Microsoft Application Virtualization Cookbook

With an ever-increasing number of applications being deployed in the workplace, Microsoft App-V 5 enables administrators to abstract these applications from the clients, which reduces the time to complete the software deployment lifecycle.

The book starts with the deployment of a scalable App-V infrastructure and progresses on to cover the sequencing of common applications. In later chapters, you will discover integrations with Microsoft Remote Desktop Services, Citrix® XenDesktop®, and Microsoft System Centre Configuration Manager. Finally, you will learn to leverage the App-V reporting server along with Microsoft Office Excel and pivot tables to gain insights on which applications are being used, along with how to troubleshoot issues with your deployment.

Who this book is written for
If you have some experience with App-V but are overwhelmed by the range of features on offer, then this book is for you. A basic understanding of App-V and common Windows Server technologies (Active Directory/Group Policy/PowerShell) is necessary.

What you will learn from this book
- Deploy a full App-V infrastructure
- Deploy App-V clients and prerequisites
- Leverage connection groups to combine App-V packages
- Reduce hardware requirements for your Remote Desktop Session Hosts
- Extend the use of your investments in Microsoft System Center Configuration Manager
- Discover which applications your users are running
- Resolve issues with your deployment quickly
- Customize App-V packages to your needs
- Scale out your App-V infrastructure to accommodate increasing requirements

Microsoft Application Virtualization Cookbook

Over 55 hands-on recipes covering the key aspects of a successful App-V deployment

James Preston

Packt Publishing

In this package, you will find:

- The author biography
- A preview chapter from the book, Chapter 1 'Deploying App-V 5 Services'
- A synopsis of the book’s content
- More information on Microsoft Application Virtualization Cookbook
About the Author

James Preston is an IT professional working in the field of education and has a broad range of interests, including virtualization with Hyper-V and App-V, data-orientated application design with Visual Studio Lightswitch, IP telephony, and remote access technologies.

Willing to share this breadth of knowledge, he runs a personal blog (myworldofit.net), which covers a wide range of topics; this most recently includes an end-to-end deployment of Microsoft Hyper-V Server 2012 R2, publishing a WebDAV server, the effective integration of student databases with virtual learning environments, and a take on an enterprise Wi-Fi deployment.

James has previously provided technical reviews for books on Microsoft Hyper-V and Citrix® VDI-In-A-Box.

When not working, he can be found in a local coffee shop, having a go at the latest computer games or planning the training program for his local Air Cadet squadron.
Preface

Microsoft first entered the Application Virtualization world in 2006 with the purchase of Softricity. At its core, App-V allows administrators to easily deploy applications in the form of packages to users without having to use traditional deployment methods.

App-V 5 (originally launched in 2012) is a generational step up from the previous versions with the introduction of the .appv extension for packages and the removal of the need to specify a package root at the time of sequencing. Since then, Microsoft has continued to enhance App-V through service packs, the most recent of which has greatly improved the connections group feature, which allows virtual applications to share components with each other.

In this book, you will discover a range of ways to utilize App-V to meet the particular needs of your deployment through step-by-step instructions.

What this book covers

Chapter 1, Deploying App-V 5 Services, covers the steps to get your backend App-V infrastructure up and running. Here, we cover everything from the installation of a SQL server and the creation of a redundant Publishing server to two options on how to store your APPV files.

Chapter 2, Deploying App-V 5 Clients and Updates, leverages your existing skills (or teaches you new ones!) in Group Policy software deployment and Microsoft System Centre Configuration Manager to deploy the App-V client prerequisites, client, and updates to your end users.

Chapter 3, Sequencing Applications, illustrates the steps to set up your sequencing PC and use a range of methods to capture applications in App-V packages.

Chapter 4, Managing Packages, covers deploying packages to your end users while managing file type associations and shortcut paths.

Chapter 5, Using Connection Groups, captures a middleware package (the Java Development Kit) and joins it with another virtual application to share application components.
Preface

Chapter 6, *Sequencing Office 2013*, utilizes the new scripted approach to obtaining a package for Office 2013 and reduces the time taken for deployment.

Chapter 7, *Deploying App-V 5 in a Virtual Environment*, covers how to take advantage of the Shared Content Store mode to further enhance your Remote Desktop Services or Citrix® XenDesktop® environment with App-V.

Chapter 8, *Managing Packages in System Center Configuration Manager 2012 R2*, covers extending your SCCM infrastructure to deploy App-V packages to your users without the need for any further App-V infrastructure.

Chapter 9, *Reporting in App-V 5*, covers helpful insights on the state of your App-V clients and lets you know which applications are being run using the App-V Reporting Server and Microsoft Office Excel.

