Ruckus Wireless™ Virtual SmartZone™

Getting Started Guide for SmartZone 3.4

Part Number: 800-71296-001 Rev C
Published: 13 December 2017
www.ruckuswireless.com

Contents

Copyright Notice and Proprietary Information
Document Conventions
Documentation Feedback
Online Training Resources

1 About This Guide

2 Preparing to Install the vSZ

Obtaining the vSZ Distribution....13
Preparing the vSZ Interface Settings to Use....13
Determining the System Resources That Virtual Machine Requires....14

3 Installing the vSZ on a Hypervisor

Preparing a Hypervisor....16
Installing the vSZ on VMWare vSphere Hypervisor....16
Before You Begin....16
Creating a vSZ Instance from the OVA File....16
Allocating Resources and Assigning Network Interfaces....27
Powering on the vSZ virtual machine....29
Installing the vSZ on Windows Server Hyper V....29
Installing the vSZ on a Kernel based Virtual Machine Hypervisor....39
Extracting the vSZ Image....39
Setting Up the vSZ....42

4 Installing the vSZ on Microsoft Azure

Logging into Microsoft Azure....51
Creating a Storage Account and Container....55
Uploading the vSZ Image to Microsoft Azure....57
Creating a vSZ Image on Microsoft Azure....59
Creating a Network....61
Creating a vSZ Virtual Machine....63
Configuring Port Numbers for Virtual Machines....69
Assigning a Static Public IP Address to a VM....73

Assigning a Static Internal IP Address to a Virtual Machine.....77

5 Installing vSZ on the Google Computing Engine

Logging into GCE and Selecting a Project.....83
Creating a Storage Bucket.....86
Uploading the vSZ image to a Storage.....90
Creating a vSZ Image for Virtual Machines.....91
Creating Networks and Configuring Firewall Rules.....95
Creating Virtual Machine (VM) Instances.....98

6 Installing vSZ on Amazon Web Services

Installing AWS CLI.....104
Creating a VM Import Service Role.....105
Installing vSZ on AWS.....106
Logging into AWS.....106
Creating a Storage Bucket.....107
Uploading vSZ Image to a Storage.....109
AWS Service Policy.....110
Importing vSZ Image.....111
Creating vSZ Instance.....113
Configuring AWS for a vSZ Instance.....120
Attach a New Disk Volume.....120
Allocate a Public IP Address.....121
Change Security Group.....123
Deleting a vSZ Instance.....124

7 Configuring the Virtual Machine Interfaces

Setting Up the vSZ with One Interface.....126
Setting Up the vSZ with Three Interfaces.....130
Important Notes About Selecting the System Default Gateway.....133

8 Using the Setup Wizard to Install vSZ

Before You Begin.....134
Step 1: Start the Setup Wizard and Set the Language.....134
Step 2: Select the Profile Configuration That Corresponds to Your vSZ License.....135
Step 3: Configure the Management IP Address Settings.....136
Important Notes About Selecting the System Default Gateway.....142

Step 4: Configure Dual Mode IP Address Settings Using CLI....142
Step 5: Configure the Cluster Settings....150
If This vSZ Is Forming a New Cluster....151
If This vSZ Is Joining an Existing Cluster....152
Step 6: Set the Administrator Password....153
Step 7: Changing the Administrator Password....154
To change the password using CLI mode: 154
Step 8: Verify the Settings....154
Logging On to the Web Interface....156

9 Configuring the vSZ High Scale for the First Time

Creating an AP Zone....158
Configuring AAA Servers and Hotspot Settings....161
Adding an AAA Server....161
Creating a Hotspot Service....163
Creating a Registration Rule....165
Configuring the Rule Priority....166
Defining the WLAN Settings of an AP Zone....167
General Options....169
WLAN Usage....169
Authentication Options....170
Encryption Options....170
Authentication and Accounting Service....171
Options....171
RADIUS Options....171
Advanced Options....172
Configuring DHCP Option 43....173
Verifying That Wireless Clients Can Associate with a Managed AP....174
What to Do Next....175

10 Ensuring That APs Can Discover the Controller on the Network

Is LWAPP2SCG Enabled on the Controller....176
Obtaining the LWAPP2SCG Application....177
Enabling LWAPP2SCG....177
Method 1: Perform Auto Discovery of the Controller Using the SmartLicense Server....177
Method 2: Perform Auto Discovery on Same Subnet then Transfer the AP to Intended Subnet....178

Method 3: Register the Controller with the DNS Server....178
Method 4: Configure DHCP Option 43 on the DHCP Server....180
Method 5: Manually Configure the Controller Address on the AP's Web Interface....183
What to Do Next....184
Bandwidth Consumption During AP Upgrade on vSZ....185

11 Upgrading the Controller for Microsoft Azure, AWS, and GCE Platforms

Performing the Upgrade....186
Verifying the Upgrade....189
Rolling Back to a Previous Software Version....189
Backing Up and Restoring Clusters....190
AP-SCG/SZ/vSZ/vSZ-D Communication

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Document Conventions

Table 1: Text conventions on page 7 and Table 2: Notice conventions on page 7 list the text and notice conventions that are used throughout this guide.

Table 1: Text conventions

Convention	Description	Example
`message phrase`	Represents messages displayed in response to a command or a status	`[Device Name] >`
`user input`	Represents information that you enter	`[Device Name] > set ipaddr 10.0.0.12`
user interface controls	Keyboard keys, software buttons, and field names	Click **Create New**
Start > **All Programs**	Represents a series of commands, or menus and submenus	Select **Start** > **All Programs**
ctrl+**V**	Represents keyboard keys pressed in combination	Press **ctrl**+**V** to paste the text from the clipboard.
screen or page names		Click **Advanced Settings**. The **Advanced Settings** page appears.
`command name`	Represents CLI commands	
parameter name	Represents a parameter in a CLI command or UI feature	
variable name	Represents variable data	*{ZoneDirectorID}*
`filepath`	Represents file names or URI strings	`http://ruckuswireless.com`

Table 2: Notice conventions

Notice type	Description
NOTE:	Information that describes important features or instructions
CAUTION:	Information that alerts you to potential loss of data or potential damage to an application, system, or device

Notice type	Description
WARNING:	Information that alerts you to potential personal injury

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https://training.ruckuswireless.com.

About This Guide

1

This Virtual SmartZone™ (vSZ) Getting Started Guide provides information on how to set up the vSZ virtual appliance on the network. You can install the vSZ on any of the supported hypervisors.

Topics covered in this guide include preparing your chosen hypervisor. installing the vSZ image on to the hypervisor, and completing the vSZ Setup Wizard.

This guide is intended for use by those responsible for installing and setting up network equipment. Consequently, it assumes a basic working knowledge of local area networking, wireless networking, and wireless devices.

NOTE: If release notes are shipped with your product and the information there differs from the information in this guide, follow the instructions in the release notes.

Most user guides and release notes are available in Adobe Acrobat Reader Portable Document Format (PDF) or HTML on the Ruckus Wireless Support website at https://support.ruckuswireless.com/documents.

Document Conventions

Table 1 and Table 2 list the text and notice conventions that are used throughout this guide.

Table 3: Text Conventions

Convention	Description	Example
monospace	Represents information as it appears on screen	`[Device name]>`
monospace bold	Represents information that you enter	`[Device name]>` **set ipaddr 10.0.0.12**
italics	Screen or page names	Click **Advanced Settings**. The *Advanced Settings* page appears.

Table 4: Notice Conventions

Notice Type	Description
NOTE	Information that describes important features or instructions
CAUTION!	Information that alerts you to potential loss of data or potential damage to an application, system, or device

Notice Type	Description
WARNING!	Information that alerts you to potential personal injury

Related Documentation

For a complete list of documents that accompany this release, refer to the *Release Notes*.

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- Document title
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- Page number (if appropriate)

For example:

- Virtual SmartZone (vSZ) Getting Started Guide
- Part number: 800-71029-001
- Page 88

Preparing to Install the vSZ

2

In this chapter:

- Obtaining the vSZ Distribution
- Preparing the vSZ Interface Settings to Use
- Determining the System Resources That Virtual Machine Requires

Obtaining the vSZ Distribution

You have to download the .OVA file and documentation for the controller from the vSZ download page on the Ruckus Wireless support website. The vSZ distribution package, which is based on the Open Virtualization Format (OVF) framework, consists of a virtual appliance.

Preparing the vSZ Interface Settings to Use

vSZ comes with the option to operate with either one (1) network interface or three (3) network interfaces. Once the network interface configuration has been made and setup executed, the number of network interfaces can no longer be modified.

CAUTION: If you choose to operate the vSZ with three network interfaces, you must configure the three vSZ interfaces to be on three different subnets when you run the Setup Wizard. Failure to do so may result in loss of access to the web interface or failure of system functions and services.

- IP address
- Netmask
- Gateway
- Primary DNS server
- Secondary DNS server

Table 5: vSZ interfaces

Interface	Description
AP	Used for AP configuration and client traffic
Cluster	Used for cluster traffic
Management (Web)	Used for management traffic. The IP address that you assign to this interface will be the IP address at which you can access the vSZ web interface.

Determining the System Resources That Virtual Machine Requires

The number of APs and clients that vSZ can support depends on the system resources (CPU and memory) that the virtual machine running vSZ has.

vSZ is capable of automatically scaling to and supporting a higher number of APs and clients if it determines, at system bootup, that there is sufficient CPU and memory on the virtual machine to support more APs and clients. Table 6: High Scale profile configuration: Recommended system resources on page 14 and Table 7: Essentials profile configuration: Recommended system resources on page 15 list the maximum recommended number of APs and clients that the vSZ can support based on the available vCPU and memory available on the virtual machine. The first row in Table 6: High Scale profile configuration: Recommended system resources on page 14, for example, shows that to support up to 100 APs, the vSZ must have at least 2-core CPU and 13GB of RAM. Whenever the CPU or memory settings are changed, the virtual controller instance must be rebooted for the updated settings to be applied to it.

CAUTION: When either the AP count or the wireless client count reaches the maximum limit specified in the tables, you must allocate additional system resources to the VM. For example, if a VM is allocated with Level 1 resources to handle 100 APs and the AP count increases to 101, you must update the VM to Level 2 resources to prevent performance-related issues.

All resource levels in the following tables are provided based on Intel Xeon CPU E5- 2630v2 @2.60 GHz. If the server on which you are hosting the controller software is using a different CPU generation and/or model, it may perform differently. In this case, CPU adjustments can be made to generate the same level of performance.

CAUTION: The minimum memory and CPU requirements have changed in this release. You may need to upgrade your infrastructure before upgrading. Please read carefully. This is the minimum requirement recommended.

Table 6: High Scale profile configuration: Recommended system resources

Nodes per Cluster	AP Count per Cluster		Client Count	Disk Size	vCPU	RAM	Preserved Events	Resource Level
	From	To	To	GB	Core	GB	To	
3-4	10,001	30,000	300,000	600	24	48	3M	8
1-2	2,501	10,000	100,000	600	24	48	3M	7
1-2	1,001	2,500	50,000	300	6	19	1.5M	6
1-2	501	1,000	20,000	100	4	15	600k	5
1-2	101	500	10,000	100	4	14	300k	4
1-2	1	100	2,000	100	2	13	60k	3

Table 7: Essentials profile configuration: Recommended system resources

Nodes per Cluster	AP Count per Cluster		Client Count	Disk Size	vCPU	RAM	Preserved Events	Resource Level
	From	To	To	GB	Core	GB	To	
3-4	1,025	3,000	60,000	250	8	23	10k	3
1-2	101	1,024	25,000	250	8	23	10k	2
1-2	1	100	2,000	100	2	15	1k	1

Clustering Limitations for vSZ-H

- vSZ-H supports up to 10,000 APs per node or 30,000 APs per cluster, assuming proper system resources are made available. It supports clustering of up to 4 nodes when using Resource Level 7.
- At 4 nodes, the maximum number of APs and clients that can be supported are 30,000 and 300,000 respectively.

Clustering Limitations for vSZ-E

- vSZ-E supports up to 1024 APs per node or 3000 APs per cluster, assuming proper system resources are available. It supports clustering of up to 4 nodes when using Resource Level 2.
- Above 2 nodes in a cluster at Resource Level 2, additional 2 CPU cores need to be added to each node to support the added search capabilities and replication.
- At 4 nodes, the maximum number of APs and clients that can be supported are 3,000 and 60,000 respectively.
- NAT operation for vSZ cluster – Currently, each node requires its own public IP address for its NAT'ed interface. As such, a 1:1 NAT is recommended for setting up a cluster behind a NAT environment.

Installing the vSZ on a Hypervisor 3

In this chapter:

- Preparing a Hypervisor
- Installing the vSZ on VMWare vSphere Hypervisor
- Installing the vSZ on Windows Server Hyper V
- Installing the vSZ on a Kernel based Virtual Machine Hypervisor

Preparing a Hypervisor

This section lists the hypervisors (and their release versions) on which you can install the vSZ.

Table 8: Hypervisors that the vSZ supports

Vendor	Hypervisor	Version
VMWare	ESXi	5.5 and later
Windows	Windows Server Hyper-V	Windows Server Hyper-V (2012 R2)
KVM	CentOS	7.0 (64bit)

Installing the vSZ on VMWare vSphere Hypervisor

You have to install the vSZ on a VMWare vSphere hypervisor.

Before You Begin

You have to complete the prerequisites before installing the vSZ on VMWare vSphere.

Verify that you have the prerequisites before installing the vSZ on VMWare vSphere.

- Verify that vSphere client is installed.
- You can deploy the vSZ only on hosts that are running ESXi version 5.5 and later.
- The vSZ appliance requires at least 100GB of disk space and is limited to a maximum size of 600GB. The vSZ appliance can be deployed with thinprovisioned virtual disks that can grow to the maximum size of 600GB.

Creating a vSZ Instance from the OVA File

You can create a vSZ instance using the vSphere Web Client.

Before continuing, ensure you have already downloaded the vSZ distribution package from the Ruckus Wireless. See Obtaining the vSZ Distribution for more information.

Follow these steps to create a vSZ instance from the OVA file.

1. Use the VMWare vSphere client to log on to the ESXi management interface.
2. Click **File**> **Deploy OVF Template**. The Source screen of the **Deploy OVF Template** wizard appears.

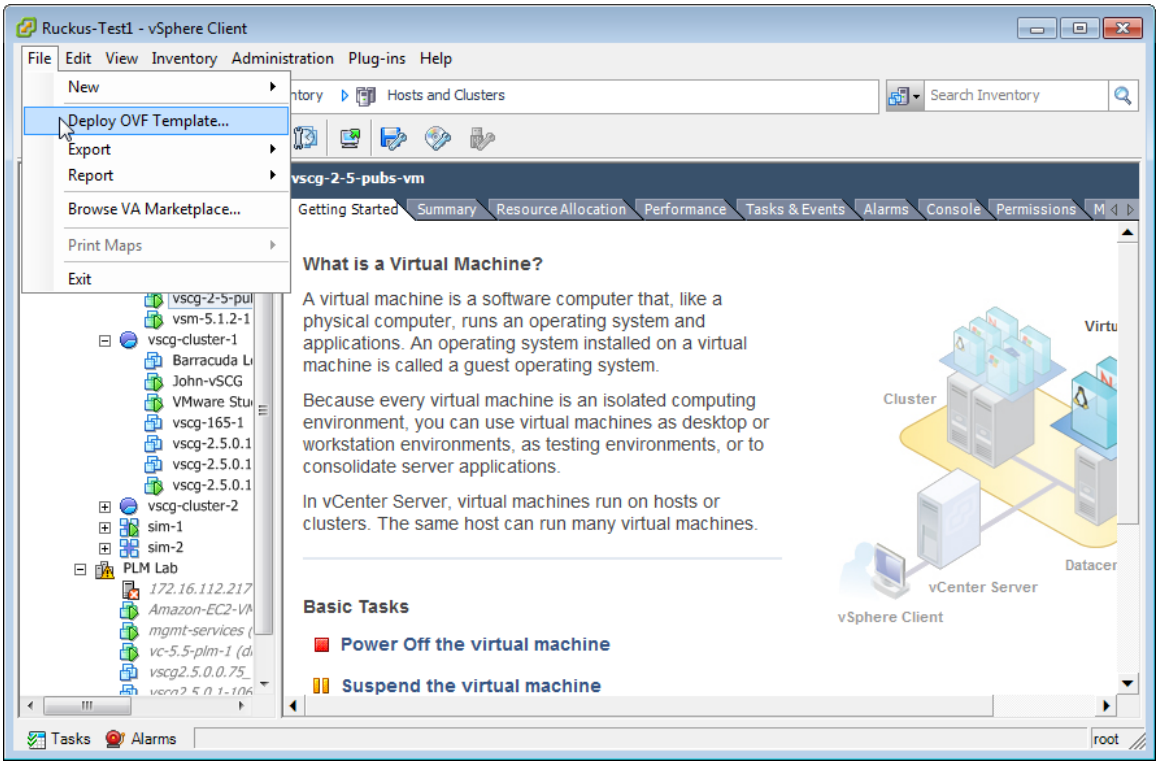


Figure 1: Click Deploy OVF Template

3. Click **Browse** to locate the .ova file that you downloaded earlier. Select the template.

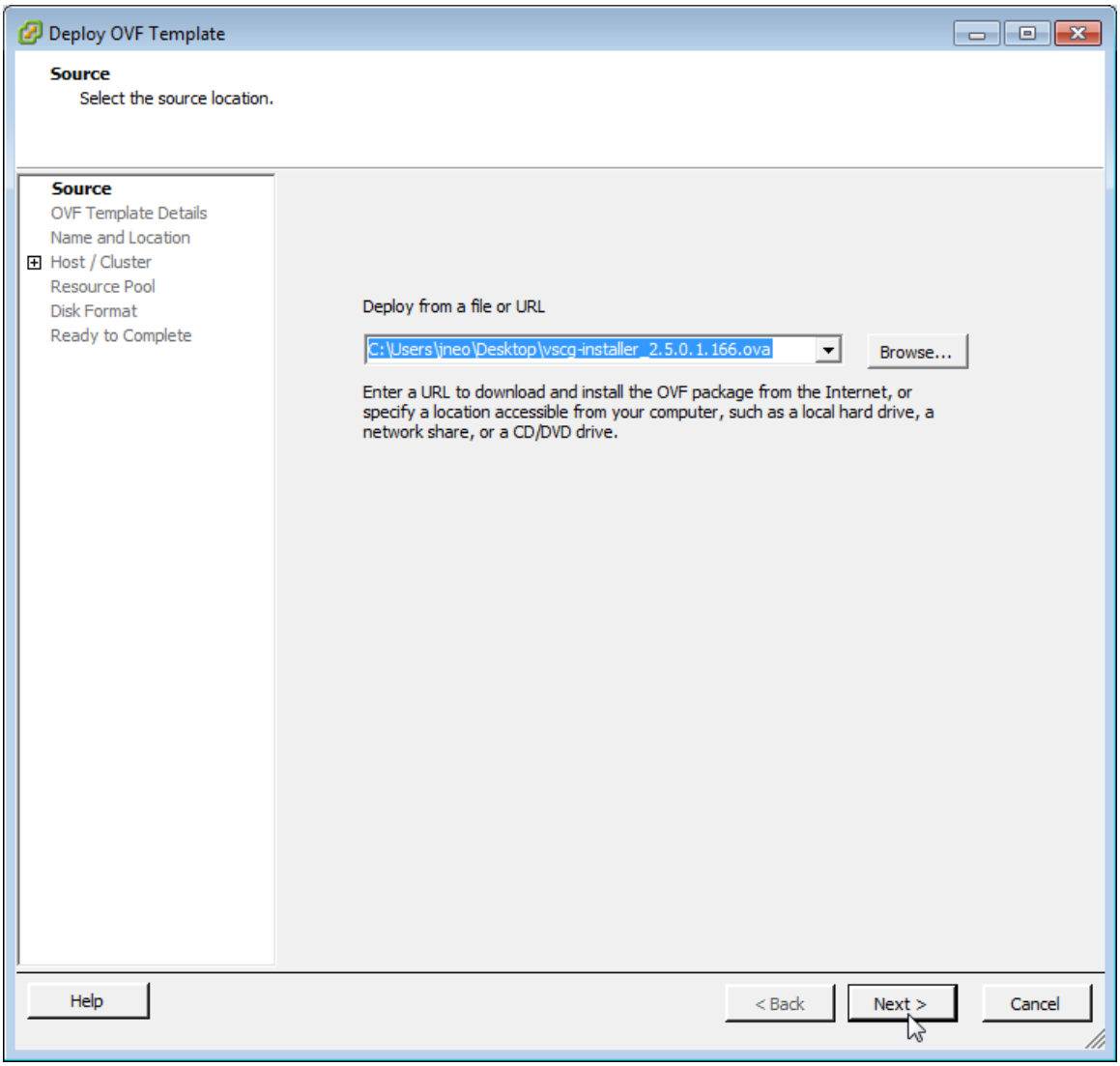


Figure 2: Click Browse, and then locate and select .ova file

4. Click **Next**. The **OVF Template Details** screen appears.

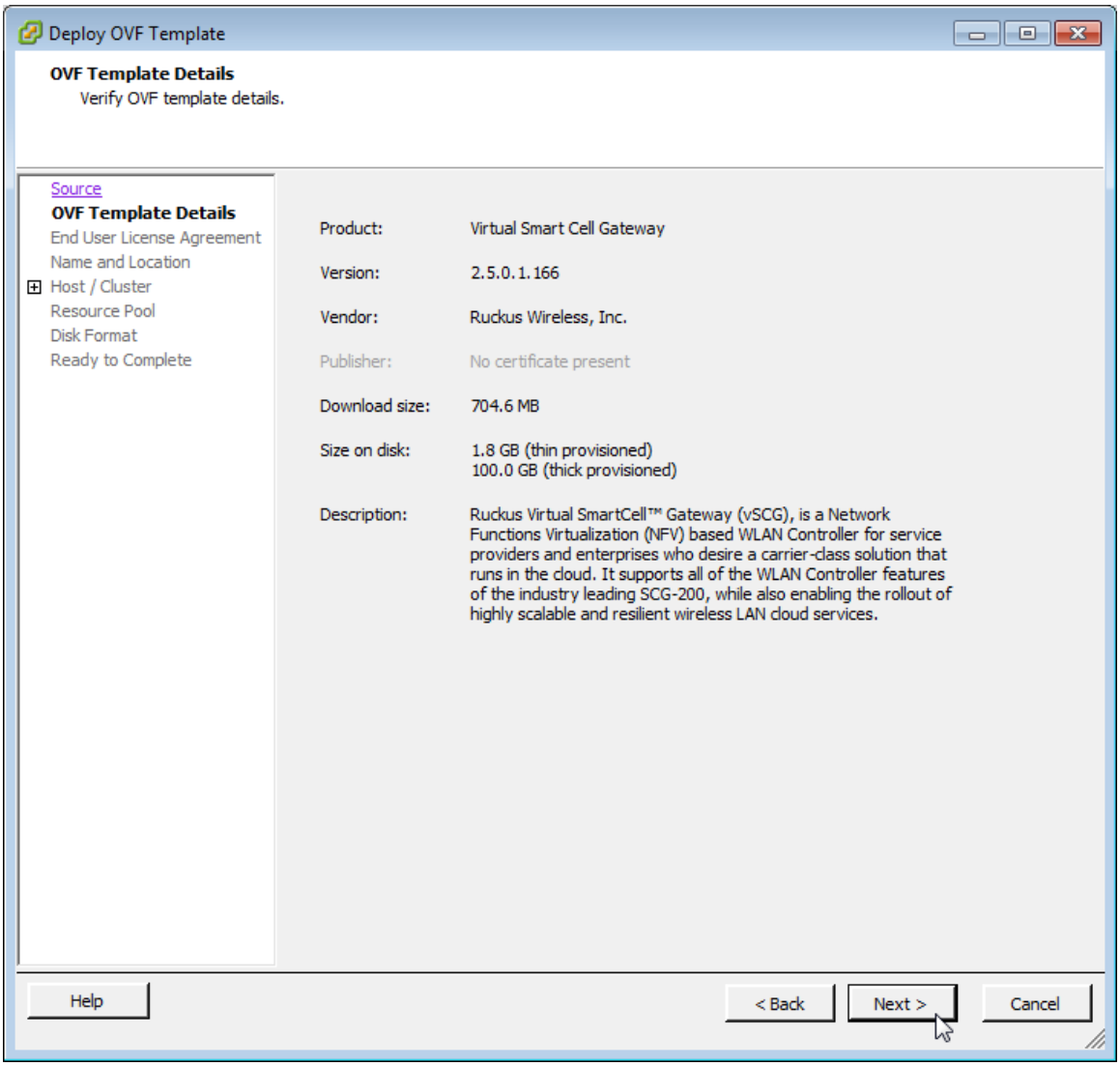


Figure 3: The OVF Template Details screen

5. Review the OVA virtual appliance details, and then click **Next**. The End User License Agreement (EULA) screen appears.
6. Click **Accept** to agree to the EULA terms, and then click **Next**. The **Host/Cluster** screen appears.

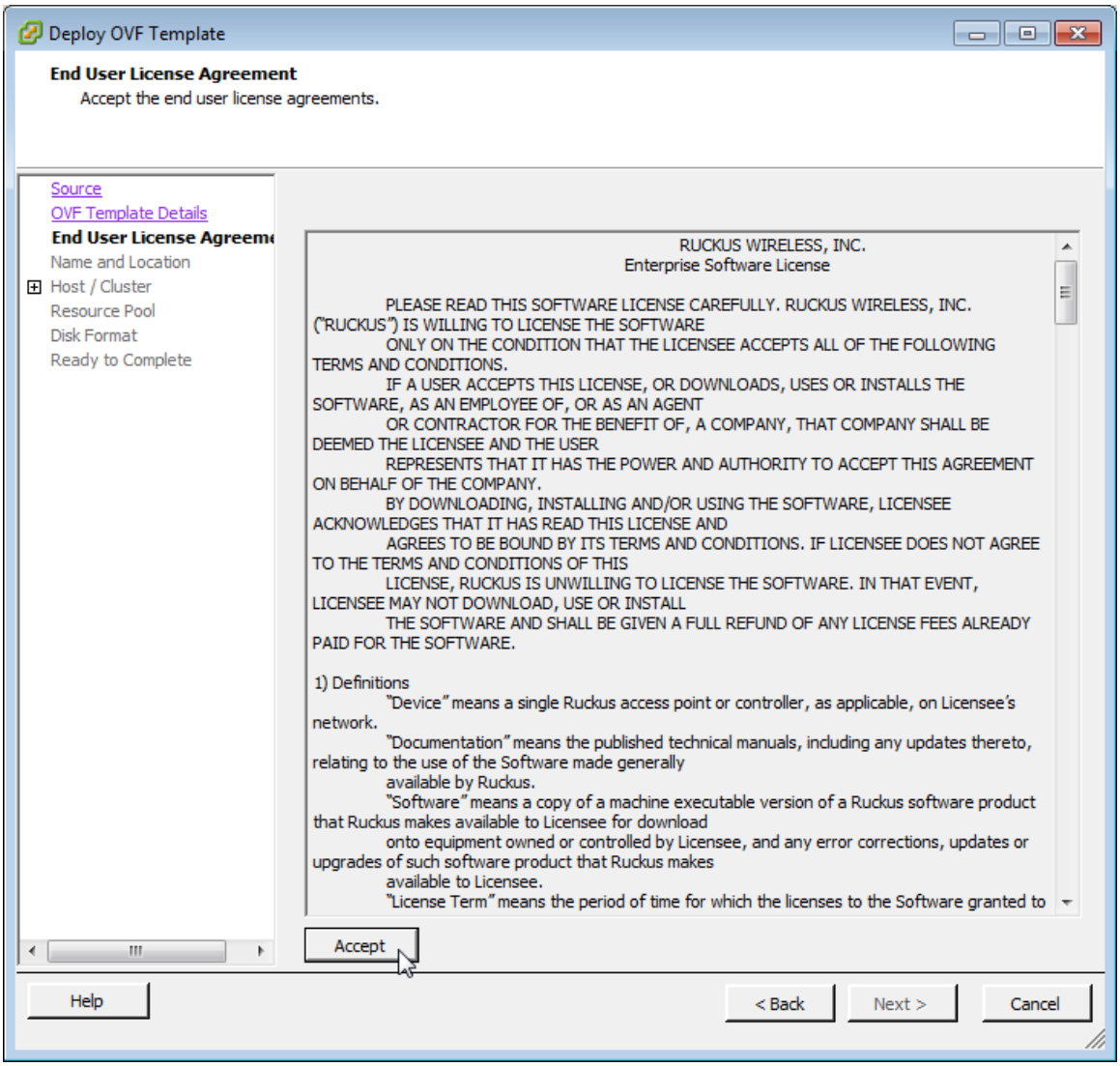


Figure 4: Accept the EULA for the vSZ OVA

7. Select the host or cluster on which you want to run the deployed template, and then click **Next**. The **Resource Pool** screen appears.

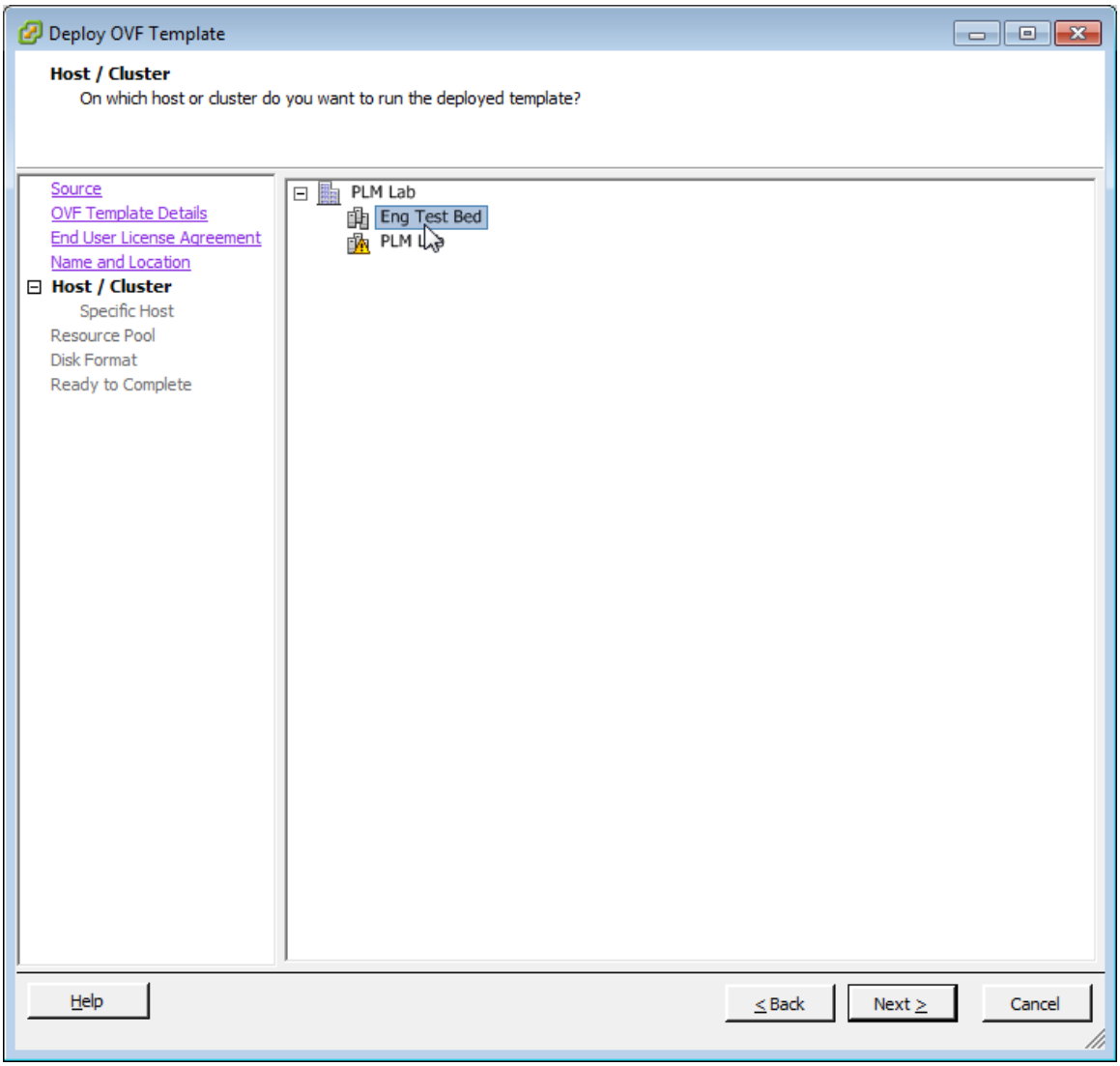


Figure 5: Select the destination host or cluster

8. Select the resource pool within which you want to deploy the template, and then click **Next**. The storage screen appears.

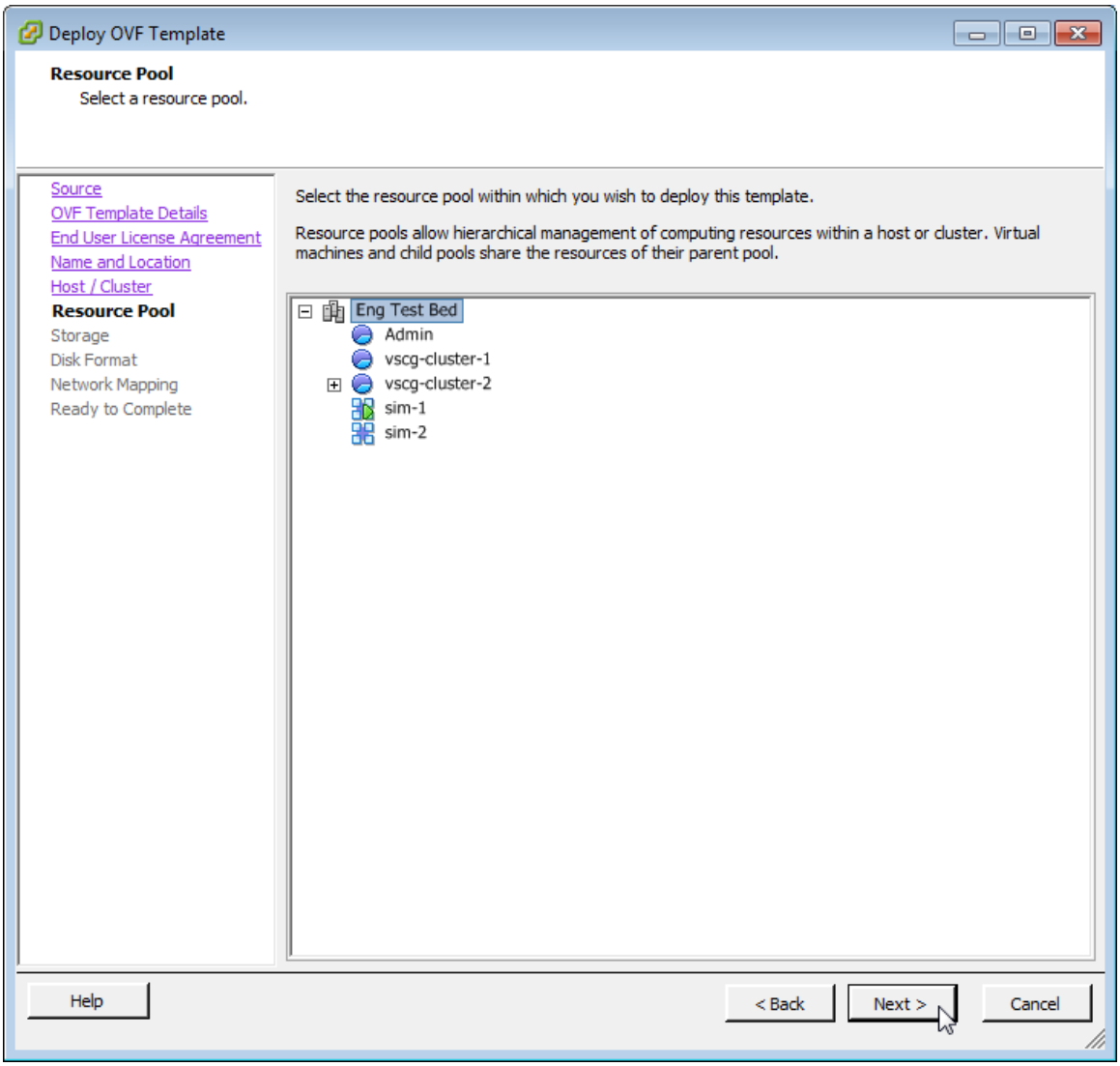


Figure 6: Select the resource pool for the OVA template

9. Select the destination storage (data store) for virtual machine files, and then click **Next**. The **Disk Format** screen appears.

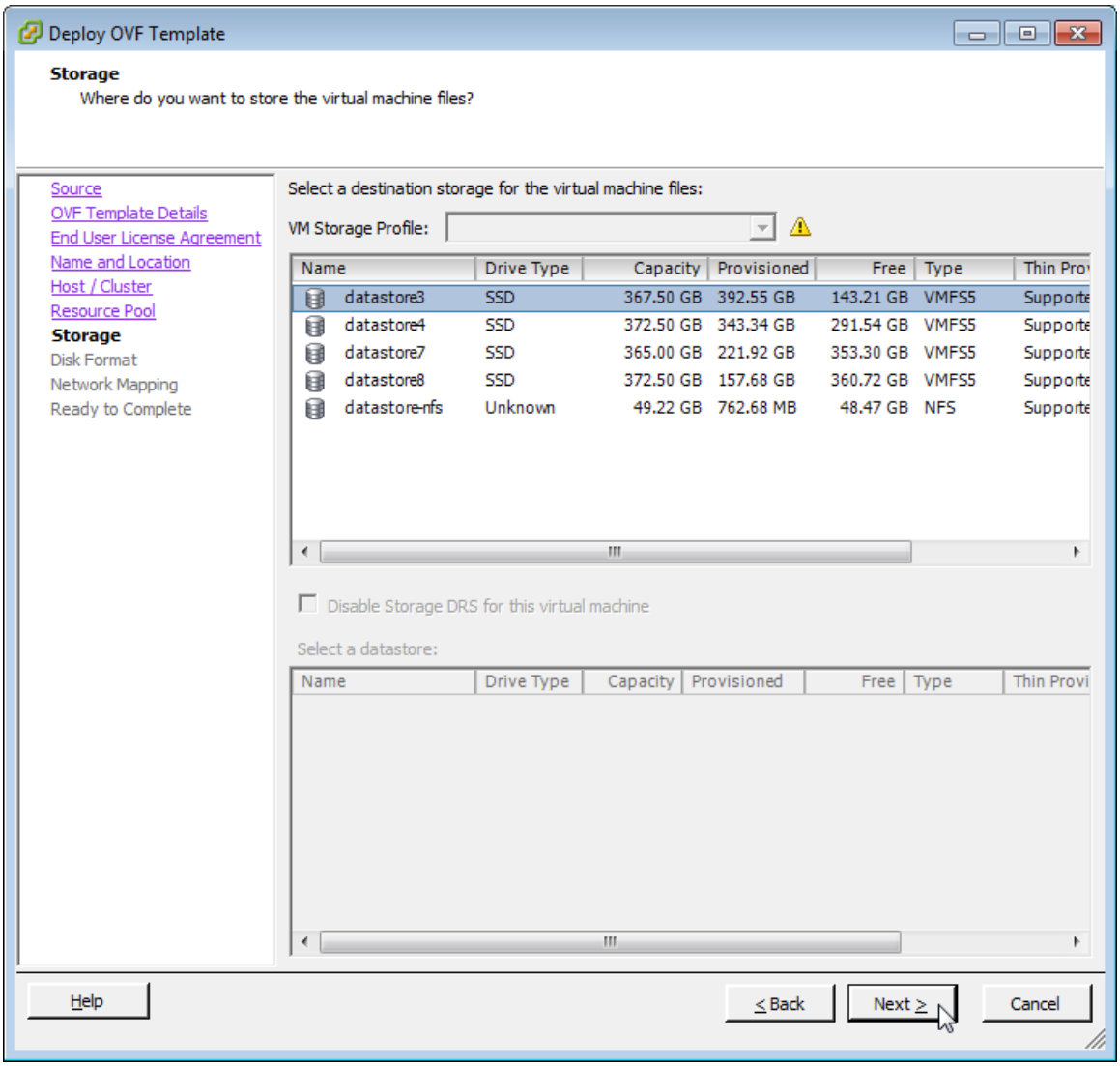


Figure 7: Select the data store for the virtual machine files

10. Select the disk format that is appropriate for your deployment scenario. Options include:
    - Thick Provision Lazy Zeroed
    - Thick Provision Eager Zeroed
    - Thin Provision

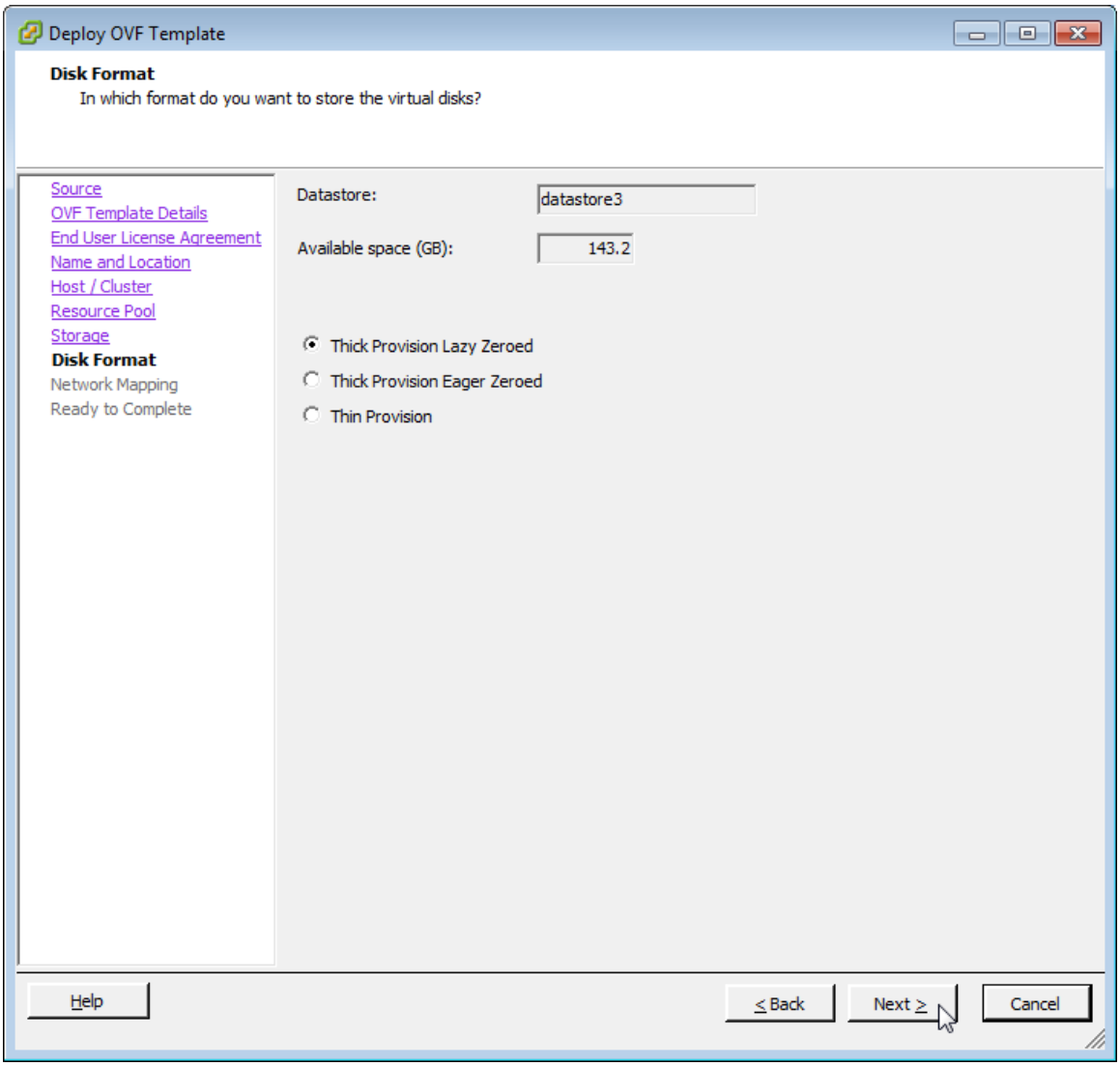


Figure 8: Select the disk format for your deployment scenario

11. Click **Next**. The **Network Mapping** screen appears.
12. Select the ESXi virtual network interface that you want to use for the control interface, and then click **Next**. The **Ready to Complete** screen appears.

    The installation screen only allows you to select the virtual network interface for the control interface. After you complete the installation (and before you power on and set up the vSZ), you will need to adjust the cluster and management interfaces as appropriate.

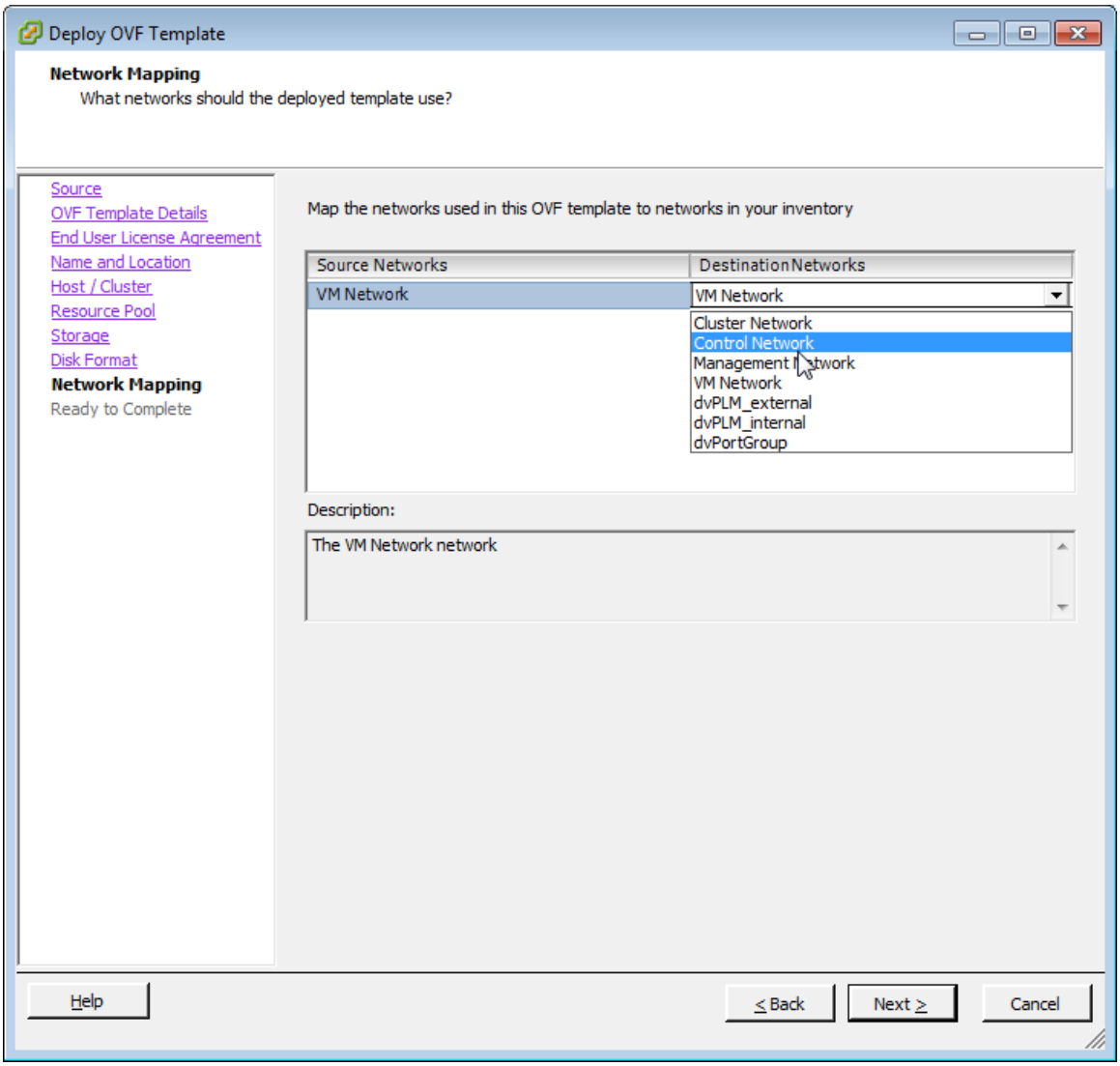


Figure 9: Select the virtual network interface that the template will use

13. Review the settings that you have configured on the previous screens. If you find a setting that you want to change, click **Back** until you reach the screen where you can edit the setting. Update the setting, and then click **Next** until you reach the **Ready to Complete** screen again.

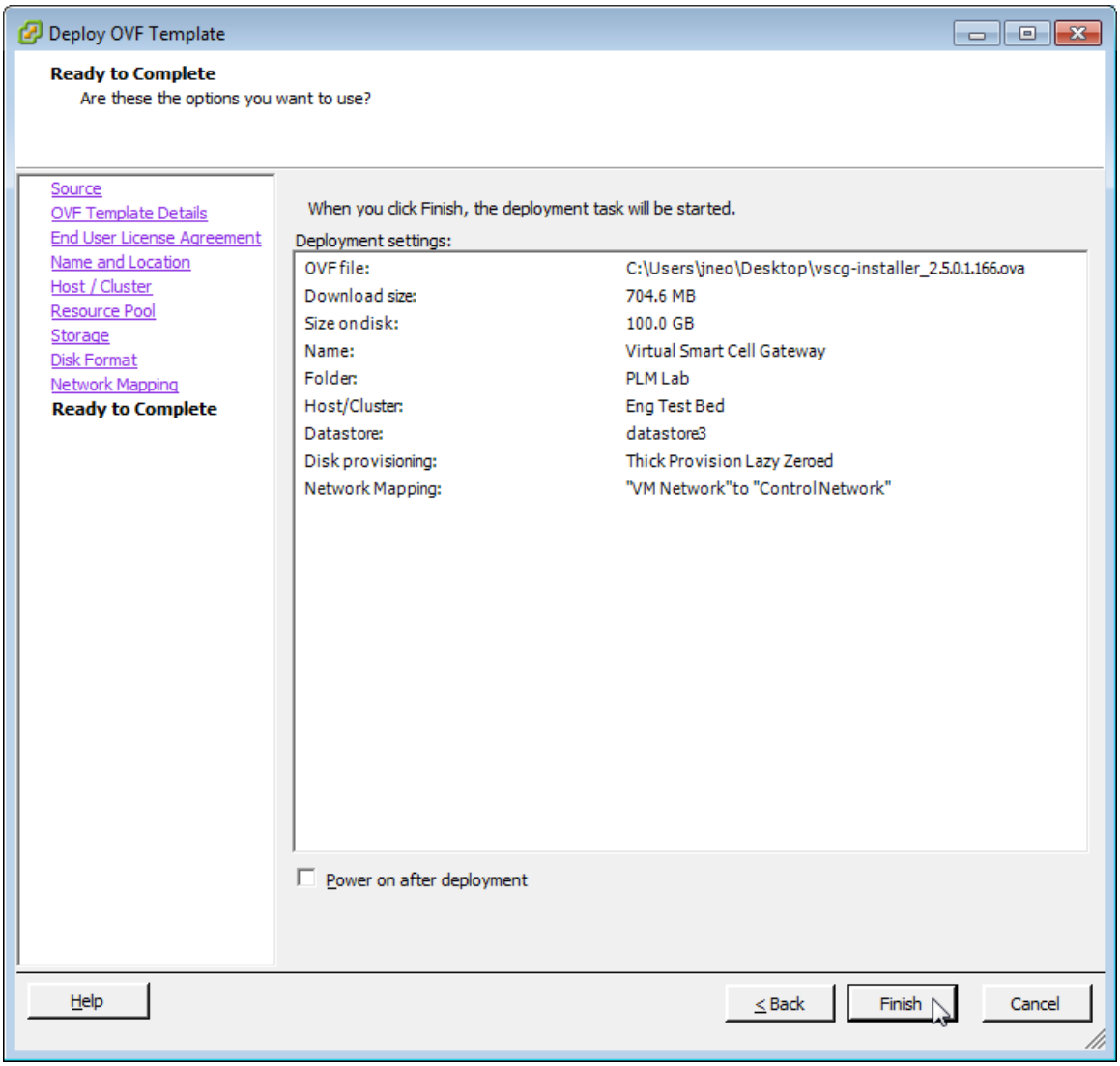


Figure 10: Review the settings that you have configured

14. Make sure that the **Power on after deployment** check box is clear so you can adjust the network settings before the vSZ setup.**Caution**: If you power on the vSZ after installation, you will no longer be able to adjust the network settings.
15. Click **Finish**.

ESXi deploys the new vSZ instance. When ESXi completes the deployment, the new vSZ instance appears on the list of installed virtual machines on the target host.

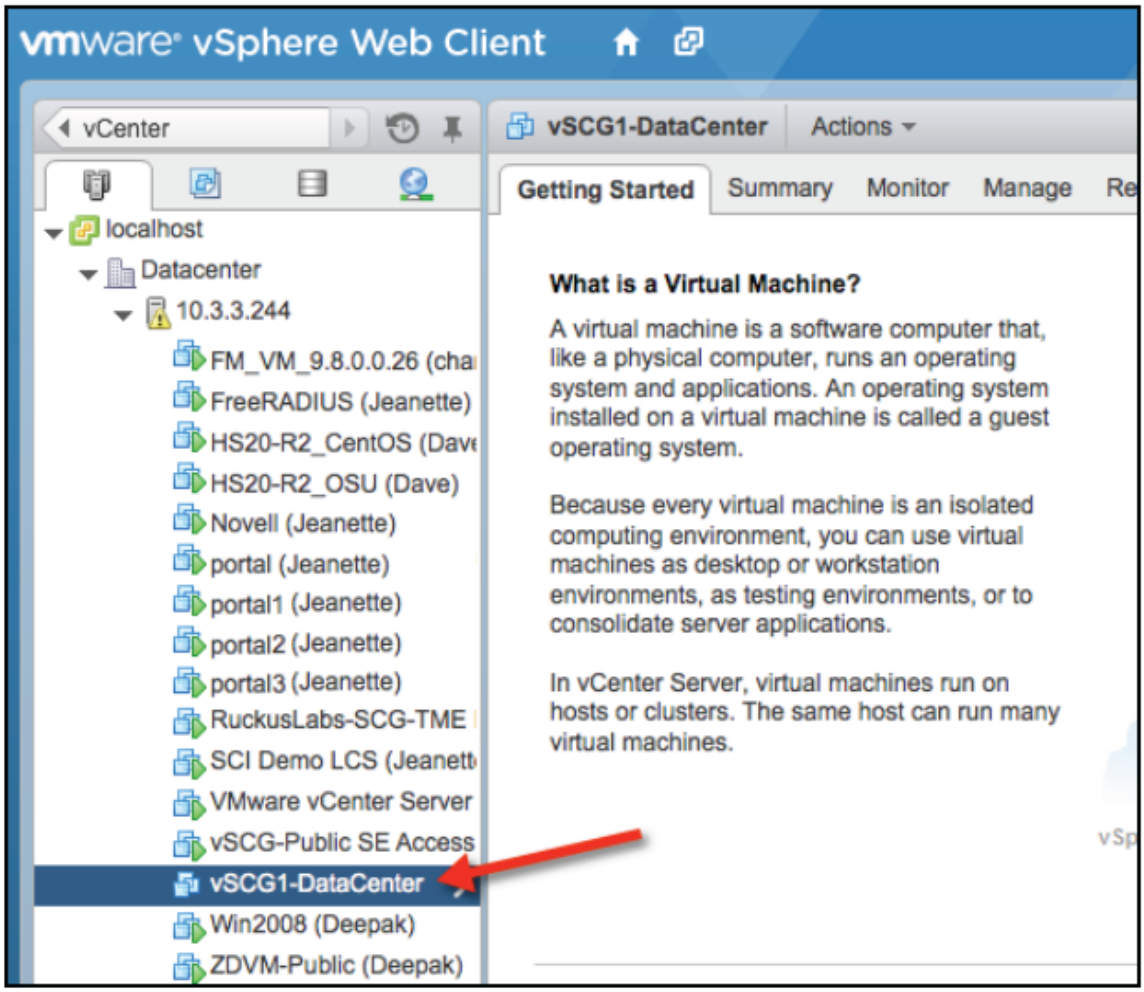


Figure 11: The vSZ instance appears on the list of installed VMs

You have completed creating a vSZ instance from the OVA file.

