Active System Manager Solution Guide
Active System 50 for Hyper-V

Version 7.1

August 2013| Rev 1.0

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Introduction to the Active System 50 solution

Dell™ Active Infrastructure is a family of converged infrastructure solutions that combine servers, storage, networking, and infrastructure management into an integrated and optimized system that provides general purpose virtualized resource pools. Active Infrastructure leverages Dell innovations including unified management with Active System Manager, LAN and SAN fabrics, and rack server architecture. Active Infrastructure helps IT rapidly respond to dynamic business demands, maximize datacenter efficiency, and strengthen IT service quality.

The Active System 50 includes Dell PowerEdge™ R620 servers, Dell EqualLogic™ PS6100 Series iSCSI storage and Dell PowerConnect™ 7024 switches.

An optional Dell PowerEdge R420 server is available to host Dell and customer management tools. Additionally, this management server can be configured with the optional Dell Active System Manager to build private cloud solutions that address key needs in for small to medium business and data centers.

Active System 50 is offered in configurations with either VMware® vSphere™ or Microsoft® Windows Server® 2012 with Hyper-V® role enabled Hypervisors. The VMware vSphere solution is the Active System 50v and the Microsoft Hyper-V solution is the Active System 50m. This document defines the solution guide for Active System 50v.

Audience

IT administrators and IT managers, who have purchased, or are planning to purchase an Active System configuration, can use this document to understand the design elements, hardware and software components, and the overall architecture of the solution.

Support

Contact Dell technical Support by visiting the Dell web site at www.dell.com/support/softwarecontacts.

Technical Documentation

The Dell Active System Manager documentation enables you to better understand your current Active Infrastructure, its deployment, and management software.

For this release, we recommend that you familiarize yourself with the following documentation:

- *Reference Architecture for Active System 50 with Hyper-V*
- *Specification Guide for Active System 50 with Hyper-V*
- *Design and Implementation Guide for Active System 50 with Hyper-V*
- *Active System Manager User Guide Release 7.1*
- *Active System Manager Web Interface User Guide Release 7.1*

To access the latest Active System Manager documentation for Version 7.1:

1. Navigate to www.dell.com/support/manuals, click Choose from a list of all Dell products and click Continue.
2. Click Software and Security → Enterprise System Management → Active System Manager → Dell Active **System Manager Version 7.1**.

Overview

This section provides a high-level product overview of the Active System supported components and configurations.

Table 1 lists the Active System Manager solution for the Active System 50-supported components.

Table 1. Active System 50-Supported Components

Component	Details
Hyper-V Hypervisor	• Up to 2x Dell PowerEdge R620 with Microsoft Windows Server 2012 Datacenter edition having Hyper-V role enabled
ToR Switches	• 2xPowerConnect 7024 for LAN connectivity • 2xPowerConnect 7024 for SAN connectivity
Storage	• Up to 2x Dell EqualLogic PS6100 series arrays (default is one)
Management Infrastructure	• 1x Dell PowerEdge R420 server with embedded VMware vSphere 5.1 hosting management VMs. OR • 1x Dell PowerEdge R420 server with Microsoft Windows Server 2012 with Hyper-V role enabled and hosting management VMs.
Management components hosted in the management infrastructure	• Microsoft Windows Server 2012 with Hyper-V Role enabled • Microsoft System Center 2012 SP1 Virtual Machine Manager SCVMM • Dell EqualLogic SAN HeadQuarters (HQ) • Dell OpenManage Essentials (optional)

Active System 50 Supported Configurations

Table 2 lists the Active System Manager solution for the Active System 50-supported configurations.

Table 2. Active System 50-Supported Configurations

Configuration	Support
Dell PowerEdge Rack servers (R620)	Support firmware images as per the Active System Manager solution for Active System 50
Dell PowerConnect Top-of-Rack (ToR) 7024 switches	The base configuration should be updated for virtual LAN (VLAN) as per data center deployment need.
Dell EqualLogic PS6100 Storage Array	Supported firmware versions will be packaged in the virtual appliance.
Microsoft Windows Server 2012 for virtual machine (VM) workloads	Microsoft Windows Server 2012 image should be copied to the virtual appliance manually
Hyper-V installation support on rack servers Dell PowerEdge R620	

Deployment Options

The Active System Manager solution for Active System 50 is packaged as a virtual appliance and is made available for VMware ESXi 5.1 and Microsoft Hyper-V Server 2012; see Table 3:

- Open Virtualization Format (OVF) for VMware—disk format is VMware virtual machine disk (VMDK).
- Hyper-V virtualization environment—disk format is virtual hard disk (VHD) for Hyper-V.

Table 3. Deployment Options

Virtual Appliance Filenames	Platform
Dell-ActiveSystemManager-7.1.0.<buildNumber>_VMware.zip	VMware ESXi 5.1
Dell-ActiveSystemManager-7.1.0.<*buildNumber*>_Microsoft.zip	Windows Server 2012 with Hyper-V

Deployment Prerequisites

Before using the Active System Manager solution for end-to-end provisioning of Active System 50 components, make sure that the prerequisites listed in Table 4 are in place.

Table 4. Deployment Prerequisites

Specification	Prerequisite
Connection requirements	Active System 50 units connected per the Active System 50 Reference Architecture and Deployment Guidelines
Management server requirements	Management server is configured per the Active System 50 Reference Architecture and Deployment Guidelines
Firmware and BIOS requirements	All equipment must be configured with firmware versions as per Appendix E—Firmware and Software Base Lineup
For the Active System 50 racks (R620) :	• Server iDRAC is configured and has the OOB IP address and login credentials.
Dell PowerConnect 7024 switches	• The management IP address is configured for the switches. • The AS 50 base configuration is applied on 4 switches. • VLANs are created on the switches per the Active System 50 deployment specification. • The virtual machine (VM) traffic VLANs will be created dynamically by Active System Manager.
EqualLogic Storage Array	• The group IP and management IP are configured for Storage Array. • All storage array members are added to the group.
Microsoft SCVMM 2012 SP1	• SCVMM 2012 SP1 is configured and accessible via the management and hypervisor management network. • Appropriate licenses are deployed on SCVMM.
Active Directory	The domain has a valid AD setup for registering the Hyper-V servers, Hyper-V cluster and VMs
DNS	DNS is configured and running.

Active System Manager Deployment

The following topics describe how to deploy the Active System Manager:

- Deploying VHD
- Changing Key Access Credentials
- Assigning IP Address to the Active System Manager Appliance
- Adding Additional Licenses
- Configuring Active System Manager Services

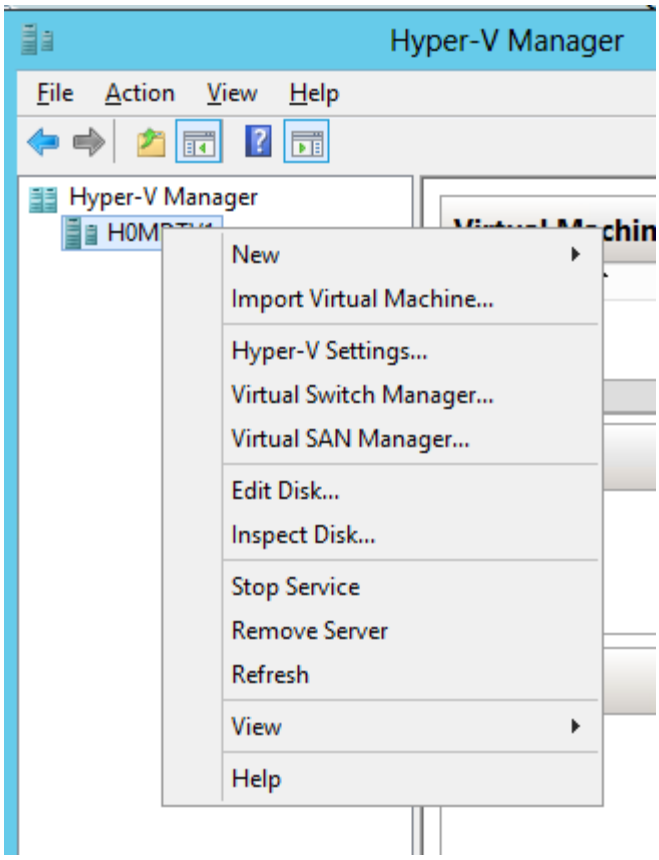
Deploying VHD

The Active System Manager Virtual Hard Disk (VHD) can be imported on to a Hyper-V host using the **Hyper-V Manager ➔ Import Virtual Machine** option. When booted, the Active System Manager VM gets its IP address from an existing DHCP server. If a DHCP server is not configured, manually assign the IP address to the appliance.

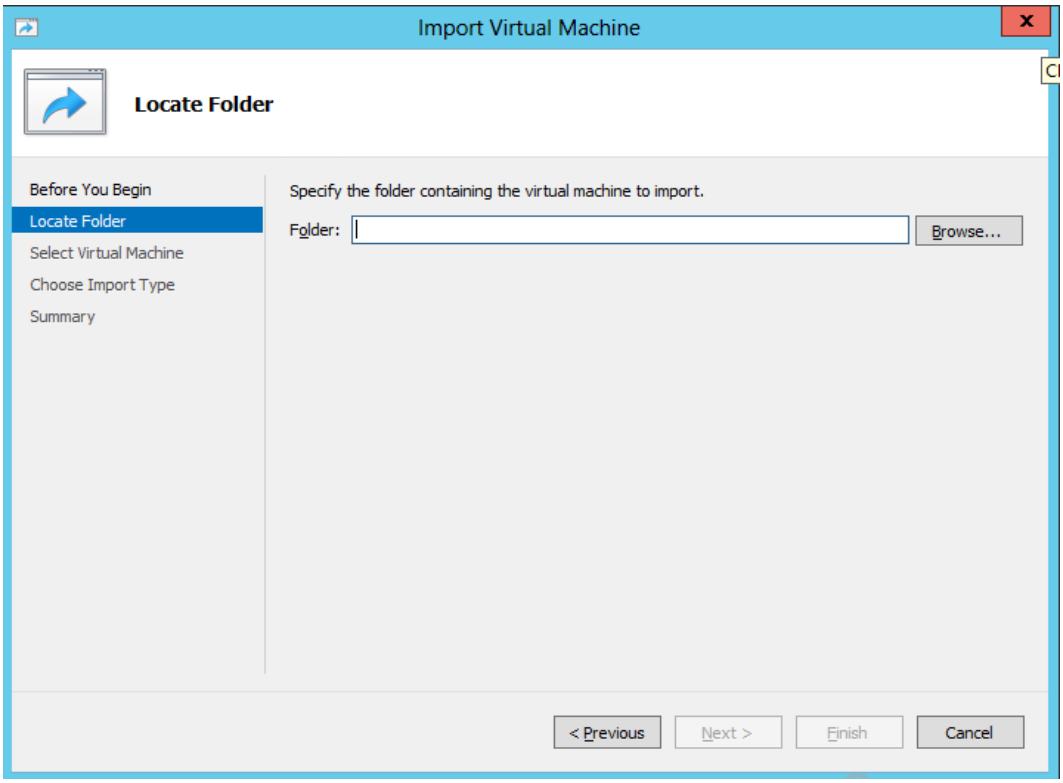
Importing the VHD Using Hyper-V Manager

1. From Hyper-V Manager, right-click on a host and select **Import Virtual Machine**.

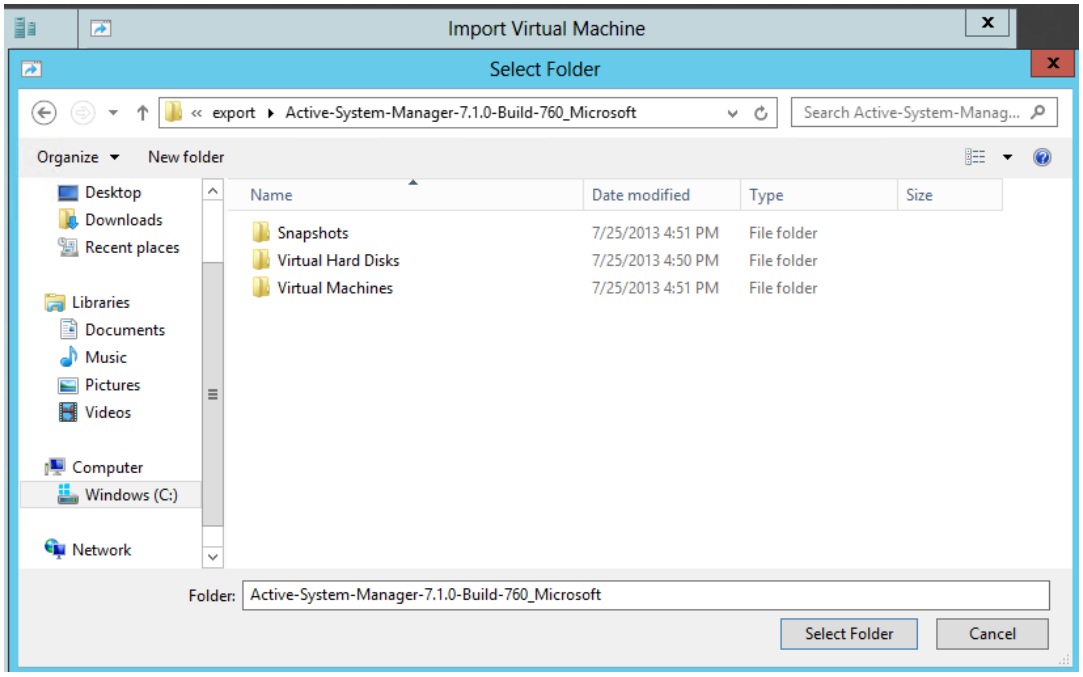
Figure 1. Hyper-V Manager → Import Virtual Machine



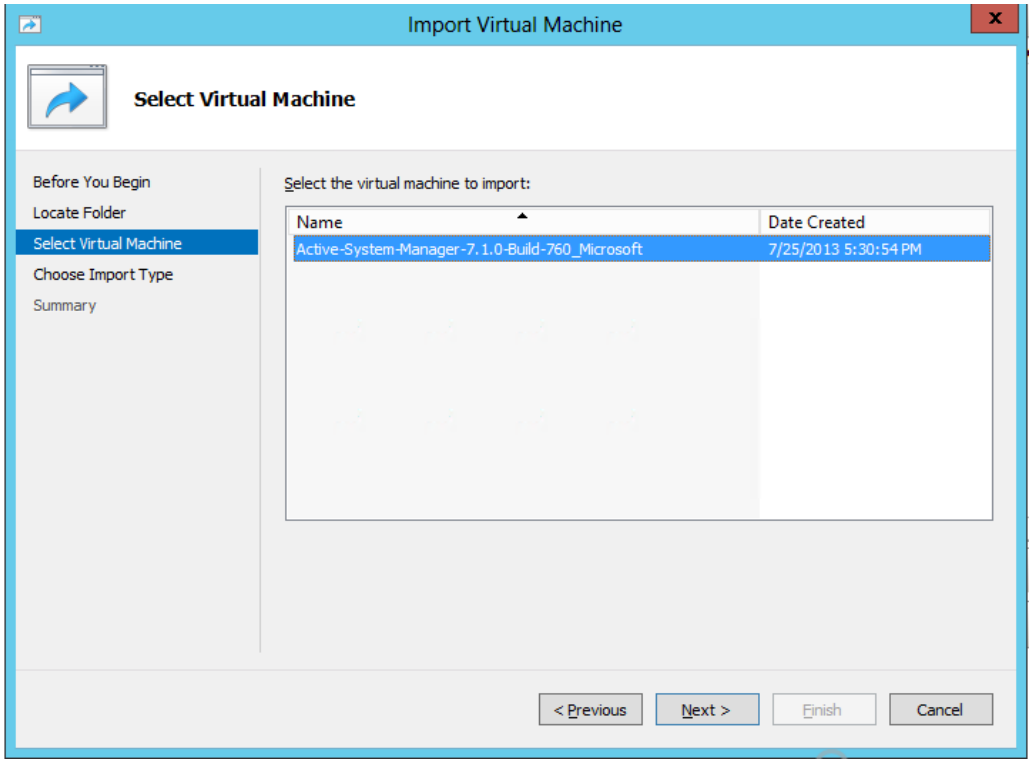
2. On the **Locate Folder** page, **Browse** to the location where the VDH is available in the extracted format



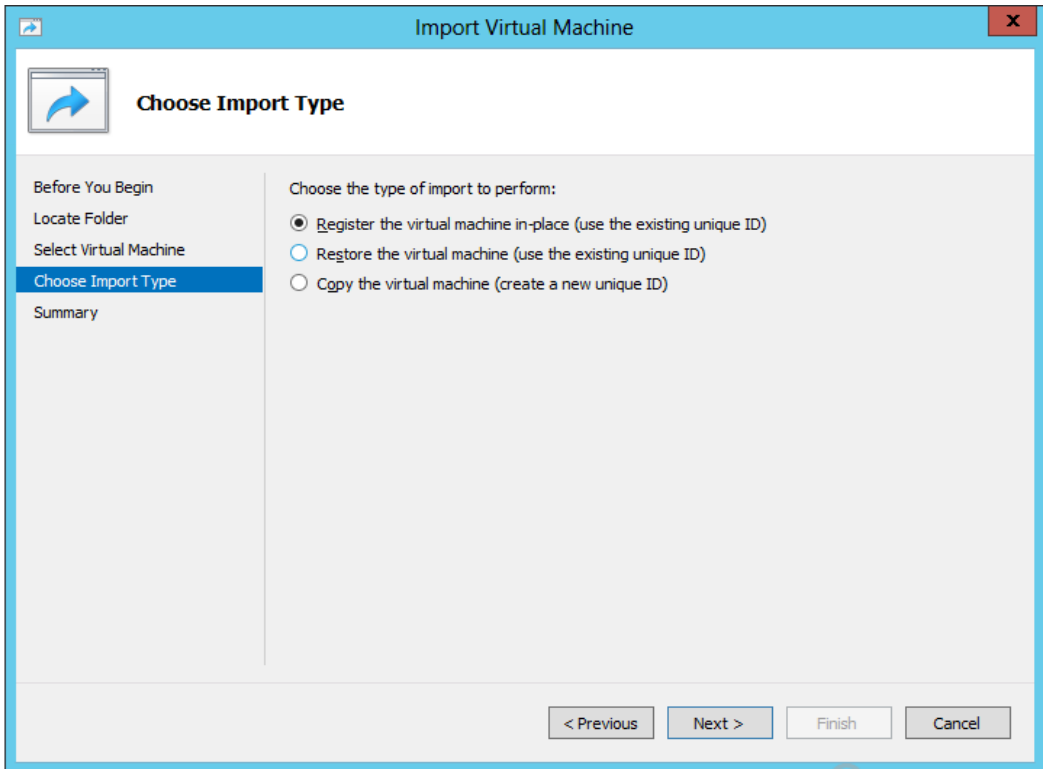
3. Click **Select Folder** and click **Next**.



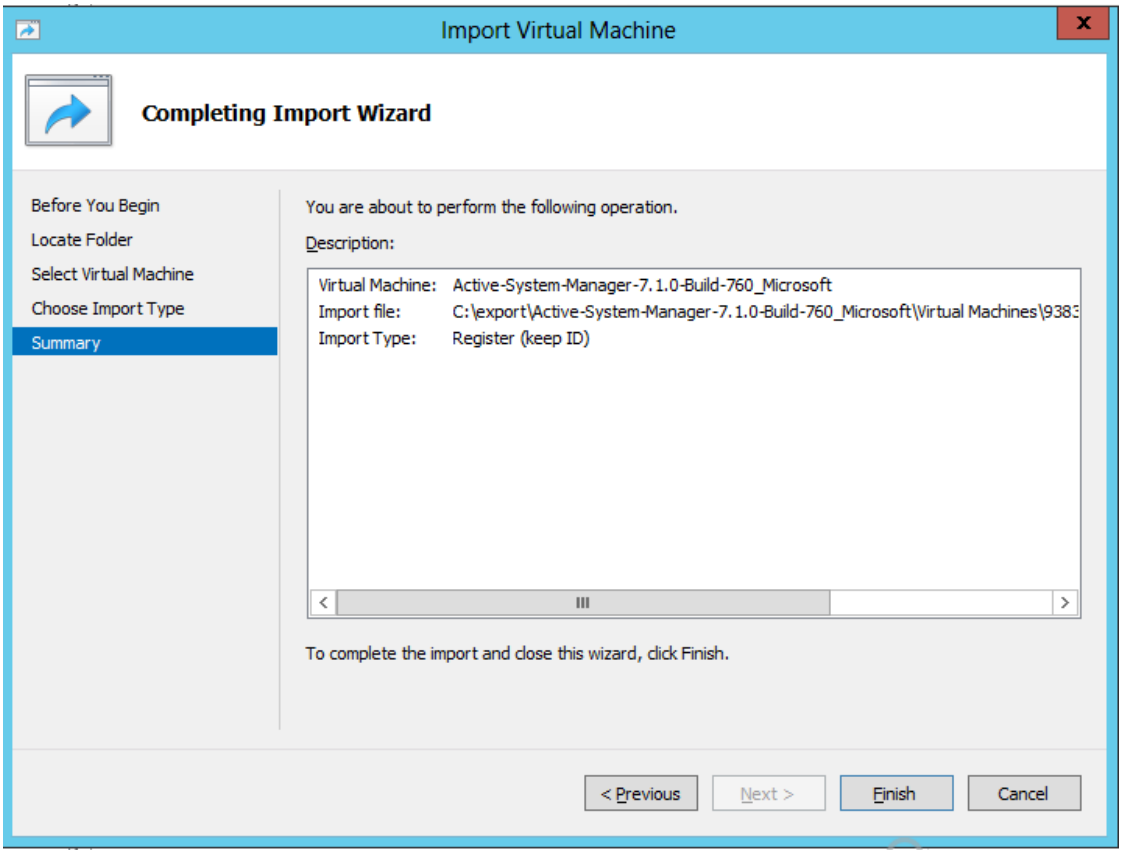
4. On the **Select Virtual Machine** page, select the VM and click **Next**.