Chapter 10, *Troubleshooting*, lets you know where to go when it all goes wrong. This demonstrates identifying the correct App-V logging and getting your users back up and running in no time.
Deploying App-V 5 Services

In this chapter, we will cover:

- Obtaining the App-V installers
- Configuring Active directory
- Configuring a distributed filesystem
- Configuring Internet Information Services
- Configuring SQL Server
- Deploying a standalone management and publishing server
- Accessing the management console
- Adding additional administrators
- Deploying a second Publishing server

Introduction

Microsoft Application Virtualization 5 (App-V 5) enables system administrators to deliver applications to end users in a consistent and efficient manner without the hassle of traditional deployment methods.
Deploying App-V 5 Services

The individual components of App-V 5 can be used in a variety of combinations to meet your particular needs. A full App-V 5 server deployment would employ the following services:

<table>
<thead>
<tr>
<th>App-V 5 component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>The management server</td>
<td>This provides a web-based console used by authorized administrators to publish applications. All this information is stored in a SQL Server.</td>
</tr>
<tr>
<td>The publishing server</td>
<td>This authenticates the clients, and in return, provides the list of authorized applications and the SMB/HTTP paths to the servers.</td>
</tr>
<tr>
<td>The file server/web server</td>
<td>Applications are stored on a file or web server, or even on a combination of the two.</td>
</tr>
<tr>
<td>The client</td>
<td>This presents applications to users and caches those applications on the client for later use.</td>
</tr>
</tbody>
</table>

The flexible nature of App-V also allows for applications to be deployed through Microsoft System Centre Configuration Manager (SCCM) as well as through Electronic Software Distribution, for example, with Group Policy assignments. In this cookbook, we will cover these alternative deployment methods in later chapters.

We will use the following IP addresses and hostnames in order to cover the full range of deployment options. Each server runs Windows Server 2012 R2 on the 255.255.248.0 subnet. These servers can be configured as virtual or physical machines. I suggest that you use vCPU, RAM, and storage allocations for the demo environment, which can also be found in the following table:

<table>
<thead>
<tr>
<th>IP Address</th>
<th>Hostname</th>
<th>vCPU</th>
<th>RAM</th>
<th>Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>172.16.0.1</td>
<td>(default gateway)</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>172.16.0.2</td>
<td>DC</td>
<td>2</td>
<td>2GB</td>
<td>40GB</td>
</tr>
<tr>
<td>172.16.0.3</td>
<td>FS1</td>
<td>2</td>
<td>2GB</td>
<td>80GB</td>
</tr>
<tr>
<td>172.16.0.4</td>
<td>FS2</td>
<td>2</td>
<td>2GB</td>
<td>80GB</td>
</tr>
<tr>
<td>172.16.0.5</td>
<td>WEB1</td>
<td>2</td>
<td>2GB</td>
<td>80GB</td>
</tr>
<tr>
<td>172.16.0.6</td>
<td>WEB2</td>
<td>2</td>
<td>2GB</td>
<td>80GB</td>
</tr>
<tr>
<td>172.16.0.7</td>
<td>RDS</td>
<td>4</td>
<td>4GB</td>
<td>80GB</td>
</tr>
<tr>
<td>172.16.0.8</td>
<td>APPV1</td>
<td>2</td>
<td>2GB</td>
<td>40GB</td>
</tr>
<tr>
<td>172.16.0.9</td>
<td>APPV2</td>
<td>2</td>
<td>2GB</td>
<td>40GB</td>
</tr>
<tr>
<td>172.16.0.10</td>
<td>SCCM</td>
<td>4</td>
<td>8GB</td>
<td>100GB</td>
</tr>
</tbody>
</table>

The 172.16.0.12 and 172.16.0.13 IP Addresses should be reserved for use with Network Load Balancing (NLB).
In addition, you will need to create a number of Windows 8.1 clients for the sequencing and testing of applications as well as to access the App-V management console.

Note that the specifications in the preceding table are only suitable for a demo environment. For your production environment, consult the App-V 5.0 Capacity Planning page at https://technet.microsoft.com/en-gb/library/dn595131.aspx.

**Obtaining the App-V installers**

This recipe provides the links to download the App-V 5 installers.

**Getting ready**

It is assumed that you have a valid Microsoft account and have purchased the Microsoft Desktop Optimization Pack (MDOP) as part of Volume License Agreement. Depending on your subscription level, you may also have access to the App-V installers as part of a Microsoft Developer Network (MSDN) subscription.

