Wyse Datacenter Appliance XC for vWorkspace

Deployment Guide

Dell Wyse Solutions Engineering
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A Dell Deployment and Configuration Guide

Revisions

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1 Introduction

The Wyse Datacenter Appliance XC utilizes Dell PowerEdge R720xd servers, the Nutanix software-defined storage (SDS) application, and VDI components to deliver an out-of-the-box infrastructure solution for virtual desktops and shared desktop sessions.

This document provides the tasks required to install and configure the Dell vWorkspace VDI components on to a Wyse Datacenter Appliance XC cluster.

2 System Requirements

Before proceeding with the Wyse Datacenter Appliance XC for vWorkspace setup, ensure the following requirements are met. To successfully complete the setup, you must be familiar with the following technologies:

- Active Directory
- Windows Server 2012 (or higher)

Supplemental Documentation

Some sections in this guide refer to the following documentation for additional details.

- vWorkspace Administration Guide
- Foglight for Virtual Desktops Administrator's Guide
- Foglight for Virtual Desktops User's Guide
- VMWare vSphere Virtual Machine Administration Guide–ESXi 5.5 (for vSphere hypervisor installations only)
- Nutanix vSphere Adminstration Guide
- Nutanix Web Console Guide

2.1 Nutanix SDS Cluster

The Wyse Datacenter Appliance XC servers must belong to a Nutanix SDS cluster.

2.2 Software

The following software is required to setup the solution:

- Microsoft Windows Server 2012 R2
- Dell vWorkspace 8.0 MR1
- Microsoft SQL Server 2012 Standard Edition with SP1 (x64)
- All software license files

The following software is required, if using Hyper-V as the hypervisor:

- Microsoft System Center Virtual Machine Manager 2012 R2

The following software is required, if using vSphere as the hypervisor:

- VMware vSphere 5.5 GA

2.3 Supported Hypervisor Platforms

The hypervisor used in this solution can be Microsoft Windows Server 2012 R2 with Hyper-V role or VMware vSphere 5.5 GA (not Update 1 or Update 2).

2.4 Active Directory (AD)

Active Directory is required for this solution; however, configuration of AD is beyond the scope of this document except where noted. DNS is required for name resolution. All Windows servers must belong to the same AD domain.

2.4.1 Domain User Accounts

We recommend creating domain accounts to be used specifically for SQL and System Center Virtual Machine Manager (SCVMM) services as opposed to using local system accounts.

SCVMM service account requirements:

- The domain account must be a member of the local administrators group on the VMM management server.
- You cannot change the service account after installation. To change it, you must uninstall and then reinstall SCVMM.

SCVMM `RunAs` account: Used to perform administrative tasks on systems from VMM.

SQL:

- Service account: It is recommended to run SQL Server and related services under a domain account (or multiple domain accounts) with minimum privilege needed to run.
- SQL administrators: domain account, group, or both with administrative access to the SQL server and databases.

2.4.2 Distributed Key Management Container

VMM encrypts some data in the VMM database, and therefore, we recommend storing the encryption keys in AD DS by using distributed key management instead of locally on the VMM management server. To set up the necessary AD container, complete the following tasks:

1. Start **ADSI Edit**, right-click the root folder, select **Connect To**, and then click **OK**.
2. Select the root folder that represents AD domain structure. This should be labeled with a prefix of DC=.

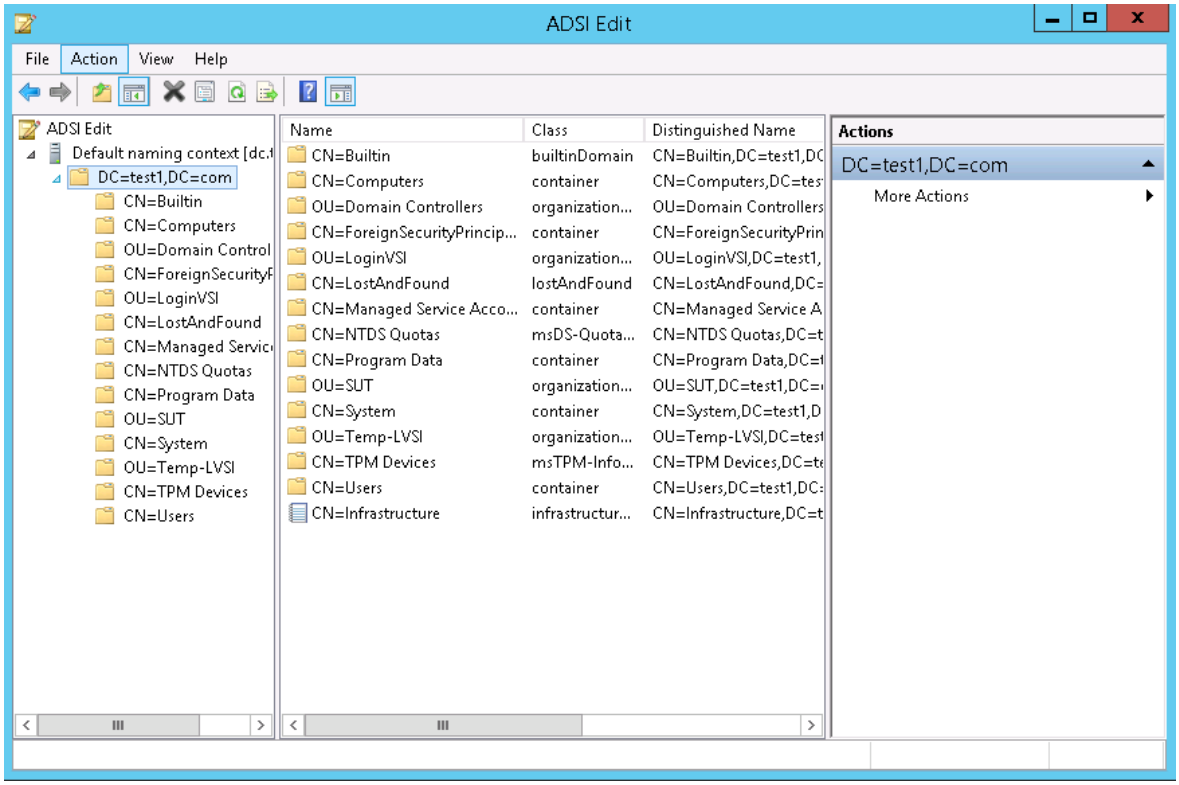


Figure 1 ADSI Edit Application

3. Right-click and select **New → Object**.
4. Select **Container** from the object class and click **Next**.
5. Enter a value for the object class. For example, VMMDKM. Click **Next**.
6. To create the new container, click **Finish**.
7. Make sure that the new container object now appears in AD.

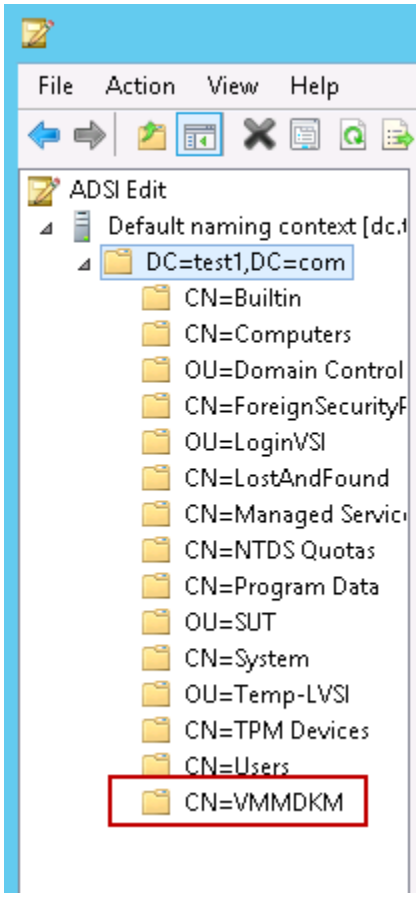


Figure 2 ADSI Edit

8. Make note of the distinguished name for the container for later use in the installation. Right-click the container and select **Properties**. Select the distinguishedName attribute in the list, double-click the attribute, and then copy the value.

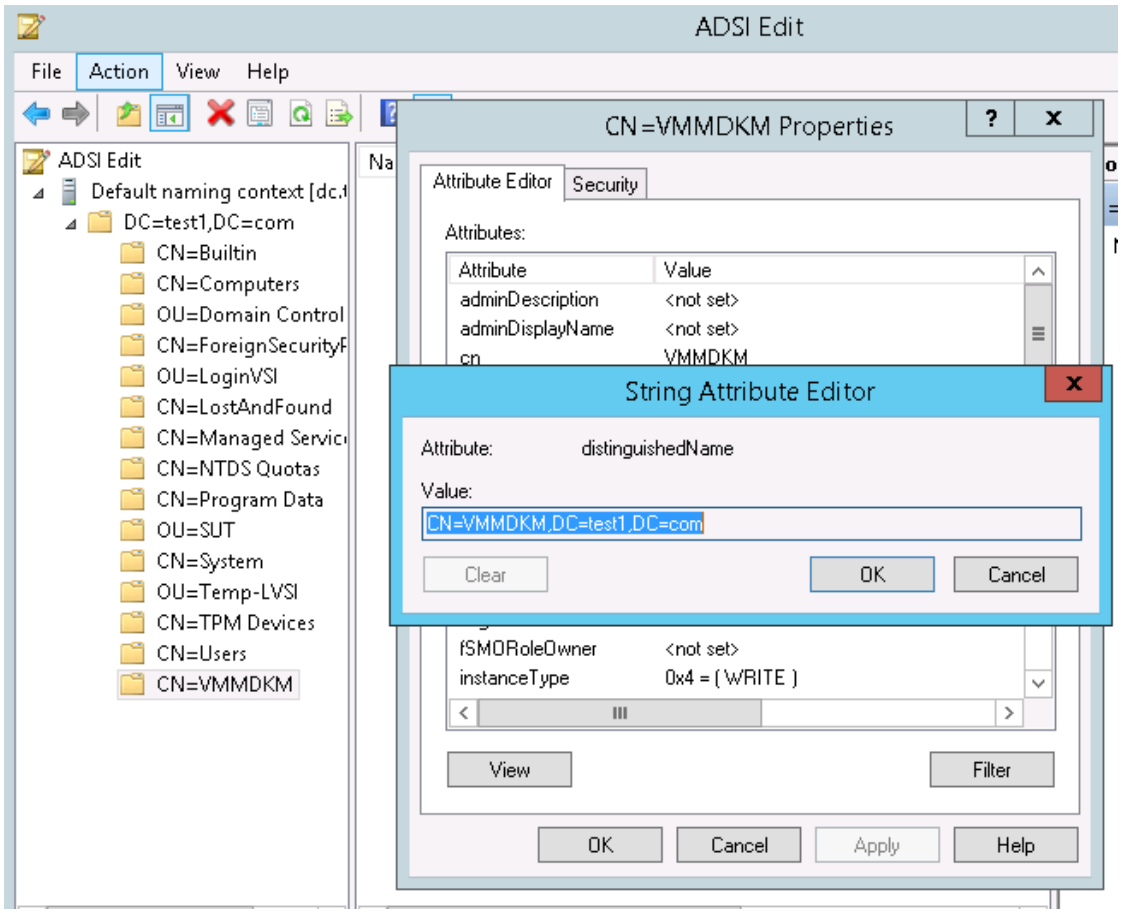


Figure 3 ADSI String Attribute Editor

9. Click the **Security** tab and add the VMM service account that you created in the earlier section by granting full control to this object and all descendant objects of the container.

3 Configuring Nutanix Storage Pool and Containers

To use the cluster storage, you must configure a storage pool and containers within the pool. Create only one pool consisting of all the disks in the cluster. Within the storage pool, we recommend creating multiple containers for a logical distinction between the compute and management storage layers.

1. To configure the storage pool and containers, log in to the Nutanix Web Console. From the **Home** drop-down menu, select **Storage**.

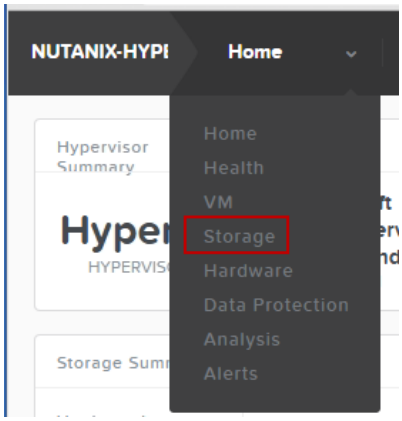


Figure 4 Nutanix Web Console

2. Click the **Create Container** link and click the plus symbol (+) under the **STORAGE POOL** section to create a pool.

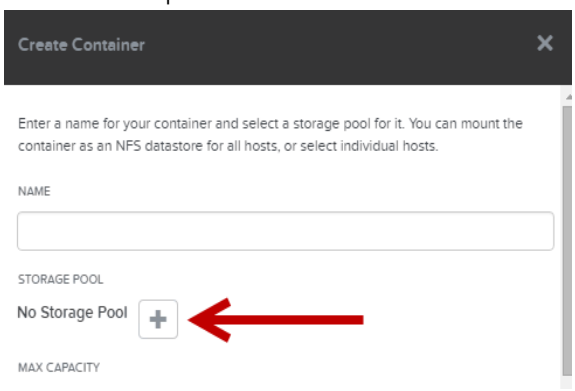


Figure 5 Create Container Wizard

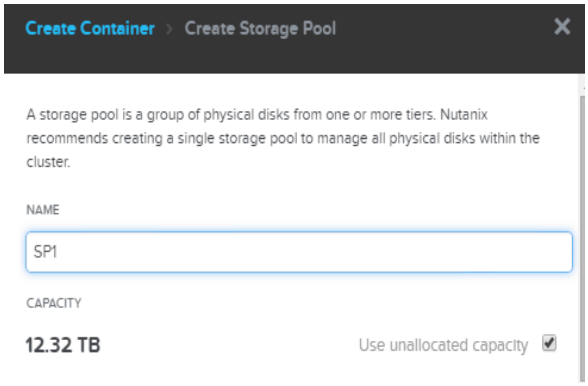
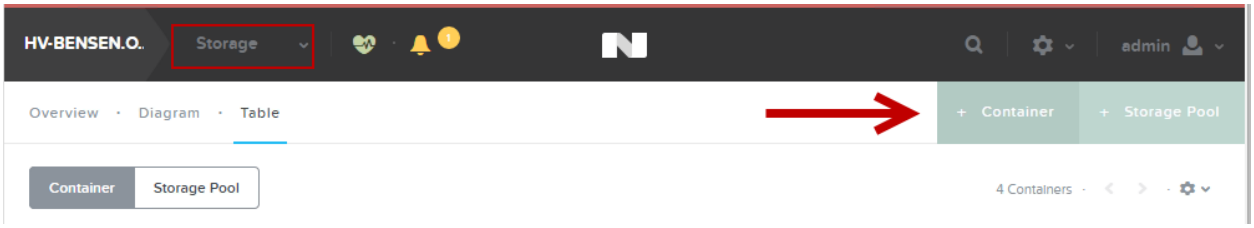


Figure 6 Creating Storage Pool

3. Provide a name for the pool (for example, SP1) and use all unallocated disk space. Click **Save**. On the **Create Container** page, to view additional settings, click the **Advanced Settings** button. The recommended settings are as follows:
   - Replication Factor: 2
   - Reserved Capacity: 4096 GB (only for the "Compute" container that contains the persistent virtual desktops)
   - Compression: Disabled
   - Delay: 0 minutes
   - Perf Tier Deduplication: On
   - Capacity Tier Deduplication: On (Post-Process)

NOTE: If using vSphere for the hypervisor, select **Mount on all hosts** under the **NFS Datastore** section.

4. Type a name for the management container such as "ds_mgmt" and click **Save**. Click **+ Container** to add another container for the compute/RDSH layer. Use the same advanced settings, provide a name (for example, ds_compute or ds_rdsh) and click **Save**. If you are using desktops and RDSH on the same cluster, create an additional container for logical separation.



Hyper-V Hypervisor and SMB Shares

While using Hyper-V for the hypervisor, SMB shares are used to store the virtual machine disks and settings files. The cluster name is the "host" portion of the SMB share name. If not created during the Nutanix cluster setup, add a DNS entry for this name and point it to the cluster IP address. The container names that you created earlier are used as the share names. The resulting share name will be `\\{cluster-name}\{container-name}`. For example, `\\cluster\ds_mgmt`.

By default, only the cluster hosts have access to the SMB shares. To change this, you must modify the Whitelist on the cluster. At a minimum, the IP address of the System Center VMM host must be added. If you want all management hosts to be able to access, you can specify the network segment as opposed to single IP address.

NOTE: The shares must be used only for storing VDI-related components.

To modify the Whitelist, go to the Nutanix Web Console, click the configuration wheel symbol in the upper-right corner, and then click **Filesystem Whitelists**.

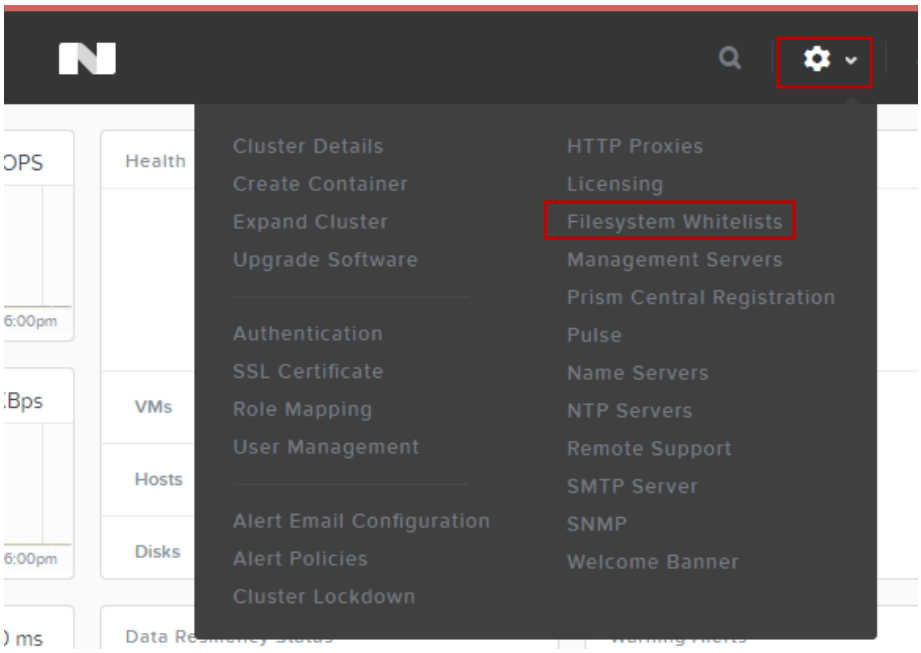


Figure 7 Filesystem Whitelists

5. Type the desired host IP address or network segment and click **Add**.

4 Configuring Hypervisor

4.1 Setting up Windows host

Joining Hyper-V Hosts to the Active Directory Domain

If using Windows 2012 R2 with Hyper-V role as the hypervisor, the hosts must have already been joined to the AD domain as part of the initial Nutanix cluster setup.

4.2 Hyper-V Virtual Switches and NICs

The Nutanix cluster setup process will create a network team using the 10 GB NICs. This team is associated with a virtual switch named "ExternalSwitch" for all external traffic to the host and VMs. There is also a virtual switch named "InternalSwitch" which is used only by the Nutanix controller VMs (CVMs).

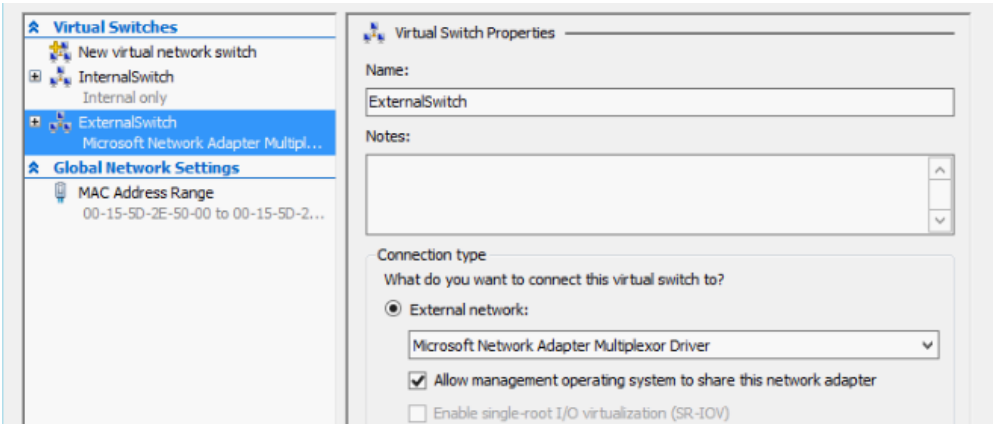


Figure 8 Virtual Switches

This configuration is sufficient for VDI to function, but we recommend that additional virtual NICs be created and associated with VLANs to segment the pertinent operations of the Management OS. For example, failover cluster heartbeating and live migration.

In the following example, the management VLAN uses 177 as the ID and is added to the ExternalSwitch vSwitch (this should be changed to the ID used for your management network).

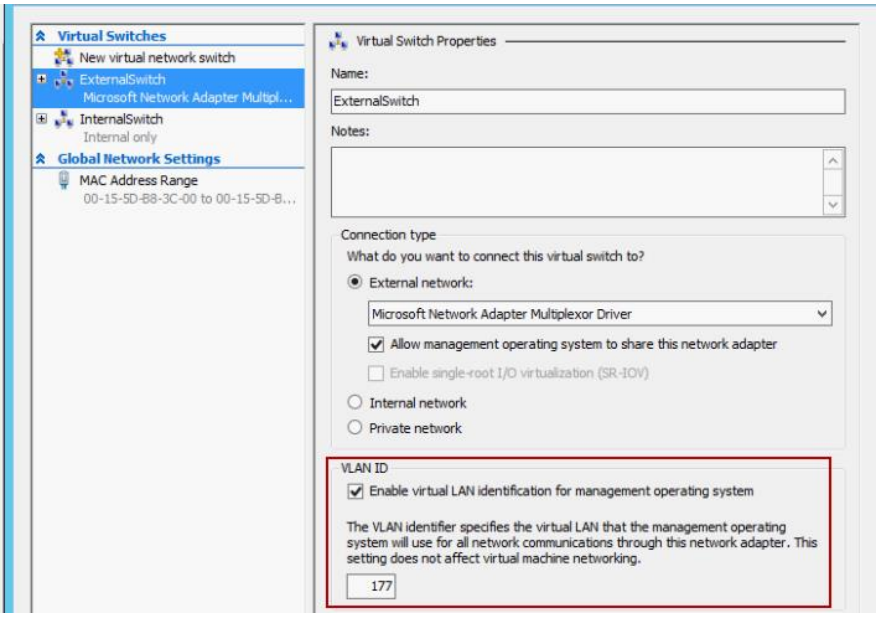


Figure 9 Virtual Switch VLAN ID

Adding Virtual NICs

Using PowerShell, you can run the `Get-VMNetworkAdapterVlan` command to view current virtual NICs and VLAN assignments.

