows desktop environment, only one user is logged in at a time and that user would simply have to close and reopen the application.

## Choosing a Delivery Method

The delivery method used depends on the version of RD Session Host server, the features that are going to be implemented, and to what purpose RD Session Host servers are deployed. In the previous table there are several methods of delivering virtual applications to a RD Session Host server.

### **Recommendations**

Several key factors will be present when deciding which deployment method should be used. The following recommendations should be implemented when choosing a deployment method to achieve the most favorable results:

- Virtual applications should be pre-cached on RD Session Host servers
- Remote Desktop servers should be placed in maintenance mode for upgrades

In order to select the appropriate delivery method, administrators will need to plan for the recommendations listed above. The following table lists the upgrade process for each delivery method and the pre-cache capabilities for each delivery method.

Using the information from the previous table, administrators can develop a solution based on the features that are required and the management tasks associated with each of them. The following information provides additional details on how different targeting and delivery methods behave and the benefits and drawbacks of each one.

### **User-Based Targeting**

Targeting users has been the standard feature with App-V Full Infrastructures. This deployment method works well with a RD Session Host server configured to deliver a remote desktop to the user. Pre-caching of applications in user-based targeting would require the use of SFTMIME or SFTTRAY to

ensure that applications are completely loaded into cache prior to users connecting to sessions and using the virtualized applications.

### **Computer-Based Targeting**

Targeting computers was introduced with the previous version of App-V. The ability to create MSIs for deployment provides a useful option for deploying applications to RD Session Host servers because it can be configured to pre-load the App-V cache. MSIs, Configuration Manager 2007 R2, and SFTMIME (with /GLOBAL switch) can all be used with computer based targeting. Computer based targeting is limited in the fact that virtual applications deployed to computers are available to any user that logs on to a session.

### **Streaming Methods**

The streaming method of deployment has the benefit of supporting an active upgrade or at least the differential streaming available to update only the changed data when upgrading. These methods are normally referred to as Full Infrastructure. All of the delivery methods support a streaming concept with the proper configuration. The use of streaming methods for delivery will require that virtual applications are pre-cached to achieve optimal results and will need to be done through scripting using SFTMIME or SFTTRAY. The Full Infrastructure provides user-based targeting that works well with a remote desktop delivery with Remote Desktop Services.

### **Stand Alone Methods**

Stand-alone methods of deployment of either MSI or Configuration Manager 2007 R2 can operate in two separate ways. For an MSI (MODE=STREAMING LOAD=FALSE) or Configuration Manager 2007 R2 (Streaming) deployment, it can be configured to support streaming of the package. This has the drawback of not pre-caching the virtual application. If used as the default MSI installation (LOAD=TRUE) or in Configuration Manager 2007 R2 (download and execute) the application will be pre-cached. However, in Configuration Manager 2007 R2 (download and execute) the virtual application will be placed in the Configuration Manager 2007 R2 cache and will be streamed into the App-V cache on first launch. Both of these stand-alone options only target computers. There is no user-based targeting available. Stand-alone delivery methods work well with both the remote desktop and RemoteApp features in Remote Desktop Services.

### **SFTMIME**

SFTMIME can operate as a delivery method that can load the package or stream the package, target users, or target computers. SFTMIME requires writing scripts to perform the addition of packages for the selected target. The packages manifest.xml file contains the publishing information. SFTMIME as the delivery method can be configured to support the remote desktop and RemoteApp features of Remote Desktop Services. More information is available on using SFTMIME to publish packages in the *Extensibility Today Before the SDK* whitepaper at: <http://go.microsoft.com/fwlink/?LinkId=127120>.

**Note: When using SFTMIME with RemoteApp it is recommended to only use computer based targeting of virtual applications.**

## Remote Desktop Services for Windows Server 2008 R2

With Remote Desktop Services, organizations can provide access to Windows-based programs from virtually any location to almost any computing device. Remote Desktop Services in Windows Server 2008 R2 includes Remote Desktop Session Host (RD Session Host), RemoteApp®, Remote Desktop Web Access (RD Web Access), Remote Desktop Gateway (RD Gateway), Remote Desktop Connection Broker and Remote Desktop Virtualization Host. Combining these features with App-V provides additional flexibility and options when planning a Remote Desktop Services infrastructure.