Allocating Resources and Assigning Network Interfaces

Before starting the vSZ instance for the first time, edit the virtual machine settings to allocate CPU and memory resources to the vSZ and to assign the ESXi network interfaces to the remaining vSZ interfaces (cluster and management).

Ensure that you read steps 1-7 before starting the application.

Follow these steps to allocate resources and assign network interfaces to the vSZ.

1. On the list of virtual machines, click the new vSZ instance.
2. Click **Actions** to display the additional options, and then click **Edit Settings**.
3. Set the number of CPUs and the amount of RAM to allocate to the vSZ instance. By default, the OVA template is set to 4 CPUs and 8GB of RAM.

4. Under **Network adapter 1**, verify that it is the same ESXi network interface that you selected for the control interface during the OVA import process. Ensure that the **Connect at Power On** check box is selected.
5. Under **Network adapter 2**, select the ESXi network interface for the cluster interface from the drop-down list. Ensure that the **Connect at Power On** option is selected.
6. Under **Network adapter 3**, select the ESXi network interface for the management interface from the drop-down list. Ensure that the **Connect at Power On** option is selected.

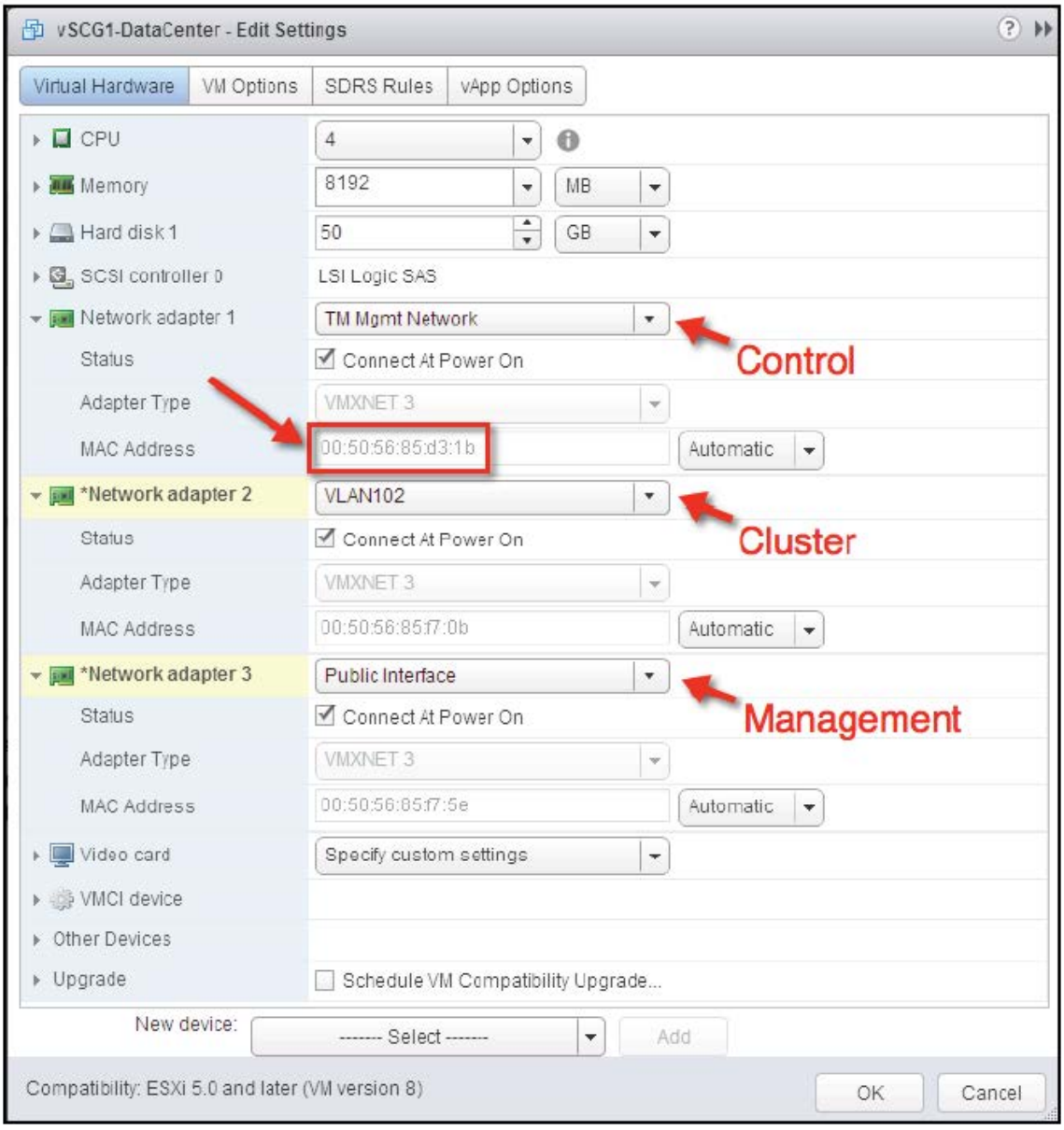


Figure 12: Select the interfaces to use

7. Click **OK**. You have completed allocating resources and assigning network interfaces to the vSZ.

Powering on the vSZ virtual machine

The next step is to power on the vSZ virtual appliance.

1. From the list of virtual machines on the host, click the vSZ instance.
2. Under **Basic Tasks**, click **Power on the virtual machine**.

Figure 13: Click Power on the virtual machine

3. Open a console window to monitor the startup process. To do this, click the *Action* menu, and then click **Open Console**.

   After the vSZ completes its startup process, you are ready to perform the initial IP address setup of the vSZ. You will use the console connection to perform this task.

Installing the vSZ on Windows Server Hyper V

Before you begin, verify that Hyper-V is enabled on Windows Server. Follow these steps to install the vSZ on Windows Server Hyper-V.

1. Obtain a copy of the vSZ image in VHD format.
2. Extract the vSZ image to the .vhd disk file.
3. Copy the image to the Windows Server on which you are running Hyper-V.
4. On the Windows Server, click **Start** > **Administrative Tools**, and then double-click **Hyper-V Manager**.
5. In the Hyper-V Manager, select the Hyper-V core for which you want to create a virtual machine and click **Virtual Machine** > **Action** > **New** > **New Virtual Machine Wizard**. The appears and displays the **Before You Begin** screen.

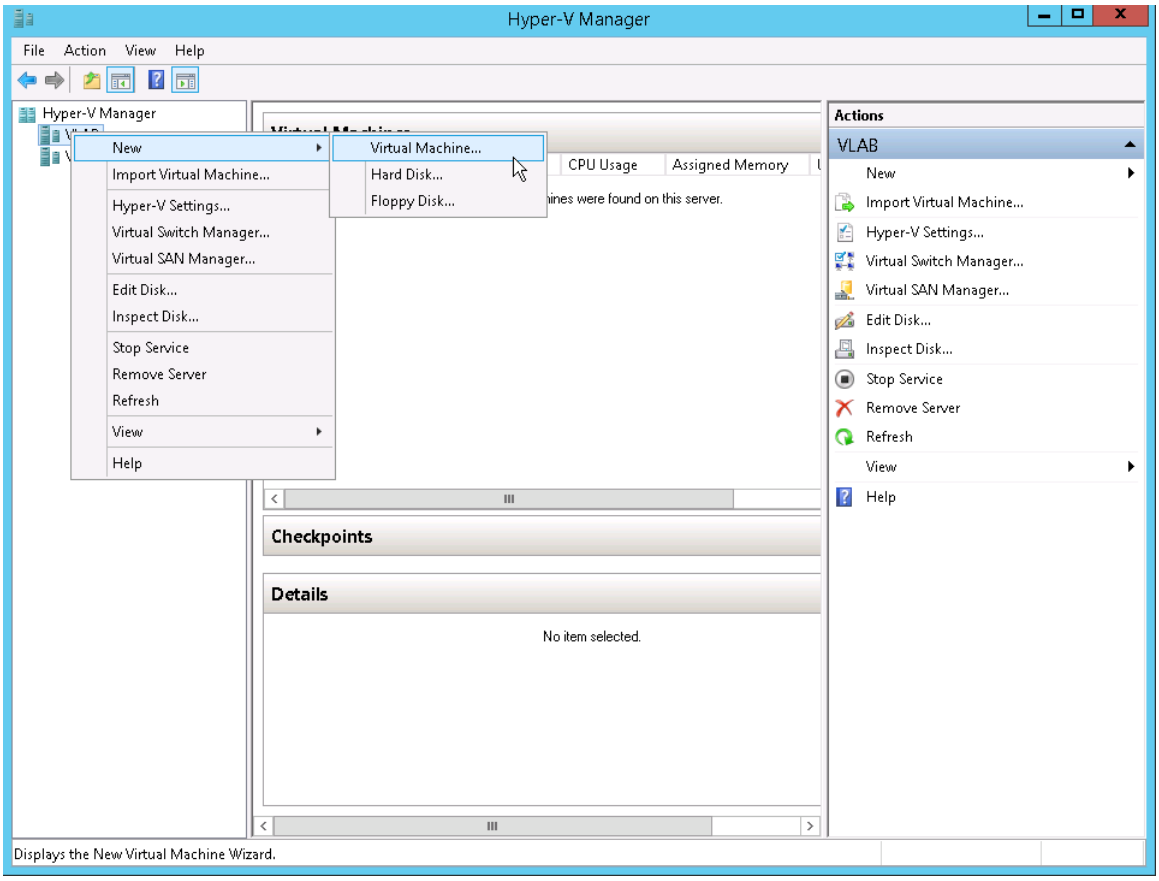


Figure 14: Click Action > New > Virtual Machine

6. Click **Next**. The **Specify Name and Location** screen appears.

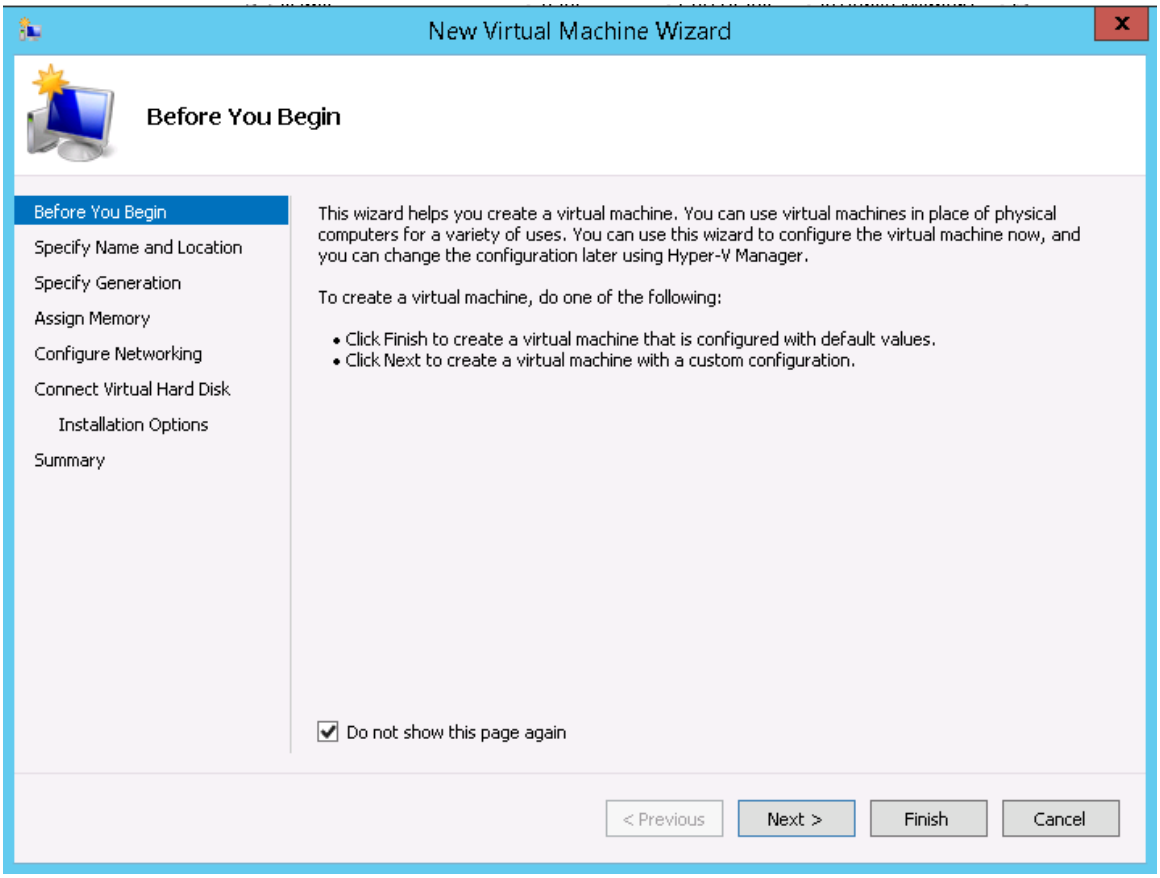


Figure 15: The New Virtual Machine Wizard screen

7. In **Name**, type a name for the virtual machine that you are installing (for example, Virtual SmartZone).

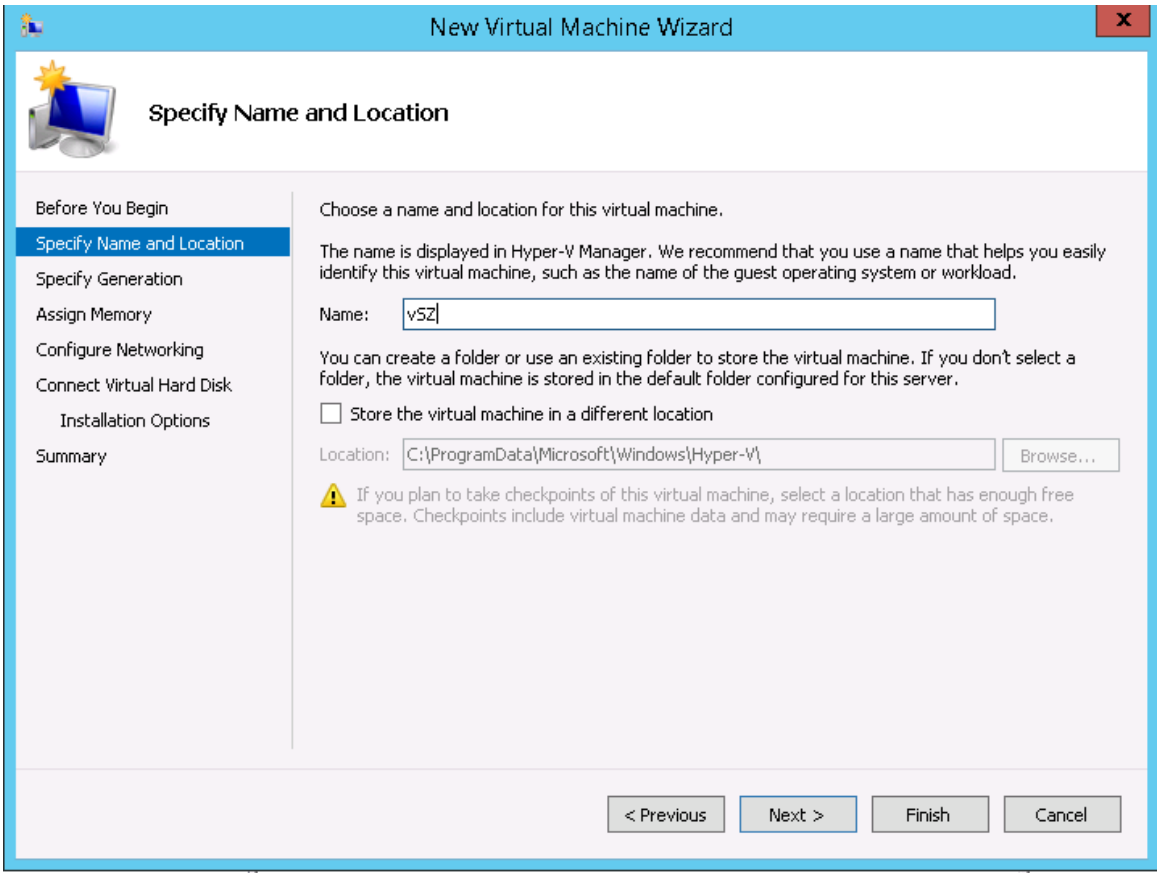


Figure 16: Specify Name and Location

8. Specify the folder on the server where you want to install the virtual machine.
   a) To install the virtual machine in the default location, make sure that the Store the virtual machine in a different location check box is clear.
   b) To install the virtual machine in a location other than the default, select and Store the virtual machine in a different location check box, and then browse to or type the new location.
9. Click **Next**. The **Specify Generation** screen appears.

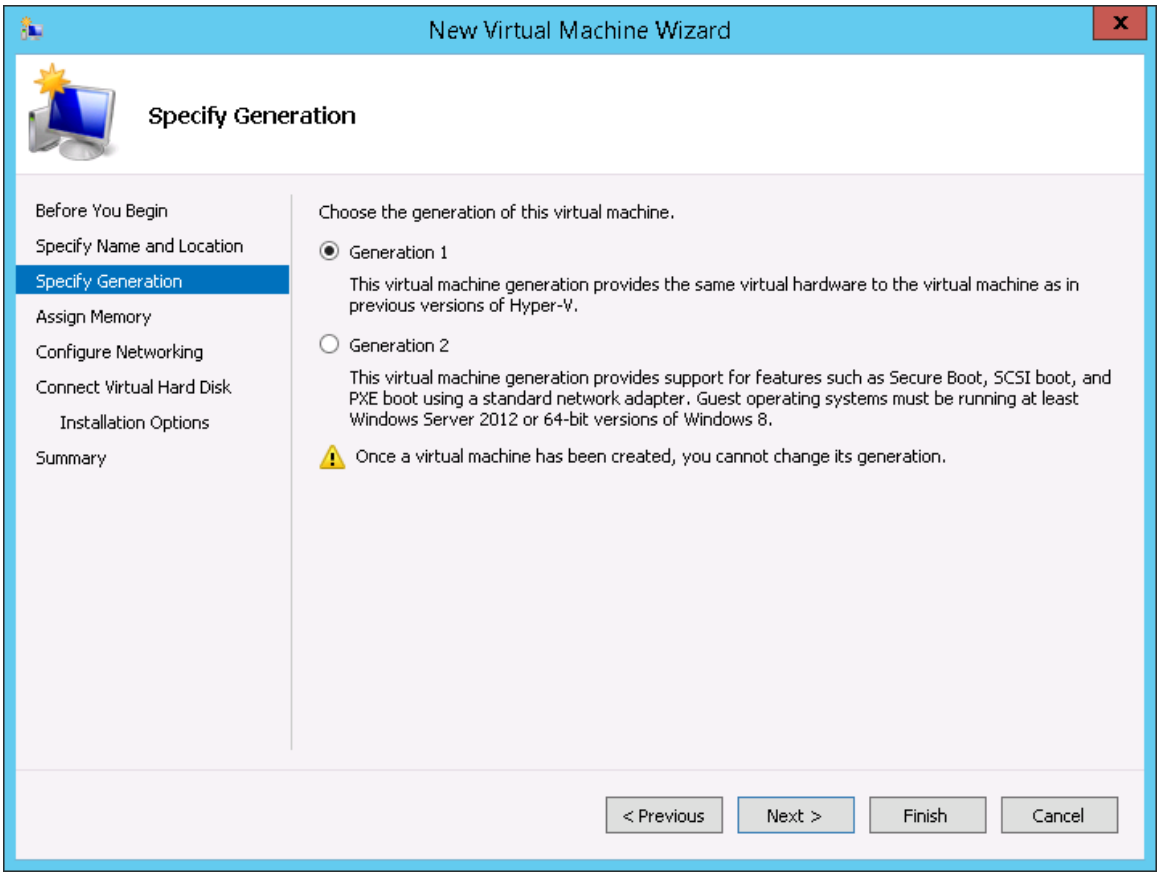


Figure 17: Specify Generation

10. Select **Generation 1** for the virtual machine that you are installing. Hyper-V offers Generation 1 and Generation 2. See the Hyper-V documentation for more information about these two generations.
11. Click **Next**. The **Assign Memory** screen appears.

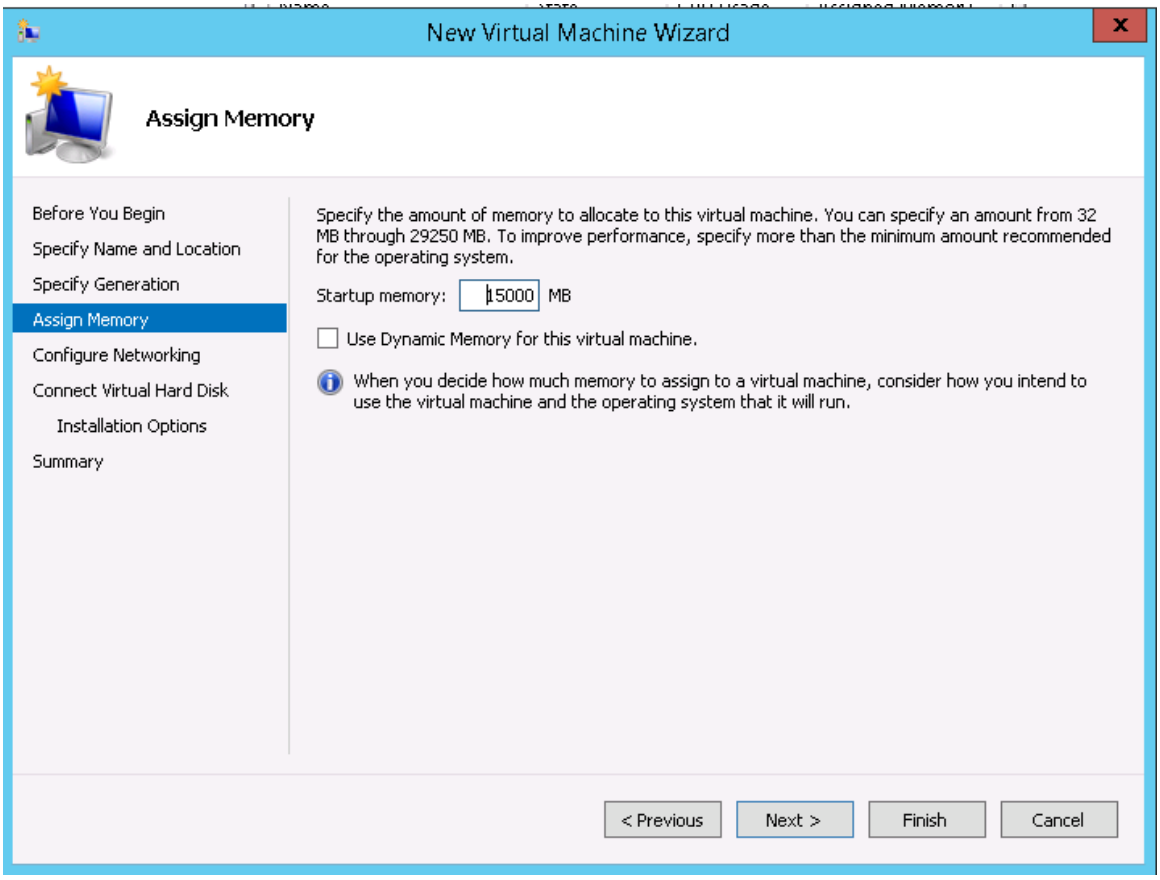


Figure 18: Assign Memory

12. In **Startup memory**, type 13GB for vSZ High Scale or 15GB for vSZ Essentials (as relevant), which are the minimum memory that Ruckus Wireless recommends for deploying vSZ. You can type a higher value if more memory is available on the server. For more information, see Table 4 and Table 5.
13. Click **Next**. The **Configure Networking**

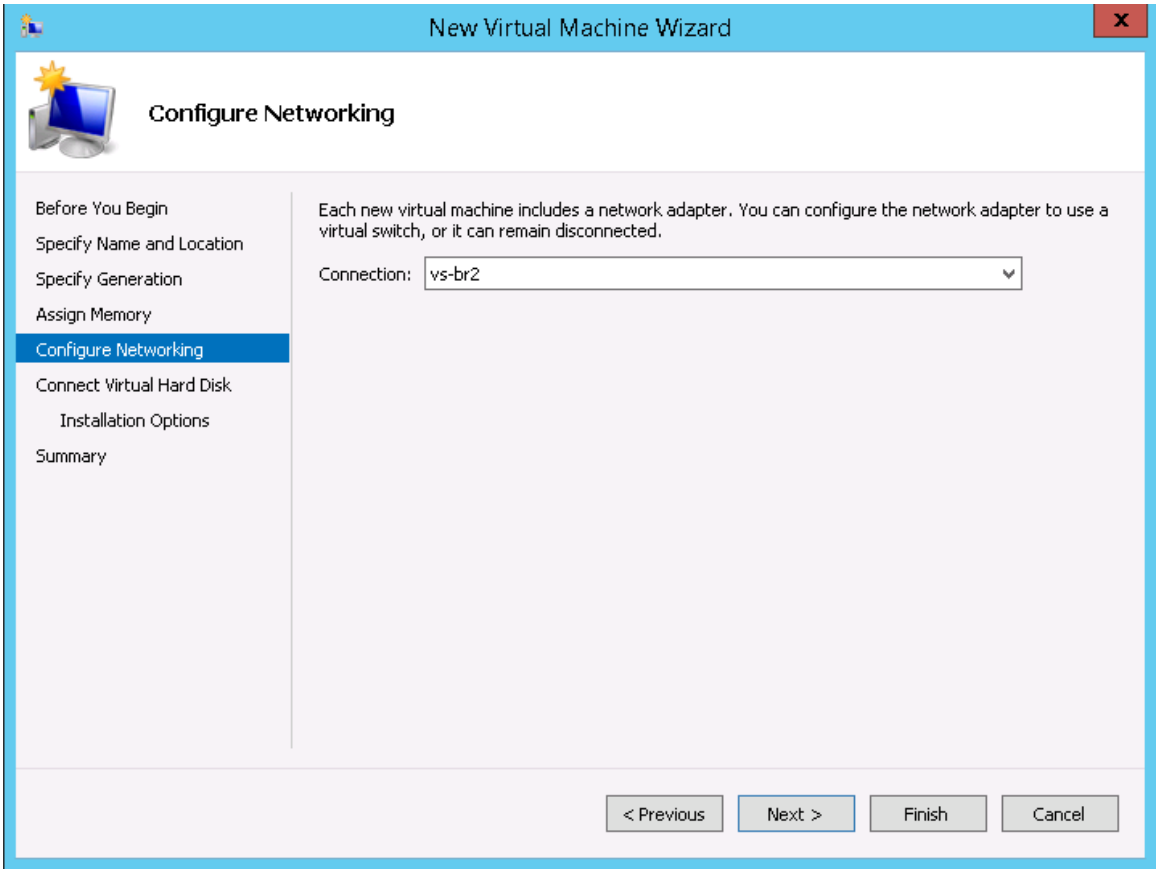


Figure 19: Configuring Network

14. In **Connection**, select the network adapter that you want the virtual machine to use.
15. Click **Next**. The **Connect Virtual Hard Disk** screen appears.

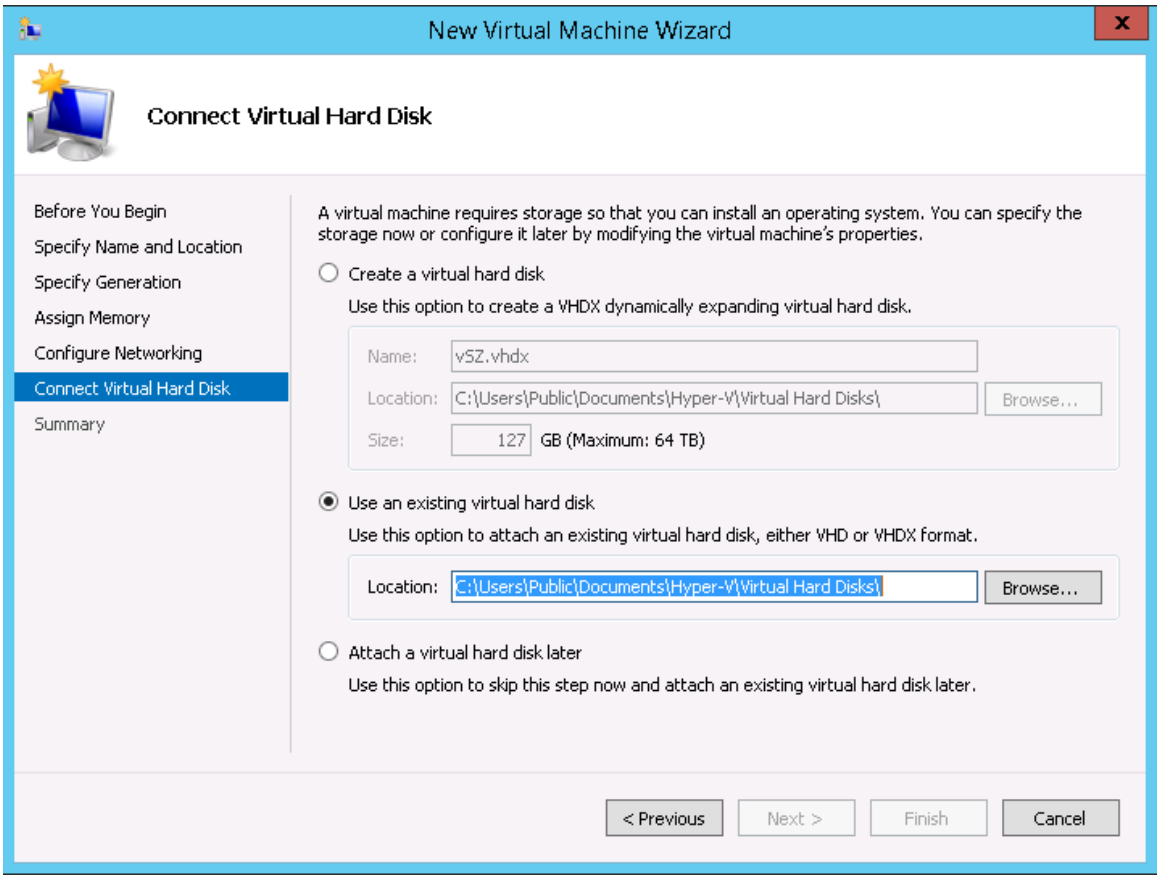


Figure 20: Connect Virtual Hard Disk

16. Select **Use an existing virtual hard disk**.
17. Click **Browse** to specify the location of the existing virtual hard disk for the virtual machine to use.

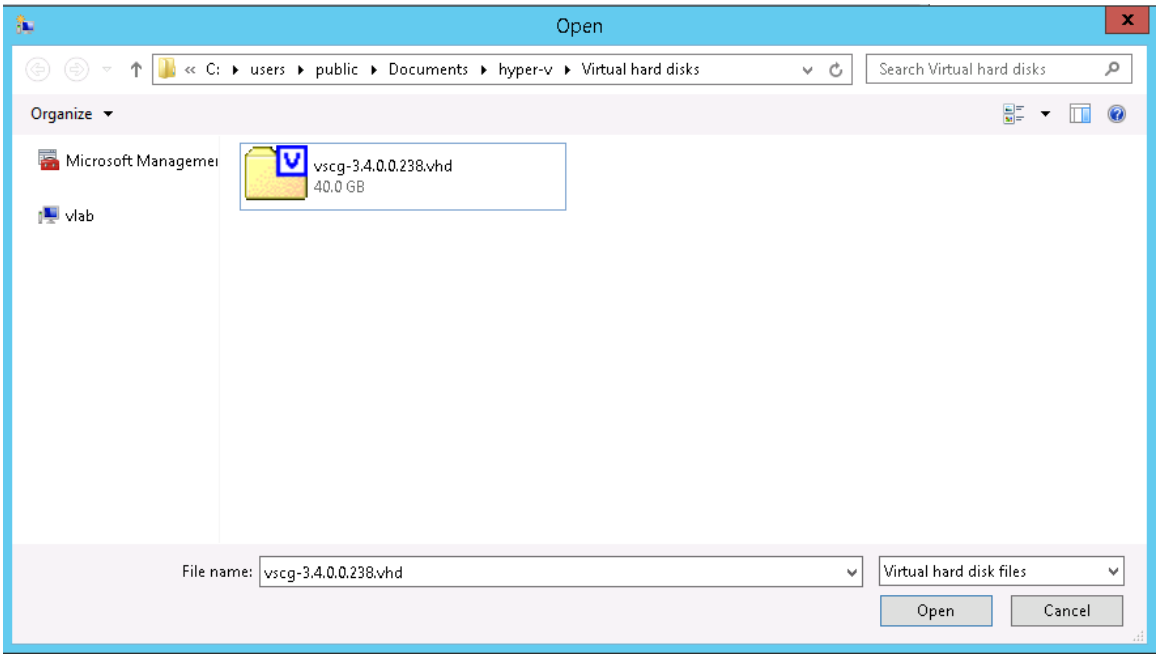


Figure 21: Selecting Virtual Hard Disk

18. Click **Next**. The **Completing New Virtual Machine Wizard** screen appears.

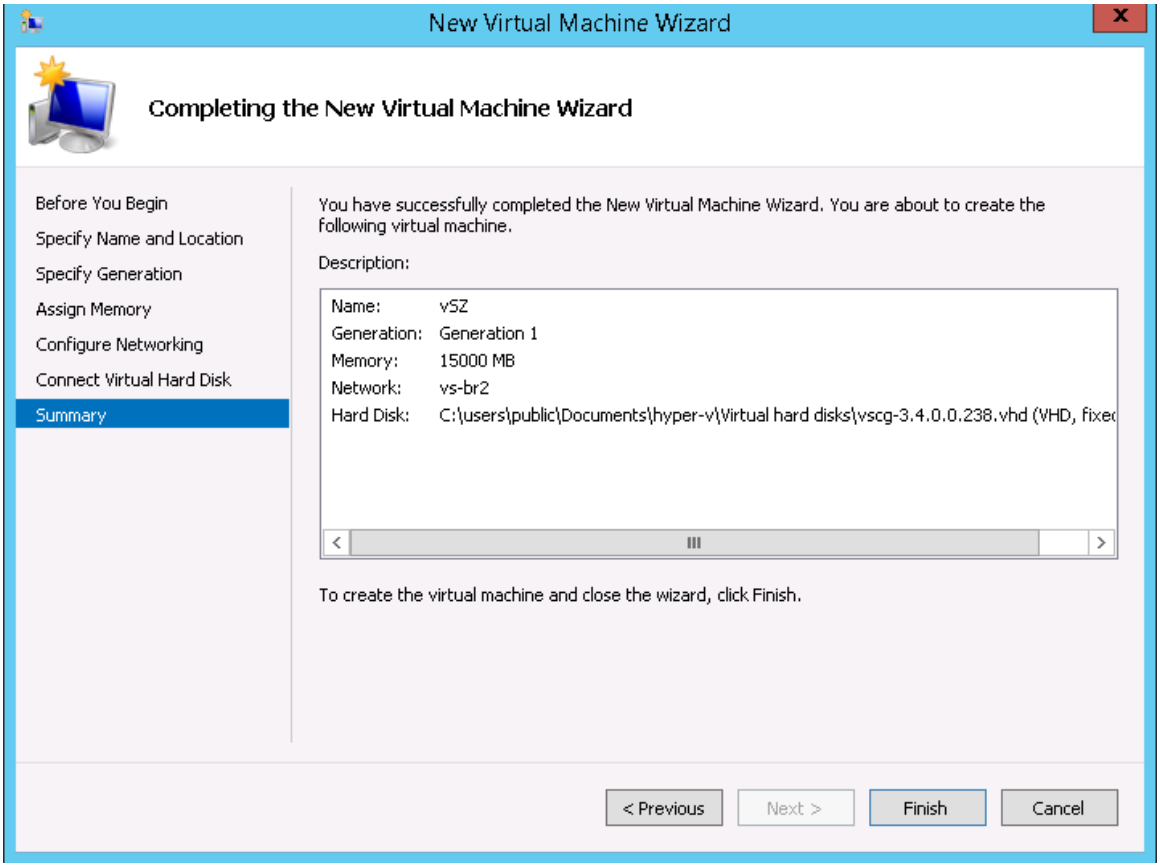


Figure 22: Completing New Virtual Machine Wizard

19. Review the settings that you can configure for the virtual machine. If you find any setting that need to be changed, click **Previous** until you reach the screen where you can update the setting. Update the setting, and then click **Next** until the **Completing New Virtual Machine Wizard** screen appears again.
20. Click **Finish** to install the virtual machine. When Windows Server completes installing the virtual machine, the **New Virtual Machine Wizard** disappears and the virtual machine you installed appears on the list of virtual machines on Hyper-V Manager.

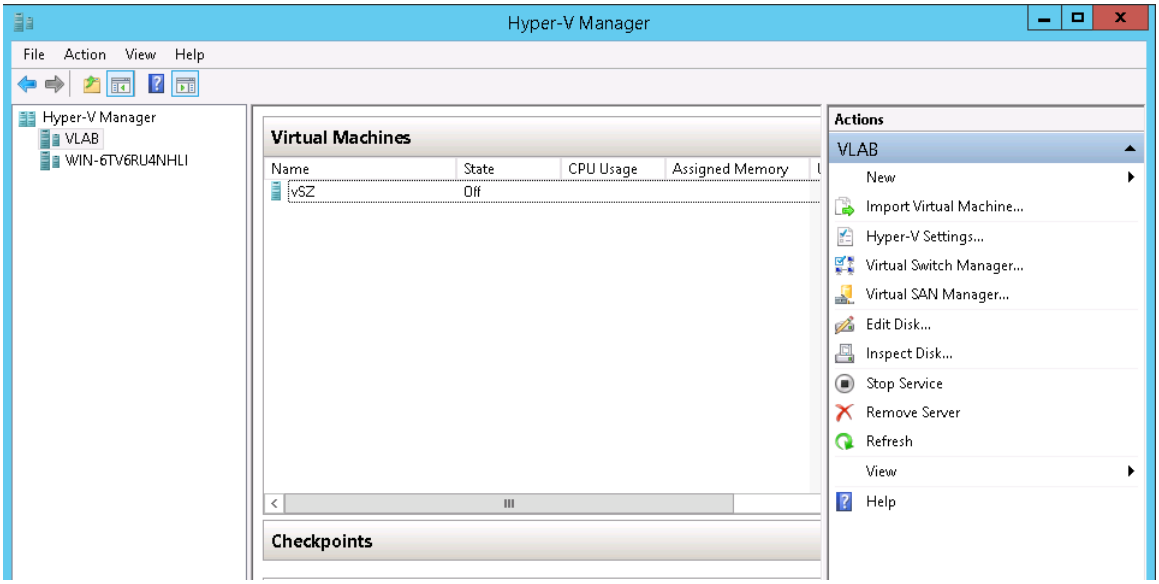


Figure 23: The virtual machine you installed appears on the list of virtual machines on Hyper- V Manager

21. Right-click the virtual machine you installed, and then click **Start** to power on the virtual machine.

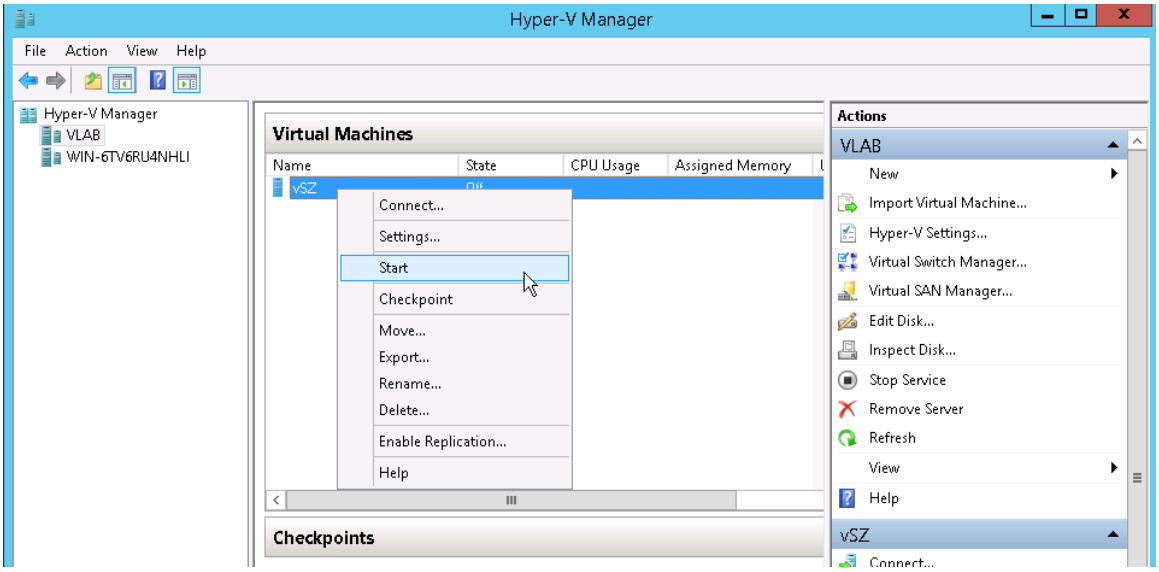


Figure 24: Right-click the virtual machine, and then click Start

The Virtual Machine Connection screen appears.

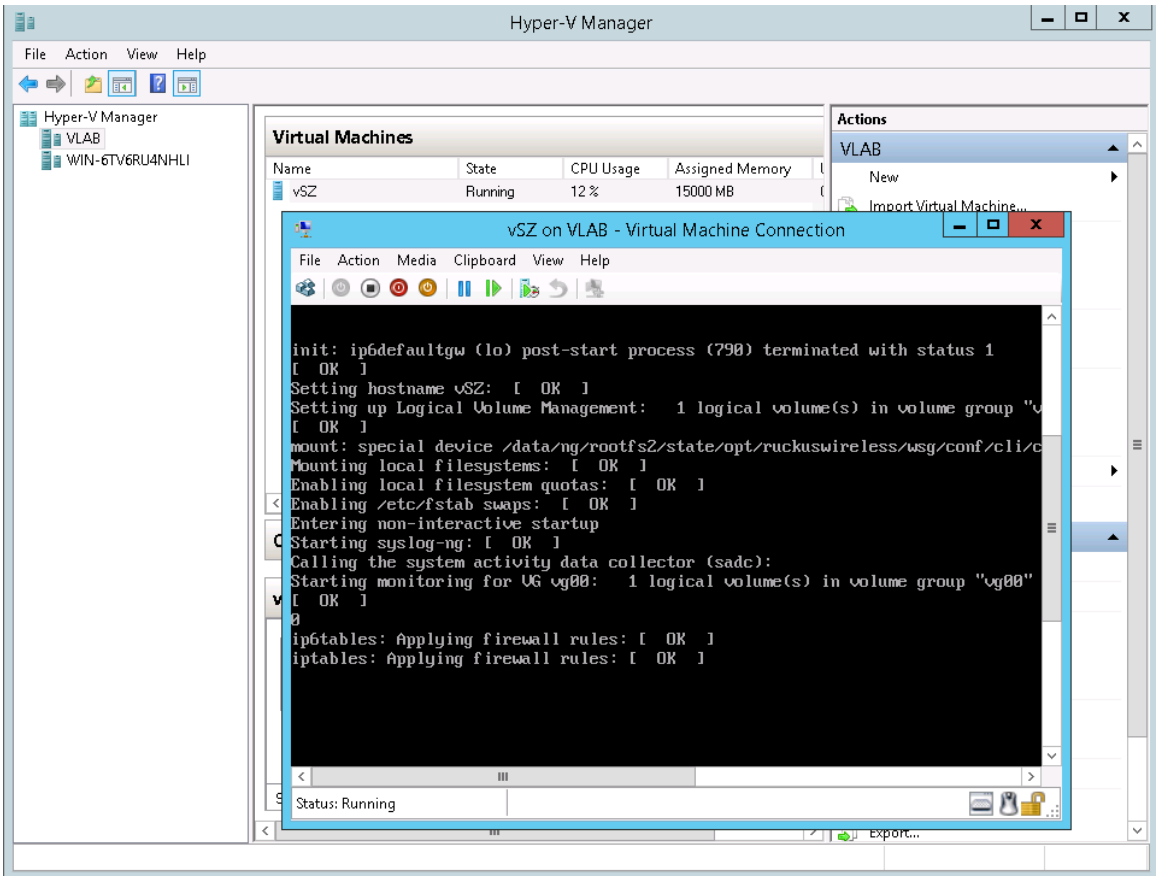


Figure 25: Virtual Machine Connection

22. Login to the virtual machine with your credentials.

You have now completed installing the vSZ on Windows Server Hyper-V.

Installing the vSZ on a Kernel based Virtual Machine Hypervisor

This section describes how to install the vSZ on a KVM hypervisor.

Extracting the vSZ Image

The vSZ image for a kernel-based virtual machine (KVM) is distributed in QCOW2 format.

1. Obtain the vSZ image in QCOW2 format.
2. Copy the image to the KVM.
3. Open the terminal window.
4. Make the image bin file executable by entering the following command: `chmod +x {file name of the controller QCOW bin}` See Figure for an example.

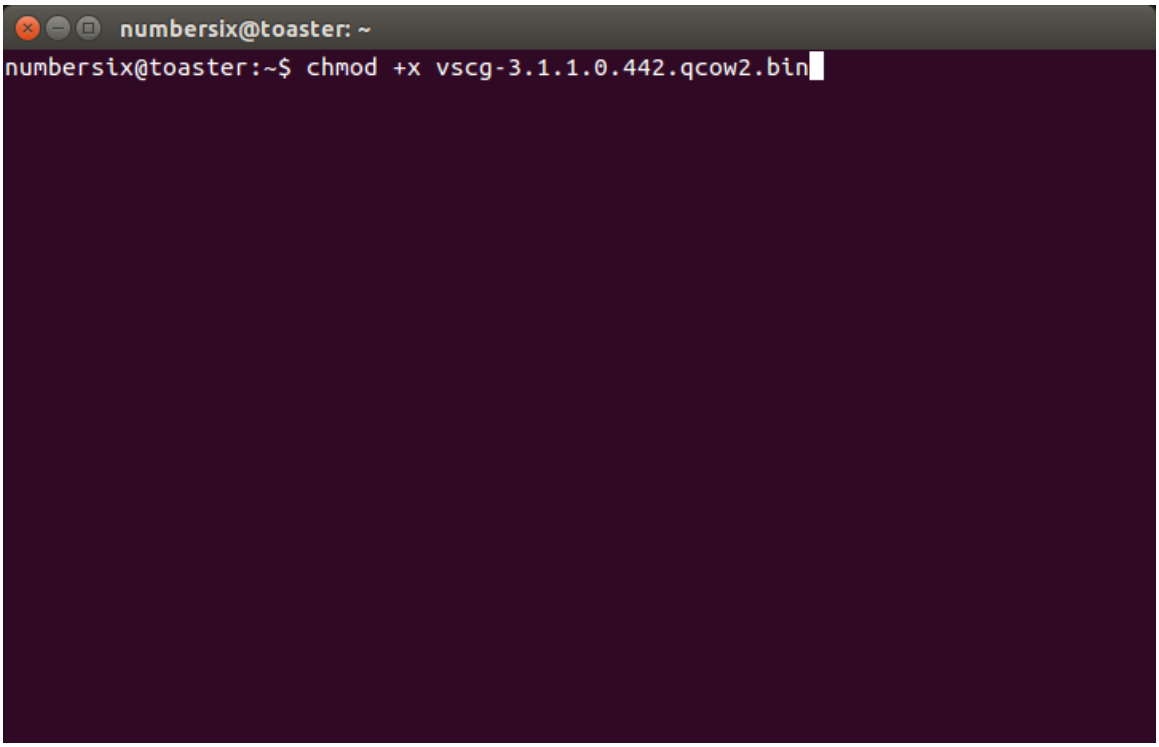


Figure 26: Make the bin file executable

5. Extract the contents of the QCOW2 bin file.

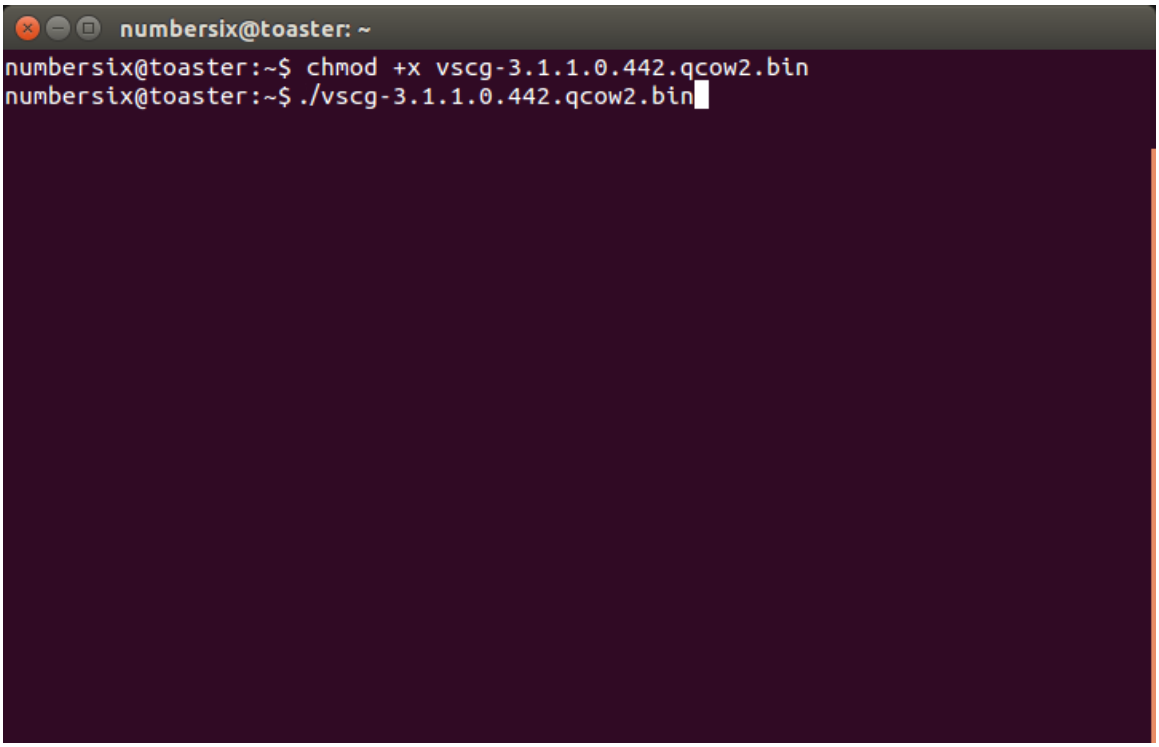


Figure 27: Extract the contents of the QCOW2 image

The end user license agreement appears on screen.

6. At the **Accept this agreement? [yes/no]** prompt, enter `yes`.

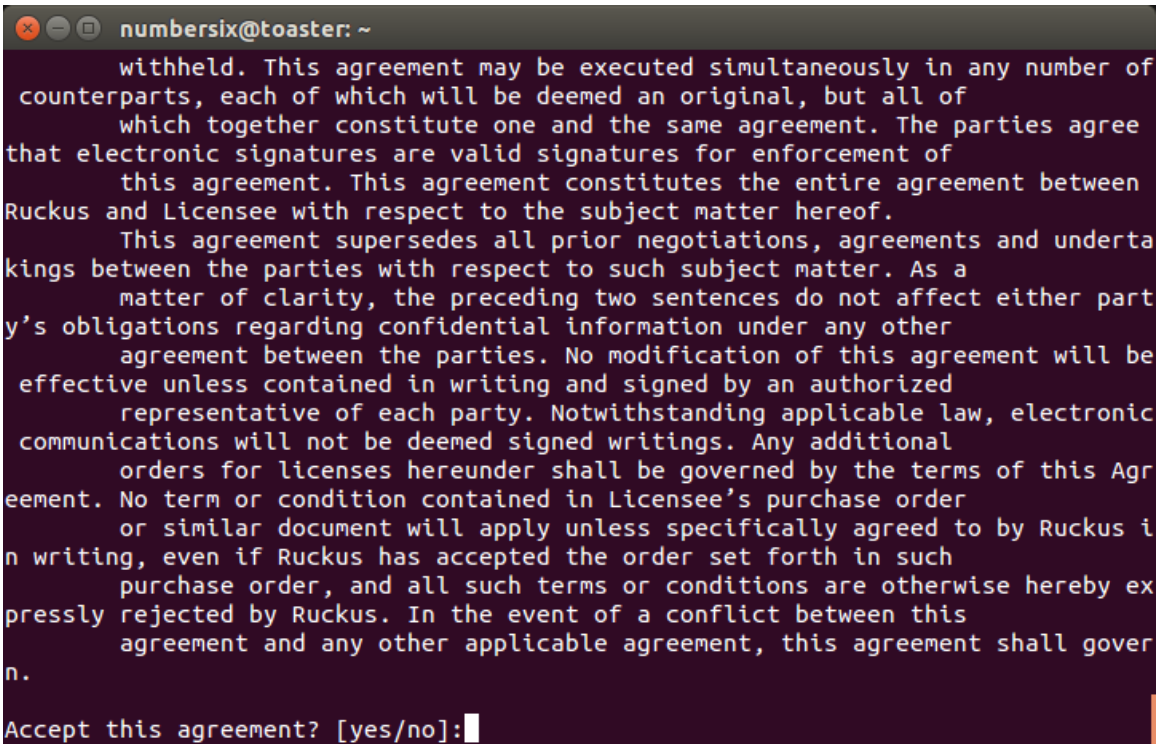
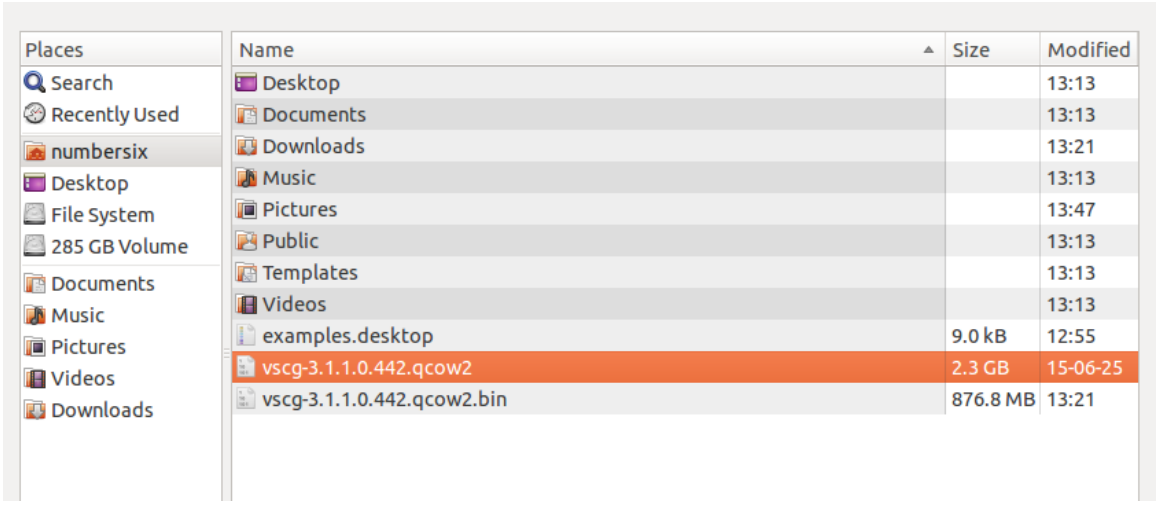


Figure 28: Accept the EULA terms

The KVM continues to extract the contents of the image. When the extraction process is complete, the QCOW2 file appears in the same directory as the .bin file.



NOTE: If the "uudecode: command not found" error appears during the extraction process, install the "sharutils" package on the KVM, and then try extracting the image again.