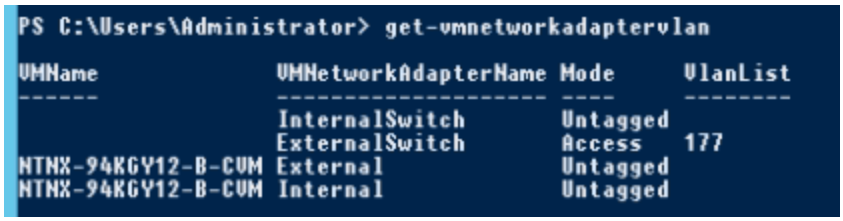


Figure 10 View Virtual NIC VLAN Assignments using PowerShell

The following PowerShell commands can be run to create additional vNICs and corresponding VLANs. The vNICs are associated with the ExternalSwitch virtual switch.

```
Add-VMNetworkAdapter -ManagementOS -Name "Cluster" -SwitchName "ExternalSwitch"

Add-VMNetworkAdapter -ManagementOS -Name "LiveMigration" -SwitchName
"ExternalSwitch"

Set-VMNetworkAdapterVlan -ManagementOS -VMNetworkAdapterName "Cluster" -Access -
VlanId 25
```

```
Set-VMNetworkAdapterVlan -ManagementOS -VMNetworkAdapterName "LiveMigration" -
Access -VlanId 50
```

Make sure the corresponding VLAN tagging is configured on the physical switches that the hosts are connected to.

NOTE: It is not necessary to create a virtual NIC and VLAN assignment for the desktops.

Network Traffic for the desktop VMs will pass through the ExternalSwitch virtual switch, but the Hyper-V host OS does not need a connection on that network or VLAN. Therefore, if you want to configure the desktops for a specific VLAN, the ID is added to the gold image template later in the configuration.

Verify the VLAN configuration by using Get-VMNetworkAdapterVlan.

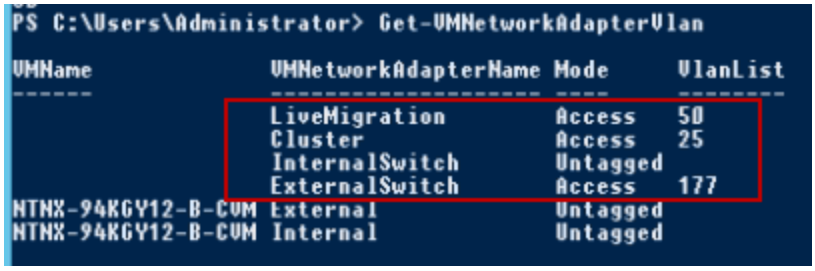


Figure 11 View Virtual NIC VLAN Assignments using PowerShell

You should also be able to see the new virtual NICs (vNICs) on the local server properties in Server Manager. We recommend assigning a static IP address to each virtual NIC.

After virtual NICs are created, the virtual switch properties in the Hyper-V Manager tool will no longer be accessible. You must modify them by using PowerShell.

Verify that the Nutanix controller VMs are configured to access the correct VLAN. In this example, VLAN 177 is used for the management network. Therefore, we must configure the CVM network adapter with the appropriate ID.

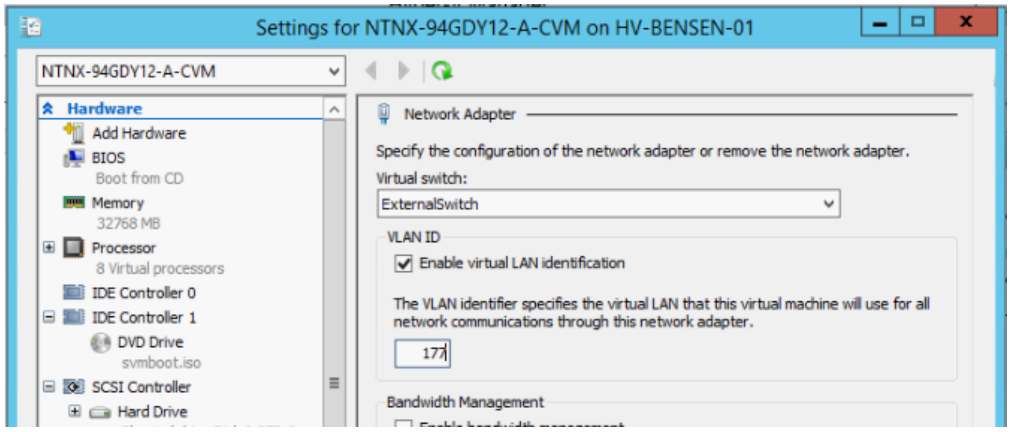


Figure 12 Configuring the CVM network adapter

Jumbo Frames

The Nutanix cluster setup should have configured the NICs to the largest supported MTU size (jumbo frames). This can be verified in Network Connections. Go to the properties of the NICs for the ExternalSwitch, Cluster, and LiveMigration, and then click **Configure**. Click the **Advanced** tab and verify that Jumbo Packet value is set to the highest value (typically, 9014 bytes) and modify if not currently set to the highest value.

NOTE: The NIC for the InternalSwitch will have a jumbo frame size of 64,000. This must be verified from the registry as the GUI properties window will not display this high value properly.

NOTE: Jumbo frames must be enabled also on the physical switch.

5 Setting up Management VMs

The table here summarizes all of the management VM specifications for the vWorkspace and Hyper-V configuration.

Role	vCPU	Startup RAM (GB)	Dynamic Memory			NIC	OS vDisk	
			Min|Max	Buffer	Weight		Size (GB)	Location
Nutanix CVM (pre-installed)	8	32	N/A	N/A	High	2	N/A	C: (rear)
Broker + RD Lic	4	4	2GB|8GB	20%	Med	1	40	ds_mgmt
WebAccess + SGW	2	4	512MB|6GB	20%	Med	1	40	ds_mgmt
vWorkspace Diagnostics and Monitoring (Foglight)	2	4	512MB|6GB	20%	Med	1	60	ds_mgmt
Foglight Agent Manager	2	4	512MB|6GB	20%	Med	1	60	ds_mgmt
SQL Server Std.	4	8	4GB|10GB	20%	Med		40 + 200	ds_mgmt
SCVMM	4	8	4GB|8GB	20%	Med	1	60	ds_mgmt

Figure 13 Hyper-V Management VM Table

This table summarizes all of the management VM specifications for the vWorkspace and vSphere hypervisor configuration.

Role	vCPU	vRAM (GB)	NIC	OS vDisk	
				Size (GB)	Location
Nutanix CVM	8	32	2	N/A	C: (rear)
Broker + Licensing	4	8	1	40	ds_mgmt
WebAccess + SGW	2	6	1	40	ds_mgmt
SQL Server Std.	4	8	1	40 + 200	ds_mgmt
vCenter Appliance	2	8	1	125	ds_mgmt
vWorkspace Diagnostics and Monitoring (Foglight)	2	6	1	60	ds_mgmt
Foglight Agent Manager	2	6	1	60	ds_mgmt

vSphere Management VM Table

The SQL and SCVMM VMs are created first for the Hyper-V configuration followed by the remaining management VMs. Similarly, the SQL and vCenter VMs are created first for the vSphere configuration.

5.1 Creating Management VMs

To create VMs for Hyper-V configuration:

1. Log in to any of the hosts in the cluster and start **Server Manager**. Any host can be logged in to because the VMs will eventually be added as roles to a Microsoft Failover Cluster.
2. In **Server Manager**, from the **Tools** menu, select **Hyper-V-Manager**.
3. In **Hyper-V Manager**, connect to the local server.
4. Right-click the name of the local server in the left pane and select **New → Virtual Machine.**
5. On the **Specify Name and Location** page of the **New Virtual Machine** wizard, type the name and location of the VM. The location is the Nutanix SMB share for your management container (for example, `\\nutanix-cluster\ds_mgmt`).. For the SCVMM VM, the server name cannot exceed 15 characters and must not contain a "-SCVMM-" pattern.
6. On the **Specify Generation** page, specify Generation 2 and click **Next**.
7. On the **Assign Memory** page, type the amount of startup memory according to the Hyper-V Shared Session VM Sizing table and select the check box next to **Use Dynamic Memory for this virtual machine**. Click **Next**.
8. On the **Configure Networking** page, select the vSwitch previously created for the management VLAN (the Nutanix setup identifies this as "ExternalSwitch").
9. On the **Connect Virtual Hard Disk** page, select the **Create a virtual hard disk** check box, type the name, location, and size of the virtual disk. The location will be the Nutanix SMB share for your management container. Recommended sizes are in the Hyper-V Management VM table.
10. On the **Installation Options** page, select the **Install an operating system later** option. Click **Finish**.
11. After the VM is created, right-click the VM in the Virtual Machines pane, and then select **Settings**.
12. Click **Memory** and adjust the settings to match those in the Hyper-V Management VM table.
13. In the VM settings, click **Network Adapter** in the left pane, and then select the **Enable Virtual LAN Identification** check box. Type the VLAN ID for your management VLAN, if applicable.

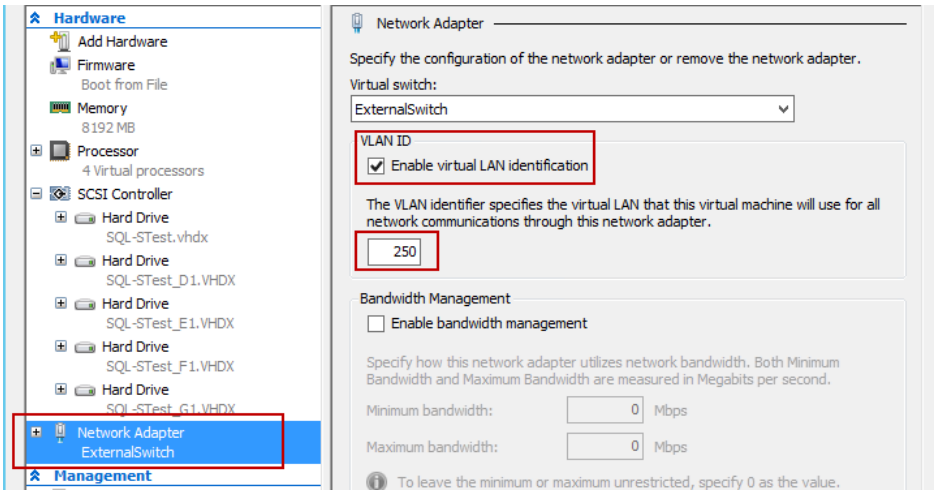


Figure 14 Network Adapter External Switch

14. For the SQL VM, we recommend creating four additional virtual disks: two for database and database log files, and two for `tempdb` and `tempdb` logs. To create four additional drives, right-click SQL VM in the **Virtual Machines** pane and select **Settings**.
15. Click the SCSI controller in the hardware pane, select **Hard Drive** in the right pane (under SCSI Controller), and then click **Add**. Repeat the task until you have four more virtual disks.

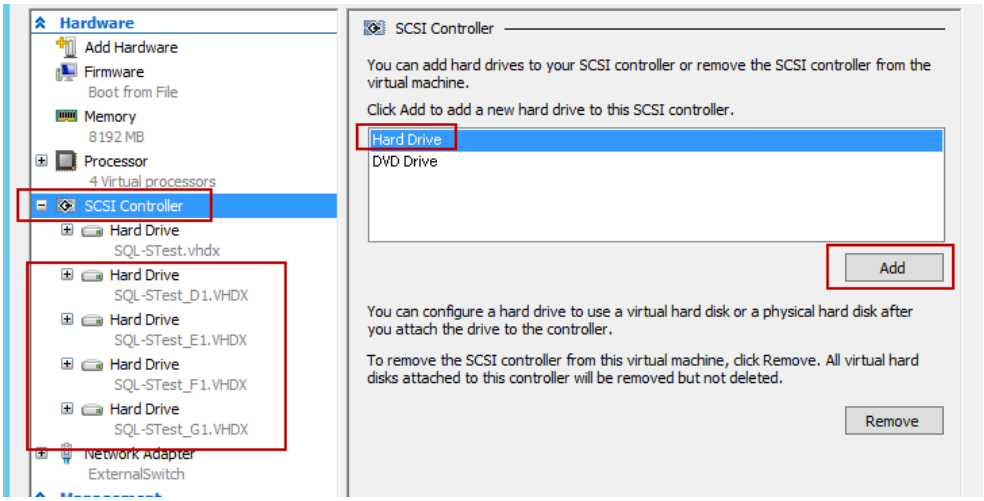


Figure 15 SCSI Controller

Virtual disks must be created with the following disk spaces:

- Data: 100 GB fixed
- Logs: 50 GB fixed
- TempDB data: 20 GB fixed
- TempDB logs: 20 GB fixed

16. After adjusting settings, click **OK**.

17. Windows Server 2012 R2 must be installed on each of the management VMs. You can install Windows Server 2012 R2 by attaching an .iso file to the virtual DVD or by using existing OS deployment applications. If installing by ISO file, add a **DVD Drive** first by clicking **SCSI Controller** in the VM Settings, highlighting **DVD Drive**, and clicking **Add.**
18. After installing the OS and applying your Windows license key, configure an IP address for the VM.
19. Change the computer name to an appropriate host name and join the VM to your domain.
20. Repeat the tasks to create all of the necessary Windows Server VMs listed in the Hyper-V Management VM table.

5.1.1 Creating Management VMs for the vSphere hypervisor configuration

For equivalent tasks to create VMs for vSphere, see the vSphere Virtual Machine Administration Guide (ESXi 5.5). For the specifications to use for the VMs, refer to the vSphere Management VM Table earlier in this guide.

5.2 Installing SQL Software

5.2.1 SQL Software Prerequisites

Prerequisites for the SQL Server installation:

1. Log in to the SQL VM to perform the SQL Server 2012 installation. For best performance, we recommend formatting the additional virtual disks for `data`, `logs`, `tempdb`, and `temp logs` using a 64K allocation size before installing SQL. To format the additional drives, right-click the partitions in Disk Management, select **Format**, and then select 64K from the **allocation unit size** drop-down menu (if new, right-click the drive and select **New Simple Volume** and continue with formatting).

NOTE: If the drives are offline, right-click the drive, select **Online**, right-click again, and then select **Initialize** before formatting.

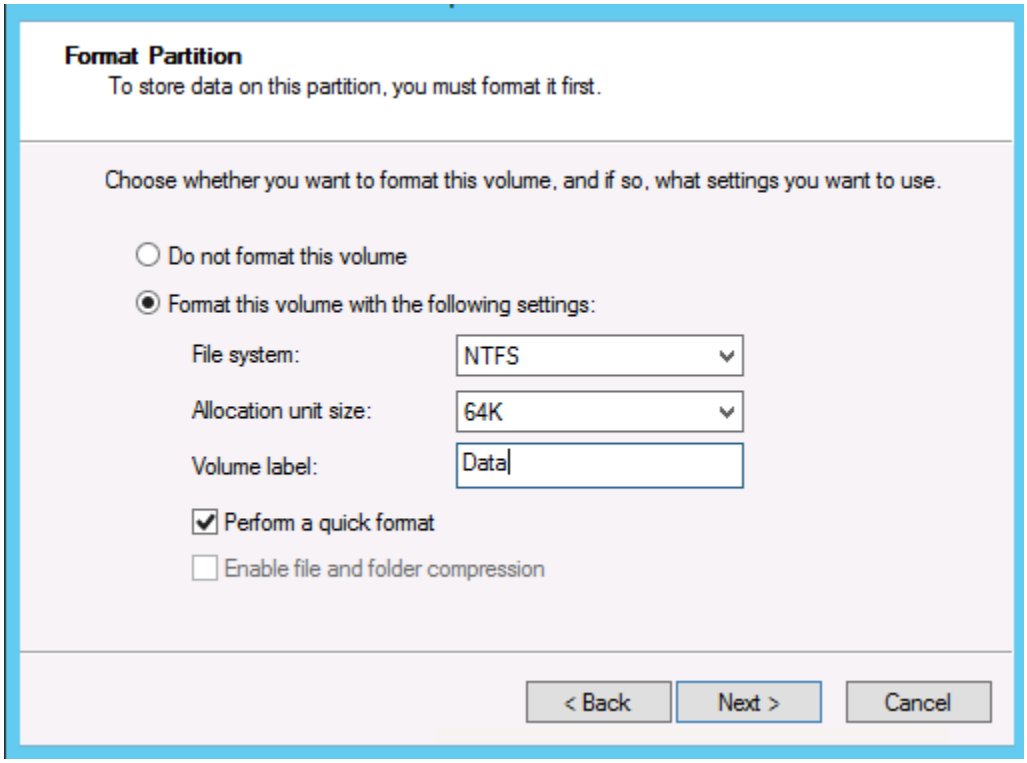


Figure 16 Formatting Virtual Drives

2. SQL service accounts created as outlined in the System Requirements section.

5.2.2 SQL Server Installation

SQL Server Installation:

1. While logged in to the SQL VM, access the SQL setup files (go to file share, copy locally, insert DVD, download, etc.)
2. Run `Setup.exe`, in the left pane, click **Installation**, and then select **new stand-alone installation**.
3. Click **OK** to continue past the discovery operation.
4. On the **Language selection** page (if displayed), click **Next**.
5. On the **Product Key** page, enter PID, and then click **Next**.
6. Accept license terms and click **Next**.
7. Enable setup to download and use update files and click **Next**.
8. Note any warnings or issues from the report and click **Next**.
9. Select **SQL Server Feature Installation** and click **Next**.
10. Database Engine Services, Management Tools (basic & completed), and SQL Client Connectivity SDK features must be installed. Other features can be installed as required. Click **Next** until you arrive at the instance configuration.
11. Select **Default instance** on the **Instance Configuration** page and click **Next**. On the **Disk Usage** page, click **Next**.

12. Change the SQL service accounts to the desired domain user accounts. Make sure to specify the domain account and password. Click **Next** to continue.

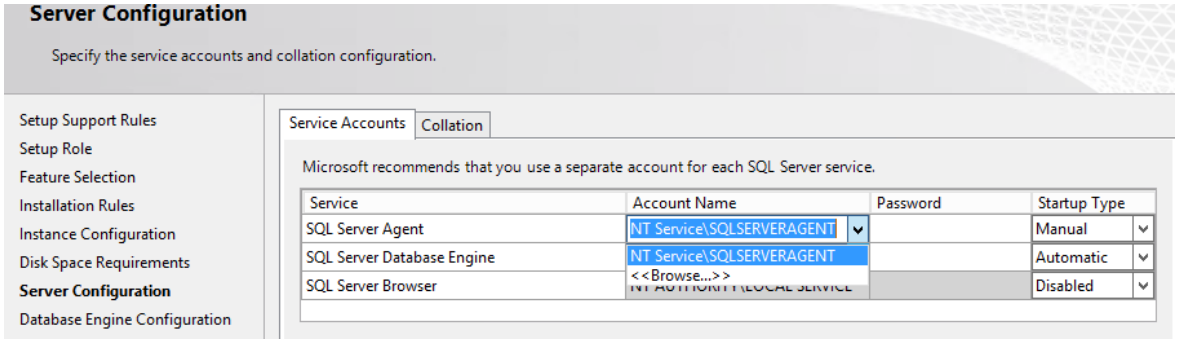


Figure 17 Server Configuration

13. Set to mixed mode authentication, specify a password for the SA account, and add domain user(s) or group(s) to be used for SQL administration.
14. On the **DataBase Engine Configuration** page, click the **Data Directories** tab. Change the database, log, and temp locations to the corresponding drives configured during the SQL VM creation. Unless you want to designate specific folders, the existing paths can be retained with only the drive letter being changed (for example, `D:\Program Files\Microsoft SQL Server\MSSQL11.MSSQLSERVER\MSSQL\Data`). Click **Next**.

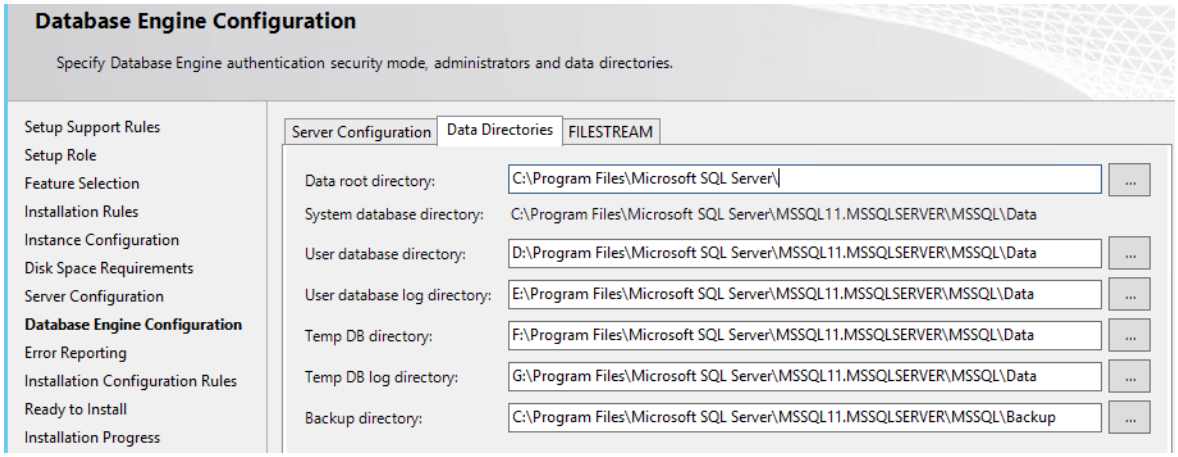


Figure 18 Database Engine Configuration

15. Click **Next** on the **Error Reporting** and **Next** again on **Installation Configuration** Rules.
16. To begin installation, click **Install** and after completing the installation process, click **Close**.