**How to do it...**

The following list shows you the fundamental steps involved in this recipe and the tasks required to complete the recipe:

1. Download MDOP.
Deploying App-V 5 Services

5. Select **Download** and then click on **Continue** to begin the download. Ensure that you save the ISO file to a memorable location:

<table>
<thead>
<tr>
<th>Microsoft Desktop Optimization Pack for Software Assurance 2014 R</th>
<th>Description</th>
<th>Download</th>
<th>Key</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Special Instructions</strong></td>
<td>None Provided.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Download Settings</strong></td>
<td>Download Manager if you would like to download multiple files or large file sizes, automatically restart the download if interrupted, or pause, start and stop downloads.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optionally, you may order the physical media directly via the Order media button below.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note that a product key is not required for App-V 5.


**Configuring Active Directory**

This recipe shows you the **Active Directory** configuration on a domain controller that will be used through this cookbook. In addition, it shows the configuration of a **Group Policy Object (GPO)** that will allow traffic through the firewall of Windows servers.
Getting ready

It is assumed that you have access rights to create objects in Active Directory, including Organizational Units (OUs), security groups, and user accounts.

How to do it...

The following list shows you the fundamental tasks involved in this recipe and the tasks required to complete the recipe (all of the actions in this recipe will take place on the server with the hostname DC):

- Creating required OUs
- Creating required security groups
- Creating required computer accounts and user accounts
- Creating a new GPO and linking it to an OU
- Configuring the GPO with a Windows firewall policy

The implementation of the preceding steps is as follows:

1. Create the following OUs and pre-provision the computer accounts as shown:
2. Under the **Domain Groups** OU, create the following Security Groups:

```
Active Directory Users and Computers
```

```
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>App-V Administrators</td>
<td>Security Group</td>
</tr>
<tr>
<td>Audacity Users</td>
<td>Security Group</td>
</tr>
<tr>
<td>Greenfoot Users</td>
<td>Security Group</td>
</tr>
<tr>
<td>Office 2013 Users</td>
<td>Security Group</td>
</tr>
</tbody>
</table>
```

3. Under **Domain Users**, create the following user accounts. In addition to this, add **Sam Adams** to the **App-V Administrators Security Group** option:

```
Active Directory Users and Computers
```

```
<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sam Adams</td>
<td>User</td>
</tr>
</tbody>
</table>
```

---

**Deploying App-V 5 Services**
4. Open the Group Policy Management Console (GPMC) console, expand the OU tree to show Domain Servers, and then right-click on the App-V Servers OU. From the menu that appears, click on Create a GPO in this domain, and Link it here.

5. In the dialogue box that appears, enter Allow 440-442 as the name and click on OK.

6. In the new window that appears, right-click on the policies title option, and from the menu that appears, click on Properties.

7. Tick the Disable User Configuration settings checkbox and click on OK:


10. In the window that appears, select the Port radio option and click on Next.

11. Leave TCP selected, enter 440-442 in the Specific local ports box, and click on Next.

12. Leave Allow the connection selected and click on Next.

13. Remove the ticks from Private and Public to leave only Domain checked. Now, click on Next.

14. Finally, give the policy the name Allow 440-442, and click on Finish.

**Configuring a distributed filesystem**

Microsoft App-V 5 packages can be stored on a Windows share or on a web server. Using a Distributed File System (DFS) namespace to host App-V packages allows you to scale out your infrastructure or move the packages between servers at a later date, if required, without the burden of updating the paths to the App-V database. Using Distributed File System Replication (DFS-R) allows you to host the packages (and keep those packages in sync) on multiple servers for redundancy.

In this recipe, we will create two DFS namespaces: FileStore for general purpose use and App-V for hosting the App-V packages.
Getting ready

This recipe assumes that you have provisioned and domain-joined two file servers with the names FS1 and FS2, respectively. It is suggested that a unique namespace be used to host the packages.

How to do it...

The following list shows you the fundamental tasks involved in this recipe and the tasks required to complete the recipe:

- Install the DFS and DFS-R roles on FS1 and FS2
- Create the FileStore namespace on FS1
- Enable replication between FS1 and FS2
- Join FS2 to the FileStore namespace
- Create the App-V namespace and replication group on FS1 and FS2

The implementation of the preceding steps is as follows:

1. Start by installing the DFS and DFS-R features on FS1 and FS2. This can be performed from a PowerShell prompt by entering the following command:

   `Install-WindowsFeature -Name FS-DFS-Namespace, FS-DFS-Replication -IncludeManagementTools -Restart`

2. Once the installation is complete (and the server is restarted if required), navigate to the start screen from the applications list, and under Administrative Tools, click on DFS Management to launch the DFS management console.