Figure 29: The QCOW2 file appears in the same directory as the .bin file

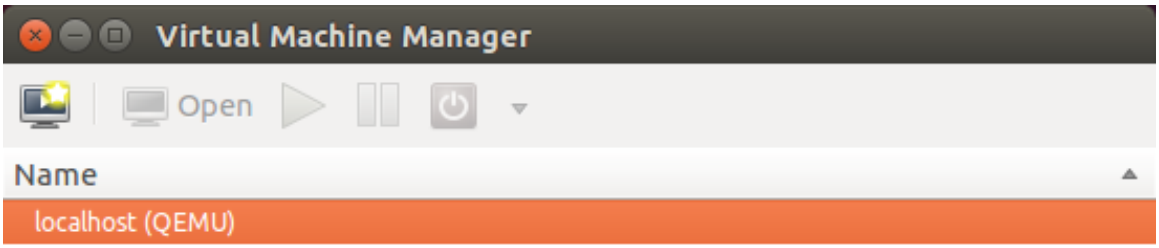
7. Resize the vSZ disk image, if necessary. By default, the vSZ disk size is 50GB. If you want to allocate more disk space to the vSZ, run the qemu-img command. The complete syntax is as follows: `qemu-img resize {file name of the controller QCOW bin} +size`

Setting Up the vSZ

You can set up the vSZ using the Red Hat Virtual Machine Manager (also known as "virt-manager"). If you are installing the vSZ on a different hypervisor or virtual machine monitor, the procedure may be slightly different. Refer to the hypervisor documentation for more information.

1. Start the Virtual Machine Manager by clicking Applications > System Tools > Virtual Machine Manager. Or double-click the Virtual Machine Manager icon if it appears on the desktop. The Virtual Machine Manager interface appears.

   Figure 30: The Virtual Machine Manager interface



2. In **File**, click `Create New VM`. Or click the `New VM` icon. **The New VM** screen appears

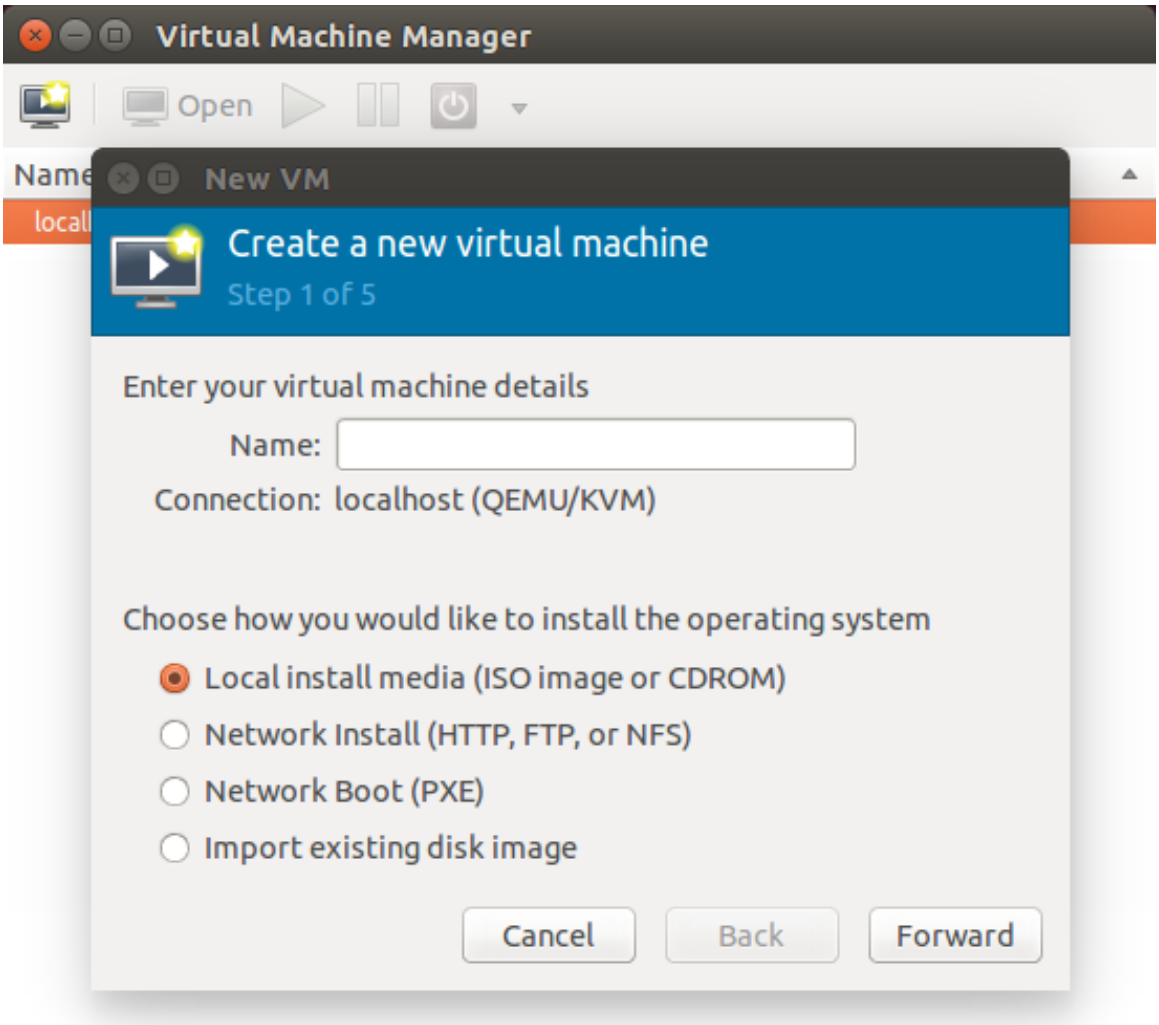


Figure 31: The New VM

3. Configure the options on the **New VM (Step 1 of 4)** screen.
   a) In **Name**, type a name that you want to assign to the virtual machine.
   b) In **Choose how you would like to install the operating system**, click **Import existing disk image**.

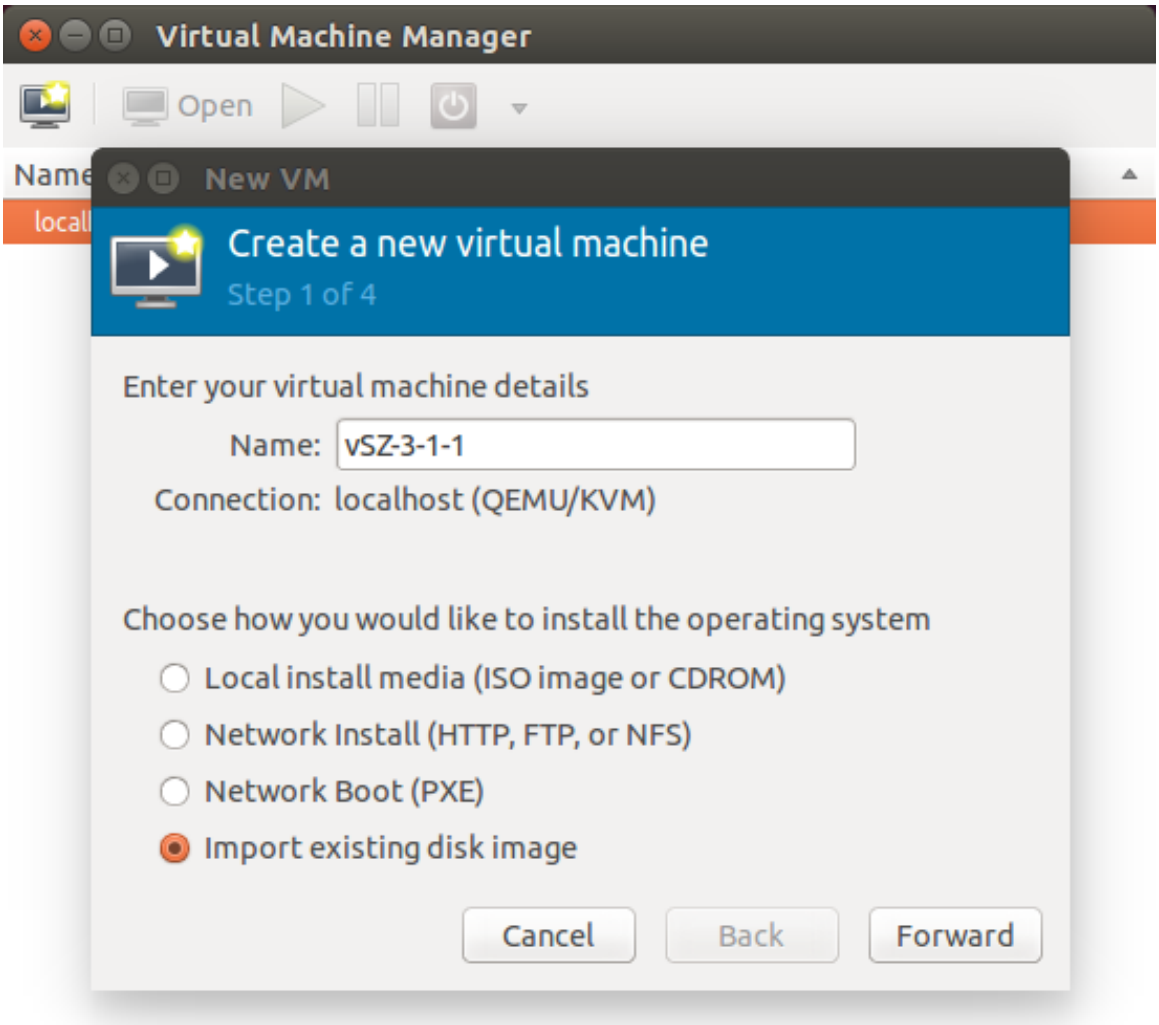


Figure 32: Type a name and select how you want to install the operating system

4. Click **Forward**. The **Locate Existing Storage** dialog box appears.
5. Browse to the location of the vSZ QCOW2 image, select the image file, and then click Open. The **New VM (Step 2 of 4)** screen reappears and displays the storage path to the QCOW2 image file that you selected.

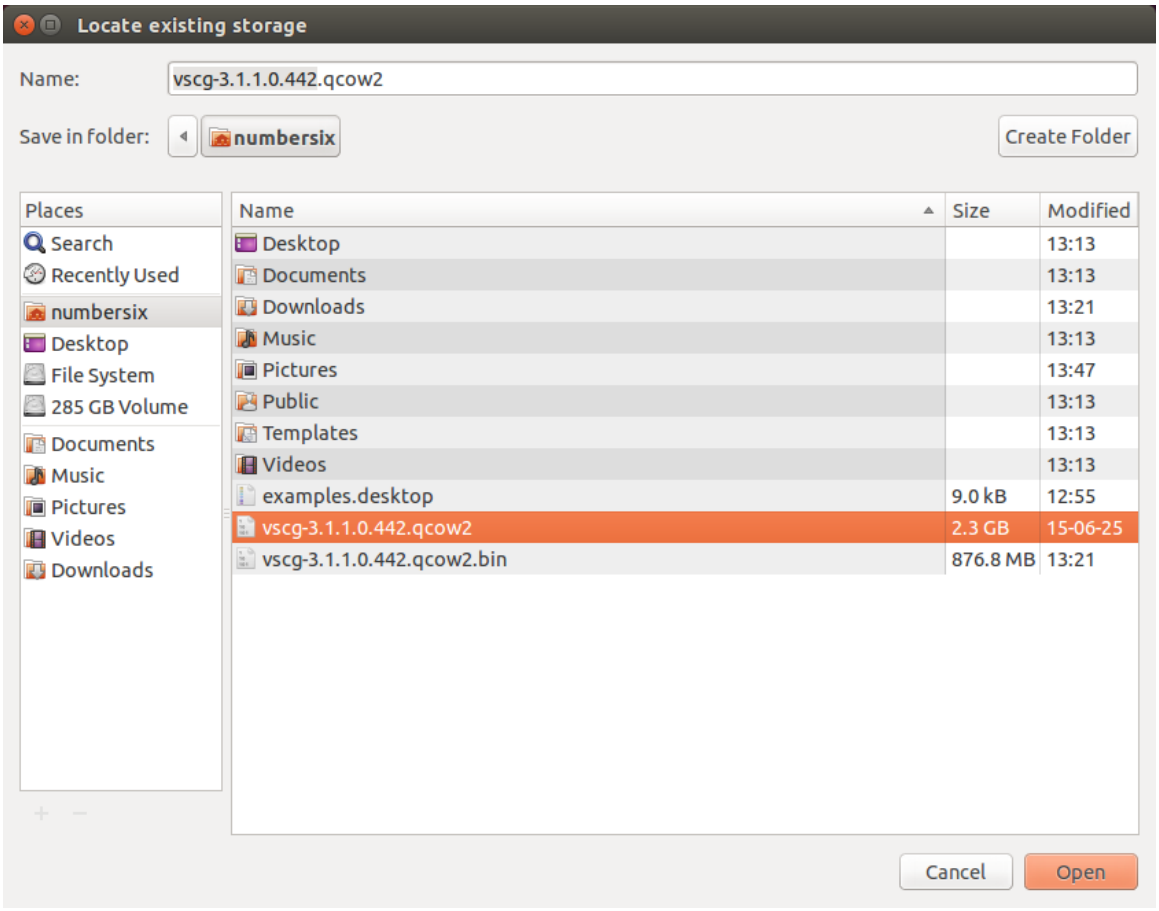


Figure 33: Browse to the vSZ QCOW2 image

6. In the lower portion of the **New VM (Step 2 of 4)** screen, select the operating system type and version.
   a) In **OS type**, select `Linux`.
   b) In **Version**, select `Generic 2.6.x kernel`.

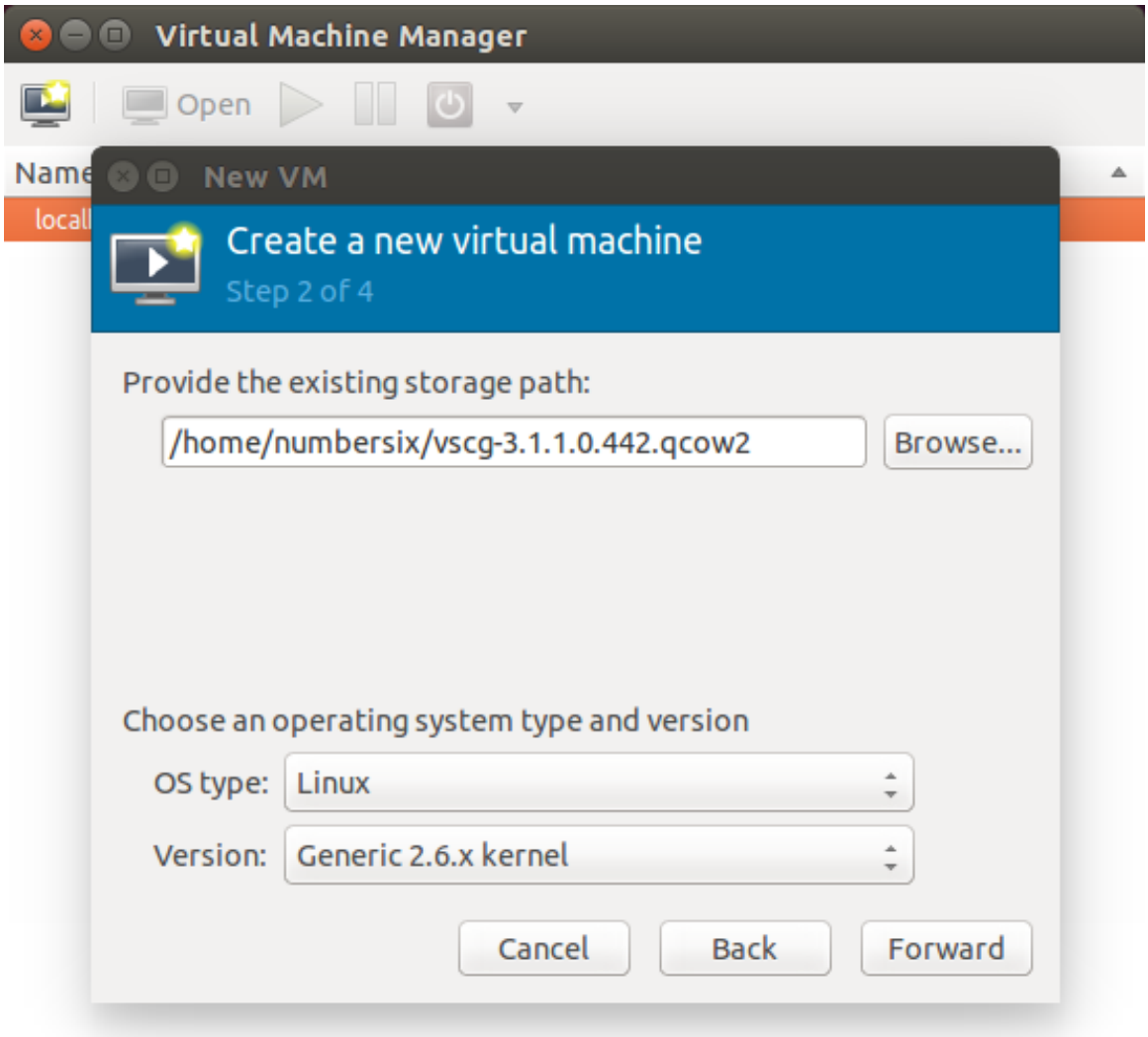


Figure 34: Select the operating system and version

7. Click `Forward`. The **New VM (Step 3 of 4)** screen appears.
8. Configure the memory and CPU settings of the virtual machine.
   a) In **Memory (RAM)**, set to memory (in MB) that you want to allocate to the vSZ.
   b) In **CPU**, set the number of CPUs that you want to allocate to the vSZ.

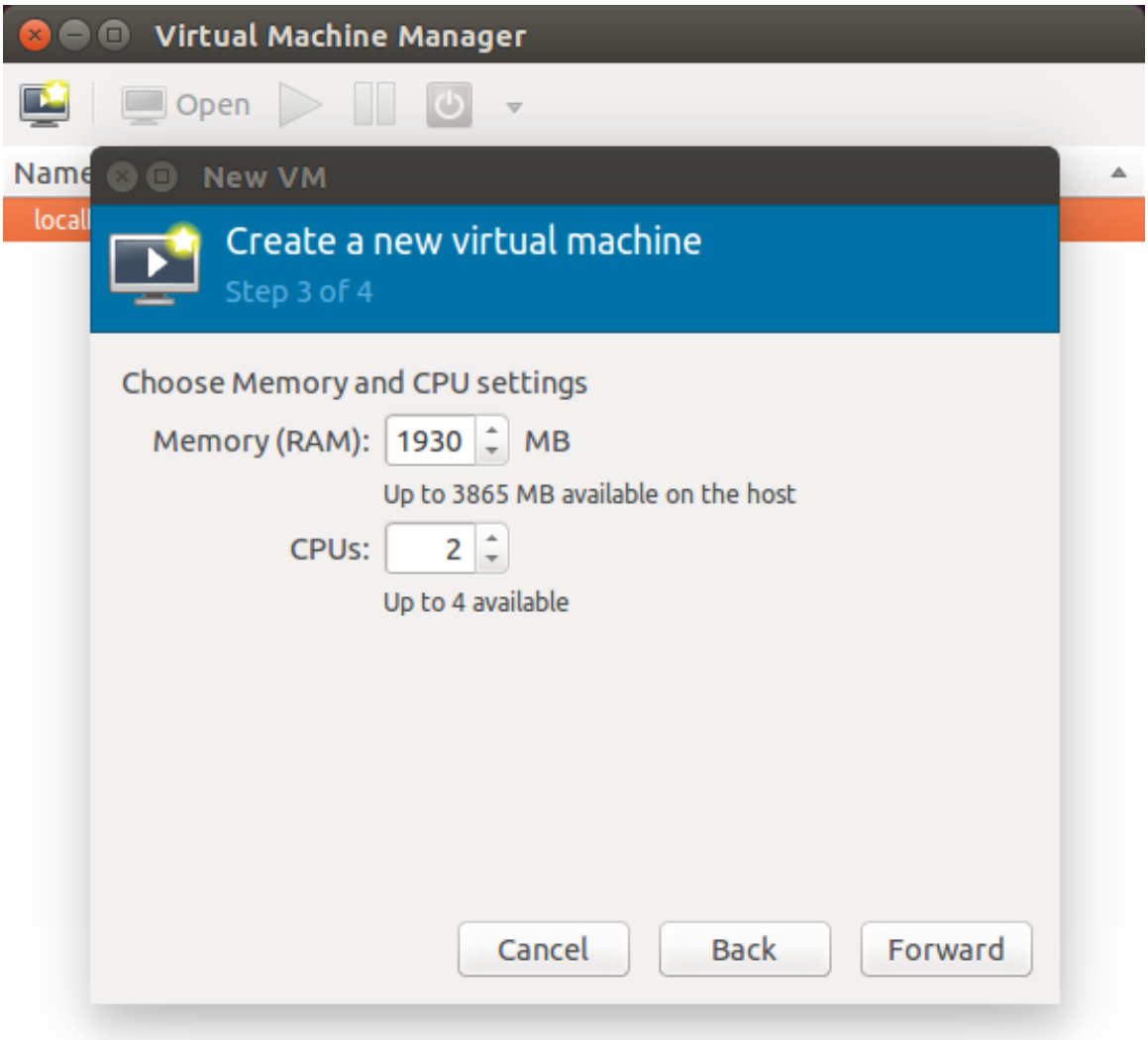


Figure 35: Configure the memory and CPU settings

9. Click **Forward**. The **New VM (Step 4 of 4)** screen appears and displays a summary of the settings you configured.

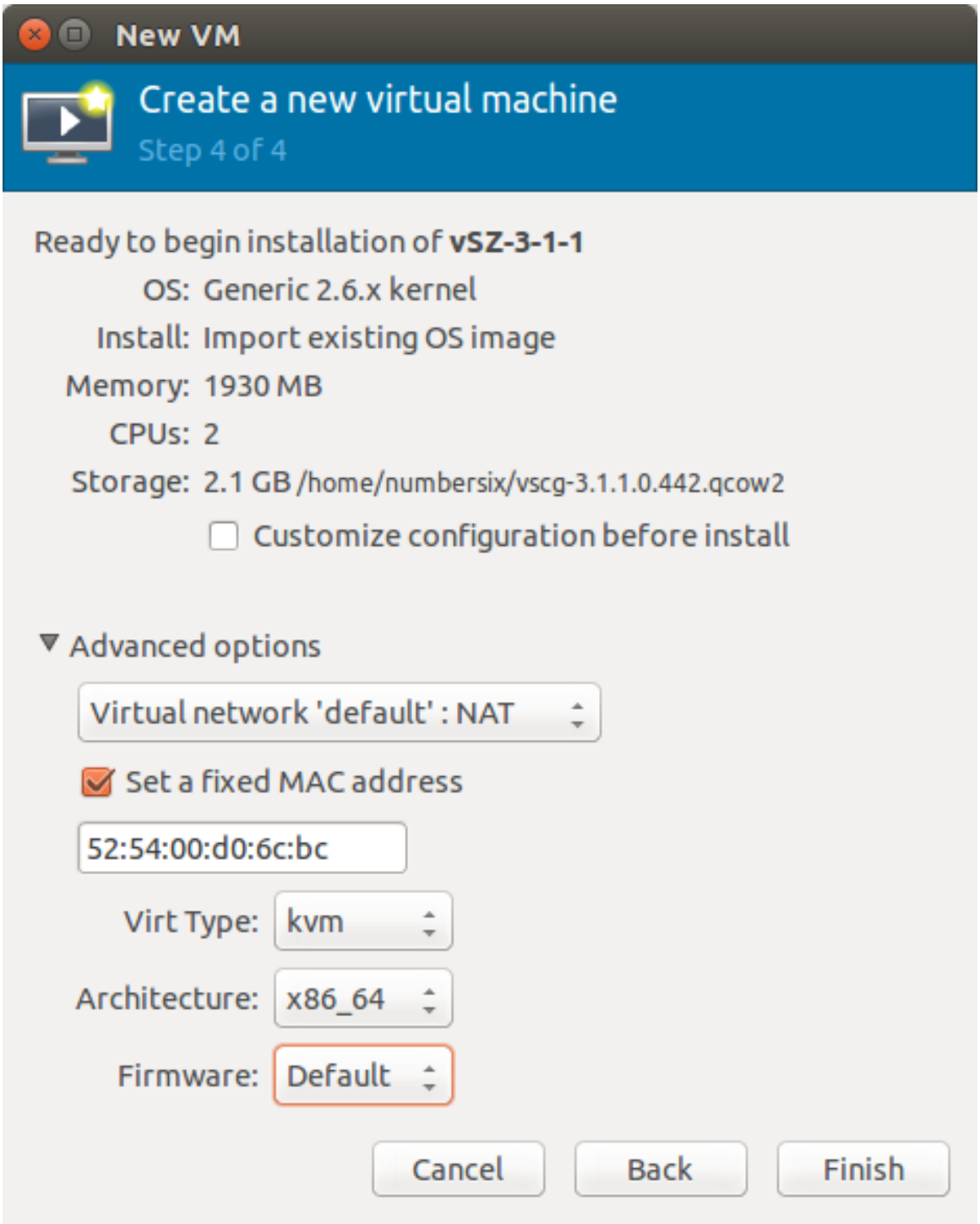


Figure 36: A summary of the settings you configured appears

10. Verify that the settings you configured on the previous screens are correct. If you need to make changes to any of the settings, click **Back** until you reach the screen on which the setting appears, make the change, and then click Forward until you reach the **New VM (Step 4 of 4)** screen again.

11. Click **Finish** to install the vSZ on the virtual machine.
12. After you complete installing the vSZ on the virtual machine, decide how many interfaces you want the vSZ to use. The vSZ supports either a single interface or three interfaces. By default, a single interface exists after installation.

    - If you want the vSZ to use a single interface, you do not need to take action in this step. Continue to the next step.
    - If you want the vSZ to use three interfaces, you must create the two additional interfaces before the initial bootup of the vSZ. Once the vSZ has completed its initial bootup, you will no longer be able to change the number of interfaces.

    If you want to add interfaces, you must do so before the initial bootup of the vSZ. After the initial bootup, you will no longer be able to change the number of interfaces.

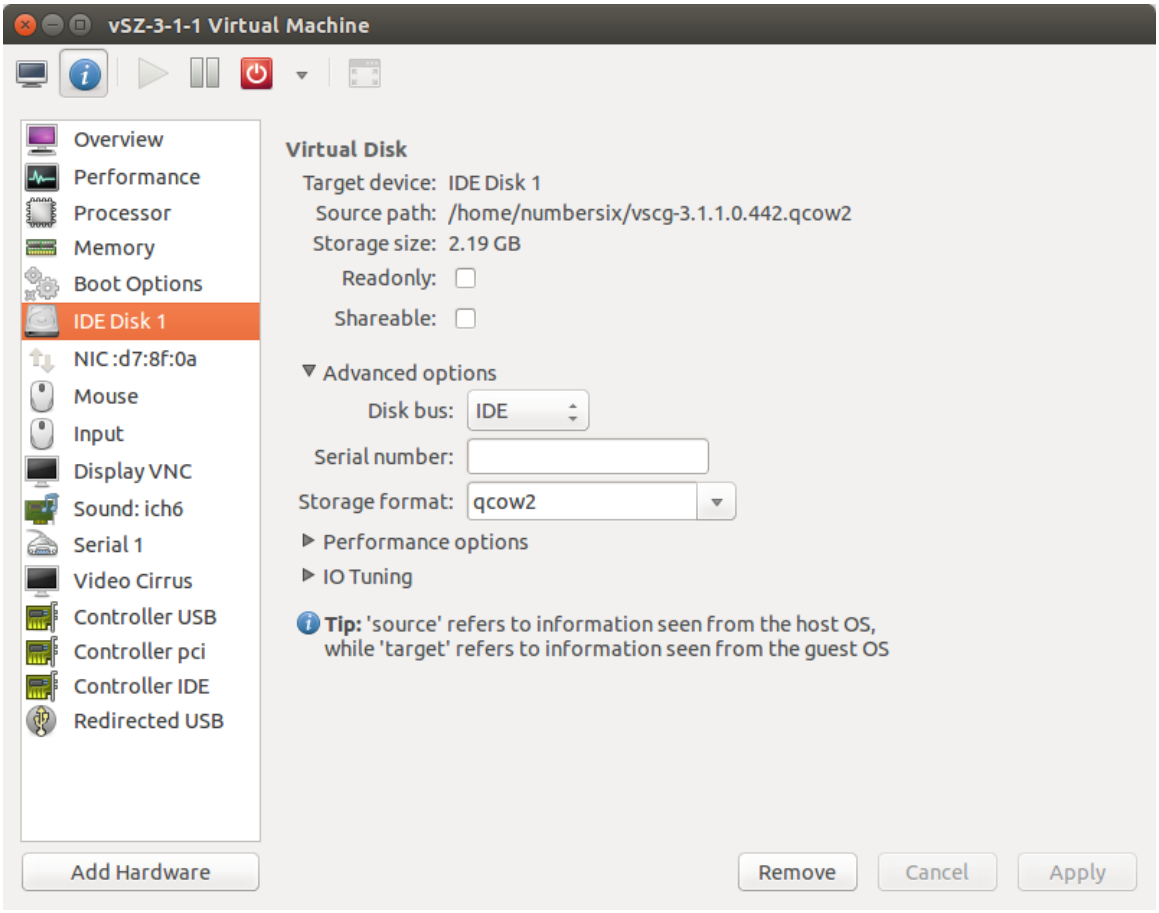


Figure 37: By default, a single interface exists

13. Power on the virtual machine. The vSZ performs its initial bootup.
14. When the **vSZ login** prompt appears, enter `admin`.

You have completed setting up the vSZ on a KVM hypervisor. You are now ready to start the vSZ Setup Wizard. See Using the Setup Wizard to Install vSZ for more information.

Installing the vSZ on Microsoft Azure 4

In this chapter:

- Logging into Microsoft Azure
- Creating a Storage Account and Container
- Uploading the vSZ Image to Microsoft Azure
- Creating a vSZ Image on Microsoft Azure
- Creating a Network
- Creating a vSZ Virtual Machine
- Configuring Port Numbers for Virtual Machines
- Assigning a Static Public IP Address to a VM
- Assigning a Static Internal IP Address to a Virtual Machine

You can install vSZ on Microsoft Azure using the procedure outlined.

NOTE: The minimum memory and CPU requirements have changed in this release. You may need to upgrade your infrastructure before upgrading. Please read carefully. This is the minimum requirement recommended. Refer to Table 5 and Table 6 in the chapter Preparing to Install the vSZ.

Logging into Microsoft Azure

As the first step of installing vSZ on Microsoft Azure, you have to log into Microsoft Azure.

1. Click http://azure.microsoft.com/en-us/ to access the **Microsoft Azure** site.
2. Click the **Portal** tab as shown in the figure.

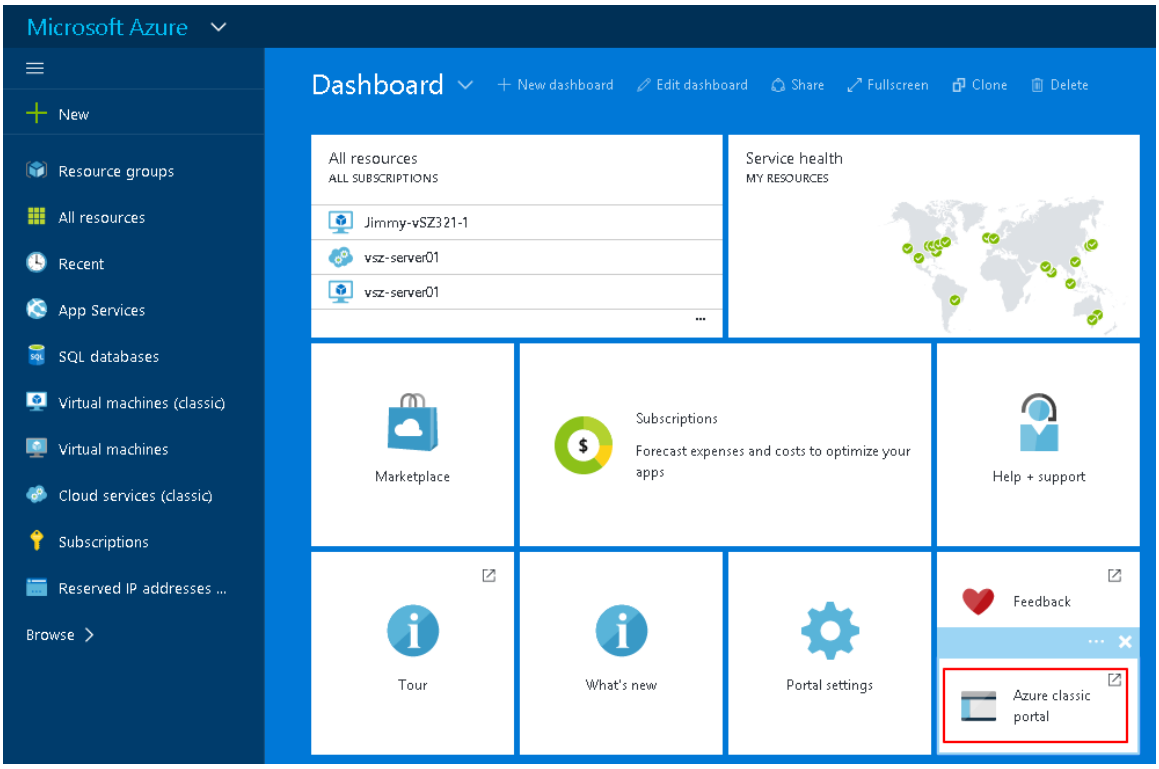


Figure 38: Portal Tab

3. Click **Azure Classic Portal**.

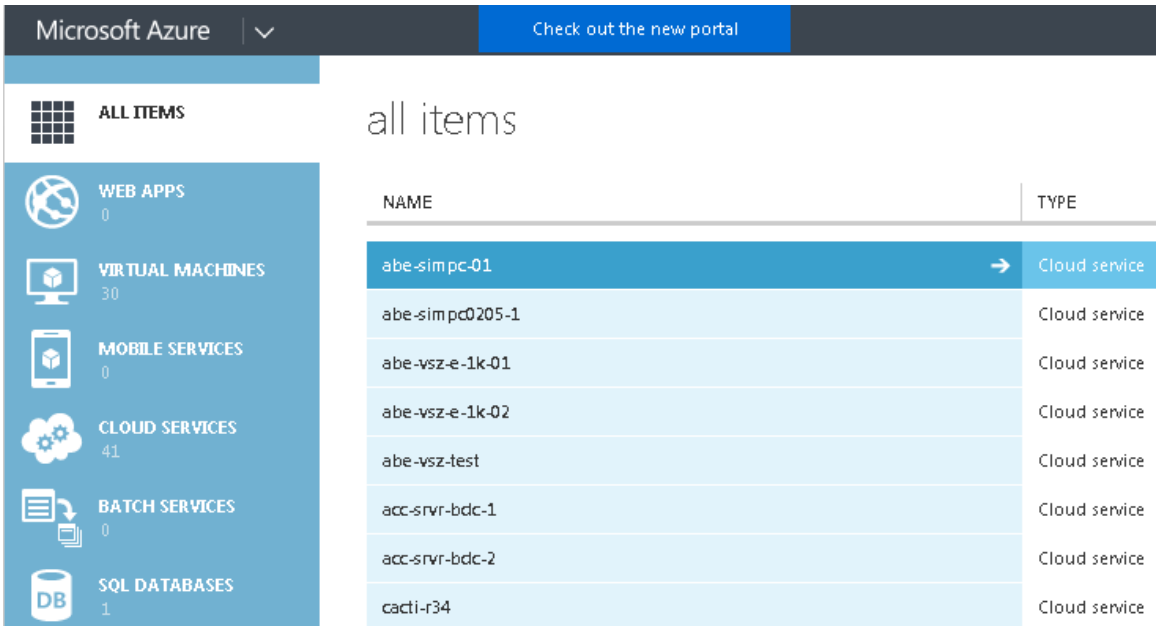


Figure 39: Azure Classic Portal

4. The **Microsoft Azure** login page appears and redirects you to the **Ruckus Wireless login** page as shown in the figure.

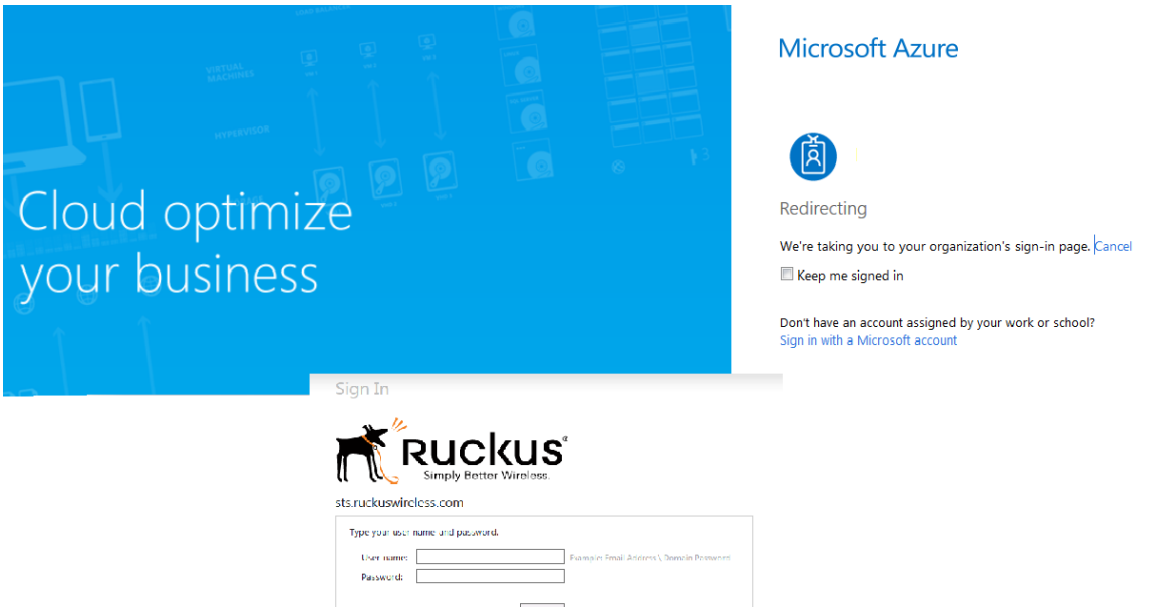


Figure 40: Microsoft Azure login page

If the page does not redirected to the **Ruckus Wireless login** page and asks to you choose a user account, select the Work or school account as shown in the figure.

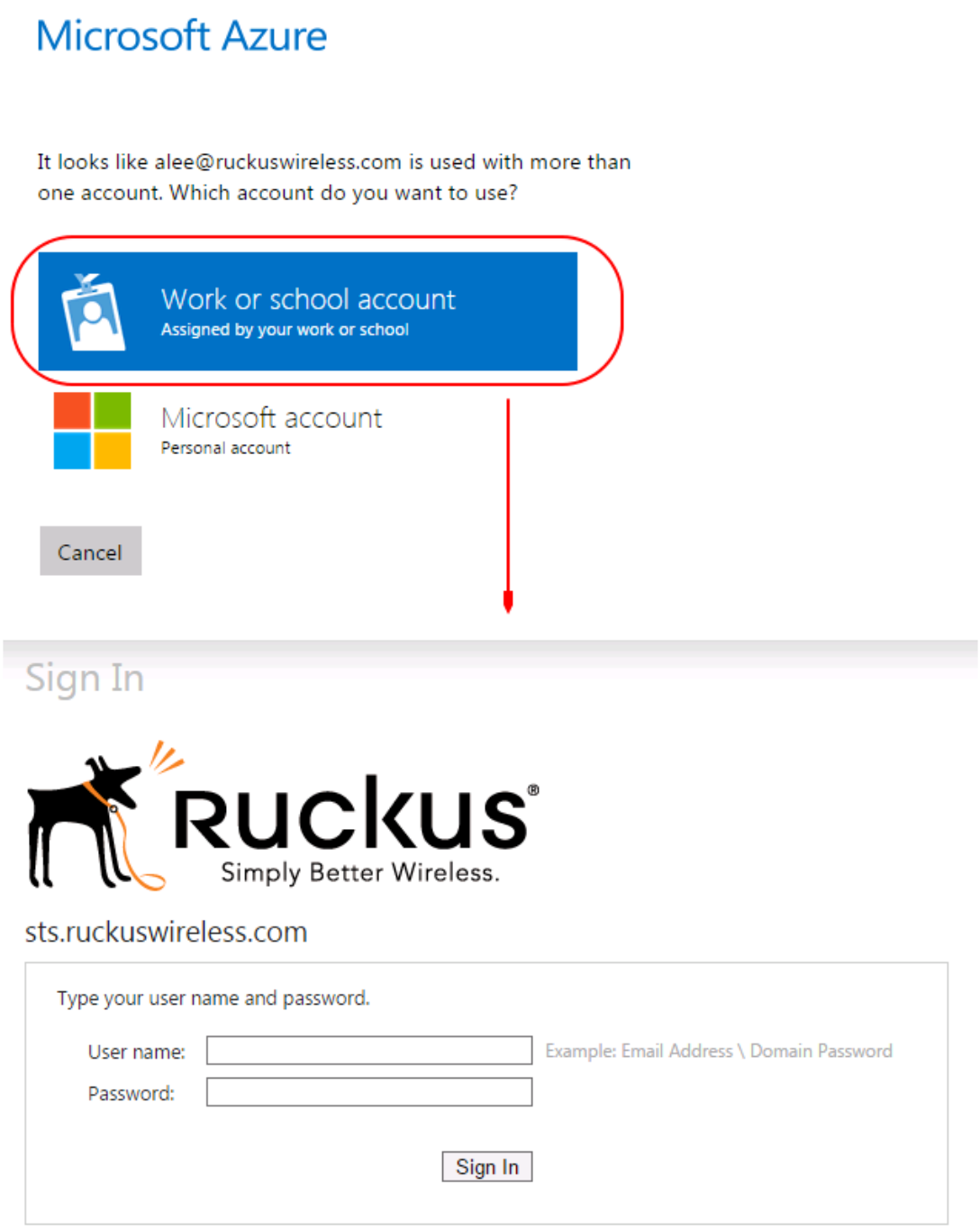


Figure 41: Microsoft Azure Account

The **Ruckus Wireless login** page appears.

5. Enter your **User name** and **Password** to login.

Creating a Storage Account and Container

To create a Microsoft Azure storage account, perform the steps outlined in this section.

1. From the **Microsoft Azure** page, click **Create a storage account**. The **Create a storage** screen appears.

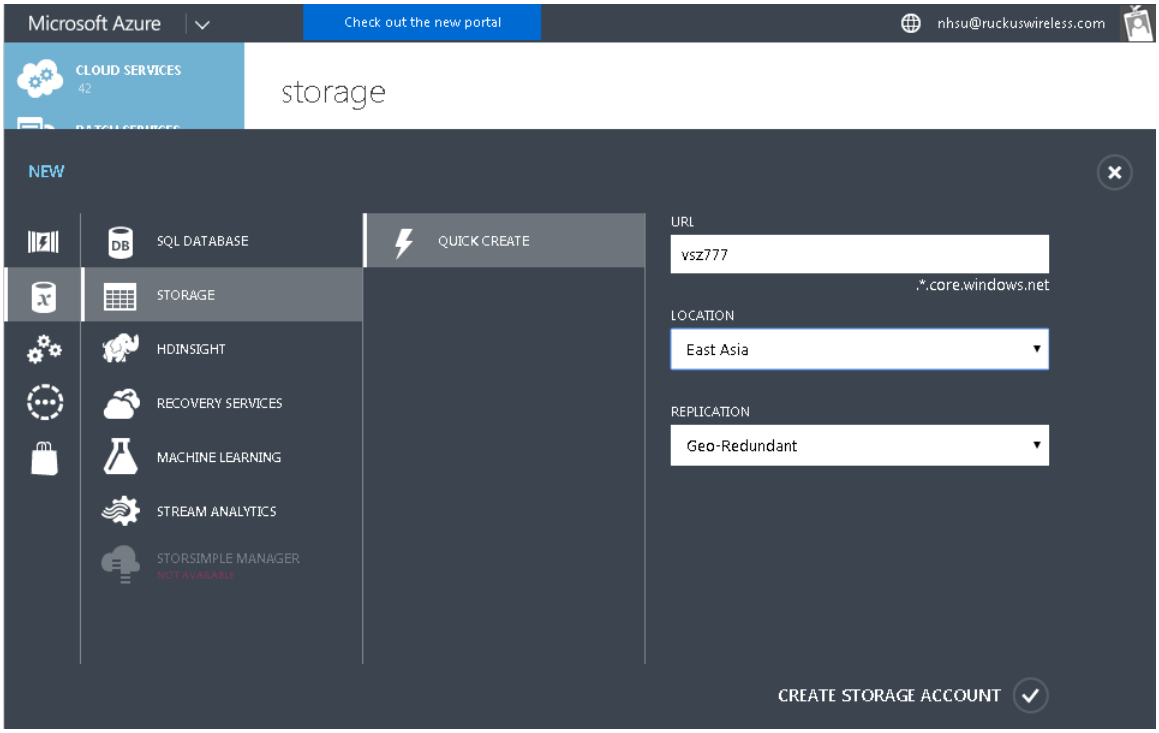


Figure 42: Creating a storage account

2. In **URL**, type the URL.
3. In **Location/Affinity Group**, type the location of the storage.
4. In **Replication**, select an option from the drop-down list.
5. Click **Create Storage Account**. The **Storage** screen appears listing the new storage account.

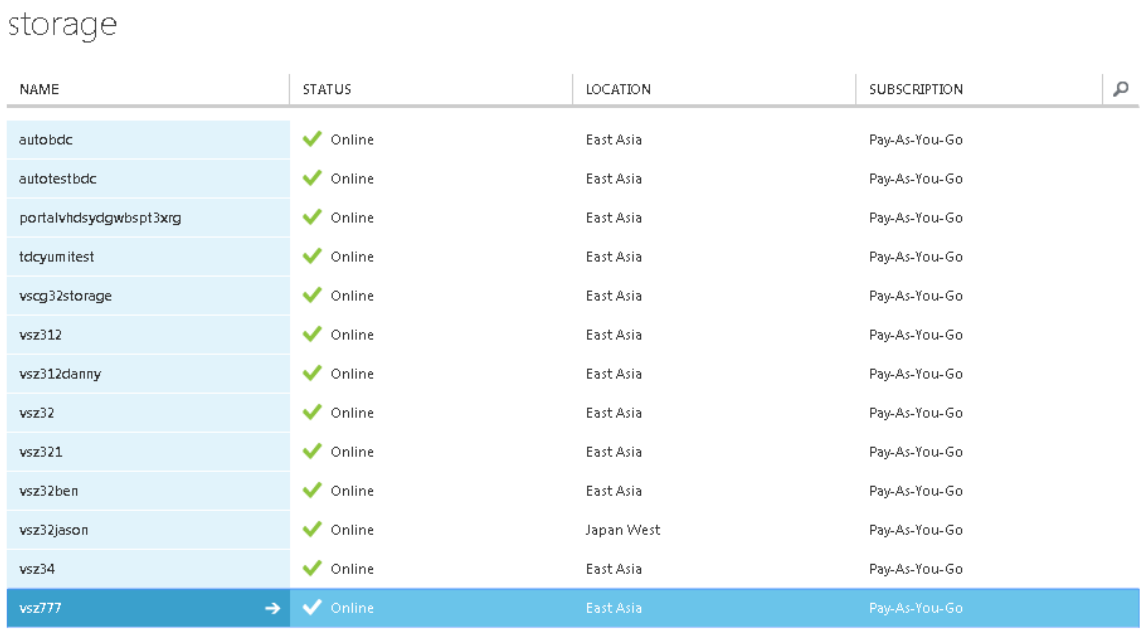


Figure 43: New storage account listed

6. Select the storage account and click **Containers** > **Create a Container**.

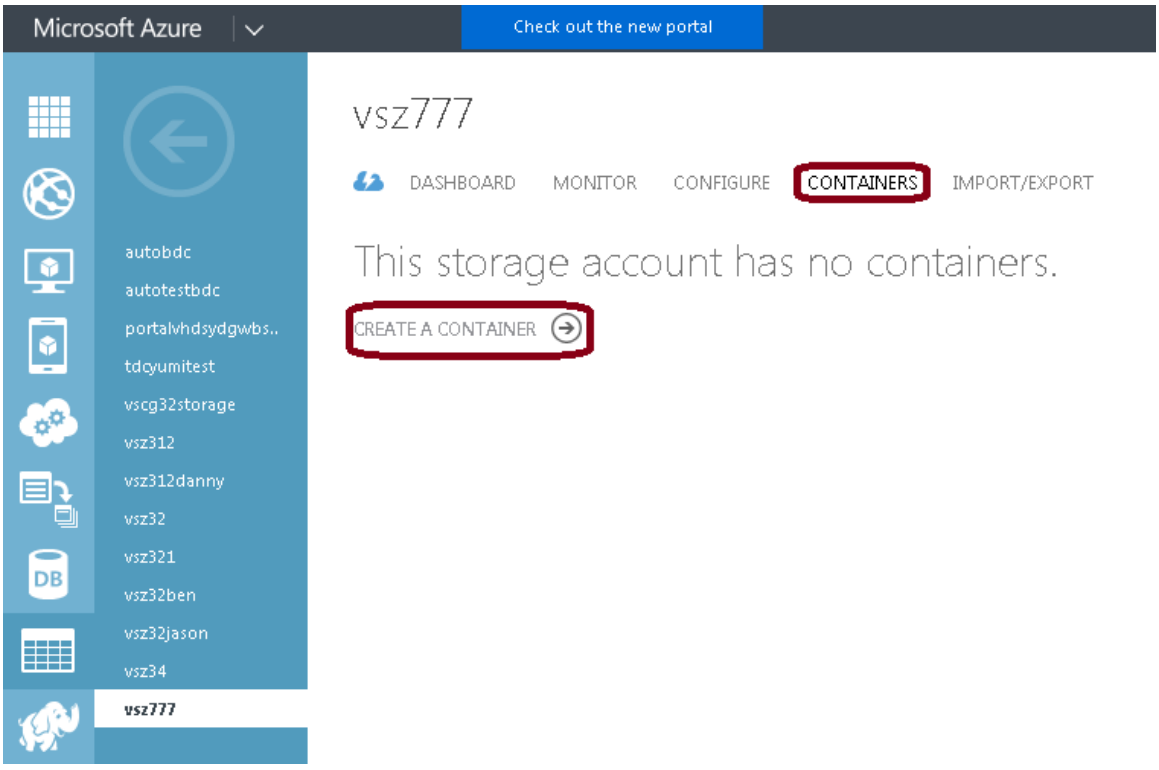


Figure 44: Creating a storage container

The **New Container** screen appears.

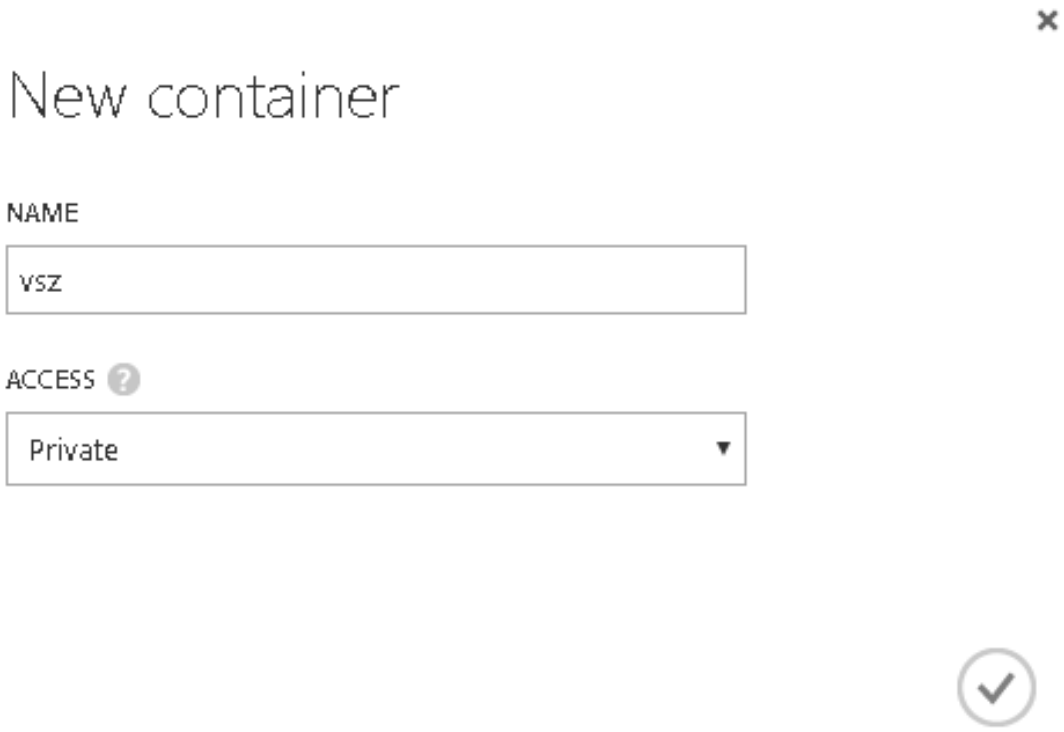


Figure 45: The New Container screen

7. In **Name**, type the name of the storage container.
8. In **Access**, select an option from the drop-down list.
9. Click the icon . The new container is listed in the **Containers** tab.

Figure 46: Containers

Uploading the vSZ Image to Microsoft Azure

You have to upload the vSZ image to Microsoft Azure. Follow these steps outlined in this section to upload the vSZ image to Microsoft Azure.

Ensure that you have installed Windows Azure Power Shell (web platform installer) from http://go.microsoft.com/fwlink/p/?linkid=320376&clcid=0x409.

1. Open Microsoft Azure PowerShell and type the `add-azureaccount` command. The **Microsoft Azure Login** screen appears.
2. Type the *User name* and *Password*.
3. Click **Sign in**. A success message appears confirming your Microsoft Azure account is added.

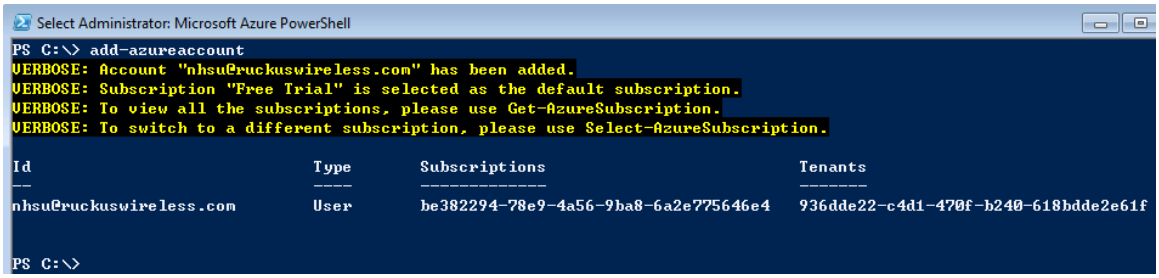


Figure 47: Account creation success message

4. Type command `add-azurevhd` to initiate uploading the image.
   Ensure that the URL in *Destination* and *Microsoft Azure* storage are the same.

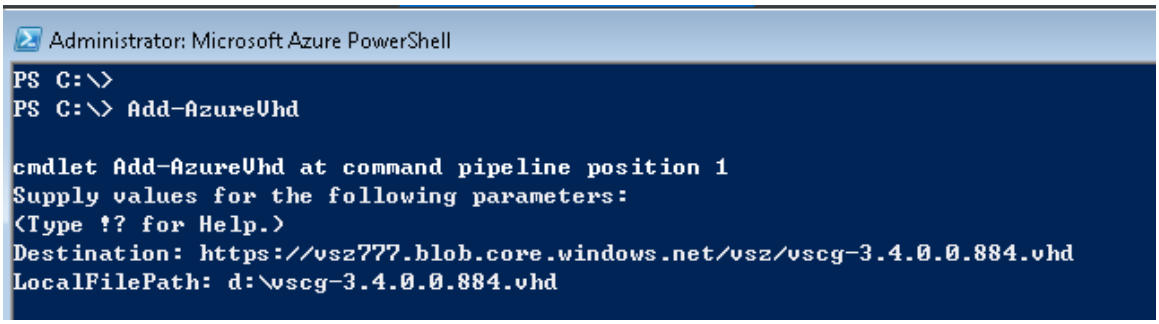


Figure 48: Verifying URLs match

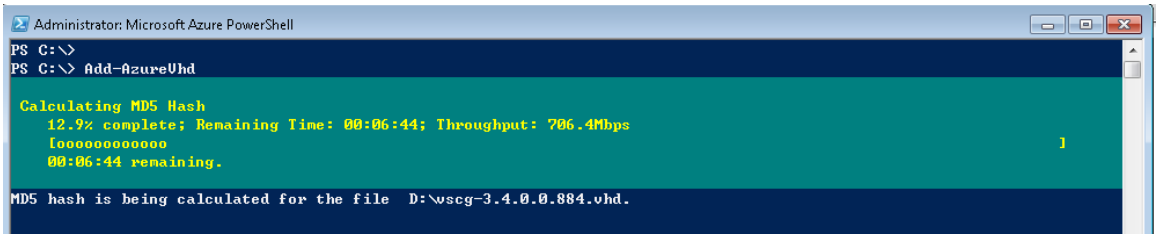


Figure 49: Uploading the vSZ image

After the vSZ image is uploaded, a confirmation message appears.