### Remote Desktop Session Host

Remote Desktop Session Host enables organizations to provide access to an entire Windows desktop environment from virtually any location to users. The RD Session Host presents the user with a Microsoft Windows® desktop running on a remote server. This can provide users access to corporate applications in more locations and in some cases be used as the user's primary desktop environment.

### RemoteApp and Desktop Connections

Microsoft RemoteApp and Desktop Connections enables organizations to provide access to standard Windows-based programs from virtually any location to users with computers running Microsoft Windows 7, Windows Vista®, Windows Server 2008, or Windows XP with Service Pack 3. RemoteApp is also available to users with computers running Windows XP with Service Pack 2 (SP2), Windows Server 2003 with Service Pack 1, or Windows Server 2003 with SP2 that have the new Remote Desktop Connection (RDC) client installed.

RemoteApp programs are programs that are accessed remotely through Remote Desktop Services and appear as if they are running on the end user's local computer. Instead of being presented to the user in the desktop of the remote RD Session Host server, the RemoteApp program is integrated with the client's desktop, running in its own resizable window with its own entry in the taskbar. Users can run RemoteApp programs side-by-side with their local programs. If a user is running more than one RemoteApp program on the same RD Session Host server, the RemoteApp programs will share the same Remote Desktop Services session.

### Remote Desktop Web Access

Remote Desktop Web Access is a role service in the Remote Desktop Services role that lets you make RemoteApp programs or an entire server-hosted desktop, available to users from a Web browser. Additionally, RD Web Access enables users to connect from a Web browser to the remote desktop of any server or client computer where they have the appropriate access.

With RD Web Access, users can visit a Web site (either from the Internet or from an intranet) to access a list of available RemoteApp programs. When they start a RemoteApp program, a Remote Desktop Services session is started on the RD Session Host server that hosts the RemoteApp program.

## Remote Desktop Gateway

Remote Desktop Gateway is a role service in the Remote Desktop Services server role of Windows Server 2008 R2 that allows authorized remote users to connect to resources on an internal corporate or private network, from any Internet-connected device. The network resources can be RD Session Host servers, RD Session Host servers running RemoteApp programs, or computers with Remote Desktop enabled.

## Remote Desktop Connection Broker

Remote Desktop Connection Broker (RD Connection Broker), formerly Terminal Services Session Broker (TS Session Broker), is used to provide users with access to RemoteApp and Desktop Connection. RD Connection Broker supports load balancing and reconnection to existing sessions on virtual desktops, Remote Desktop sessions, and RemoteApp programs accessed by using RemoteApp and Desktop Connection. RD Connection Broker also aggregates RemoteApp sources from multiple Remote Desktop Session Host (RD Session Host) servers that may host different RemoteApp programs.

## Remote Desktop Virtualization Host

Remote Desktop Virtualization Host (RD Virtualization Host) is a new role service in the Remote Desktop Services for Windows Server 2008 R2. The RD Virtualization Host integrates with Hyper-V to provide virtual machines that can provide personal virtual desktops or pooled virtual desktops by using RemoteApp and Desktop Connection. The RD Virtualization Host is an important component in the Microsoft VDI solution.

## Configuring Remote Desktop Services for Windows Server 2008 R2

This document does not focus on any specific settings when configuring Remote Desktop Services for Windows Server 2008 R2. Links are provided for step-by-step detail in configuring Remote Desktop Services for Windows Server 2008 R2 below:

[http://technet.microsoft.com/en-us/library/dd736539\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/dd736539(WS.10).aspx)

Additional guidance on configuring Remote Desktop Services for Windows Server 2008 R2 is available at: [http://technet.microsoft.com/en-us/library/dd647502\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/dd647502(WS.10).aspx).

## Remote Desktop Services for Windows Server 2008 R2 and App-V Considerations

Configuring a Windows Server 2008 R2 RD Session Host server with App-V for Remote Desktop Services brings many benefits to the environment that have been listed previously in this document. There are some considerations that must be made when choosing between the Remote Desktop and RemoteApp features of Remote Desktop Services for Windows Server 2008 R2.