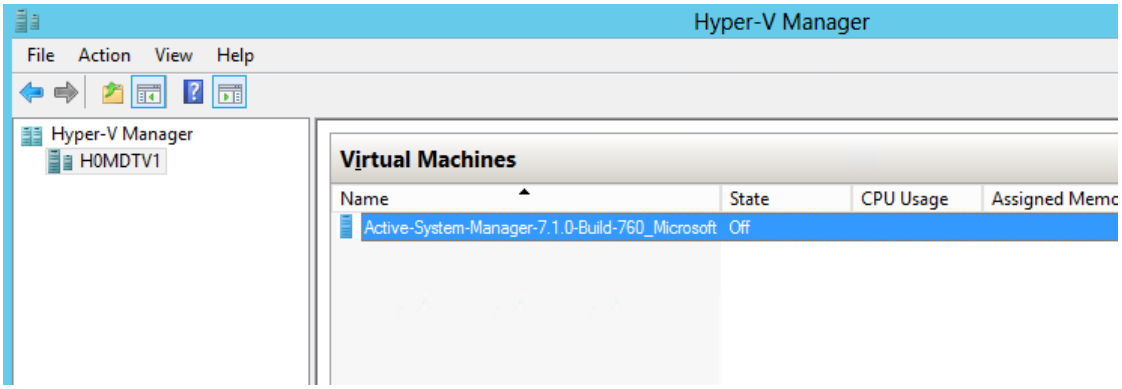
5. On the **Choose Import Type** page, select **Register the virtual machine in place (use the existing unique ID)** and click **Next**.



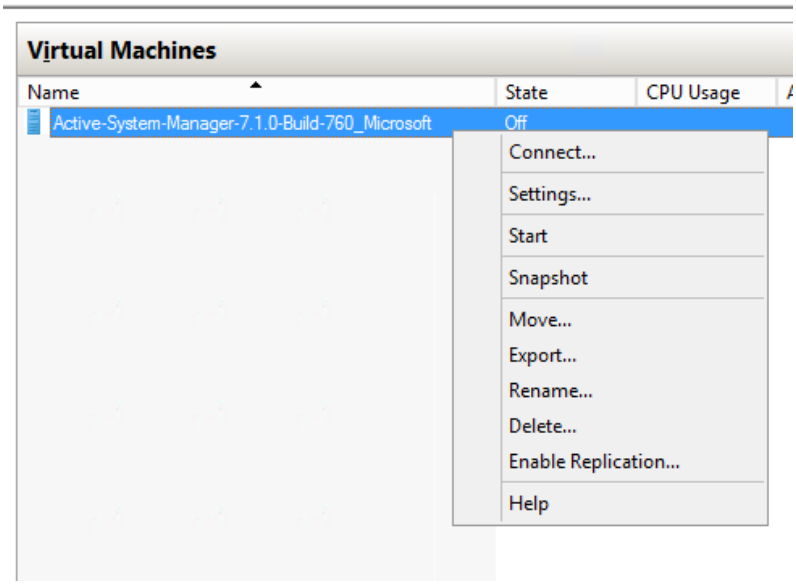
6. On the **Summary** page, click **Finish**.



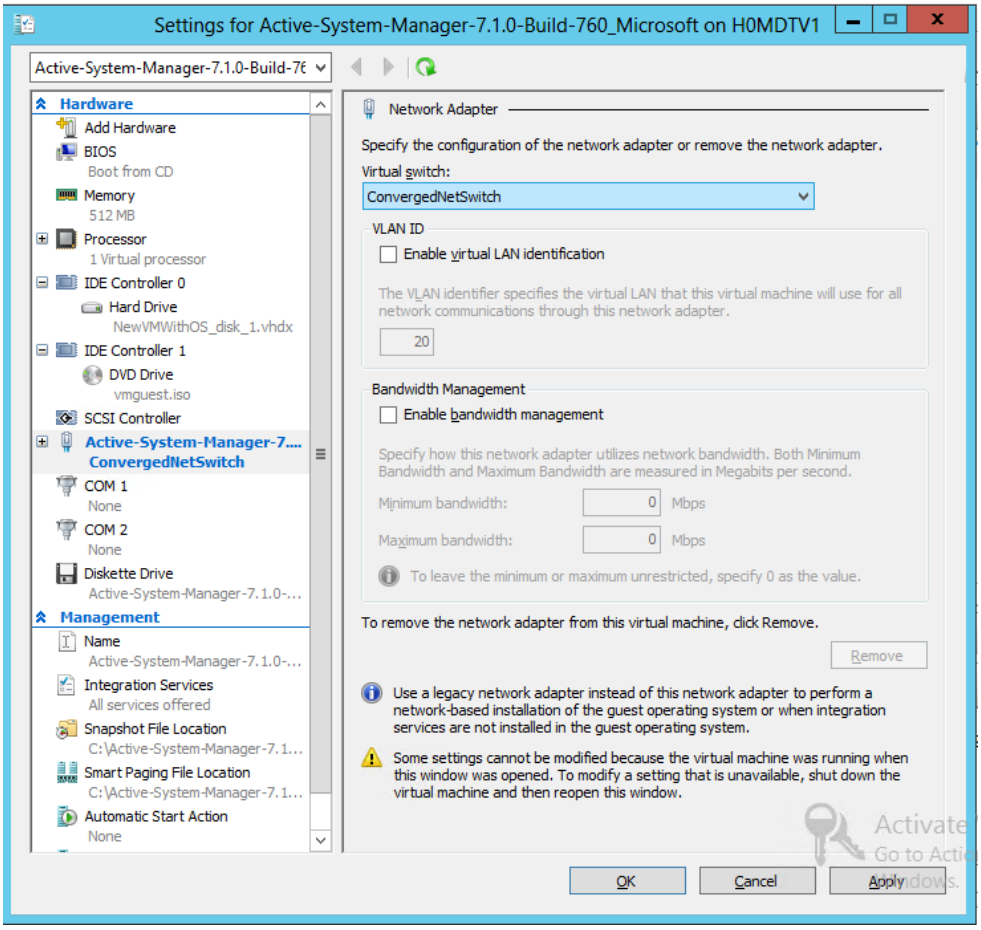
7. The newly imported Virtual Machine appears on the Hyper-V Manager.



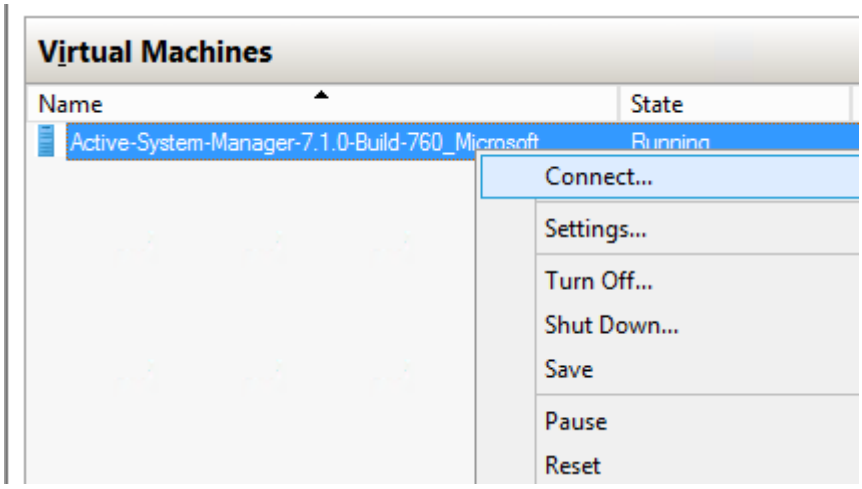
8. Right-click the Virtual Machine and select **Start** to power-on the Virtual Machine.



9. Select the network name. The VM needs to be mapped to the Hypervisor Management Network. All the networks (e.g. OOB, Hypervisor Management, vMotion and VM workloads) are expected to be accessible from the appliance.



10. Right-click the Virtual Machine and select **Connect** to launch the console.



11. Use the following necessary key access credentials.

Table 5. Key Access Credentials

VM Access Credentials	Username/Password
Active System Manager server installation login	delladmin/delladmin
Active System Manager server root	root/Dell@123
Active System Manager client applications (Web UI/RCP)	admin/admin

Changing Key Access Credentials

Passwords should be changed at the time of deployment. You should change the passwords before creating or changing any of the software repositories.

1. Stop Active System Manager services:
   a. Log in as user **delladmin** (see Table 5).
   b. Execute following commands:

```
cd $HOME/asm-galeforce/gf/sbin

./stopasm.sh
```

   Make sure that all of the services are stopped before continuing.

2. Change the passwords using the standard Linux command `passwd` to change the passwords for any of the three stock accounts.
   - root
   - delladmin
   - oracle

You will need root access to modify the passwords. Run the following commands:

```
su
```

<Enter root password>

```
passwd delladmin
```

<Enter new password>

<Re-enter new password>

3. Repeat these steps until all three user accounts have been modified.

   IMPORTANT: Do not rename the user accounts, only change their passwords.

4. Reboot your Active System Manager VM.

   After you have changed your passwords you must reboot your Active System Manager VM. Before you reboot, make any other changes such as IP address or time (NTP) configurations and then reboot once to encompass all of your changes.

5. Update any already existing software repositories that are running on the Active System Manager appliance.

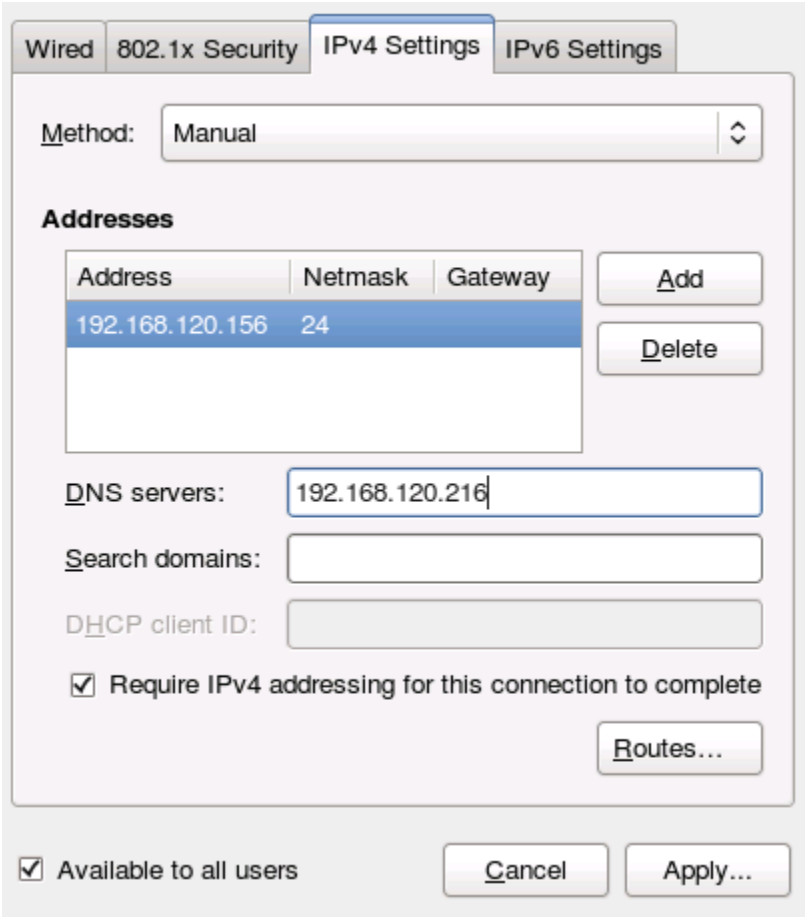
   Most of your software repositories depend on credentials to be able to access firmware, ISO files, PXE boot files, etc. If the passwords are changed as part of an initial deployment, there will be fewer repositories to update with the new credentials. If you change passwords on an Active System Manage server that has been in use for a while, you may have many more repositories to update.

Assigning IP Address to the Active System Manager Appliance

This procedure is necessary only if the Active System Manager does not automatically obtain IP address from DHCP.

1. On the vSphere or Hyper-V Manager client, select the deployed **Active System Manager** appliance and open its console.
2. Log in as the **root** user. See the Table 5.
3. Navigate to **System➔Preferences➔Network Connections** to launch the Network Connections wizard.
4. Select the network interface card (NIC) appliance on which IP address should be configured manually and click **Edit**.
5. On the **Editing** dialog box, click the **IPv4 Settings** tab. Select **Manual** for the **Method**.
6. Click **Add** and enter the IP address and other networking information (for example, DNS). Click **Apply**

Figure 2. Assigning IP Addresses



7. Open the terminal console by clicking **Applications ➔ System Tools ➔ Terminal**.
8. Execute the following command:

```
/etc/init.d/network restart
```

9. Log in to the appliance with the newly configured IP address. This will ensure that the IP address is configured correctly on the appliance.

Adding Additional Licenses

To add a license:

1. Perform one of the following methods:
   - To add a license using web client, click **Settings → License** on the menu bar.
   - To add a license using thick client, click **Tools → Settings** on the menu bar, and click License tab.

   The License screen displays the current licensing information and associated live (current) counters.
2. Optional. In the License screen, click the Refresh icon to refresh the resource count and view the currently allocated resources.
3. Click Get New License. The next license screen allows you to request and deploy or install new product license.
4. In the **Request Product License** section, click **NOW** and enter the following contact details:
   - First name
   - Last name (optional)
   - Email address
   - Company name
   - Group or organization name
5. Click **Send Email** to send an email (support@dell.com) to the Dell Support team, requesting for a product license.

   The Dell Support team responds to your software license request with a license file.
6. In the **Deploy Product License** section, copy and paste the content of the license file provided in the **License File** text box.
7. Click **Submit**.

Configuring Active System Manager Services

The following sections describe how to start, stop, and verify Active System Manager services.

Starting Services

The appliance is configured to start Active System Manager services during start-up. To start the services manually:

1. Log in as user **delladmin** (see Table 5).
2. Execute following command:

```
cd $HOME/asm-galeforce/gf/sbin
```

```
./startasm.sh
```

NOTE: The Active System Manager services must not be started by user **root**.

Stopping Services

To stop the services manually:

1. Log in as user **delladmin** (see Table 5).
2. Execute following command:

```
cd $HOME/asm-galeforce/gf/sbin
```

```
./stopasm.sh
```

Verifying Service Status

To verify that all Active System Manager services are running:

1. Log in as user **delladmin** (see Table 5).
2. Run the following script to display the current status of all services, including the Oracle database status:

```
cd asm-galeforce/gf/sbin
```

```
./asmstatus.sh
```

Figure 3. Sample Active System Manager Services Status Output

```
Active System Manager Service
---------------------------------
Host: asm-galeforce Port: 40500 Secure Port: 50500
Enterprise: Dell
Lab: DEMO
Status: Running
```

```
Domain Services

---------------

1. Domain     : System (Id: 1)

   Description:

   ------------------------------------------------------

   Session server

      Host: asm-galeforce  Port: 40500  Secure Port: 50500

      Status: Running
```

Installing the Active System Manager Client

You can install the Active System Manager Client on the following platforms:

- Installing Active System Manager Client Software on Windows
- Installing Active System Manager Client Software on Mac
- Installing Active System Manager Client Software on Linux

Installing Active System Manager Client Software on Windows

1. Download the Active System Manager installer, Win 64 version should be downloaded for Win 64 OS and Win 32 should be downloaded for Win 32 based OS.
2. On your desktop, click **Start ➔ Run ➔ Browse**, navigate to the **setup.exe** file, and click **OK**. Alternatively, from your Windows Explorer window, navigate to the **setup.exe** file and double-click.

   A Security Warning window prompts you to run the file.
3. Click **Run** and complete the installation wizard.

   NOTE: If an existing version of the client is on the client machine, invoking the installer prompts you to uninstall the existing version already on the system. Once selected, the installer uninstalls the existing version and then exits. Restart the installer to install the new version.
4. Click **Finish** to complete the installation process.

Installing Active System Manager Client Software on Mac

1. Download the **ActiveSystemManager-macosx.x86_64_7.1.0_xyzt.zip** file.
5. Unzip the file into a specific folder destination on your hard drive.
6. Create an Active System Manager folder and move the file contents to this location.
7. Execute the **Active System Manager.app** file.

Installing Active System Manager Client Software on Linux

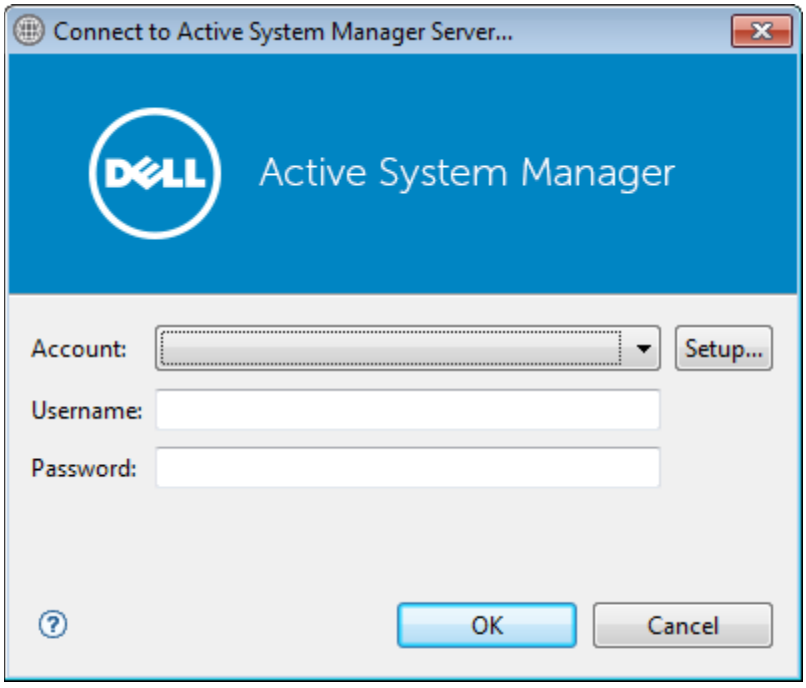
1. Download the **ActiveSystemManager-linux.gtk.x86_7.1.0_xyzt.zip** file.

8. Unzip the file into a specific folder destination on your hard drive.
9. Create an Active System Manager folder and move the file contents to this location.
10. In the console, execute the **Active System Manager** file.

Accessing Active System Manager Using the Windows Client Software

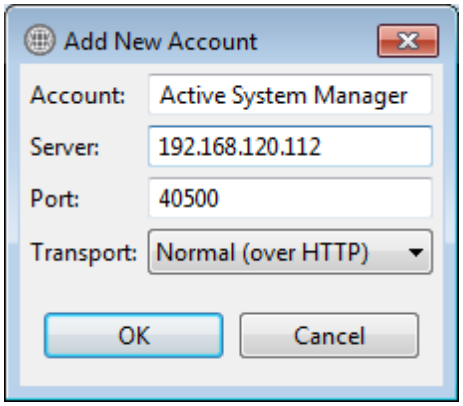
1. Launch the client software application.
2. On the **Connect to Active System Manager Server** dialog box, click **Setup**.

Figure 4. Connecting to the Active System Manager Server



3. On the **Setting up Accounts** dialog box, click **Add**.
4. Enter a unique and descriptive **Account** name for the account and **Server** IP address of the appliance. The name of the account can be any descriptive as shown in the following figure. **NOTE:** If secure connection is required, then port number must be 50500 and transport option must be HTTPS.

Figure 5. Adding New Account



5. Click **OK**.
6. Select the account created earlier.
7. Enter the username and the password for the appliance. The default username and password is **admin**/**admin**.
8. Click **OK** to launch the Active System Manager application.

Active System Manager Setup

This section describes the steps to manage and deploy the rack servers in the Active System 50. The sequence of steps includes:

- Managing Users and Groups
- Discovering Active System 50 Components
    - **WindowsDomainAdminUser—**Domain user whose credentials must be created on the Hyper-V server.
    - **WindowsDomainFullyQualifiedName—**Fully qualified domain name of the domain to which the servers must be joined.
    - **WindowsDomainName—**Domain name to which the servers have to be joined
    - **WindowsDomainPassword—**Domain user password which will be used to access the domain
    - **WindowsPassword—**Password for the Windows local administrator
    - **WindowsProductKey—**Product key for the Windows Server 2012 installation
- Configuring Software Repositories Required for AS 50 Orchestration

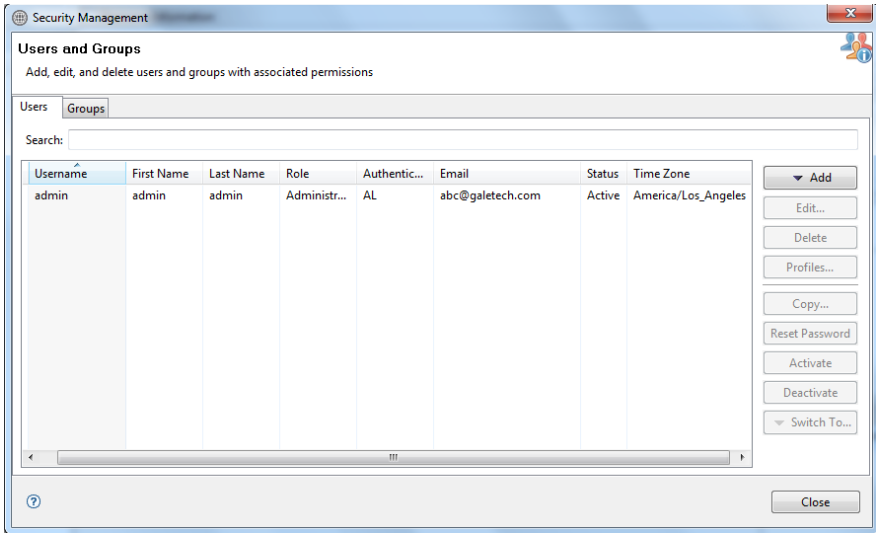
Managing Users and Groups

You can manage users and groups within the Active System Manager by either manually entering individual users and groups, or by importing users from an external repository, such as Lightweight Directory Access Protocol (LDAP), Active Directory (AD), or Network Information Service (NIS).