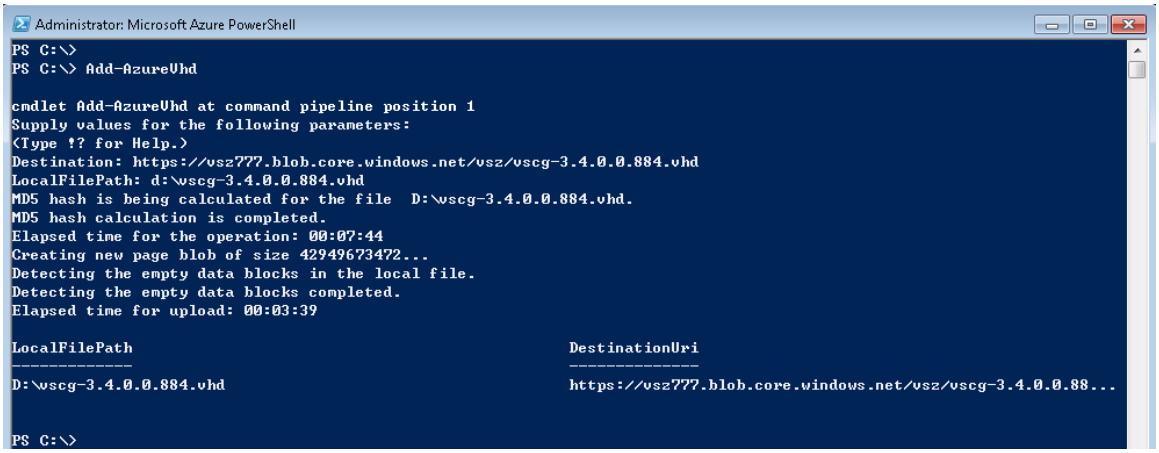


Figure 50: vSZ message indicating image upload is complete

Creating a vSZ Image on Microsoft Azure

ollow these steps to create a vSZ image on Microsoft Azure:

1. From the **Microsoft Azure** page, click **Virtual Machines** > **Images**.

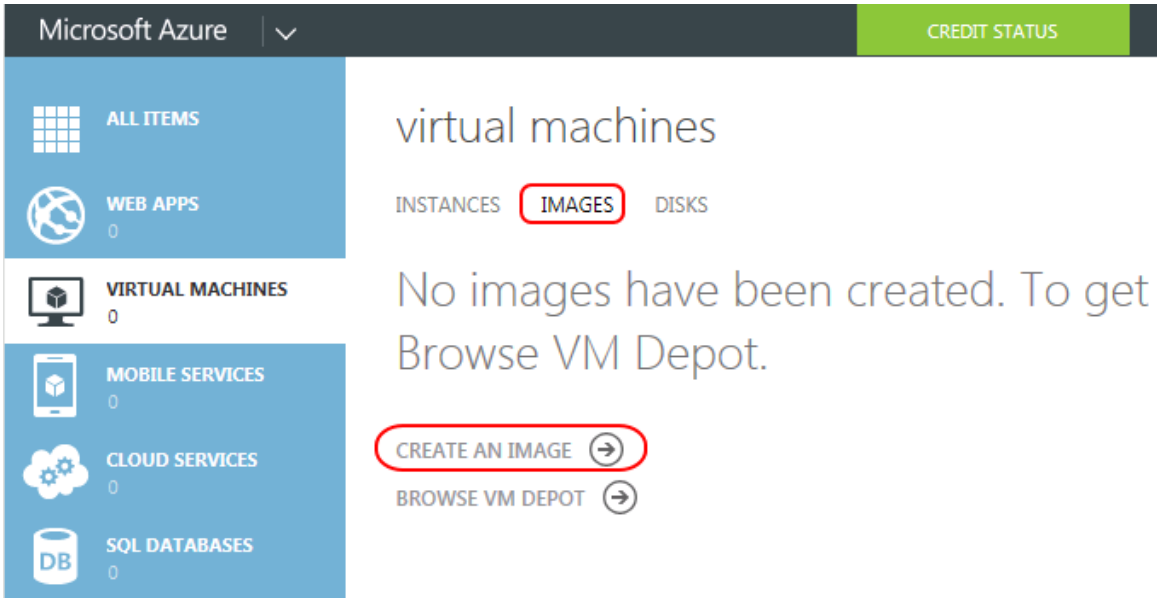


Figure 51: Creating an image

2. Click **Create an Image**. The **Create an Image from VHD** screen appears.

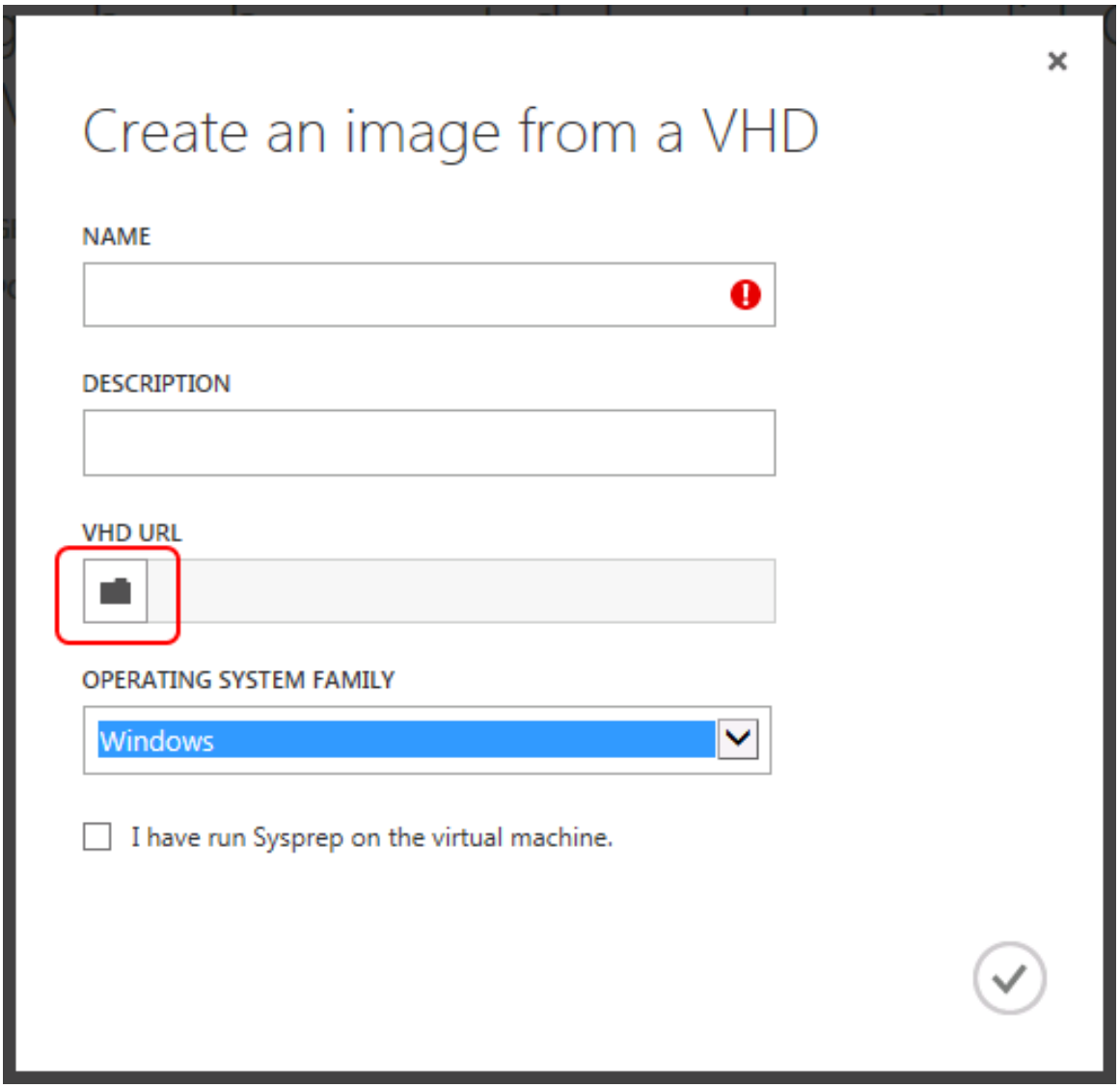


Figure 52: Create an Image from VHD

3. In **Name**, type the name of the image.
4. In **Description**, provide a brief description about the image.
5. Click **VHD URL** and browse to the cloud storage to select the VHD file.
6. In **Operating System Family**, select an option from the drop-down list.
7. Click the icon. The new image is listed in the **Images** tab.

NAME	STATUS	SOURCE	LAST UPDATE	SUBSCRIPTION	LOCATION
vsz32jason	Available	-		Pay-As-You-Go	Japan West
vsz-3.4.0.0.884	Available	-		Pay-As-You-Go	East Asia

Figure 53: A new vSZ image is created

Creating a Network

Follow these steps to create a virtual network.

1. From the **Microsoft Azure** page, click **Networks** > **Virtual Networks**.

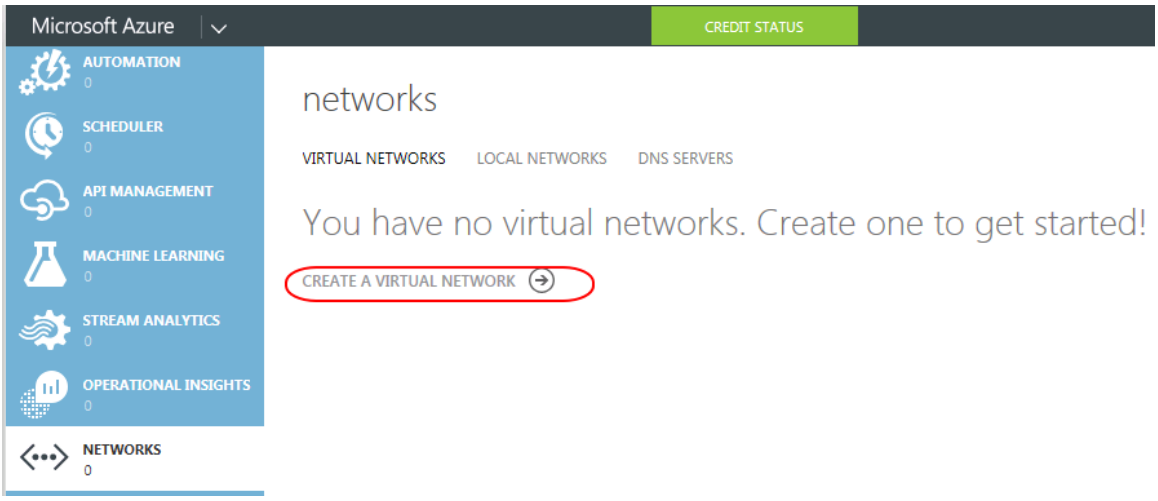


Figure 54: Creating a virtual network

2. Click **Create a Virtual Network**. The **Virtual Network Details** screen appears.

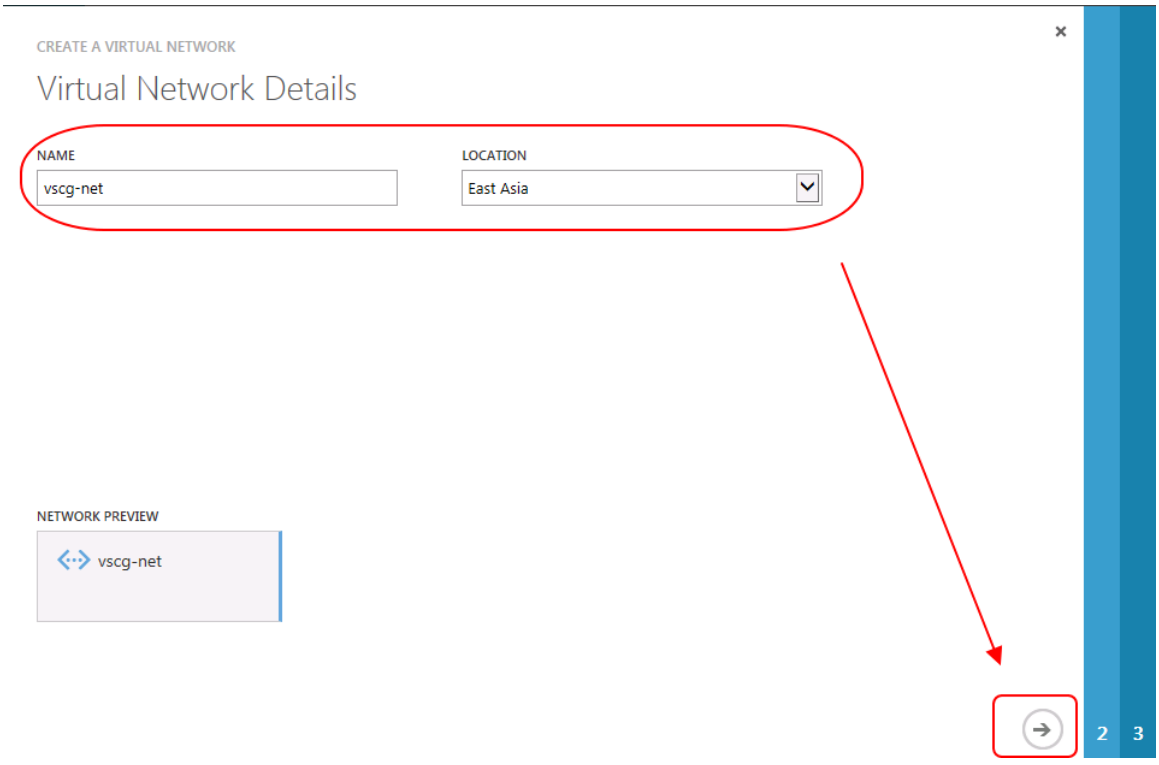


Figure 55: Virtual Network Details screen

3. In **Name**, type the name of the virtual network.

4. In **Location**, select a location from the drop-down list.
5. Click the icon. The **DNS Servers and VPN Connectivity** screen appears.

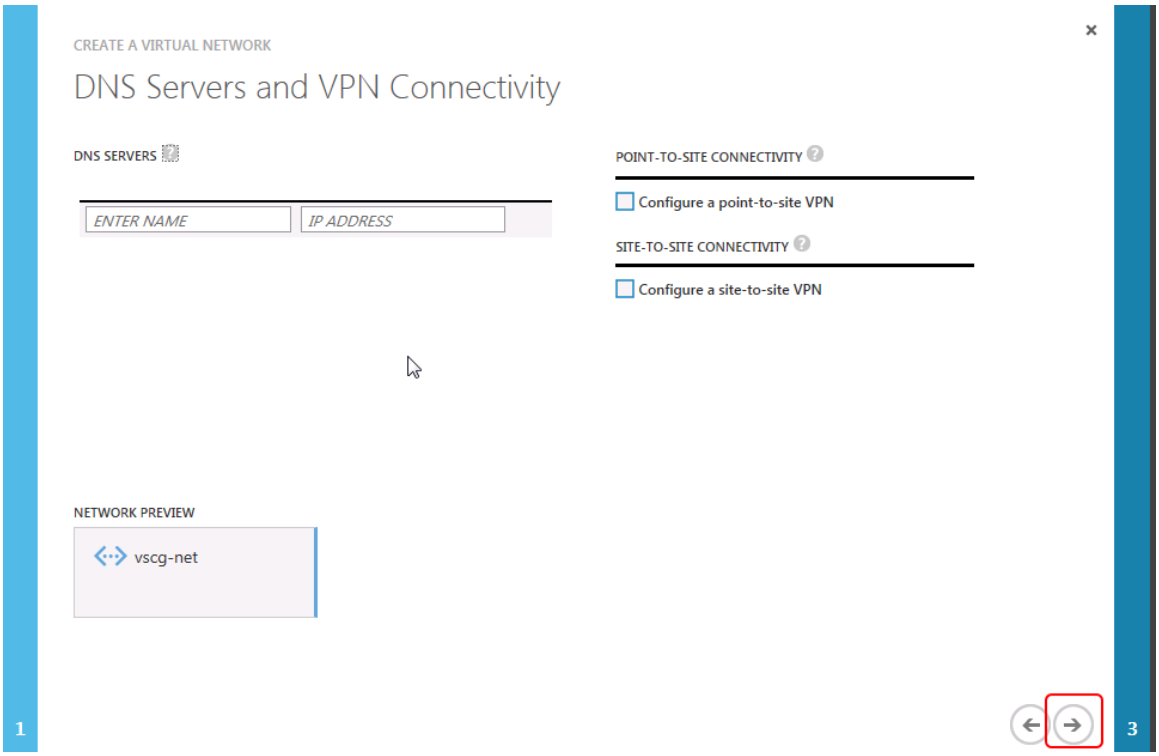


Figure 56: DNS Servers and VPN Connectivity screen

6. In **DNS Server**, type the name of the server and IP address.
7. Configure the VPN connectivity. You can choose between a point-to-site or site-to-site connectivity.
8. Click the icon. The **Virtual Network Address Spaces** screen appears.

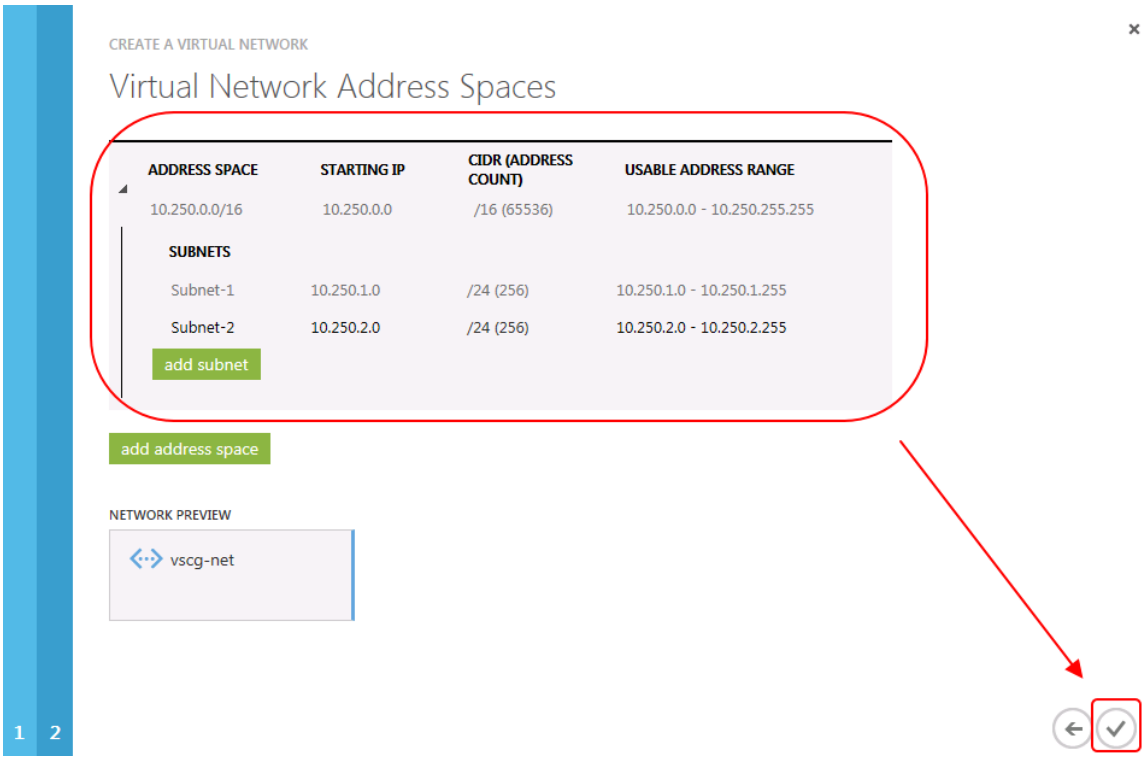


Figure 57: Virtual Network Address Spaces screen

9. Type the address space and subnet information as appropriate.
10. Click the icon. The virtual network is created and listed in the *networks* page.

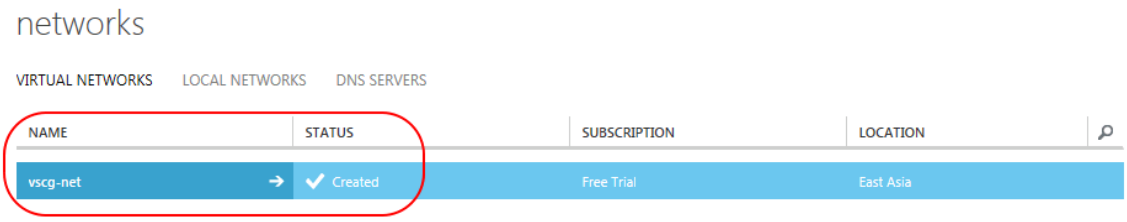


Figure 58: The new virtual network is added and listed in the Networks page

Creating a vSZ Virtual Machine

Follow these steps to create a vSZ virtual machine.

1. From the **Microsoft Azure** page, click **Virtual Machines** > **Instances**. The **New** screen appears.

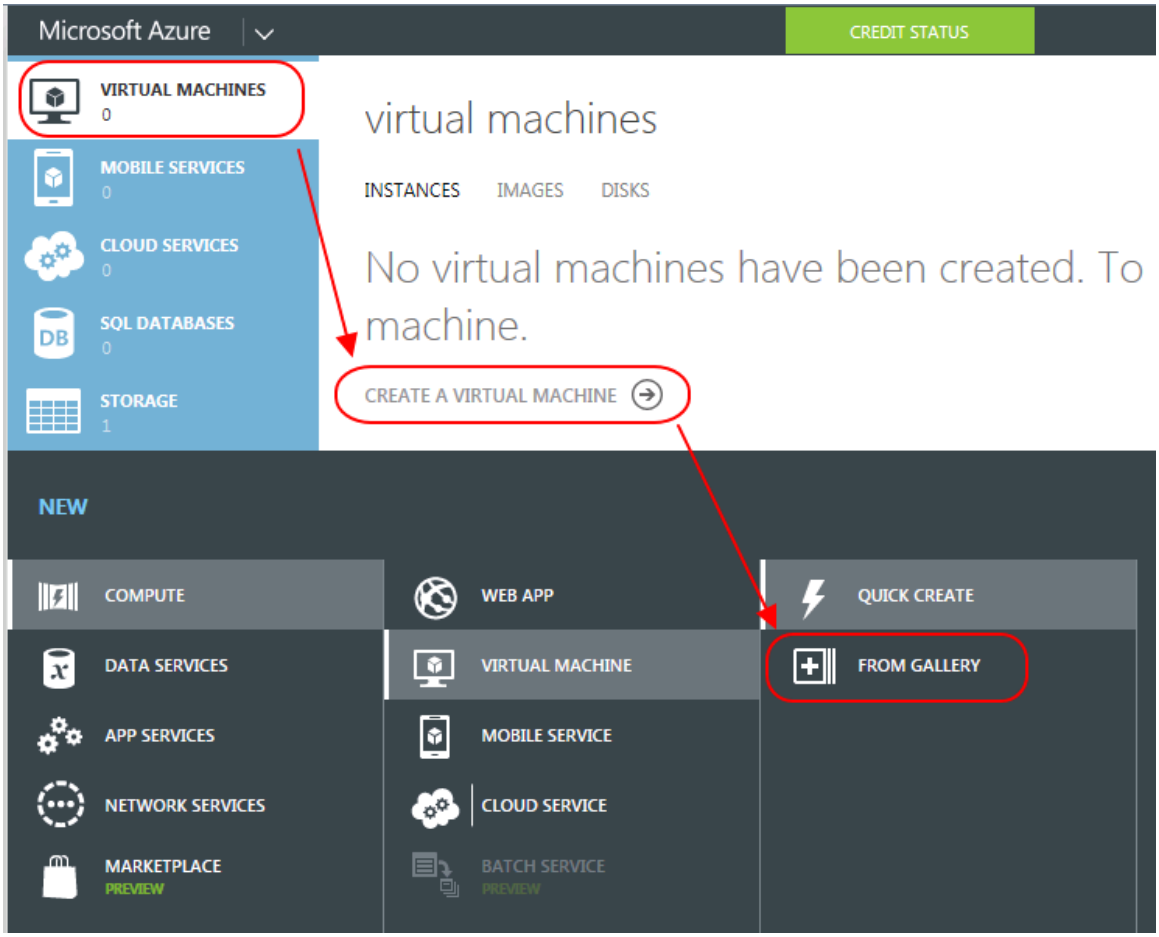


Figure 59: New screen

2. Click **Compute** > **Virtual Machine** > **Quick Create** > **From Gallery**. The **Choose an Image** screen appears.

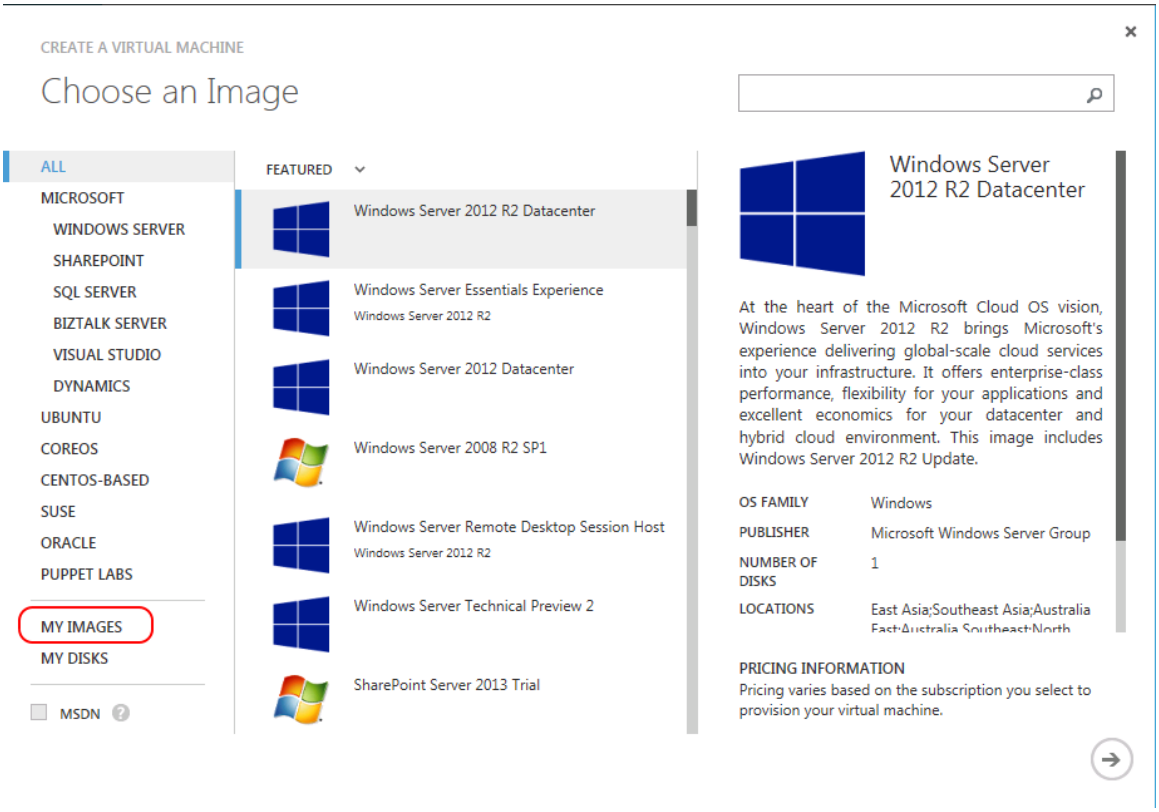


Figure 60: Choosing an image

3. Click **My Images**. A list of images you created appears.

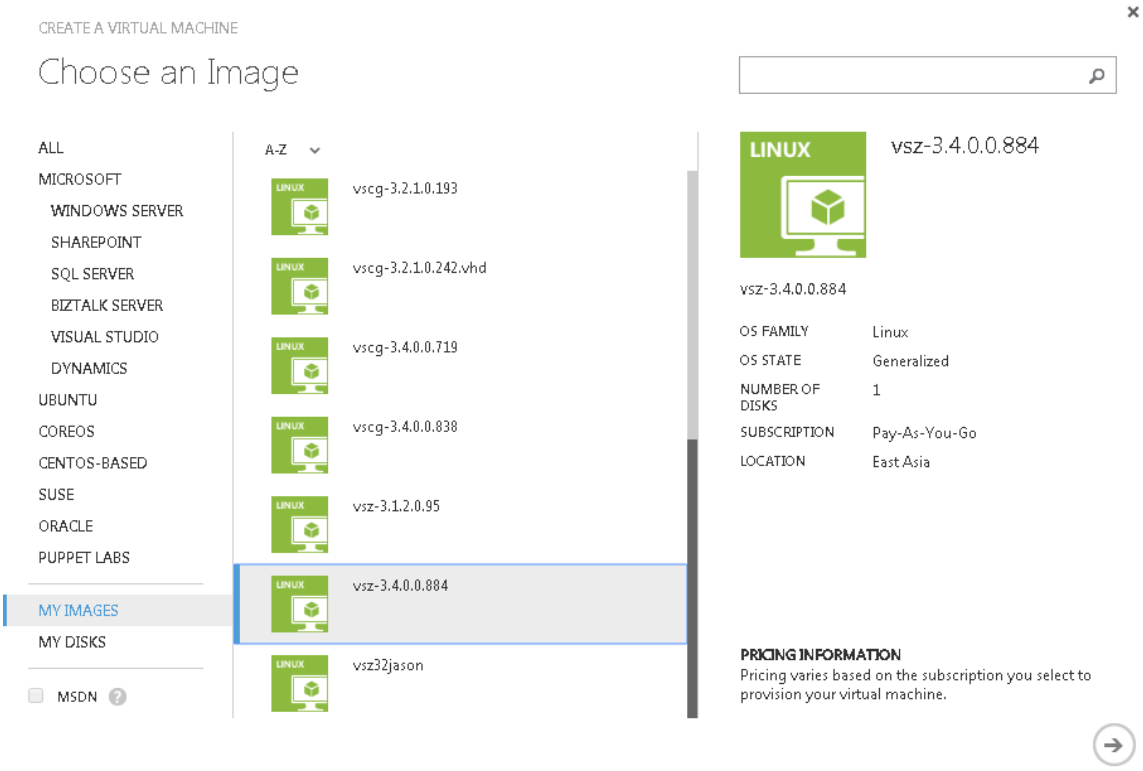


Figure 61: A list of images

4. Select an image.
5. Click the icon. The **Virtual Machine Configuration** screen appears.

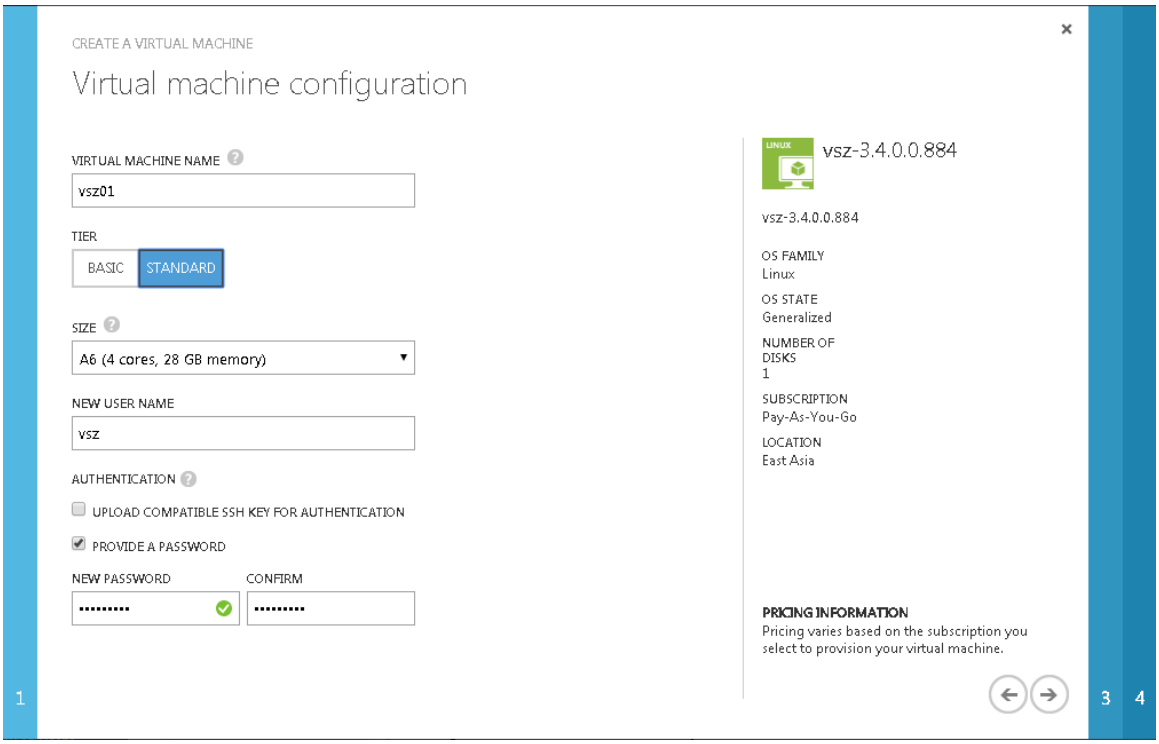


Figure 62: Virtual machine configuration - screen 1

6. In **Virtual Machine Name**, type the name of the VM.
7. In **Tier**, select **Standard**.
8. In **Size**, select an option from the drop-down list.
9. In **New User Name**, type the user name.
10. In **Authentication**, select the **Provide a Password** option. Type the new password and confirm.
11. Click the icon. The next configuration screen appears

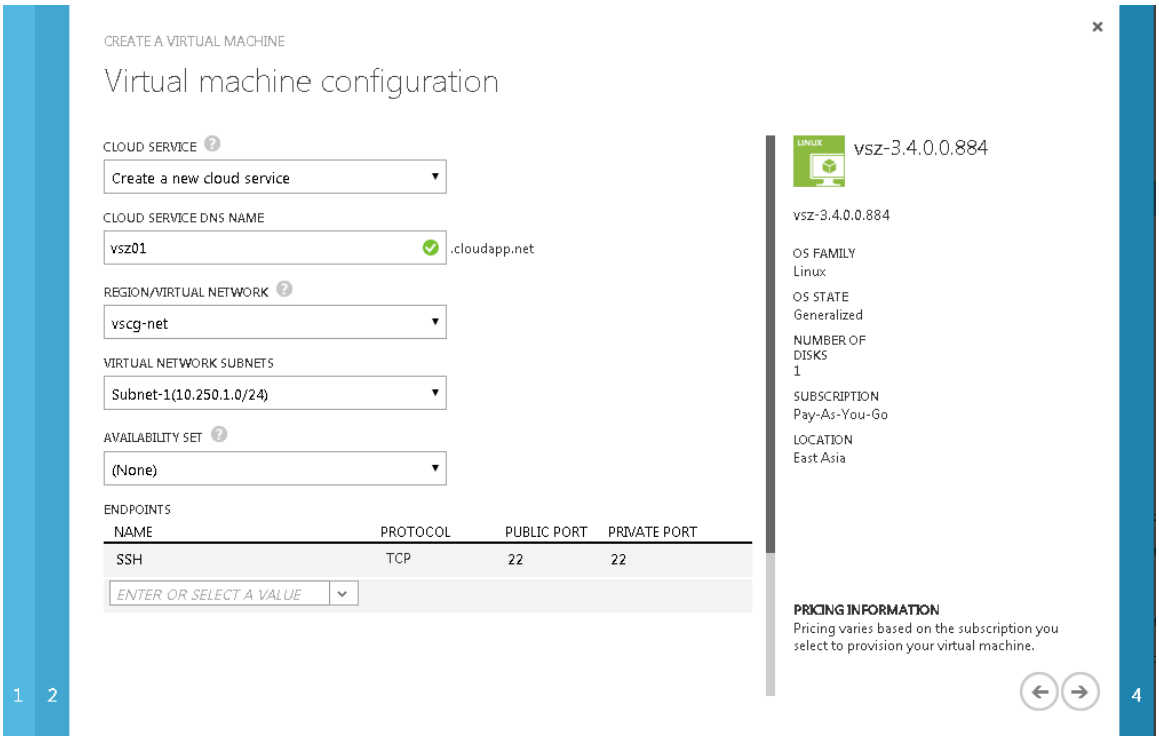


Figure 63: Virtual machine configuration - screen 2

12. In **Cloud Service**, select a service from the drop-down list.
13. In **Cloud Service DNS Name**, type the DNS name.
14. In **Region/Affinity Group/Virtual Network**, select an option from the drop-down list.
15. In **Virtual Network Subnets**, select an option from the drop-down list.
16. In **Availability Set**, select an option from the drop-down list.
17. In **End Points**, type the values as appropriate. Refer to step 4 of Creating vSZ Instance on page 113
18. Click the icon. The next configuration screen appears.

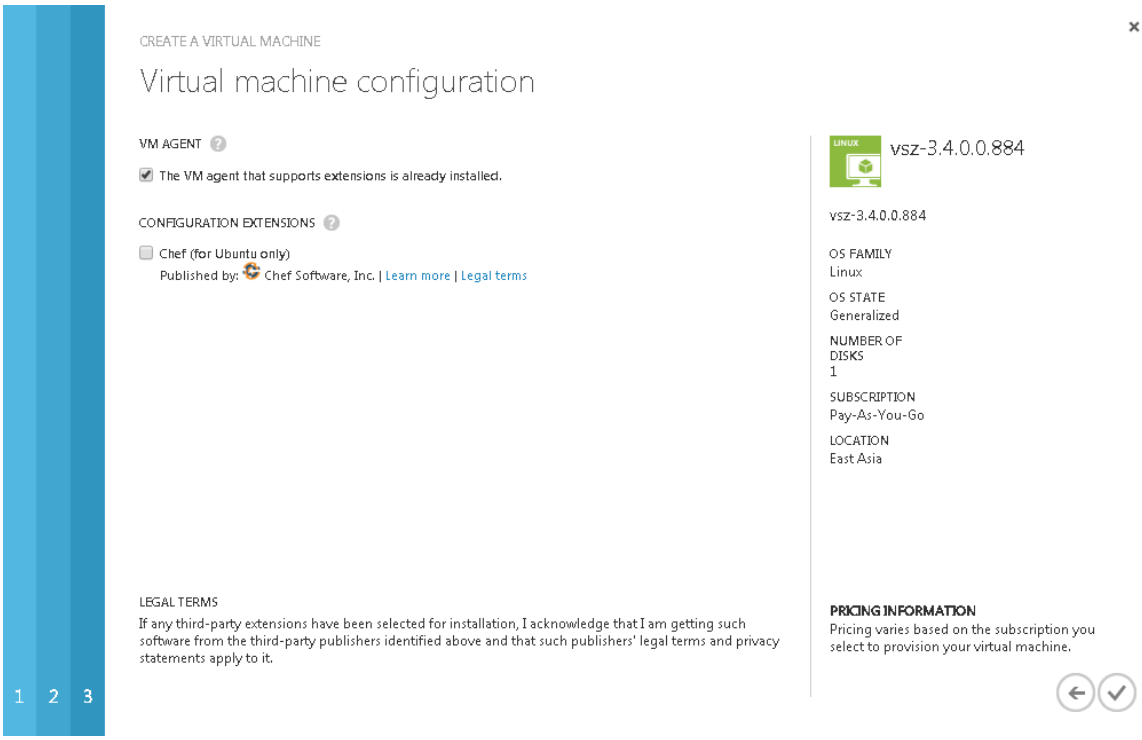


Figure 64: Virtual machine configuration - screen 3

19. In **VM Agent**, select the check-box to enable VM agent.
20. Click the icon. The new VM is listed in the **Virtual Machines** page.

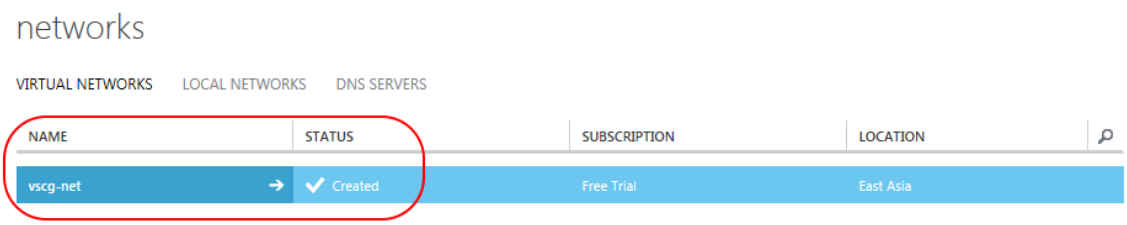


Figure 65: The new VM is created and listed

Configuring Port Numbers for Virtual Machines

Follow these steps to configure port numbers for your VM using Microsoft Azure.

1. From the **Microsoft Azure** page, click **Virtual Machines** > **Instances**.

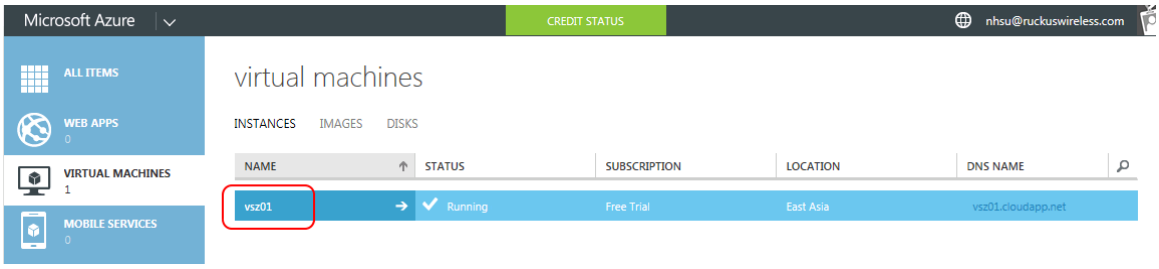


Figure 66: Selecting a VM

2. Select the virtual machine to configure the ports.
3. Click **Endpoints**.
4. Select **Add Endpoint.**.

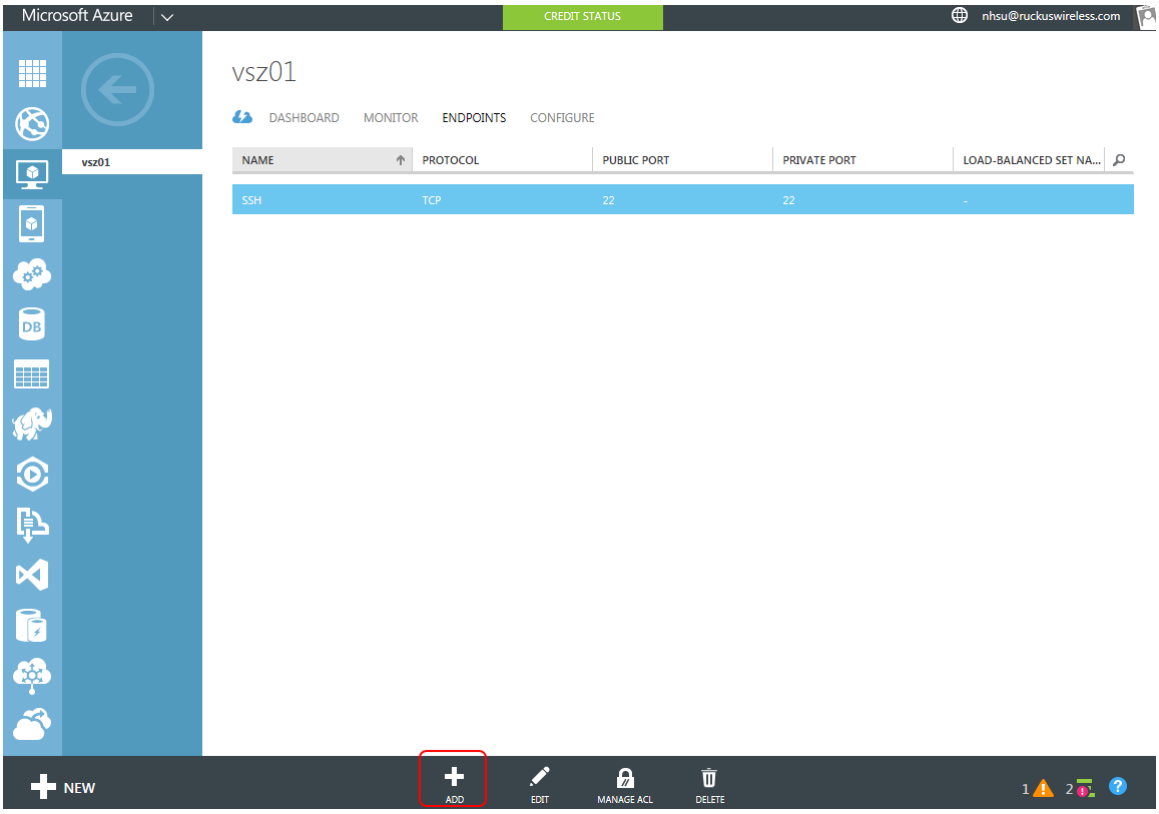


Figure 67: Adding endpoints

The **Add Endpoint** screen appears.

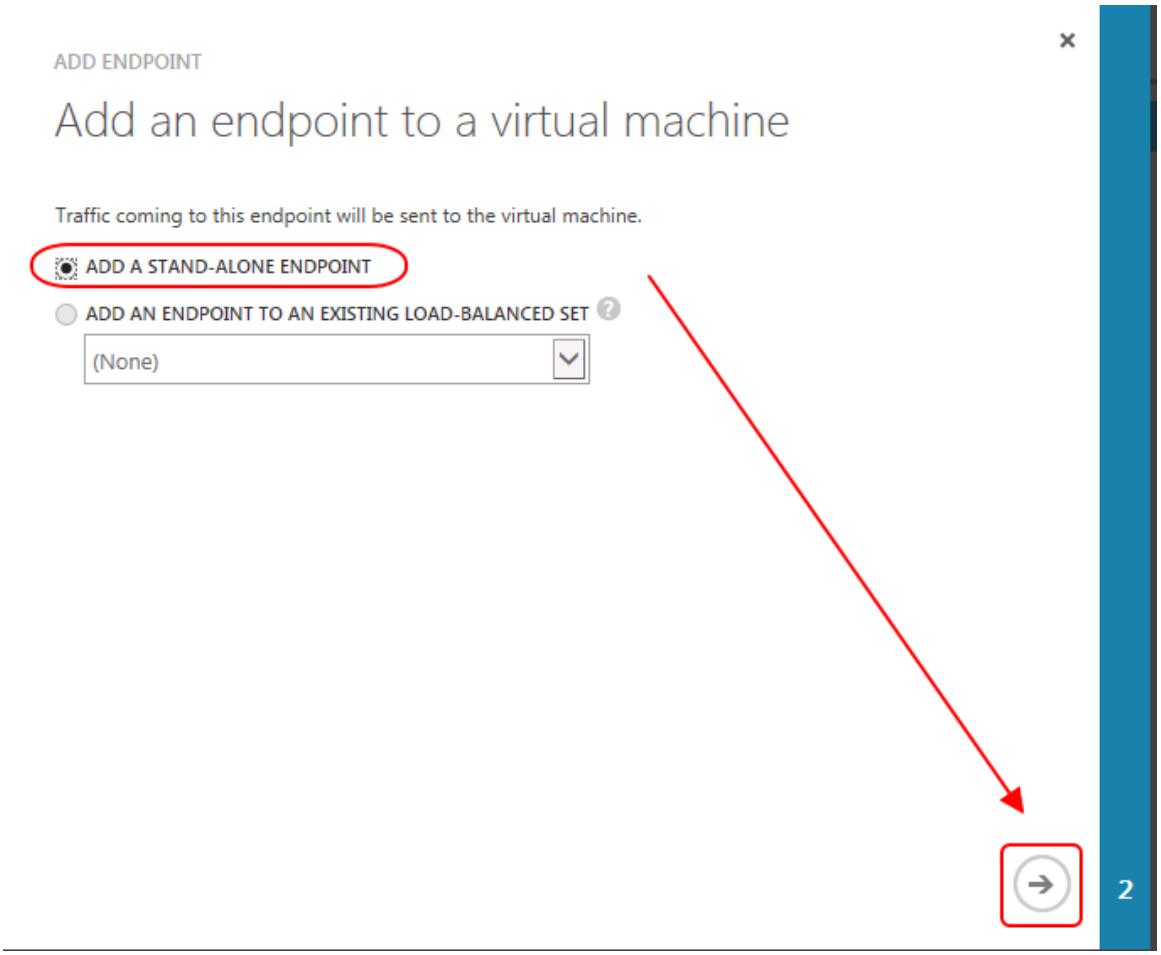


Figure 68: Add Endpoint - screen

5. Select **Add a stand-alone end point**.
6. Click the → icon. The next configuration screen appears.

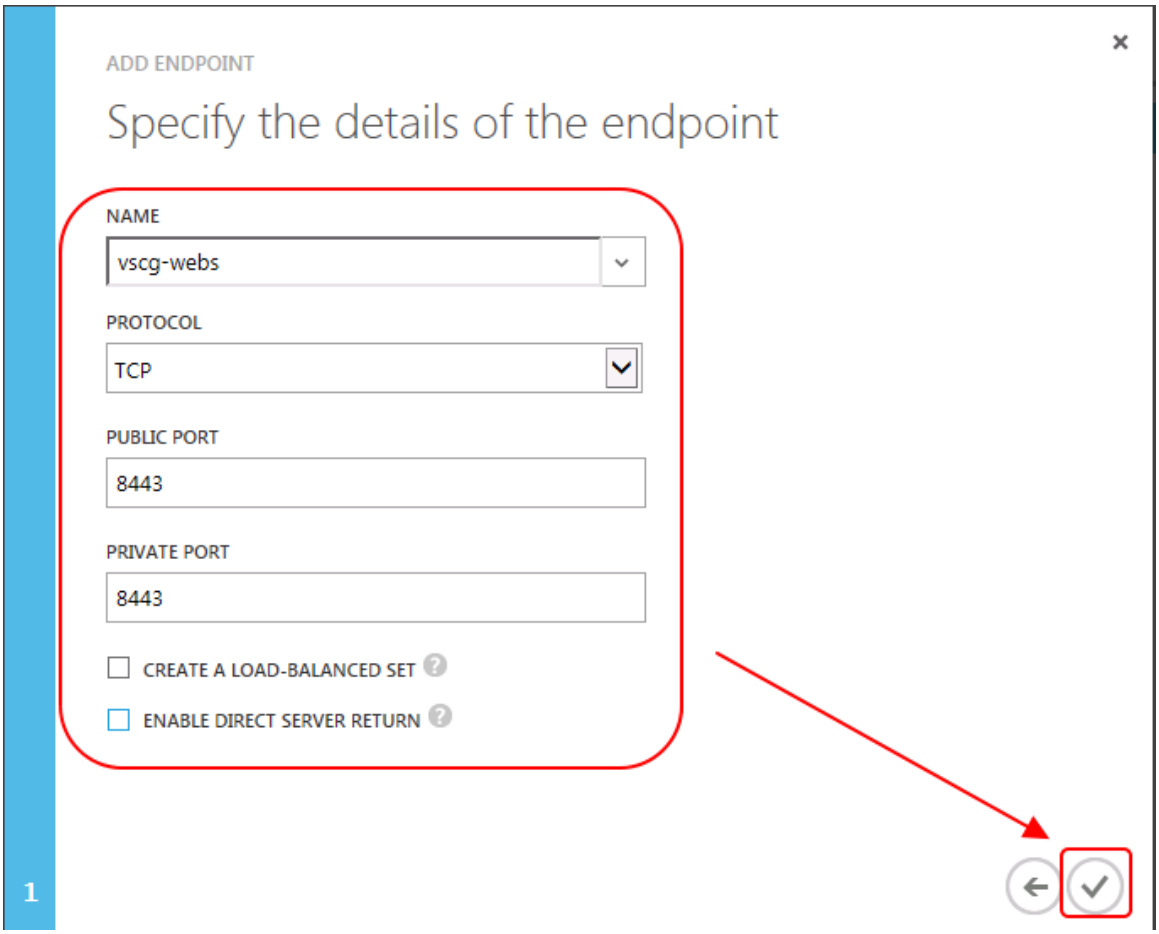


Figure 69: Adding Endpoint - screen 2

7. In **Name**, type the name of the endpoint.
8. In **Protocol**, select the protocol from the drop-down list.
9. In **Public Report**, type `8443`.
10. In **Private Report,** type `8443`.
11. Click the icon. The endpoint is created and listed in the **Endpoints** tab for the VM.

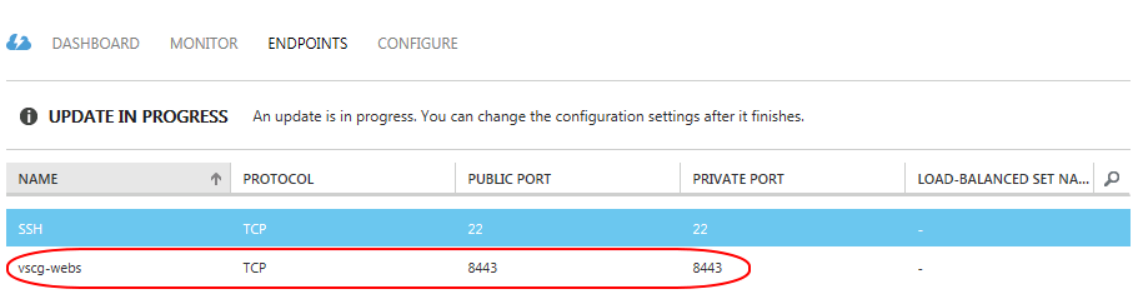


Figure 70: A new endpoint for the VM is created and listed

Assigning a Static Public IP Address to a VM

Microsoft Azure assigns a dynamic IP address to a VM when it is created. In addition, a static public IP address must be assigned to a VM as DNS names cannot be configured in a vSZ; resulting in changes to the public IP address. Follow these steps to assign a static public IP address to a VM:

1. Open the command prompt and create a static IP by typing the `New-AzureReservedIP-ReservedIPName <name>-Label <label name>-Location <location name>` command.

```
PS C:\> New-AzureReservedIP -ReservedIPName "vsz-IP_01" -Label "Nick_for-vsz01" -Location "East Asia"
VERBOSE: 上午 11:13:45 - Begin Operation: New-AzureReservedIP
VERBOSE: 上午 11:14:17 - Completed Operation: New-AzureReservedIP

OperationDescription                    OperationId                             OperationStatus
--------------------                    -----------                             ---------------
New-AzureReservedIP                     bbad788d-3f79-b0c3-8826-d85b4795029f    Succeeded


PS C:\>
```

Figure 71: Creating a static IP address

2. Verify that the static IP address is created by typing the `Get-AzureReservedIP` command.

```
PS C:\> Get-AzureReservedIP
VERBOSE: 下午 01:49:33 - Begin Operation: Get-AzureReservedIP
VERBOSE: 下午 01:49:36 - Completed Operation: Get-AzureReservedIP


ReservedIPName       : MyReservedIP
Address              : 23.99.118.9
Id                   : a7f1f41a-0427-4b9b-a410-b632ea06d907
Label                : ReservedIPLabel
Location             : East Asia
State                : Created
InUse                : True
ServiceName          : vsz-server01
DeploymentName       : vsz-server01
OperationDescription : Get-AzureReservedIP
OperationId          : 8409bfdf-fd02-bfe9-afd6-e3ea05262d83
OperationStatus      : Succeeded

ReservedIPName       : vsz-IP_01
Address              : 23.99.122.87
Id                   : 9d876fb4-0bc6-4177-8427-e27f60fc863f
Label                : Nick_for-vsz01
Location             : East Asia
State                : Created
InUse                : True
ServiceName          : vsz-cp01
DeploymentName       : vsz-cp01
OperationDescription : Get-AzureReservedIP
OperationId          : 8409bfdf-fd02-bfe9-afd6-e3ea05262d83
OperationStatus      : Succeeded
```

Figure 72: Verifying static IP address is created

3. Select a VM to assign the static public IP by typing the `get-azurevm` command.

```
PS C:\> get-azurevm

ServiceName                    Name                           Status
-----------                    ----                           ------
sim01                          sim01                          ReadyRole
vsz-cp01                       vsz-cp01                       ProvisioningFailed
vsz-server01                   vsz-server01                   ReadyRole
```

Figure 73: Selecting the VM to assign a static IP address

4. Set the IP address to the VM by typing the `Set-AzureReservedIPAssociation-ReservedIPName <name>-ServiceName <name>` command.

```
PS C:\> Set-AzureReservedIPAssociation -ReservedIPName vsz-IP_01 -ServiceName vsz-cp01
VERBOSE: 下午 01:42:19 - Begin Operation: Set-AzureReservedIPAssociation
VERBOSE: 下午 01:44:17 - Completed Operation: Set-AzureReservedIPAssociation

OperationDescription                OperationId                          OperationStatus
--------------------                -----------                          ---------------
Set-AzureReservedIPAssociation      503e8b53-3c0d-b4c5-ac3c-68d06bb6f231    Succeeded


PS C:\>
```

Figure 74: Setting the IP address

5. Verify that the static public IP address to assigned to the VM by typing the `Get-AzureReservedIP` command.

```
PS C:\> Get-AzureReservedIP
VERBOSE: 下午 01:49:33 - Begin Operation: Get-AzureReservedIP
VERBOSE: 下午 01:49:36 - Completed Operation: Get-AzureReservedIP


ReservedIPName        : MyReservedIP
Address               : 23.99.118.9
Id                    : a7f1f41a-0427-4b9b-a410-b632ea06d907
Label                 : ReservedIPLabel
Location              : East Asia
State                 : Created
InUse                 : True
ServiceName           : vsz-server01
DeploymentName        : vsz-server01
OperationDescription  : Get-AzureReservedIP
OperationId           : 8409bfdf-fd02-bfe9-afd6-e3ea05262d83
OperationStatus       : Succeeded

ReservedIPName        : vsz-IP_01
Address               : 23.99.122.87
Id                    : 9d876fb4-0bc6-4177-8427-e27f60fc863f
Label                 : Nick_for-vsz01
Location              : East Asia
State                 : Created
InUse                 : True
ServiceName           : vsz-cp01
DeploymentName        : vsz-cp01
OperationDescription  : Get-AzureReservedIP
OperationId           : 8409bfdf-fd02-bfe9-afd6-e3ea05262d83
OperationStatus       : Succeeded
```

Figure 75: Verifying that the IP address is assigned

6. From the **Microsoft Azure** page, click **Virtual Machines** > **Instances** and verify that DNS Name.
7. Select the VM.
8. Click the **Dashboard** tab. Verify that you are able to see the updated Public IP address.