### **Session-based Desktop with App-V vs. RemoteApp with App-V**

Choosing between session-based desktop and RemoteApp will depend on the desired result. If Remote Desktop Services is being used to present a user with an entire desktop environment with all of the user's applications, then RD Session Host is an easy choice. If Remote Desktop Services is being used to make an application or a few applications available seamlessly to a user's local desktop and applications, then RemoteApp becomes more compelling. RemoteApp presents the applications to the user in a way that they appear to be locally installed, whereas RD Session Host will require a user to use a separate desktop to access applications hosted on the RD Session Host servers.

### **Remote Desktop Session Host Considerations**

When using RD Session Host, App-V behavior is similar to that of the Windows Desktop client. A RD Session Host server or farm of RD Session Host servers could host many users, but with different virtual applications published to different users. This can be achieved with an App-V full infrastructure and user-based targeting. This option requires much less administrative overhead than the same option using RemoteApp. However, if an organization decides to implement an App-V computer-based targeting deployment method (see App-V Stand-alone MSI or Configuration Manager 2007 R2 in Table 1), virtual application shortcuts are published machine-wide to all users that are connected to the RD Session Host server.

### **RemoteApp Considerations**

By using RemoteApp with App-V it is possible to deploy virtual applications to users. However, configuring a virtual application for RemoteApp will require additional administrative steps and is not recommended. Using RemoteApp with computer-based targeting, administrators can control which applications are available to individual users by only deploying the RDP or MSI files to the appropriate users. This will achieve a similar functionality as a session-based desktop with user-based targeting, but will have the added benefit of integrating the virtual application into the user's local desktop.

### **Configuring RemoteApp with App-V**

When configuring the RemoteApp program list, App-V virtualized applications are only included in the list of available applications for the administrator of the RD Session Host server to configure when the applications have been deployed using the Stand-alone MSI or Configuration Manager 2007 R2 deployment methods. Therefore, when using the App-V Management Server for virtual application publishing services, there are extra steps to perform in the RemoteApp Wizard. The steps to accomplish this follow below. This is by design as the RD Session Host server is not aware of the App-V virtual applications which have been published to users on the App-V for Remote Desktop Services Client. Remote Desktop Services is only aware of virtual applications that have been published to the RD Session Host server computer.

When a program that has been virtualized using App-V is configured as a RemoteApp, the icon for the program is displayed as the standard App-V icon instead of the icon normally associated with the virtualized application. You are also unable to change the icon to use an ICO file from the application package ICO files. This behavior is by design as Remote Desktop Services with RemoteApp in Windows Server 2008 R2 only allows icons that are embedded in DLLs and EXEs. With App-V, the executable points to SFTTRAY.EXE and not the application EXE. The following KB article describes the behavior at: <http://support.microsoft.com/default.aspx?scid=kb;en-us;970831&sd=rss&spid=13952>

The following steps can be completed to acquire the correct icon from a virtual application for use with RemoteApp.

1. Publish the virtual application to a user on the RD Session Host server.
2. At a command prompt run the following command:

**SFTTRAY.EXE /exe cmd.exe /launch "Application Name"**

**NOTE: The "/launch "<Name of Program + Version>" can be found by looking at the details of a shortcut to a virtual App-V application (e.g., /launch "Microsoft Office Word 2003"). Alternatively the App-V Client Management console, SFTMIME, or the registry can be used to find the correct "<Name of Program + Version>". The "Application Name" is also case sensitive in the SFTTRAY.EXE command.**

3. Once the command prompt is open, copy the EXE or DLL for the application that has the embedded icons in it to the location on the RD Session Host server (e.g., c:\AppVEXEs).

Next, if using a full infrastructure (user-based targeting with a Management Server publishing) with RemoteApp, the following steps must be completed:

1. Launch the **Add RemoteApp Programs** wizard from the **Actions** in the **RemoteApp Manager** located in **Administrative Tools | Remote Desktop Services**.
2. Click **Next**.
3. Click **Browse** in the **Choose programs to add to the RemoteApp Programs List** screen.
4. Browse to **Program Files\Microsoft Application Virtualization Client** and select **sftray.exe** and choose **Open**.
5. Select **Properties** and change the following settings:
  - a. **RemoteApp program name:** <Name of Application>
  - b. **Alias:** <Alias Name of Application>
  - c. **Command-line arguments:** Change setting to **Always use the following command-line arguments:** and specify the following arguments:
    - i. **/launch "<Name of Program + Version>"**