5.3 Installing System Center VMM Software

NOTE: SCVMM is only required when the hypervisor is Hyper-V.

Log in to the SCVMM VM to perform the SCVMM prerequisites and installation tasks here.

5.3.1 SCVMM Software Prerequisites

Windows ADK for Windows 8.1

Download the Windows ADK for Windows 8.1 installation file available at Microsoft website: **http://www.microsoft.com/en-US/download/details.aspx?id=39982**

1. Run `adksetup.exe` and accept the default location.
2. Select **No** to the customer experience program and click **Next**.
3. Accept the license agreement.
4. Only the Deployment Tools and Windows Preinstallation Environment features are required. Select only necessary options and click **Install**.
5. Click **Close**.

SQL Native Client and Command Line Utilities

Download and install the SQL Server 2012 Native Client and Command Line Utilities available on Microsoft Web site:

- SQL Server Native Client: **http://go.microsoft.com/fwlink/?LinkID=239648**
- SQL Command Line Utilities: **http://go.microsoft.com/fwlink/?LinkID=239650**

1. To install the SQL Native Client, run sqlncli.msi.
2. Accept license agreement and click **Next**.
3. Only the client components are necessary. You must not install the SDK.
4. Click **Next**, and then click **Install** to begin.
5. Click **Finish** when complete.
6. To install the SQL Command Line Utilities, run `SqlCmdLnUtils.msi`.
7. Accept license agreement and click **Next**.
8. Click **Install** to begin.
9. Click **Finish** to complete.

.NET Framework 3.5

.NET Framework 3.5 is required for the vWorkspace Broker Helper service.

1. In **Server Manager**, click **Manage** and select **Add Roles and Features**.
2. On the **Before You Begin** page, click **Next**, select Role-based or feature-based installation, and then click **Next**.
3. The local server should be selected as the destination. Click **Next**.
4. Click **Next** on server roles without selecting any roles.
5. Select **.NET Framework 3.5** and click **Next**.
6. Select the **Restart the destination server automatically if required** check box and click **Install**.

Windows Server 2012 R2 is used for the OS for the VMM management server and has the following required components installed by default:

- Windows Remote Management service (WinRM 3.0)
- .NET Framework (version 4.5)

5.3.2 SCVMM Installation

System Center VMM Installation

1. Add the previously created VMM service account to the local administrators group on the VMM server (see the System Requirements section in this document).
2. Run setup and select **Install**.
3. Select VMM management server. The console is installed by default.
4. Type your product key.
5. Accept the license.
6. Select **Yes** or **No** for customer experience.
7. Select **On** or **Off** for updates.
8. Click **Next** on default installation location.
9. Browse through or specify the previously created SQL database server that is used to host the database. If using a port different than the default 1433, specify it. If installing with an account that doesn't have permissions to the SQL server, specify appropriate credentials. Instance name must be present (default of MSSQLSERVER). Enter desired database name or leave the default and click **Next**.
10. Type the VMM Service Account and Distributed Key Management container details (see the System Requirements section in this document) and click **Next**.
11. Use the default port values, and then click **Next**.
12. Select **Create a new library share** on the VMM management server and click **Next**.
13. Review the installation summary and click **Install**.
14. After setup is complete, click **Close** twice.

15. If you left the checkmark next to **Open the VMM console** check box, the **Connect to Server** window is displayed. Otherwise, click the **Console** icon on the desktop. Connect to the VMM Console.

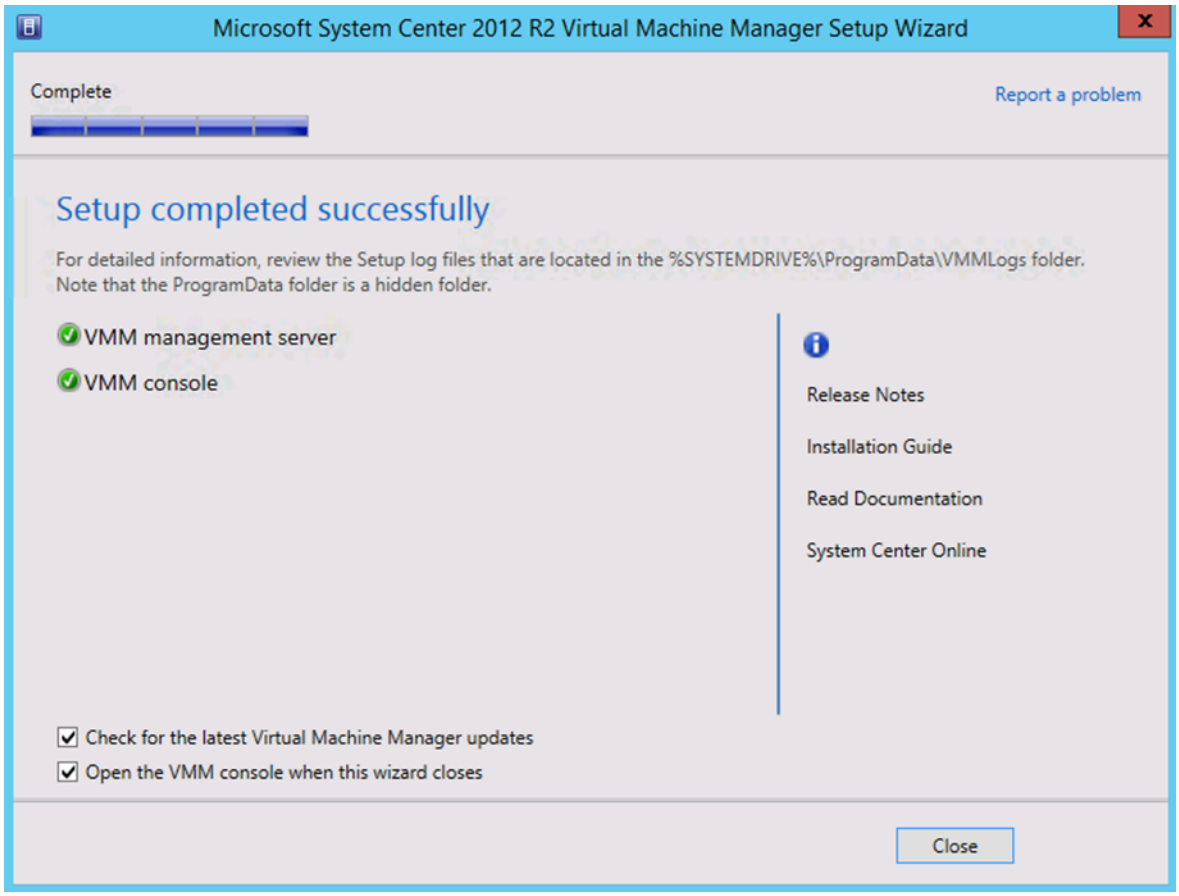


Figure 19 SCVMM Installation Screen

vWorkspace Broker Helper Service for SCVMM:

1. For vWorkspace 8.5 and later, use the Broker Helper Service (BHS) installer included with the vWorkspace installation files. For vWorkspace 8.0 MR1, download the Broker Helper Service (hotfix ID #412931) from : **https://support.software.dell.com/vworkspace/8.0.1/category/Patches**
2. The BHS relies on CredSSP. To enable properly, log in to each Nutanix/Hyper-V host and run the following from an elevated administrator PowerShell command prompt.

   ```
   Enable-WSManCredSSP -Role server
   ```

   When prompted, select **Y** and press Enter. Type `Get-WSManCredSSP` to verify the setting. The following message is displayed.

   ```
   The machine is not configured to allow delegating fresh credentials.
   ```

```
This computer is configured to receive credentials from a remote client
computer.
```

3. On the SCVMM VM, enter the following from at an administrator PowerShell command prompt. The computer names must be the FQDN of each Nutanix or Hyper-V separated by commas along with the Microsoft Failover Cluster (MFC) name associated with the cluster:

   ```
   Enable-WSManCredSSP –Role Client –DelegateComputer
   Host1.domain,Host2.domain,Host3.domain,MFC_name.domain
   ```

   When prompted, select **Y** and press Enter. Enter `Get-WSManCredSSP` to verify the setting. The response should be as given here (the target names are just examples).

   ```
   The machine is configured to allow delegating credentials to the
   following targets: wsman/NTNX-HV-MFC.osprey.com,wsman/HV-Bensen-
   03.osprey.com,wsman/HV-Bensen-02.osprey.com,wsman/HV-Bensen-
   01.osprey.com,WSMAN/*

   This computer is configured to receive credentials from a remote client
   computer.
   ```

4. Run the `brokerhelper.exe` to begin the installation.
5. Click **Next** on the **Welcome** page. Accept the license and click **Next**.
6. Type user name and organization, and then click **Next**.
7. Click **Install**. Click **Finish** when completed.
8. Reboot the system.

5.4 Installing vCenter Server Appliance

NOTE: vCenter is required only when the hypervisor is vSphere.

The VMware vCenter VM will be created using the VMware vCenter Server Appliance. The VMware vCenter Server Appliance is a preconfigured Linux-based virtual machine that is optimized for running vCenter Server and associated services. Visit the VMware website for information on downloading version 5.5.0 and licensing.

1. Connect to one of the Nutanix configured ESXi hosts using the VMware vSphere client.
2. In the VMware vSphere client, click **File → Deploy OVF Template**.

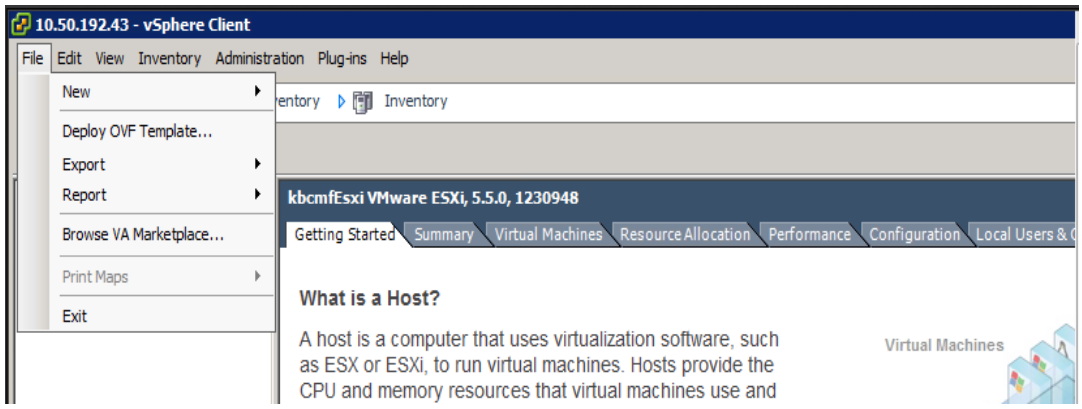


Figure 20 Deploy OVF Template

3. In the OVF deployment wizard, click **Browse,** select the vCenter Appliance OVF template file, and then click **Next**.
4. Confirm the template details and click **Next**.
5. Specify a name for the vCenter Server Appliance VM and click **Next**.
6. Select the datastore you created for your management VMs as the storage location and click **Next**.
7. Select **Thin Provision** for disk format and click **Next**.
8. Review the settings and click **Finish** to deploy.

The vCenter Appliance deployment will now run.

9. After deployment, the vCenter Appliance VM will appear listed under the ESXi host in the vSphere client window.

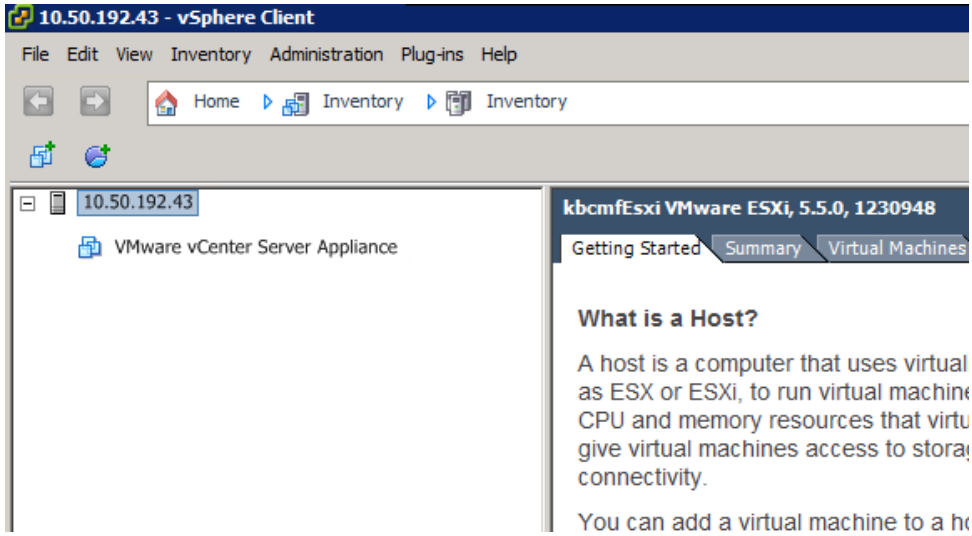


Figure 21 vCenter Appliance

10. Turn on the vCenter Appliance VM and click the **Console** tab to view the on-screen Quick Start Guide.

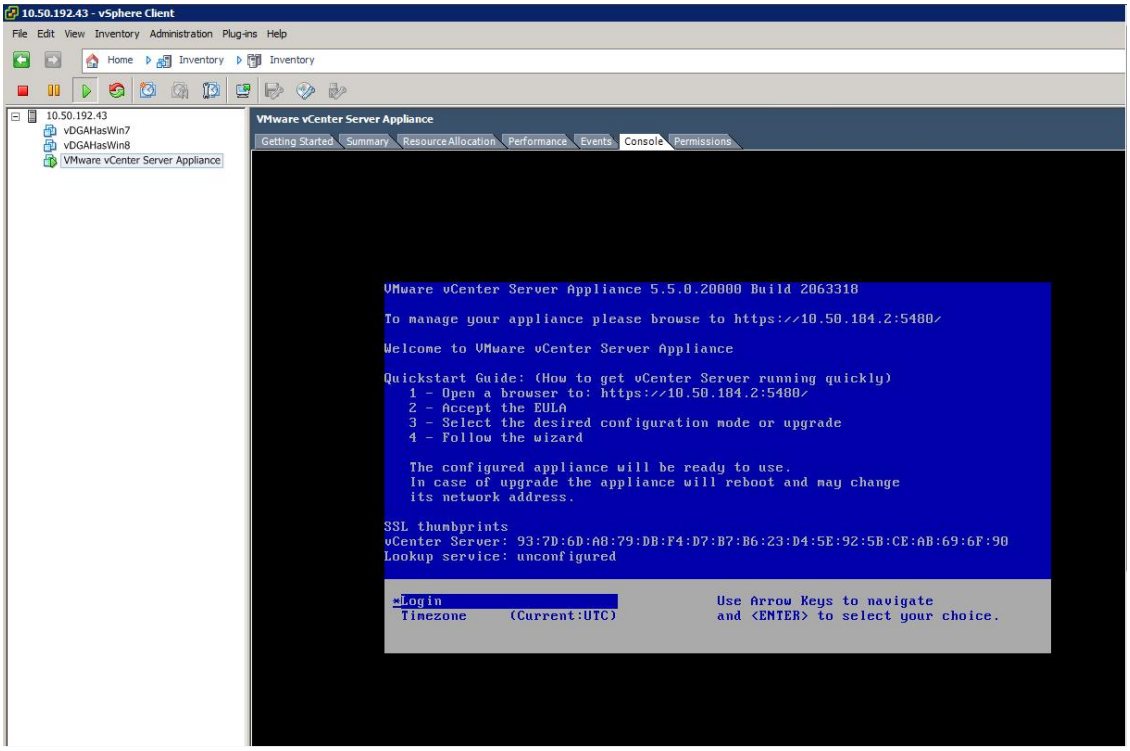


Figure 22 vCenter Appliance VM Console

11. Open a web browser window to the URL indicated in the Quick Start Guide (displayed on the console screen) and type the User Name `root` and Password `vmware`, and then click **Login**.

Figure 23 vCenter Appliance login screen

12. Accept the EULA and click **Next**.
13. Click **Next** to skip the **Customer Experience Improvement Program** page.
14. If using a static IP address, you must close the wizard and set a hostname. In this guide, a static IP address will be used. Click **Cancel** to exit the wizard.
15. Click the **Network** tab, select **Address,** and from the **IPv4 Address Type** drop-down menu, select **Static**.

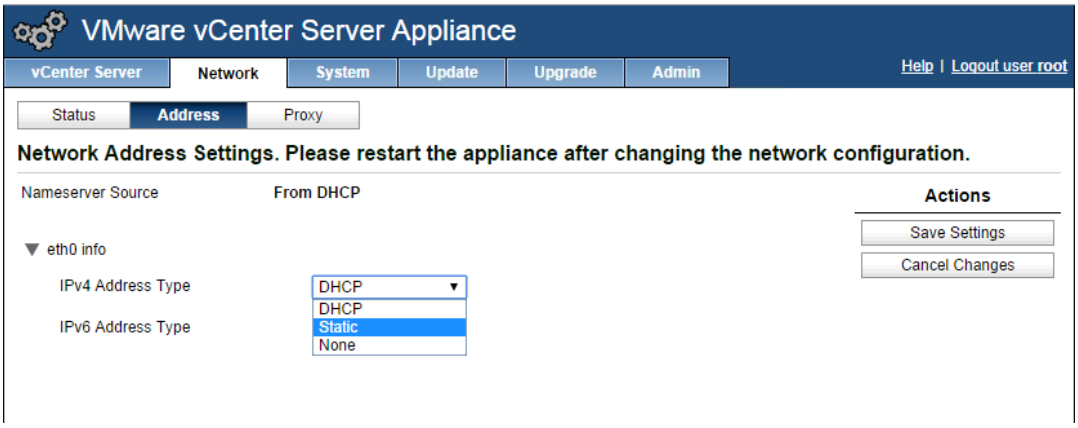


Figure 24 Static IP Address

16. Set the Hostname and IPv4 address settings. Click **Save Settings**.

Note: The fully qualified domain name (FQDN) format must be used for the host name.

17. When the network settings have saved, change the URL on the web browser to the static IP address you just set, and log in again using the login 'root' and password 'vmware', and then click the **Network** tab to verify your IPv4 settings.
18. Click the **vCenter Server** tab and under the **Utilities** section, and then click the **Launch** button to restart the Setup Wizard.

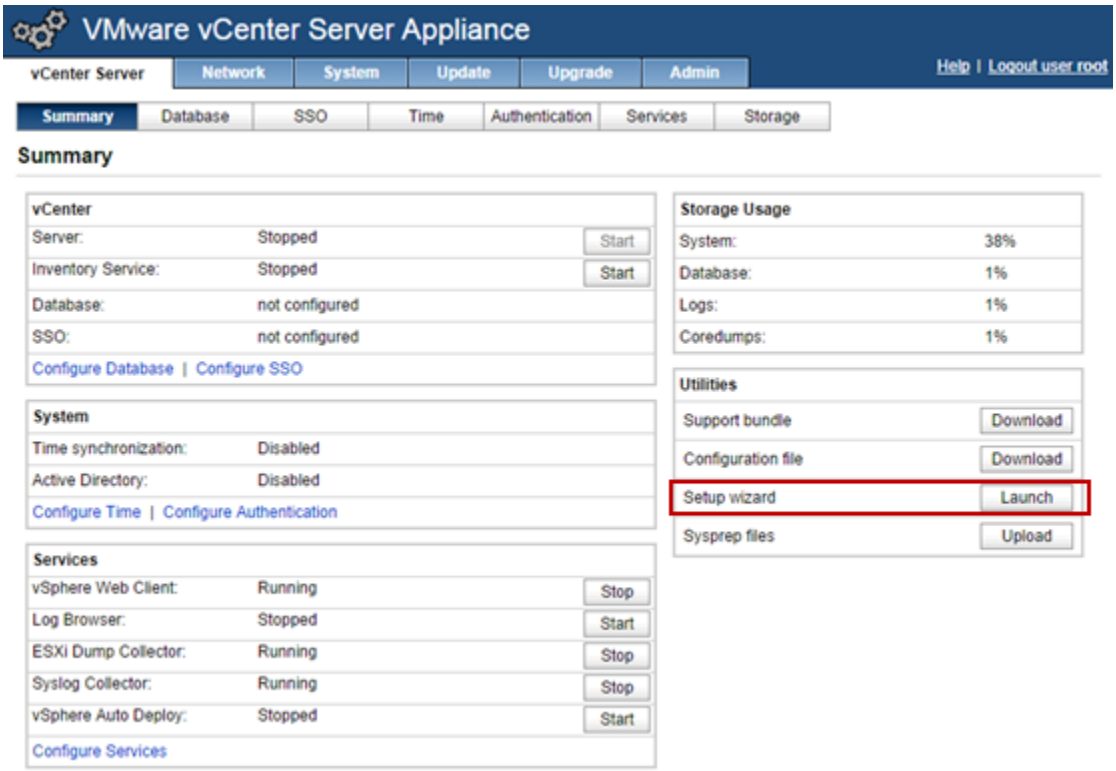


Figure 25 Setup wizard re-launch

19. Do not change selections on the **Customer Experience Improvement Program** page, click **Next**.
20. Select the **Set custom configuration** check box and click **Next**.
21. For this solution, the embedded database option will be used. Accept the default database settings and click **Next**.
22. Select **embedded** for the SSO deployment type, type a password for the **administrator@vsphere.local** user, and then click **Next**.
23. To configure Active Directory authentication, select the **Active Directory Enabled** check box and enter the domain name to authenticate to, along with an administrative user login and password for that domain.
24. Click **Next**.
25. Review the configuration settings and click **Start**
26. When the setup wizard completes its configuration processes, click **Close**.

5.5 Installing vWorkspace Broker

The following tasks describes the process of installing the vWorkspace broker components:

1. Log in to the vWorkspace broker VM.
2. In **Server Manager**, click **Manage → Add Roles and Features**, click **Next** and select Role-based or Feature-based installation. Click **Next**. Make sure the broker VM is the selected server and click **Next**.
3. In the left pane, click **Remote Desktop Services**, and click **Next** until you see the **Role services** page.
4. Select **Remote Desktop Licensing** from the list.

   In the **Add Roles and Features Wizard** dialog box, ensure that the **Include management tools** check box is selected and click **Add Features**.