3. In the new window that appears, click on New Namespace... to create a new DFS namespace.

4. In the New Namespace Wizard window, enter FS1 as the server that will host the namespace, and click on Next.

5. Enter FileStore as the name of the namespace, click on Edit Settings. In the window that appears, set `C:\DFSRoots\FileStore` as the local path to the shared folder and set the shared folder permissions to custom with the Everyone security group having read only access and the App-V Administrators having full access. Click on Next.
6. Leave the domain-based namespace selected with the Enable Windows Server 2008 mode tick box checked. Now click on Next:

Select the type of namespace to create.

- Domain-based namespace

A domain-based namespace is stored on one or more namespace servers and in Active Directory Domain Services. You can increase the availability of a domain-based namespace by using multiple servers. When created in Windows Server 2008 mode, the namespace supports increased scalability and access-based enumeration.

- Enable Windows Server 2008 mode

Preview of domain-based namespace:
\demo.org\FileStore

Using Windows Server 2008 mode with your DFS namespace allows your namespace to utilize access-based enumeration, as well as support for clusters.

7. Review the settings and then click on Create to set up the namespace.
8. When the final page confirms that the setup is completed successfully, click on Close.
9. With the DFS namespace created, we will now create a replication group between FS1 and FS2. This will automatically replicate changes between the two file servers.
10. In the DFS management console, click on New Replication Group....
11. In the window that appears, leave the Multipurpose replication group selected option selected and click on Next.
12. Set the name of the replication group as FileStore and click on Next.
13. On the Replication Group Members screen, add both FS1 and FS2, and click on Next.
14. Leave Full mesh selected on the topology screen and click on Next.
15. On the Schedule and Bandwidth screen, leave the default settings as they are and click on Next.
16. Set **FS1** in the **Primary member** option of the replication group and click on **Next**:

Select the server that contains the content you want to replicate to other members. This server is known as the primary member.

**Primary member:**

FS1

- If the folders to be replicated already exist on multiple servers, the folders and files on the primary member will be authoritative during initial replication.

17. Add C:\DFSRoots\FileStore as the path for the replicated folder on **FS1** (the one created in step 5 in this recipe) and click on **Next**.

<table>
<thead>
<tr>
<th>Replicated folders:</th>
<th>Local Path</th>
<th>Replicated Folder Name</th>
<th>NTFS Permissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>C:\DFSRoots\FileStore</td>
<td>FileStore</td>
<td>Use existing per...</td>
<td></td>
</tr>
</tbody>
</table>

18. At the **Local Path** option of **FileStore** on the **Other Members** screen, set the path of **FS2** as C:\DFSRoots\FileStore, click on **Next**.

To specify the local path of the replicated folder or whether the folder is read-only, select the appropriate member and then click **Edit**.

- **Primary member:** FS1
- **Primary member local path:** C:\DFSRoots\FileStore

**Member details:**

<table>
<thead>
<tr>
<th>Member</th>
<th>Local Path</th>
<th>Membership Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>FS2</td>
<td>C:\DFSRoots\FileStore</td>
<td>Enabled</td>
</tr>
</tbody>
</table>

- Allowing DFS to create the folder for you removes the need to create the folder manually.

19. Review the settings that will be used to create the replication group and click on **Create**.

20. You will then receive confirmation that the replication group has been created successfully. Click on **Close** to finish the wizard.
21. Before joining FS2 to the DFS namespace, you must increase the size of the **Staging Quota** option on the replication group. This allows for large files (for example, whole App-V packages or ISOs) to replicate between the servers successfully.

22. In the DFS management console, expand **Replication** and select **FileStore**. In the memberships tab, right-click on **FS1** and select **Properties** from the drop-down menu.

23. In the **Properties** window, browse to the **Staging** tab and set the **Quota** option to the size of the largest file that you will be storing on your file server (for example, 8192 MB). Do the same for **FS2** as well.

![Staging Quota Configuration](image)

By way of example, Office 2013 with Visio and a single language pack is approximately 1.2 GB in size, while the Adobe CS6 suite is up to 4 GB. Ensure that you continue to review the size of your staging quota as your use of App-V increases to ensure that the single largest file will always be able to replicate.

24. We will now add FS2 to the namespace. Doing this provides redundancy in the namespace, allowing for FS1 to fail without impacting your clients.