For user management, log in to the Windows client and navigate to **Tools ➔ User and Groups**. The **Security Management—Users and Groups** dialog box displays.

NOTE: Set the time zone to match the time on the workstation that the Active System Manager client is installed.

Figure 6. Security Management—Users and Groups



For details on user and group administration, see the "User Profile Management" chapter in the ***Active System Manager User Guide***, which is downloadable from the Active System Manager 7.1 web portal (**Help** menu) or from the Thick client (Eclipse-based).

Discovering Active System 50 Components

Active System 50 components to be discovered include:

- Dell R620 rack servers
- PowerConnect Top-Of-Rack (ToR) 7024 switches
- Dell EqualLogic Storage Array
- Microsoft SCVMM 2012 SP1 components

Initiating Discovery

To initiate the Discovery process, perform the following tasks in this order:

- Configuring Discovery Setup
-

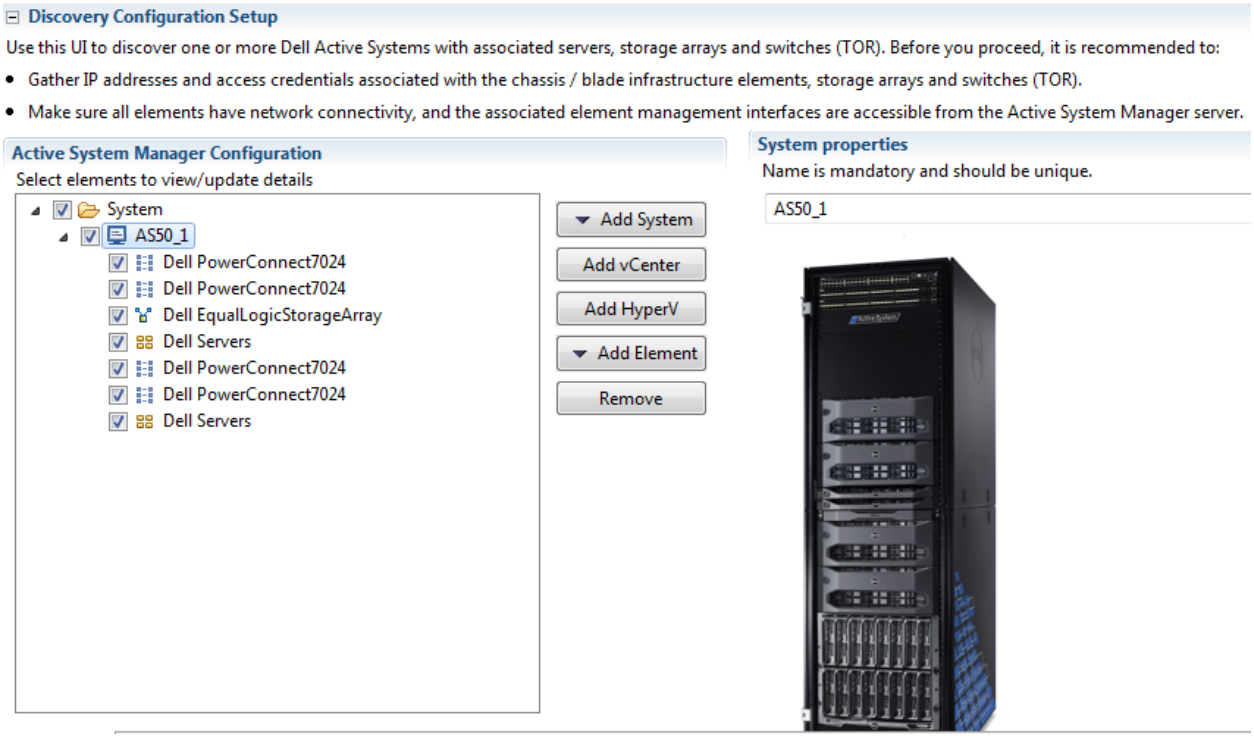
- Adding Details for the Active System
- Adding SCVMM System Properties
- Starting the Discovery Process

Configuring Discovery Setup

1. Connect to the Active System Manager Client using user credentials with Administrator privileges.
2. Select **Tools ➔ Discovery ➔ Setup**.

The **Discovery Configuration Setup** page displays.

Figure 7. Discovery Configuration Setup Page



Adding Details for the Active System 50 Unit

NOTE:

- In general for all the devices, when defining names and provisioning parameters, you should avoid using the following special characters: @ # $ % ^ () + = " | } { [ ] . , | : ; " ' ? / > <
- The volume names of the Dell EqualLogic Storage Array can contain only alphanumeric characters, and the following special characters: colon (:), period (.), and dash (-).
- When discovering a POD, the value for the AssetTag cannot contain any of the strings in the following names: Dell, Force10Switch, EqualLogicStorageArray, VMware, or Host. For example, AssetTag cannot have a value of "Storage" as this value matches exactly with a string in "EqualLogicStorageArray".

1. Click **Add System ➔ AS50**.
2. Enter a unique name for the AS 50 pod.

   NOTE: In general for all the devices, when defining names and provisioning parameters, you should avoid using the following special characters: @ # $ % ^ () + = " | } { [ ] . , | : ; " ' ? / > <

   NOTE: The volume names of the Dell EqualLogic Storage Array can contain only alphanumeric characters, and the following special characters: colon (:), period (.), and dash (-).

   The following AS 50 components are listed:

   - Dell Servers
   - Dell EqualLogic Storage Array
   - Dell PowerConnect 7024

11. Provide the following element properties for each of the **Dell Ser**vers component:

Input Name	Description
Assettag	Unique key or name used to import or identify the R620 server within Active System Manager
Username	iDRAC username to access and manage the Dell R620 server
Password	iDRAC password to access and manage the Dell R620 server
IP Address	iDRAC IP address of the Dell R620 server iDRAC. The iDRAC should be IP reachable from the Active System Manager server.

12. Provide the following element properties for the **Dell EqualLogicStorageArray** component**:**

Input Name	Description
Assettag	Unique key or name for the EqualLogic Storage Array, which is used to import or identify an EqualLogic Storage Array in the Active System Manager.
Username	Management username to access and manage the EqualLogic Storage Array.

Password	Management password to access and manage the EqualLogic Storage Array
IP Address	Management IP address for the EqualLogic Storage Array. Management IP should be reachable (via ping to test) from the ACTIVE SYSTEM MANAGER server

NOTE: If there are multiple storage groups, there should be an entry for each of the Storage Group in the **Discovery Configuration Setup** view. To add a new element in an existing Active System 50 unit, click **Add Element**, select **Dell EqualLogicStorageArray**, and provide required details to initiate discovery.

13. Provide the following element properties for the **Dell PowerConnect 7024** switch component**:**

Input Name	Description
Assettag	Unique key or name for Dell PowerConnect 7024 Switch which is used to import or identify the 7024 Switch in Active System Manager.
Username	Username to manage the switch
Password	Password to manage the switch
IP Address	Management IP address for the switch. This should be IP reachable from the Active System Manager server.
SupportedVLANIDs	VLAN IDs that could be provisioned on the LAN switch. Sample input format (2..1024); the switch supports a VLAN range from 2 to 1,024. **NOTE:** This is present only for PowerConnect LAN switch components and not present for PowerConnect SAN switches.
enablePassword	Password to manage the switch.
Role	It is recommended not to edit the Role. The IP Address, Username and Password fields mentioned above should be entered for the switch corresponding to this role.

NOTE: Discovery will fail if SSH is not enabled in the switches, see Appendix D—Enabling SSH in PowerConnect 7024 switches.

Adding SCVMM System Properties

For successful deployment of Hyper-V, all the Active System 50 elements have to be successfully discovered in a single run.

1. In the **Active System Manager Configuration** area, click **Add SCVMM** and enter a unique key or name for Microsoft SCVMM which is used to import or identify SCVMM in the Active System Manager.

14. Click on the **Microsoft Host**, and provide the following properties:

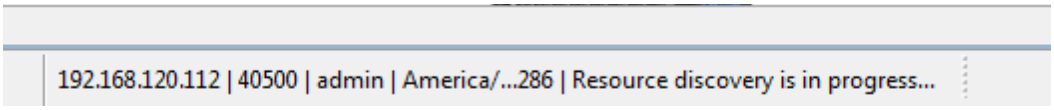
Input Name	Description
Asssettag	Unique key or name for Microsoft host
Username	Domain username to access and manage SCVMM. This user must have full administrator rights to SCVMM.
Password	Domain password to access and manage the SCVMM.
IP Address	IP address for the SCVMM server. This must be IP reachable from the Active System Manager server.
SCVMMFullyQualified DomainName	The FQDN of the domain in which SCVMM is present
SCVMMDomainName	The domain name in which SCVMM is present.

Starting the Discovery Process

1. Connect to the Active System Manager Client using user credentials with Administrator privileges.

15. On the menu bar, click **Tools ➔ Discovery ➔ Start**, which initiates the discovery process for components that were set up during the discovery configuration setup.

    NOTE: You can view the discovery progress from the task bar shown at the bottom of the client.



    If the discovery progress is initiated when a discovery process is already in progress, the Active System Manager User is prompted with a message, indicating the same.

Configuring Server Inventory

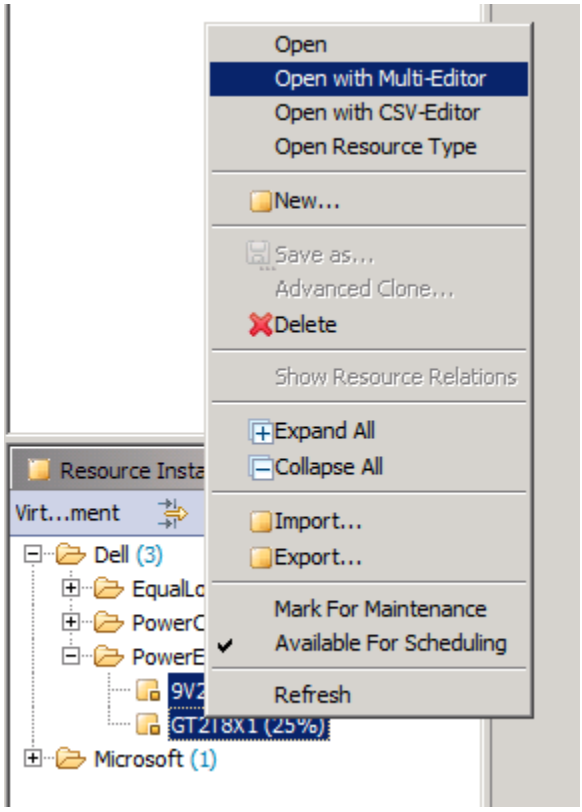
After completing the Active System 50 components discovery, update the following information manually for all rack servers. These parameters will be used for configuring the Hyper-V Server with appropriate information (for example, IP Address, hostname, username, password).

Editing Individual Server Inventory

1. Click **Inventory** in left pane.
2. In the **Resource Instances** area, select **PowerEdge R620**.
3. Double-click the asset tag of the server to open a new page.
4. Scroll down to **Inventory Parameters**.

This information can also be updated by using the multi-editor feature. You can launch the multi-editor by selecting multiple server instances from **Inventory → Resource Instances →PowerEdge R620** and right-clicking **Open with Multi-Editor**.

Figure 8. Open with Multi-Editor



The following parameters must be updated

- **WindowsComputerName—** Hostname to be assigned to the Hyper-V server, should be restricted to 15 characters
- **WindowsDomainAdminUser—**Domain user whose credentials must be created on the Hyper-V server.

- **WindowsDomainFullyQualifiedName—**Fully qualified domain name of the domain to which the servers must be joined.
- **WindowsDomainName—**Domain name to which the servers have to be joined
- **WindowsDomainPassword—**Domain user password which will be used to access the domain
- **WindowsPassword—**Password for the Windows local administrator
- **WindowsProductKey—**Product key for the Windows Server 2012 installation

Configuring Software Repositories Required for AS 50 Orchestration

The following Hyper-V repositories are used by the Active System Manager for Hyper-V related provisioning activities are available in the Active System Manager virtual appliance:

- Windows Image Repository - Applicable for Dell Servers, where the repository has the Windows Server 2012 ISO bootable images. This is pre-packed and made available in Active System Manager, but you must edit it for your environment.
- SCVMM Baseline images - Applicable for Microsoft Virtual Machines, where the repository has the Gold VM image already configured. You must configure this repository for your environment.

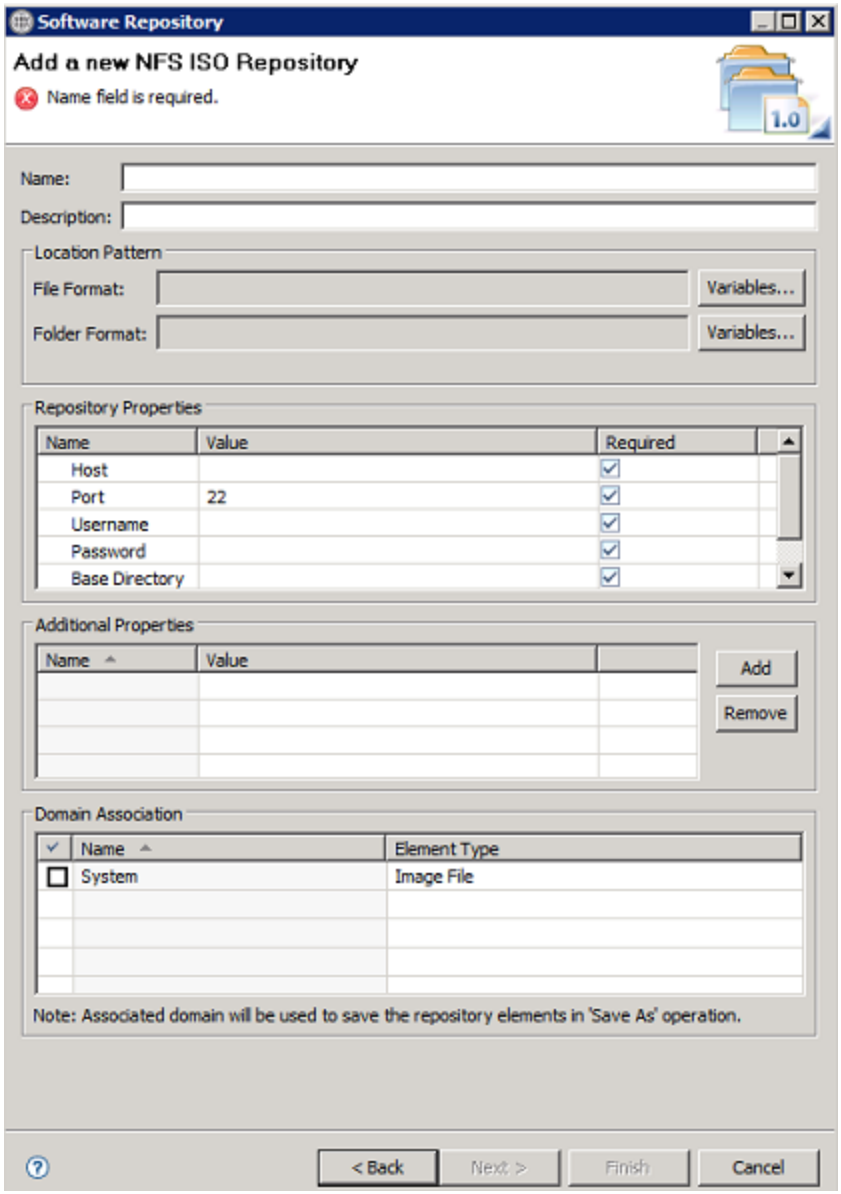
Updating Repository Elements for Windows Image Repository

This repository contains Windows Server 2012 images for deploying on the rack servers. Before executing the steps below, log in to the Active System Manager appliance as **delladmin** user and copy the Windows Server 2012 iso in the location **/var/nfs**.

1. Open the **Software Repositories** view in the setup perspective by clicking **Setup ➔ Software Repositories** on the client.
2. In the **Software Repositories** view, right-click and select **Repositories**.
3. On the **Software Repository—Select Repository Type** dialog box, select **Software Repository** and **Existing**.

16. Select **Windows Image Repository** from the list, and click **Next**.
17. On the **Software Repository—Repository Properties** section, update the Host (IP address), Port, Username, Password and Base Directory.

Figure 9. NFS ISO Repository Configuration



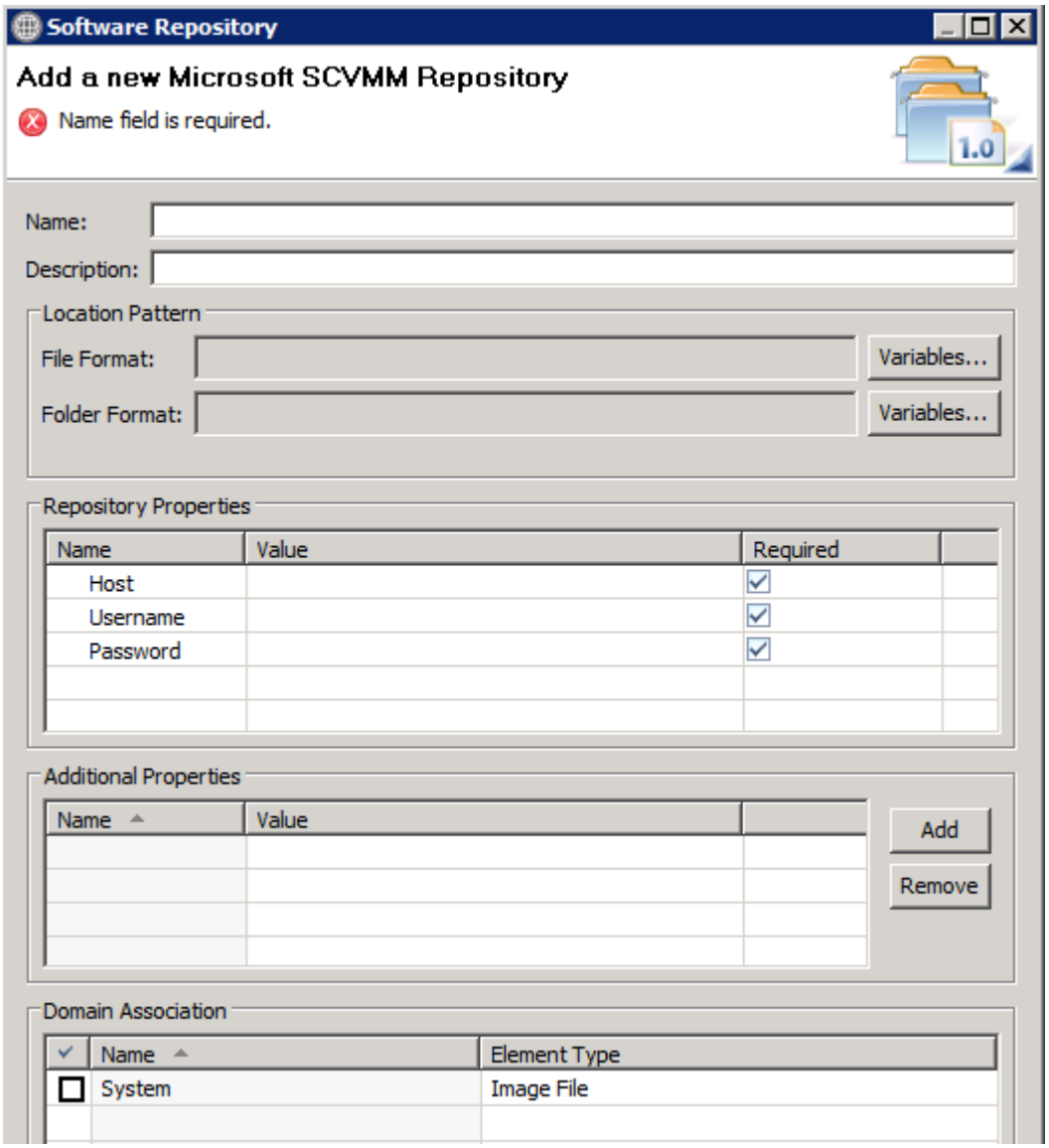
18. Click **Next** to display the list of repository files.
19. Click **Discover** to initiate the discovery of the repository files. The list of images exported by the NFS repository is displayed.
20. Select the Windows Server 2012 image.
21. Right-click the selected image and from the menu and select **set type as → Image file**.
22. Click **Finish.**

Updating Repository Elements for SCVMM Baseline Images

This repository contains Windows Server 2012 baseline images for creating VM clones.

1. Open the **Software Repositories** view in the setup perspective by clicking **Setup ➔ Software Repositories** on the client.
2. In the **Software Repositories** view, right-click and select **Repositories**.
3. On the **Software Repository—Select Repository Type** dialog box, select **Software Repository** and **New**.
4. Select **Microsoft SCVMM Repository** from the list, and click **Next**.

Figure 10. SCVMM Repository Configuration



5. On the **Software Repository—Repository Properties** dialog box, update the SCVMM (host IP address), username, and password.