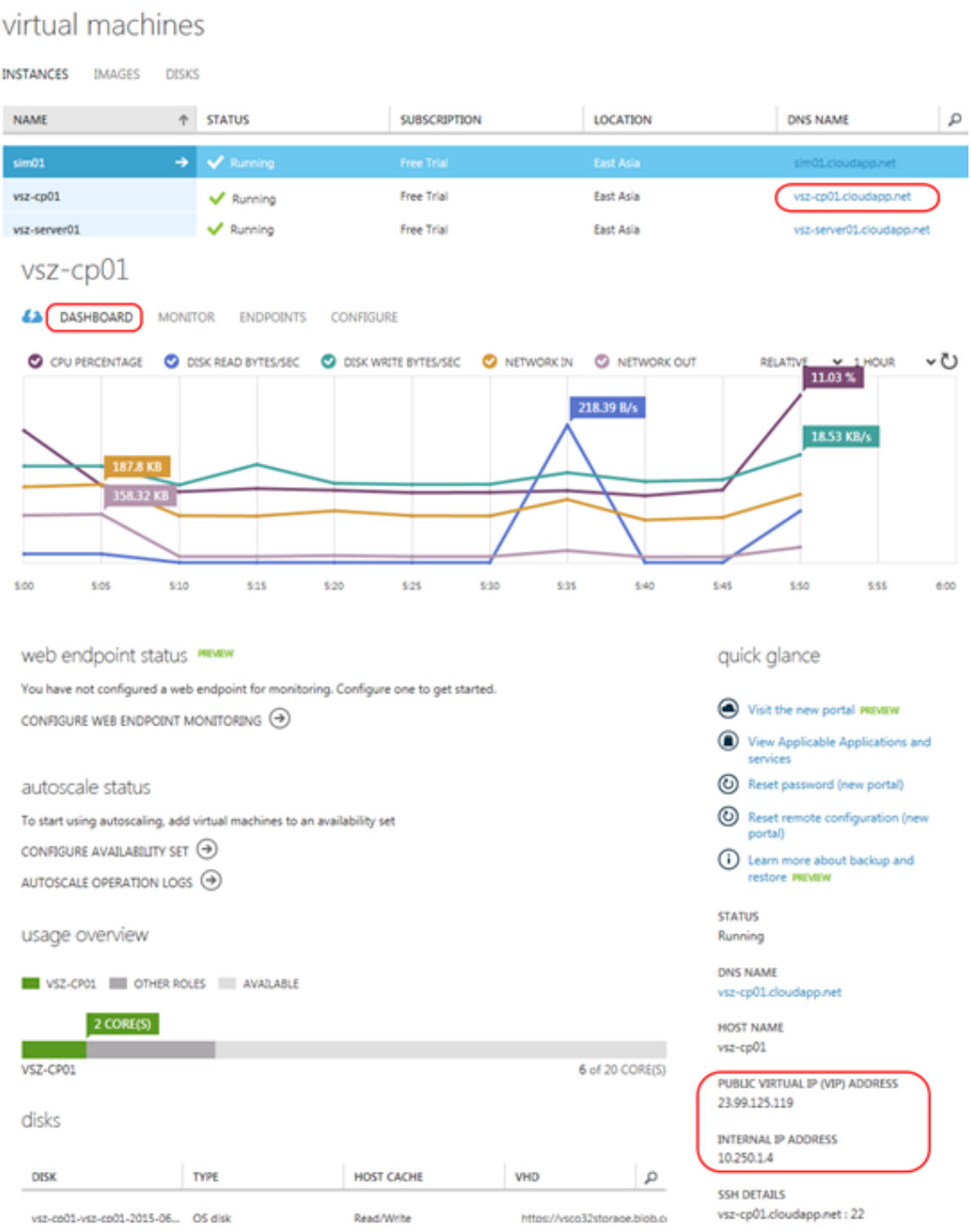


Figure 76: Verifying the DNS name and static public IP address changes

Assigning a Static Internal IP Address to a Virtual Machine

A Virtual machine in a network is assigned an internal IP address. These addresses change when the VM is restarted. Some scenarios such as the following might require VMs to have a static internal IP address that does not change: If the VM is an internal DNS server, If the VM is a node within a cluster, and If the VM is part of a site-to-site VPN connection..

Before You Begin:

- Ensure that a vSZ virtual machine is created using Microsoft Azure.
- Ensure that you assign an internal IP for the VM before configuring the virtual network.

Follow these steps to assign an static internal IP to a VM:

1. From the **Microsoft Azure** page, click **Virtual Machines** > **Instances**.
2. From the **Virtual Machines** page, select the VM.
   An internal IP is assigned to the VM by default when it is created.

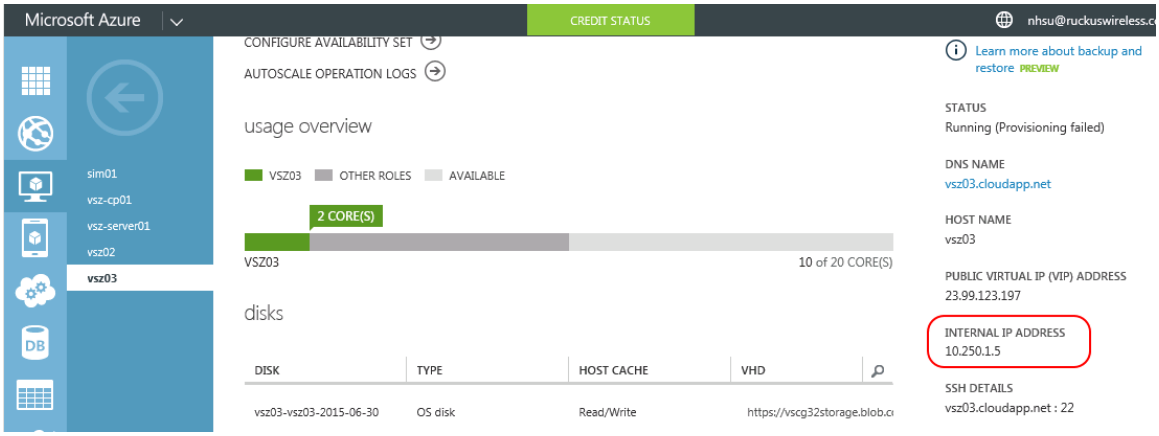


Figure 77: Default IP assigned to the VM

3. Click **Shutdown**.

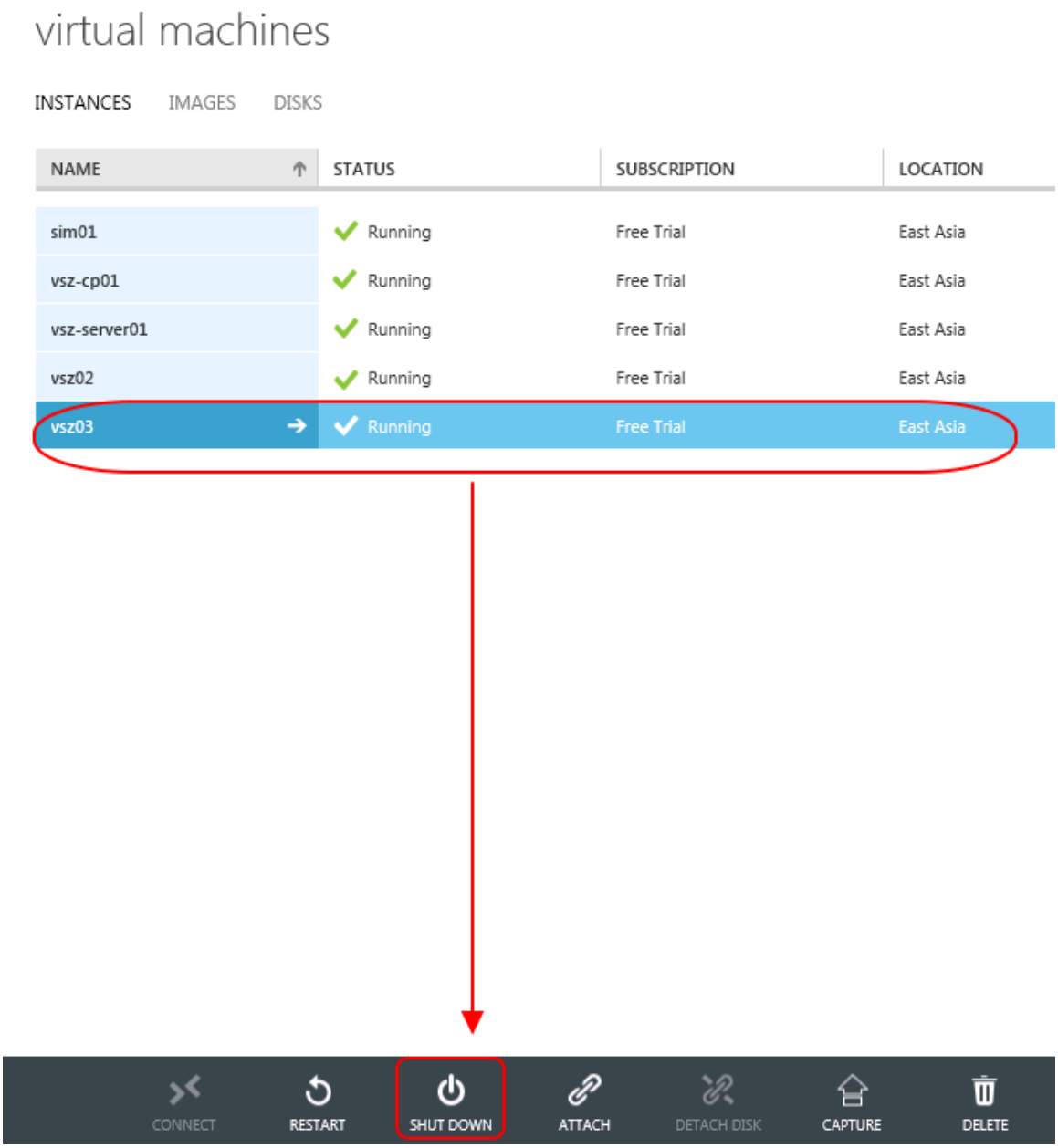


Figure 78: Shutting down the VM

4. Verify that the VM has stopped running.

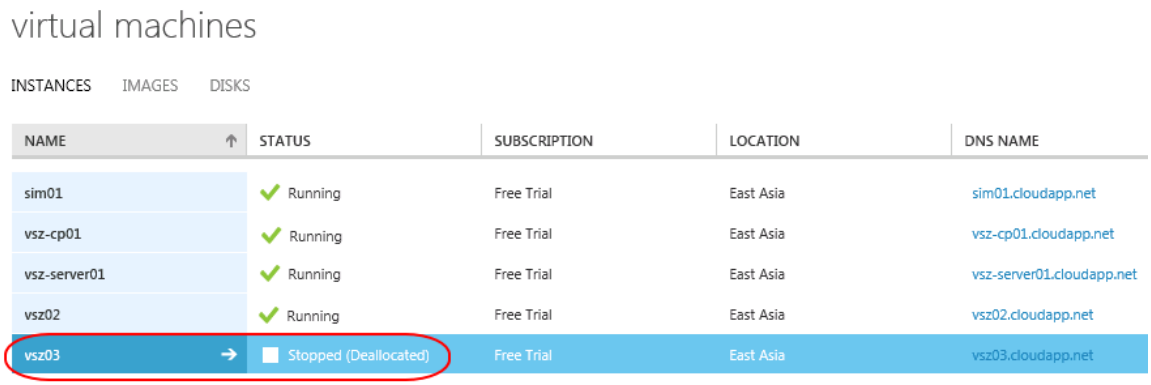


Figure 79: Verifying VM has stopped running

5. Open command prompt.
6. Enter the `Test-AzureStaticVnetIP -VnetName <name> -IPAddress <test IP address>` command to verify that the IP address is available to assign to the VM.

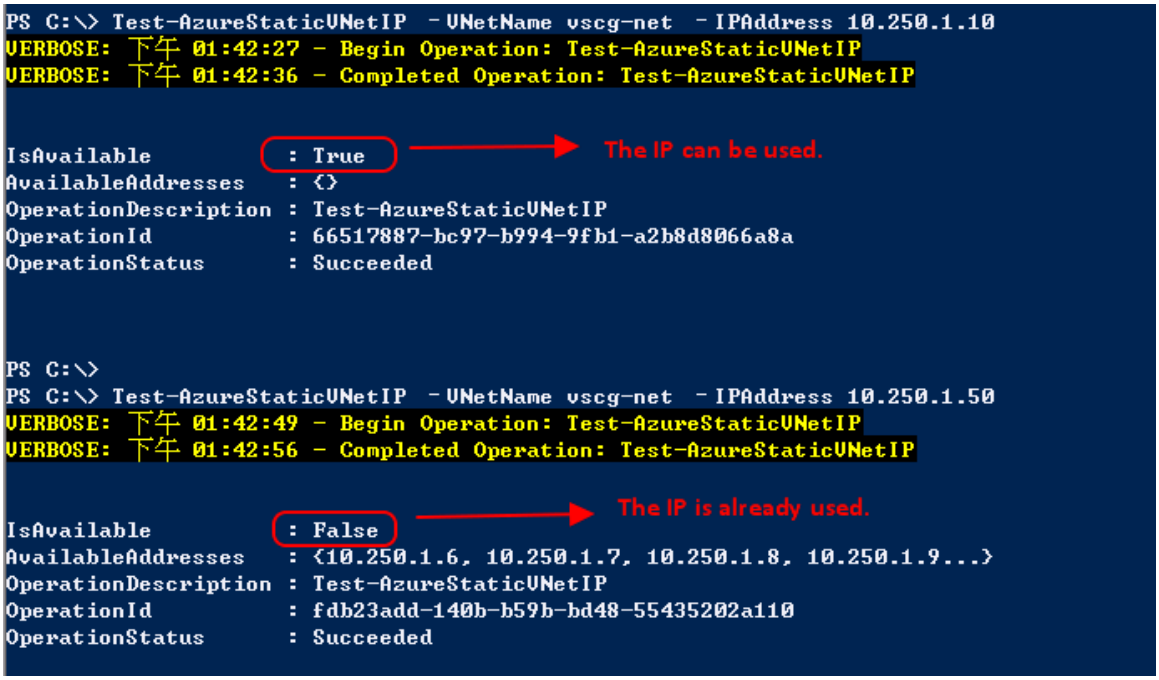


Figure 80: Verifying IP address availability

7. Assign the available IP (10.250.1.10 in this example) to the VM using the `Get-AzureVM -ServiceName vsz03 -Name vsz03 `| Set-AzureStaticVNetIP -IPAddress 10.250.1.10 `| Update-AzureVM` commands.

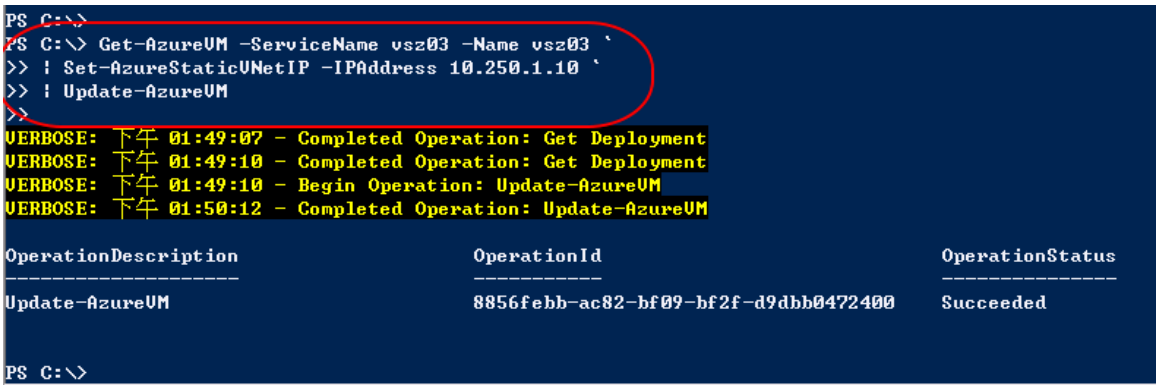


Figure 81: Assigning the static IP to the VM

8. From the **Virtual Machines** page, select the VM.
9. Click **Start**.

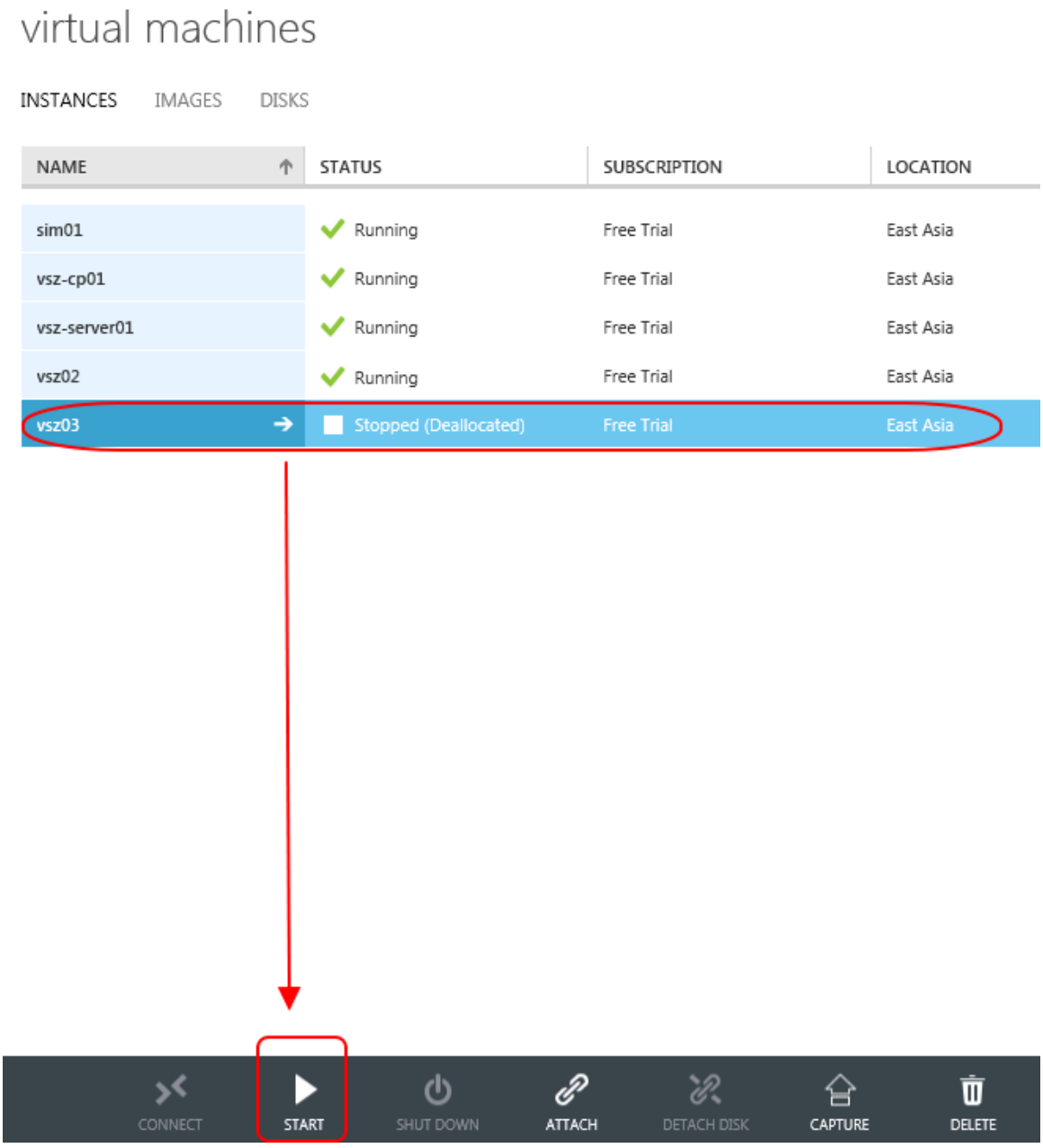


Figure 82: Starting the VM

10. Click the VM properties and verify that the IP address has changed.

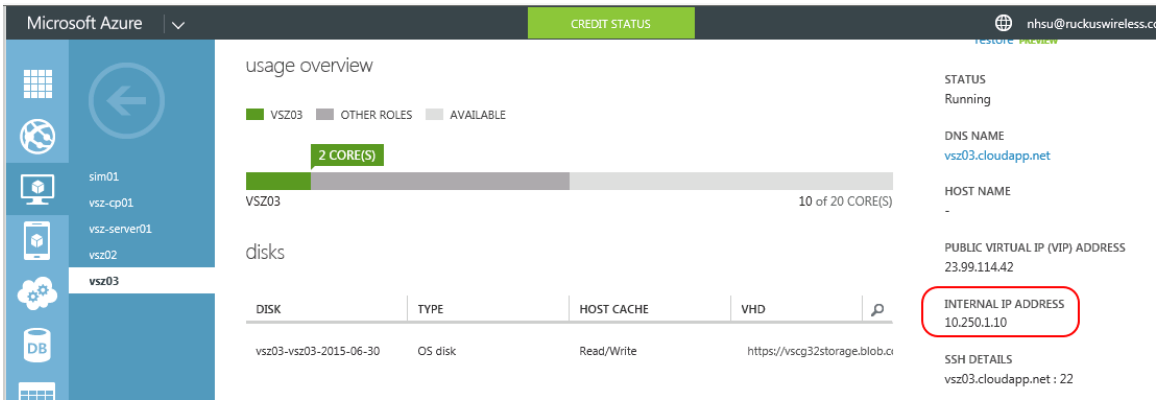


Figure 83: Verifying static IP address is assigned to the VM

Installing vSZ on the Google Computing Engine

5

In this chapter:

- Logging into GCE and Selecting a Project
- Creating a Storage Bucket
- Uploading the vSZ image to a Storage
- Creating a vSZ Image for Virtual Machines
- Creating Networks and Configuring Firewall Rules
- Creating Virtual Machine (VM) Instances

You can install vSZ on the Google Computing Engine using the steps mentioned in this section.

NOTE: The minimum memory and CPU requirements have changed in this release. You may need to upgrade your infrastructure before upgrading. Please read carefully. This is the minimum requirement recommended. Refer to Table 5 and Table 6 in the chapter Preparing to Install the vSZ.

Logging into GCE and Selecting a Project

This section describes how to log into the GCE and select a project.

Ensure that you have created an account with GCE and have the login details for the same.

1. Click http://cloud.google.com to access the **Google Cloud Platform** website.
2. Login with your user credentials of user name and password.

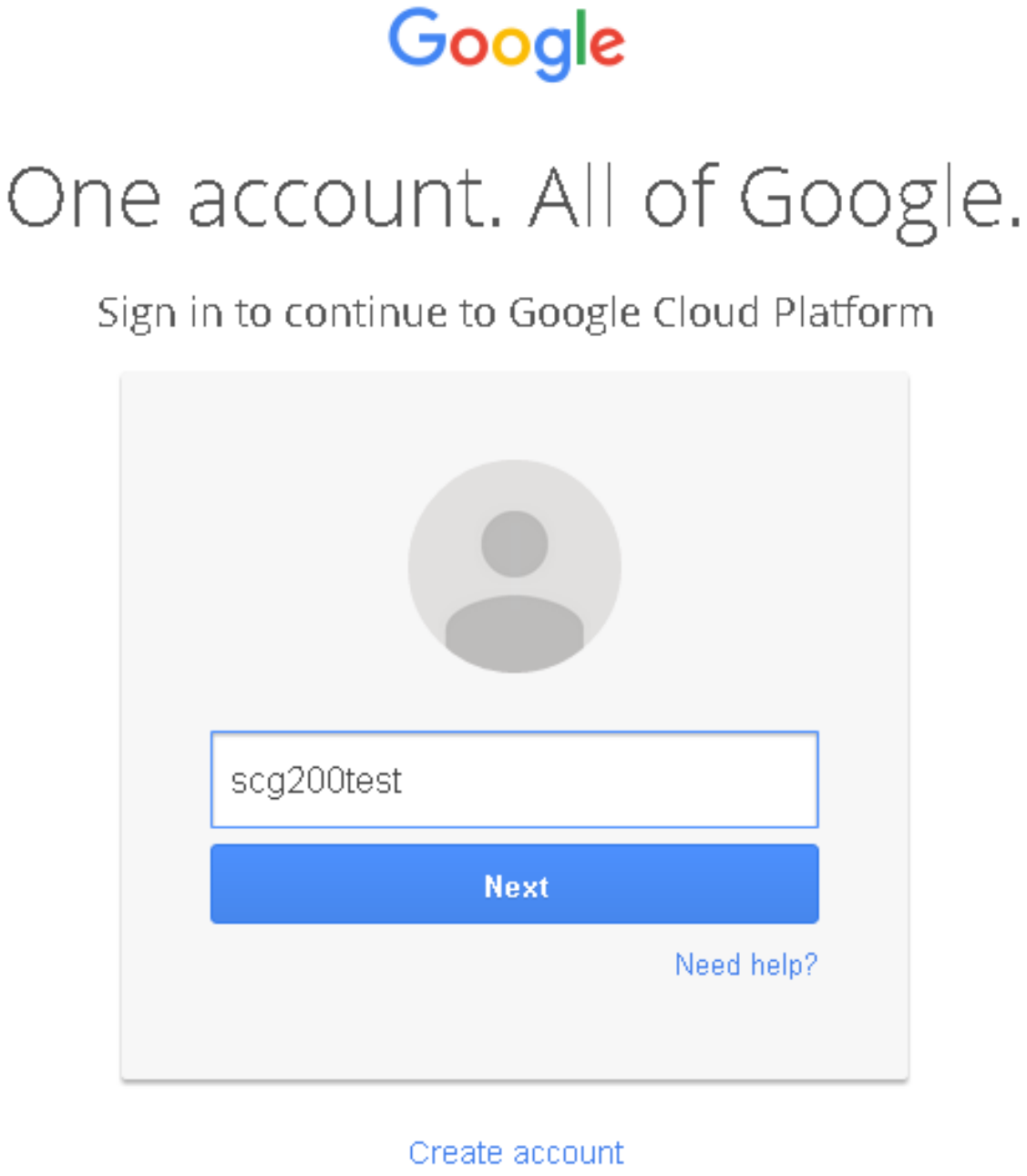


Figure 84: Login with user credentials

3. Select **My console** as shown.

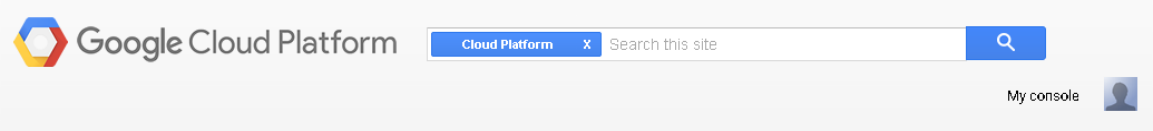


Figure 85: GCE Page - My console

4. A list of projects you created is displayed. Click to choose a project.

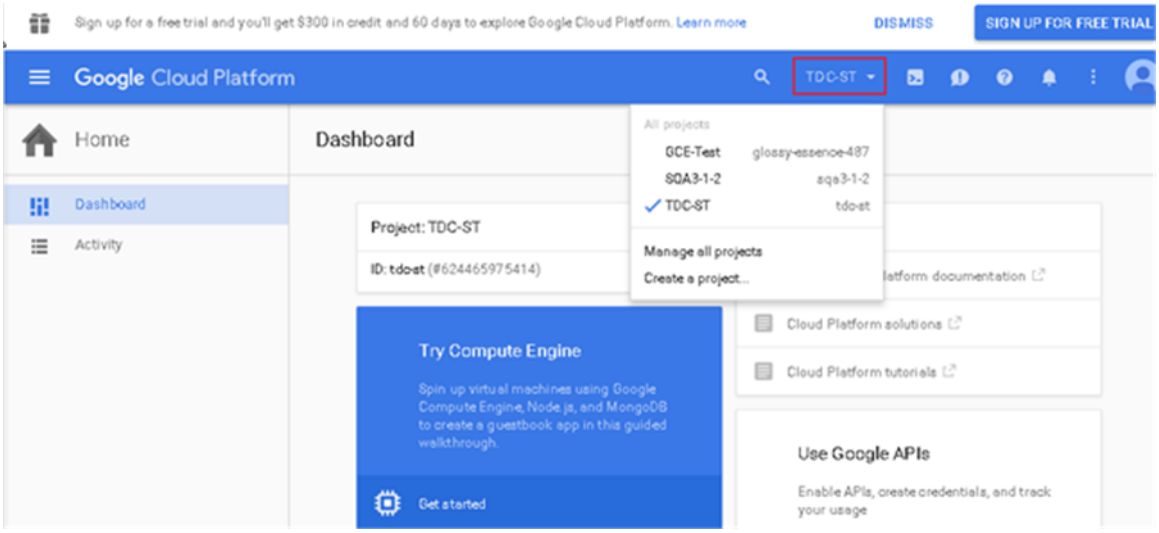


Figure 86: Choose the project

NOTE: You can create projects by clicking **Create a project** in the drop-down.

5. Click **Product and Services** icon to view the list of GCE services.

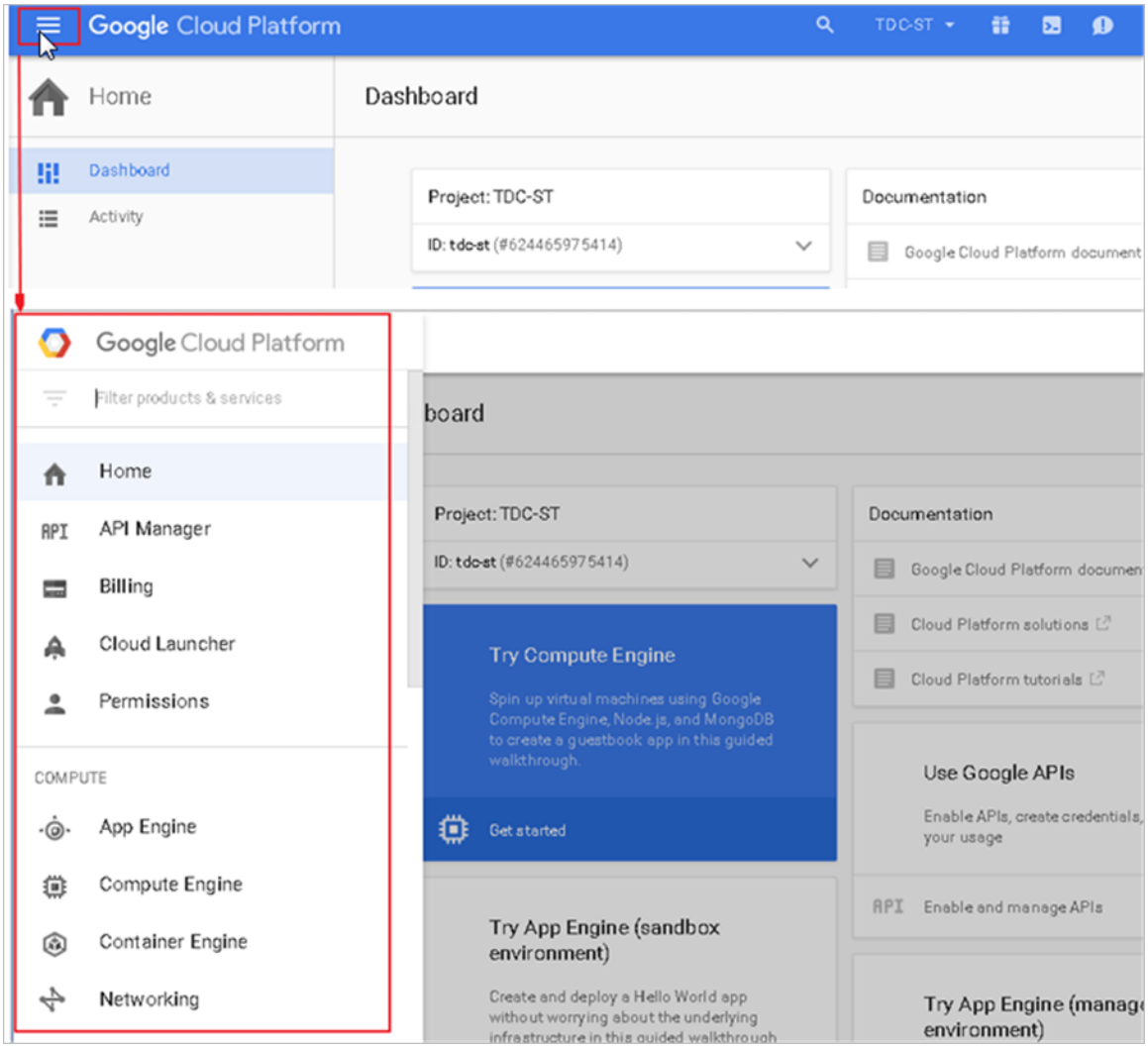


Figure 87: Selecting a Project

Creating a Storage Bucket

You can create storage for the objects you create. Follow these steps to create storage.

1. From **Google Developers Console**, click **Product and Services** icon > **Storage**. The **Cloud Storage Buckets** screen appears.

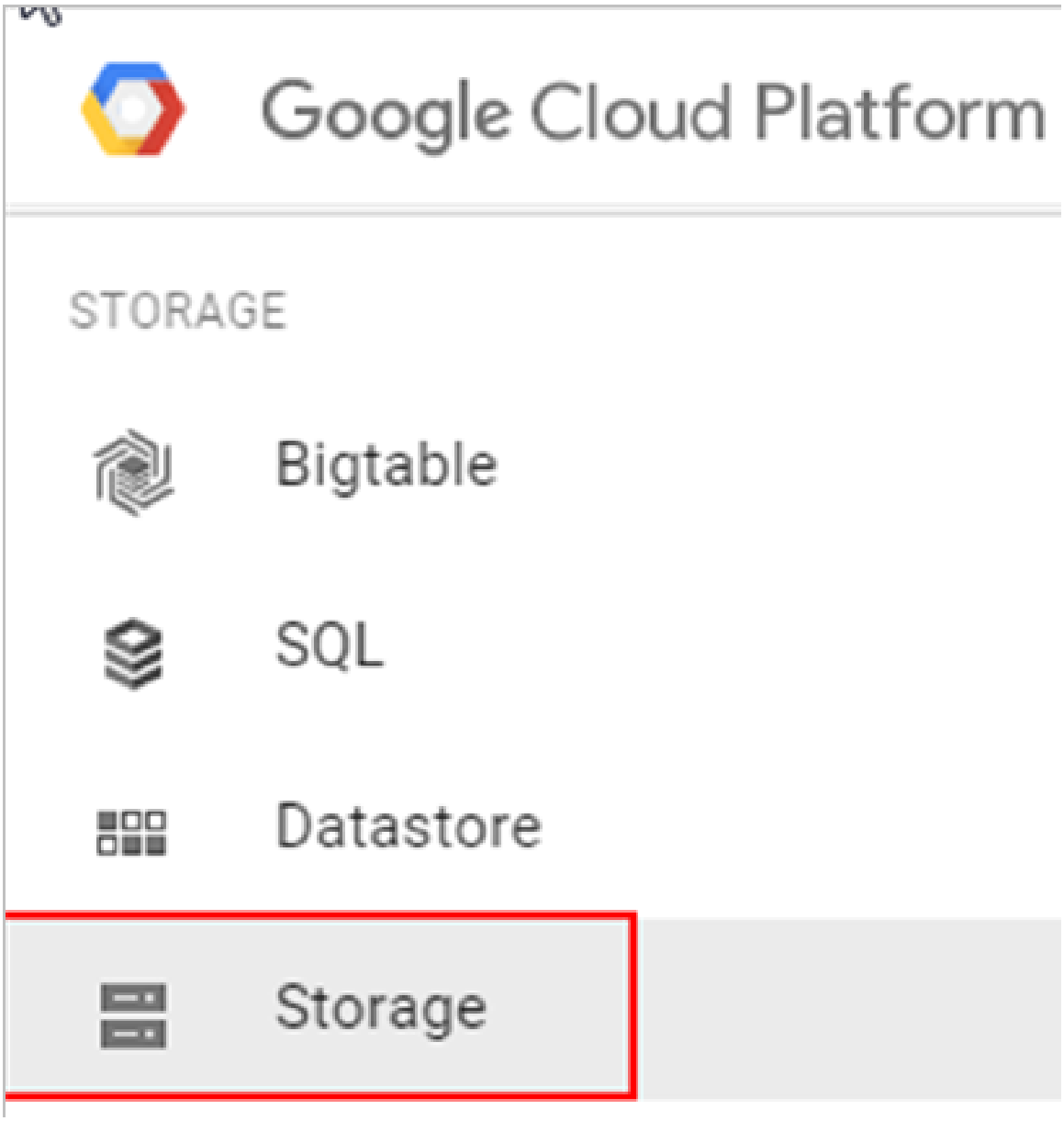


Figure 88: Storage Bucket Browser

2. Click **Create Bucket**. The New bucket screen appears.

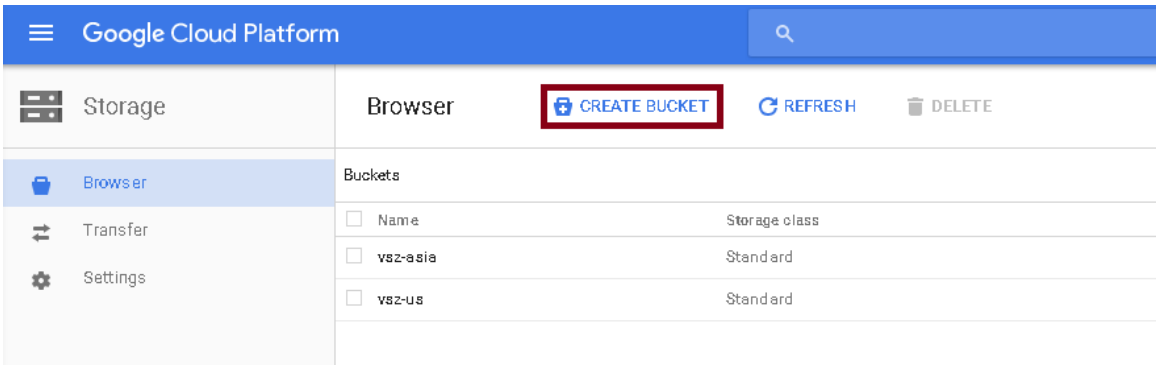


Figure 89: Creating a Storage Bucket

3. Complete the following fields,
   a) In **Name**, type the name of the storage bucket
   b) In **Storage class**, select the storage class you want. You can choose from **Standard**, **Durable Reduced Availability (DRA)** or **Cloud Storage Nearline** in the drop-down list. Use the below table to compare the storage classes.
   c) In **Location**, select the location from the drop-down list.

Storage Class	Characteristics	Use Cases	Bucket Location
Standard Storage	High availability, low latency (time to first byte is typically tens of milliseconds).	Storing data that requires low latency access or data that is frequently accessed ("hot" objects), such as serving website content, interactive workloads, or gaming and mobile applications	Continental locations
Durable Reduced Availability (DRA)	Lower availability than Standard Storage and lower cost per GB stored.	Applications that are particularly cost-sensitive, or for which some unavailability is acceptable such as batch jobs and some types of data backup.	Continental and regional locations
Cloud Storage Nearline	Slightly lower availability and slightly higher latency (time to first byte is typically 2 - 5 seconds) than Standard Storage but with a lower cost.	Data you do not expect to access frequently (i.e., no more than once per month). Typically this is backup data for disaster recovery, or so called "cold"	Continental locations

Storage Class	Characteristics	Use Cases	Bucket Location
		storage that is archived and may or may not be needed at some future time.	

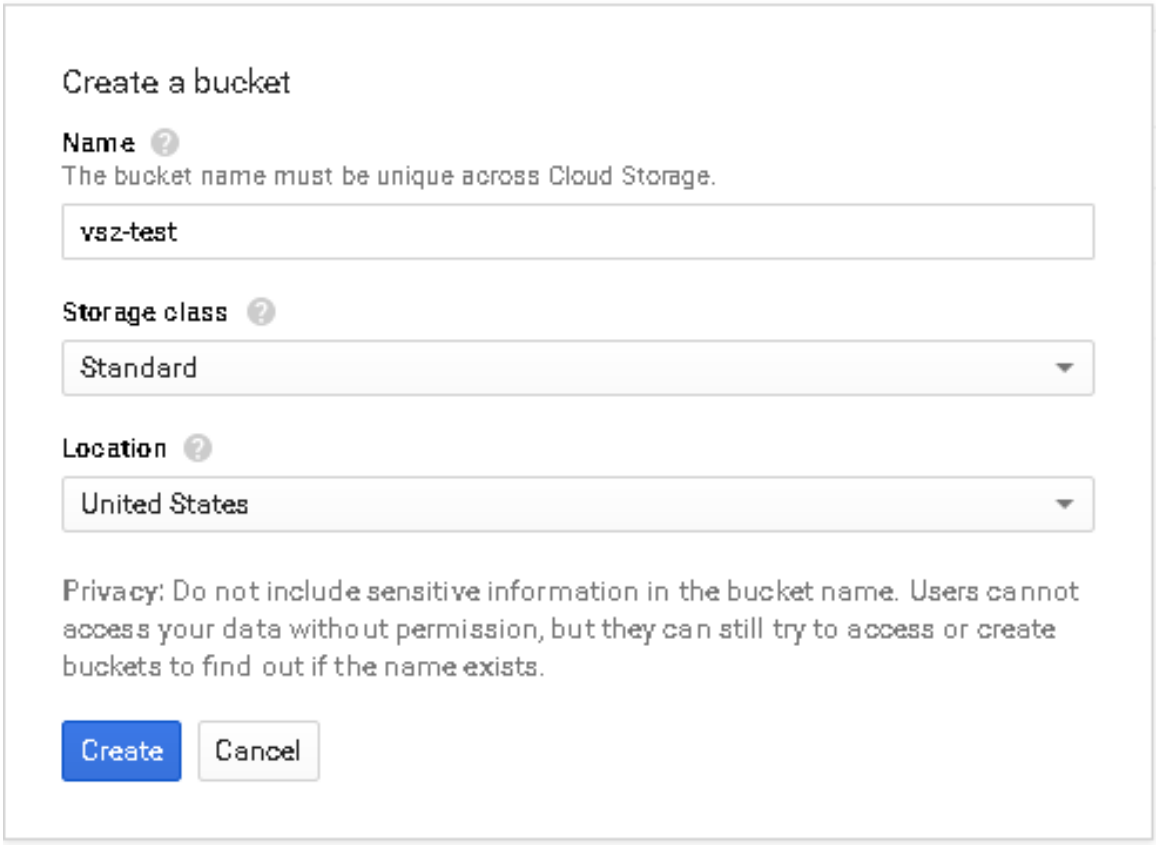


Figure 90: New Bucket Information

4. Click **Create**. The storage bucket you created is listed in the browser.
5. To create another storage, click **Create bucket** as shown.

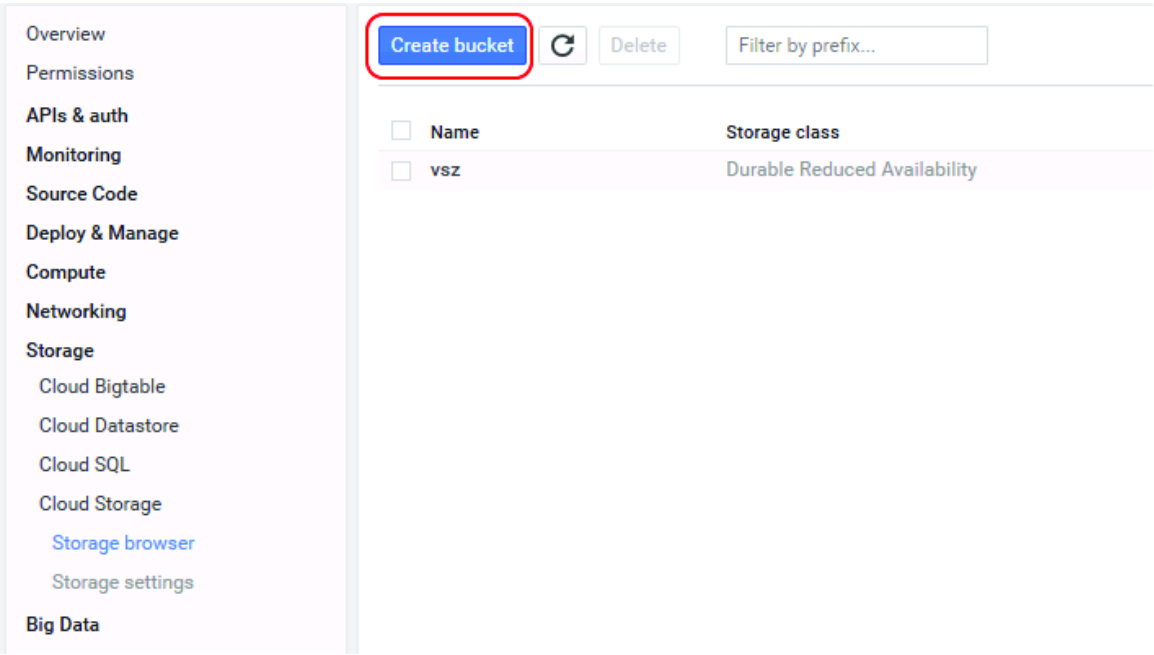


Figure 91: Creating Another Storage Bucket

6. Check the storage bucket has been created.

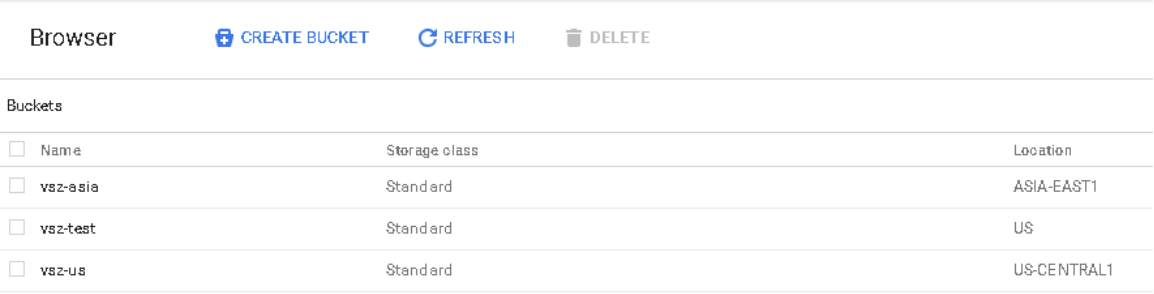


Figure 92: Selecting the Storage Bucket

Uploading the vSZ image to a Storage

Follow these steps to upload a vSZ image to the storage bucket you created.

1. Select the storage bucket to upload the vSZ image as shown.

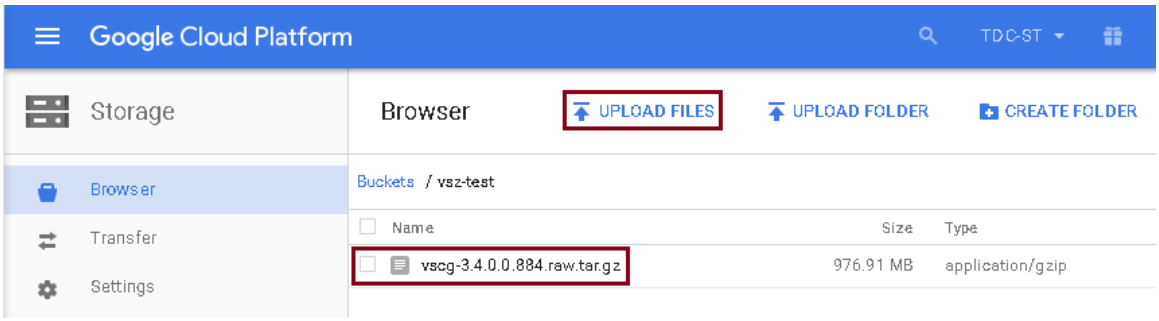


Figure 93: Selecting the Storage

2. Click **Upload files**.
3. Browse to the location of the vSZ image and select vSZ image file.
   Only images with file-type *.raw.tar.gz can be selected.
4. Click Open to upload the file. The upload process is displayed.
5. The image is listed in the storage bucket after the image is uploaded.

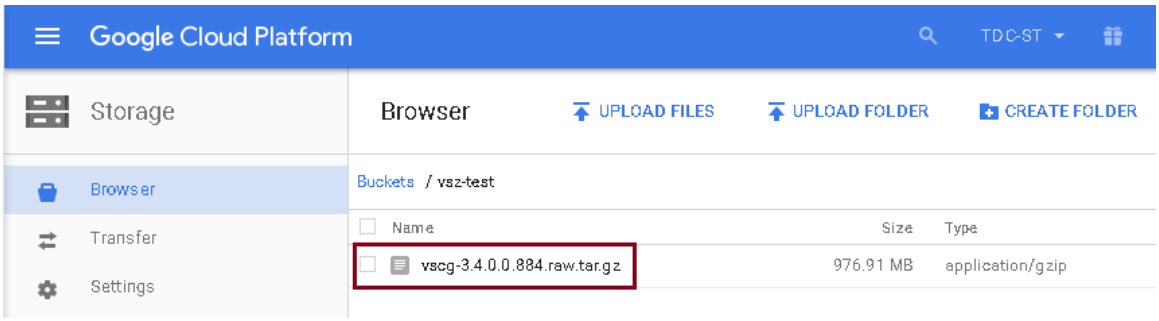


Figure 94: vSZ Image Uploaded to Storage Bucket

Creating a vSZ Image for Virtual Machines

Follow these steps to create a vSZ image for virtual machines.

1. From **Google Developers Console**, click **Compute** > **Compute Engine**.

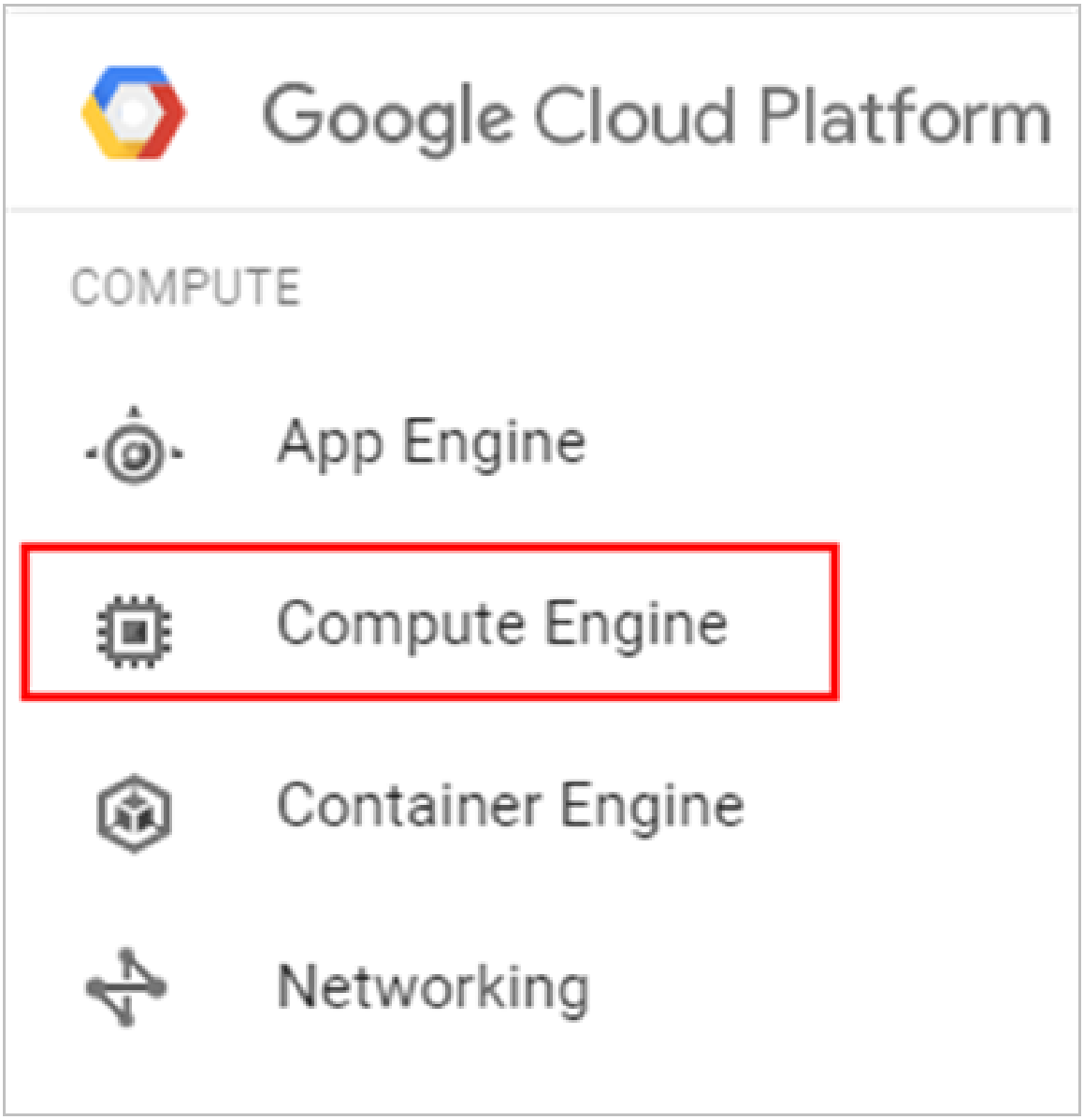


Figure 95: Select Compute Engine

2. Click Images to view a page displaying a list of images. Click **Create Image** as shown.

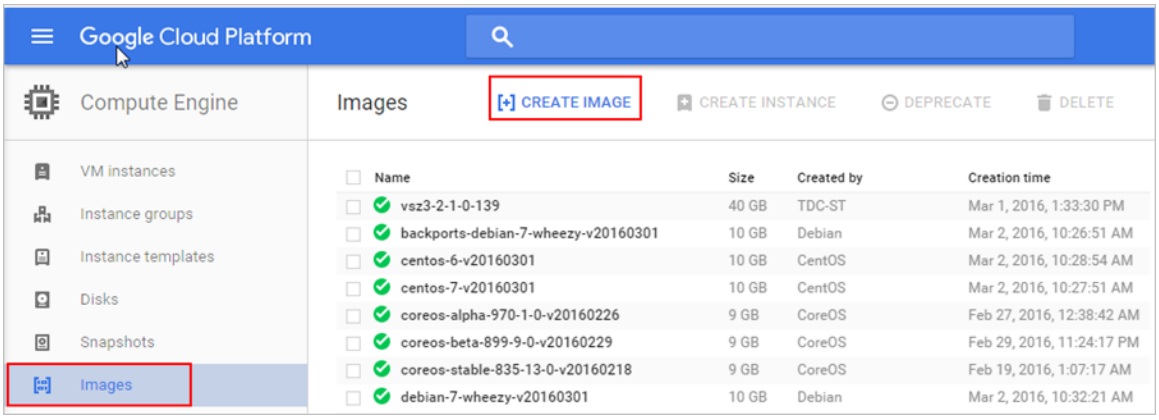


Figure 96: Create Image

3. The **Create a new image** screen appears.
   a) In **Name**, type the name of the image.
   b) In **Description**, provide a brief description about the image.
   c) In **Encryption**, select an option from the drop-down list containing Automatic (recommended) and Customer supplied.
   d) In **Source**, select **Cloud storage file**.
   e) In **Cloud Storage file**, click **Browse** to select the file.