25. In the DFS management console, expand namespaces and select the **FileStore** namespace that you created earlier. Select the **Namespace Servers** tab and note that only **FS1** is listed. On the right-hand side of the window, click on **Add Namespace Server**.
26. In the window that appears, set FS2 as the **Namespace server** option and click on **Edit Settings**:

![Add Namespace Server](image)

27. Set `C:\DFSRoots\FileStore` as the path and use custom permissions with the **Everyone** security group set as read-only, and the **App-V Administrators** security group set to full control.

28. Click on **OK** to close the **Edit Settings** window, and then click on **OK** again to add FS2 to the namespace.

29. Finally, set the NTFS permissions on the **FileStore** to allow everyone to read the contents of the folder and for App-V Administrators to have full control over the folder.

30. To complete this recipe, repeat steps 3 to 26 using App-V as the name of the namespace with the file path set as `C:\DFSRoots\App-V` and replication enabled for that folder between FS1 and FS2.

### Configuring Internet information services

As an alternative to using a simple DFS share, you can also host App-V packages on an **Internet Information Services (IIS)** web server. Doing this gives you the added benefit of caching the App-V packages in RAM, which allows for multiple loads of the same package on multiple clients to be faster than just hosting the package on a network share.

Using NLB and hosting the packages on a DFS share allows the web servers to have a fault-tolerant configuration.
Getting ready

This recipe assumes that you have provisioned and domain-joined two web servers with the names WEB1 and WEB2, respectively. You will need administrative permissions on both WEB1 and WEB2 as well as the ability to create a DNS entry.

How to do it...

The following list shows you the fundamental steps involved in this recipe and the tasks required to complete this recipe:

- Provision a DNS entry for the load balancer
- Install the required Windows server roles on WEB1 and WEB2
- Create the App-VIIS namespace and replication group on WEB1 and WEB2
- Configure Network Load Balancing
- Configure IIS
- Configure caching

The implementation of the preceding steps is as follows:

1. On DC, launch the DNS management console, expand Forward Lookup Zones, and right-click on your domain. From the drop-down menu, select New Host (A or AAAA)....
2. Set the name to appv and the IP address option to 172.16.0.12. Click on Add Host to create the record:
3. On WEB1 and WEB2, launch PowerShell and run the following command to install the DFS and DFS-R roles along with NLB and IIS:

   ```powershell
   ```

4. After allowing the server to restart if required, launch the DFS management console on WEB1, and using steps 3 to 26 of the previous recipe, provision a DFS namespace and replication group with the name App-VIIS and the folder path set to C:\DFSRoots\App-VIIS on WEB1 and WEB2. This namespace and replication group will be used to host the App-V packages on the web servers; however, IIS will be used to present the files to the clients.

5. We will now configure NLB between WEB1 and WEB2; doing this provides redundancy between the two servers and ensures that under normal conditions, neither server is overloaded with requests.

6. From the Start screen, launch the Network Load Balancing Manager software:

   ![Network Load Balancing Manager](image)

7. In the window that appears, select Cluster and then click on New.

8. In the New Cluster option, connect window enter WEB1 as the host and click on Connect. From the list of interfaces, select the interface with the IP address 172.16.0.5 and click on Next.

   ![In this evaluation environment, only a single network interface has been configured. In a production environment, you would want to have two interfaces, one for the management of the server and another purely for NLB traffic.](image)

9. From the Host Parameters screen, leave the default settings in place and click on Next.
10. On the **Cluster IP Address** screen, add a new IP address and set the **IPv4 address** option to 172.16.0.12 with 255.255.248.0 as the **Subnet mask** option:
11. At the **Cluster Parameters** option, leave 172.16.0.12 as the IP address and set the **Full Internet** name to appv.demo.org (as set in step 1 of this recipe). Also, set the **Cluster operation** mode to **Multicast** and click on **Next**.

![New Cluster: Cluster Parameters](image)

If you are using hosts with a management and an NLB network adapter, select **Unicast** as the **Cluster operation** mode.

12. Accept the default configuration for **Port Rules** and click on **Finish** to create the cluster.
13. To add WEB2 to the cluster, expand **Network Load Balancing Clusters**, right-click on **appv.demo.org (172.16.0.12)**, and click on **Add Host To Cluster**:

14. In the window that appears, set WEB2 as the host and click on **Connect**. In the interface with the IP address **172.16.0.6** selected, click on **Next**.

15. At the host parameters, accept the defaults (note that the unique host identifier of this server is set to 2) and click on **Next**.

16. Accept the defaults for the **Port Rules** option and click on **Finish**.

17. After a short wait, the two hosts will enter the **Converged** state. This completes the setup of the NLB cluster.

We will now configure the IIS web server on **WEB1**.