6. Click **Next** to display the list of repository files.
7. Click **Discover** to initiate the discovery of the repository files. The list of VMs managed by the SCVMM displays.
8. Right-click the discovered element, set the **Type** to **Image File**.
9. Associate this to the Microsoft Virtual Machine Resource type by clicking **Associate → Resource Types**. Select **Microsoft → Microsoft Virtual Machine**.
10. Click **Associate** to associate the selected element with the **Microsoft-VirtualMachine** resource type, and click **Finish**.

Configuring Networks

This section describes configuring the networks that are to be used in AS 50 Orchestration and configuration. The various networks have to be configured prior to doing an orchestration. For more information about networks, see the *Active System Manager 7.1 User Guide* Chapter 10, "Network Management".

Accessing the Network Configuration Setup

The network configuration setup can be accessed from the **Tools**->**Discovery**->**Networking** as shown in Figure 11. This will open a new page where the new networks can be configured and default networks can be modified.

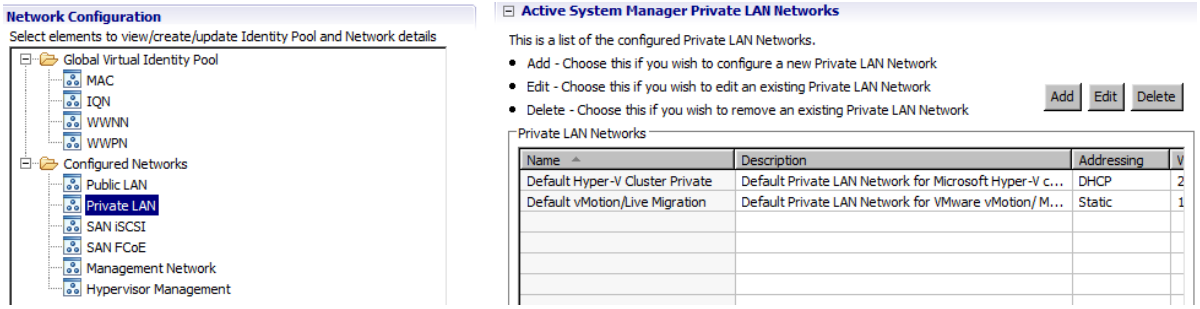
Configuring the Default Networks

AS 50 come with six different types of networks already added. These networks have to be modified as per the environment in which the AS 50 is being used. The below sections describes configuring those networks.

Configuring Existing Networks

In order to configure any network, select the network that needs to be configured. The list of existing networks that are part of this network category are displayed.

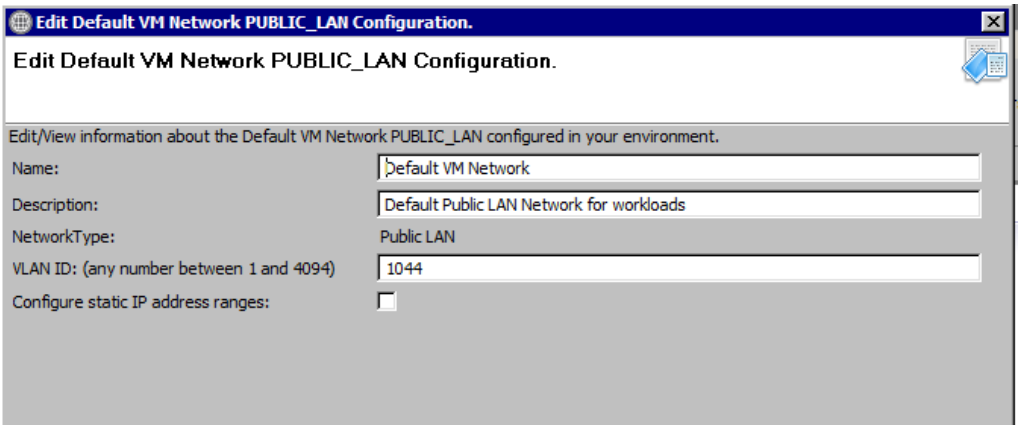
Figure 11. Network Setup Wizard



From the list of pre-configured networks, select the network that needs to be modified and click the **Edit** button. From the **Edit** dialog box, you can modify network parameters.

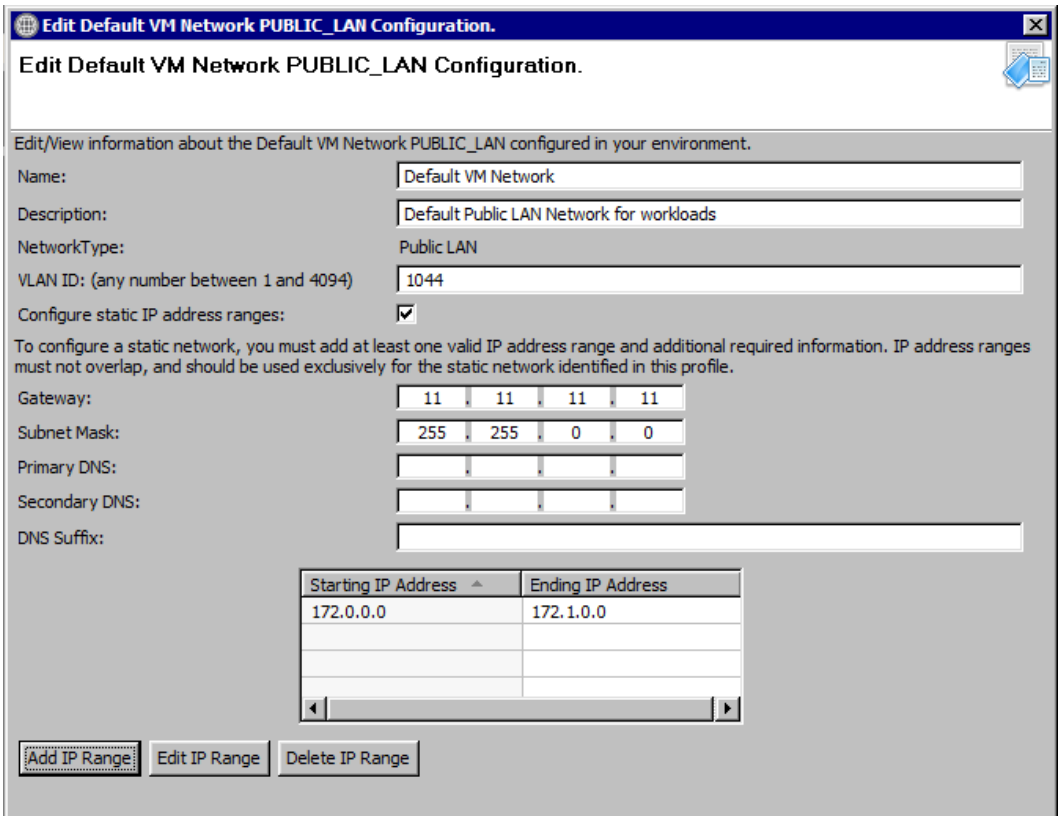
NOTE: AS50 does not support SAN FCoE networks.

Figure 12. Editing an Existing Network



To configure static network ranges, select the **Configure static IP address ranges** check box.

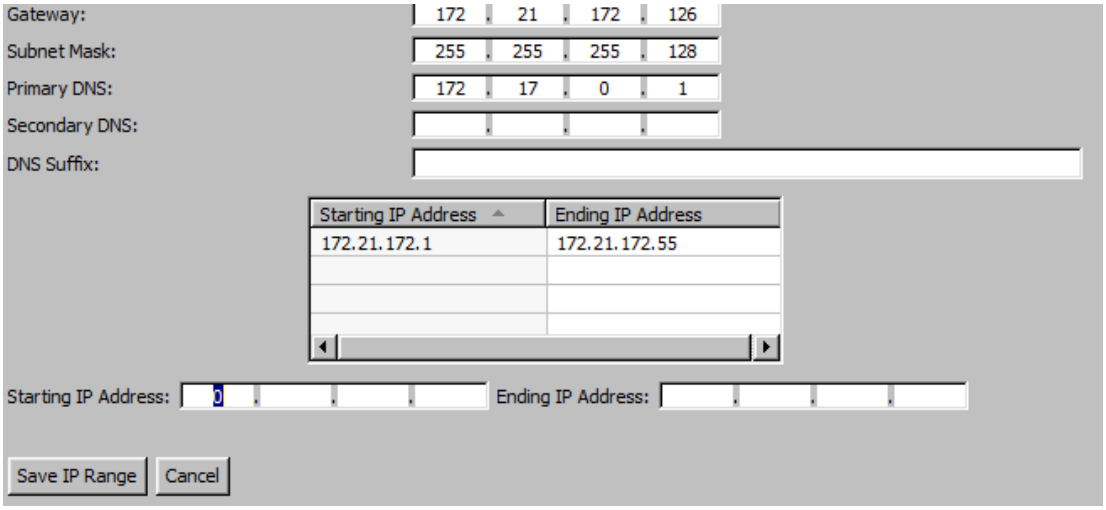
Figure 13. Editing an Existing Static Network



Adding Static IP Address Ranges

1. Click **Add IP Range**.
2. Specify the starting and ending IP addresses.
3. Click **Save IP Range**.

Figure 14. Adding IP Address Range



To configure an existing IP range, select the already configured range, and click **Edit IP Range**.

Table 6 summarizes the list of values that needs to be configured for a network.

Table 6. Values Required for Configuring Networks

Entry	Details
VLAN ID	The VLAN ID that is configured on the switch for this network type.
Static IP address ranges	For configuring static IP addresses
Gateway	Gateway IP for this network
Subnet Mask	Subnet mask of this network
Primary DNS	Primary DNS
Secondary DNS	Secondary DNS (not mandatory)
DNS Suffix	Domain name
Starting IP Address	The starting IP address
Ending IP Address	The ending IP address

Configuring Default Server Templates

The Active System 50 orchestration applies the server templates to the server at the time of setup. For more information about server templates and profiles, see the *Active System Manager 7.1 User Guide* Chapter 7, "Server Templates and Profiles".

If multiple VM workload VLANs are required, use the **Add** button to add more. The networks need to be added with naming convention Workload-<*VLANID*>. For example, Workload-20.

NOTE:

- Server Template names should not contain spaces.
- Server Templates for Active System 50 Hyper-V should have VM NICs with the name: NIC_1.
- Active System Manager does not pick up the workload VLAN based on the VLAN ID defined in the Network setting. The workload VLANs are randomly picked up based on the VLAN range defined for the layer 2 switch in the Active System Manager Inventory System. If a specific workload VLAN ID is needed, it should be specified in the VLAN Resource Type → Provisioning settings in the physical template.
- Attaching more than one Server Profile Template to a physical orchestration template will cause the physical orchestration to fail.

Table 7. Default Hyper-V Host Mapping

Network Type	Server Template Network Name	Hyper-V host Network Mapping
Hypervisor Management	DefaultHypervisorManagement	Management Network
Public LAN	DefaultWorkload	Virtual Machine Network
Private LAN	DefaultvMotionLiveMigration	Live Migration Network
Private LAN	DefaultHyperVClusterPrivate	Cluster Private Network
SAN iSCSI	DefaultSANiSCSI	iSCSI Network to access EqualLogic storage array.

The following networks should have unique VLAN IDs:

- Hypervisor Management
- Public LAN
- Private LAN
- SAN iSCSI

The network names should contain the following substring for enabling RA to identify proper networks

- Hypervisor Management network should contain "HypervisorManagement" substring.
- Compute Live Migration network should contain "vMotionLiveMigration" substring.
- Compute Cluster Private network should contain "HyperVClusterPrivate" substring

NOTE: Hypervisior Management, LiveMigration, Cluster, and SAN iSCSI networks must be configured with static IP Addresses.

Physical Templates and Orchestration

The following sections describe physical template management and orchestration.

Updating Physical Templates

This section lists all of the mandatory input parameters that have to be updated prior to provisioning the Hyper-V cluster template.

Post deployment, it is a best practice to run cluster validation on any newly deployed Hyper-V clusters. For more information, see "Validate Hardware for a Windows Server 2012 Failover Cluster" at: http://technet.microsoft.com/en-us/.

Updating Global Parameters of the Template

The Global parameters have to be modified prior to running any orchestration. The Global parameters can be updated from the **Global parameters** tab of the template as shown in Figure 15. Table 8 specifies the list of mandatory global parameters that need to be configured.

Figure 15. Updating Global Parameters

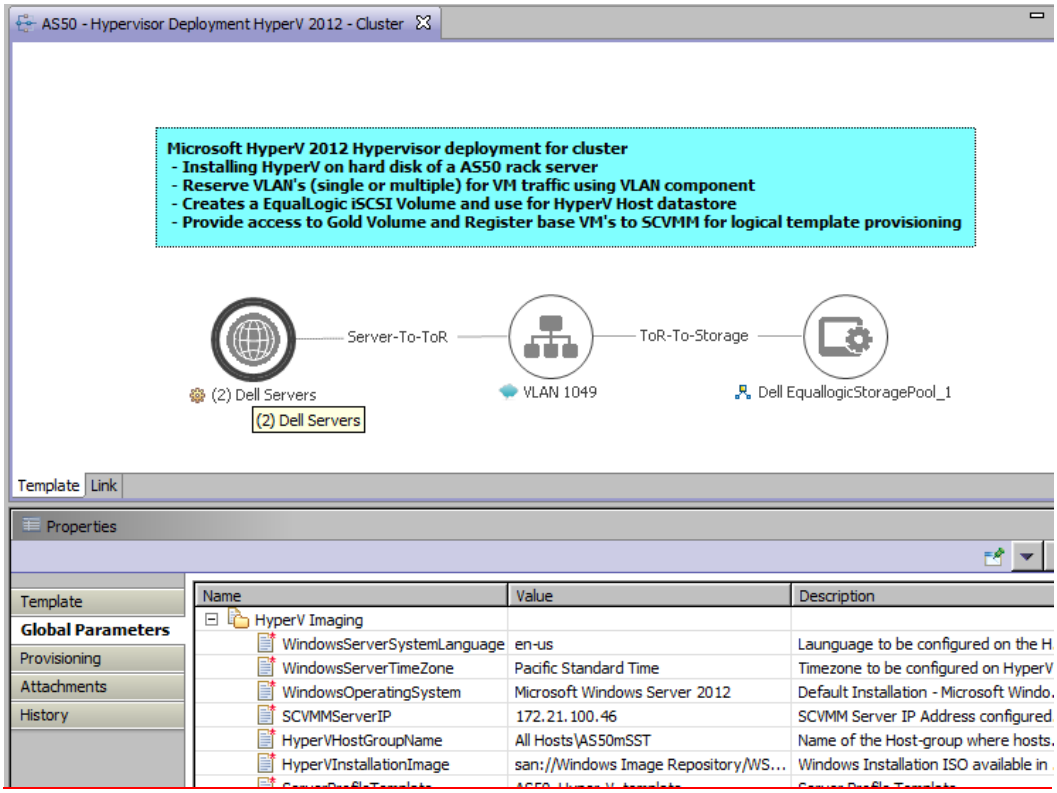


Table 8. List of Mandatory Global Parameters to Configure

Parameter	Description
SCVMM Information	

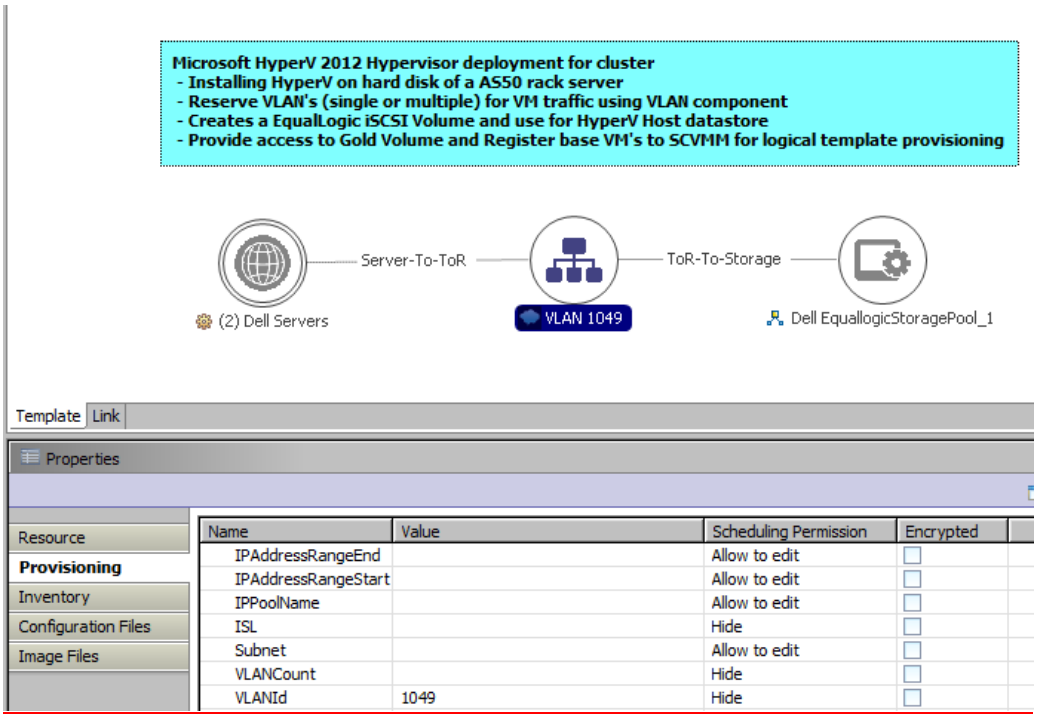
SCVMMServerIP	IP Address to access and manage SCVMM
HyperVHostGroupName	The host group in SCVMM under which hosts have to be created. By default it is "All Hosts". If user wants the hosts to be grouped in a new custom folder then "All Hosts\folder1" input has to be given. Then AS 50 orchestration creates a new folder under "All Hosts".
HyperVInstallationImage	Hyper-V installation image present in NFS ISO Repository. Refer to Updating Repository Elements for Windows Image Repository for details.
Serverprofiletemplate	The server profile that has to be applied to the AS 50 hosts. By default, it is mapped to AS50_HyperV-template. If user has created a custom server profile template then it can be specified by editing this parameter.
HyperVClusterName	The SCVMM cluster to be created under which the hosts are grouped and also name of the EqualLogic storage volume which is mapped to the SCVMM cluster. **NOTE:** The **HyperVClusterName** can contain only alphanumeric characters, and the following special characters: colon (:), period (.), and dash (-).
Network	
HyperVClusterIPAddress	The management network IP address that has to be assigned to the Hyper-V cluster.
vmNetworkName	VM network to be created on the SCVMM. By default it is convergednetswitch.
LogicalNetworkName	Logical network to be created on the SCVMM. By default it is convergednetswitch.
Storage	
ClusterVolumeSize	The size of the EqualLogic storage cluster to be created. By default it is 500g (500 gigabytes). It can be customized by giving custom value followed by a 'g'.
iSCSIVolumeSubnet	The specific subnet access to the EqualLogic volumes. If *.*.*.* is given then everyone will be able to access the newly created volumes.
QuorumVolumeSize	The quorum storage volume size, by default it is 1g(1 gigabyte). It can be customized by giving custom value followed by a 'g'.
QuorumVolumeName	The Quorum volume that has to be created in the

	EqualLogic
HyperVISCSIStoragePrefix	This is the prefix that needs to be prepended before the following orchestration parameters: • HyperVClusterName • QuorumVolumeName For example, if the prefix is AS50x, then the two above parameters would be AS50x<*hypervcluserName*> and AS50x<*quorumvolumename*>
StoragePoolName	The storage pool name under which the newly created storage volumes have to be mapped. If no new storage pool to be created then "default" has to be mentioned.

Updating VLAN Auto Properties

1. Select the **VLAN Component**, click the **Provisioning** tab, and update the **VLANCount** with the number of VLANs to be provisioned.
23. Update the **VLANId** parameter, as applicable.
24. Save the template.

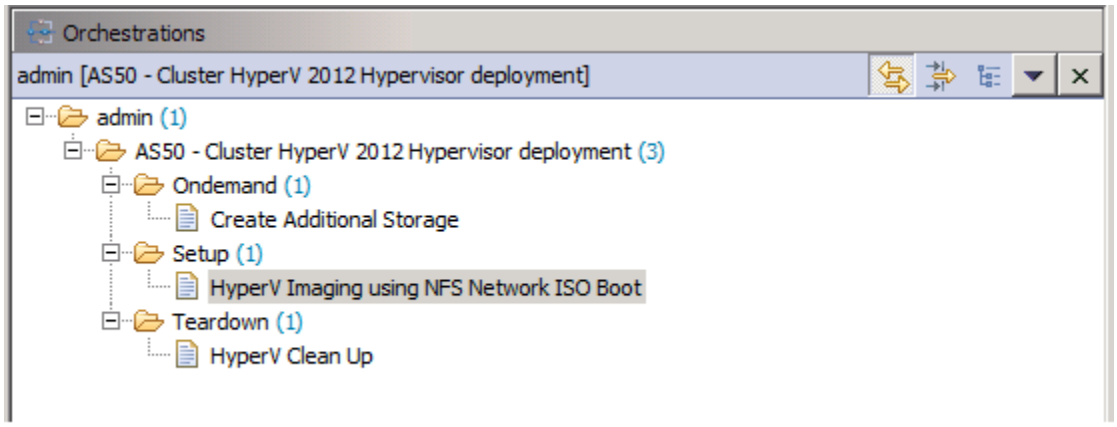
Figure 16. Updating VLAN Auto Properties



Associated Orchestrations with Hyper-V Host Templates

The AS50 Hyper-V template has three orchestrations associated with it:

Figure 17. Orchestrations



- **On-demand**—*Create Additional Storage*
  This orchestration can be executed on demand when the session is in *running* state.
- **Set-up**—*Hyper-V Imaging using NFS Network ISO Boot*
  This orchestration executes when template provisioning starts and the session is in the Setting Up state. This will deploy Hyper-V on the servers, and configure EqualLogic storage volumes and workload VLANS in switches.
- **Tear-down**—*Hyper-V Clean Up*
  This orchestration executes when a session in the *running* state is cancelled.