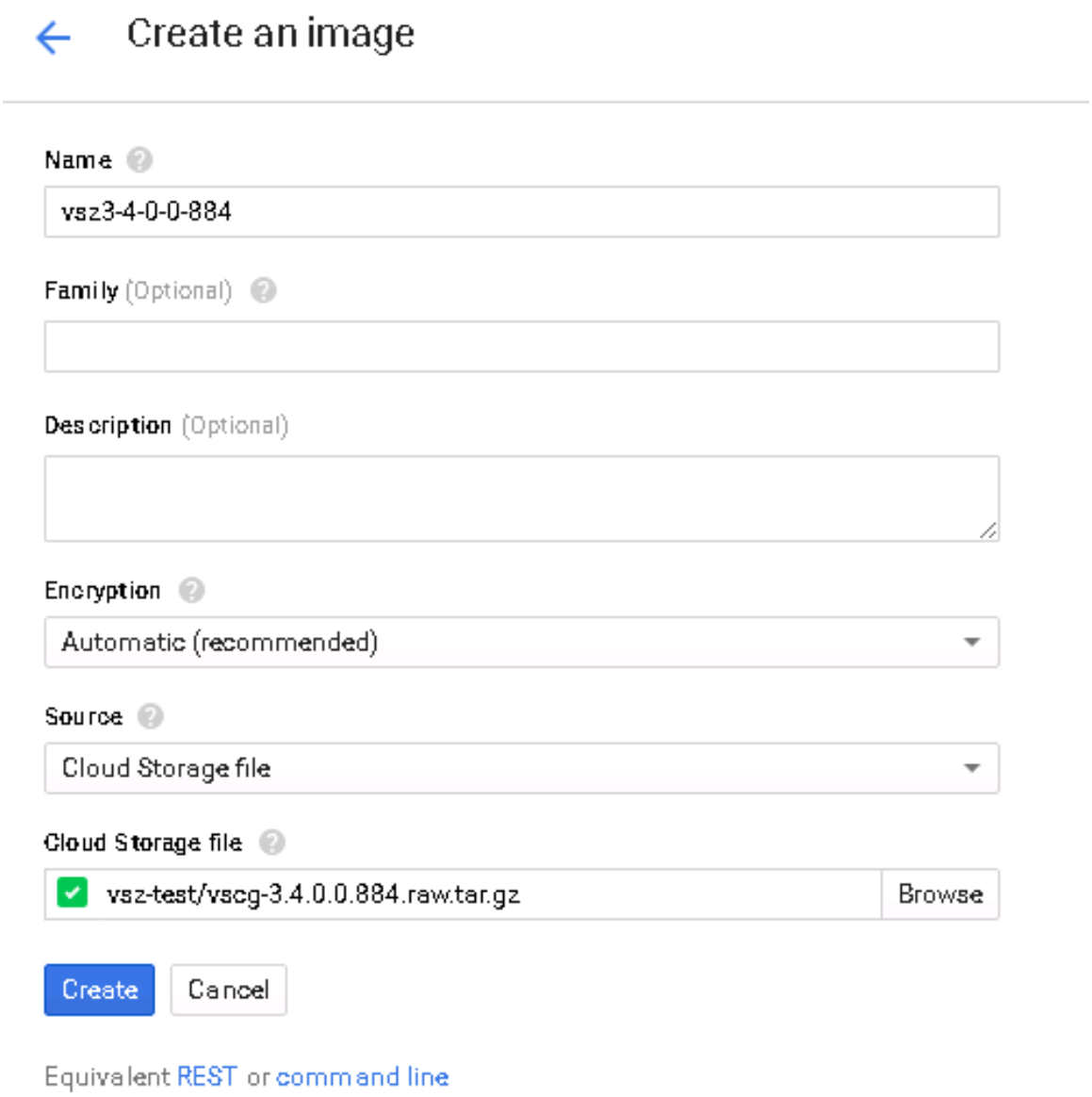


Figure 97: Create a New Image Screen

4. Click **Create**. The new image is listed.

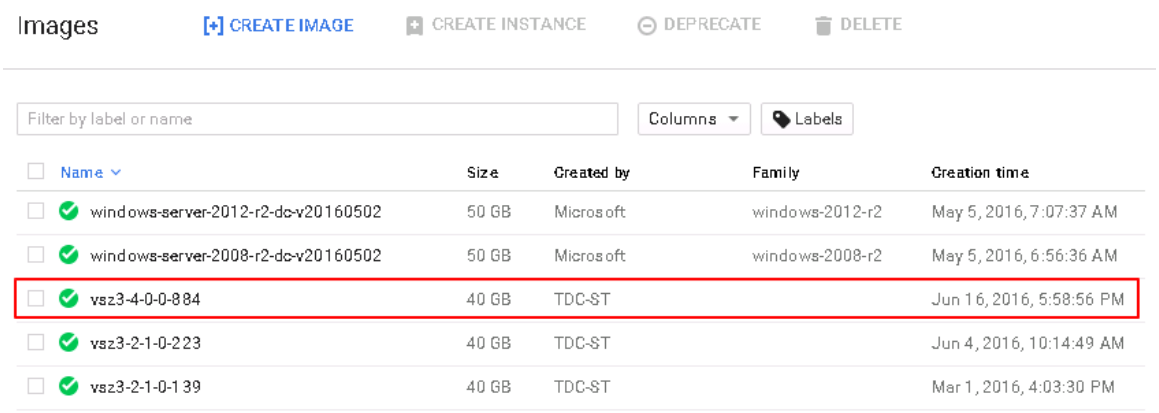


Figure 98: The New Image is Listed

Creating Networks and Configuring Firewall Rules

Follow these steps to create a network and configure firewall rules for your network.

1. From **Google Developers Console**, click **Networking** > **Networks**. A page displaying a list of networks appears. Select the default network.

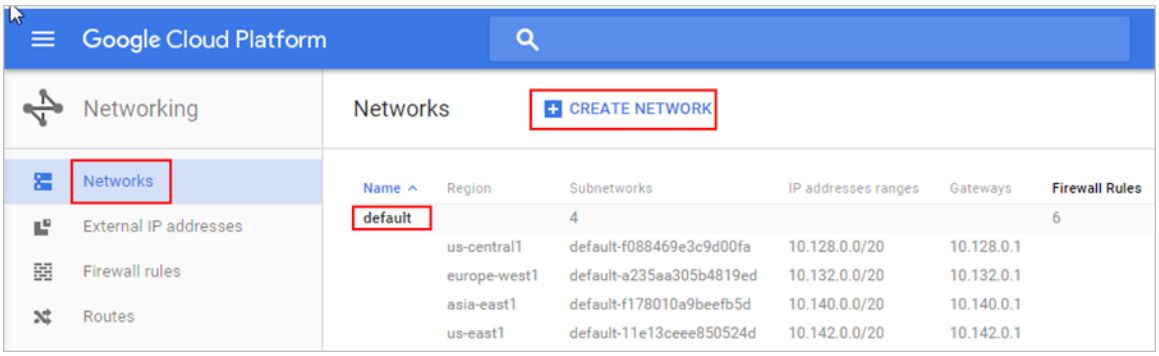


Figure 99: List of Networks

2. To create a firewall rule, click **Add a firewall rule**.

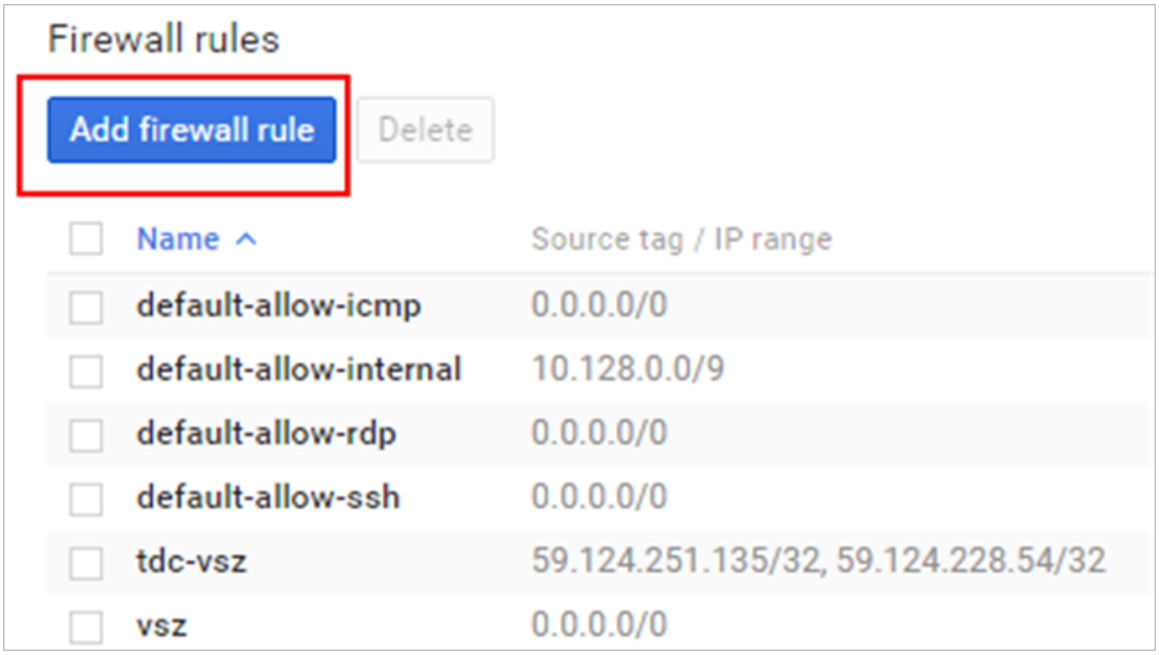


Figure 100: Add a Firewall Rule

3. The **Create a firewall rule** screen appears.
   a) In **Name**, type the name of the rule
   b) In **Description**, provide a brief description about the rule.
   c) In **Network**, type the network address.
   d) In **Source filter**, select **Allow from any source**.
   e) In **Source IP ranges**, type the range.
   f) In **Allowed protocols and ports**, type the protocols and ports that will be allowed
   g) In **Target tags**, specify a tag name. It is recommended that you provide a tag as all network instances with this tag will adhere to the firewall rule.

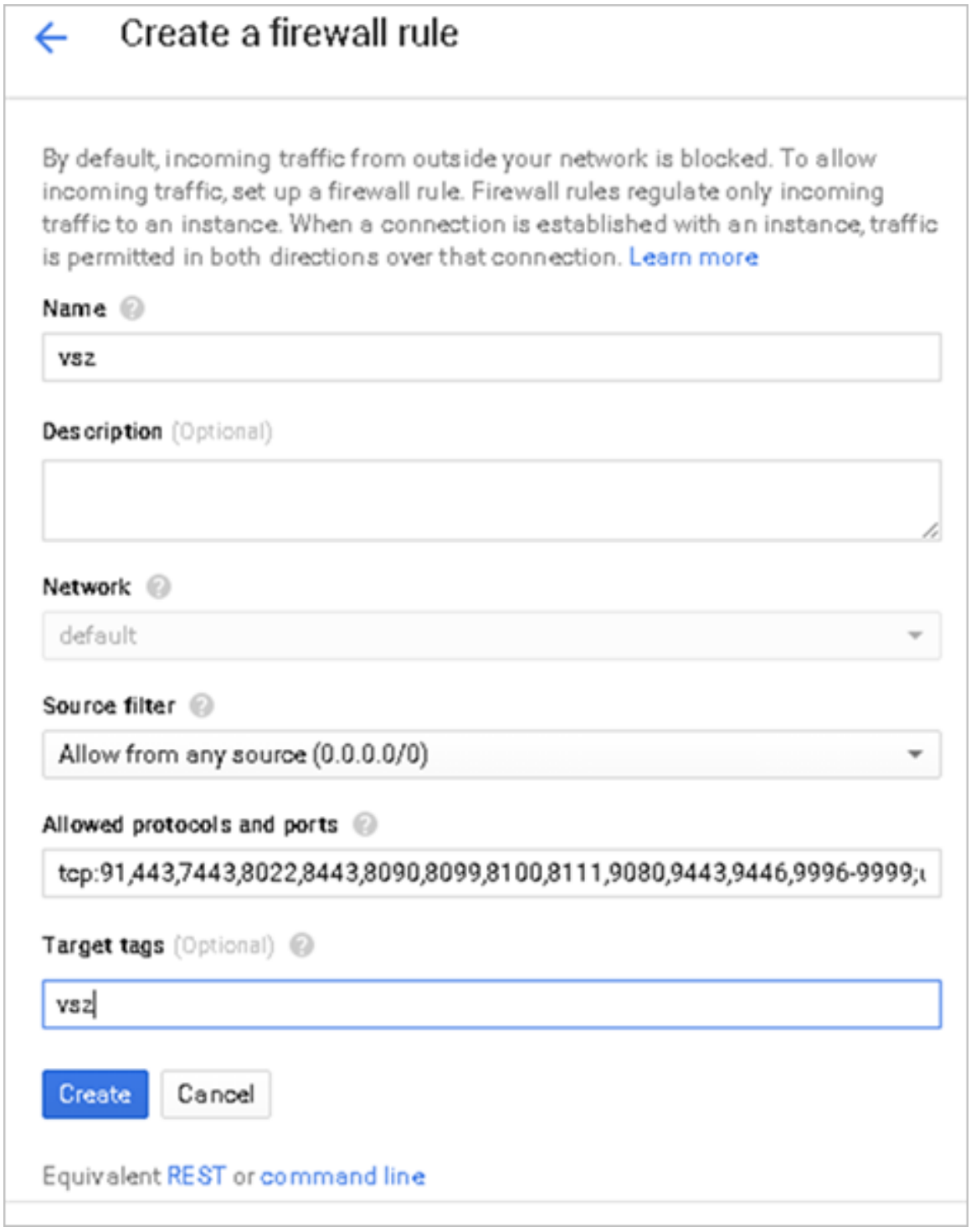


Figure 101: Creating a Firewall Rule

4. Click **Create**. A page displaying the new firewall rule appears.

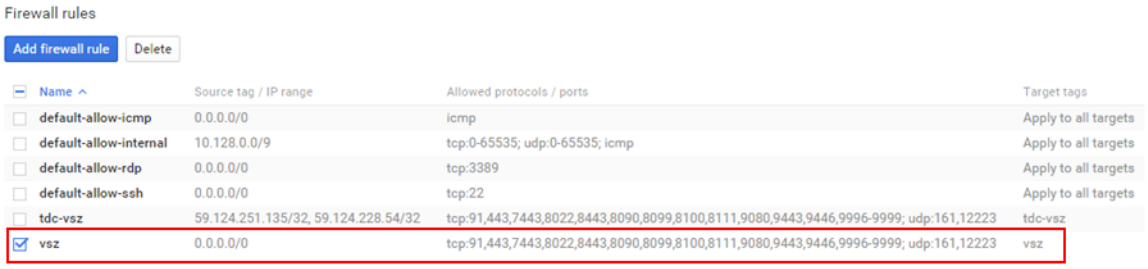


Figure 102: Adding Firewall Rules

Creating Virtual Machine (VM) Instances

Follow these steps to create new VM instances.

1. From **Google Developers Console**, click **Compute** > **Compute Engine** > **VM instances**. The **Compute Engine VM instances** screen appears. Click **Create instance**.

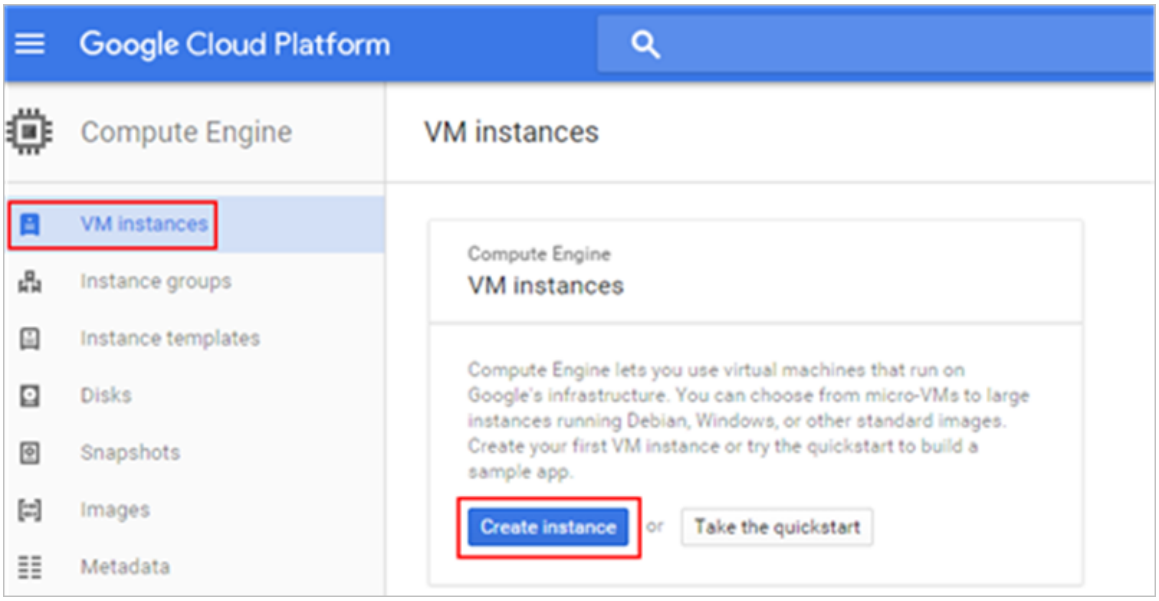


Figure 103: Select Create Instance

2. The **Create a new instance** screen appears.
   a) In **Name**, type the name of the VM instance.
   b) In **Zone**, select a zone from the drop-down list.
   c) In **Machine type**, **CPU**, and **Memory** are selected by default.
   d) To modify **Boot disk**, click **Change**. The **Boot disk** screen appears.
   e) In **Boot disk**, a standard image is selected by default. To modify, click **Change**. The **Boot disk** screen appears. From **Your image**, select the vSZ image.
   f) Click **Select**.
   g) In **Firewall**, select the options as appropriate.
   h) In **Project access**, allow API access as appropriate.

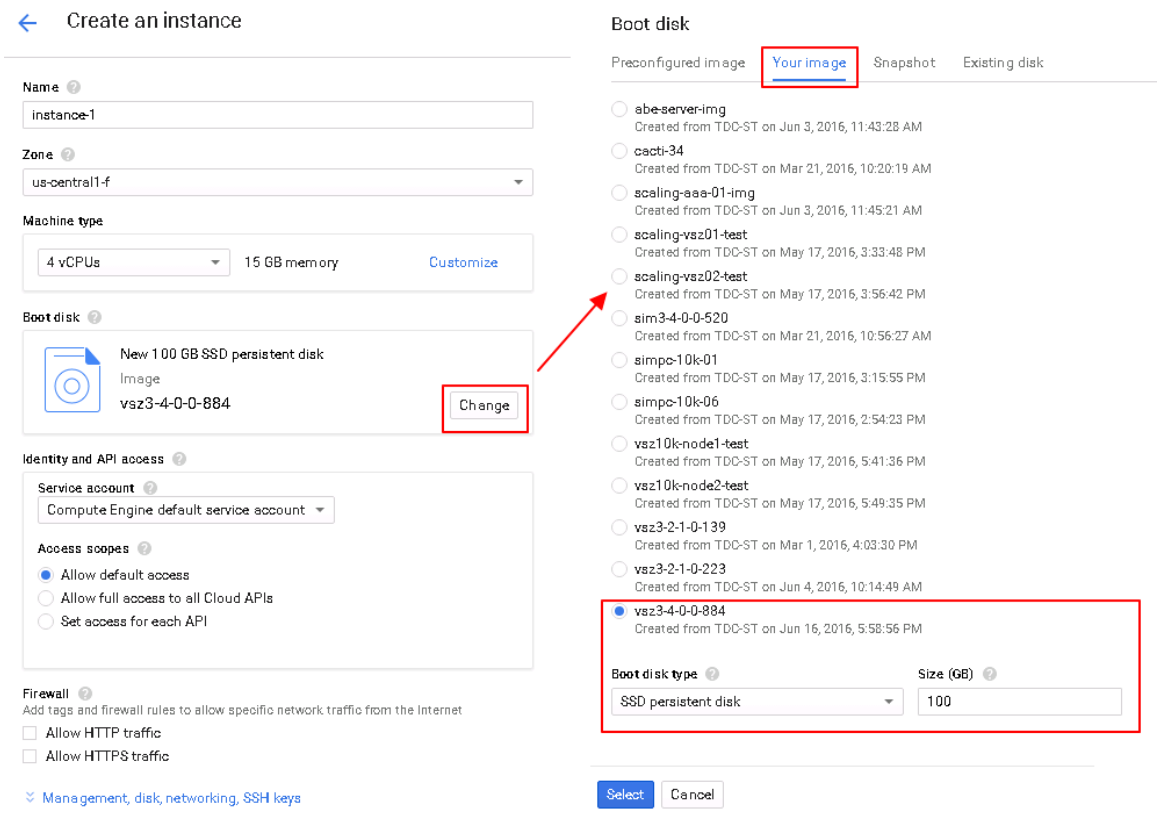


Figure 104: Create a New Instance

i) In **Management**, ensure that the tag provided is the same as the one provided while creating a firewall rule. This ensures port mapping happens correctly.

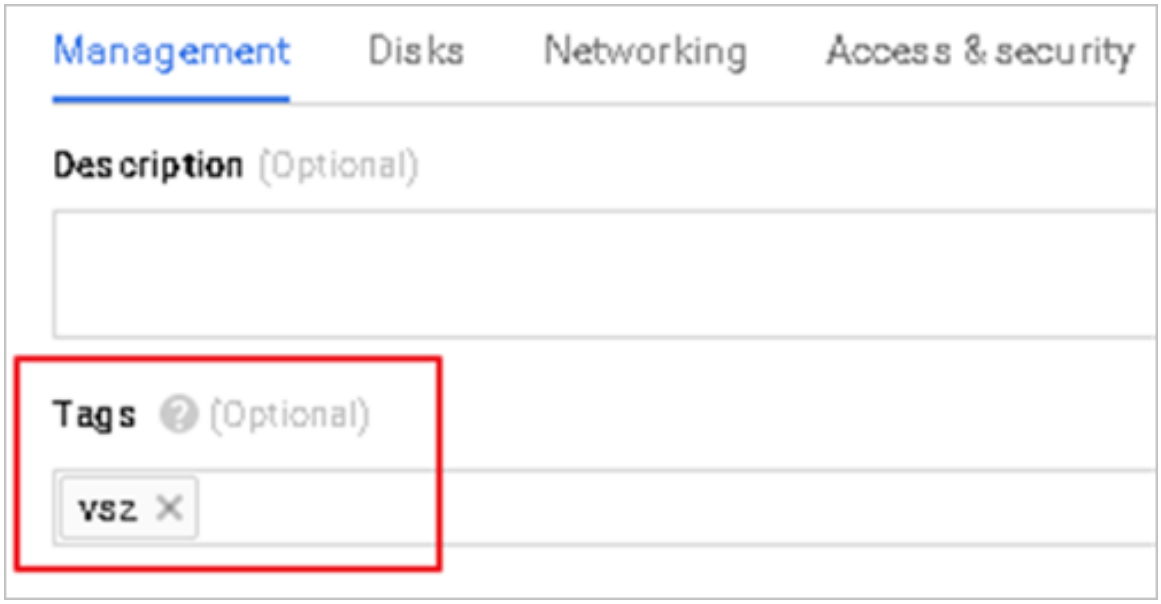


Figure 105: Management Tab

j) In **Disk**, select the options as appropriate.

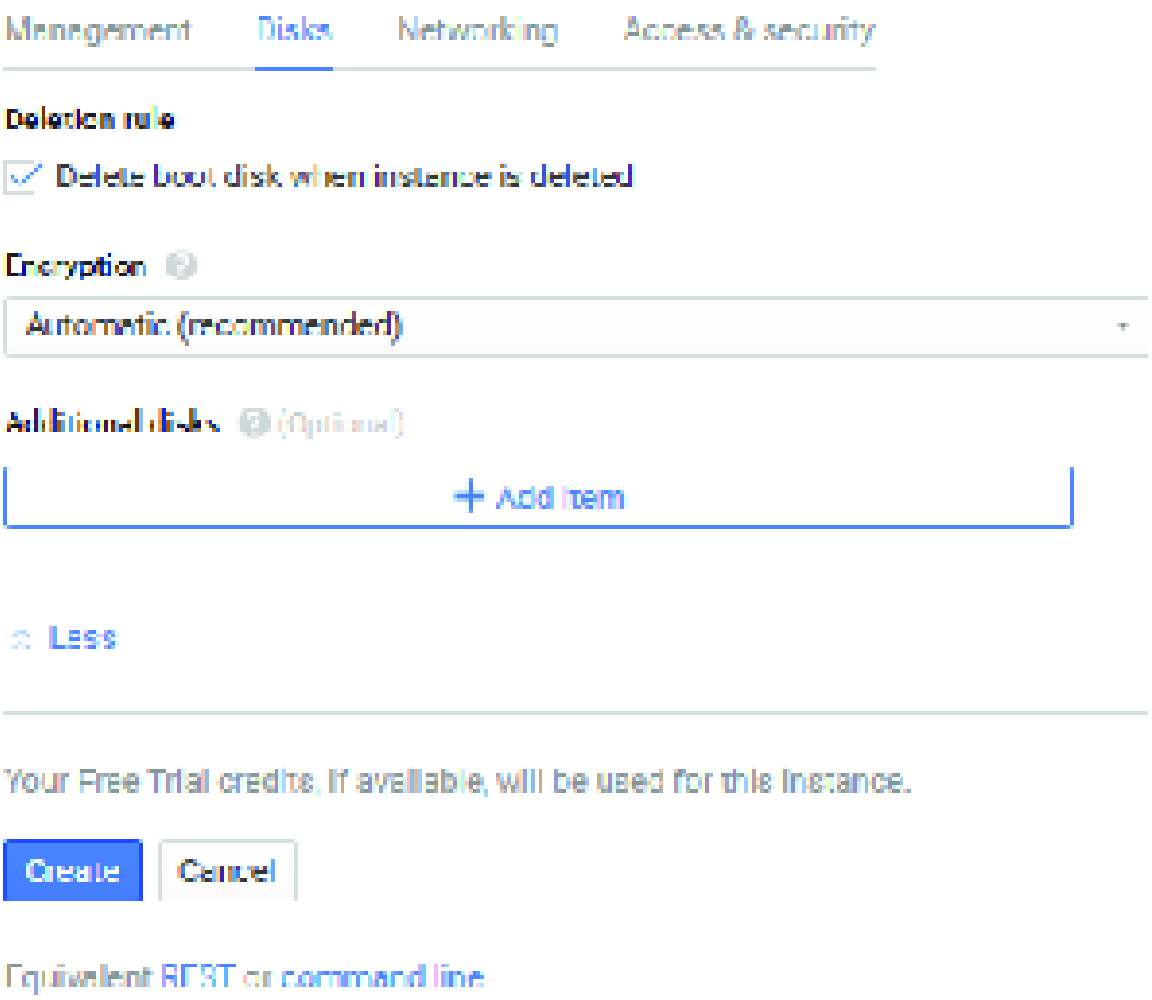


Figure 106: VM Disk Configuration

k) In **Networking**, select the external options as per the following table.

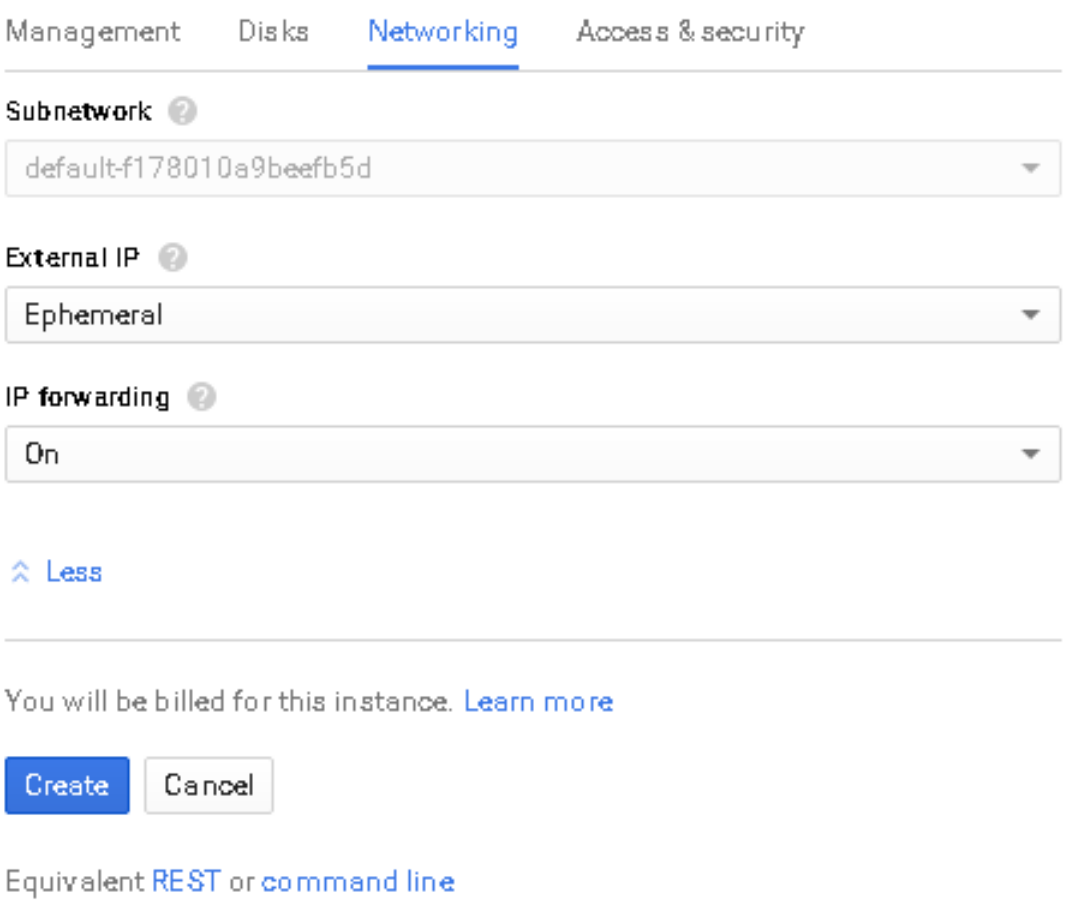


Figure 107: Networking

External IP Options	Description
Ephemeral	The VM is assigned a dynamic public IP address
None	The VM instance is not assigned an external IP address
New static IP address	The VM is assigned a static public IP address

l) In **Access and security**, select the options as appropriate.

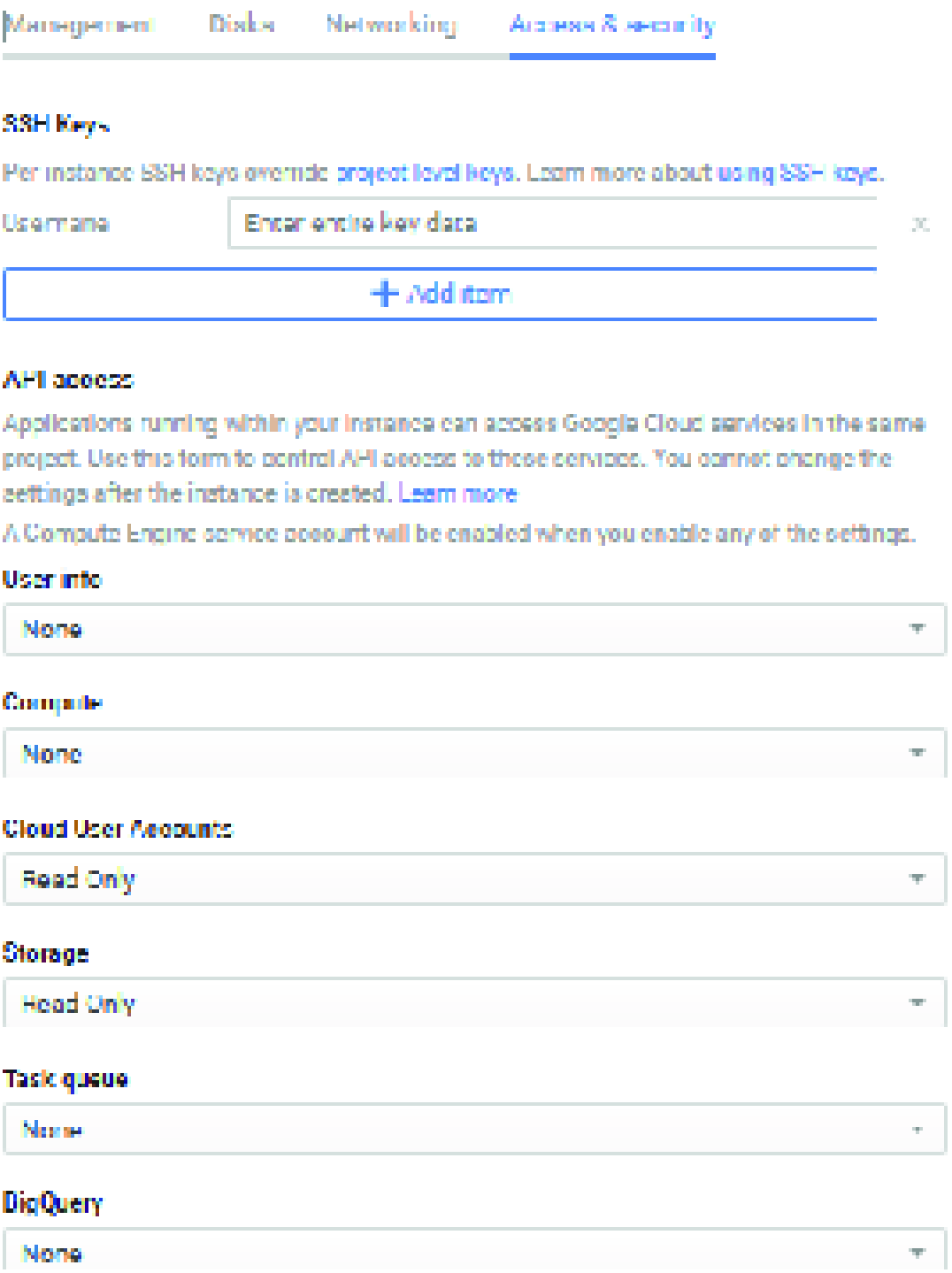


Figure 108: Access and security

m) Click **Create**. The **VM instances** page appears listing the new VM that is created.

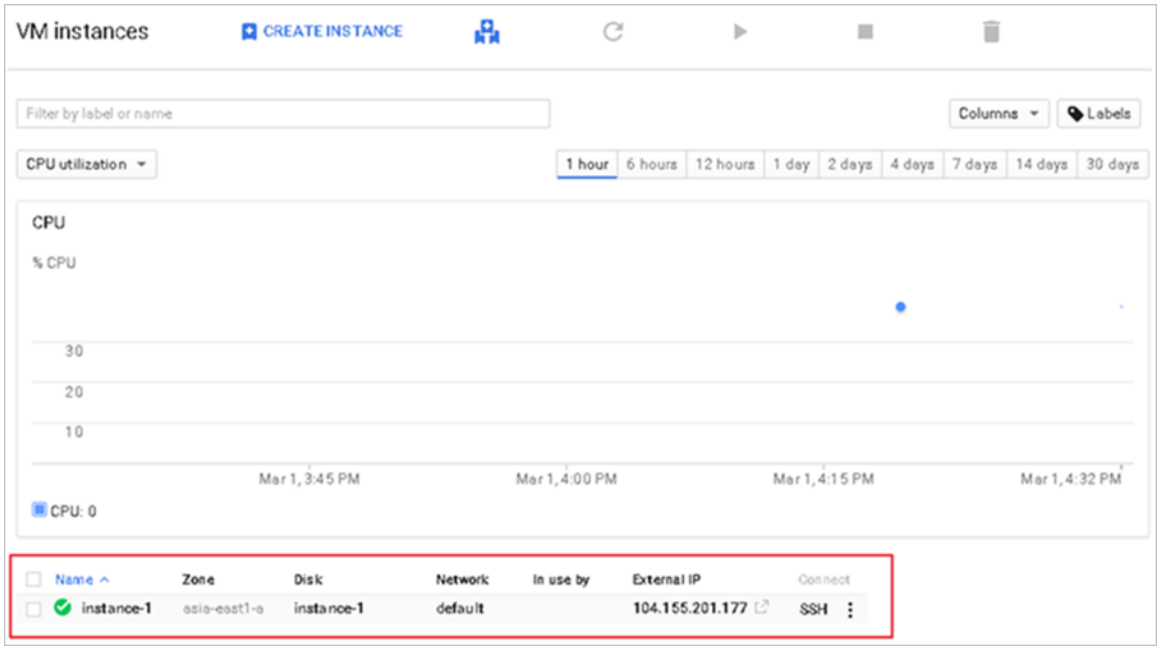


Figure 109: New VM is Created

Installing vSZ on Amazon Web Services 6

In this chapter:

- Installing AWS CLI
- Creating a VM Import Service Role
- Installing vSZ on AWS
- Creating vSZ Instance
- Configuring AWS for a vSZ Instance
- Deleting a vSZ Instance

Installing AWS CLI

Ensure that you have created an account with AWS and have the login details for the same.

1. Install pip by running the command

```
# curl-O https://bootstrap.pypa.io/get-pip.py
# sudo python27 get-pip.py
```

2. Install AWS CLI using pip:`# pip install`
3. Test the installation by using the command: `# aws help`
4. To set up AWS CLI you need to get your access and secret key identifier. Follow the instructions and find your identifier keys.
5. Use the following command to configure CLI:

```
# aws configure
AWS Access Key ID [None]: xxx
AWS Secret Access Key [None]: xxx
Default region name [None]: us-west-2
Default output format [None]: json
```

6. The default region should be the same as the bucket region. Refer to Table for the mapping details. In addition refer to you can also refer to latest version.

Region Name	Region
us-east-1	US East (N. Virginia)
us-west-2	US West (Oregon)
us-west-1	US West (N. California)
eu-west-1	EU (Ireland)
eu-central-1	EU (Frankfurt)
ap-southeast-1	Asia Pacific (Singapore)
ap-northeast-1	Asia Pacific (Tokyo)

Region Name	Region
ap-southeast-2	Asia Pacific (Sydney)
ap-northeast-2	Asia Pacific (Seoul)
sa-east-1	South America (Sao Paulo)

Creating a VM Import Service Role

1. In the AWS web interface navigate to **AWS dashboard** > **Identity & Access Management**.
2. Check your account permission by navigating to **Users** > **select your Username** > **Permissions**. Your account should have the permission - *IAMFullAccess*.

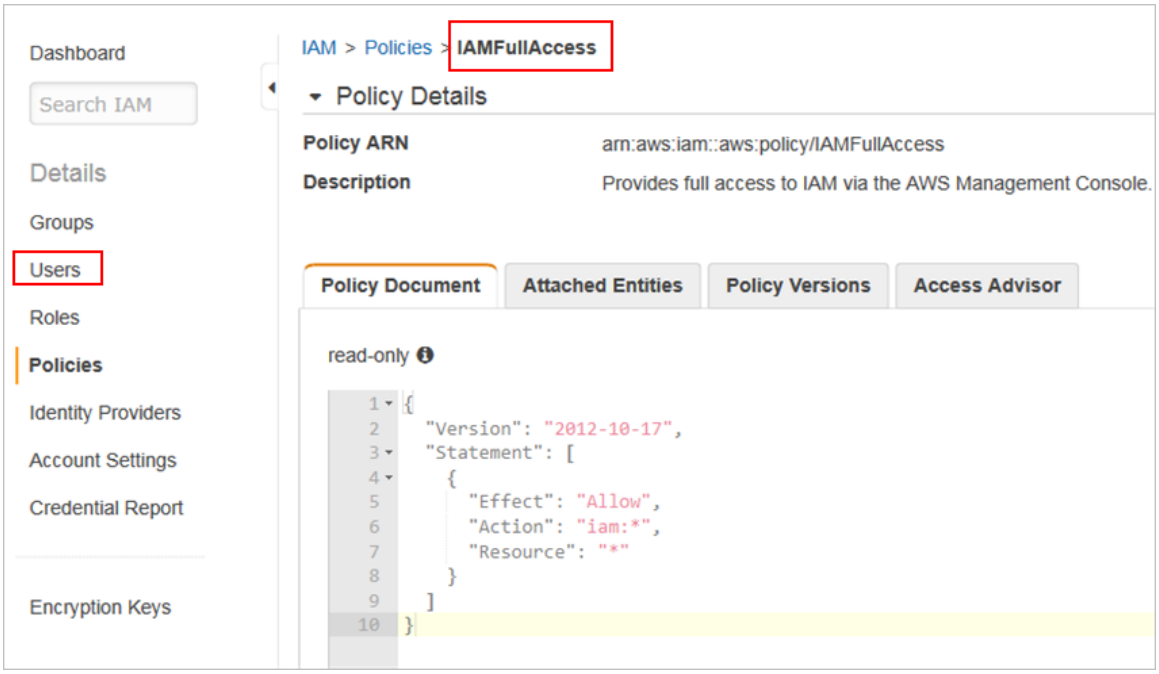


Figure 110: Account Permission

3. Create a JSON file called trust-policy.json using the following commands:

```
{   "Version":"2012-10-17",
   "Statement":[
      {
         "Sid":"",
         "Effect":"Allow",
         "Principal":{            "Service":"vmie.amazonaws.com"
         },
         "Action":"sts:AssumeRole",
         "Condition":{
            "StringEquals":{
               "sts:ExternalId":"vmimport"
            }
```

```
            }
        }
    ]
}
```

4. Use the following command to create a role. Specify the name as vmimport and give the option VM Import/Export access.

```
# aws iam create-role --role-name vmimport
--assume-role-policy-document file://trust-policy.json
```

5. Create a policy for the service role by creating a JSON file called role-policy.json using the following commands. Replace the bucket name with the storage bucket name that you created.

```
{
   "Version":"2012-10-17",
   "Statement":[
      {
         "Effect":"Allow",
         "Action":[
            "s3:ListBucket",
            "s3:GetBucketLocation"
         ],
         "Resource":[
            "arn:aws:s3:::<bucket-name>"
         ]
      },
      {
         "Effect":"Allow",
         "Action":[
            "s3:GetObject"
         ],
         "Resource":[
            "arn:aws:s3:::<bucket-name>/*"
         ]
      }
```

6. Run the following command to attach the policy to the service role created. `# aws iam put-role-policy --role-name vmimport --policy-name vmimport --policy-document file://role-policy.json`

Installing vSZ on AWS

Follow the steps to install vSZ using the AWS web user interface.

Logging into AWS

Follow these steps to login to the AWS site.

1. Click https://aws.amazon.com, to access the **Amazon Web Services** website.

2. Login with your user credentials of user name and password.

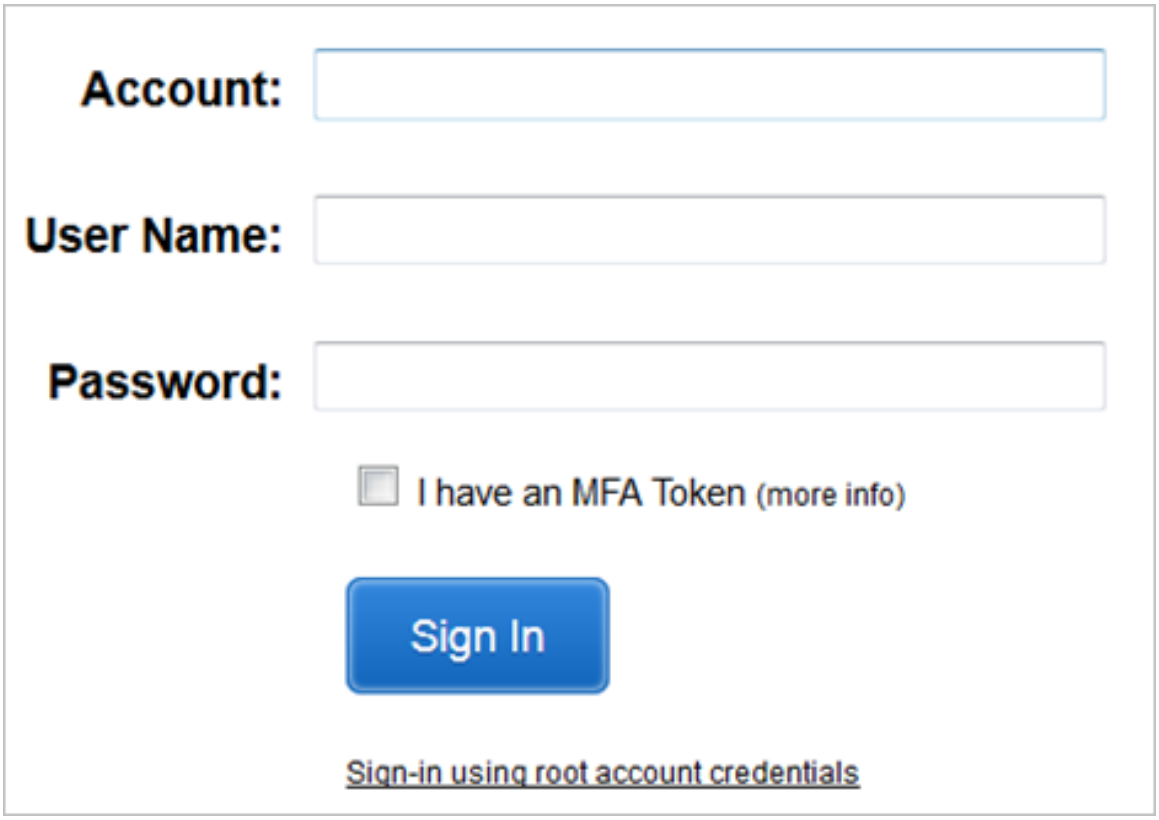


Figure 111: Login with user credentials

3. Select **My Account** > **AWS Management Console** as shown.

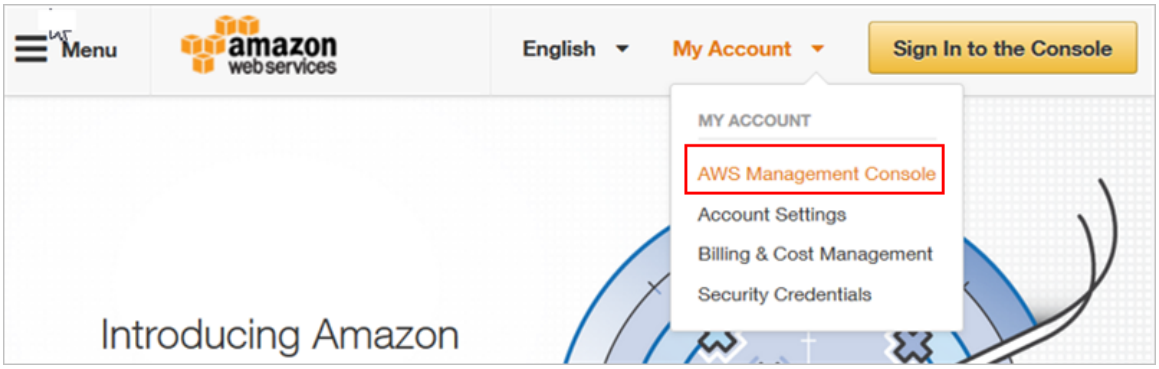


Figure 112: AWS management console

Creating a Storage Bucket

Create storage for the objects you create. Follow these steps to create storage.

1. Navigate to **Amazon Web Services** > **Storage and Content Delivery** > **S3**, click **Create Bucket** as shown.

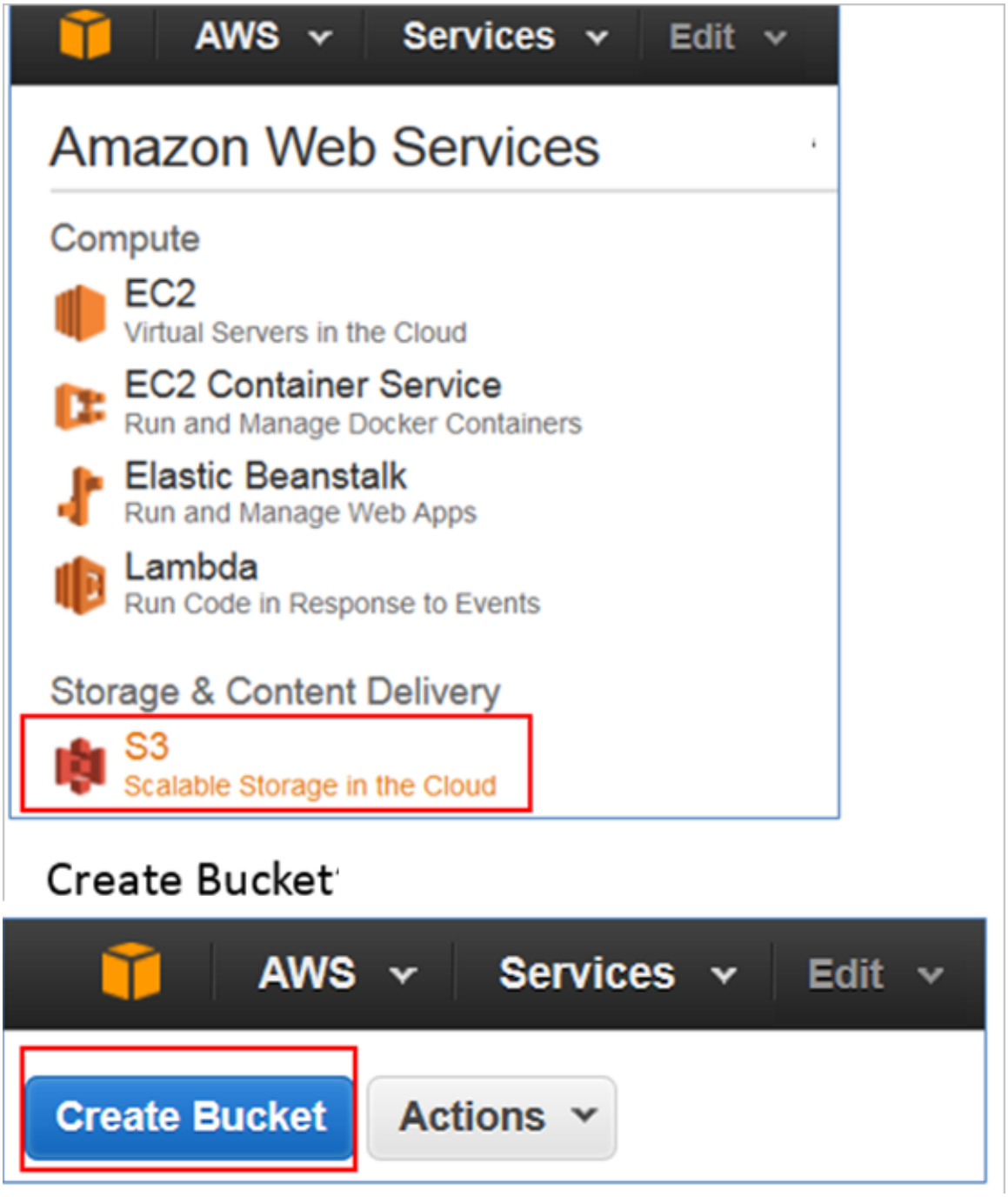


Figure 113: Create Bucket

2. Type the name of the storage bucket and select a suitable regional endpoint to reduce data latency.

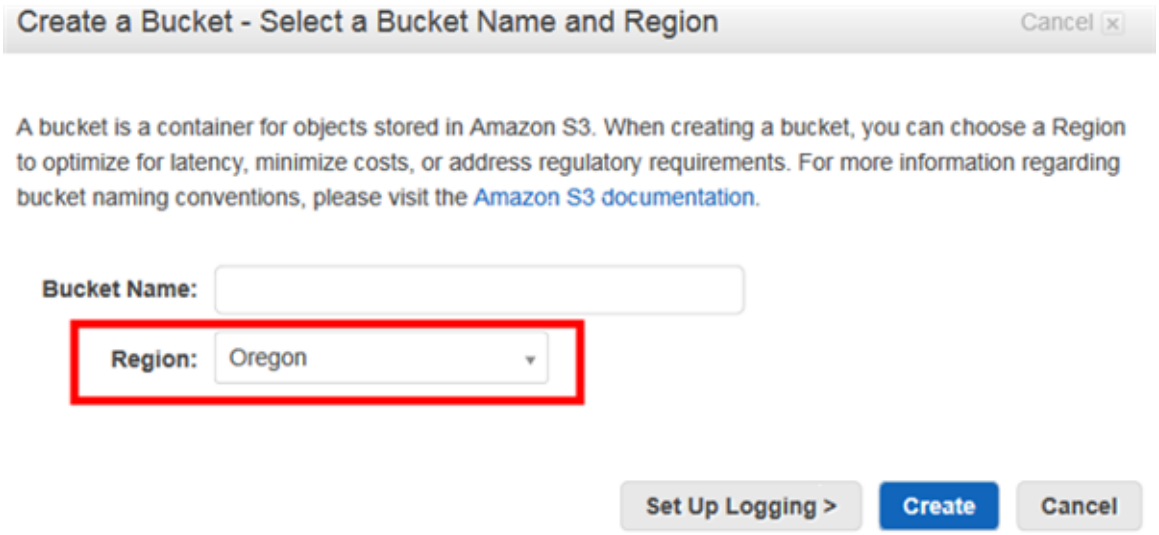


Figure 114: Selecting regional endpoint

3. Click **Create**. The storage bucket you created is listed in the browser.
4. Check the storage bucket has been created.

Uploading vSZ Image to a Storage

Follow these steps to upload a vSZ image to the storage bucket you created.