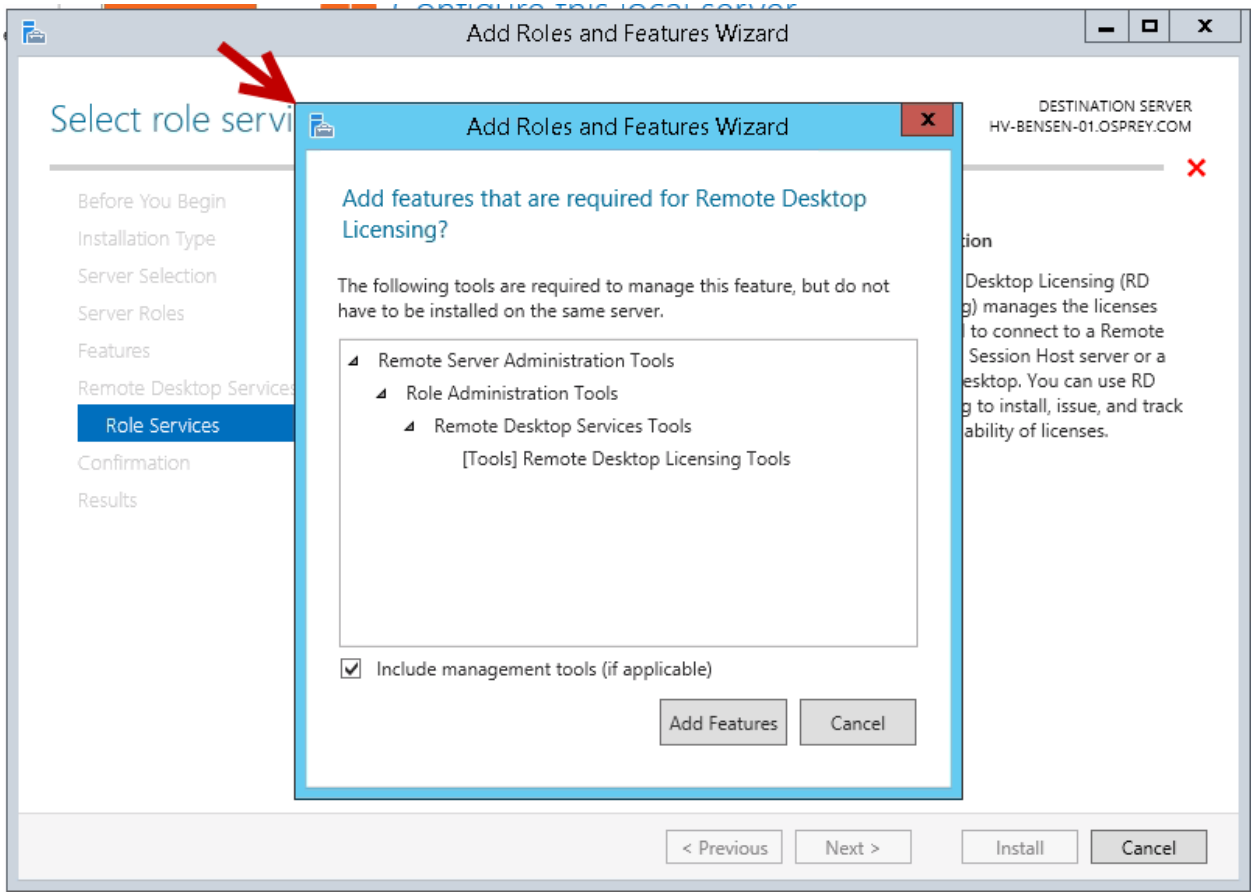


Figure 26 Add Roles and Features Wizard

5. Click **Next** to continue. Confirm the selections and click **Install**.
6. Click **Close** when completed.

NOTE: Appropriate remote desktop licenses must be added.

7. Access the vWorkspace setup files (go to file share, copy locally, insert DVD, download, etc.).

8. Right-click the `start.exe` file, and then run as an administrator.
9. Click the **Install** button to begin.
10. Click **Yes** in the **.NET Framework** dialog box, and then click **Next**.
11. Accept the license agreement and click **Next**.
12. Type your user name and organization information and click **Next**.
13. Select **Advanced setup** type and click **Next**.
14. Select only **Connection Broker Role** and **vWorkspace Management Console Role** (**Management Console** on version 8.5 and later) features and click **Next**.
15. Select the **Create a new database on an existing SQL Server** check box and click **Next**.
16. Specify your database configuration information using the SQL server name and SA password created during the SQL installation. The data source and database names can be modified as desired but we recommend to leave the vWorkspace login name as "pnadmin". Also, specify a unique password for the vWorkspace login. Click **Next**.

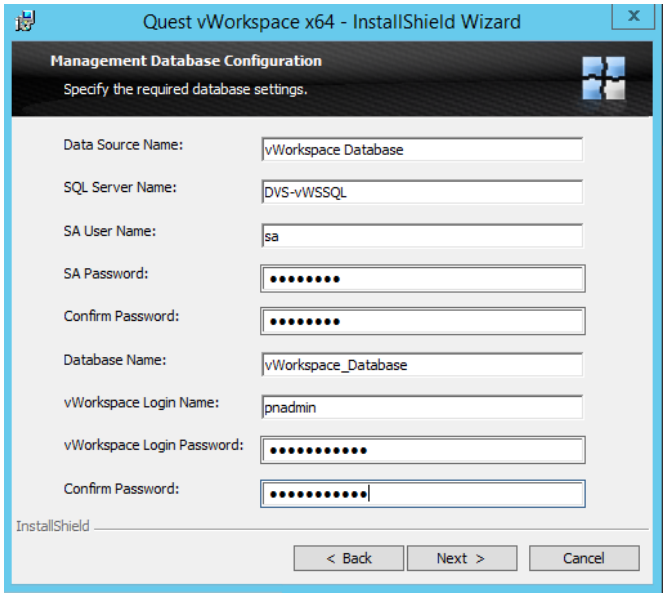


Figure 27 Management Database Configuration

17. Click **Finish** when completed.
18. You will be prompted to view a Web site with a list of hotfixes. Click **Yes** and download the hotfixes listed here. Install these after restarting and completing the installation.
19. Click **Yes** to restart and complete the installation.

For vWorkspace version 8.0 MR1, apply the following vWorkspace hotfixes which can be downloaded from **https://support.software.dell.com/vworkspace/8.0.1/category/Patches**:

- 321755
- 327208
- 333063
- 333739 (Hyper-V configuration only)
- 331043

- 342720 (vSphere configuration only)

5.5.1 Applying vWorkspace Licenses

To apply your vWorkspace license:

1. Open the vWorkspace Management Console.
2. From the **File** menu, select **Licensing**.
3. Select the **Licenses** option.
4. Click the **Add License** button.
5. Browse to the location of your ASC license file (provided by Dell Licensing team).
6. Select the file and click **Open**.
7. On the message window stating the license has been added, click **OK**.
8. Click **Close**.

5.6 Installing vWorkspace Web Access and Secure Gateway

The following tasks describe the process of installing the Web Access and Secure Gateway components:

1. Log in to the vWorkspace Web Access/Secure Gateway VM.
2. Access the vWorkspace setup files (go to file share, copy locally, insert DVD, download, etc.).
3. Right-click the `start.exe` file and run as administrator.
4. Click the **Install** button to begin.
5. Click **Yes** in the **.NET Framework** dialog box, and then click **Next**.
6. Accept the license agreement and click **Next**.
7. Type your user name and organization information and click **Next**.
8. Select the **Advanced setup** type and click **Next**.
9. Select only the **Web Access Role** and **Secure Gateway Role** (**Secure Access Role** in vWorkspace 8.5 and later) features and click **Next**.
10. Enter a name for the Web Access site. This name will also be a virtual directory in IIS and will be used in the URL when accessing your desktops or published applications. We recommend not to use white spaces or special characters. Click **Next** after typing the name.
11. Click **Install** to begin and **Finish** when completed.
12. You will be prompted to view a website with a list of hotfixes. Click **No** to proceed.
13. Click **Yes** to restart and complete the installation.
14. After the system restarts, log in again, and then click the **Web Access Site Manager** icon on the desktop.
15. The site manager displays the Friendly Name and Virtual Directory name that was configured based on the Web Access site name you provided previously. If you want to change the friendly name, select the existing name by clicking **Edit**. Remember the friendly name because this will be used when configuring Web Access.
16. To configure the roles, see the "Configuring Web Access and Secure Gateway" section in this document.

5.7 Installing Foglight for Virtual Desktops

Foglight account requirements:

- Administrator access to all machines requiring a Foglight agent.
- An administrator password for Foglight. The user name foglight and the default password for this account can initially be used to log in to the browser interface and to use command line interface options with administrator privileges. It is recommended that you change the default password for this account.

The following procedure describes the process of installing the Foglight for Virtual Desktops component for vWorkspace 8.0 MR1:

1. Log in to the vWorkspace Foglight for Virtual Desktops VM.
2. Access the vWorkspace setup files (go to file share, copy locally, insert DVD, download, etc.).
3. Right-click the `start.exe` file and run as administrator.
4. Click the **Install** button.
5. Click **Yes** in the **.NET Framework** dialog box, and then click **Next**.
6. Accept the license agreement and click **Next**.
7. Enter your user name and organization information and click **Next**.
8. Select the **Advanced setup** type and click **Next**.
9. Select only **Reporting and Logging Role** and **Foglight for Virtual Desktops Role** features and click **Next**.
10. You can select to run a discovery now or after the installation has completed. To run the discovery now, click **Yes**.
11. Select **Connect to an existing database** and click **Next**.
12. Specify your database configuration information using the SQL server name created during the SQL installation. The database name and vWorkspace login and password must match what was previously used when configuring the broker. Click **Next**.

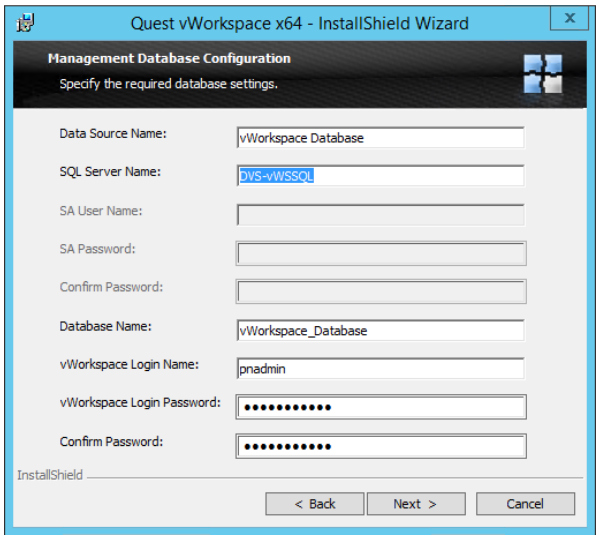


Figure 28 Management Database Configuration

13. The main installer extracts files and spawns another installation process. Click **Next** on the **Foglight for Virtual Desktops** introduction window.
14. Accept the license agreement and click **Next**.
15. Select **Custom Install** and click **Next**.
16. Select the location where you want to install Foglight. You can accept the default location `C:\Quest_Software\Foglight` or click the **Browse** button to navigate to another location. Click **Next**.
17. Select the location where you want to create product icons. Select the **Create Icons for all Users** option to create shortcuts for all Foglight users. Click **Next**.
18. Select **Enable Foglight as a Service** and click **Next**.
19. Review the installation information. If you are satisfied with the parameters of your installation, click **Install**. To make changes to the installation parameters, click **Previous**.
20. In the **Foglight Administrator Password** box, accept the default password (foglight) or type an alternate one. In the **Retype Administrator Password** box, accept the default (foglight) or, if you have provided an alternate password, retype the password for verification. Click **Next**.
21. Select **Standalone server mode** and click **Next**.
22. In the **Foglight Database Account User ID** box, accept the default user ID (foglight) or type an alternate one. This is the name for the Foglight user that you are creating. The Management Server uses this account to store data in the database.
23. In the **Foglight Database Account Password** box, accept the default password (foglight) or type an alternate one.
24. In the **Foglight Database Account Retype Password** box, accept the default (foglight). Or, if you have provided an alternate password, retype the password for verification.
25. From the **Foglight Database** list, select **External**.
26. From the **DB Type** list, select **SQL Server**.
27. In the **DB Host** box, type the database host name (that is the SQL VM host name that was previously created).
28. In the **DB Port or Instance** box, type `1433`.
29. In the **DB Name** box, type the name of the database (the default is **foglight**).
30. Select **Now** for the Setup DB option and type the SQL administrator account user ID (`SA`) and password.
31. Click **Next**.
32. Unless you want to adjust the port settings, retain the default values and click **Next**.
33. Specify the path to the Foglight license file in the **Install a license from the following file** box. Or, browse to a license file by clicking the **Browse** button. Alternatively, you can provide a license file to the Management Server after the installation is complete. To do so, leave the **License File** box blank. Click **Next**.
34. Click the **Done** button in the **Install Complete** window.
35. The installer starts Foglight and opens the **Foglight Server Startup** page in a Web browser.
36. The **Foglight Server Startup** page displays information about the status of Foglight as it starts up, such as:
    - The number of services that have started and cartridges that are enabled.
    - The latest status of the Management Server as it starts.

- A list of the Foglight services that are starting. Services listed in grey have not yet started, services listed next to a blue circle are starting, and services listed next to a green square with a check mark have started.

37. The information on the page is updated as Foglight starts. The page also includes a link that allows you to refresh the page. When the server startup is complete, a link to the Foglight login page appears. Close the browser window.
38. Click **Finish** on the original vWorkspace installation window.
39. Click **No** when prompted to visit the hostfixes website.
40. Click **Yes** when prompted to restart the system.
41. After the Foglight VM has restarted, open the vWorkspace Management Console, and then click the **Diagnostics & Monitoring** link underneath vWorkspace Farm in the upper left corner.
42. Click **Yes** if prompted with a certificate security alert.
43. The system will automatically log you in. The default user name and password are both set to **foglight**.
44. If you did not perform a discovery during installation, click the link **Discover and Configure Foglight for My Virtual Desktop Environment**.
45. Click the **Manage Credentials** link to specify the Windows domain credentials to access components in your virtual desktop environment.
46. Under **Managing Credentials**, click the **Add** button to enter the credentials.

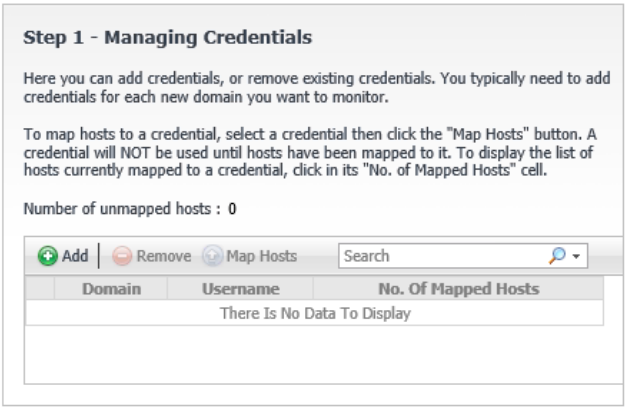


Figure 29 Managing Credentials

47. Click the **Release Lockbox** link under task 2 and enter the lockbox password (the default is **foglight**). We recommend to also change the lockbox password.
48. Click **Add** to specify your vWorkspace Farm.
49. Type a unique identifier for your farm and click **Next**.

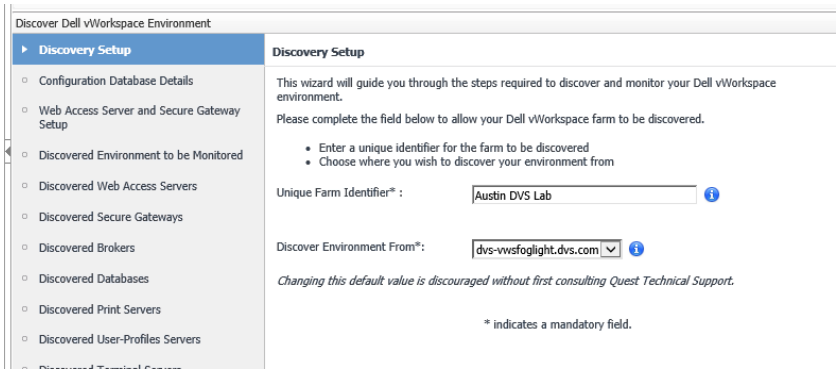


Figure 30 Discovery Setup

50. Click the **Configure Database Details** button and type the information to connect to the vWorkspace database. Make sure to change the database instance from "VWORKSPACE" to "MSSQLSERVER" (default instance) or type port as `1433`. You can click the **Test** button to ensure the details are correct, and then click **OK**. Click **Next** to continue.

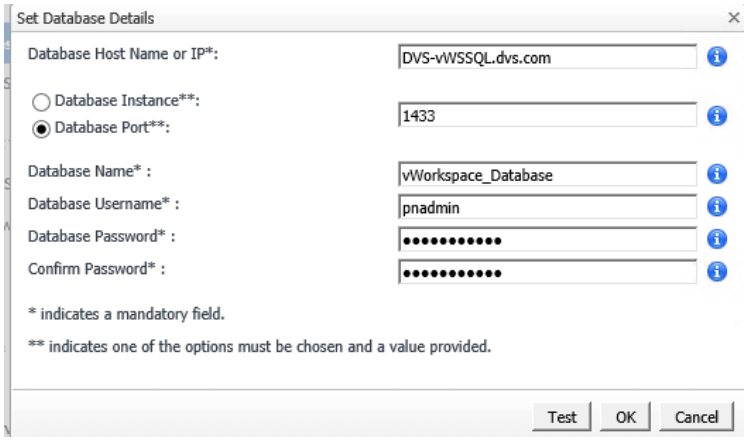


Figure 31 Set Database Details

51. Click the **Add** button to enter information about your Web Access and Secure Gateway servers if necessary.
52. Click the **Discover Environment** button to begin discovery. If a discovery has already been completed (that is during installation) then click **Next**.
53. After discovery is completed, click **OK**, and then click **Next** to view different wizards and fine tune the settings.
54. The **Discovered Environment to be Monitored** page displays components that were discovered. Click **Next**.
55. Verify your Web Access server(s) , if already configured, and then click **Next**.
56. Click **Next** on the **Discovered Secure Gateways** section.

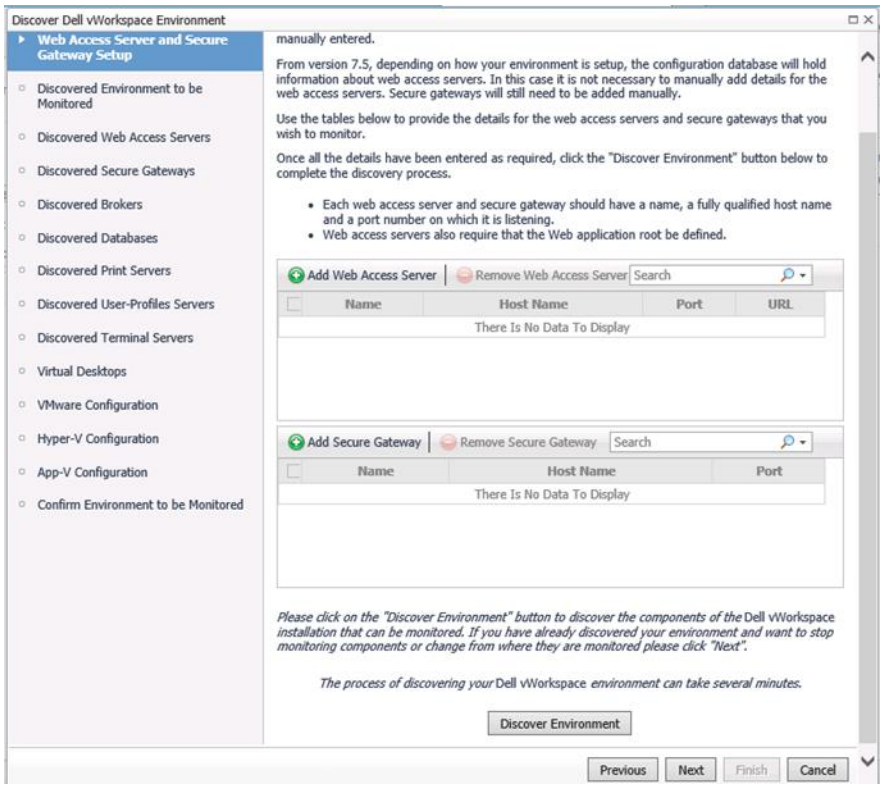


Figure 32 Foglight Configuration Screen

57. Verify your broker and click **Next**.
58. Verify your database and click **Next**.
59. Click **Next** until the **Hyper-V Configuration** page is displayed. The Hyper-V hosts should have been discovered but you must specify credentials to connect to the servers. Select the check box to select all of the hosts and click the **Credentials** button. Type the credentials in the dialog box and click **OK**. Click **Next** to continue.

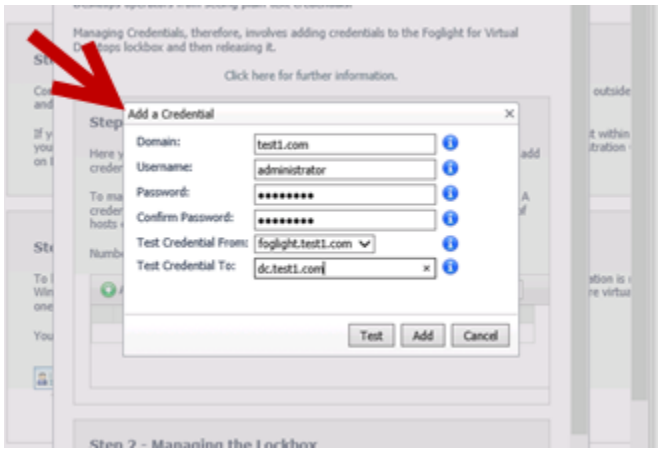


Figure 33 Add Credential

60. Click **Next** on the App-V Configuration page.
61. Click **Finish**.

Apply the following vWorkspace hotfixes:

- 331043

The following procedure describes the process of installing the Foglight for Virtual Desktops component for vWorkspace 8.5 and later:

1. Log in to the vWorkspace Foglight for Virtual Desktops VM.
2. Access the vWorkspace setup files (go to file share, copy locally, insert DVD, download, etc.).
3. Right-click the `start.exe` file and run as administrator.
4. Click the **Install** button.
5. Click **Yes** in the **.NET Framework** dialog box, and then click **Next**.
6. Accept the license agreement and click **Next**.
7. Enter your user name and organization information and click **Next**.
8. Select the **Advanced setup** type and click **Next**.
9. Select only the **Monitoring and Diagnostics Role** feature and click **Next**.
10. You can select to run a discovery now or after the installation has completed. To run the discovery now, click **Yes**.
11. Select **Connect to an existing database** and click **Next**.
12. Specify your database configuration information using the SQL server name created during the SQL installation. The database name and vWorkspace login and password must match what was previously used when configuring the broker. Click **Next**.