Set-Up Orchestration

The AS50 - *Cluster HyperV 2012 Hypervisor deployment* template can be used for installing Hyper-V on the hard disk of the rack server, using iDRAC ISO Boot. You can specify one or more rack servers using this template for creating a cluster.

Default Server Templates

The AS 50 Orchestration applies the Server templates to the server at the time of Set-Up. Refer to the *Active System Manager User Guide* for information on configuring the default templates.

When this template is scheduled, it performs the following sequence of operations:

1. Validates the user input provided in the template.
2. Creates server profiles and attaches the server profiles to the servers.
3. Reserves single or multiple VLANs for VM traffic using a VLAN component. If the VLAN reserved in the session is not already configured on the ToR switches, then the VLANs are created and tagged to appropriate port-channels.
4. Creates the ISO files for each server dynamically based on the service tag of the server.
5. Mounts the ISO using iDRAC Virtual Media on all the servers and initiates the installation process.

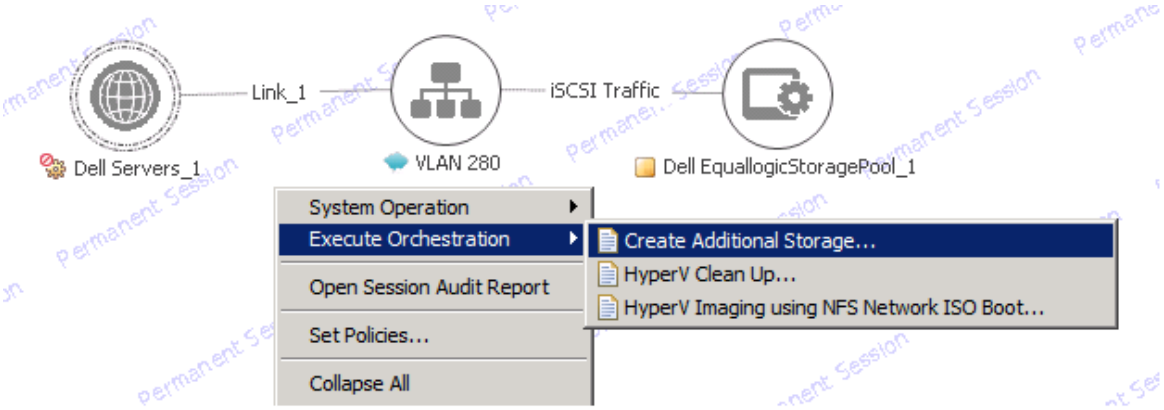
25. Creates two volumes on the EqualLogic Storage Array
    a. A Quorum volume and a cluster volume is created based on the volumes specified in the template input.
    b. Access to the volumes is granted to the each of the servers.
    c. The servers then connect to the EqualLogic storage and initialize the discovered disks.
26. Creates a host group (if one does not already exist) on the specified SCVMM server.
27. Add Hyper-V hosts to the host group.
28. Creates a cluster (if one does not already exist) on the specified SCVMM server.
29. Adds Hyper-V hosts to the cluster.
30. Creates a logical network on SCVMM and associates it with the VLAN configured using the VLAN component in step 3.
31. Creates a VM network on the SCVMM server and associates it with the logical network created in step 11. The Hyper-V hosts are also bound to this VM network.
32. Creates an IP pool having IP addresses in the range specified in the public LAN component the network. This IP pool is associated with the logical network created in step 11.
33. Removes the installation and ISO files from the servers.
34. Initiates the discovery of the SCVMM and the entire pod and updates the inventory with latest information.

On-Demand Orchestration

For additional cluster storage on a Hyper-V host reserved through the Active System Manager, you can execute on-demand orchestration from a *Running* session.

For executing the on demand orchestration, open the session by double-clicking it. In the session window, right-click and select **Execute Orchestration ➔Create Additional Storage.**

Figure 18. Create Additional Storage



On-Demand Orchestration Input

Before starting an on-demand orchestration, you must provide the name of the volume that must be created.

1. On any running physical orchestration, right-click and select **Execute Orchestration → Create Additional Storage**.
2. In the **Execute Orchestration Create Additional Storage** window, double-click the **volume create** step present in **Step 1: Create volume**.
3. In the **Specify Input Values** window, in the **volumeName** row, provide the name for to the additional volume.

NOTE: The volume Name should have same the prefix that was given to the **HyperVISCSIStoragePrefix** variable in the global parameters of the template.

On-Demand Sequence of Operations

The on-demand orchestration performs the following sequence of operations:

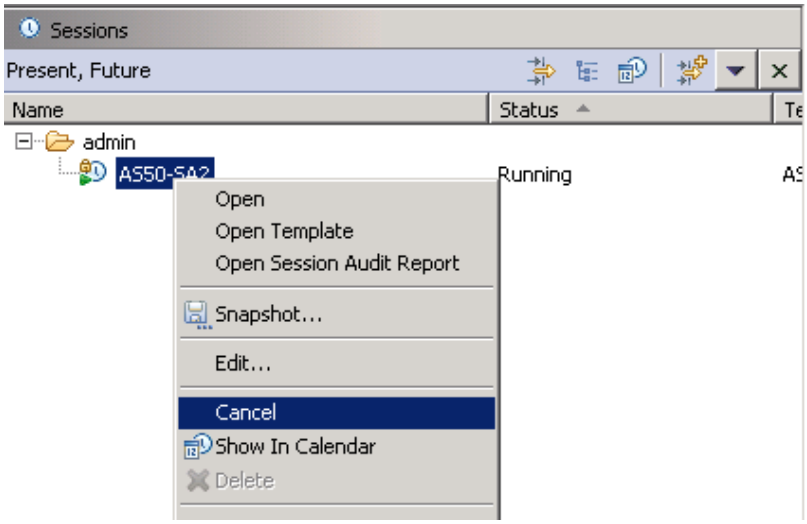
- Creates a new volume on EqualLogic storage.
- Allows access to the new volume to each of the Hyper-V hosts.
- Configures the volume and adds it to the cluster.

Tear-Down Orchestration

This orchestration stops any running physical session and cleans up the resources provisioned as part of it. In order to execute a tear down orchestration, perform either of the following:

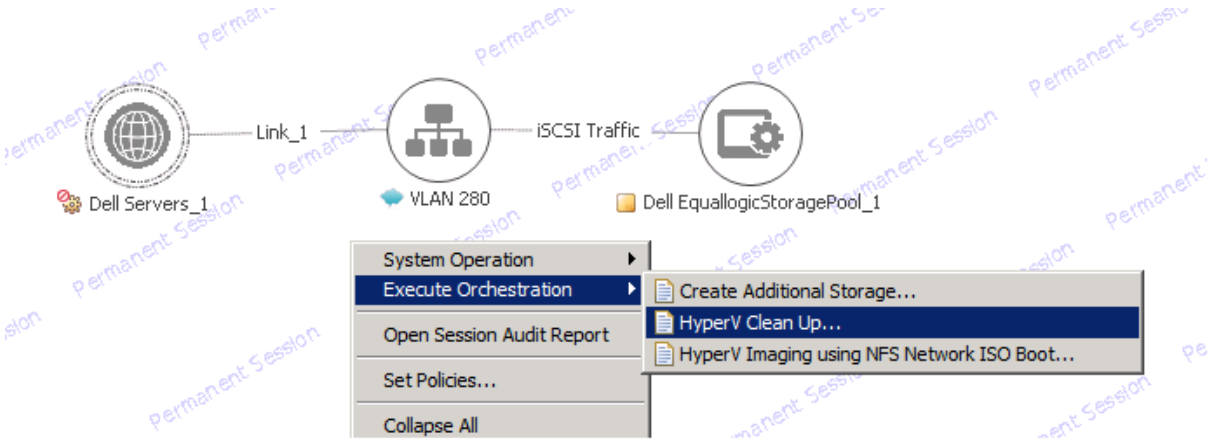
- From the sessions tab on the left, right-click on any running session and select cancel. This will cancel the physical session by executing the tear-down orchestration.

Figure 19. Cancel Session



- Alternatively, right-click on any running session and select **Execute Orchestrations → HyperV Clean Up.** This will not cancel the physical session, but will only run the tear down steps.

Figure 20. Hyper-V Cleanup



The tear-down orchestration performs the following sequence of operations:

1. Removes all the hosts from the cluster and host group on SCVMM server.
2. Removes the ippool that was created in the logical network.
3. Detaches the server profile.
4. Deletes the temporary server profiles that were created for the rack servers.
5. Releases the IP addresses that were blocked at the starting of the orchestration back to the free pools.
6. Reinitiates the discovery of the SCVMM environment to populate the latest inventory.
7. Powers off servers.

   Unmounts the Windows ISO that was mounted at the time of the installation.

Workload Provisioning Using Logical Templates

The following sections describe configuring logical templates and provisioning workloads, which can be run only on top of a fully successful physical session.

NOTE:

- AD and DNS to be configured in the VM should be reachable from the network which the VMs are going to use.
- The gold VM to be used for template creation should be either already licensed or it should be running on a trial license. If it prompts the user for a license upon booting, logical provisioning may fail.
- If a license needs to be applied to the newly created VM in the logical session, then the license should be provided in the logical **template → provisioning → product-key** parameter of the VM in the template, and Guest customization also should be enabled.

Updating the Logical Templates

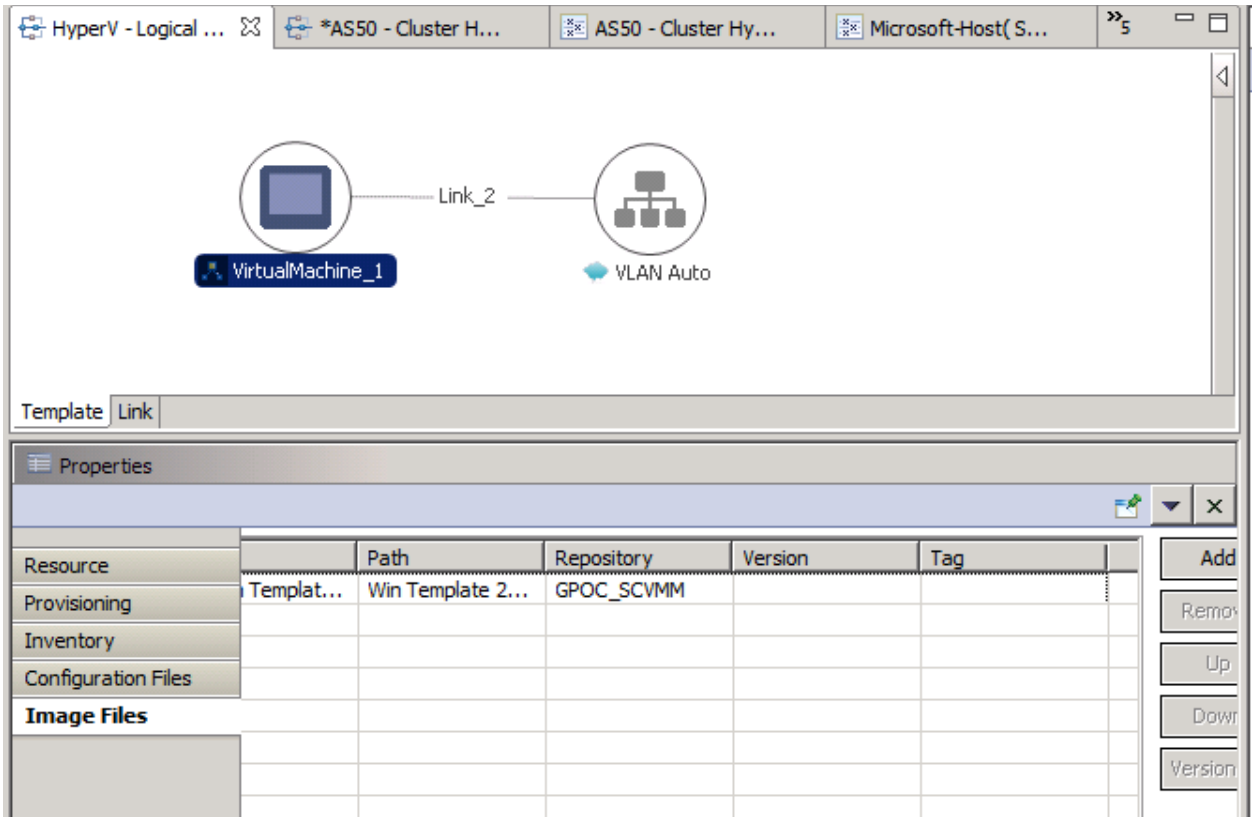
The logical templates have to be edited prior to doing a logical template provisioning. The following sections explain the inputs that have to be done prior to scheduling a logical template.

Updating the Baseline VM Image File on Logical Template

The baseline VM image associated with the VM object in the template has to be updated to refer the SCVMM baseline image. See Updating Repository Elements for SCVMM Baseline Images for details.

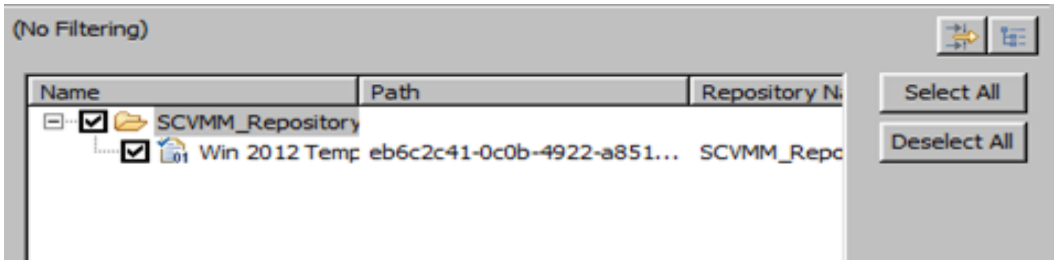
1. Select the VM object in the template and click the **Image Files** tab.

Figure 21. Image Files Properties



35. If there is already associated image file, click **Remove** to remove the existing association.
36. Click **Add** to select the gold VM image to be associated with the VM object.
37. Select the **Show all Image files** checkbox to open the list of configured repositories in the system.
38. From the Microsoft SCVMM Repository, select the VM image that needs to be deployed.

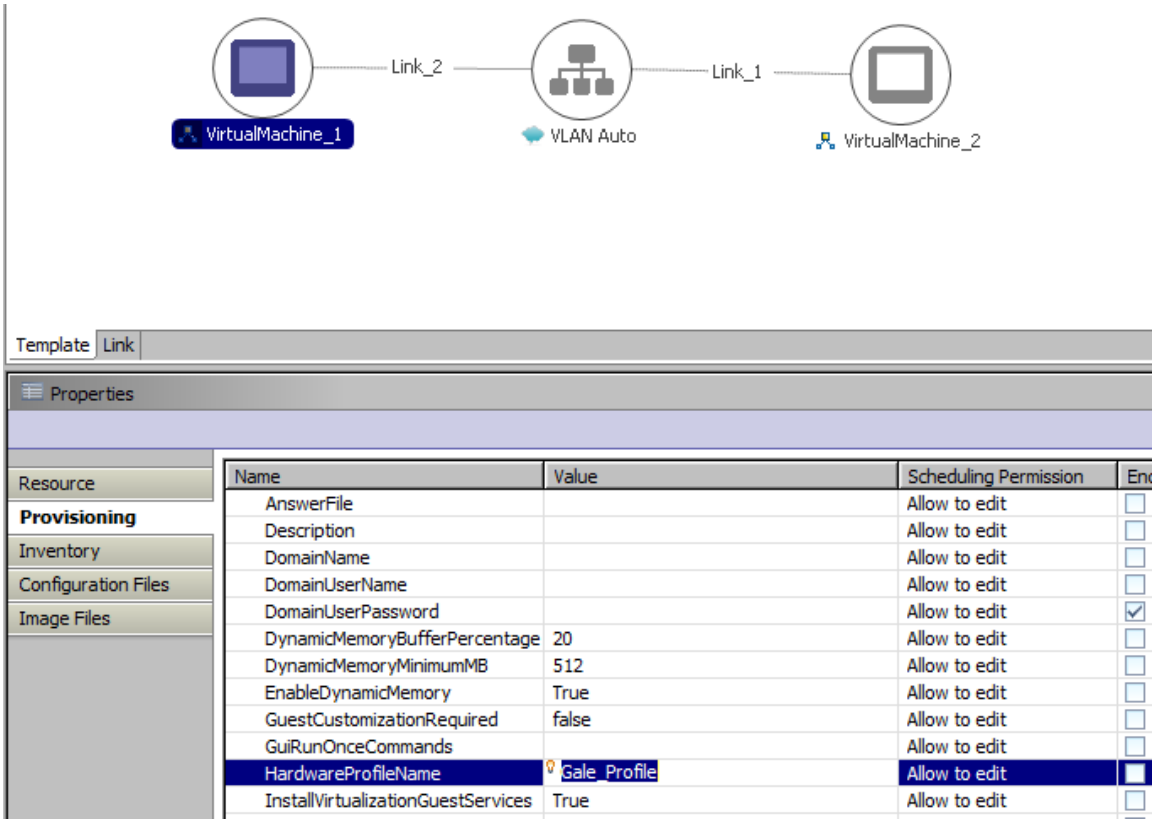
Figure 22. Select VM Template file



Updating the Hardware Profile to use the SCVMM Hardware Profile (optional)

The logical template can consume the existing SCVMM hardware profile for provisioning VMs. In order to use it, the provisioning parameter **hardwareprofile** of the virtual machines in the logical templates have to be modified with the existing hardware profile in the SCVMM as shown in the below in Figure 23.

Figure 23. Hardware Profile Name



NOTE: For cloning the existing VMs, the hardware profile does not have to be updated.

Customizing the Guest OS (Optional)

Active System Manager supports Windows 2012 and Windows 2008 based Guest OS for VM creation. However, during Windows 2008 VM creation, Active System Manager is not able to retrieve the VM IP address. In this case, the Windows 2008 VM does have an IP address, but Active System Manage is not able to retrieve the IP address using the supported API set.

NOTE: Due to SCVMM limitations, you can customize the guest OS only on a VM template clone, not on the Gold VM.

In order to customize the Operating System that will be on the VM, complete the following steps.

1. Open the logical template.
2. Select **Virtual Machine** object.
3. In the **Provisioning** tab, set **GuestCustomizationRequired** to **true** and update the following properties:
    a. DomainName
    b. TimeZone
    c. AnswerFile
    d. LocalUserName

e. LocalUserPassword

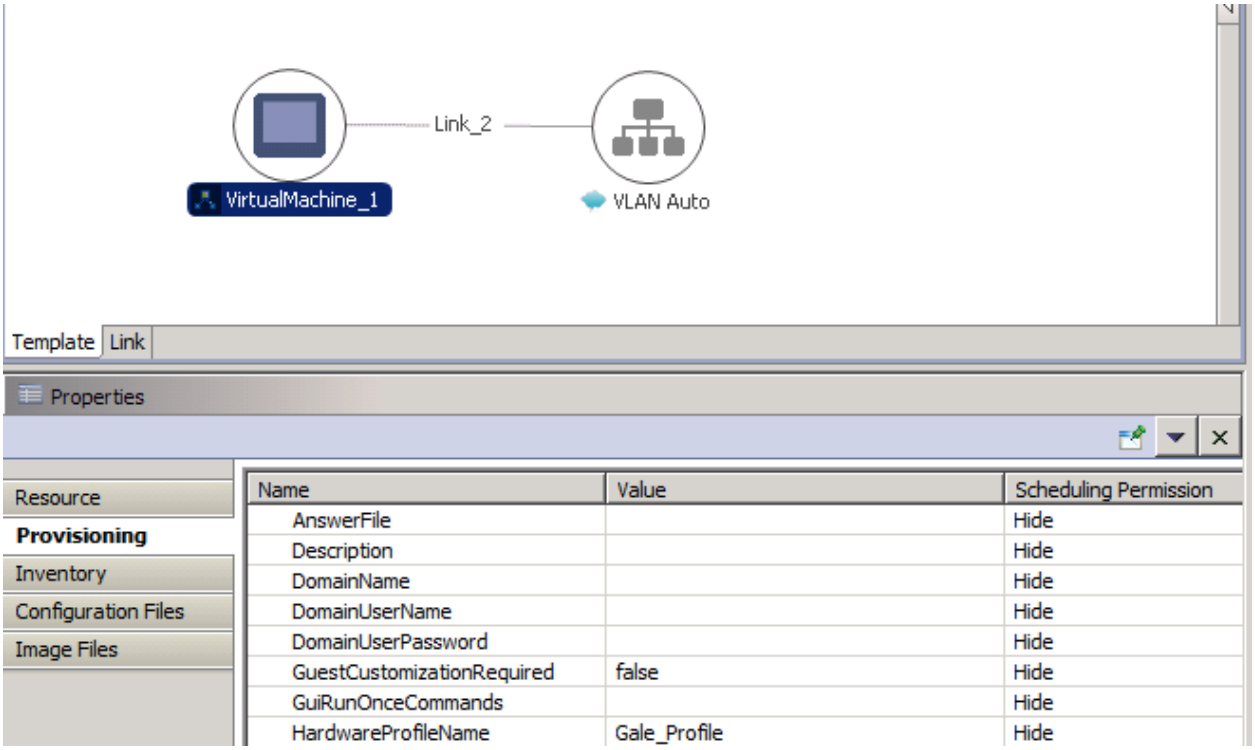
f. DomainUserName

g. DomainUserPassword

h. GuiRunOnceCommands

i. ProductKey

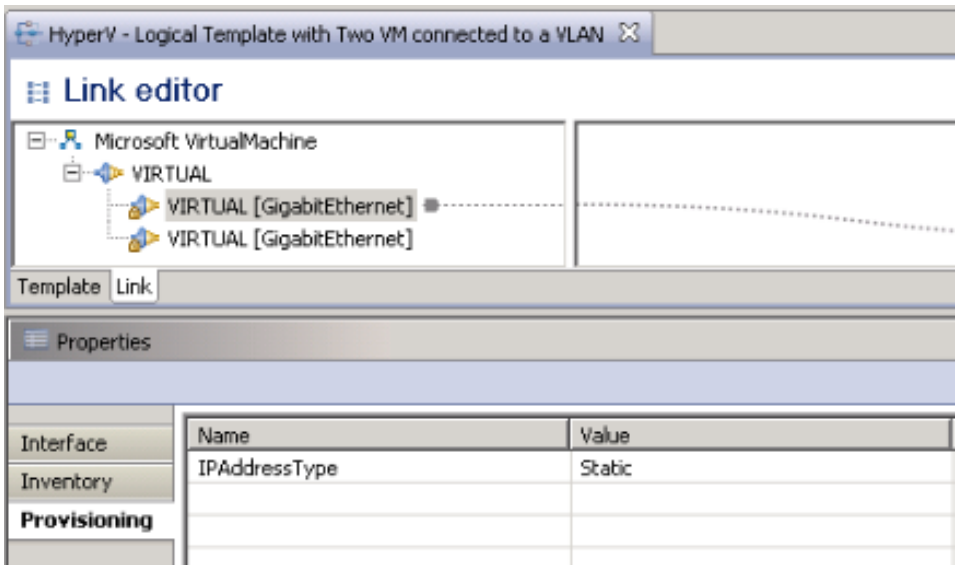
Figure 24. Customizing the Guest OS



Using DHCP for Assigning IP Address to the Provisioned VMs

Provisioned VM are assigned their IP address using DHCP or the Static IP Pool which is defined in the logical template. By default, VM fetches its IP address from the IP Pool which is created in SCVMM during the physical template session. User can change the IP addressing to DHCP using the interface level provisioning parameter **IPAddressType**; default value for this provisioning parameter is **Static** which can be changed to **DHCP**.