1. From the Start screen, launch the **Internet Information Services management** console:

2. Expand the **WEB1** option, go to the **Sites** option and then right-click on the **Default Web Site** option and click on **Remove**.

3. Click on **Application Pools**, right-click on **DefaultAppPool**, and click on **Remove**.
4. Right-click on Sites and click on Add Website...

5. In the Add Website... window, set the Physical path option to the DFS root that you created earlier (C:\DFSRoots\App-VIIS) and the Host name to appv.demo.org. Leave Start Website immediately checked and click on OK.

6. To allow the server to handle the .appv file type, select WEB1 from the connection tree and then double-click on MIME Types in the Features View option:
7. In the **MIME Types** window, click on **Add...**. In the window that appears, set the **File name** extension as `.appv` and the **MIME Types** option as `application/appv`.

![Add MIME Type dialog](image)

8. With IIS configured, we will now set the file cache on the server to allow for large files (up to 4096 MB) to be stored in RAM when served through the web server.

9. On WEB1, open Notepad from the Start screen and enter the following:

   ```
   Windows Registry Editor Version 5.00
   
   [HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\InetInfo\Parameters]
   "ObjectCacheTTL"=dword:000004b0
   "MaxCachedFileSizeInMB"=dword:00001000
   ```

10. Save the Notepad file to the desktop with the name `updatecache.reg`, and then double-click on it to run the file; this will in turn add the entries to the registry under the `HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\InetInfo\Parameters` parameter.

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>[\w]*</code> (Default)</td>
<td>REG_SZ</td>
<td>(value not set)</td>
</tr>
<tr>
<td>ObjectCacheTTL</td>
<td>REG_DWORD</td>
<td>0x000004b0 (1200)</td>
</tr>
<tr>
<td>MaxCachedFileSizeInMB</td>
<td>REG_DWORD</td>
<td>0x00001000 (4096)</td>
</tr>
</tbody>
</table>

These additional registry entries extend the file cache up to 4096 MB and allow objects to stay in the cache for up to 120 seconds. Although 4096 is the largest object that can be in the cache, you can extend the period for which it will stay in the cache by altering the `ObjectCacheTTL` value.
11. Finally, open the C:\Windows\system32\inetsrv\config\applicationHost.config file in Notepad, search for <serverRuntime />, and replace it with the following:

```
<serverRuntime frequentHitTimePeriod="00:00:01"
frequentHitThreshold="1"/>
```

12. The frequentHitThreshold parameter determines how many hits the file receives before it is cached (in this case, only one hit is required), and the frequentHitTimePeriod value determines how many hits the file receives in a time period before it is cached (in this case, in a single second).

**Configuring SQL Server**

Microsoft SQL Server is required to host the App-V Management and Reporting databases. With the exception of very large deployments of App-V, SQL server can be collocated on the App-V Management Server (and on the Publishing server as well).

**Getting ready**

This recipe assumes that you have provisioned and domain-joined a server with the name APPV1, and that you have a valid licence to install Microsoft SQL Server 2008, 2008 R2, or 2012 at the Standard, Enterprise, Datacenter, or Developer Edition levels. Note that the Express edition is not supported.

**How to do it...**

Here are the fundamental steps involved in this recipe:

1. Install and configure a default setup of SQL Server.
2. Launch the SQL Setup application, select Installation and New SQL Server stand-alone installation or add features to an existing installation.

3. Allow the Setup Support Rules check to complete and click on OK.
4. Enter your product key and click on Next.
5. Review the terms of the licensing agreement, tick the **I accept the license terms** box, and click on **Next**.

6. Allow the **Setup Support Rules** check to finish. At this stage, you might have a warning on Windows Firewall stating that certain ports are not open. This can be safely ignored as we are hosting the App-V Management server and SQL server on the same machine. Click on **Next**.

7. On the **Setup Role** screen, select **SQL Server Feature Installation** and click on **Next**.

8. On the **Feature Selection** screen, tick the **Database Engine Services** option and click on **Next**.

![SQL Server Feature Selection](image)

Note that no other SQL Server features are required for App-V; however, you may install the Complete Management Tools set to allow you to examine the contents of the App-V Management database.

9. Allow the **Installation Rules** check to complete and click on **Next**.
10. Leave the **Default instance** option selected with **Instance ID** set to **MSSQLSERVER**. Click on **Next**.