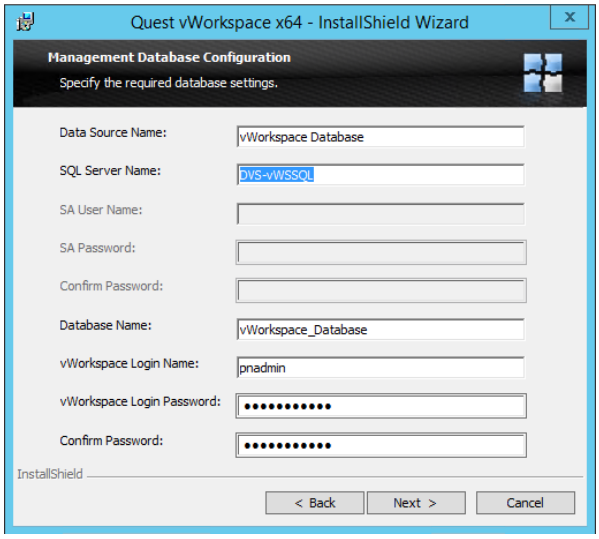


Figure 34 Management Database Configuration

13. The main installer extracts files and spawns another installation process. Click **Next** on the **vWorkspace Monitoring and Diagnostics** introduction window.
14. Accept the license agreement and click **Next**.

15. Select **Custom Install** and click **Next**.
16. Select the location where you want to install Foglight. You can accept the default location `C:\Quest_Software\FoglightvDesktops` or click the **Browse** button to navigate to another location. Click **Next**.
17. Select the location where you want to create product icons. Select the **Create Icons for all Users** option to create shortcuts for all Foglight users. Click **Next**.
18. Select **Enable** to enable as a service and click **Next**.
19. Review the installation information. If you are satisfied with the parameters of your installation, click **Install**. To make changes to the installation parameters, click **Previous**.
20. In the **Administrator Password** box, accept the default password (foglight) or type an alternate one. In the **Retype Administrator Password** box, accept the default (foglight) or, if you have provided an alternate password, retype the password for verification. Click **Next**.
21. Select **Standalone server mode** and click **Next**.
22. **Select SQL Server (External database)** and click **Next**.
23. In the **DB Host** box, type the database host name (that is the SQL VM host name that was previously created).
24. In the **Database Account User Name** box, accept the default user ID (foglight) or type an alternate one. This is the name for the Foglight user that you are creating. The Management Server uses this account to store data in the database.
25. In the **Database Account Password** box, accept the default password (foglight) or type an alternate one.
26. In the **Database Account Retype Password** box, accept the default (foglight). Or, if you have provided an alternate password, retype the password for verification.
27. In the **DB Name** box, type the name of the database (the default is **foglight**).
28. Type the SQL administrator account user ID (`SA`) and password and click **Next**.
29. Unless you want to adjust the port settings, retain the default values and click **Next**.
30. Specify the path to the Foglight license file in the **Install a license from the following file** box. Or, browse to a license file by clicking the **Browse** button. Alternatively, you can provide a license file to the Management Server after the installation is complete. To do so, leave the **License File** box blank. Click **Next**.
31. The installation begins and the **vWorkspace Monitoring and Diagnostics startup** page displays the progress.
32. A Web browser window will open displaying the vWorkspace Monitoring and Diagnostics console. Copy the URL to the page as you will need to specify it later. Close the browser window.
33. Click the **Done** button in the **Install Complete** window.
34. Click **Finish** on the original vWorkspace installation window.
35. Click **No** when prompted to visit the hostfixes website.
36. Click **Yes** when prompted to restart the system.
37. After the Foglight VM has restarted, open the vWorkspace Management Console, and then click the **Diagnostics & Monitoring** link underneath vWorkspace Farm in the upper left corner.
38. Click the **Properties** link and specify the URL to the Monitoring and Diagnostics console along with the user name and password.
39. Click **OK** and click **OK** on the dialog box.

40. The system will log you in automatically using the user name and password that you specified.
41. If you did not perform a discovery during installation, click the link **Discover and Configure Foglight for My Virtual Desktop Environment**.
42. Click the **Manage Credentials** link to specify the Windows domain credentials to access components in your virtual desktop environment.
43. Under **Managing Credentials**, click the **Add** button to enter the credentials.

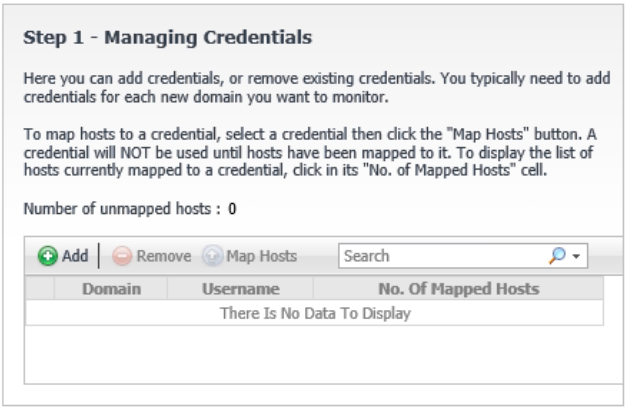


Figure 35 Managing Credentials

44. Click the **Release Lockbox** link under task 2 and enter the lockbox password (the default is **foglight**). We recommend to also change the lockbox password. Click **Close**.
45. Click **Add** to specify your vWorkspace Farm.
46. Type a unique identifier for your farm and click **Next**.

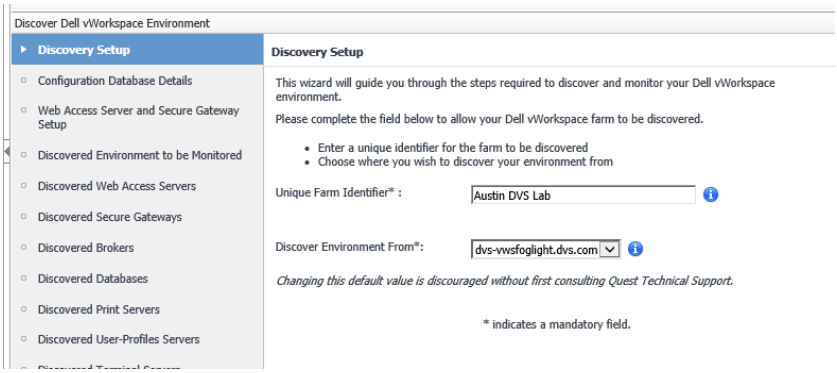


Figure 36 Discovery Setup

47. Click the **Configure Database Details** button and type the information to connect to the vWorkspace database. Make sure to change the database instance from "VWORKSPACE" to "MSSQLSERVER" (default instance) or type port as `1433`. You can click the **Test** button to ensure the details are correct, and then click **OK**. Click **Next** to continue.

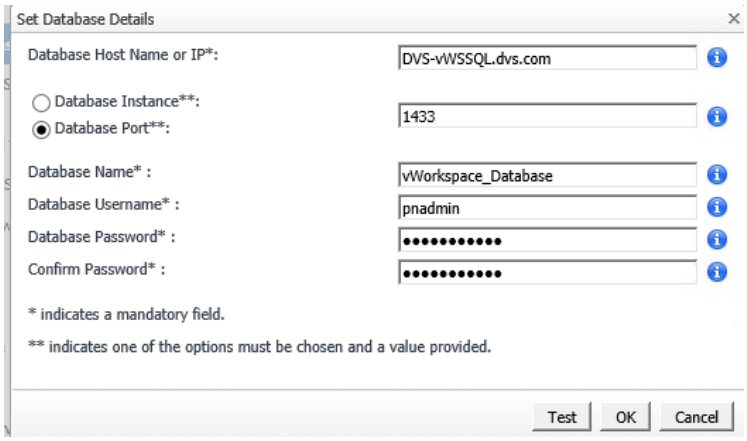


Figure 37 Set Database Details

48. Click the **Add** button to enter information about your Web Access and Secure Gateway servers if necessary.
49. Click the **Discover Environment** button to begin discovery. If a discovery has already been completed (that is during installation) then click **Next**.
50. After discovery is completed, click **OK**, and then click **Next** to view different wizards and fine tune the settings.
51. The **Discovered Environment to be Monitored** page displays components that were discovered. Click **Next**.
52. Verify your Web Access server(s) , if already configured, and then click **Next**.
53. Click **Next** on the **Discovered Secure Gateways** section.

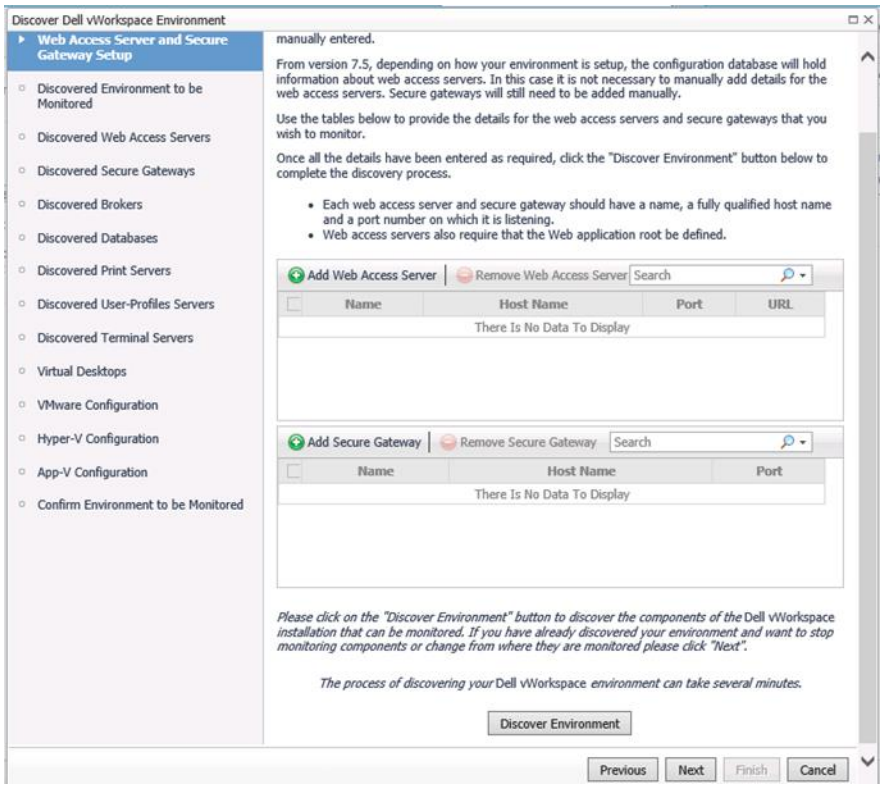


Figure 38 Foglight Configuration Screen

54. Verify your broker and click **Next**.
55. Verify your database and click **Next**.
56. Click **Next** until the **Hyper-V Configuration** page is displayed. The Hyper-V hosts should have been discovered but you must specify credentials to connect to the servers. Select the check box to select all of the hosts and click the **Credentials** button. Type the credentials in the dialog box and click **OK**. Click **Next** to continue.

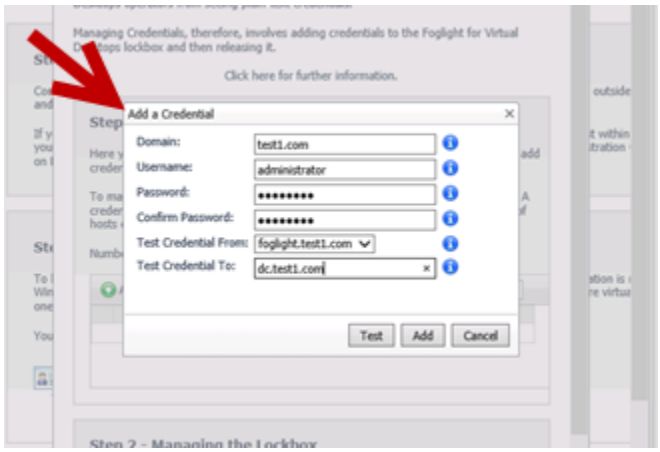


Figure 39 Add Credential

57. Click **Next** on the App-V Configuration page.
58. Click **Finish**.

5.7.1 Applying Foglight License

If you did not specify the Foglight license during installation, perform the following tasks to apply.

1. Log in to the vWorkspace Broker VM, start the vWorkspace Management Console, and then click the **Diagnostics & Monitoring** link under **vWorkspace Farm** in the upper-left corner.
2. On the navigation panel, under **Dashboards**, click **Administration → Setup & Support → Manage Licenses** to display the Manage Licenses dashboard and click **Install**.
3. In the **Install License** dialog box, click **Browse**.
4. In the file browser that appears, specify the location of the ASC license file.
5. In the **Install License** dialog box, click **Install License**.
6. After a few moments, the **Install License** dialog box closes, and the **Manage Licenses** dashboard is automatically refreshed by showing the newly installed license in the list.

5.8 Installing Foglight Agent Manager

The following tasks describe the process of installing the Foglight Agent Manager component for vWorkspace 8.0 MR1:

1. Log in to the vWorkspace Broker VM, start the vWorkspace Management Console and click the **Diagnostics & Monitoring** link under **vWorkspace Farm** in the upper left corner.
2. Go to the **Components for Download** dashboard (**Dashboards → Administration → Cartridges → Components for Download**).
3. Click the download icon for the `fglam-5.6.7-windows-x86_64.exe` file and save the installer to a location that is accessible to the Foglight Agent Manager VM.
4. Log in to **Foglight Agent Manager**, right-click the installer you saved, and then select **Run as Administrator**.
5. The **Agent Manager Installation and Configuration program** window is displayed. Read through the information in the **Introduction** and click **Next**.
6. To accept the terms of the license agreement, select the check box, and then click **Next**.
7. Select the directory where you want to install the Agent Manager and click **Next**. If the directory does not exist, the installer displays appropriate message and prompts you regarding whether or not you want the directory to be created. To create the directory, click **Yes**.
8. On the **Host Display Name** page, you can configure the host name that the Agent Manager uses to identify itself. This is also the name under which the Agent Manager submits metrics to the Management Server. By default, the Agent Manager uses the host name that is automatically detected for the machine on which it is being installed. This host name initially appears in the **Host Display Name** box. Configure the host name settings as required and click **Next**.
9. To open the **Edit Server URL** dialog box, click **Add**. Specify the host name and port (default is 8443) used by the Agent Manager to connect to the Management Server. These can be seen from accessing the vWorkspace Management Console and clicking the **Diagnostics &**

Monitoring link under vWorkspace Farm in the upper left corner. After you have specified the required connection options, click **OK**.

10. To test the connection between the Agent Manager and the Management Server, click **Test**. A URL for which the connection has not been tested appears next to an orange-colored exclamation mark icon. URLs that fail the connectivity test displays a red-colored **x** icon.
11. When you complete adding Management Server URLs, click **Next**.
12. On the **Windows Service** page, leave the check box selected (the default setting) to install the Agent Manager as a Windows service and have it start automatically when Windows starts. The Agent Manager also starts automatically when the installation is complete. Click **Next**.
13. On the next page, leave the box blank for migrating agents and click **Next**.
14. Click **Finish** to complete the installation.

The following tasks describe the process of installing the Foglight Agent Manager component for vWorkspace 8.5 and later:

1. Log in to the vWorkspace Foglight for Virtual Desktops VM.
2. Access the vWorkspace setup files (go to file share, copy locally, insert DVD, download, etc.).
3. Right-click the `start.exe` file and run as administrator.
4. Click the **Install** button.
5. Click **Yes** in the **.NET Framework** dialog box, and then click **Next**.
6. Accept the license agreement and click **Next**.
7. Enter your user name and organization information and click **Next**.
8. Select the **Advanced setup** type and click **Next**.
9. Select only **Monitoring and Diagnostics Agent Manager Role** and click **Next**.
10. Type the Foglight credentials, type 8080 for the HTTP port, type 1 for the number of instances and click **Next**.
11. Click **Finish** to complete the installation.
12. Click **No** when prompted to view a Web site with a list of hotfixes.
13. Click **Yes** to restart and complete the installation.

6 Configuring SCVMM

The following sections describe the tasks that must be completed to configure SCVMM for integration with the Nutanix cluster and vWorkspace broker.

NOTE: SCVMM is required only when the hypervisor is Hyper-V.

6.1 Run As Account

Log in to the VMM host and start the Virtual Machine Manager Console and do the following:

1. Click **Settings** in the lower right pane of the console.
2. Click the **Create Run As Account** button from the **Home** menu.
3. Type a name and description.
4. For user name and password, type the previously created AD account information (refer to the "System Requirements" section of this guide).
5. Make sure **Validate domain credentials** is selected and click **OK**.
6. To verify that the account has been added, click the arrow next to **Security** to expose **Run As Accounts**. Click **Run As Accounts** and now you can see the newly added account in the left pane.

6.2 Performance Tuning

We recommend making the following registry changes on the SCVMM VM:

Name	Type	Registry Location	Recommended Value
IndigoSendTimeout	DWORD	HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft System Center Virtual Machine Manager Server\Settings	300
VHDMountTimeoutSeconds	DWORD	HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft System Center Virtual Machine Manager Server\Settings	3600
HostUpdateInterval	DWORD	HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft System Center Virtual Machine Manager Server\Settings	7200
VMUpdateInterval	DWORD	HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft System Center Virtual Machine Manager Server\Settings	7200
TaskGC	DWORD	HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Microsoft System Center Virtual Machine Manager Server\Settings\Sql	7

After changing the registry settings, reset the VMM service. For explanations and more information about System Center performance planning, refer to the article: http://social.technet.microsoft.com/wiki/contents/articles/18059.planning-capacity-and-performance-for-system-center-2012.aspx

6.3 Integrating SCVMM, Nutanix, and Microsoft Failover Cluster

The Nutanix CVMs contain a script that creates a Microsoft Failover Cluster using the cluster nodes and add the cluster along with file share storage to SCVMM.

1. Log in to the host running the SCVMM server and start PowerShell.
2. Allow the host to access unsigned storage by running the following command.
   `Set-SMBClientConfiguration -RequireSecuritySignature $False -Force`
3. Log in to any Controller VM in the cluster with SSH by using the cluster IP.
4. Verify that all services are running on all Controller VMs by running the following comand.
   `nutanix@cvm$ cluster status`
5. If the cluster is running properly, the output displays **UP** for the various components on the nodes.
6. Run the `setup_hyperv.py` script with `setup_scvmm` as the parameter from the Nutanix CVM prompt:
   `nutanix@cvm$ setup_hyperv.py setup_scvmm`
7. The utility prompts for the necessary parameters and attempts to create a Microsoft Failover Cluster using the Nutanix hosts, if one has not already been created.
8. When prompted, type a name for the Hyper-V failover cluster (this is the Microsoft failover cluster name and is different from the Nutanix cluster name).
9. Type the domain account username that has administrator access to the hosts. This username must include the fully-qualified domain name. For example, `DC01.EXAMPLE.COM\Administrator`. Enter password when prompted.
10. Type the SCVMM server name. The name must resolve to an IP address.
11. Type the SCVMM user name and password if they are different from the domain account. Otherwise, press Enter to use the domain account.
12. Type an IP address for the Hyper-V failover cluster. This address is for the cluster of Hyper-V hosts currently being configured. It must be unique, different from the cluster external IP address, and from all other IP addresses assigned to hosts and Controller VMs. It must be in the same network range as the Hyper-V hosts.
13. Script output displays several tasks being run with a status **Done** when completed.
14. When prompted, we recommend to add a library share for VMM. Provide the desired name when prompted. The library share is displayed as another container in the Nutanix GUI where you can adjust the space if required.
15. Setup is now completed with the Microsoft Failover Cluster created and added to your SCVMM configuration. To verify, go to Server Manager on any of the cluster hosts and click **Tools →**

Failover Cluster Manager. You can also verify by accessing the VMM console, select **Fabric**, and then click **Servers**.

Placement Paths on Hosts in SCVMM

1. In the VMM console, select **Fabric** in the bottom left pane, and then click **Servers**.
2. Expand the **All Hosts** folder under **Servers** to view the Microsoft Failover Cluster that you previously added. Click the Microsoft Failover Cluster object.

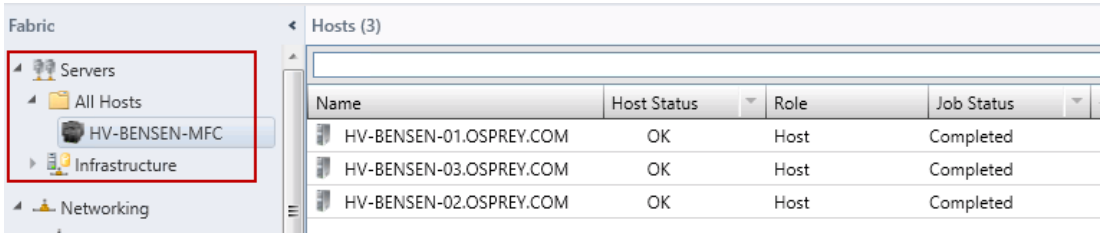


Figure 40 Microsoft Failover Cluster

3. Under the **Hosts** pane, right-click the first host and select **Properties**.

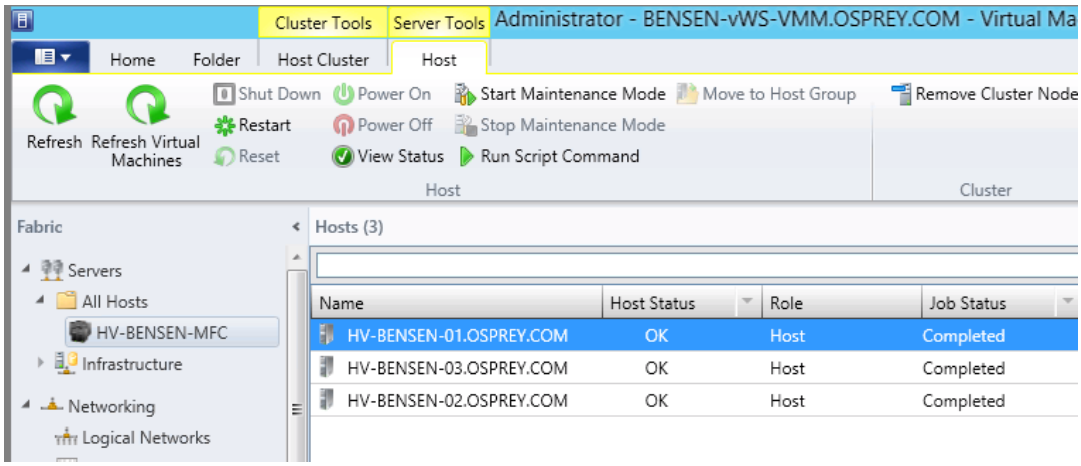


Figure 41 Host Properties

4. In the host **Properties** window, click **Placement Paths** in the left pane.

5. In the **Specify the default parent disk paths to be used for the virtual machines** section, remove all existing paths (if present) by selecting them, and then clicking **Remove**. When finished, click **OK**.