Figure 25. Updating IP address type



Provisioning Logical Templates

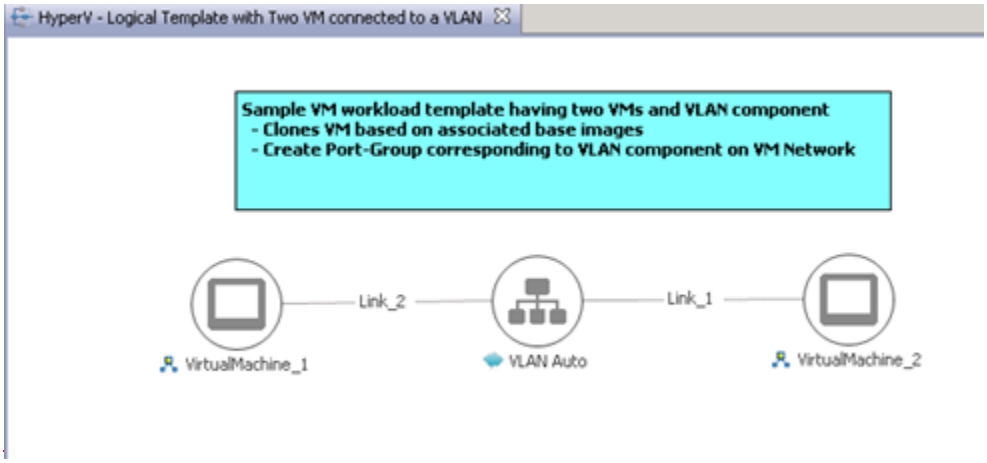
The following sections describe different configuration of provisioned workflows, which can be run only on top of a fully successful physical session.

NOTE: The default value for the **InstallVirtualizationGuestServices** parameter is **True**. Changing this parameter to **False** can cause your orchestration to fail.

Two VMs with a VLAN

The *HyperV-Logical Template with Two VM Connected to a VLAN* template can be used to create VM workloads by scheduling a logical template over existing physical resources sessions.

Figure 26. Two VMs Connected to a VLAN



When scheduled, this template performs the following sequence of operations:

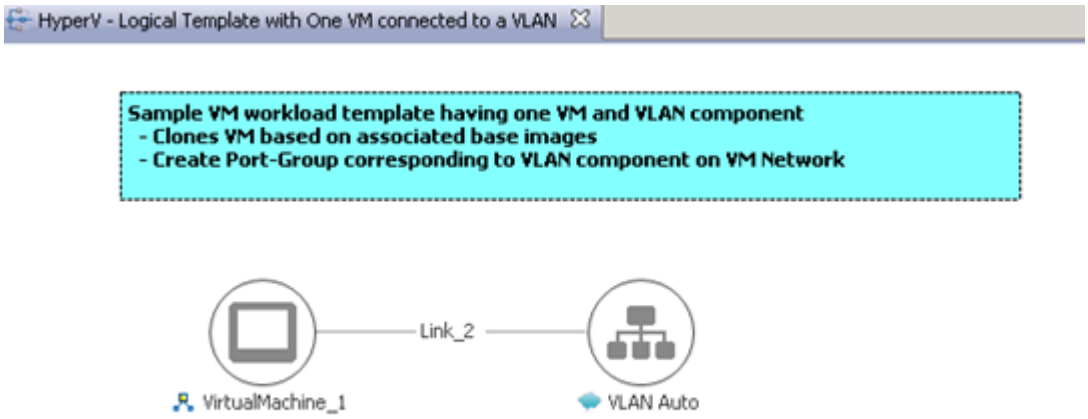
- Clones and powers on two Hyper-V VMs based on the gold VM Image associated with the template.
- Creates network site corresponding to VLAN component on logical network

NOTE: While scheduling a template with VM having multiple interfaces, even if VM is mapped to a Host having multiple interfaces, all the interfaces of VM are mapped to the same interface of the Host.

Single Virtual Machine with VLAN

The **HyperV-*Logical Template with One VM Connected to a VLAN*** template can be used to create VM workloads by scheduling logical template over existing physical resources session.

Figure 27. Single VM Connected to a VLAN



When scheduled, this template performs the following sequence of operations:-

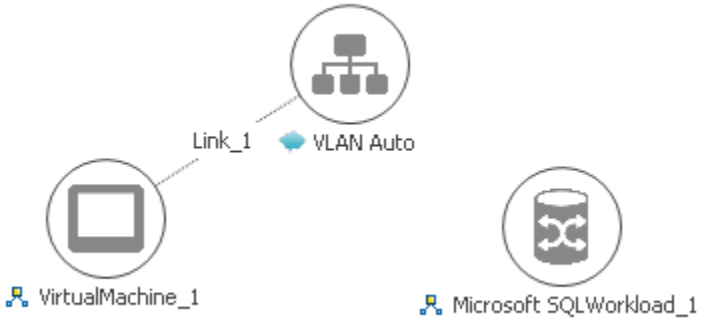
- Clones and powers on a single Hyper-V VMs based on the gold VM image associated with the template.
- Creates network site corresponding to VLAN component on logical network

NOTE: While scheduling a template with VM having multiple interfaces, even if VM is mapped to a Host having multiple interfaces, all the interfaces of VM are mapped to the same interface of the Host.

Microsoft SQL Workloads

The **HyperV-Microsoft SQL Workloads** logical template can be used to create SQL workloads by scheduling logical template over existing physical resources session.

Figure 28. Microsoft SQL Workloads

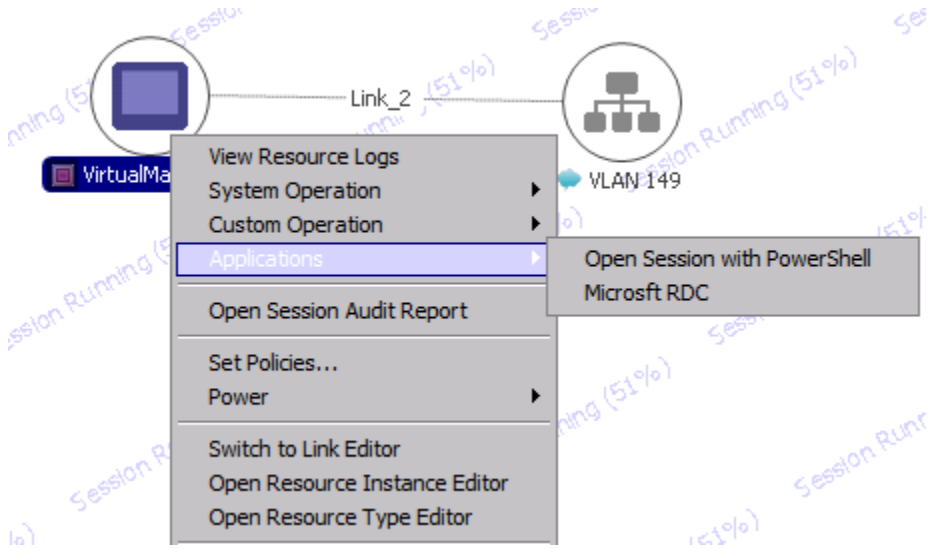


Launching Applications from the Logical Session

Once the VMs are provisioned the user can also launch custom applications as applicable from Active System Manager.

1. Select a VM in a session.
2. Right-click on the VM, and select **Applications**.
3. Select the Application to be launched.

Figure 29. Launch Applications



Operation Center View—Administrative Operations

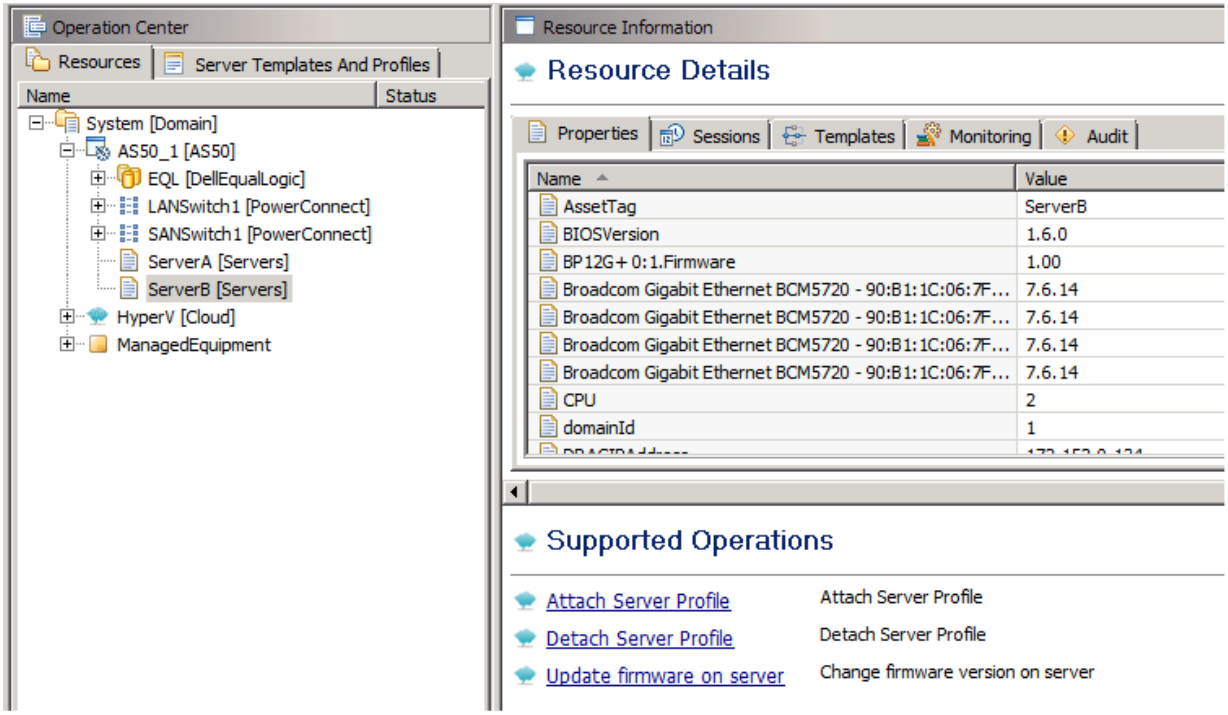
The following sections describe Active System Manager administrative operations.

Managing Rack Servers

The following operations are provided on the Active System Manager **Server Operation Center** view to perform administrative tasks:

- Attach Server Profile—Used to apply the configurations associated with Server Profile on the rack server using iDRAC
- Detach Server Profile—Used to remove the configurations associated with Server Profile from the rack server
- Update firmware on server—Used to update firmware for BIOS, iDRAC, Lifecycle Controller etc. on the rack server

Figure 30. Managing Rack Servers



Managing SCVMM Objects

This section describes how the following managed objects can be directed through the **Operation Center** view.

- Host Groups
- Clusters
- Hyper-V Hosts

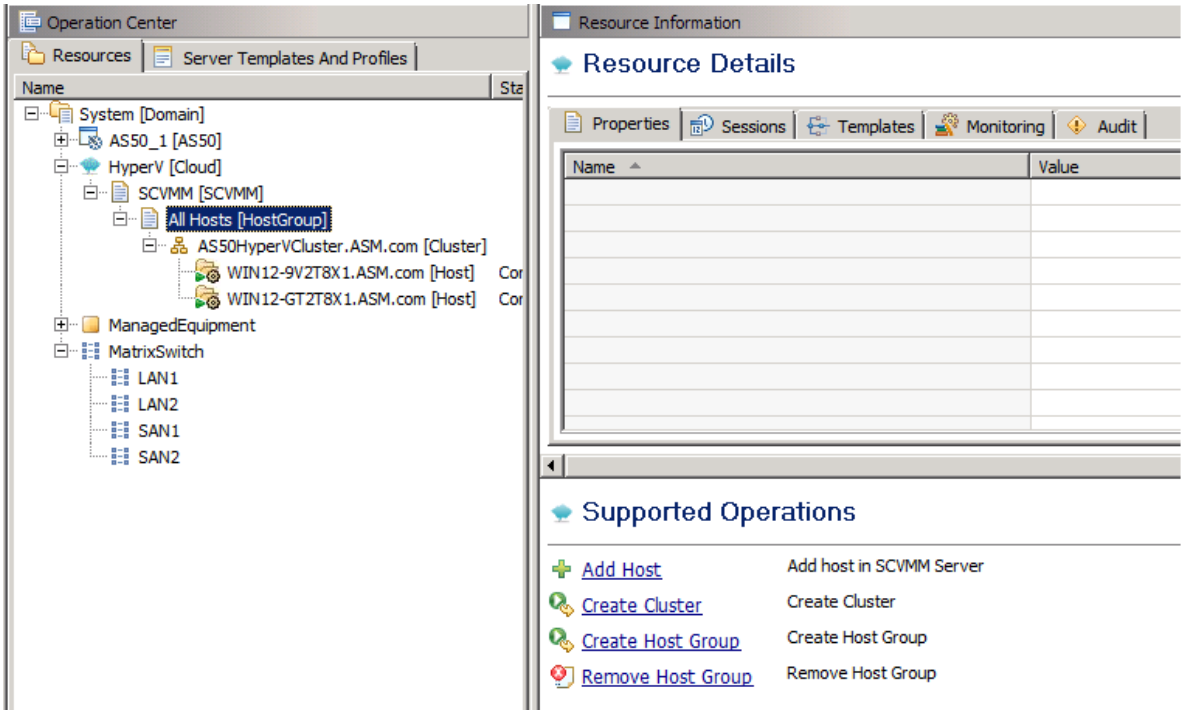
The SCVMM discovery can be initiated using the Active System Manager Discovery facility, which populates the **Operation Center** view.

To initiate the discovery of SCVMM, various discovery elements, and their corresponding attributes can be provided in the **Discovery Configuration Setup** wizard; steps for configuring the discovery setup for a SCVMM are detailed in Discovering Active System 50 Components section.

Host Groups

Host groups along with their attributes are discovered and populated in the Active System Operation Center view. This view enables methods to be executed on host groups.

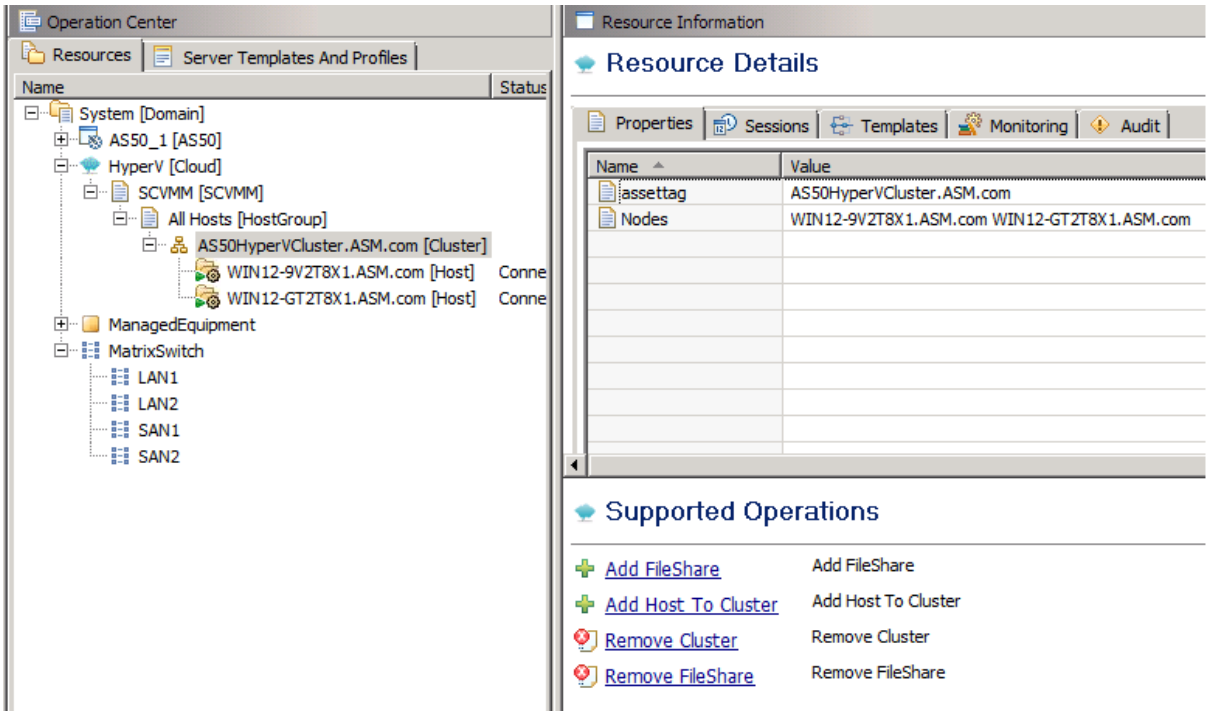
Figure 31. Managing Host Groups



Clusters

Clusters are also discovered and populated in the **Operation Center** view.

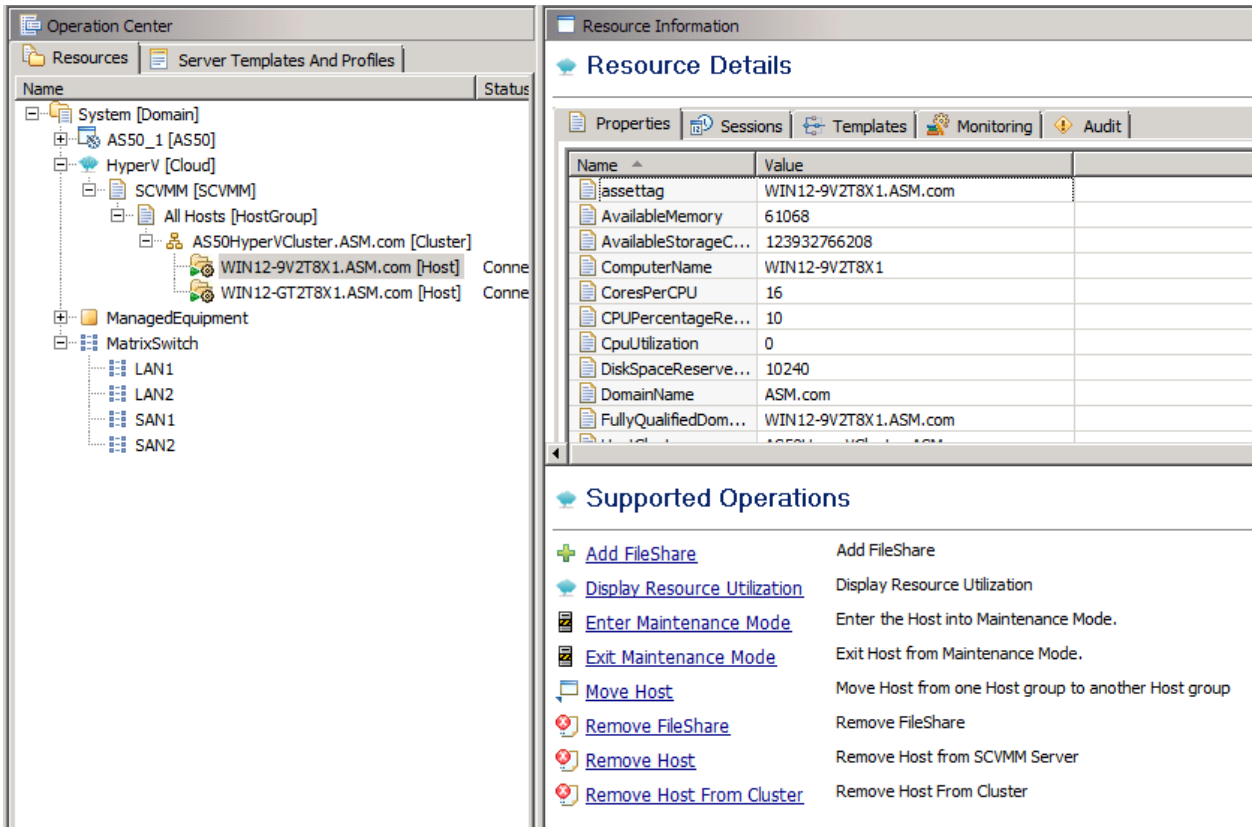
Figure 32. Managing Clusters



Hyper-V Hosts

Hyper-V hosts are discovered and populated in the **Operation Center** view. This view enables methods to be executed on hosts for on demand provisioning, as required.