**NOTE: The "/launch "<Name of Program + Version>" can be found by looking at the details of a shortcut to a virtual App-V application (e.g., /launch**

**“Microsoft Office Word 2003”). Alternatively the App-VApp-V Client Management console, SFTMIME, or the registry can be used to find the correct “<Name of Program + Version>”**

- d. **Change Icon:** Browse to the location where the EXE or DLL with embedded icon files have been copied (e.g., c:\AppVEXEs) as described above, and select the appropriate file to acquire the correct icon. The icon filename path should not have more than one ‘.’ in it or the icon will not appear correctly when used with RemoteApp.

**NOTE:** If deploying applications with stand-alone methods MSI or Configuration Manager 2007 R2, the above steps are not applicable as the virtual applications and icons will appear correctly.

### **Provisioning the RemoteApp Advertisement**

After completing the RemoteApp Wizard, the RemoteApp advertisement can be provisioned in four ways – RD Web Access, RemoteApp and Desktop Connection, RDP File or Windows Installer Package.

- **RD Web Access:** The default settings in the RemoteApp Wizard enable the advertisement on the RD Web Access page. Users can browse to <https://server/rdweb> to see the list of applications to which they have access.

Enable RemoteApp Programs for Remote Desktop Web Access:

<http://technet.microsoft.com/en-us/library/cc731450.aspx>

- **RemoteApp and Desktop Connections:** In Windows 7, clients can configure the URL to the RD Web Access page and have the advertisements display in their Start Menu.

Steps to configure RemoteApp and Desktop Connections:

<http://blogs.msdn.com/rds/archive/2009/06/08/introducing-remoteapp-and-desktop-connections.aspx>

- **RDP File:** In the RemoteApp Manager, administrators can generate an RDP file that can be distributed to advertise the application on client computers.

Create an .rdp File:

<http://technet.microsoft.com/en-us/library/cc731192.aspx>

- **Windows Installer Package:** In the RemoteApp Manager, administrators can generate an MSI that can be distributed to advertise the RDP file on client computers. When a RemoteApp program is deployed to clients by using the Windows Installer Package option, the MSI that is generated may need to be modified to correctly associate file types with the deployed application. To edit the contents of the MSI, you can use the Orca database editor available at: <http://support.microsoft.com/kb/255905>. Once the RemoteApp MSI has been generated, open it with your MSI editor, select the Extension table and remove the filename extension entries that should not be associated with the application. Repeat this process with the contents of the MSI’s Registry table. You can now save and deploy the MSI.

### **Publishing Considerations**

When an application is published to all users on a Remote Desktop Services system, care must be taken to publish it to locations that will be accessible to all users. For example, if specifying the CSIDLs

in the App-V Management Server, use the COMMON CSIDLs such as CSIDL\_COMMON\_PROGRAM instead of CSIDL\_PROGRAM. Similarly, if using SFTMIME to publish, use the /GLOBAL flag to publish to all users.

## App-V for Remote Desktop Services and Citrix Presentation Server / XenApp

App-V 4.6 can be used on both native RD Session Host servers and those RD Session Host servers with XenApp or Presentation Server installed. App-V is ideal for use when you require the same infrastructure for both your desktop PCs and your RD Session Host servers.

How to publish an App-V-enabled application in Citrix XenApp:

<http://support.microsoft.com/?kbid=931576>

To learn more about App-V integration with XenApp, please see:

[www.citrixandmicrosoft.com](http://www.citrixandmicrosoft.com)

<http://www.citrix.com/English/ps2/products/subfeature.asp?contentID=1863016>

<http://community.citrix.com/display/ocb/2010/03/12/Go+ahead+use+App-V%2C+no+really%2C+please...>

## More Information

To learn more about Remote Desktop Services, go to:

<http://www.microsoft.com/rds>

To learn more about App-V, go to:

<http://go.microsoft.com/fwlink/?LinkId=127120>

Windows Server 2008 R2 Remote Desktop Services Solution Accelerator:

<http://go.microsoft.com/fwlink/?LinkId=177881>

To find out about the Windows Server 2008 Terminal Services Resource Kit, go to:

<http://www.microsoft.com/learning/en/us/Books/12716.aspx>