1. Select the storage bucket to upload the vSZ image.
2. Click **Upload** as shown.

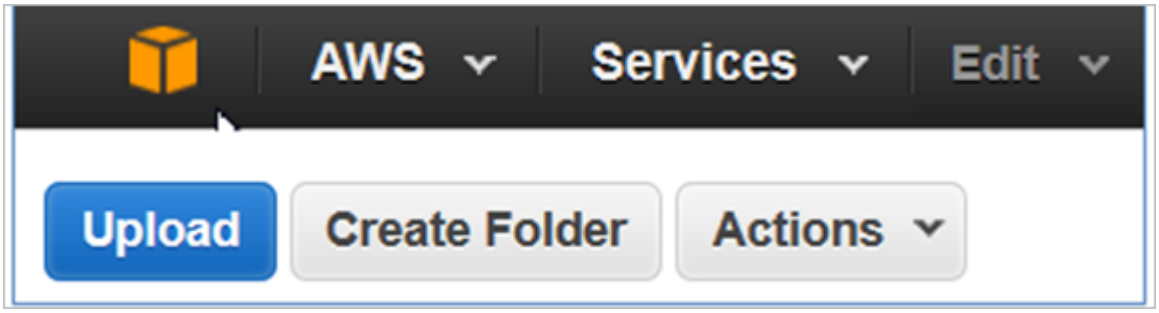


Figure 115: Selecting the Storage

3. Browse to the location of the vSZ image and select vSZ image file.
   Only images with file-type *.raw or .ova or vmdk can be selected.
4. Click **Start Upload** to upload the file. The upload process is displayed.
5. The image is listed in the storage bucket after the image is uploaded.

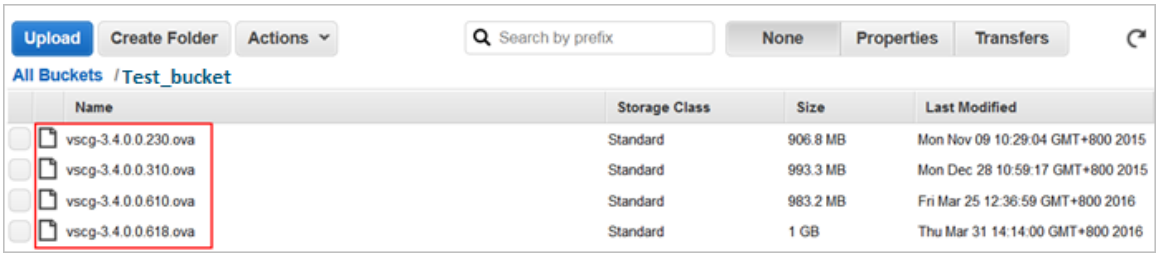


Figure 116: vSZ Image Uploaded to Storage Bucket

NOTE: The vSZ image should be in the Bucket, which has Region information. Example: **Test_bucket**

AWS Service Policy

VM Import uses a role in your AWS account to perform certain operations (e.g: downloading disk images from an Amazon S3 bucket). You must create a role with the name vmimport with the following policy and trusted entities.

1. Install AWS CLI using http://docs.aws.amazon.com/cli/latest/userguide/installing.html
2. Enter the following command in the AWL CLI `#sudo pip install awscli`
3. Get the access key for AWS CLI from using AWS web follow the steps outlined: http://docs.aws.amazon.com/AWSSimpleQueueService/latest/SQSGettingStartedGuide/AWSCredentials.html
4. Add the access key details to the AWL CLI using the following commands

```
# aws
        configureAWS Access Key ID [None]:
        AWS Secret Access Key
        [None]: Default region name [None]:
        us-west-2Default output format
        [None]: json
```

5. Create a file named role-policy.json with the following policy:

```
{
   "Version":"2012-10-17",
   "Statement":[
      {
         "Effect":"Allow",
         "Action":[
            "s3:ListBucket",
            "s3:GetBucketLocation"
         ],
         "Resource":[
            "arn:aws:s3:::<disk-image-file-bucket>"
         ]
      },
      {
        "Effect":"Allow",
         "Action":[
```

```
            "s3:GetObject"
         ],
         "Resource":[
            "arn:aws:s3:::<disk-image-file-bucket>/*"
         ]
      },
      {
         "Effect":"Allow",
         "Action":[
            "ec2:ModifySnapshotAttribute",
            "ec2:CopySnapshot",
            "ec2:RegisterImage",
            "ec2:Describe*"
         ],
         "Resource":"*"
      }
   ]
}
```

6. Replace <*disk-image-file-bucket*> with the appropriate Amazon S3 bucket where the disk files are stored. Run the following command to attach the policy to the role created above:
7. Replace <*disk-image-file-bucket*> with the appropriate Amazon S3 bucket where the disk files are stored. Run the following command to attach the policy to the role created above `aws iam put-role-policy --role-name vmimport --policy-name vsz34-policy --policy-document file://role-policy.json`

Importing vSZ Image

Follow these steps to import vSZ image into AWS shared AMI.

1. Create a JSON file called import.json using the following commands. Replace the bucket name with the storage bucket name that you created. In this example the vSZ image file name is seen as `vscg-3.4.0.0.750.ova`.

```
{
    "Description": "Import vSZ",
    "DiskContainers": [
        {
            "Description": "vSZ 3.4.0.0.969",
            "UserBucket":{
                "S3Bucket": "<bucket-name>",
                "S3Key": "vscg-3.4.0.0.96950.ova"
            }
        }
    ]
}
```

2. Run the following command to attach the policy to the role created. `# aws ec2 import-image --cli-input-json file://import.json`

3. The system displays the below response.

```
{
    "Status": "active",
    "Description": "Import vSZ",
    "Progress": "2",
    "SnapshotDetails": [
        {
            "UserBucket": {
                "S3Bucket": "<bucket-name>",
"S3Key": "vscg-3.4.0.0.750.ova"
            },
            "DiskImageSize": 0.0
        }
    ],
    "StatusMessage": "pending",
    "ImportTaskId": "import-ami-ffgof9w1"
}
```

4. Check the status of the import vSZ image by running the following command. Ensure to enter the correct import task identifier.`# aws ec2 describe-import-image-tasks --import-task-ids "import-ami-ffgof9w1"`
5. You will see the following converting status response. Check the status until the converting is complete. The estimated time for conversion is 30 minutes.

```
{
    "ImportImageTasks": [
        {
            "Status": "active",
            "Description": "vSZ test",
            "Progress": "28",
            "SnapshotDetails": [
                {
                    "UserBucket": {
                        "S3Bucket": "<bucket-name>",
                        "S3Key": "vscg-3.4.0.0.750.ova"
                    },
                    "DiskImageSize": 964430848.0,
                    "Format": "VMDK"
                }
            ],
            "StatusMessage": "converting",
            "ImportTaskId": "import-ami-ffgof9w1"
        }
    ]
}
```

Creating vSZ Instance

Follow these steps to create a vSZ instance on AWS.

1. From **Amazon Web Service**, click **Compute** > **EC2**.

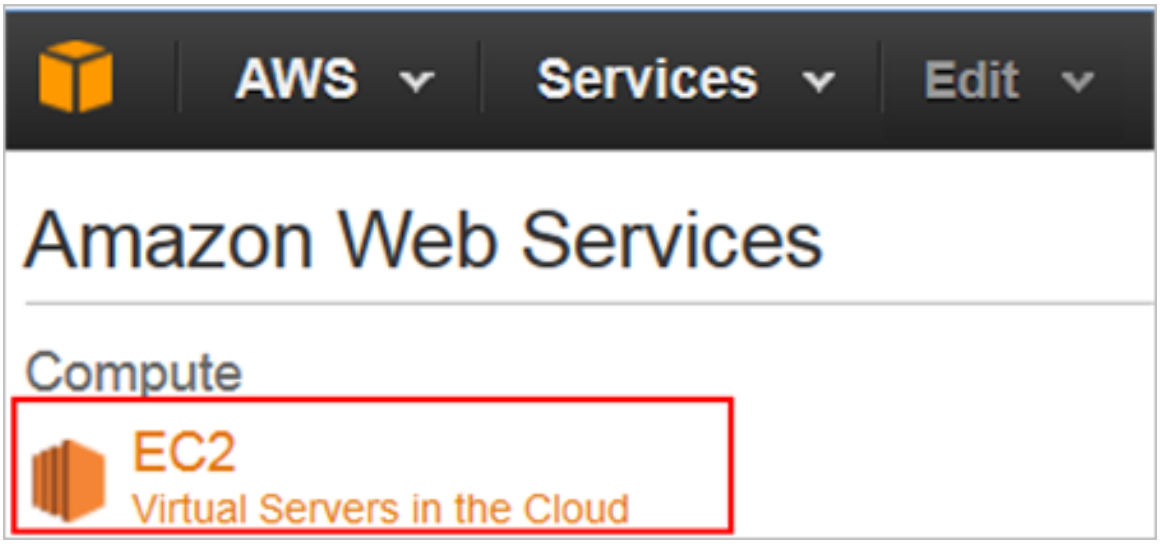


Figure 117: Select EC2

2. Navigate to **Images** > **AMIs** to ensure that the imported **Amazon Machine Image (AMI)** exists. In this example the AMI file is `import-ami-ffgof9w1`.

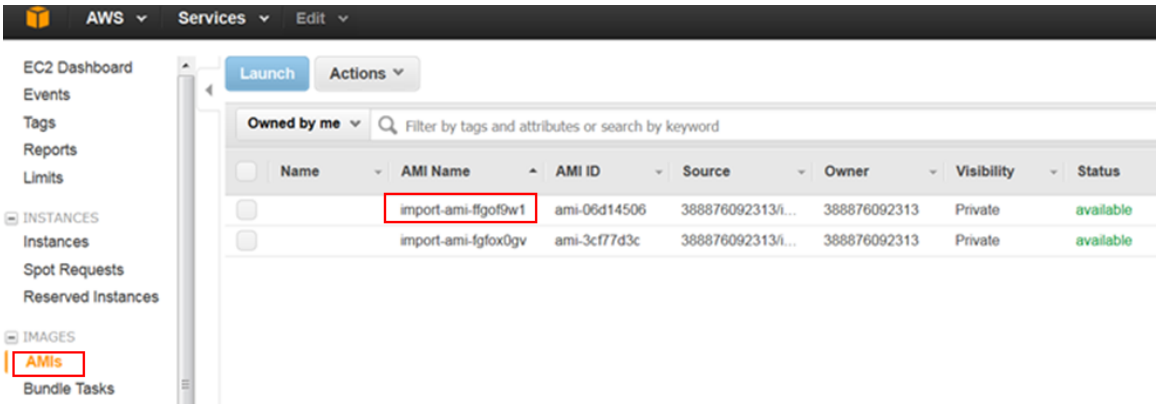


Figure 118: Select AMI

3. Navigate to **Network & Security** > **Security Groups** > **Create Security Group**. Security group acts as a virtual firewall that controls the traffic for one or more instances.

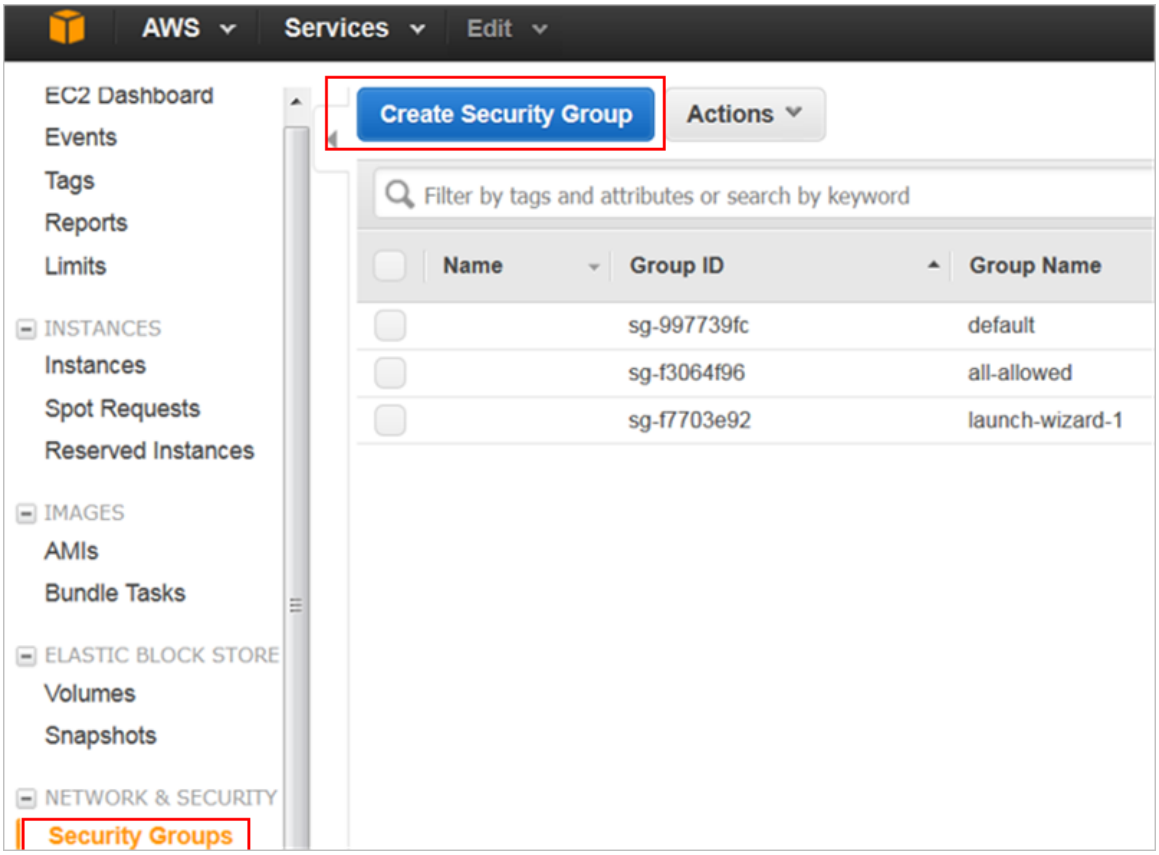


Figure 119: Create Security Group

4. Define the setup group name, description, ports and the firewall rule. The table lists the common service ports. For more information, see Ports to open for AP-vSZ communication.

Option	Description
Port Number	Detail
UDP	
161	SNMP
12223	ZD AP forward update using FTP (control connection)
TCP	
21	ZD AP forward update using FTP (control connection)
22	AP SSH
91	SCG AP forward update using HTTP
443	Allows SCG AP get SSH private key and do AP FW udpate via HTTPs
7443	Public API
8022	SSH for management (mgmt-acl is enabled on 1 nic vSZ)

Option	Description
8080	vSZ setup wizard using the web user interface (User will be redirected to the port 8443)
8443	vSZ web user interface
8090, 8099	WISPr for non-web-proxy user equipment
8100	WISPr for web-proxy user equipment
9998	Tomcat for WISPr (internal WISPr portal uses the port 9998)
9080, 9443	Northbound API (NBI)
16384-65000	ZD AP forward update using FTP (data connection)

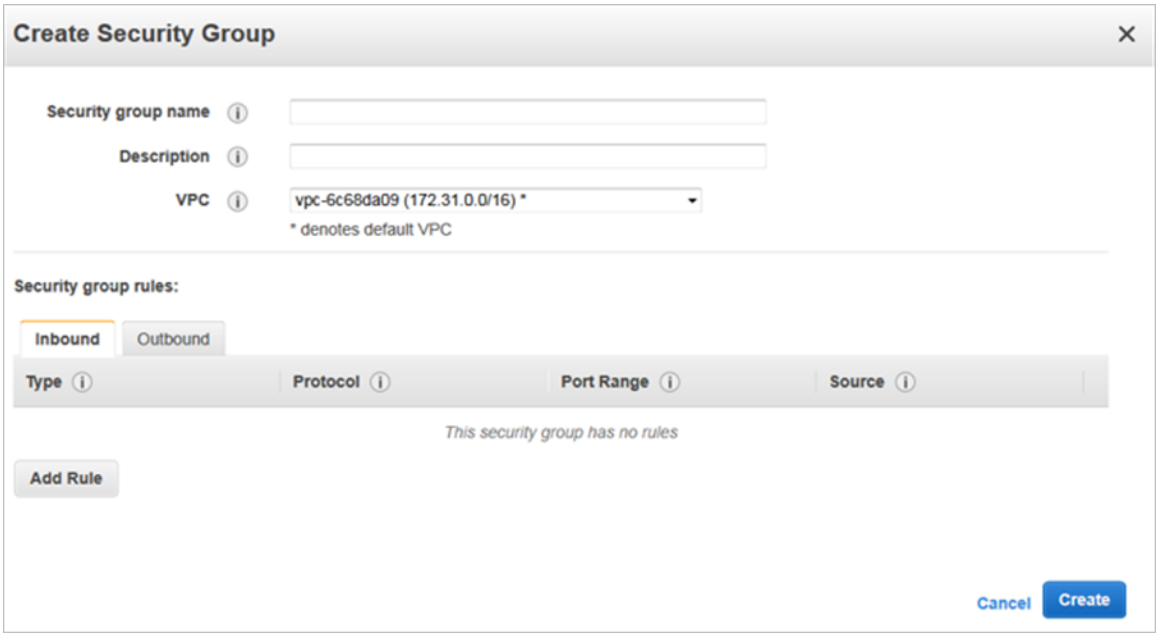


Figure 120: Define Security Group

5. Navigate to **Instances** and click on **Launch Instances**. Follow these steps.
   a) Launch Instance

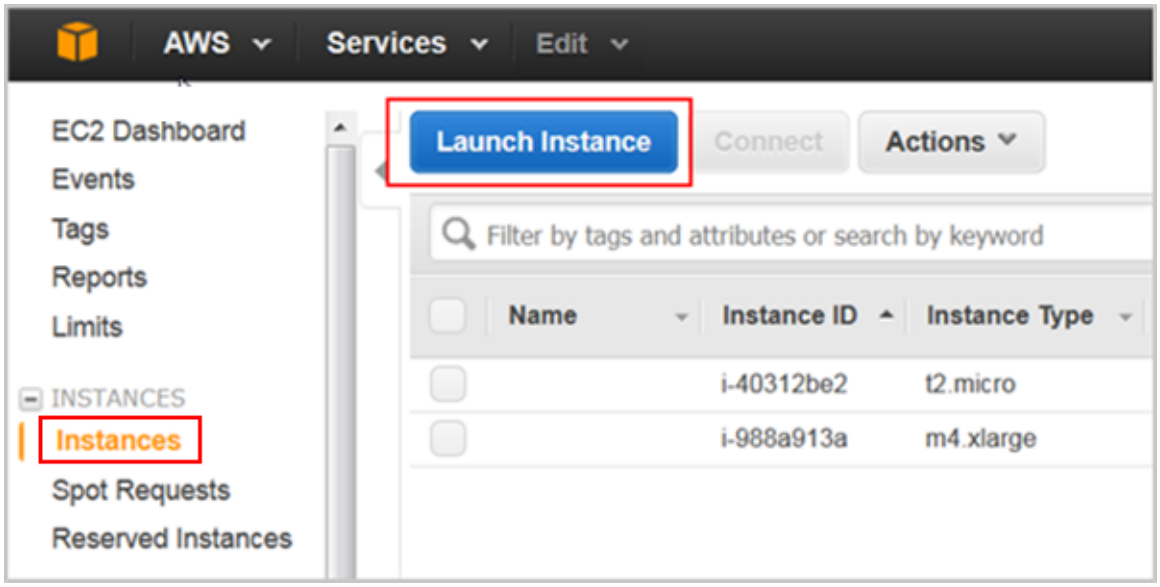


Figure 121: Launch instances

b) Navigate to **My AMIs** and choose the **Amazon Machine Image (AMI)** that you imported previously.

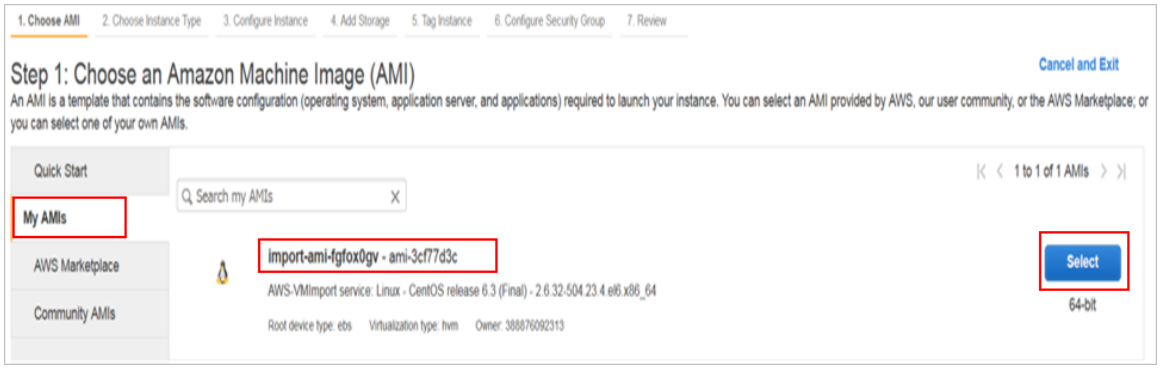


Figure 122: Choose the imported AMI

c) Click **Next**.

d) Choose a suitable instance type. In this example the instance type is *m4.xlarge*. Based on the number of APs and client counts, select the instance type to fit the recommended system resources.

The minimum memory and CPU requirements have changed in this release. You may need to upgrade your infrastructure before upgrading. Please read carefully. This is the minimum requirement recommended. Refer to Table 5 and Table 6 in the chapter Preparing to Install the vSZ.

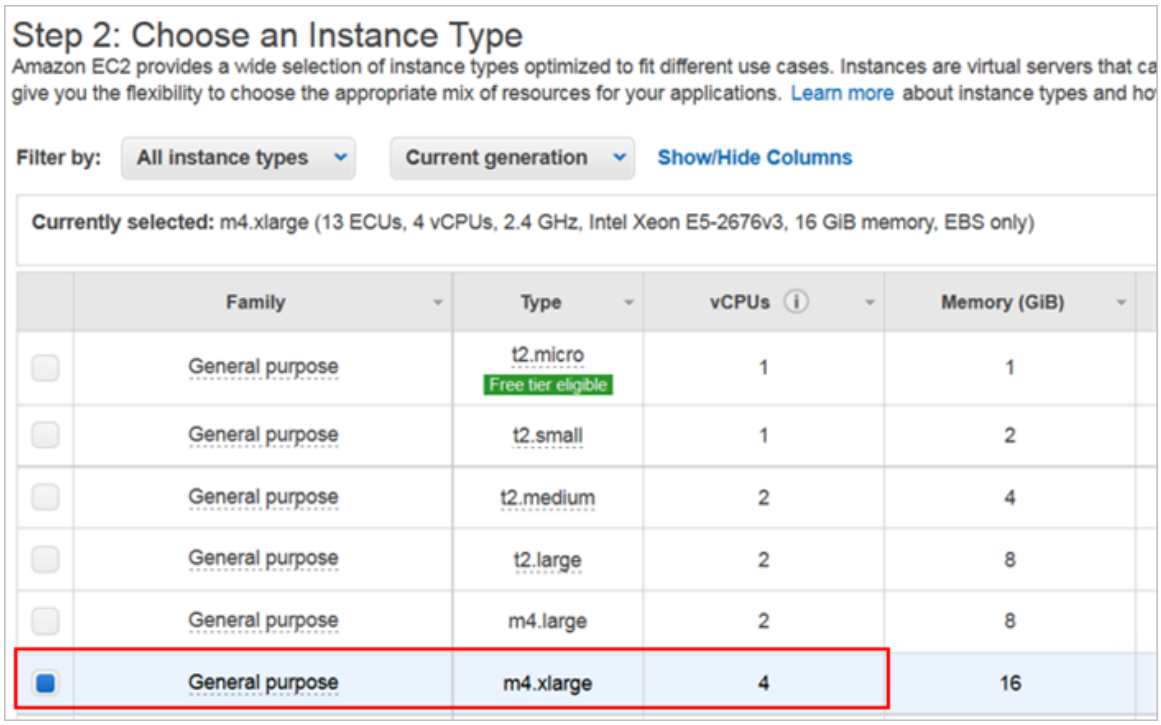


Figure 123: Choose the instance type

e) Click **Next**.

f) Select the required network, subnet, and private IP address.

The private IP address cannot be changed once the vSZ image is launched.

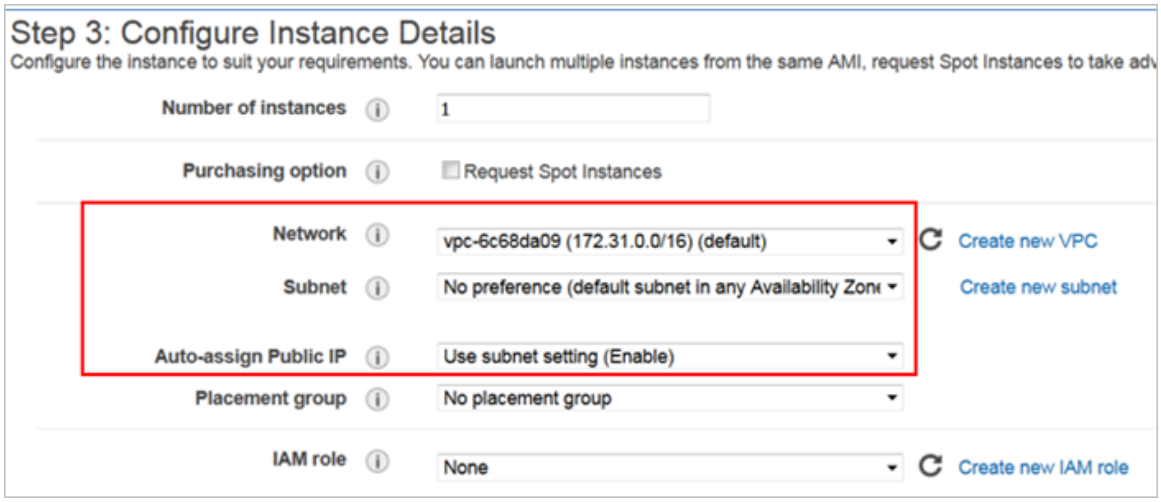


Figure 124: Configure the instance

g) Click **Next**.

h) Change the size of storage as required.

Figure 125: Change the storage size

i) Click **Next**.
j) Specify the vSZ instance by giving it a name.

Figure 126: Specify the vSZ instance

k) Click **Next**.
l) Create a new security group or select an existing group. Configure the rules if required.

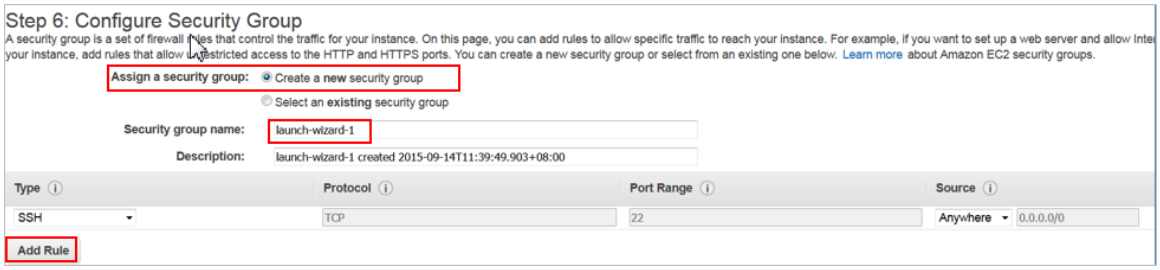


Figure 127: Specify the security group

m) Click **Next**.
n) Review the configuration settings.

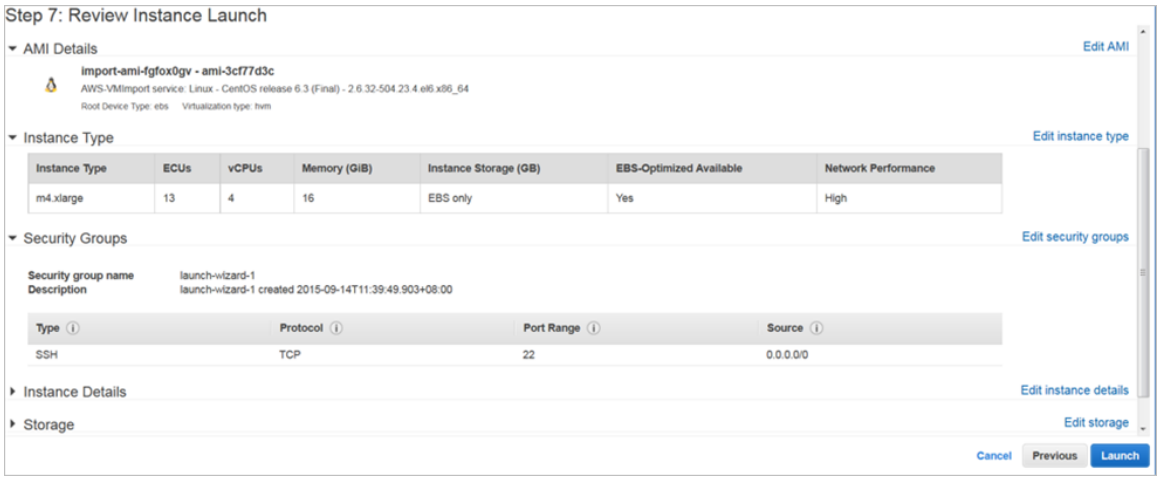


Figure 128: Review the configuration settings

o) Click **Launch**

p) Select the **Proceed without a key pair** for vSZ instance.

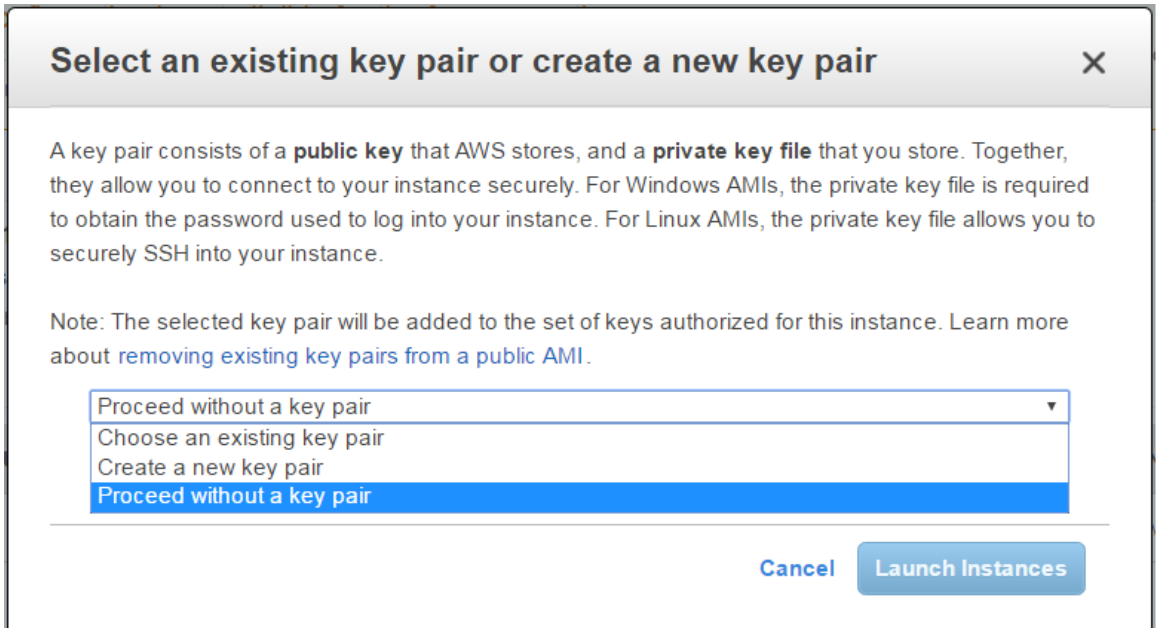


Figure 129: Select existing key pair

q) Verify that the vSZ instance is running. Connect the vSZ instance with the selected key pair using the SSH interface.

Configuring AWS for a vSZ Instance

Follow these steps to configure AWS for creating and launching a vSZ instance.

Attach a New Disk Volume

Follow these steps to add a new disk volume.

1. Navigate to **EC2 Dashboard** > **Elastic Block Store** > **Volumes** and click **Create Volume** as shown.

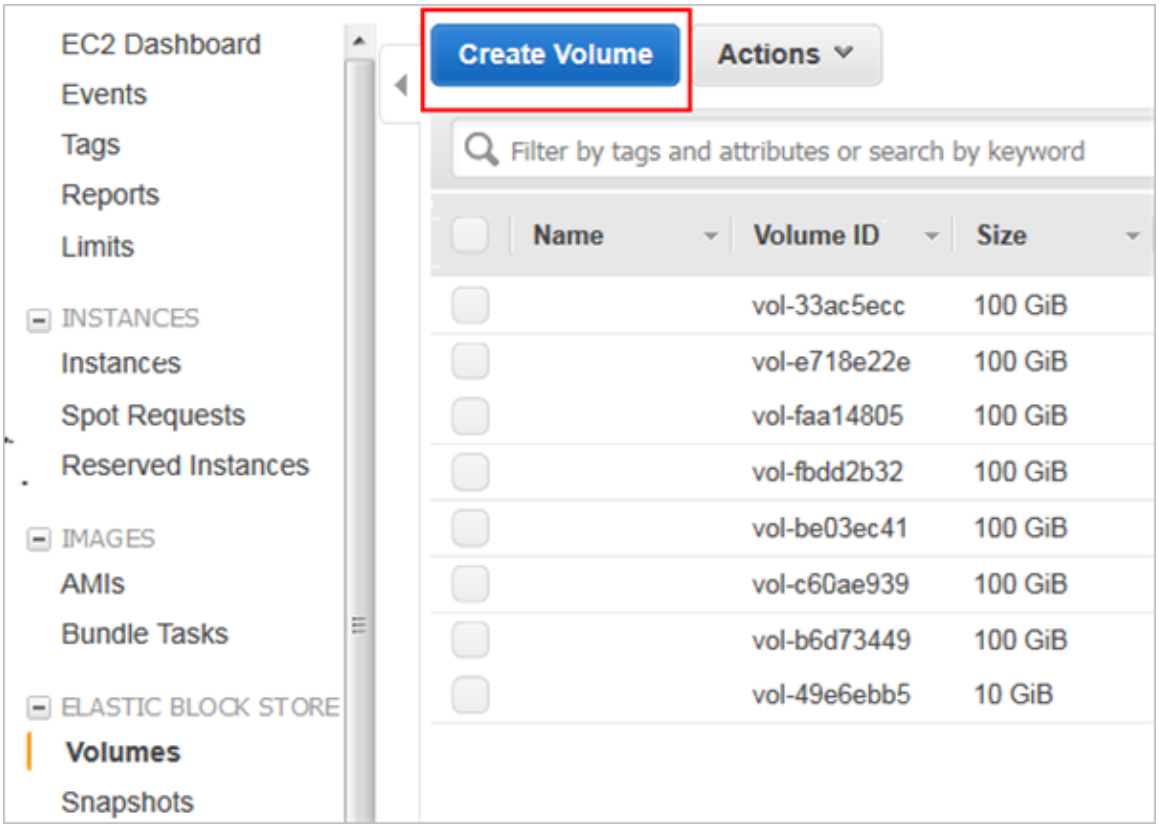


Figure 130: Create Volume

2. Enter the required disk type, size and availability zone.

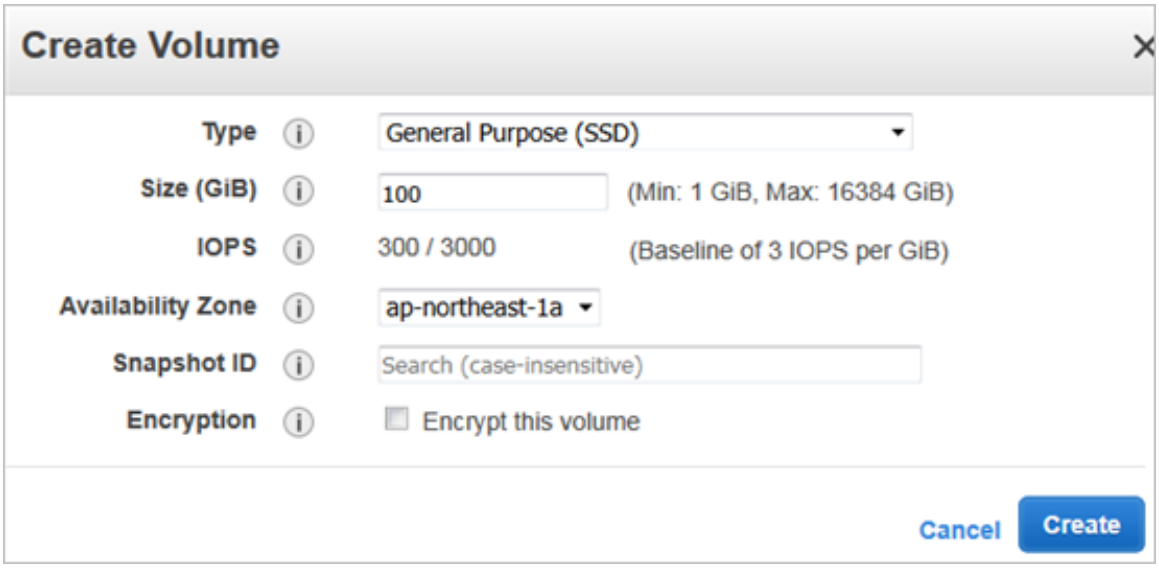


Figure 131: Create Volume

3. Click **Create**.
4. Right click on the newly created disk and select **Attach Volume**. Enter the instance identifier and the desired device name.

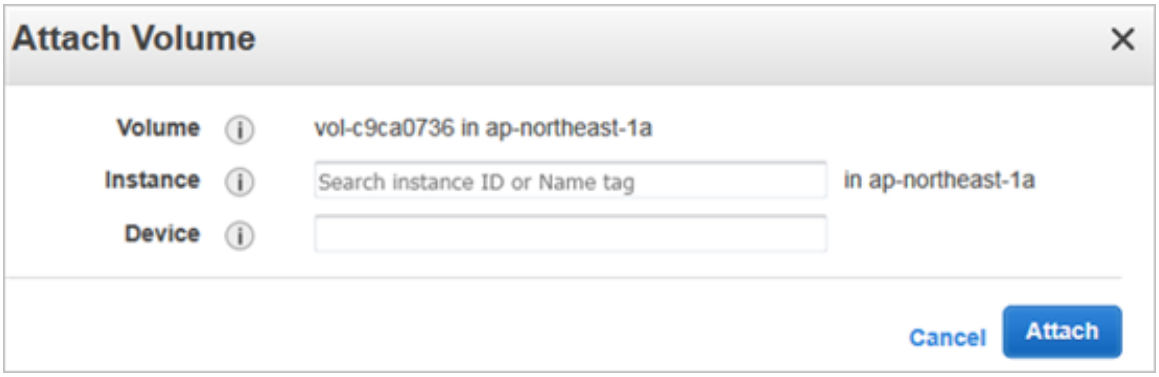


Figure 132: Attach Volume

5. Click **Attach**.

Allocate a Public IP Address

Follow these steps to allocate a public IP address.

1. Navigate to **EC2 Dashboard** > **Network & Security** > **Elastic IPs.** Click **Allocate New Address** as shown.

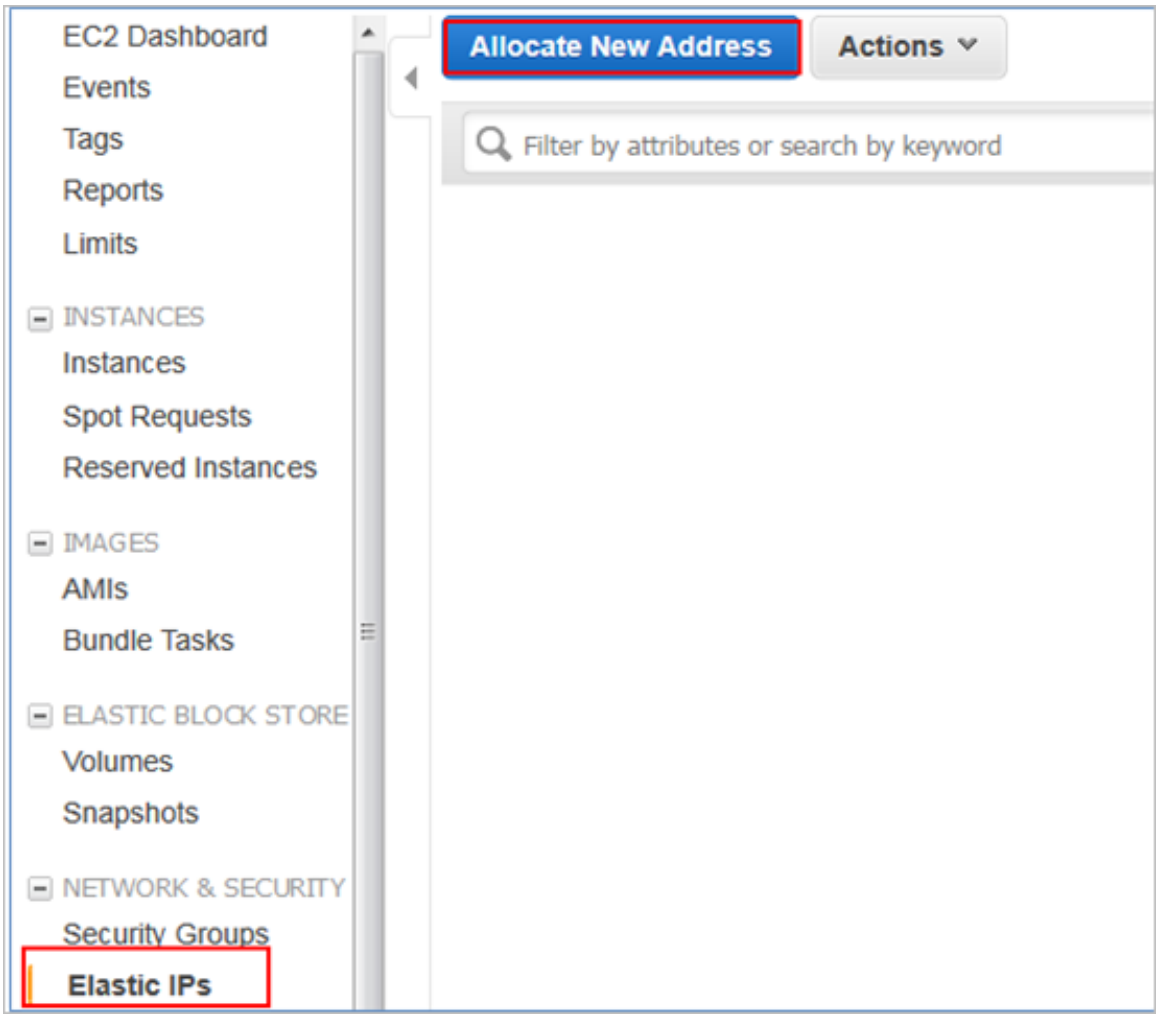


Figure 133: Allocate New IP Address

2. Click **Create**.
3. Right click on the newly created IP address and select **Associate Address**. Enter the instance identifier or network interface and the desired device name.

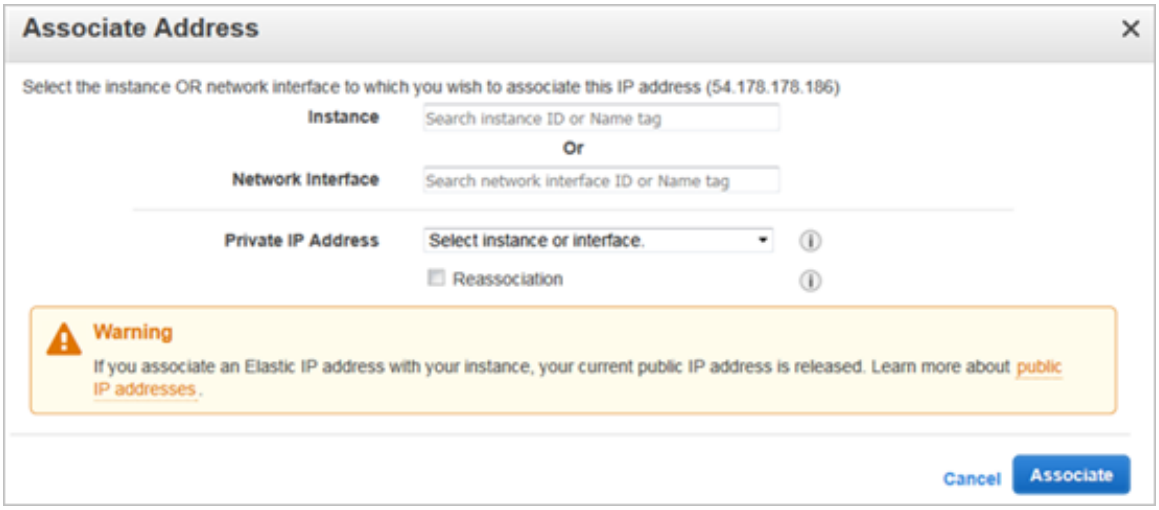


Figure 134: Associate Address

4. Click **Associate**.

Change Security Group

Follow these steps to change the security group.

1. Navigate to Instances and right click the target instance.
2. Select **Network** > **Change Security Group**.
3. Select the security groups.

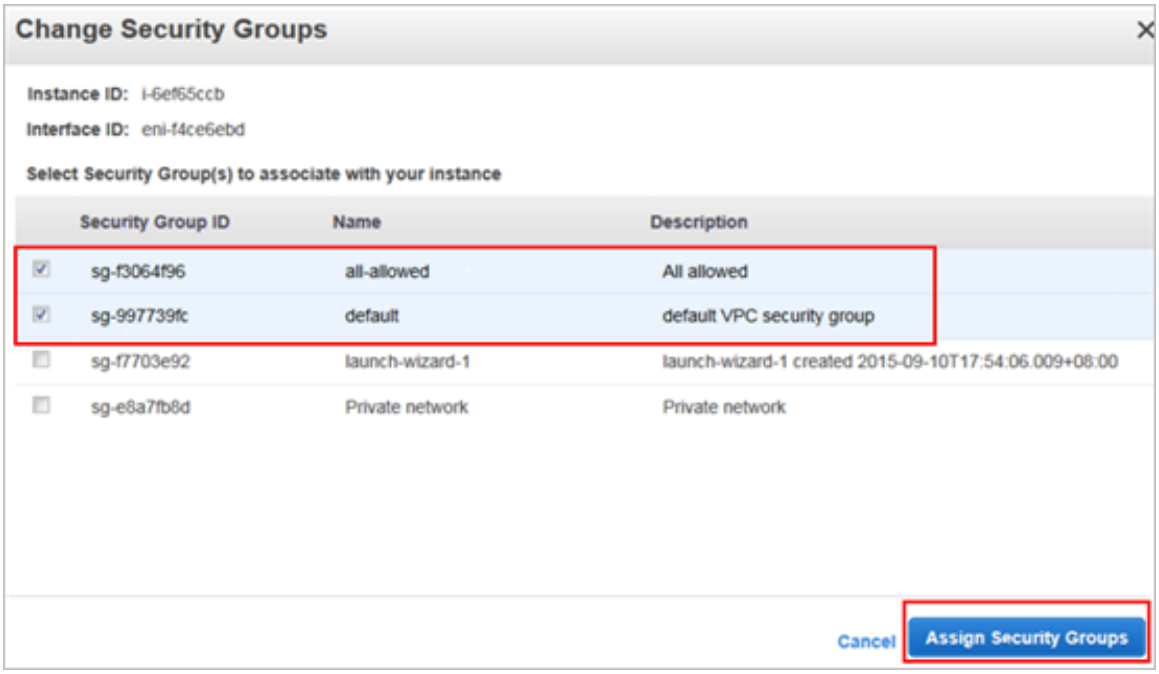


Figure 135: Allocate New IP Address

4. Click **Assign Security Groups**.

Deleting a vSZ Instance

Follow these steps to delete a vSZ instance on AWS.

1. Navigate to Instances and right click to select the vSZ instance that you want to delete.
2. Select **Instance State** > **Terminate**.

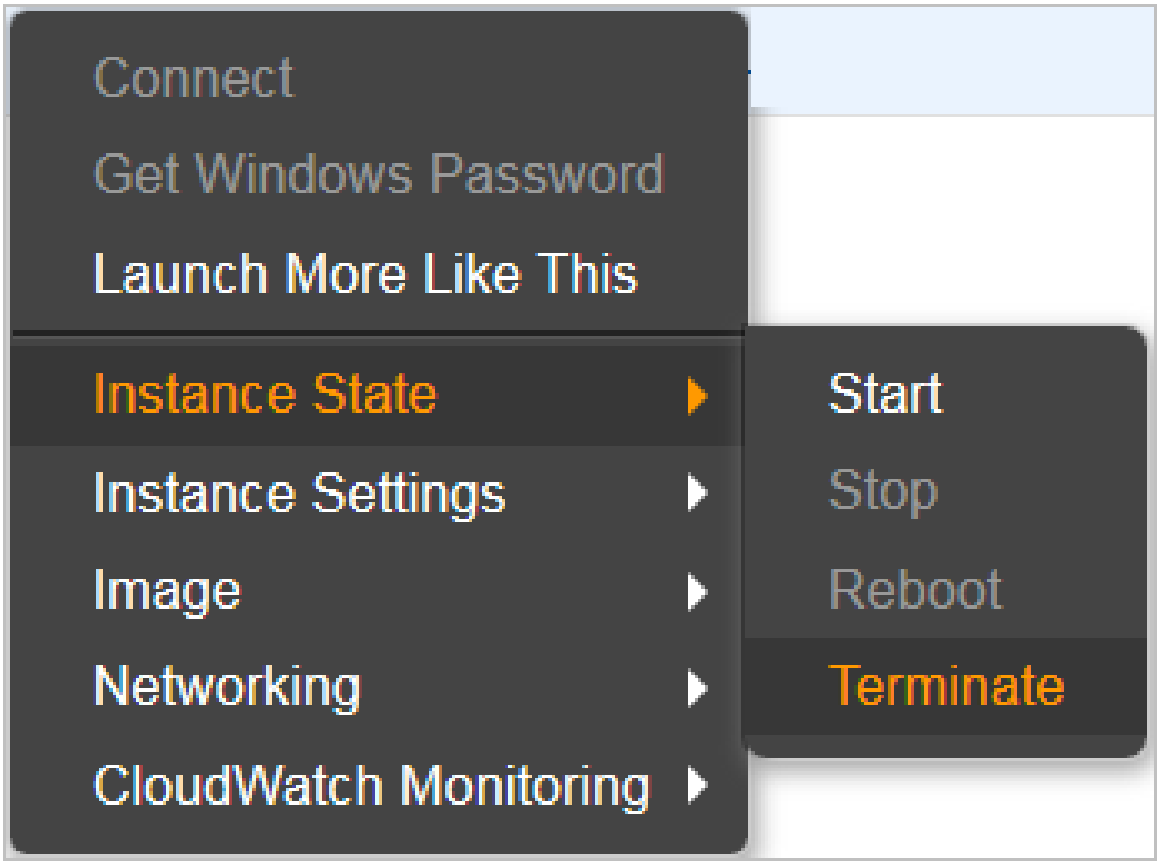


Figure 136: Select terminate

3. Confirm deletion of the vSZ instance by clicking on **Yes, Terminate**. The vSZ instance is deleted from AWS.

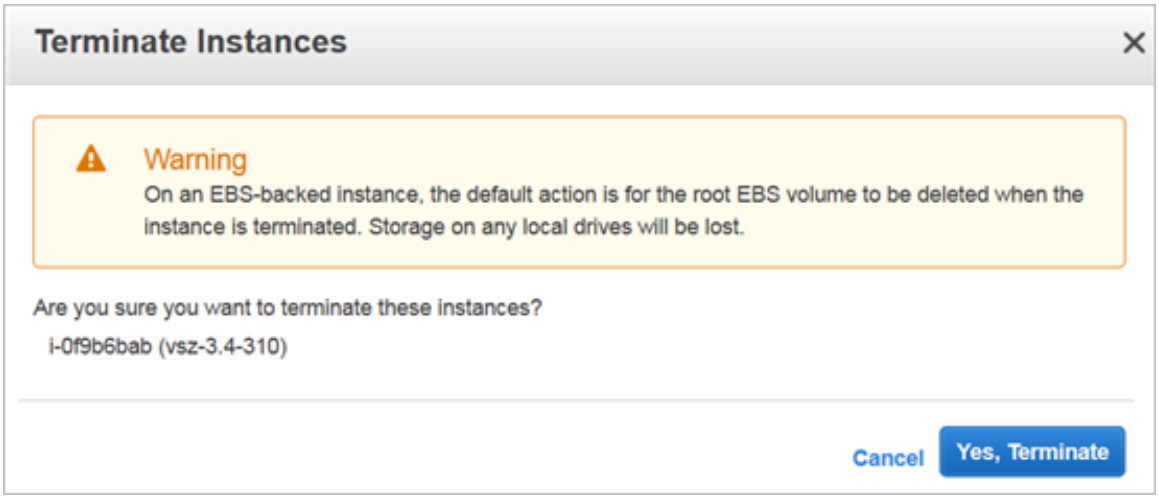


Figure 137: Confirm termination of vSZ instance

Configuring the Virtual Machine Interfaces 7

In this chapter:

- Setting Up the vSZ with One Interface
- Setting Up the vSZ with Three Interfaces
- Important Notes About Selecting the System Default Gateway

The vSZ comes with the option to operate with either one (1) network interface or three (3) network interfaces. Therefore the procedure for setting up the vSZ interface depends on the number of interfaces that it has.

Follow the procedure below that corresponds to the number of interfaces that the vSZ you are installing has:

- Setting Up the vSZ with One Interface
- Setting Up the vSZ with Three Interfaces

NOTE: By default, the VMWare ESXi package comes with three network interfaces. If you want to deploy the vSZ with only one interface, you can edit the virtual machine settings to remove the extra interfaces. The KVM package, on the other hand, comes with a single interface. If you want to deploy the vSZ with three interfaces, edit the virtual machine settings to create two additional interfaces.

Setting Up the vSZ with One Interface

Follow these steps to set up the vSZ with a single network interface

1. Log on to the console using; **User name:** `admin` **Password**: `admin`
2. At the `vSZ>` prompt, enter `en` to enable privileged mode.
3. At the **Password** prompt, enter `admin`. The **vSZ#** prompt appears.
4. Enter `setup`. The console displays the current network settings (if any), and then displays the following prompt: **Do you want to setup network? [YES/no]**

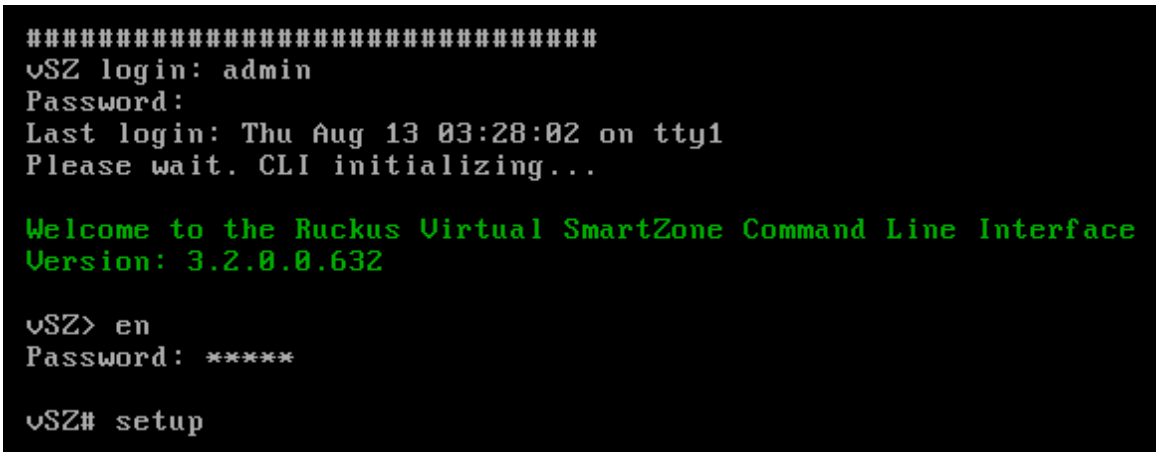


Figure 138: At the vSZ> prompt, enter setup

5. Enter `YES`. The next screen prompts you to select the profile configuration that you want to use for this instance of vSZ. The options include: **(1) High-Scale (2) Essentials**
6. Enter the number that corresponds to the profile configuration that you want to deploy.

   If you selected Essentials and the virtual machine has insufficient memory resources available (for example, the VM has only 8GB of RAM when the minimum RAM requirement is 12GB), you will be unable to continue with the setup process.