Figure 33. Managing Hyper-V Hosts



Managing EqualLogic Storage

Table 9 lists and defines the group members provided in the Active System Manager EqualLogic storage **Operation Center** view.

Table 9. EqualLogic Group Members

Operation	Description
PoolCreate	Creates a new storage pool on an EqualLogic storage array.
PoolAddMember	Adds a storage array to a given storage pool on an EqualLogic storage array.
PoolDelete	Deletes a storage pool present on an EqualLogic storage array.
PoolRename	Renames an existing storage pool present on an EqualLogic storage array.

Managing Volume

Table 10 lists and defines the operations provided in the Active System Manager EqualLogic Storage Operation Center view.

Table 10. EqualLogic Volumes

Operation	Description
VolumeOffline	Offlines a volume present on an EqualLogic Storage Array
VolumeOnline	Onlines a volume present on an EqualLogic Storage Array
VolumeResize	Resizes a volume present on an EqualLogic Storage Array

Managing Storage

The following operations are provided on the Active System Manager EqualLogic Storage **Operation Center** view for performing administrative tasks:

- Storage group-level supported operations
- Storage member-level supported operations

Table 11. Storage Group-Level Supported Operations

Operation	Description	Input Parameter
PoolCreate	Creates a new storage pool in the storage group.	poolName—Storage pool name

Table 12. Storage Member-Level Supported Operations

Operation	Description	Input Parameter
ConfigureRAIDPolicy	Configures the required redundant array of independent disks (RAID) level on an EqualLogic Storage Array.	raidType {raid6 | raid10 | raid50}
UpgradeFirmware	Upgrades the firmware image on an EqualLogic Storage Array.	imageName—Image from repository. delayInMinutesAfterRestart—Introduce a delay between when the firmware is installed and the member storage device is restarted, the RA connects the storage after this defined delay (in minutes) after the restart parameter.

Dashboard Reports

The following sections describe the following Active System Manager dashboard reports:

- Resource Allocation by Sessions Report
- Resource Allocation by Hosts Report
- Resource Allocation by Groups Report
-

- Top Ten Resource Allocation Report
- Top Ten Resource Utilization Report
-

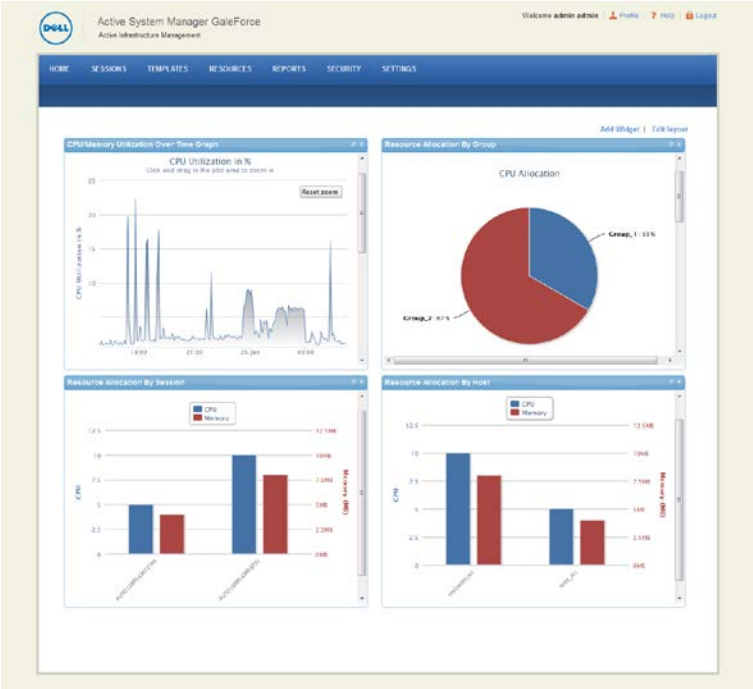
- VM Utilization by Session Report
- Host Utilization (Consolidated) Report
-

- Cluster Utilization (Consolidated) Report
- Storage Utilization (Consolidated) Report

Resource Allocation by Sessions Report

This report provides resource allocation data for sessions which are in a *Running* state. This report displays CPU and memory allocations grouped by Active System Manager session, and can be used to view the CPU and memory allocation in a data center environment at that particular instant.

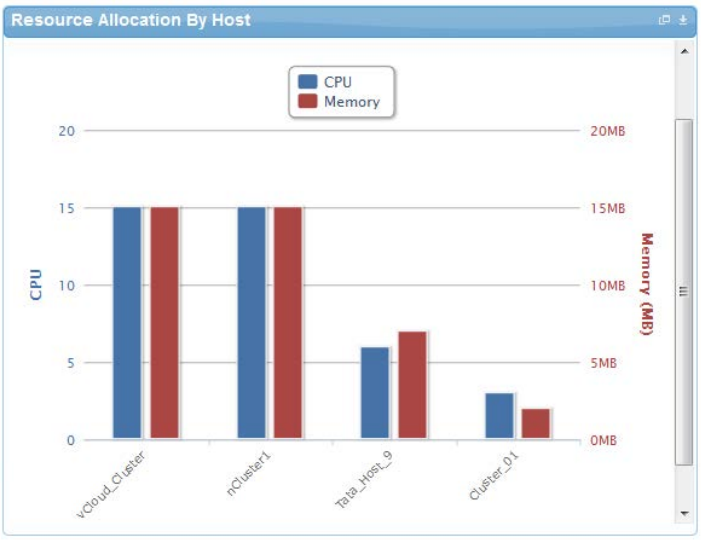
Figure 34. Resource Allocation by Sessions report



Resource Allocation by Hosts Report

This report provides resource allocation data for hosts on which some virtual resources are provisioned in running sessions. This report displays CPU and memory allocations grouped by hosts, and can be used to view a current usage of the CPU and memory allocation per host for a data center.

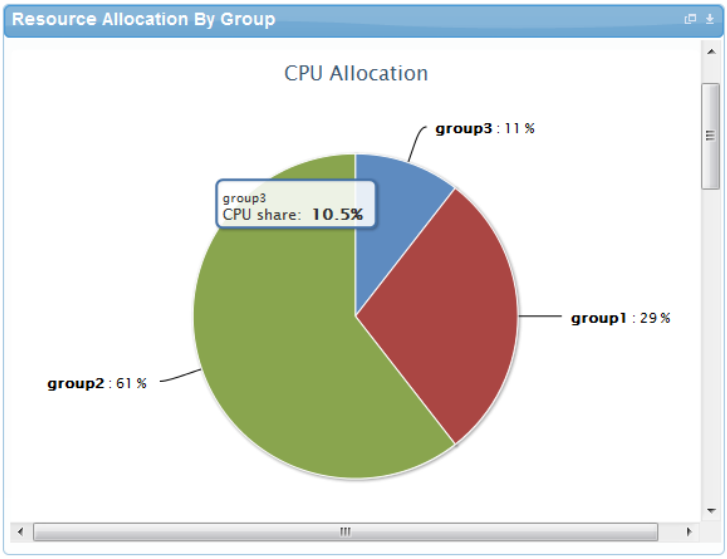
Figure 35. Resource Allocation by Hosts report



Resource Allocation by Groups Report

This report provides resource allocation data for virtual resources that are utilized in sessions owned by members of a group (grouped by group name). This report also captures the current allocation by groups and works for CPU and memory allocation.

Figure 36. Resource Allocation by Groups report



Top Ten Resource Allocation Report

This report includes three sub-options for different groupings:

- **By Host**—Lists top ten hosts which are currently in use and have allocated maximum CPU and memory attributes.
- **By User**—Displays the list of top 10 users who are currently consuming the maximum number of CPUs and memory.
- **By Group**—Similar to By User, but consolidated at the group level.

Figure 37. Top Ten Resource Allocation report

Top Ten Resource Utilization Report

This report is similar to the Top Ten Resource Allocation report; however, this report provides utilization data as opposed to allocation. The required data is made available using a monitoring method that continuously keeps polling the device, VM, or cluster for current utilization data. The data is persisted in the database and the last polled data is provided to the user. This report can be grouped by the following:

- VMs
- Hosts
- Clusters
- Storage

Figure 38. Top Ten Resource Utilization report by cluster

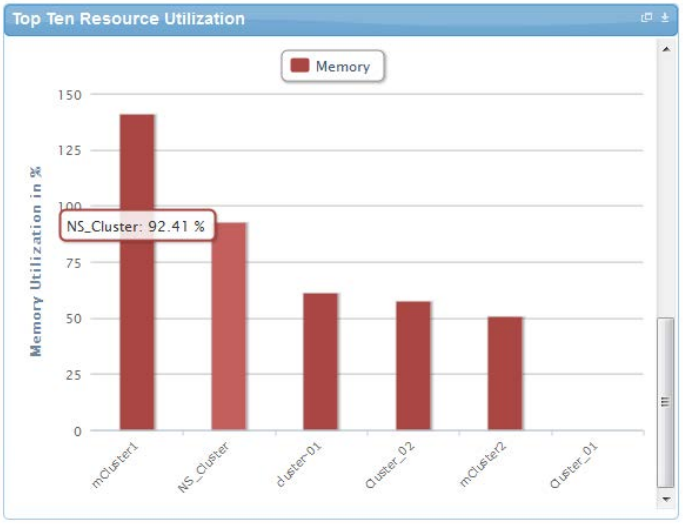
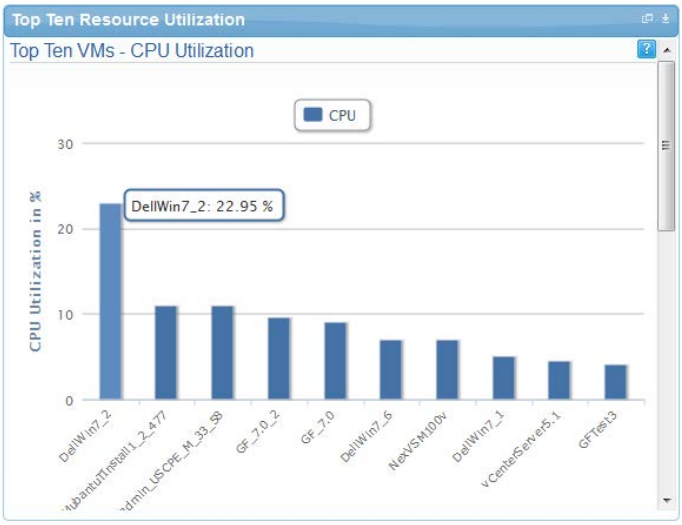


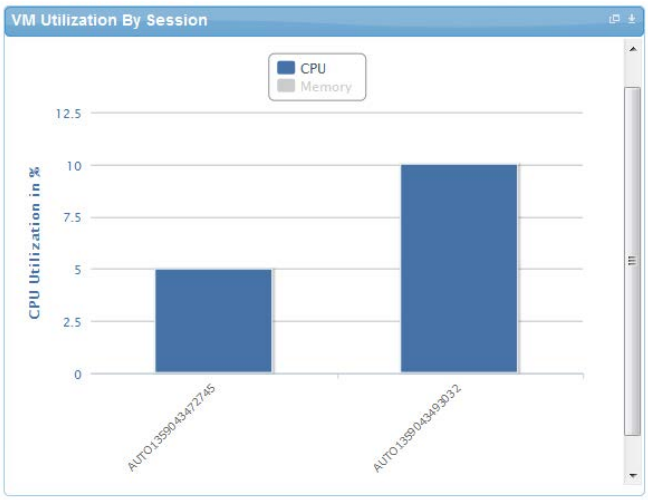
Figure 39. Top Ten Resource Utilization report by host



VM Utilization by Session Report

This report provides the most recent data for CPU and memory utilized on any VM, grouped by sessions. This data is available in terms of percentage with respect to the allocated limits.

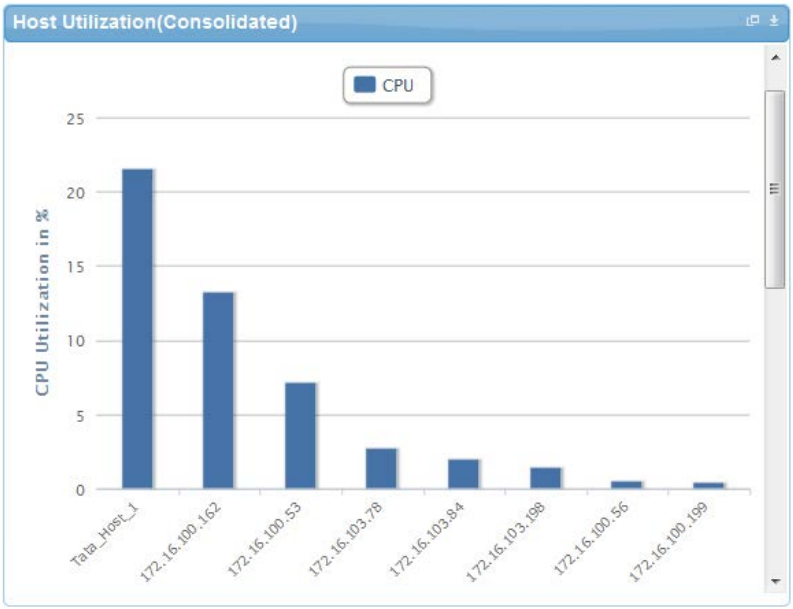
Figure 40. VM Utilization by Session report



Host Utilization (Consolidated) Report

This report displays information about how much capacity is being utilized on a host by all running VMs, with respect to the allocated capacity. This report is available for CPU and memory attributes.

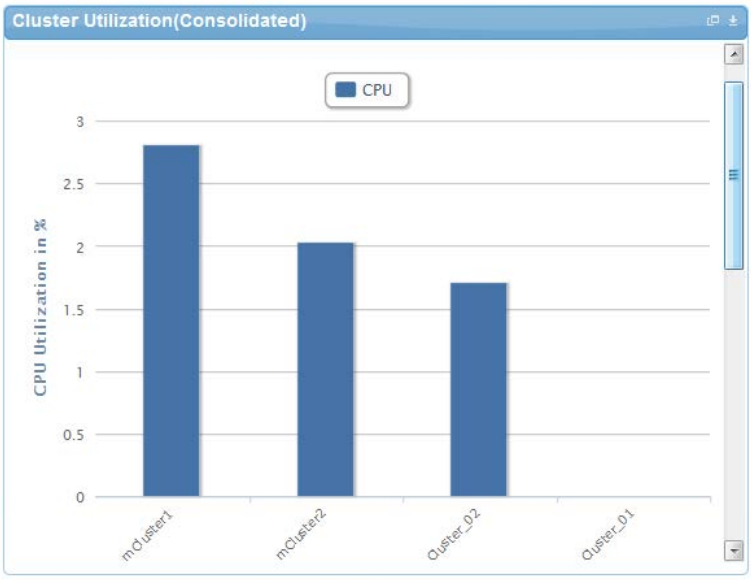
Figure 41. Host Utilization (Consolidated) report



Cluster Utilization (Consolidated) Report

This report is similar to the Host Utilization (Consolidated) report, except that it uses clusters.

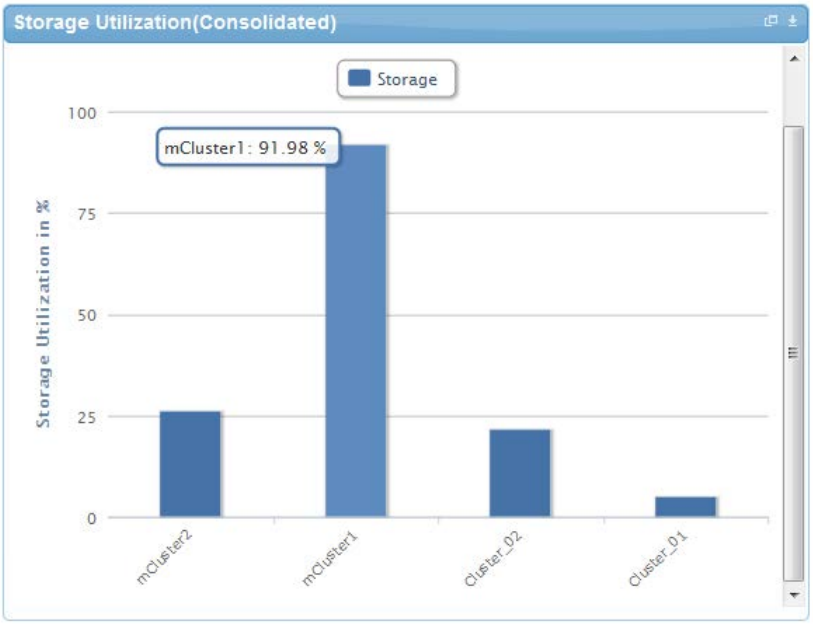
Figure 42. Cluster Utilization (Consolidated) report



Storage Utilization (Consolidated) Report

This report provides storage utilization as a percentage of allocated storage for clusters.

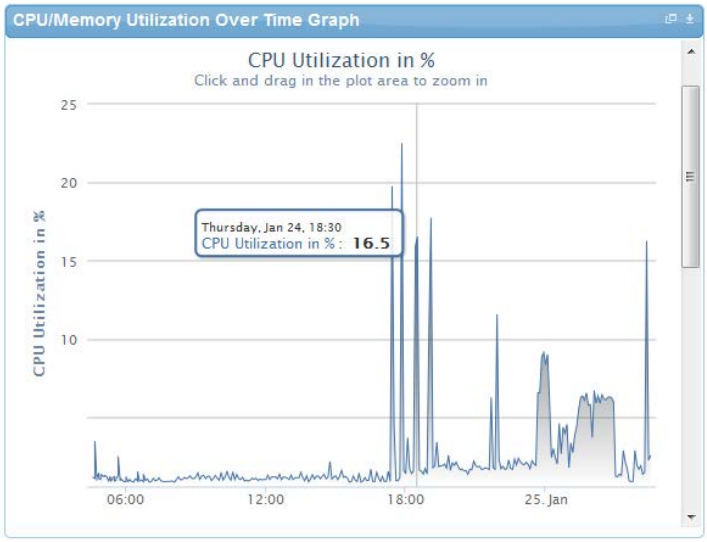
Figure 43. Storage Utilization (Consolidated) report



CPU and Memory Utilization Showback Report

This report provides CPU and memory utilization of hosts in percentage over a period of given time (for example, weekly, daily, and hourly).

Figure 44. CPU & Memory Utilization Showback Report



You can view the data for a specific time interval (with a minimum time interval limit of ten minutes between two data points). To view the specific time interval data, select a point and drag the mouse to a desired data point; this will show the data for the specific time interval. You can reset the time interval to default by clicking **Reset Zoom**.

Appendix A—Bill of Materials

Table 13 displays the bill of materials, grouped by resource adapters.

Table 13. Bill of Material—Resource Adapters

Vendor	Model	Description
Dell	Servers	Dell Servers resource adapter using WSMAN and RACADM CLI used for provisioning the servers
Dell	EqualLogicStorageArray	Management of EqualLogic storage
Dell	EqualLogicStoragePool	Management of EqualLogic storage pool
Dell	PowerConnect-7024	Management of ToR switches
Template	HyperVLib	Microsoft Host Provisioning on Racks
Microsoft	Host	Hyper-V 2012 Management
Microsoft	Virtual Machine	Hyper-V Virtual Machine Instance Management
Microsoft	SQLWorkload	Microsoft SQL Instance Management

Table 14 displays the list of bill of materials, grouped by templates.

Table 14. Bill of Material—Templates

ID	Description	Workflows
1—Physical	AS50 – Cluster Hyper-V 2012 Hypervisor Deployment	Hyper-V Imaging using NFS Network ISO Boot, Hyper-V Clean Up, and Create Additional Storage.
2—Logical	Hyper-V - Logical template with one VM connected to a VLAN	Built-in orchestration.
3—Logical	Hyper-V - Logical template with two VMs connected to a VLAN	Built-in orchestration.
4—Logical	Hyper-V – Microsoft SQL Workload	Hyper-V – Microsoft SQL Workload

Appendix B— Planning Worksheet

Table 15. IP Address Configuration

Equipment	IP Address	Subnet Mask	Gateway	Username	Password
iDRAC for all R620					
PowerConnect 7024 LAN Switch1					
PowerConnect 7024 LAN Switch2					
PowerConnect 7024 SAN Switch1					
PowerConnect 7024 SAN Switch2					
EqualLogic Storage Array Group Management					
EqualLogic Storage Array Group on iSCSI Network					
Active System Manager Appliance					
SCVMM					

VLAN for NIC Configuration

Table 16. VLAN Configuration

Traffic Type	VLAN
Management	
Live Migration	
Cluster Private	
VM Workload	
iSCSI / iSCSI Management	

NOTE: Static IP range for the VM Workload subnet should be available as a prerequisite for running the orchestration.

Appendix C—SCVMM Setup Requirements

Considerations after creating the SCVMM Server:

- The SCVMM server should be a member of an Active Directory domain.
- OpenSSH should be installed on the SCVMM server.