![Database Engine Configuration](image1)

11. Review the **Disk Space Requirements** check and click on **Next**.

12. Accept the defaults for the **Service Accounts** option and click on **Next**.

13. On the **Database Engine Configuration** set, select **Windows authentication** mode and click on **Add Current User** to make the account that you are logged in with an administrator on SQL Server. You must use the same account to install the App-V Management Server in the next recipe.
14. On the **Error Reporting** page, accept the defaults and click on **Next**.
15. Review the **Installation Configuration Rules** check and click on **Next**.
16. Review the final SQL Server configuration and click on **Install** to begin the setup.
17. After the installation is complete (depending on your hardware this could take a few minutes), click on **Close** to finish the setup process.

### Deploying a standalone Management and a Publishing server

In a typical App-V 5 deployment, you will deploy a Management server that stores information about packages, applications, file types, and shortcuts in SQL server (as set up in the previous recipe). In turn, Publishing servers regularly poll the management server for a compiled list of these applications and settings to present authenticated requests to the clients. In this recipe, you will deploy a standalone Management and Publishing server.

#### Getting ready

This recipe assumes that you have completed the steps in the previous recipe and have set up SQL server to host the Management database on.

#### How to do it...

The following list shows you the fundamental steps involved in this recipe and the tasks required to complete the recipe:

- Install the App-V 5 Server prerequisites
- Install the Management and Publishing server roles of App-V 5
- Install the latest App-V 5 hotfix


The implementation of the preceding steps is as follows:


2. Next, install the required Window Server features by executing the following command in a PowerShell session:
   
   ```powershell
   ```

3. With the prerequisites installed, mount the MDOP 2014 R2 ISO file and navigate to D: \App-V\App-V 5.0 SP3\Server, where D is the drive letter of the mounted ISO file.

4. Launch the `appv_server_setup.exe` application to begin the installation process.

5. On the installation splash page, click on **Install**.

6. Review the **Software Licence Terms** and select the **I accept the license terms** radio button and click on **Next**.

7. Select the **Use Microsoft Update when I check for updates** radio box and click on **Next**.
8. Select the **Management Server**, **Management Server DB** and **Publishing Server** features and click on **Next**.

9. Review the default installation location and click on **Next**.
10. On the **Create New Management Server Database** page, leave the **Use the default instance** and **Use the default configuration** radio boxes selected and click on **Next**.

11. Review the **Create New Management Server Database** page and click on **Next**.

12. Set the **demo\App-V Administrators** security group as the group that is authorized to manage App-V and set **Port binding** to 440 (to match the firewall rule configured in the second recipe). Click on **Next**.
13. In the **Publishing Server configuration** option, set **Port binding** to 441 and leave all other settings as the defaults.

14. Review the list of the features to be installed and click on **Install** to begin the installation process.

15. The installation should take minutes, if not seconds, and at the end, you will be presented with the URL that can be used to access the App-V management web console from the local machine. Click on **Close** to finish the installation.

---

**Accessing the management console**

The App-V Management Console is hosted on the App-V Management server. The console is based on **Microsoft Silverlight**, and as such, can be accessed only on Windows PCs from Internet Explorer with the Silverlight 5 plugin installed.

**Getting ready**

This recipe assumes that you have completed the steps in the previous recipe and have set up an App-V Management server with the Publishing role included. All of the actions in this task will be conducted on a domain-joined Windows 8.1 client.

**How to do it...**

The following list shows you the fundamental steps involved in this recipe and the tasks required to complete the recipe:

- Install the latest version of Microsoft Silverlight
- Browse to the web-based management console and log in

The implementation of the preceding steps is as follows:

2. Allow the download to complete and then launch the **Install Silverlight** application and click on **Install now** to begin the installation. Close any open Internet Explorer windows.


4. A dialogue box will prompt you to log in with your credentials. Log in with the Sam Adams account created earlier, which is part of the App-V Administrators security group.

5. Once logged in, you will be presented with the Packages screen of the console. Note that the name of the account is listed in the top-right hand corner and that you can check the version number of the console by clicking on the **About** option.
Adding additional administrators

App-V leverages Active Directory Security Groups and user accounts to define administrators. When installing the App-V Management server, you can only choose a single Security Group or account; you can then configure extra accounts to manage your App-V deployment through the web-based management console.

Getting ready

This recipe assumes that you have completed the steps in the previous recipe and have successfully logged in to the App-V management server.

How to do it...

The following list shows you the fundamental steps involved in this recipe and the tasks required to complete the recipe:

- Add an Active Directory Security Group as an App-V administrator
- Add an Active Directory user account as an App-V administrator
- Remove administrator permissions from a Security Group or User account

The implementation of the preceding steps is as follows:

1. Log in to the App-V management console and select Admin. When the page refreshes, you will see the current administrators that are assigned to the App-V server. Click on Add Administrator in the top-right hand corner of the page.