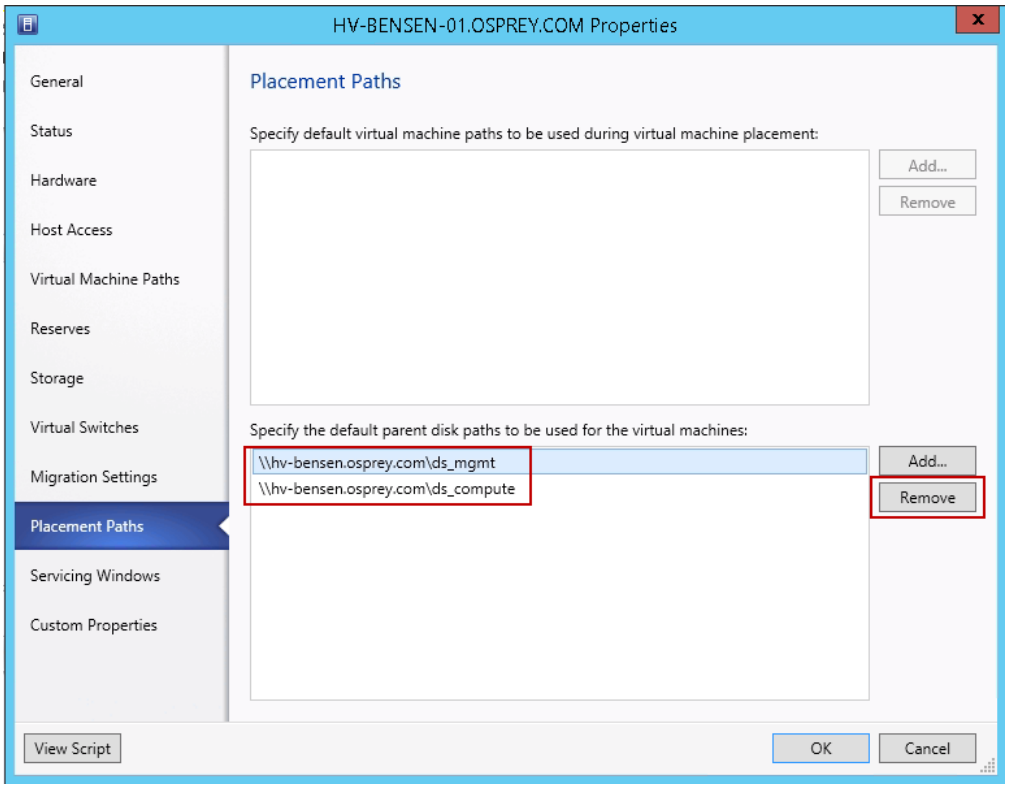


Figure 42 Placement Paths

6. Repeat tasks 3–5 for all hosts in the cluster.
7. Right-click the MS Failover Cluster and select **Properties**.
8. In the **Properties** window, click **File Share Storage** in the left pane.

9. By default, the containers you created in the **Configuring Nutanix Storage Pool and Containers** section will be present. Select each file share path listed and click **Remove** to remove file shares.

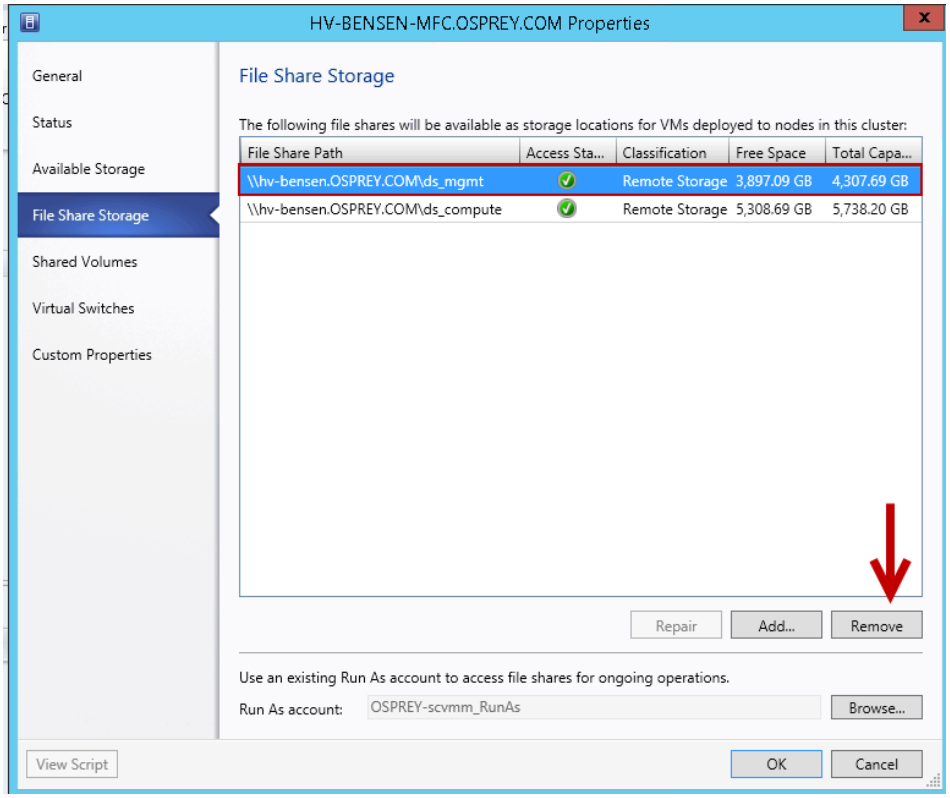


Figure 43 Remove File Shares

10. Also, by default, the file share path will contain the FQDN of the host. Because of an apparent bug in SCVMM, you must specify a placement path on each host that contains only the host name in order for ODX Fast File Copy to work properly. If you specify the default path using the FQDN, SCVMM will fall back to using BITS for copying the virtual disk files which will result in much slower provisioning times. To specify a placement path that contains only the host name in the UNC path, you must first add it to the file share storage paths for the MS Failover Cluster. Click the **Add** button on the **File Share Storage** page.
11. In the **Add File Share** window, type the path to your compute container but do not use the FQDN for the host—only use the host name.

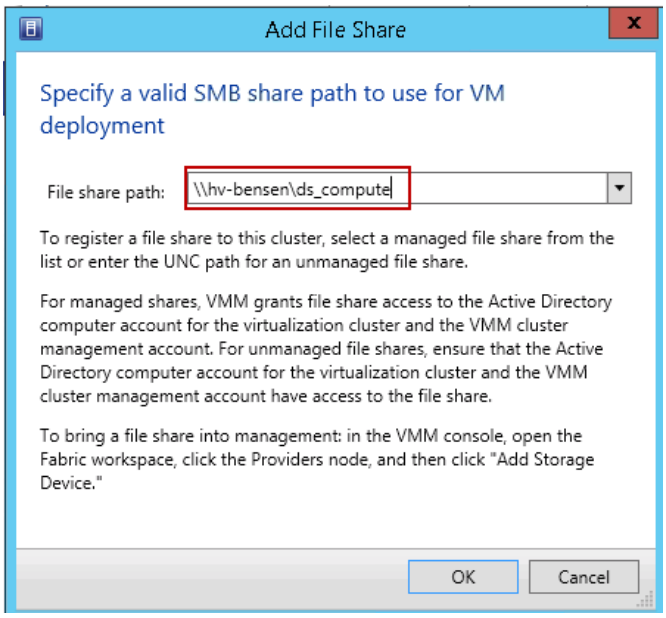


Figure 44 Specify SMB Share Path

12. Click **OK** in the **Add File Share** window. The share will be listed on the **File Share Storage** page of the **Properties** window until you click **OK**. After you click **OK** and view the properties of the Failover Cluster again. The original FQDN path will be listed. This is the expected behavior.
13. Click **OK** to close the **Properties** window. Right-click the Failover Cluster and select **Refresh**.
14. In the VMM console, under the **Hosts** pane, right-click the first host and select **Properties**.

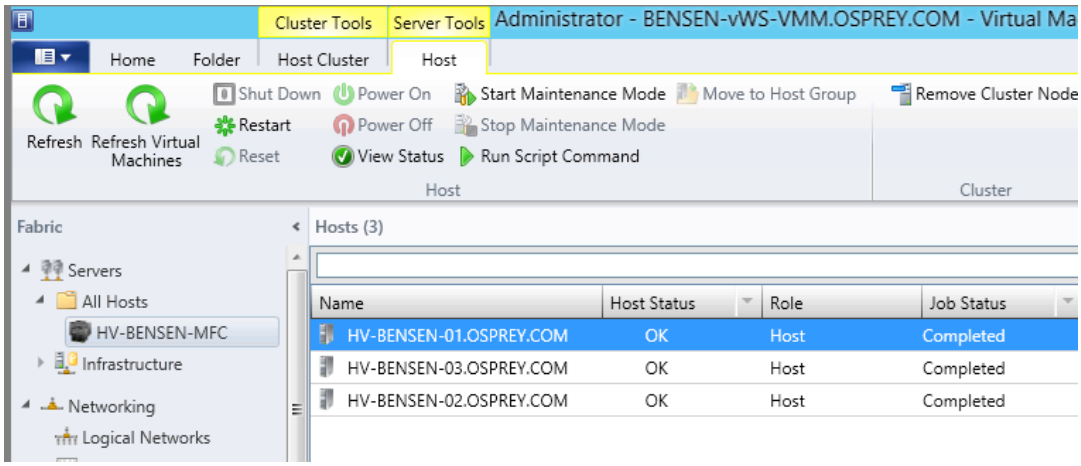


Figure 45 Hosts Properties

15. In the host **Properties** window, click **Placement Paths** in the left pane.
    The **Specify the default parent disk paths to be used for the virtual machines** section will now display the UNC share that contains the host name instead of the FQDN.

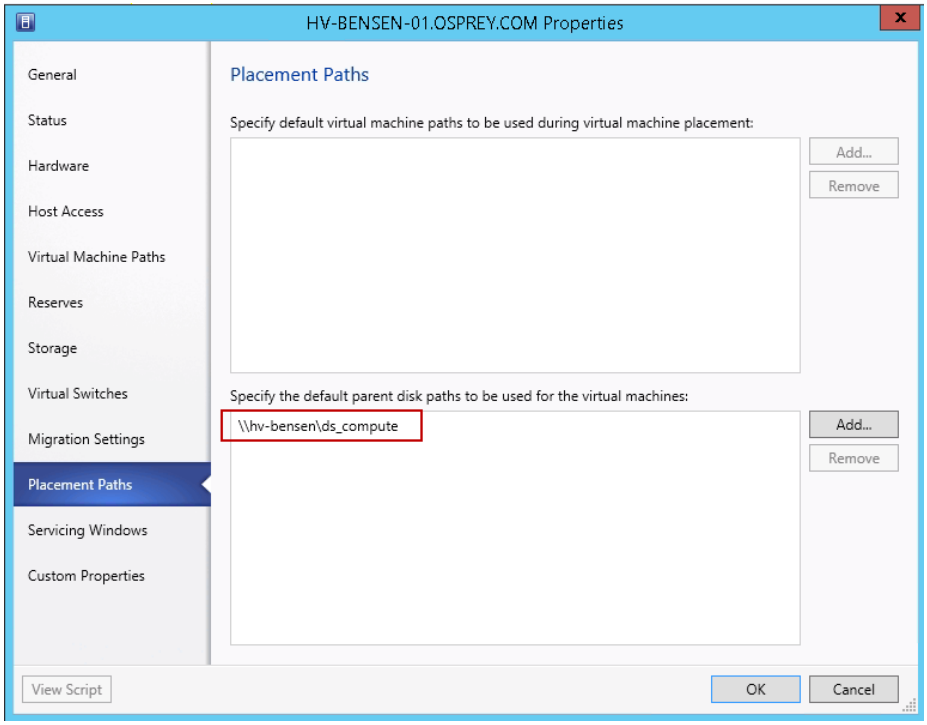


Figure 46 Specify Placement Paths

16. If any other file paths are listed, select them and click **Remove**. Only the file path to your compute container that is not using the FQDN of your host must be present.

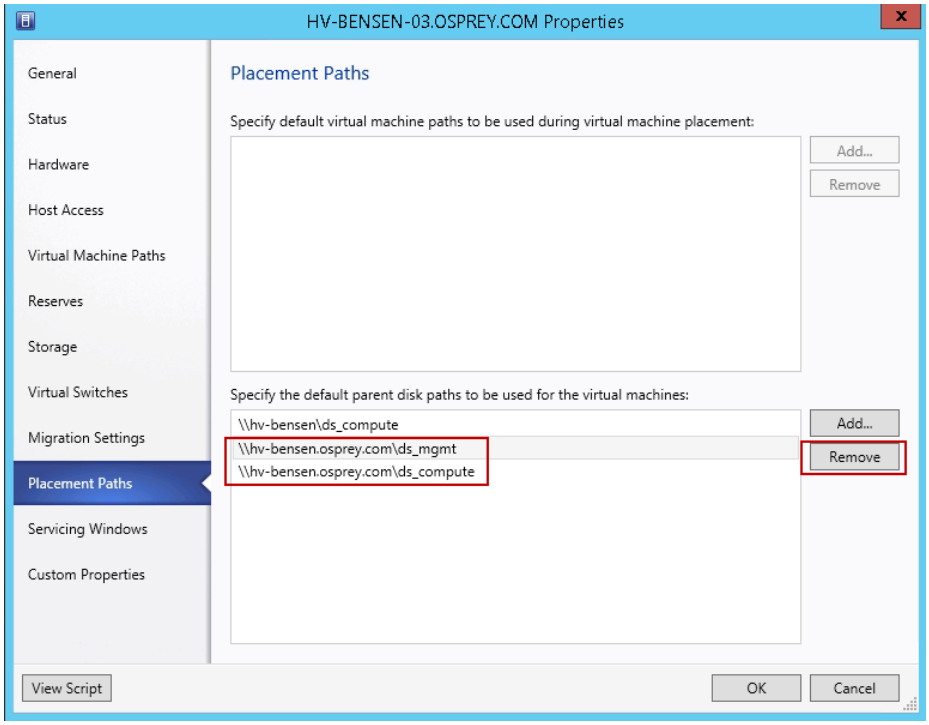


Figure 47 Remove File Paths

17. Click **OK**. Repeat tasks 14–17 for all hosts in the cluster.

NOTE: If the FQDN of the host is used in the placement path, SCVMM will use BITS instead of Fast File Copy to copy the virtual disk files resulting in much slower provisioning times. Also, if more than one placement path is specified, SCVMM will distribute the virtual disk files across the multiple locations.

6.4 Integrating vWorkspace with SCVMM

Log in to the vWS connection broker VM and start the Management Console.

1. In the left pane, click **Locations** under **vWorkspace Farm** until SCVMM is displayed under Virtualization Hosts.
2. Right-click SCVMM and select **Add host groups or clusters**.
3. Click **Next** on the **Import Host Groups & Clusters** page. Click the **Edit Virtualization Servers** button.
4. Click the **New** button. On the **Welcome** screen, click **Next**.
5. Type a name for the SCVMM server (this can be the actual host name or whatever you want as it only applies to what is displayed in the console). Select **Microsoft SCVMM** as the system type and click **Next**.
6. Type the actual host name (or IP address) of the SCVMM server along with the credentials to access. Click the **Test connection to server** button to verify connectivity, and then click **Next**.

7. On the **Other Settings** page, adjust the concurrency settings to 10 and click **OK**.
8. On the **Management Servers** window, click **OK**.
9. To select Host Groups & Clusters, click **Next**.
10. The SCVMM server should appear in the **Host Groups & Clusters** pane. Expand the SCVMM server until the Microsoft Failover Cluster name is displayed and click the name to select the cluster. Click **Finish**.

7 Configuring Microsoft Failover Cluster

Perform the following tasks to complete the configuration of the Microsoft Failover Cluster.

NOTE: Microsoft Failover Cluster is required only when the hypervisor is Hyper-V.

7.1 MS Failover Cluster Quorum

The Microsoft Failover Cluster does not use any of the host drives for its configuration. For quorum, configure a file share witness using the ds_mgmt container.

1. Log in to one of the Hyper-V hosts. In **Server Manager**, click **Tools,** and then select **Failover Cluster Manager**. In **Failover Cluster Manager**, click the name of the cluster. Click **Action** on the top menu of Failover Cluster Manager, click **More Actions**, and then select **Configure Cluster Quorum Settings**.
2. On the **Before You Begin** window, click **Next**.
3. Select **Select the quorum witness** and click **Next**.
4. Select **Configure a file share witness** and click **Next**.
5. Type the path to your ds_mgmt share (that is `\\cluster\ds_mgmt`) and click **Next**.
6. On the confirmation page, click **Next** and click **Finish** to complete.

7.2 Setting up MS Failover Cluster Network

To view the cluster network settings, expand **Networks** in **Failover Cluster Manager**.

For each network available, right-click and select **Properties** to change the name. In the following example, this network is associated with the cluster VLAN and renamed it to **Cluster**.

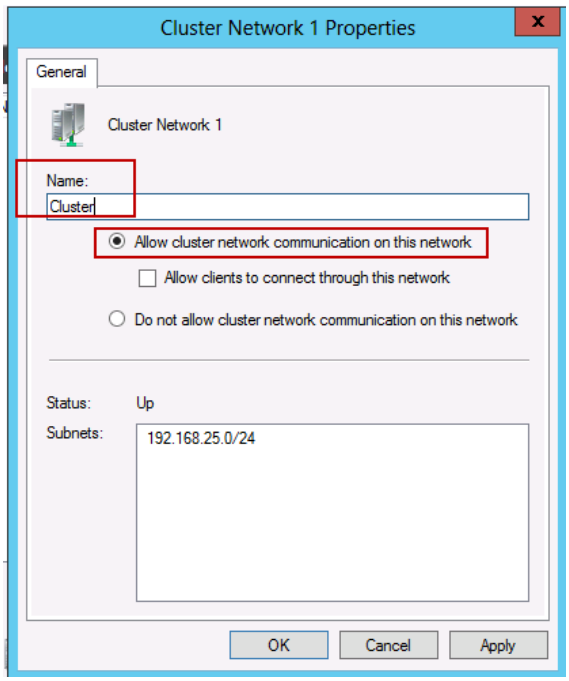


Figure 48 Cluster Network 1 Properties

NOTE: Clients should not be allowed to connect through the Cluster or Live Migration networks.

After configuring the properties for each of your networks, click **Live Migration Settings** under the **Actions** pane. Specify that only the Live Migration network be used for this purpose.

7.3 Adding Management VMs as Highly Available VMs

Now that the Microsoft Failover Cluster is created, the Management VMs should be added to the cluster.

To add the existing VMs to the cluster and configure for high availability:

1. In **Failover Cluster Manager**, in the left pane, click the cluster name, right-click **Role** and select **Configure Role**.
2. On the **Before You Begin** window, click **Next**.
3. Select **Virtual Machine** as the role and click **Next**.
4. Select all the Management VMs that you created in Section 5.
5. To confirm and proceed with the configuration, click **Next**.
6. A summary displays when complete. Click **Finish**.

8 Configuring vCenter

The following sections describe the tasks that must be completed to configure vCenter for integration with the Nutanix cluster and vWorkspace broker.

NOTE: vCenter is required only when the hypervisor is vSphere.

8.1 Integrating vCenter and Nutanix

The Nutanix cluster and nodes must be added to vCenter. To add the Nutanix configured ESXi hosts to vCenter:

1. Open the vSphere Client to attach to the vCenter Server Appliance and click **File → New → Datacenter**. Type a meaningful name for the datacenter.
2. Right-click the datacenter and select **New Cluster**. The **New Cluster Wizard** is displayed.
3. On the **New Cluster Wizard** page, type a meaningful name for the cluster in the **Name** box. Refer to the *Nutanix vSphere Adminstration Guide* for recommended vSphere cluster settings related to HA and DSR. Click **Next**.
4. Select **Disable EVC** for the VMWare EVC and click **Next**.
5. On the **VM Swapfile Location** page, select **Store the swapfile in the same directory as the virtual machine (recommended)** and click Next.
6. Click **Finish** on the **Ready to Complete** page to complete the cluster setup.
7. Right-click the newly created cluster and select **Add Host**. Type the ESXi host FQDN or IP address and the ESXi host user name and password in the **Add Host** wizard, and then click **Next**.
8. Review the host summary in the **Add Host** wizard and click **Next**.
9. On the **Assign License** page, assign a license key using an existing or new license key and click **Next**.
10. On the **Configure Lockdown Mode** page, do not select the **Enable Lockdown mode** check box as it is not supported. Click **Next**.
11. Click **Finish** to add the ESXi host to the cluster.
12. Repeat tasks 7–11 to add all Nutanix configured ESXi hosts to the cluster in vCenter.

8.2 Integrating vWorkspace with vCenter

Log in to the vWS connection broker VM and start the Management Console.

1. In the left pane, click **Locations** under **vWorkspace Farm** until **VMware** is displayed under Virtualization Hosts.
2. Right-click VMware and select **Add datacenters**.
3. Click **Next** on the **Welcome** page of the Datacenter Wzard.
4. Click the **Edit Virtualization Servers** button. On the **Welcome to the vCenter Server Wizard** page, click **Next**.