Installing OpenSSH Server on a SCWMM Server

Windows X64 OpenSSH 6.2p1 version should be installed on SCVMM server.

1. Download the **Windows X64 setupssh-6.2p1-2(x64)-v1.exe** version, available at: http://www.mls-software.com/opensshd.html
2. Double-click the **setup.exe** for installation.

   Options that needs to be selected during OpenSSH installation:

   a. In **Install under Local System or SSHD_Server Account** window, select **Run As SSHD_SERVER (Required for W2k3)** and click **Next**.

   b. In **Setup Privilege Separation** window, select **Yes (Required for W2K3)** and click **Next**.

   c. In **Create Password and Group files**, select **Domain Users**, and click **Next**.

Configuring OpenSSH Server on a SCWMM Server

1. Execute the cmd prompt.
2. Go to **bin** directory inside OpenSSH installation directory path:

   `cd <openSSHInstallationDirPath>/bin`

3. Create group file using `mkgroup` command:

   ```
   mkgroup -d > ..\etc\group
   ```

4. Create passwd file using `mkpasswd` command:

   ```
   mkpasswd -d -u Administrator > ..\etc\passwd
   ```

5. Open **etc/sshd_config** file inside openSSH installation directory path using Notepad.
6. Append the following text to the file:

   ```
   Subsystem   sftp   internal-sftp

   PubkeyAuthentication no
   ```

   NOTE: Comment out existing `Subsystem` line before adding the new lines.
7. Restart **opensshd** services using following commands:

   ```
   net stop opensshd

   net start opensshd
   ```

8. Verify the SSH connectivity using any available SSH tool.

Appendix D—Enabling SSH in PowerConnect 7024 switches

1. Telnet to the Powerconnect switch or open the console connection to the switch.
2. Switch to enable mode.
3. Execute the following commands on the switch:

```
Configure

!DSA key generation

crypto key generate dsa

!RSA key generation

crypto key generate rsa

!enable SSH server

ip ssh server


line ssh

login authentication default

enable authentication default

end


write
```

Appendix E—Firmware and Software Base Lineup

The following table lists the minimum recommended firmware/software versions.

Table 17. Firmware and Software Versions

Device	Revision
Host Server(Dell PowerEdge R620)	
BIOS	1.6.0
Backplane Firmware	1.03
iDRAC7 Enterprise	1.40.40
LCC (Life Cycle Controller) 2	1.1.5.165,A00
Network Controller Broadcom FW	7.6, A00
Network Controller Broadcom Driver (NetXtreme II)	17.6.0
Windows Server 2012	Datacenter
Storage Controller H710 FW	21.2.0-0007
Storage Controller H710 Driver	5.2.220.64, A00
EqualLogic HIT KIT	4.6
OpenManage Essentials	1.2
Active System 50 Dell PowerEdge R420 Hyper-V Management Server	
Windows Server 2012	Datacenter
BIOS	1.5.2
iDRAC7 + 8GB vFlash	1.40.40
LCC (Life Cycle Controller)	1.1.5.165, A00
Network Controller Broadcom Firmware	7.6, A00
Network Controller Broadcom Driver (NetXtreme II)	17.6.0
Storage Controller H710 Firmware	21.2.0-0007

Device	Revision
Host Server(Dell PowerEdge R620)	
Storage Controller H710 Driver	5.2.220.64, A00
EQL HIT Kit	4.6
SAN HQ 2.	6.0
OpenManage Essentials	1.2
Switch and Storage	
Dell Networking 7024 Switch Firmware	5.1.0.1 (A13)
EqualLogic PS6100X Firmware	6.0.5

Appendix F—FAQs

1. Volumes on EqualLogic Array are not removed for cancelled sessions. This wastes storage space and consumes iSCSI connections. How do you remove the volumes?

   User should manually cleanup the unused volumes on the EqualLogic storage array and iSCSI connections after session is canceled.

2. Where is the VM created? Is there way to specify in which datastore it gets created?

   The VM will be automatically created in the Cluster Storage Volume (CSV) to provide high availability. The location of the VM cannot be customized.

3. Is there a way to revert a template or import the original template?

   The original templates are available on the appliance in folder **$HOME/DefaultTemplates.**

   As a best practice:

   a. Make a copy of the template and make the required modification in the cloned template.

   b. Keep the copy of the original templates by exporting them locally on a client machine and importing it as needed.

4. What is the difference between synchronize and discovery?

   During the discovery process, the following information is discovered and added to Active System Manager:

   - Inventory information
   - Operation center view
   - Link information

   During the synchronize process, information is discovers only for the **Operation Center** view hierarchy.

5. Are SSI properties overwritten when upgrading the RA?

   Yes, upgrading the RA will override the **ssi.properties** file. As a best practice, before upgrading the RA, backup the RA directory by following the steps given below:

   a. Log in to the Active System Manager server as **delladmin** user.

   b. Run the following commands:

   ```
   cd $HOME/asm-galeforce/gf/common/integrations

   cp –r <manufacturer>/<model> <manufacturer>/<model>_<CurrentDate>
   ```

6. Will images and firmware released after this release of Active System Manager 7.1 work with Active System Manager 7.1?

   Images and firmware versions that are released after Active System Manager 7.1 should work.

7. What is the base level configuration for Dell PowerConnect 7024 switches?

   The base level configuration is the minimal set of configurations running on the switches that bring them to an operational state. Additional details of these configurations can be found in the embedded sample configuration file.

8. Is it a requirement to create pools on the Dell EqualLogic storage array?

   Creating pool is optional. If there are no user-defined pools on the EqualLogic Storage array, then a newly created volume becomes part of the default storage pool. Pools can be created by executing the **PoolCreate** method on the EqualLogic group object in the **Operation Center** View.

9. Is HTTPS supported for connecting to Active System Manager?

   Yes, HTTPS is supported on Active System Manager. The default HTTPS port is 50500.

10. Is terminal server connectivity required for Dell PowerConnect 7024 switches?

    SSH connectivity is mandatory, but telnet connectivity is optional for PowerConnect 7024 switches.

11. Does the default password of the Active System Manager appliance get updated?

    The appliance login password can be changed. If the password is changed, software repositories that are configured on Active System Manager Appliance should be modified with the new password.

12. How would a user know what are the optional parameters in an orchestration step method?

    Parameters with the * sign suffixed in front of them are mandatory and the ones without * sign are optional.

13. How do you change the hostname of the Active System Manager server?

    To change hostname of the Active System Manager server:–

    c. Log in to the Active System Manager as the **root** user.

    d. Open the **/etc/sysconfig/network** file, and specify the new host name in the **HOSTNAME** field.

    e. Update the host name in the **/etc/hosts** file.

    f. Run the `reboot` command to restart the server.

    g. Log in to the server as a delladmin user after restarting the server.

    h. Run the `hostname` command to verify if the new host name is configured as host name.

    i. Stop the Active System Manager services.

    j. Change the directory using **cd $HOME/asm-galeforce/gf/sbin**

    k. Run **./updateHostName.sh** and follow the instructions to configure the host name in the Active System Manager installation.

    l. Delete the following files from the **/home/delladmin/directory:**

- **.ssh/id_rsa**
- **.ssh/id_rsa.pub**

m. Create a password less connection using the command `ssh-keygen`.

n. Start the Active System Manager Services. For details on starting and stopping the Active System Manager services, see Configuring Active System Manager Services.

14. Can I change the default SFTP installation path for Hyper-V RA?

    You can change the default SFTP installation path for Hyper-V RA. The default SFTP installation path is externalized in the Microsoft Host RA **ssi.properties** file. You can update this property from the client in case installation path is different from default SFTP installation path. For example:

    SSIOBJ:scriptPath C:\\Program Files\\OpenSSH\\home

15. When Active System elements are discovered separately, why does template validation fail?

    This is as per design, the DIS links are discovered only when the complete Active System discovery is performed. DIS links are required for Active System Manager template validation

16. Interface mapping (DIS links) between the end devices is not correct as they don't represent the actual location of the end devices.

    Links discovered during discovery don't represent the actual connection between the end devices, those are dummy connections. The DIS links are discovered so that we could represent connection/links in the ASM template. This allows scheduling of the ASM templates with links in ASM template.

17. While creating/editing the server profile template or attaching server profile to a server, can I select firmware files from different repositories?

    No, selected firmware files must belong to a single repository. For example, if you choose iDRAC and BIOS firmware for update; both should be from the same repository.

18. How to remove a server from a session, either to free-up the unused servers or because the server has broken.

    The server can be removed from the session but no cleanup operations are currently performed while removing a specific server from the session. You must cancel the session and then remove the server from a session.

19. When a failover cluster is created, Active System Manager enables **Live Migration** settings for all networks in the cluster.

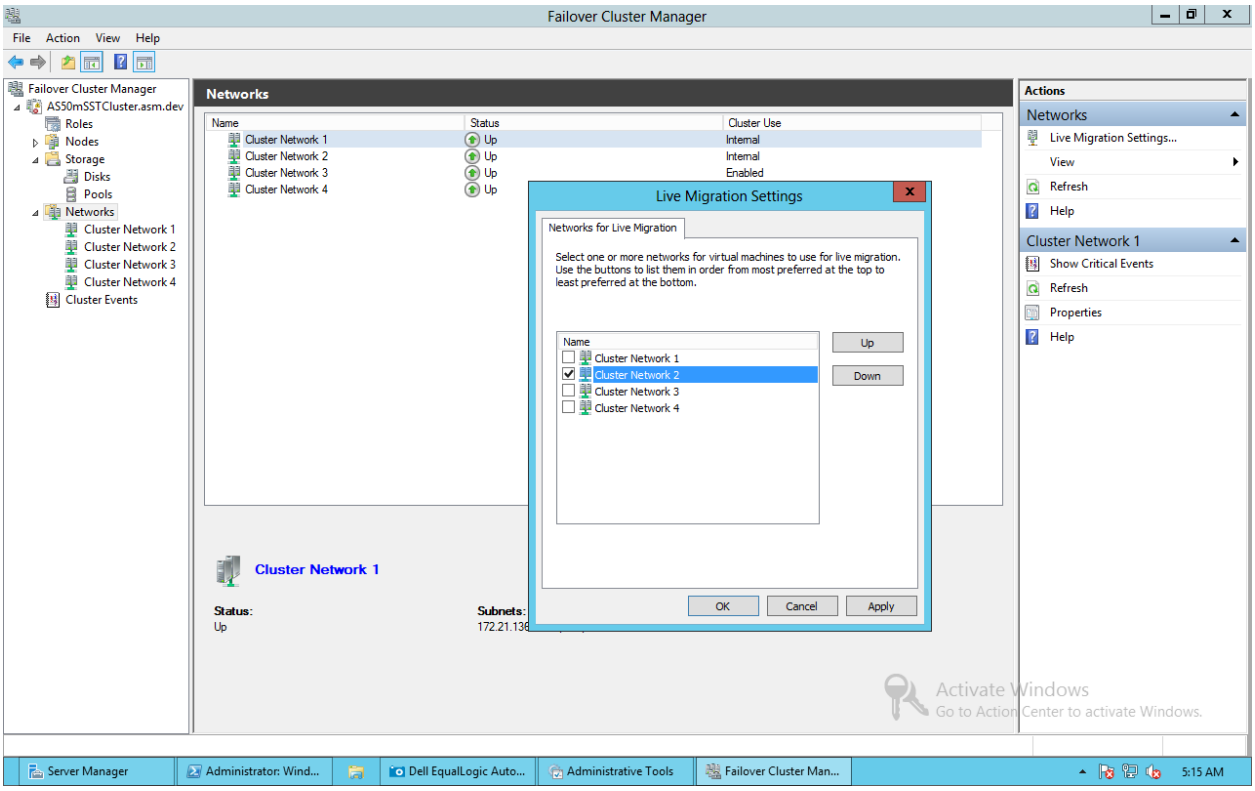
    To disable the Live Migration settings:

    a. Log in to one of the provisioned Hyper-V hosts of the cluster with the domain credentials provided during provisioning.
    b. Open the failover cluster snap-in, **Start**, → **Administrative Tools**, → **Failover Cluster Manager**.
    c. In the **Failover Cluster Manager,** expand the **Cluster** and go to **Networks**.
    d. Right-click on **Networks** and select **Live Migration Setting.**

e. In the **Live Migrations Setting** dialog box, select only the **Cluster Network 2** (Live Migration) as shown below and click **OK**.

NOTE: Make sure that the right Cluster Network is selected for the Live Migration by checking the values for the network connections like **vEthernet(LiveMigration)**.

Figure 45. Live Migration Settings

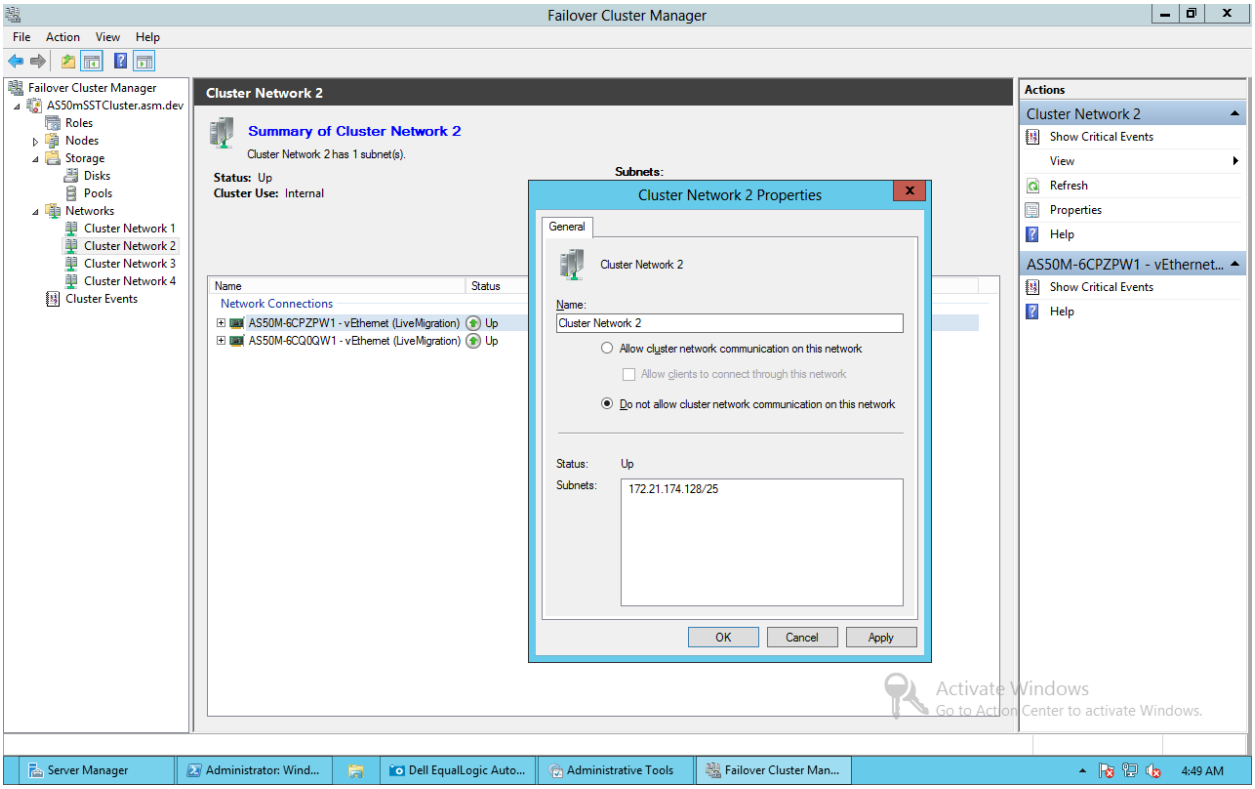


20. After the physical orchestration is completed, the **Allow cluster network communication on this network** option is incorrectly selected for Live Migration and iSCSI.

    To disable the **Allow cluster network communication on this network** option:

    a. Log in to one of the provisioned Hyper-V hosts of the cluster with the domain credentials provided during provisioning.
    b. Open the failover cluster snap-in, **Start**, → **Administrative Tools**, → **Failover Cluster Manager**.
    c. In the **Failover Cluster Manager,** expand the **Cluster** and go to **Networks**.
    d. Right-click on **Cluster Network 2** (Live Migration) and select **Properties.**
    e. In the **Cluster Network 2 Properties** dialog box, select **Do not allow cluster network communication on this network** and click **OK**.

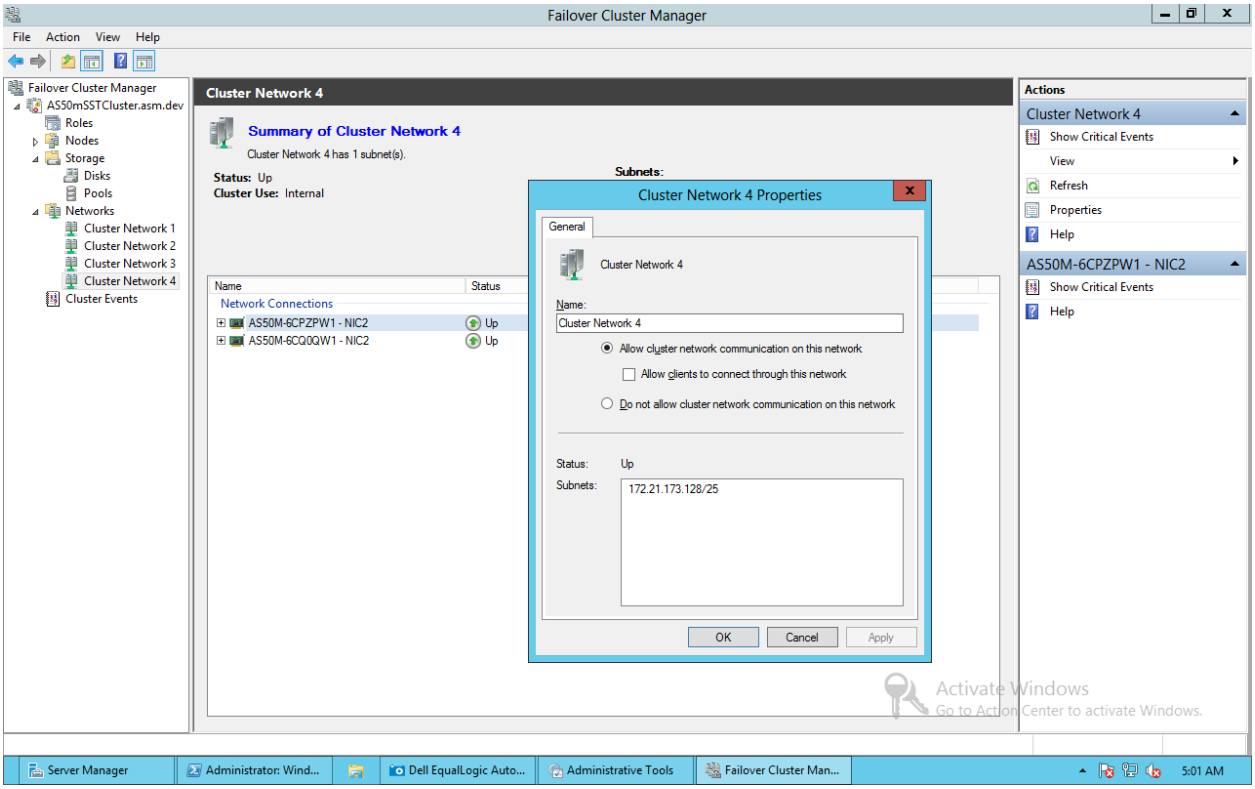
Figure 46. Cluster Network 2 Properties



f. Right-click on **Cluster Network 4**(iSCSI) and select **Properties.**

g. In the **Cluster Network 4 Properties** dialog box, select **Do not allow cluster network communication on this network** and click **OK**.

Figure 47. Cluster Network 4 Properties



NOTE:

- Make sure that the right Cluster Network is selected for the Live Migration by checking the values for the network connections like **vEthernet(LiveMigration)**.
- Make sure that the right Cluster Network is selected for the iSCSI by checking the values for the network connections like **NIC2** or similar.

21. Why are orchestrations failing on servers with dual SD cards?

    If a server has dual SD cards, the BIOS setting must be set to mirror mode to avoid orchestration failures.

22. How do I increase the number of logical deployments that can run concurrently on the system?

    For better performance of the individual sessions, the appliance has a default limit of 10 parallel actions. Logical sessions are long-running, so deploying more than 10 at a time will cause the system to queue up sessions greater than 10. This will also prevent other logical or virtual actions from being run until the logical jobs clear. If you need to run large batches of logical jobs, the SSH session limit can be increased to allow other actions to be performed while those jobs are running.

    The SSH session limit for parallel execution is set to 10 by default on the appliance. However, the session limit can be configured based on your requirements and if you are facing bottlenecks because of it. Active System Manager has been validated with parallel executions. Therefore, to reduce the waiting time, it is recommended to set the thread pool size and parallel execution count to less than or equal to 50.

To change the Parallel SSH execution limit on the appliance to 50:

a. Log in as delladmin user.

b. Open the `./common/etc` folder using the following command:

```
cd asm-galefore/gf/common/etc
```

c. Open the **remoteExecServer.xml** file and set the value for the following parameters to less than equal to 50:

- **Set poolsize –** Attribute in the threadpool node
- **Set executioncount –** Attribute in maxparallel node

d. Run the **reboot** command to restart the server.

23. Using Active System Manager, can I create an IP pool based on class A/B/C address in SCVMM?

Active System Manager supports IP pool creation in SCVMM, which utilizes the complete class A/B/C address. Active System Manager does not support dividing a class address into multiple subnets.

If the requirement is to use a class address, which is divided into multiple subnets, then you should manually create the IP Pool in SCVMM and associate the same with the required VLAN in the SCVMM.