2. In the Active Directory Name box, enter the name of the security group in the format <domain>\<security group name>. In this case, enter demo\Domain Admins and then click on Check.
3. Select the **demo\Domain Admins** security group from the drop-down menu that appears and click on **Add** to confirm the selection:

4. Alternatively, you can type the name of a user account again in the format `<domain>\<account name>`. In the following demonstration, you can see that the account user **Maddy** has been added and that its status as a user account instead of a security group is listed under the **Type** heading.

5. To remove a security group or user account from the administrators list, right-click on it and select the **remove as administrator** option.

6. A confirmation dialogue will appear at the top of the page. Click on **Confirm** to complete the removal.
Deploying a second Publishing server

The App-V Publishing server regularly polls and caches the list of App-V packages and applications to present to the clients. Deploying a second Publishing Server and utilizing NLB between the servers provides a basic level of redundancy to your clients, as well as offering a way to scale out your deployment in the event that your initial publishing server becomes overwhelmed. The App-V capacity planning guide at the following link can prove helpful in determining whether you will need an additional publishing server: https://technet.microsoft.com/en-gb/library/dn595131.aspx.

Getting ready

This recipe assumes you have provisioned APPV1 as prescribed in the previous recipes and that you have provisioned APPV2 for use throughout this recipe.

How to do it...

The following list shows you the fundamental steps involved in this recipe and the tasks required to complete the recipe:

- Create a DNS entry for use with the NLB cluster
- Install and configure NLB between APPV1 and APPV2
- Install the Publishing server role on APPV2
- Register the server in the App-V management console on APPV1
- Configure the Publishing Server website to accept requests from the NLB domain name

The implementation of the preceding steps is as follows:

1. On DC, launch the DNS management console, expand Forward Lookup Zones, and right-click on your domain. From the drop-down menu, select New Host (A or AAAA)....
2. Set the name as **app-vpublishing** and the **IP address** to **172.16.0.13**. Click on **Add Host** to create the record:

3. On APPV1 and APPV2, run the following command in a PowerShell session to install the NLB feature:
   
   ```powershell
   Install-WindowsFeature -Name NLB -IncludeManagementTools -Restart
   ```

4. Complete steps 5 to 16 of the *Internet information services configuration* recipe, setting up an NLB cluster between APPV1 and APPV2 with a cluster IP address of **172.16.0.13**, the **Full Internet** name of **app-vpublishing.demo.org** with **Multicast** as the **Cluster operation** mode.
5. With the cluster configured being the installation process for App-V on the server APPV2 (as per the instructions given in the Deploying a standalone management and publishing server recipe), simply select the Publishing Server role from the Select App-V Server Features to be Installed page:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Server</td>
<td>Provides overall management functionality for the App-V infrastructure.</td>
</tr>
<tr>
<td>Management Server DB</td>
<td>Database Pre-Deployments for App-V management.</td>
</tr>
<tr>
<td>Publishing Server</td>
<td>Provides hosting and streaming functionality for virtual applications.</td>
</tr>
<tr>
<td>Reporting Server</td>
<td>Provides App-V reporting services.</td>
</tr>
<tr>
<td>Reporting Server DB</td>
<td>Database Pre-Deployments for App-V reporting.</td>
</tr>
</tbody>
</table>

6. On the Publishing Server Configuration page, set http://appv1.demo.org:440 as the management service to be used by this publishing server. In addition, set 441 as the Port binding for the Publishing Server Web Site Configuration:

7. Complete the installation.

8. On your Windows 8.1 client machine, log in to the App-V web-based management console, and from the navigation bar on the right, select Servers.

9. Click on Register New Server. In the Server Name box that appears, enter the name of your second publishing server in the format <domain>\<hostname of the server>; In this example, demo\APPV2.
10. Click on the Check button and from the drop-down list that appears, select the server demo\APPV2 and click on Add to include the server in the list of publishing servers.

By default, the publishing server will poll the management server every 10 minutes for updates to the packages. You can force an update by restarting the AppVPublishing Application Pool service in the IIS management console. It is also possible to change the interval by modifying the registry on a publishing server. Visit http://support.microsoft.com/kb/2780177 for more details.

11. To complete the configuration, open the IIS management console on APPV1, expand Sites, and select the Microsoft App-V Publishing Service website. On the Actions pane, select Bindings.

12. Select the existing binding and click on Edit.

13. Enter app-vpublishing.demo.org as your Host name and click on OK. Close the Site Bindings window.

14. Repeat steps 11 to 13 for the server APPV2.
Where to buy this book

You can buy Microsoft Application Virtualization Cookbook from the Packt Publishing website.

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