5. Type a name for the vCenter server (this can be the actual host name or whatever you want as it applies only to what is displayed in the console). Select **VMware vCenter Server** as the system type and click **Next**.
6. Type the vCenter server name along with the credentials to access. Click the **Test connection to server** button to verify connectivity, and then click **Next**.
7. On the **Other Settings** page, click **Finish**.
8. On the **Datacenter Wizard** page, click **Next**.
9. On the **Select Datacenters** page, select the name of the datacenter that you created in the previous section. Click **Finish**.

9 Floating vs Dedicated Management

If your cluster is running more than 1000 desktops or contains 10 or more nodes, we recommend that the management VMs reside on dedicated hosts (Dedicated Management model). For environments smaller than this, the management VMs will be spread evenly across the cluster nodes (Floating Management model). For example, if your cluster consists of three Hyper-V nodes, two of the management VMs will be configured to run on each node.

To configure the management VMs in a Floating Management model when using Hyper-V as the hypervisor:

1. In **Failover Cluster Manager**, click **Roles** in the left pane, right-click the broker VM, and then select **Properties**.
2. Click to select the first node as the Preferred Owner and select High as the priority from the Priority drop-down menu. Click **OK**.
3. Right-click the broker VM again and select **Move → Quick Migration → Select Node**. Click the name of the first node to select and click **OK**.
4. Right-click the Web Access VM and select **Properties**. Also select the first node as the preferred owner and change the priority to **High**. Click **OK**.
5. Right-click the Web Access VM again and click **Move → Quick Migration → Select Node**. Click the name of the first node to select and click **OK**
6. Right-click the SQL VM and select **Properties**. Select the second node as the preferred owner and change the priority to **High**. Click **OK.**
7. Right-click the SQL VM again and click **Move → Quick Migration → Select Node**. Click the name of the second node to select and click **OK**
8. Right-click the Foglight VM and select **Properties**. Also, select the second node as the preferred owner and change the priority to **High**. Click **OK.**
9. Right-click the Foglight VM again and click **Move → Quick Migration → Select Node**. Click the name of the second node to select and click **OK**
10. Right-click the SCVMM VM and select **Properties**. Select the third node as the preferred owner and change the priority to **High**. Click **OK.**
11. Right-click the SCVMM VM again and click **Move → Quick Migration → Select Node**. Click the name of the third node to select and click **OK.**
12. Right-click the Foglight Agent Manager VM and select **Properties**. Also select the third node as the preferred owner and change the priority to **High**. Click **OK**
13. Right-click the Foglight Agent Manager VM again and click **Move → Quick Migration → Select Node**. Click on the name of the third node to select and click **OK**

10 Deploying Virtual Desktops

The process for deploying virtual desktops consists of creating a desktop template, importing the template to SCVMM or vCenter (depending on the hypervisor used), and adding the template to a provisioning group in vWorkspace. The vWorkspace broker will create the specified number of desktops from the template to be used in the virtual desktop deployment.

To provision virtual desktops, perform the following tasks.

10.1 Desktop Template (Gold Image) Setup

10.1.1 Template VM Creation

The tables here summarize the desktop template configurations used by Dell during solution testing.

Solution Platform	OS	vCPU	Startup RAM (GB)	Dynamic Memory			NIC	OS vDisk	
				Min|Max	Buffer	Weight		Size (GB)	Location
Entry Platform	Win 8.1 Ent. x32	1	1	512MB|2GB	20%	Med	1	25	ds_compute
Mid Platform	Win 8.1 Ent. x32	2	1	512MB|3GB	20%	Med	1	25	ds_compute
High Platform	Win 8.1 Ent. x64	2	1	1GB|4GB	20%	Med	1	25	ds_compute

Hyper-V Desktop VM Example Configuration Table

Solution Platform	OS	vCPU	vRAM (GB)	NIC	OS vDisk	
					Size (GB)	Location
Entry Platform	Win 8.1 Ent. x32	1	2	1	25	ds_compute
Mid Platform	Win 8.1 Ent. x32	2	3	1	25	ds_compute
High Platform	Win 8.1 Ent. x64	2	4	1	25	ds_compute

vSphere Desktop VM Example Configuration Table

The desktop template VM can be created by using any appropriate vCPU and memory allocations. However, we recommend completing the following tasks to create the VHDX file for optimal use with vWorkspace and Hyper-V.

10.1.2 Creating VHDX for Hyper-V

NOTE: Solution is provided on the basis of using full clones for persistence (Standard provisioning) and recommended disk format is VHDX. If using linked clones and rapid provisioning is necessary, you must use VHD format with this version of vWorkspace.

1. Open PowerShell and go to the path where you want the template VM to be stored.
2. Run the following command to create a VHDX file for the template VM using the following necessary specifications. Replace "VMName.vhdx" with the full path and name for the VHDX file.
   ```
   new-vhd -path "VMName.vhdx" -dynamic -SizeBytes 25GB -
   PhysicalSectorSizeBytes 512 -LogicalSectorSizeBytes 512 -BlockSizeBytes
   2MB
   ```
3. Create a desktop VM using the desired vCPUs and vRAM allocation and attach the newly created VHDX file to the VM.

To create a desktop VM template for Hyper-V configuration:

1. Log in to any of the hosts in the cluster and start **Server Manager**.
2. In **Server Manager**, from the **Tools** menu, select **Hyper-V-Manager**.
3. In **Hyper-V Manager**, connect to the local server.
4. Right-click the name of the local server in the left pane and click **New → Virtual Machine**.
5. On the **Specify Name and Location** page of the **New Virtual Machine** wizard, type the name and location of the VM. The location is the Nutanix SMB share for your compute container (for example, `\\nutanix-cluster\ds_compute`).
6. On the **Specify Generation** page, specify Generation 1 and click **Next**.
7. On the **Assign Memory** page, type the amount of startup memory according to your needs (optionally, type the setting from the Hyper-V Desktop VM Example Configuration table). Click the **Use Dynamic Memory for this virtual machine** check box, and then click **Next**.
8. On the **Configure Networking** page, select the "ExternalSwitch" vSwitch. Click **Next**.
9. On the **Connect Virtual Hard Disk** page, select the **Use an existing virtual hard disk** option. Type or browse to the location of the virtual disk you created using the VHDX Creation Steps for Hyper-V. Click **Next**.
10. On the **Installation Options** page, select the **Install an operating system later** option. Click **Finish**.
11. After creating the VM, right-click the VM in the **Virtual Machines** pane and select **Settings**.
12. Click **Memory** and adjust the settings according to your requirements (optionally, type the settings from the Hyper-V Desktop VM Example Configuration table).
13. In the VM settings, click **Network Adapter** in the **Hardware** pane, and enable virtual LAN identification. Enter the VLAN ID for your desktop VLAN, if applicable.

10.1.3 Creating Desktop VMs for the vSphere hypervisor configuration

For equivalent steps to create desktop VMs for vSphere, see the *vSphere Virtual Machine Administration Guide (ESXi 5.5)*. For example specifications to use for the desktop VMs, refer to the vSphere Desktop VM Example Configuration Table earlier in this guide.

NOTE: Solution is provided on the basis of using full clones for persistence (Standard provisioning) and recommended disk format is VMDK. Ensure the Template VM is placed in the same container as the Desktop pool (for example, ds_compute) for faster deployment.

10.1.4 Installing Desktop OS and Application

1. Install the appropriate Windows desktop OS using Windows 7 or later (other OSs are supported but out of scope for this document) on the desktop template VM. Attach an .iso file to the virtual DVD drive or use existing OS deployment applications to install the desktop OS.
2. Install all of the necessary corporate applications. For example, Microsoft Office suite.

10.1.5 Installing vWorkspace Agent

The Instant Provisioning and PNTools components must be installed as part of the vWorkspace agent setup.

NOTE: Instant Provisioning and PNTools Installers are available at the following location on the vWorkspace broker VM: `C:\Program Files(x86)\Quest Software\vWorkspace`.

10.1.5.1 Installing Instant Provisioning

Instant provisioning services are installed on the master template, and instant provisioning is the mechanism which customizes the VMs during the cloning process.

1. Right-click the `InstantProvisioning.exe` file and select **Run as administrator.**
2. When prompted to install .NET Framework, click **Yes**, and then click **Next**.
3. To acknowledge the message about installing the service to the master template, click **OK**.
4. Accept the EULA and click **Next**.
5. Type customer information and click **Next**.
6. To complete the installation, click **Install,** and then click **Finish**.

10.1.5.2 Installing PNTools

PNTools (Virtual Desktop Extensions) is a set of executables, libraries, and device drivers that provide features and management functionality for managed computers in a vWorkspace infrastructure.

1. To begin installation, double-click **PNTools.msi** installer.
2. Click **Next**.
3. Accept the EULA and click **Next**.

4. Select Complete installation type and click **Next**.
5. To complete the installation, click **Install,** and then click **Finish**.
6. To restart the system, click **Yes**.

10.1.6 Optimizing Desktop OS

vWorkspace includes an application called Desktop Optimizer that can be used to optimize desktop settings for a VDI environment including disabling unnecessary services.

The vWorkspace Desktop Optimizer is installed with the Instant Provisioning Tools and can be opened from `C:\Program Files\Quest Software\vWorkspace\Desktop Optimizer`. The application has a list of settings or services in the left pane along with a description and reason for modifying in the right pane.

Windows 8.x Optimization

The Desktop Optimizer tool can be used for Windows 8.x or alternatively, you can use an optimization script from Microsoft that is available at:

http://blogs.technet.com/b/jeff_stokes/archive/2013/04/09/hot-off-the-presses-get-it-now-the-windows-8-vdi-optimization-script-courtesy-of-pfe.aspx

A new feature in Win 8.1 is Automatic Windows Maintenance, which is a feature of the dism tool that checks the system and application for update compatibility and file integrity. By default, the system scheduled task runs at 1 A.M. everyday, or any time after 10 min of idle time. When the system runs, the tiworker.exe process can consume 100 percent CPU on any recently booted desktop VMs, possibly overloading servers.

The administrator accounts cannot change the services because the services (idle time check and automatic check) run as a SYSTEM. You must get SYSTEM rights to disable services.

You can still run the checks manually even if the services are disabled. You must have psexec.exe (sysinternals) on the Master Image VM to fix this problem.

The following are the three scheduled tasks that must be disabled on your desktop template.

```
psexec \\SERVERNAME -s schtasks /change /tn
"\Microsoft\Windows\TaskScheduler\Maintenance Configurator" /DISABLE

 psexec \\SERVERNAME -s schtasks /change /tn
"\Microsoft\Windows\TaskScheduler\Idle Maintenance" /DISABLE

 psexec \\SERVERNAME -s schtasks /change /tn
"\Microsoft\Windows\TaskScheduler\Regular Maintenance" /DISABLE
```

After the desktop template VM has been optimized, shut down the desktop VM to import the template.

10.2 Adding Desktop Template to SCVMM

NOTE: SCVMM is only required when the hypervisor is Hyper-V.

The desktop template must first be added to SCVMM as a VM template and then imported to vWorkspace as a template while creating a computer group.

After creating a desktop VM on one of the Hyper-V hosts, log in to the SCVMM server to add it as a template.

1. Shut down the desktop VM that you want to use as your template before you begin.
2. Start the Virtual Machine Manager Console (the console is installed to the SCVMM VM during the VMM installation) and click **Library** in the lower-left pane.
3. In the left pane, click **Templates** and right-click VM Templates. Select **Create VM Template**.
4. In the **Select Source** window, select **From an existing virtual machine that is deployed on a host,** and then click **Browse**. Select the desktop VM that you want to use as a template and click **OK**.
5. Click **Next** and click **Yes** to proceed. The source VM is destroyed on the Hyper-V host but the settings and VHDX are imported to the SCVMM server and library.
6. Provide a name and optional description for the template and click **Next**.
7. Click **Next** on the **Configure Hardware** page and the **Configure Operating System** page.
8. Select the SCVMM server from the list of library servers and click **Next**.
9. To store the VHDX file, click the **Browse** button and select a library folder. This library folder must be the folder that was created earlier on the Nutanix cluster. Click **OK** and click **Next**.
10. Click **Create** to complete the task. If job fails immediately, verify that the desktop VM was not running. If the desktop VM was not running, shut down the desktop VM. In the Jobs window, right-click the **Create template** and select restart. After creating the templates, close the Jobs window if still open.
11. The template should now appear in the **Templates** pane in VMM.
12. Right-click the template and select **Properties**.
13. Click **Hardware Configuration** in the left pane and use the scroll box in the middle of the page until you see the **Advanced** section.

14. Click **Availability** under the **Advanced** section and select the **Make this virtual machine highly available** check box. The default **Medium** priority is sufficient.

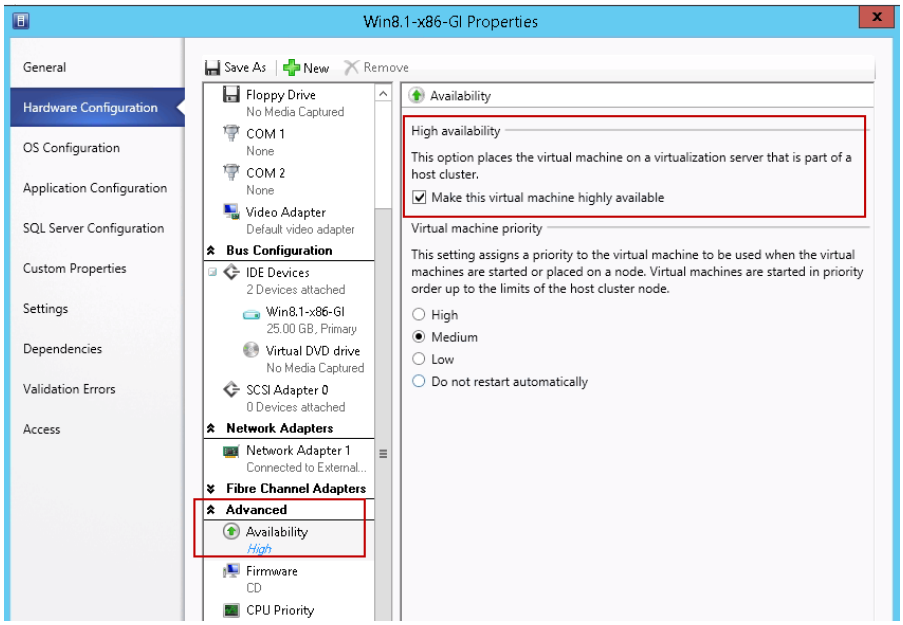


Figure 49 VM Template Properties

15. Click **OK** to exit and save.

10.3 Adding Desktop Template to vCenter

NOTE: vCenter is required only when the hypervisor is vSphere.

The desktop template must first be added to vCenter as a VM template, and then imported to vWorkspace as a template while creating a computer group.

Refer to the *vSphere Virtual Machine Administration Guide (ESXi 5.5)* for instructions about cloning a desktop VM to a template.

10.4 Creating a Computer Group and Provisioning Desktops

A computer group in vWorkspace is used to create and maintain desktops.

To set up a computer group when using SCVMM and define its properties:

1. Start vWorkspace Management Console (by default, installed to the vWorkspace Broker VM).
2. Open the **Computer Group** wizard from **Desktops node** (right-click **Desktops node**, and then select **New Computer Group**).
3. Click **Next** on the **Welcome** window of the New **Computer Group** wizard.

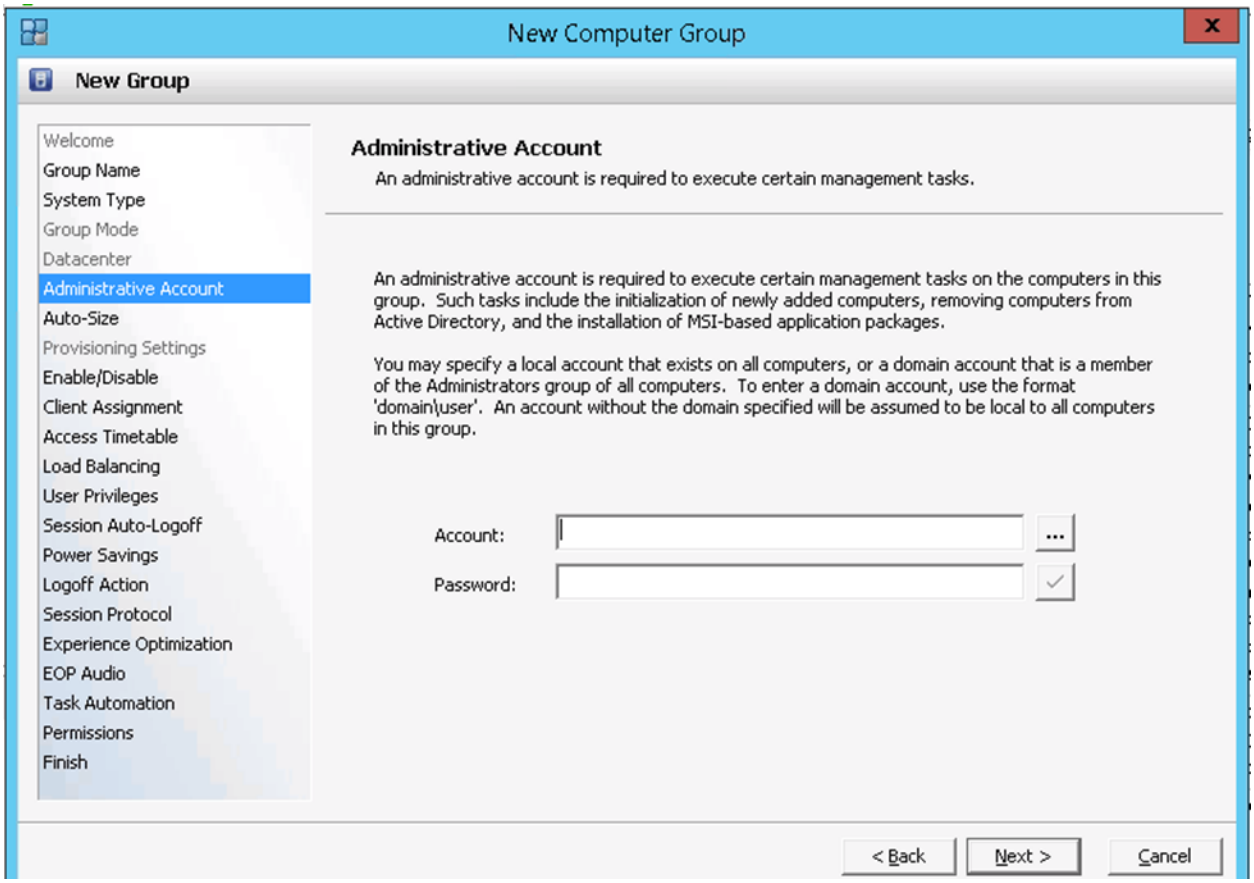


Figure 50 vWorkspace New Computer Group Wizard

4. Type name of the computer group in the **Group Name** box on the **Group Name** page, and then click **Next**.
5. Select Microsoft SCVMM on the **System Type** page, and then click **Next**.
6. On the **Administrative Account** page, type information about the domain account that will be used as an administrative account. Select the **password** check box to validate the credentials. Click **Next**.
7. On the **Auto-Size** page, you can allow the group to increase the number of desktops based on demand if required. Click **Next** to retain the default of controlling the number of desktops.
8. Click **Next** on the **Enable/Disable** page.
9. On the **Client Assignment** page, select **Persistent** and **User** to create persistent desktops assigned to user accounts. Otherwise, select the appropriate combination for your configuration and click **Next**.
10. Click **Next** on the **Access Timetable** page unless you want to limit the hours of access.
11. Select **Use the default load balancing rule** on the **Load Balancing** page and click **Next**.
12. Select the appropriate privileges on the **User Privileges** page and click **Next**.
13. Click **Next** on the next two pages to accept the default settings.
14. Select the preferred logoff action on the **Logoff Action** page. For persistent desktops, the typical choice is to do nothing. Click **Next**.

15. Click **Next** on the **Session Protocol** page for RDP protocol.

NOTE: This page does not appear in vWorkspace 8.5 and later**.**

16. Click **Next** to accept defaults on the **Experience Optimization** page.
17. Enable support for EOP Audio on the **EOP Audio** page if necessary and click **Next**.
18. Click **Next** on the **Task Automation** page.
19. Click **Next** on the **Permissions** page.
20. Select **Create new computers from a master template** and click **Finish**. The **Add Computers** wizard is displayed.
21. Click **Next** on the **Welcome** page for the **Add Computers** wizard.
22. Specify the number of computers you want to create for the group on the **Number of Computers to Create** page and click **Next**.
23. For persistent desktops, select **Standard** on the **Clone Method** page and click **Next**.
24. On the **Host Groups & Clusters** page, select your VMM server from the SCVMM server drop-down menu. The **Failover Cluster** should appear in the **Host Groups & Clusters** box. Select the cluster and click **Next**.
25. Click **OK** to acknowledge the information window.
26. On the **Template** page, click the **Import** button to import the VM template from SCVMM. Click **OK** to acknowledge the information box. Click the name of the template and click **Next**.
27. On the **Naming Conventions** page, specify the base name and values and click **Next**.
28. On the **Customize Operating System** page, click the **New** button. The **New Operating System Customizations** is displayed.
29. Click **Next** on the **Welcome** page for the **New Operating System Customizations** wizard.
30. On the **Name** page, type a name for the customization object and click **Next**.
31. Click through the customization pages and select the appropriate settings for your environment.
32. After clicking **Finish** on the **New Operating System Customization** wizard, you will be returned to the **Add Computers** wizard.

NOTE: After creating a customization object, it can be re-used for additional groups.

33. The customization object is displayed in the window on the **Customize Operating System** page. Click the name to select it and click **Next**.
34. On the **Configure Hardware** page, the video adapter, memory, and network adapter settings can be adjusted. By default, the settings associated with the SCVMM VM template are used. Click the **Network Adapter** tab to specify the VLAN ID for your virtual desktops. Click **Next**.
35. In vWorkspace 8.0 MR1, an **Object variable or With block variable** error message is displayed indicating a known bug. Click **No** to ignore.
36. On the **Options** page, click **Next** to create the desktops
37. On the **Finish** page, a list of computer names that will be created is displayed. Click **Finish** to provision the desktops.

To setup a computer group when using vCenter and define its properties:

Refer to the vWorkspace Administration Guide for the equivalent steps for provisioning persistent desktops using standard provisioning.

11 Deploying Shared Sessions (RDSH)

The process for deploying RDSH is similar to deploying virtual desktops. A template VM for RDSH is first created and then imported to SCVMM or vCenter (depending on the hypervisor used) and added to a provisioning group in vWorkspace. The vWorkspace broker will create the specified number of RDSH VMs from the template to be used in the shared session deployment.

To provision shared sessions, perform the following tasks.

11.1 Setting up Shared Session (RDSH)

11.1.1 Creating RDSH VM Template

The tables here summarize the RDSH VM configuration.

Solution Platform	VMs per host	vCPU	Startup RAM (GB)	Dynamic Memory			NIC	OS vDisk	
				Min|Max	Buffer	Weight		Size (GB)	Location
Entry Platform	6	3	16	512MB|32GB	20%	Med	1	80	ds_rdsh
Mid Platform	6	4	16	512MB|32GB	20%	Med	1	80	ds_ rdsh
High Platform	6	5	16	512MB|32GB	20%	Med	1	80	ds_ rdsh

Hyper-V Shared Session VM Sizing Table

Solution Platform	VMs per host	vCPU	RAM (GB)	NIC	OS vDisk	
					Size (GB)	Location
Entry Platform	6	3	32	1	80	ds_rdsh
Mid Platform	6	4	32	1	80	ds_ rdsh
High Platform	6	5	32	1	80	ds_ rdsh

vSphere Shared Session VM Sizing Table

To create an RDSH VM Template for Hyper-V configuration:

1. Log in to any of the hosts in the cluster and start **Server Manager**.
2. In **Server Manager**, from the **Tools** menu, select **Hyper-V-Manager**.
3. In **Hyper-V Manager**, connect to the local server.
4. Right-click the name of the local server in the left pane and select **New → Virtual Machine**.

5. On the **Specify Name and Location** page of the **New Virtual Machine** wizard, type the name and location of the VM. The location is the Nutanix SMB share for your RDSH container (for example, \\nutanix-cluster\ds_rdsh).
6. On the **Specify Generation** page, specify Generation 2 and click **Next**.
7. On the **Assign Memory** page, type the amount of startup memory according to the Hyper-V Shared Session VM Sizing table and select the **Use Dynamic Memory for this virtual machine** check box. Click **Next**.
8. On the **Configure Networking** page, select the "ExternalSwitch" vSwitch. Click **Next**.
9. On the **Connect Virtual Hard Disk** page, select the option to **Create a virtual hard disk**. Type the name, location, and size of the virtual disk. The location will be the Nutanix SMB share for your RDSH container. Recommended sizes are in the Hyper-V Shared Session VM Sizing table. Click **Next**.
10. On the **Installation Options** page, select **Install an operating system later**. Click **Finish**.
11. After creating the VM, right-click the VM in the **Virtual Machines** pane and select **Settings**.
12. Click **Memory** and adjust the settings to match those in the **Hyper-V Shared Session VM Sizing** table.
13. In the VM settings, click **Network Adapter** in the hardware pane and enable virtual LAN identification. Enter the VLAN ID for your management VLAN, if applicable.
14. Windows Server 2012 R2 must be installed to the VM. To install Windows Server 2012 R2, attach an .iso file to the virtual DVD drive or by using existing OS deployment tools.
15. After installing the OS and applying your Windows license key, configure an IP address for the VM (**DHCP** is acceptable).
16. Change the computer name to your required host name and join the VM to your domain. Remember that this source VM is destroyed once imported in to SCVMM.

11.1.2 Installing RDSH Role and User Applications

These tasks will be performed after logging in to the RDSH VM.

Remote Desktop Session Host Role

1. Log in to the RDSH VM, open **Server Manager**, click **Manage** and select **Add Roles and Features**.
2. Click **Next** on the **Before you begin** page.
3. On the **Installation Type** page, select Role-base or feature-based installation and click **Next**.
4. Select your RDSH server from the pool and click **Next**.
5. Select **Remote Desktop Services** on the **Server Roles** page and click **Next**.
6. Click **Next** until the **Role Services** page opens and select **Remote Desktop Session Host**.
7. In the dialog box, make sure **Include management tools** is selected and click **Add Features**.
8. Select **Restart the destination server,** click **Yes** to restart, and then click **Install**.
9. After the VM restarts and the RDSH configuration has successfully completed, click **Close**.

Application Installation

The RD Session Hosts require the user software installed locally as this is the OS that it is being used by the users connected using the Remote Desktop Session. The requirement is customer specific but includes your standard office type applications.

vWorkspace Terminal Server Role

1. Access the vWorkspace setup files (go to file share, copy locally, insert DVD, download, etc.).
2. Right-click `start.exe` and run as administrator.
3. Click the **Install** button to begin.
4. Click **Yes** in the **.NET Framework** dialog box and click **Next** to continue.
5. Accept the license agreement and click **Next**.
6. Type your user name and organization information and click **Next**.
7. Select Advanced setup type and click **Next**.
8. Select "**Terminal Server/RD Session Host Role**" and click **Next**.
9. Click **OK** to acknowledge the terminal server information message.
10. Click **Yes** to enable RDP-TCP audio redirection.
11. Select "**Connect to an existing database**" and click **Next**.
12. Specify your database configuration information using the SQL server name created during the SQL installation. The database name, vWorkspace login, and password must match with what was previously used when configuring the vWorkspace Broker in section 5. Click **Next**.
13. Click **Finish** and select **Yes** to restart.

Apply the following vWorkspace hotfixes:

- 318403
- 331043

Instant Provisioning Service

NOTE: Instant Provisioning installer is available in the following location on the vWorkspace broker VM: "C:\Program Files(x86)\Quest Software\vWorkspace".

1. Right-click **InstantProvisioning.exe** and select **Run as administrator**.
2. Click **Yes** to install .NET Framework and click **Next**.
3. Click **OK** to acknowledge the message about installing the service to the master template.
4. Accept the EULA and click **Next**.
5. Enter customer information and click **Next**.
   Click **Install** and click **Finish** to complete the installation.
6. Shut down the RDSH VM to allow it to be imported to SCVMM.

11.2 Adding RDSH Template to SCVMM

NOTE: SCVMM is required only when the hypervisor is Hyper-V.

The RDSH template must first be added to SCVMM as a VM template and then imported to vWorkspace as a template while creating a Session Host provisioning group.

After creating a RDSH VM on one of the Hyper-V hosts, log in to the SCVMM server to add it as a template.

1. Shut down the RDSH VM that you want to use as your template before you begin.
2. Start the Virtual Machine Manager Console (the console is installed to the SCVMM VM during the VMM installation) and click **Library** in the lower left pane.
3. Click the arrow next to **Templates** in the upper left pane to expose menu options and right-click VM Templates. Select **Create VM Template**.
4. In the **Select Source** window, select **From an existing virtual machine that is deployed on a host** and click **Browse**. Select the RDSH VM that you want to use as a template and click **OK**.
5. Click **Next** and click **Yes** to proceed. The source VM is destroyed on the Hyper-V host but the settings and VHDX are imported to the SCVMM server and library.
6. Provide a name and optional description for the template and click **Next**.
7. Click **Next** on the **configure hardware** page and the **configure operating system** page.
8. Select the SCVMM server from the list of library servers and click **Next**.
9. Click the **Browse** button and select the library folder that was created earlier on the Nutanix cluster. Click **OK** and click **Next**.
10. Click **Create** to complete the task. If the job fails immediately, verify that the desktop VM is not running. Shut down the desktop VM if it is running. In the **Jobs** window, right-click the **Create template** job and select **Restart**. After the job completes, close the **Jobs** window
11. The template should now appear in the **Templates** pane in VMM.
12. Right-click the template and select **Properties**.
13. Click **Hardware Configuration** in the left pane and use the scroll bar in the middle of the page until you see the **Advanced** section.
14. Click **Availability** under the **Advanced** section and select the **Make this virtual machine highly available** check box. The default **Medium** priority is sufficient.

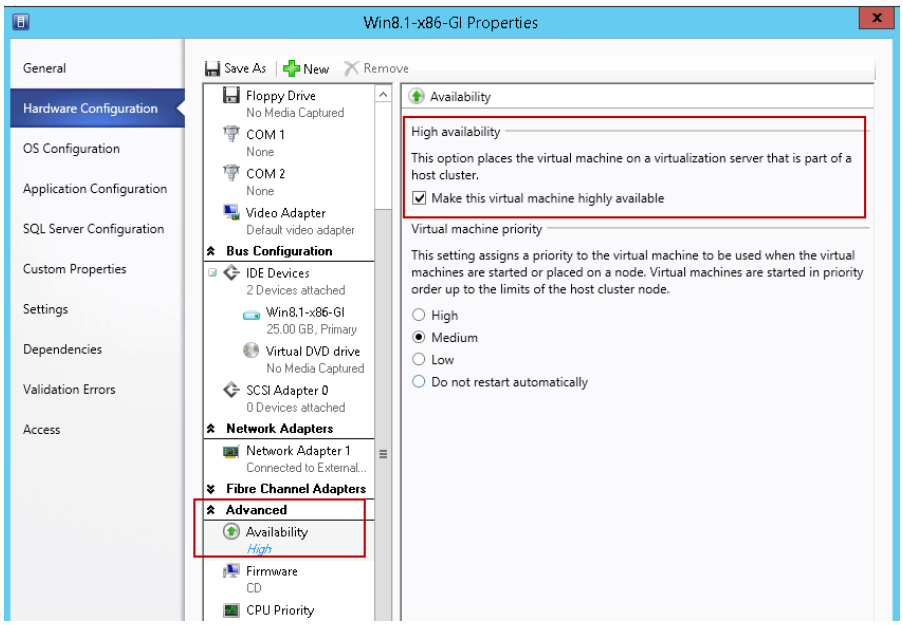


Figure 51 VM Template Properties

15. Click **OK** to exit and save.

11.3 Adding RDSH Template to vCenter

NOTE: vCenter is only required when the hypervisor is vSphere.

The RDSH template must first be added to vCenter as a VM template, and then imported to vWorkspace as a template while creating a Session Host provisioning group.

Refer to the *vSphere Virtual Machine Administration Guide (ESXi 5.5)* for steps on cloning a RDSH VM to a template.

11.4 Creating RDSH Computer Group

A RDSH computer group in vWorkspace is used to provision and maintain RDSH servers.

To setup a RDSH computer group when using SCVMM and define its properties:

1. Start vWorkspace Management Console (by default, installed on the vWorkspace Broker VM).
2. In the **vWorkspace Management Console**, navigate to **Provisioning** (**Location → Session Hosts → Provisioning**). Right-click **Provisioning** and then click **New Computer Group**. The **New Computer Group** wizard is displayed.
3. Click **Next** on the **Welcome to the Computer Group Wizard** page.
4. Type name of the computer group in the **Group Name** box on the **Group Name** page, and then click **Next**.
5. Select Microsoft SCVMM on the **System Type** page, and then click **Next**.

6. On the **Administrative Account** page, type information about the domain account that will be used as an administrative account. Select the **password** check box to validate the credentials.
7. Click **Next**.
8. Click **Next** on the **Task Automation** page.
9. Click **Next** on the **Permissions** page.
10. On the **Finish** page, select **Create new computers from a master template** check box, and then click **Finish**. The **Add Computers** wizard is displayed.
11. Click **Next** on the **Welcome** page for the **Add Computers** wizard.
12. On the **Number of Computers to Create** page, type the number of RDSH computers to be created from the template, and then click **Next**.
13. Select **Standard** on the **Clone Method** page and click **Next**.
14. On the **Host Groups & Clusters** page, select your VMM server from the SCVMM server drop-down menu. The **Failover Cluster** should appear in the **Host Groups & Clusters** box. Select the cluster and click **Next**.
15. Click **OK** to acknowledge the information box.
16. On the **Template** page, click the **Import** button to import the RDSH VM template from SCVMM. Click **OK** to acknowledge the information box. Click the name of the template and click **Next**.
17. On the **Naming Conventions** page, specify the base name and values and click **Next**.
18. On the **Customize Operating System** page, click the **New** button. The **New Operating System Customizations** wizard appears.
19. Click **Next** on the **Welcome** page for the **New Operating System Customizations** wizard.
20. On the **Name** page, type a name for the customization object, and then click **Next**.
21. Complete the on-screen instructions on the customization pages and select the appropriate settings for your environment.
22. After clicking **Finish** on the **New Operating System Customization** wizard, you will be returned to the **Add Computers** wizard.

NOTE: After creating a customization object, it can be reused for additional groups.

23. The customization object is displayed in the window on the **Customize Operating System** page. Click the name to select customization object and click **Next**.
24. On the **Configure Hardware** page, the video adapter, memory, and network adapter settings can be adjusted. By default, the settings associated with the SCVMM VM template are used. Click the **Network Adapter** tab to specify the VLAN ID for your RDSH VMs, if necessary. Click **Next**.
25. In vWorkspace 8.0 MR1, an **Object variable or With block variable** error message is displayed indicating a known bug. Click **No** to ignore.
26. On the **Options** page, select **Now** and click **Next** to create the RDSH server VMs.
27. On the **Finish** page, a list of computer names that will be created is displayed. Click **Finish** to provision the RDSH servers.

To setup a RDSH computer group when using vCenter and define its properties:

Refer to the *vWorkspace Administration Guide* for the equivalent steps for provisioning RDSH with VMware vCenter.

12 Using the VDI Environment

To connect to the provisioned desktops or shared sessions, you must first create a **Managed Application**, publish it to the corresponding desktop computer group or RDSH hosts, and assign it to the entitled users or user groups. You must then allow access by using web browsers or installed client or both.

12.1 Creating Managed Application and Assigning Users and Groups

vWorkspace allows for the use of virtualized applications in addition to virtualized desktops and share sessions. The object that allows access to these applications and desktops is known as a **Managed Application**. This section describes how to create a Managed Application for accessing desktops (full clone virtual desktops or shared sessions) and how to grant access to the assigned users or groups.

You must have already completed the tasks to create a Desktop Computer Group or RDSH Computer Group before proceeding.

1. Start the vWorkspace Management Console (by default installed to the vWorkspace Broker VM).
2. Right-click **Managed Applications** under **vWorkspace Farm** and select **New Managed Application**.
3. Click **Next** on the **Welcome** page.
4. On the **Application Name** page, type a name for the application you want to publish. This name will be displayed in the vWorkspace Management Console, and in the client and web access page. Click **Next**.
5. Select **Desktop** on the **Application Type** page and click **Next**.
6. On the **Publishing** page, select **Session Host(s)** if using RDSH and place a checkmark next to **Session Hosts** to use all RDSH VMs. If using desktops, select **Managed Computer Group**, click the plus (+) icon next to **Desktops**, and select the name of your desktop computer group. Click **Next**.
7. On the **Display Name** page, type a display name for the application and click **Next**. This is optional.
8. Select a display icon on the **Icon** page and click **Next**.
9. Select the appropriate option (Desktop, Start Menu, Start Menu \Programs) for clients using AppPortal in desktop integrated mode on the **Desktop Integration** page, and then click **Next**. It is not necessary to select an option if you are not using desktop integrated mode.
10. Select the appropriate option on the EOP Graphics Acceleration page and click **Next**. Refer to the *vWorkspace Administration Guide* to determine if EOP Graphics Acceleration is appropriate for your environment.
11. Click **Enabled** on the **Enable/Disable** page and click **Next**.
12. On the **Load Balancing** page, select **Use the default load balancing rule** (only applies to RDSH) and click **Next**.
13. Click **Next** on **Application Restrictions** page (only applies to RDSH).
14. On the **Virtual IP** page, do not enable any features (only applies to RDSH). Click **Next**.
15. On the **Target Assignments** page, click the plus (+) icon to open the **Select Targets** window.
16. In the **Select Targets** window, click the plus (+) icon to add targets from the domain users and groups. Add the required domain user or group and click **OK**.

17. After clicking **OK** on the **Select Targets** window, the **Select Folder(s)** window is displayed. Select the desired folder location and click **OK** to proceed
18. Repeat the tasks 16–17 to add more users or groups. When finished, click **OK**.
19. On the **Target Assignments** page, click **Next**.
20. On the **Permissions** page, adjust permissions as necessary. Permissions here are for the group that has access to modify the Managed Application. Click **Finish**.

12.2 Connecting to vWorkspace

12.2.1 Configuring Web Access and Secure Gateway

The Web Access and Secure Gateway components allow users to connect to desktops and shared sessions using a web browser.

The configuration for the Web Access component is performed from the vWorkspace Management Console. Log in to a computer that has the console installed (for example, the vWorkspace broker VM) and perform the following tasks:

1. Start the vWorkspace Management Console.
2. In the upper-left pane of the console, under **vWorkspace Farm**, click **Web Access**.
3. In the right pane, click **Actions** and select **New website**.
4. Click **Next** on the **Welcome** page.
5. Type the name for the Web access site (the friendly name used during the installation) and the URL which is in the form of "http://WebAccessVMName/WebAccessVirtualDirectory". If unsure, click the **Import** button, type `http://WebAccessVMName` in the address bar, and then click **OK**.

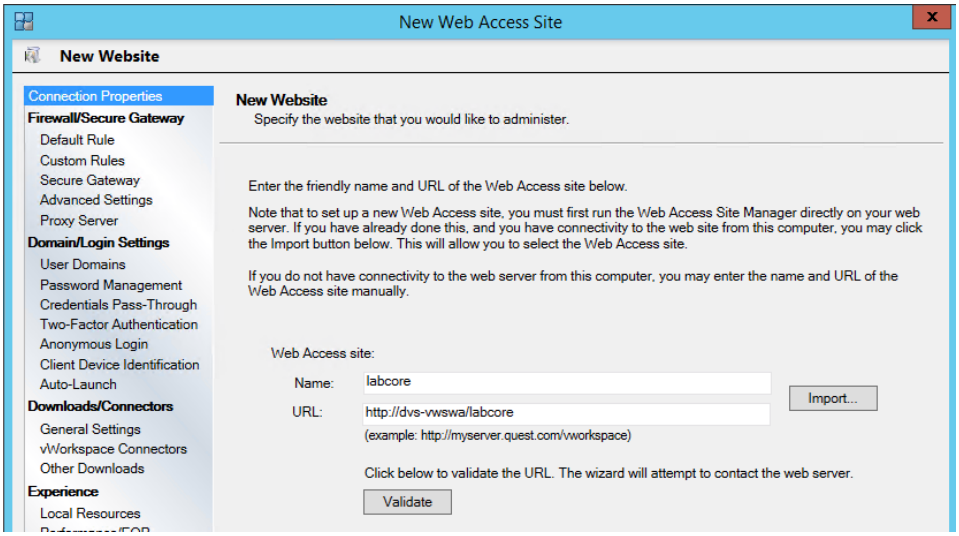


Figure 52 New website

6. Click the **Validate** button to verify and click **Next**.

The remaining settings will vary depending on your network environment and needs. For help determining what is appropriate, refer to the **Using Web Access** and **Secure Gateway** sections of the vWorkspace Administration Guide.

12.2.2 Installing vWorkspace Client (Connector)

The vWorkspace Connector allows users to establish a connection to the vWorkspace farm and receive a list of authorized desktops and applications. Several versions exist for different platforms, but this section describes the installation for vWorkspace Connector for Windows.

Copy the `vasclient32` installer file from the vWorkspace installation folder, from the path `vWorkspace_x64\connectors\Windows\vasclient32`.

1. Right-click and click **Run as administrator**.
2. Click **Next**.
3. Accept EULA and proceed.
4. Enter customer information and click **Next**.
5. Click **Next** again to proceed.
6. Click **Next**.
7. Click **Next**.
8. Click **OK** and install flash, if required.
9. Click **Finish** and restart your computer, if prompted.

Refer to the **vWorkspace Connectors** section of the *vWorkspace Administration Guide* for information on configuration settings for the connector client.

12.3 Using Foglight for Virtual Desktops

For information about Foglight for Virtual Desktops, refer to the *Foglight for Virtual Desktops Administrator's Guide* and the *Foglight for Virtual Desktops User's Guide*.

13 Adding Hosts

This section describes the tasks to add hosts to the cluster.

13.1 Adding Nutanix Nodes

Refer to the *Nutanix Web Console Guide* for the procedure to expand an existing cluster.

13.2 Adding MS Failover Cluster Nodes

To add nodes to an existing failover cluster:

NOTE: Microsoft Failover Cluster is required only when the hypervisor is Hyper-V.

1. Start **Failover Cluster Manager** on an existing node.
2. Right-click **Nodes → Add Nodes**.
3. In the **Add Node wizard** dialog box, to select the new servers to be used as nodes, type or browse through to the server name.

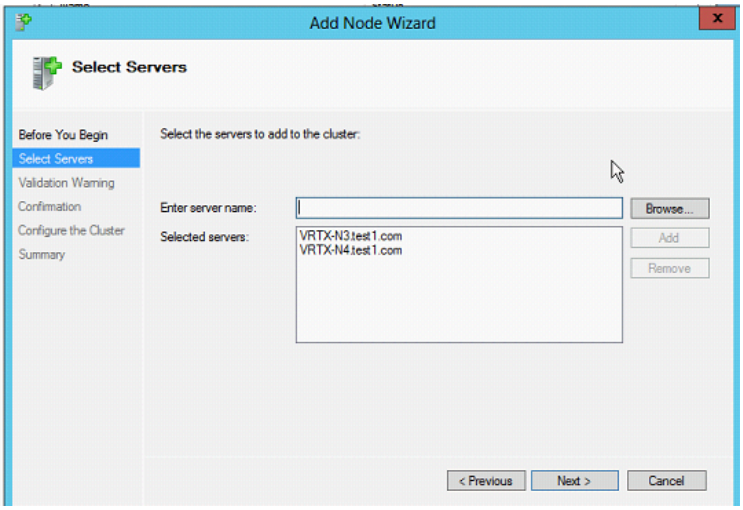


Figure 53 Adding MS Failover Cluster Nodes using Failover Cluster Manager

4. Select **No** on the **Validation Warning** page and click **Next**.

5. Follow the on-screen instructions and add the other nodes.
6. Refer to section 6.3 in this guide to ensure the Placement Paths have been configured properly in SCVMM for the newly added nodes.