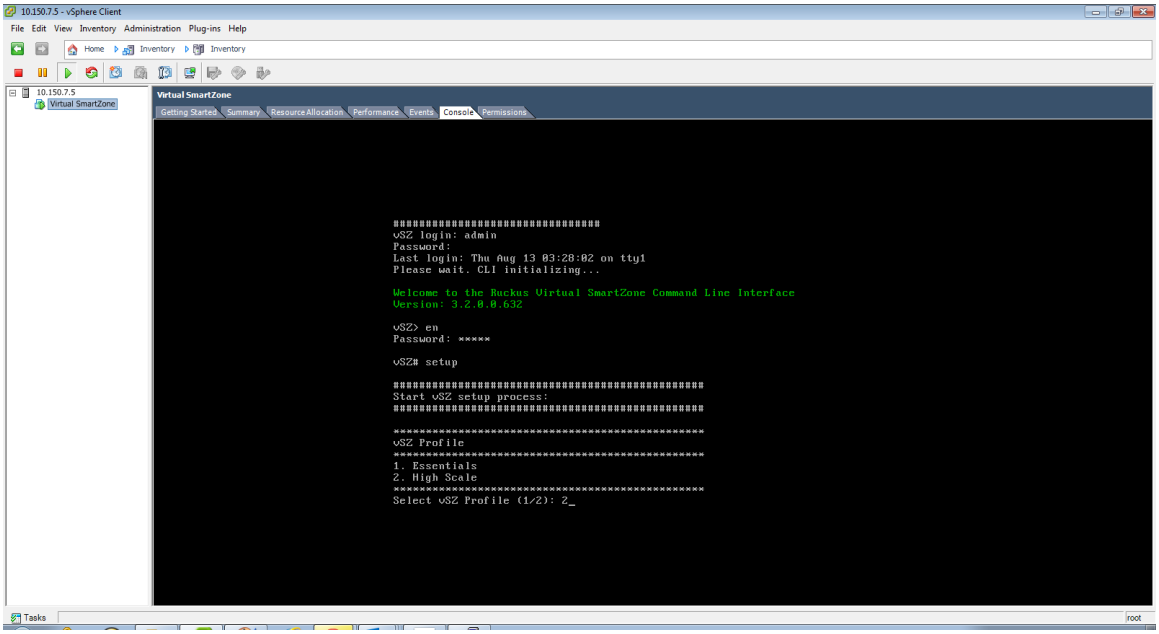


Figure 139: Enter the number that corresponds to the profile that you want to deploy

7. At the **Select IP Version Support** prompt, enter one of the following options: **1: IPv4 Only 2: IPv4 and IPv6**
8. At the **Select IP configuration** prompt, enter `1` to set up the single vSZ interface (for Control [AP], Cluster, and Management [Web]) manually.

9. Configure the IP address, netmask, and gateway of the *control interface*, and then press **<Enter>**. The IP address configuration that you entered appears.
10. When the prompt **Are these correct? (y/n)** appears, enter `y` to confirm the IP address configuration.

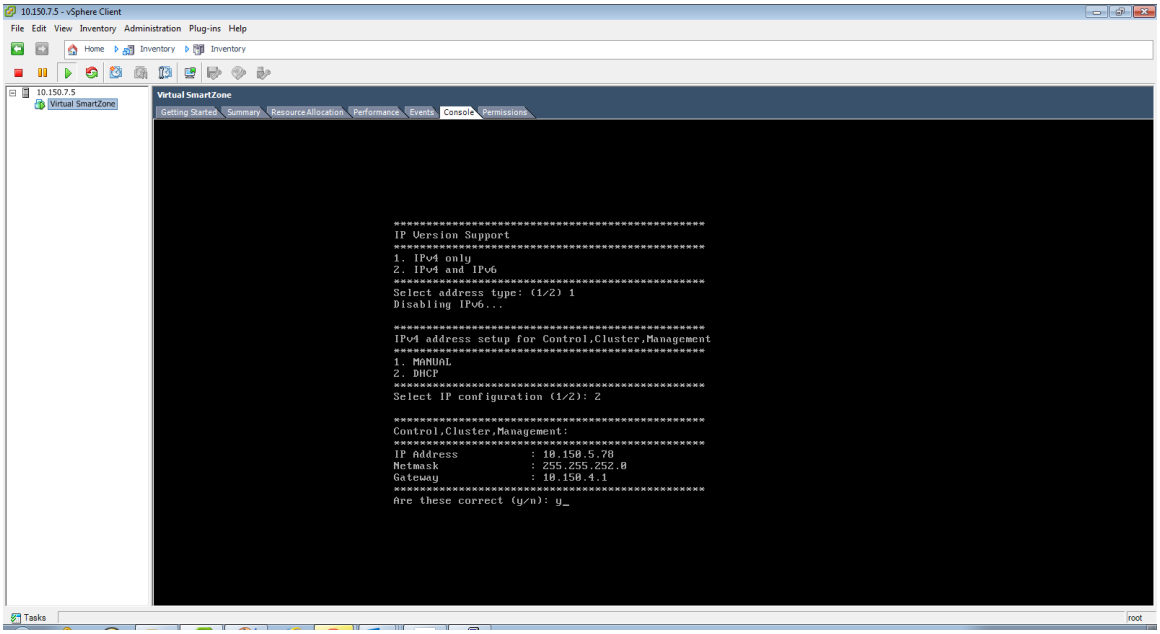


Figure 140: Configure the IP address settings of the single interface

11. When the prompt **Select system default gateway (Control, Cluster, Management)?** appears, enter `Control`.

    This entry is case-sensitive. Make sure you enter the system default gateway exactly as shown at the prompt.

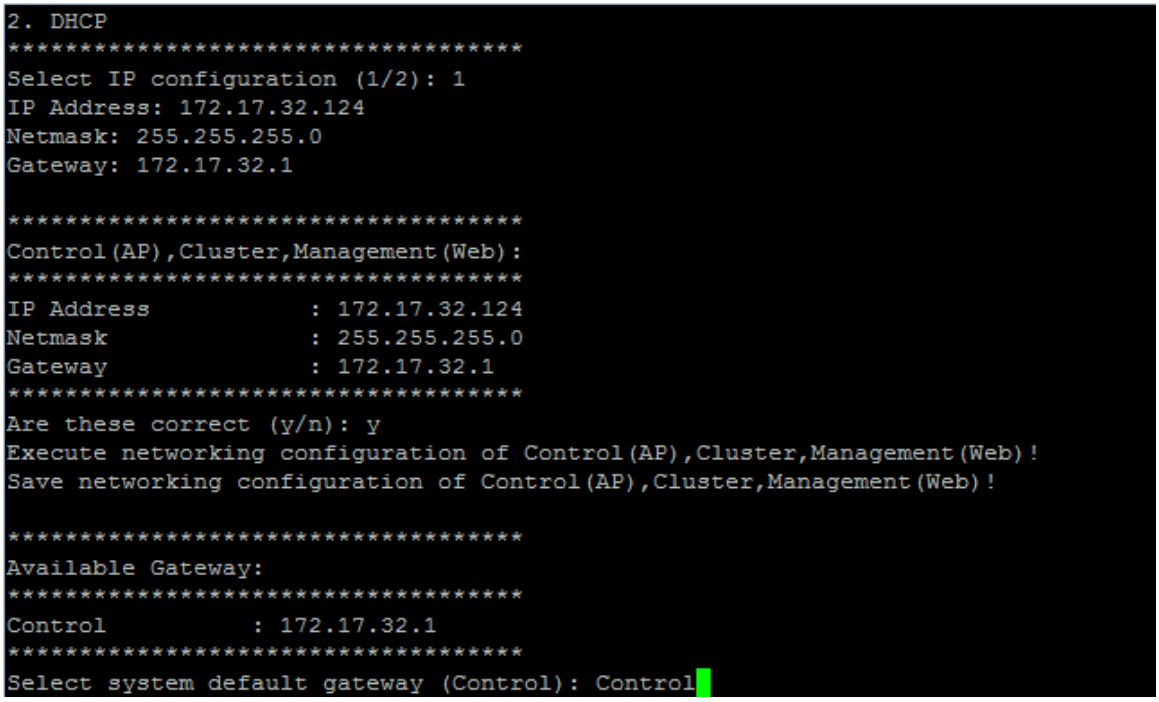


Figure 141: When prompted for the system default gateway, enter Control

12. At the **Primary DNS Server** prompt, enter the primary DNS server on the network.
13. At the **Secondary DNS Server** prompt, enter the secondary DNS server (if any) on the network.
14. At the **Control NAT IP** prompt, enter the public IP address of the NAT server on the network. If you are not deploying the vSZ behind a NAT server, press <Enter> without typing an IP address.

    Ensure that each vSZ is associated with a dedicated NAT device.

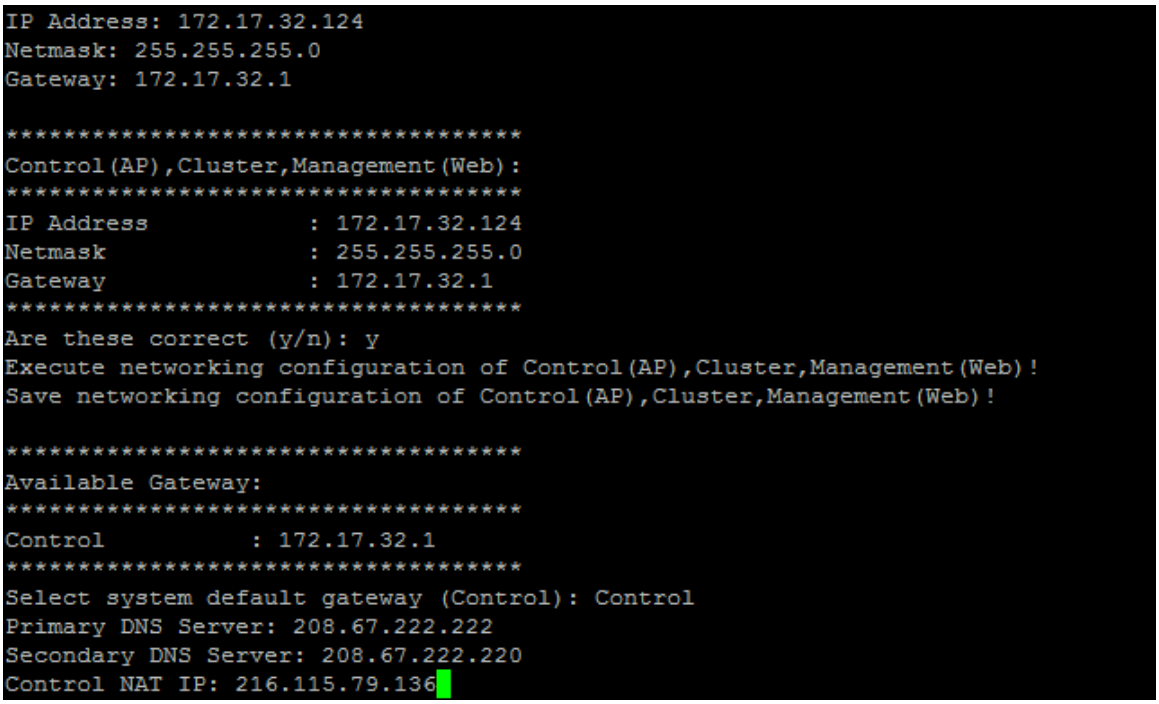


Figure 142: Enter the public IP address of the NAT server (if any)

15. Enter `restart network`.

You have completed configuring the vSZ interfaces. You are now ready to run the vSZ Setup Wizard. See Using the Setup Wizard to Install vSZ.

Setting Up the vSZ with Three Interfaces

1. Log on to the console using the following credentials: **User name:** `admin` **Password:** `admin`
2. At the **vSZ>** prompt, enter `en` to enable privileged mode.
3. At the **Password** prompt, enter `admin`. The **vSZ#** prompt appears.
4. Enter `setup`. The console displays the current network settings (if any), and then displays the prompt: **Do you want to setup network? [YES/no]**

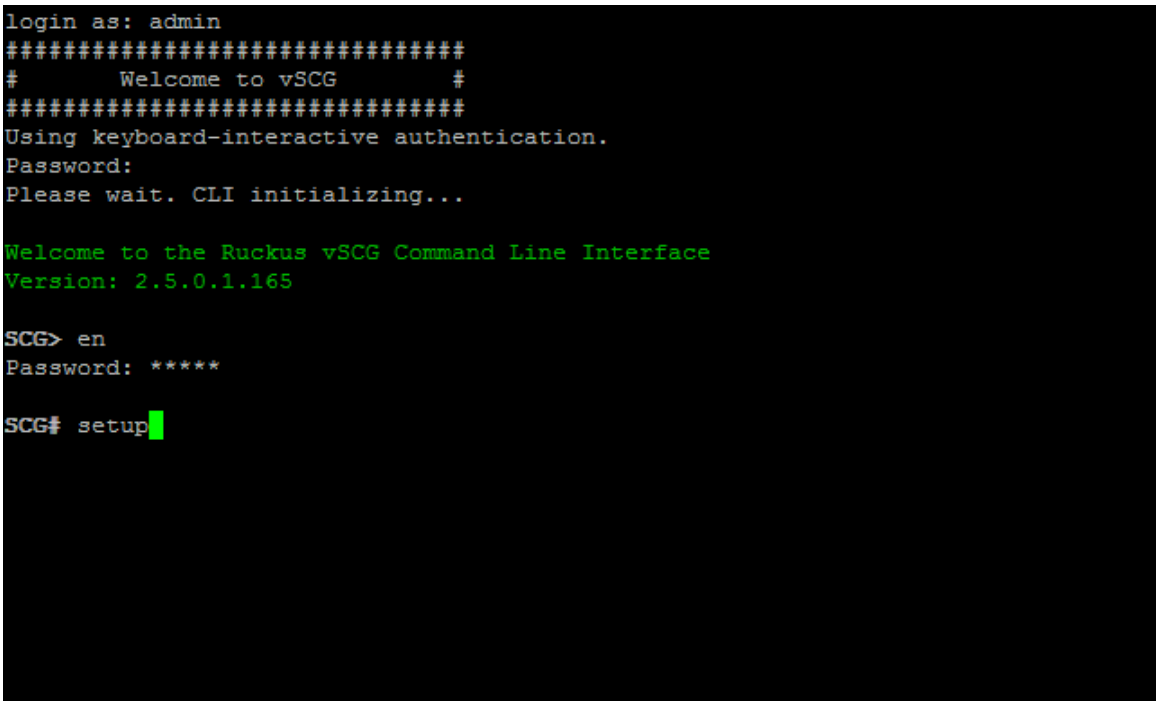


Figure 143: At the vSZ> prompt, enter setup

5. At the **Select IP configuration** prompt, enter `1` to set up the *control interface* manually.
   a) Configure the IP address, netmask, and gateway of the control interface, and the press **<Enter>**. The IP address configuration that you entered appears.
   a) When the message **Are these correct?** appears, enter `y` to confirm the IP address configuration.

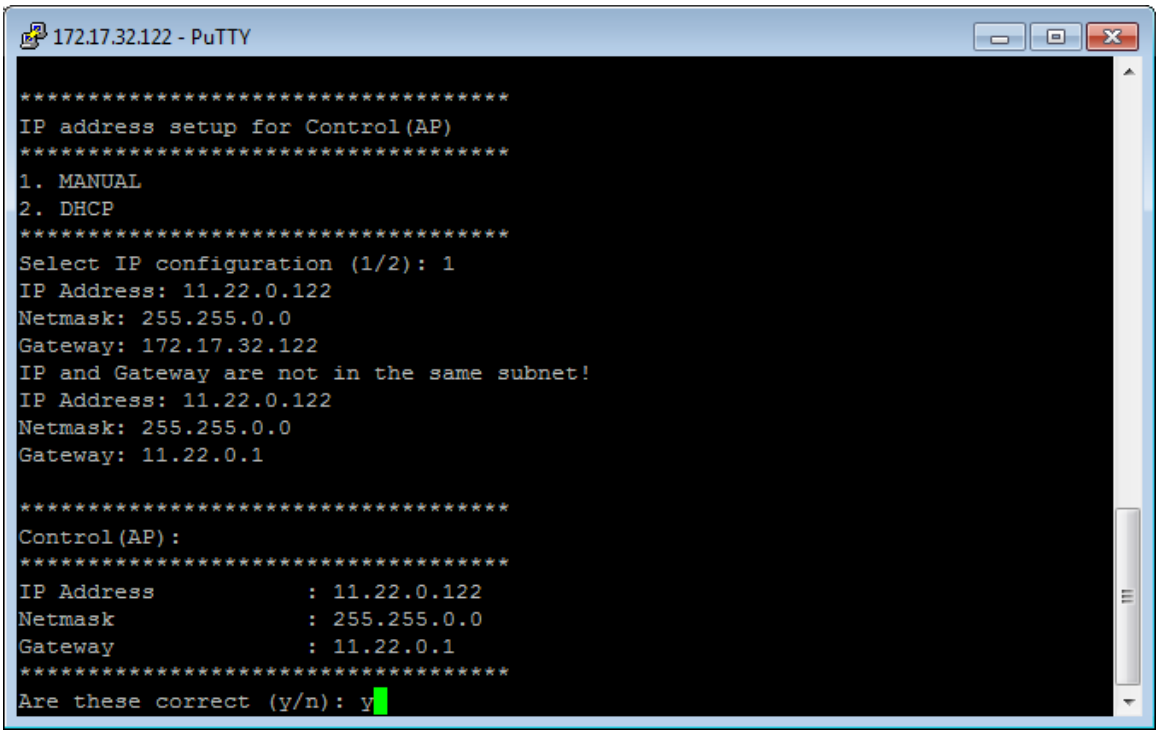


Figure 144: Configure the IP address settings of the control interface

6. At the **Select IP configuration** prompt, enter `1` to set up the cluster interface manually.
   a) Configure the IP address, netmask, and gateway of the *cluster interface*, and then press **<Enter>**. The IP address configuration that you entered appears.
   b) When the message **Are these correct?** appears, enter `y` to confirm the IP address configuration.
7. At the **Select IP configuration** prompt, enter `1` to set up the management interface manually.
   a) Configure the IP address, netmask, and gateway of the management interface, and the press **<Enter>**. The IP address configuration that you entered appears.

      Take note of the IP address that you assign to the management interface – you will use this IP address to log on to the vSZ web interface.
   b) When the message **Are these correct?** appears, enter `y` to confirm the IP address configuration.
8. When the message **Select system default gateway (Control, Cluster, Management)?**, enter `Control` or `Management`, depending on your network topology (see Important Notes About Selecting the System Default Gateway).

   This entry is case-sensitive. Make sure you enter the system default gateway exactly as shown at the prompt.

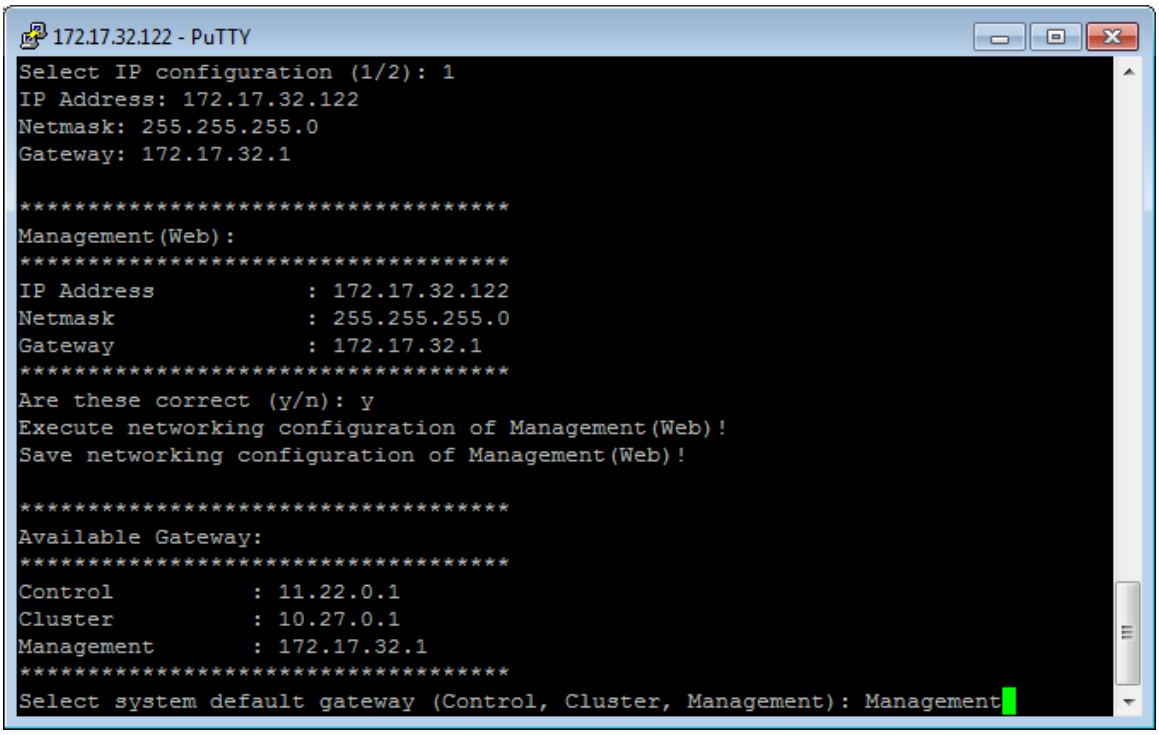


Figure 145: When prompted for the system default gateway, enter either Management or Control (depending on your network design)

9. When prompted, enter the primary and secondary DNS server IP addresses.
10. Enter `restart network`.

You have completed configuring the vSZ interfaces. You are now ready to run the vSZ Setup Wizard. See Using the Setup Wizard to Install vSZ.

Important Notes About Selecting the System Default Gateway

Depending on your network topology, you may select either the Management or Control interface as the system default gateway.

- If all of the managed APs are located in different locations on the Internet, the vSZ may not know all of the IP subnets of these APs. In this case, the control interface should be set as the default gateway for the vSZ and you will need to add a static route to reach the management network.
- If all of the managed APs belong to a single subnet or to multiple subnets on which you can set the route statically, then you can set the management interface as the default gateway users can set default gateway for the vSZ and set static routes for the vSZ to reach all of its managed APs.

Using the Setup Wizard to Install vSZ 8

In this chapter:

- Before You Begin
- Step 1: Start the Setup Wizard and Set the Language
- Step 2: Select the Profile Configuration That Corresponds to Your vSZ License
- Step 3: Configure the Management IP Address Settings
- Step 4: Configure Dual Mode IP Address Settings Using CLI
- Step 5: Configure the Cluster Settings
- Step 6: Set the Administrator Password
- Step 7: Changing the Administrator Password
- Step 8: Verify the Settings
- Logging On to the Web Interface

Before You Begin

The Setup Wizard helps you perform the initial configuration of the vSZ by presenting the vSZ configuration options in a set of easy-to-complete screens. The Setup Wizard will prompt you to select one of the two available profile configurations (High-Scale profile and Essentials profile). You must select the profile configuration that corresponds to the vSZ license that you purchased. Before you start the Setup Wizard, make sure you know the profile configuration that you need to select. If you are unsure which profile configuration you need to select, contact Ruckus Wireless Support.

Follow these steps to run and complete the vSZ Setup Wizard:

- Start the Setup Wizard and Set the Language
- Select the Profile Configuration That Corresponds to Your vSZ License
- Configure the Management IP Address Settings
- Configure Dual Mode IP Address Settings Using CLI
- Configure the Cluster Settings
- Set the Administrator Password
- Verify the Settings

NOTE: This guide describes the Setup Wizard screens that appear when you select the High-Scale profile configuration. If you select the Essentials profile configuration, the screens that appear may be slightly different.

Step 1: Start the Setup Wizard and Set the Language

1. Start your web browser, and then enter the following in the address bar: `https://{management-IP-address}:8443` Where management-IP-address is the

address you assigned to the management interface. The vSZ Setup Wizard appears, displaying the **Language** page.

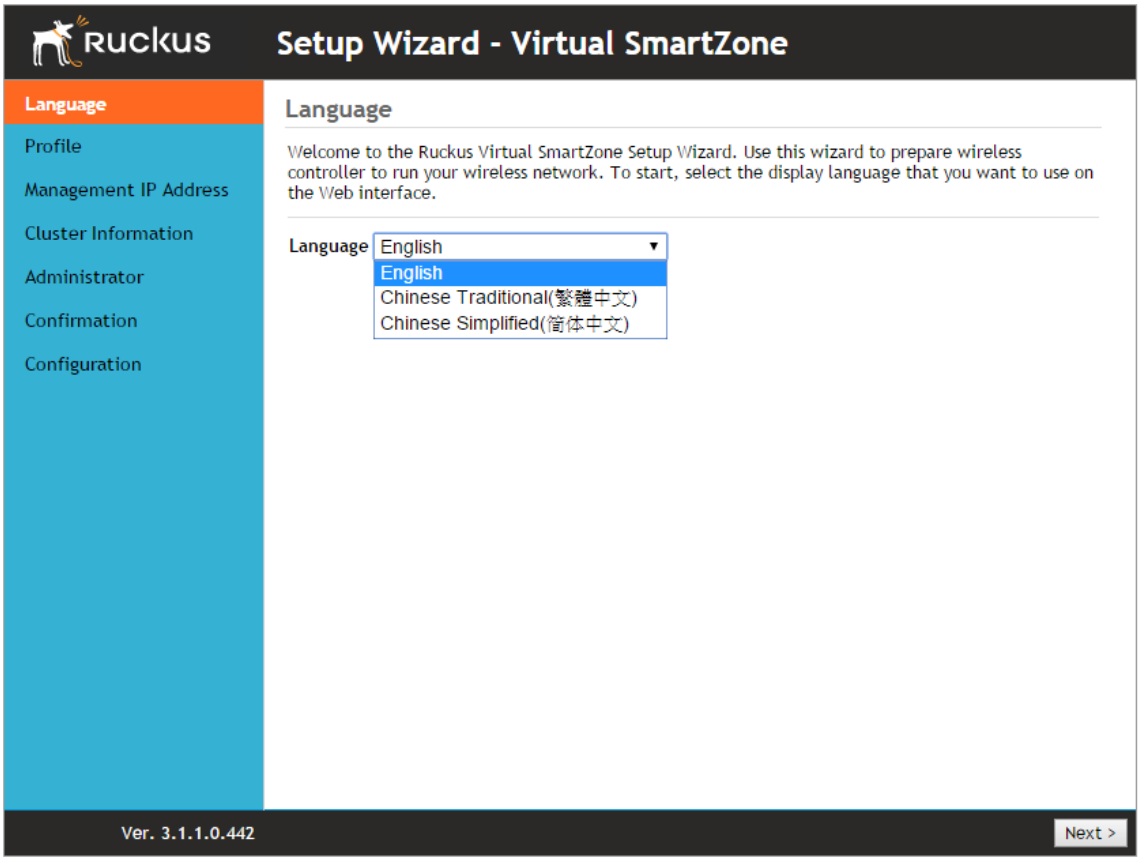


Figure 146: The Language page

2. Select your preferred language for the vSZ web interface. Available options include:
   a) English
   b) Traditional Chinese
   c) Simplified Chinese
3. Click **Next**. The **Profile** page appears.

Step 2: Select the Profile Configuration That Corresponds to Your vSZ License

1. Select the profile configuration that corresponds to the vSZ license that you purchased. Available profile configurations include:
   a) High Scale
   b) Essentials
2. Click **Apply**. The message **Applying profile** appears, and then the **Management IP** page appears.

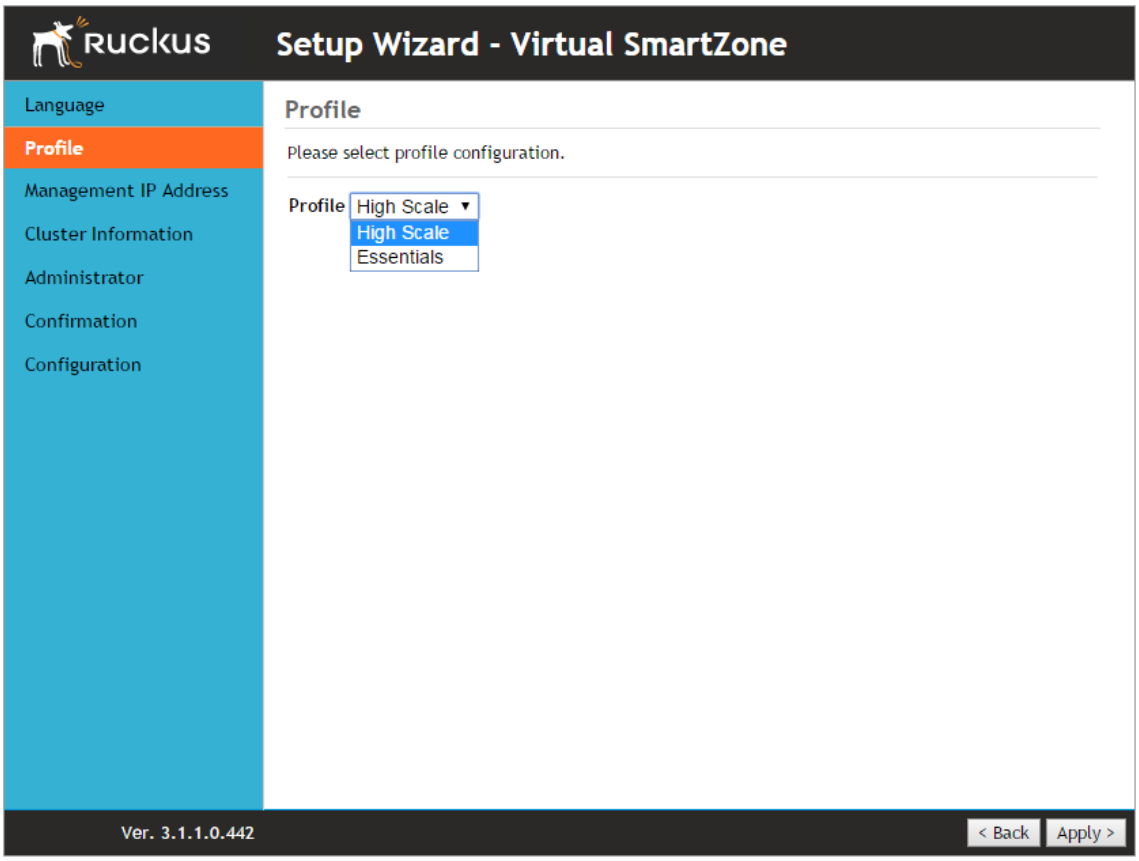


Figure 147: The Profile page

Step 3: Configure the Management IP Address Settings

The vSZ comes in either a single network interface or three network interfaces (one interface each for Control (AP), Cluster, and Management (Web) traffic). The following procedure assumes that the vSZ you are installing uses a single network interface.

If the vSZ that you are installing comes with three network interfaces, you must configure each of the three interfaces to be on three different subnets. Failure to do so may result in loss of access to the web interface or failure of system functions and services.

1. In *IP Version* Support, select one of the following options:

   IPv4 Only: Click this option if you want the controller to obtain an IPv4 address from a DHCP server on the network.

   IPv4 and IPv6: Click this option if you want the controller to obtain both IPv4 and IPv6 addresses from DHCP and DHCPv6 servers on the network. Refer to Step 4: Configure Dual Mode IP Address Settings Using CLI for configuring dual setup using CLI. This is an alternative method for configuring IPv4 and IPv6 manually if the DHCP server is not available on the network.

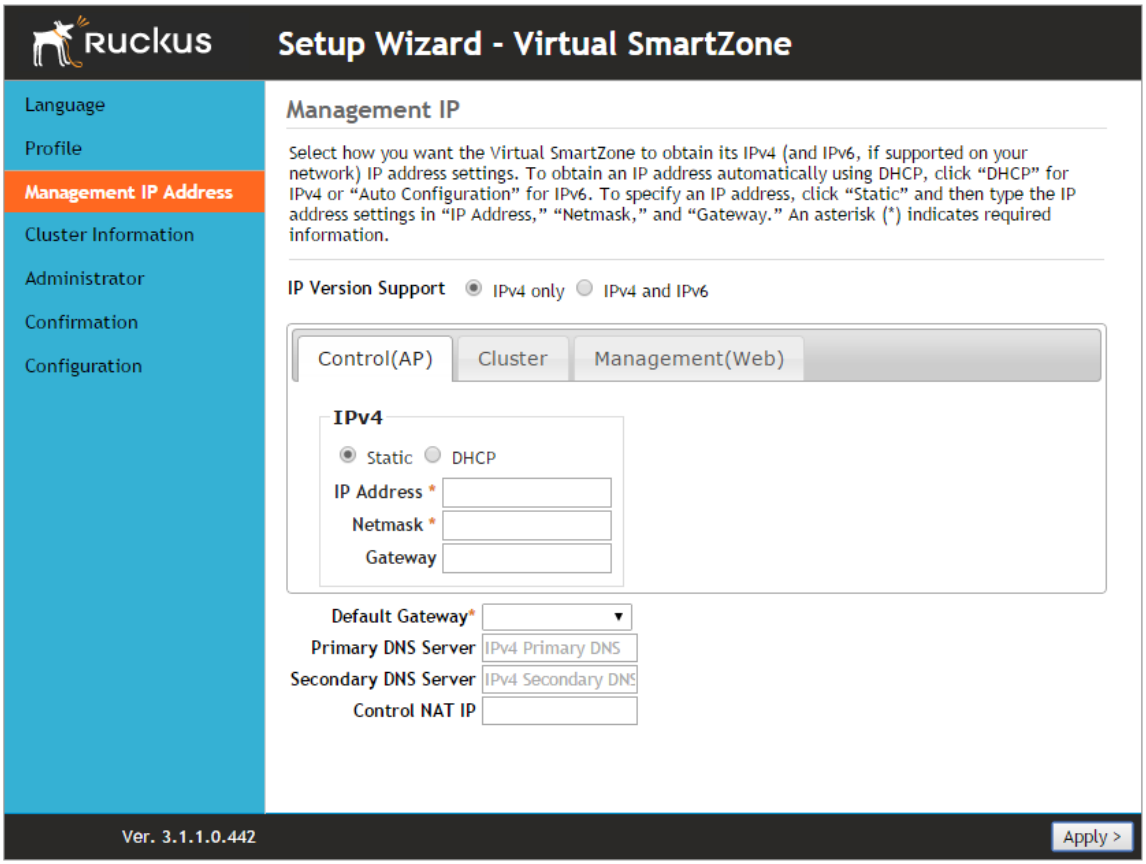


Figure 148: Select the IP version support

2. Configure the IP address settings of the *Control (AP/DataPlane)* interface.
   a) Under the **IPv4** section, click **Static**, and then enter the network settings that you want to assign to the AP/DataPlane interface, through which client traffic and configuration data are sent and received.

      Although it is possible to use DHCP to assign IP address settings to the Control interface automatically, Ruckus Wireless strongly recommends assigning a static IP address to this interface.The following network settings are required (others are optional):

      - IP address
      - Netmask
      - Default gateway

   a) If you clicked IPv4 and IPv6 at the beginning of this procedure, under the IPv6 section, click **Auto Configuration** if you want the controller to obtain its IP address from Router Advertisements (RAs) or from a DHCPv6 server on the network. If you want to manually assign the IPv6 network address, click **Static**, and then set the values for the following: IP address (IPv6): Enter an IPv6 address (global only) with a prefix length (for example, `1234::5678:0:C12/123`). Link-local addresses are unsupported.Gateway: Enter an IPv6 address (global or link-local) without a prefix length. Here are examples:
      Global address without a prefix length: `1234::5678:0:C12`
      Link-local address without a prefix length: `fe80::5678:0:C12`

a) Click the **Cluster** tab when done.

3. On the **Cluster** tab, click **Static** under the **IPv4** section, and then enter the network settings that you want to assign to the cluster interface, through which cluster data will be sent and received.

   Although it is possible to use DHCP to assign IP address settings to the Cluster interface automatically, Ruckus Wireless strongly recommends assigning a static IP address to this interface. The following network settings are required (others are optional):

   - IP address
   - Netmask
   - Default gateway

4. Click the **Management (Web)** tab when done

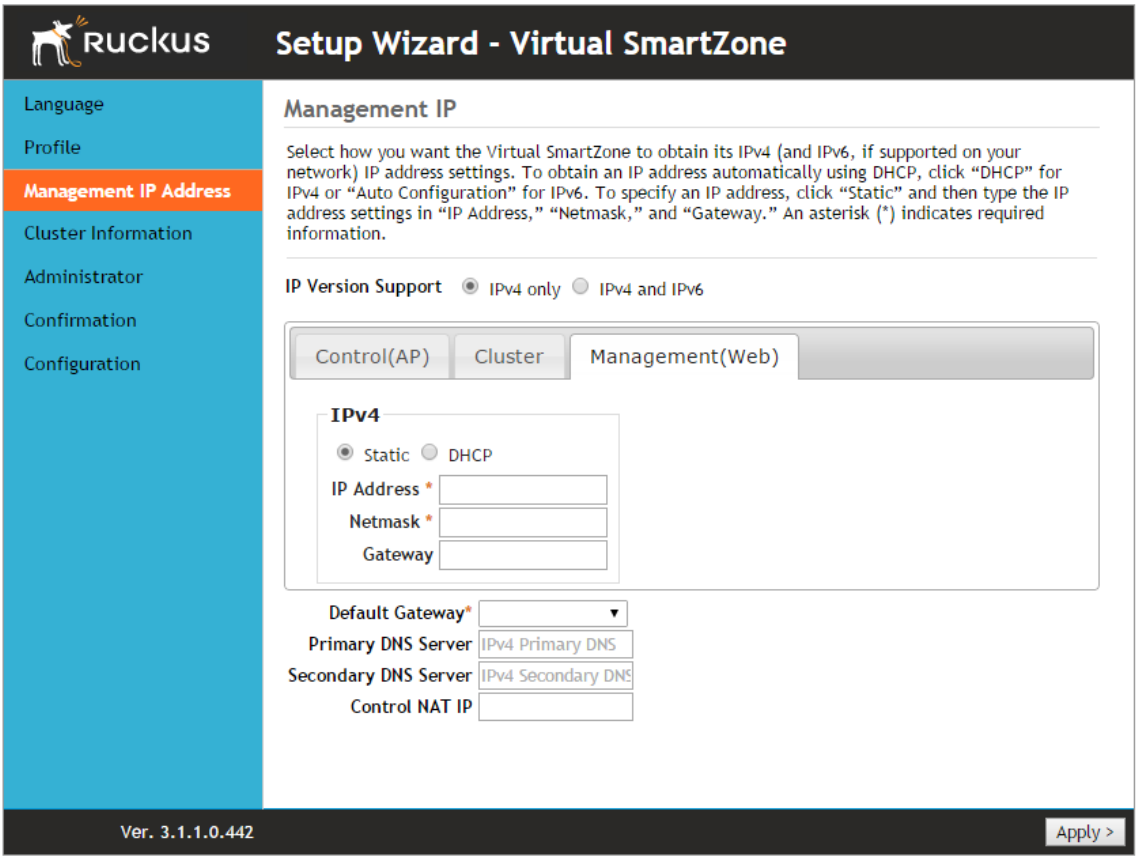


Figure 149: The Management (Web) tab

5. On the **Management (Web)** tab, configure the IP address settings of the management interface.

   a) Under the **IPv4** section, click **Static**, and then enter the network settings that you want to assign to the AP/DataPlane interface, through which client traffic and configuration data are sent and received.

Although it is possible to use DHCP to assign IP address settings to the Control interface automatically, Ruckus Wireless strongly recommends assigning a static IP address to this interface. The following network settings are required (others are optional):

- IP address
- Netmask
- Default gateway

b) If you clicked IPv4 and IPv6 at the beginning of this procedure, under the **IPv6** section, click **Auto Configuration** if you want the management (web) interface to obtain its IP address from Router Advertisements (RAs) or from a DHCPv6 server on the network. If you want to manually assign the IPv6 network address, click **Static**, and then set the values for the following: IP address (IPv6): Enter an IPv6 address (global only) with a prefix length (for example, `1234::5678:0:C12/123`). Link-local addresses are unsupported.Gateway: Enter an IPv6 address (global or link-local) without a prefix length. Here are examples:
Global address without a prefix length: `1234::5678:0:C12`
Link-local address without a prefix length: `fe80::5678:0:C12`

6. At the bottom of the screen, select the interface that you want to set as the default system gateways for IPv4 and IPv6 (if enabled), and then type the primary and secondary DNS server addresses.

   The appropriate interface to use as the default system gateway depends on the topology of your network. See Important Notes About Selecting the Gateway for more information.

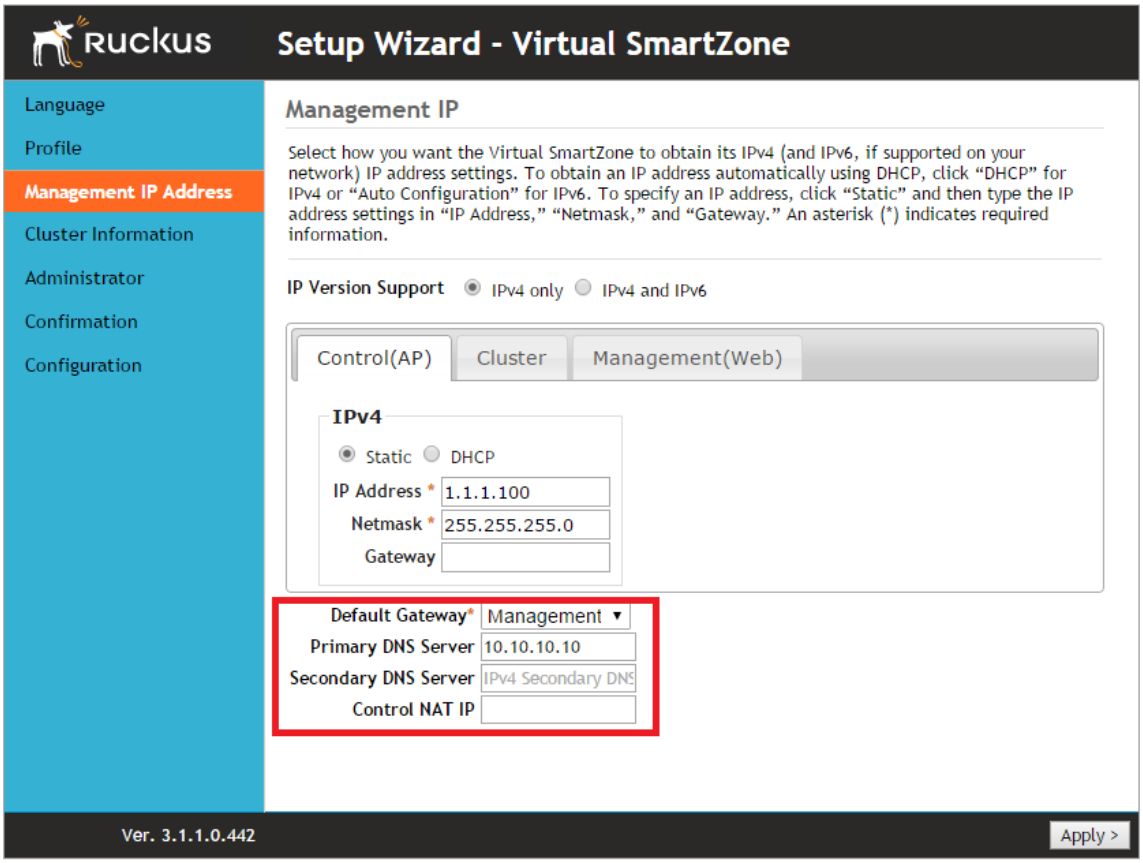


Figure 150: Select the IPv4 and IPv6 (if enabled) default system gateways

7. Check the network settings that you have configured on the **Control**, **Cluster**, and **Management** tabs and the default gateway that you have selected. Verify that they are all correct.
8. Click the **Apply** to continue. The controller validates and applies the network settings that you have configured.

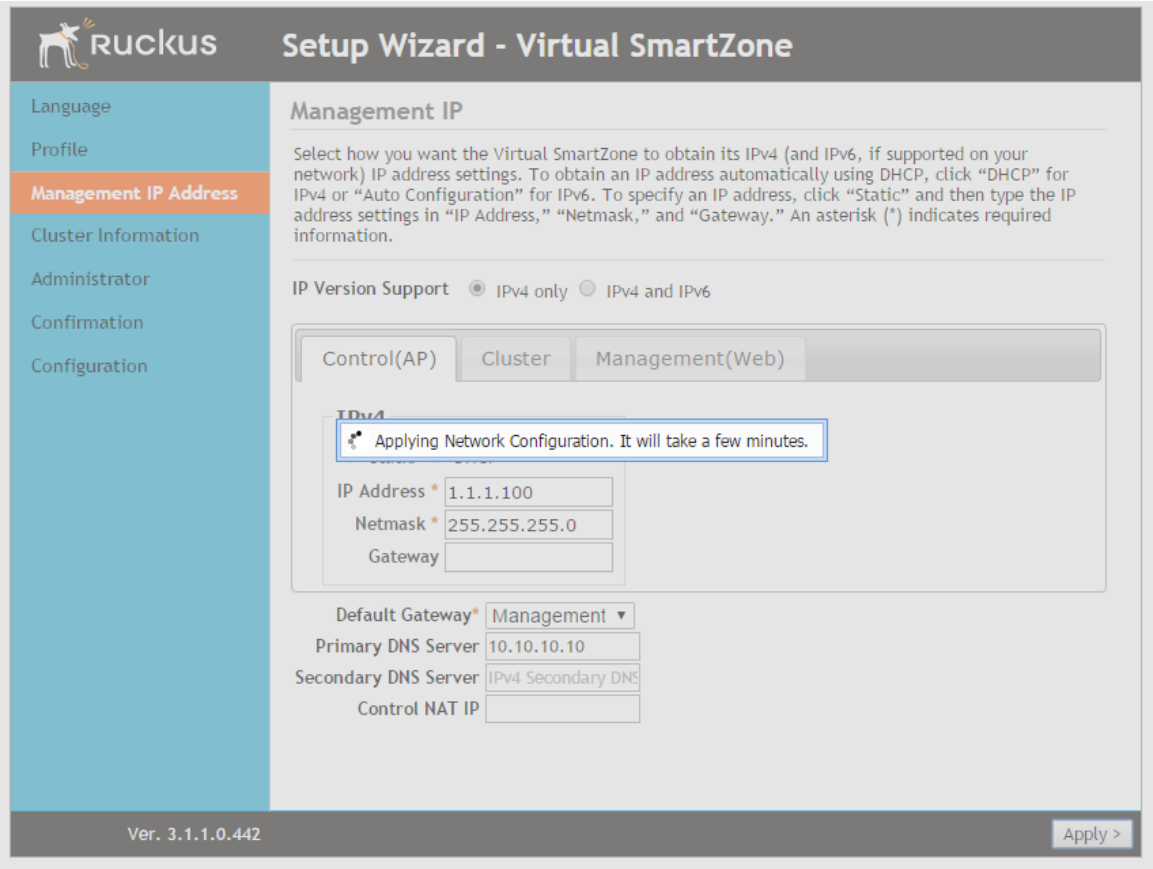


Figure 151: The controller validates and applies the network settings you have configured

NOTE:

- It may take the controller up to 15 minutes to activate its interfaces. An error message may appear after you apply the network interface settings.
- Wait at least for 15 minutes, and then try again.

NOTE: If the controller is unable to validate the network settings that you configured, an error message appears. If this happens, check the network settings that you configured and verify that you are able to connect to the IP address that you assigned to the **Management (Web)** interface.

9. Update the IP address settings of the administrative computer with the same subnet settings that you assigned to the **Management (Web)** interface (see Step 4). Continue to step 5: Configure the Cluster Settings.

Important Notes About Selecting the System Default Gateway

Depending on your network topology, you may select either the Management or Control interface as the system default gateway.

- If all of the managed APs are located in different locations on the Internet, the vSZ may not know all of the IP subnets of these APs. In this case, the control interface should be set as the default gateway for the vSZ and you will need to add a static route to reach the management network.
- If all of the managed APs belong to a single subnet or to multiple subnets on which you can set the route statically, then you can set the management interface as the default gateway users can set default gateway for the vSZ and set static routes for the vSZ to reach all of its managed APs.

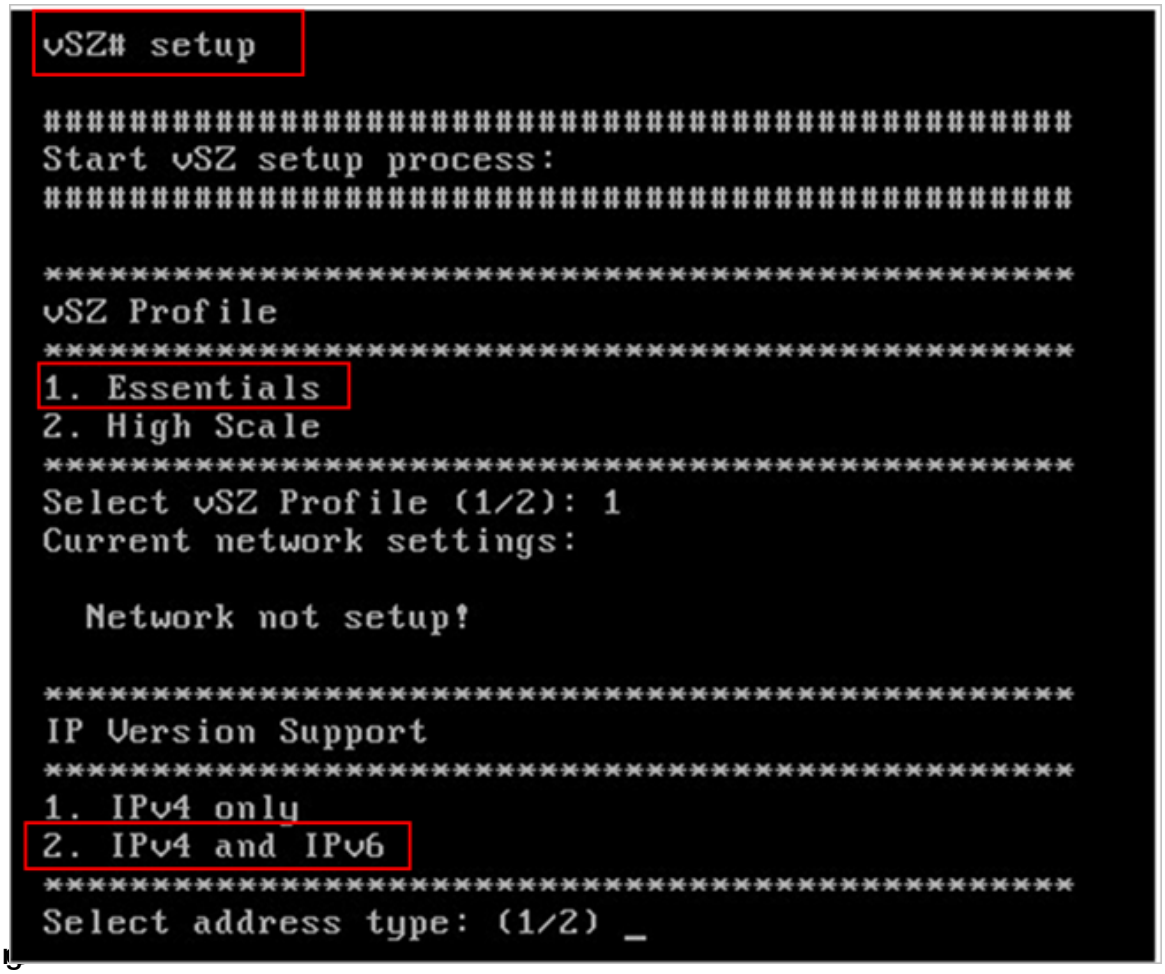
Step 4: Configure Dual Mode IP Address Settings Using CLI

The following are the steps to configure the dual setup using CLI. This is an alternative method of configuring IPv4 and IPv6 manually if the DHCP server is not available on the network.

1. Using CLI execute the setup command: `vSZ# setup`
2. In the vSZ Profile choose option 1 - Essentials.

3. In the IP version support choose option 2 - IPv4 and IPv6

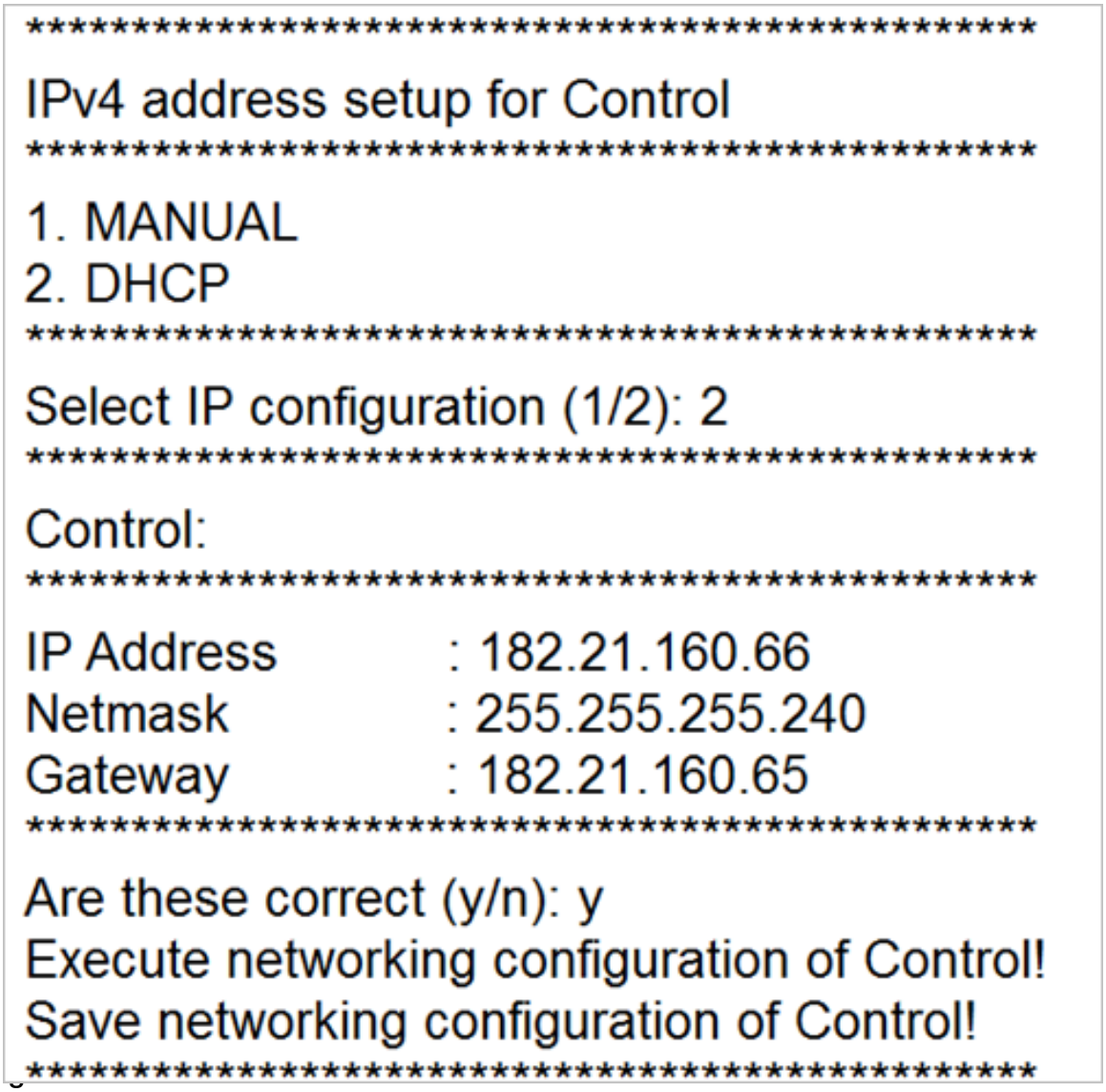
Figure 152: Select dual mode IP



4. Configure the IPv4 address settings that you want to assign to the AP/DataPlane interface, through which client traffic and configuration data are sent and received.
   a) Enter the setup for **Control** (see Figure 117) as either:
      1. Manual
      2. DHCP
   b) Enter the IP configuration as 2 (DHCP).
   c) Enter following network settings as required: IP address Netmask Default gateway

d) Save the networking configuration of **Control** settings.

Figure 153: IPv4 Control



e) Enter the setup for Cluster as either: **1. Manual 2. DHCP**
f) Enter the IP configuration as 1 (Manual)
g) Enter following network settings as required: **IP address**, **Netmask**, and **Default gateway**
h) Save the networking configuration of **Cluster** settings.

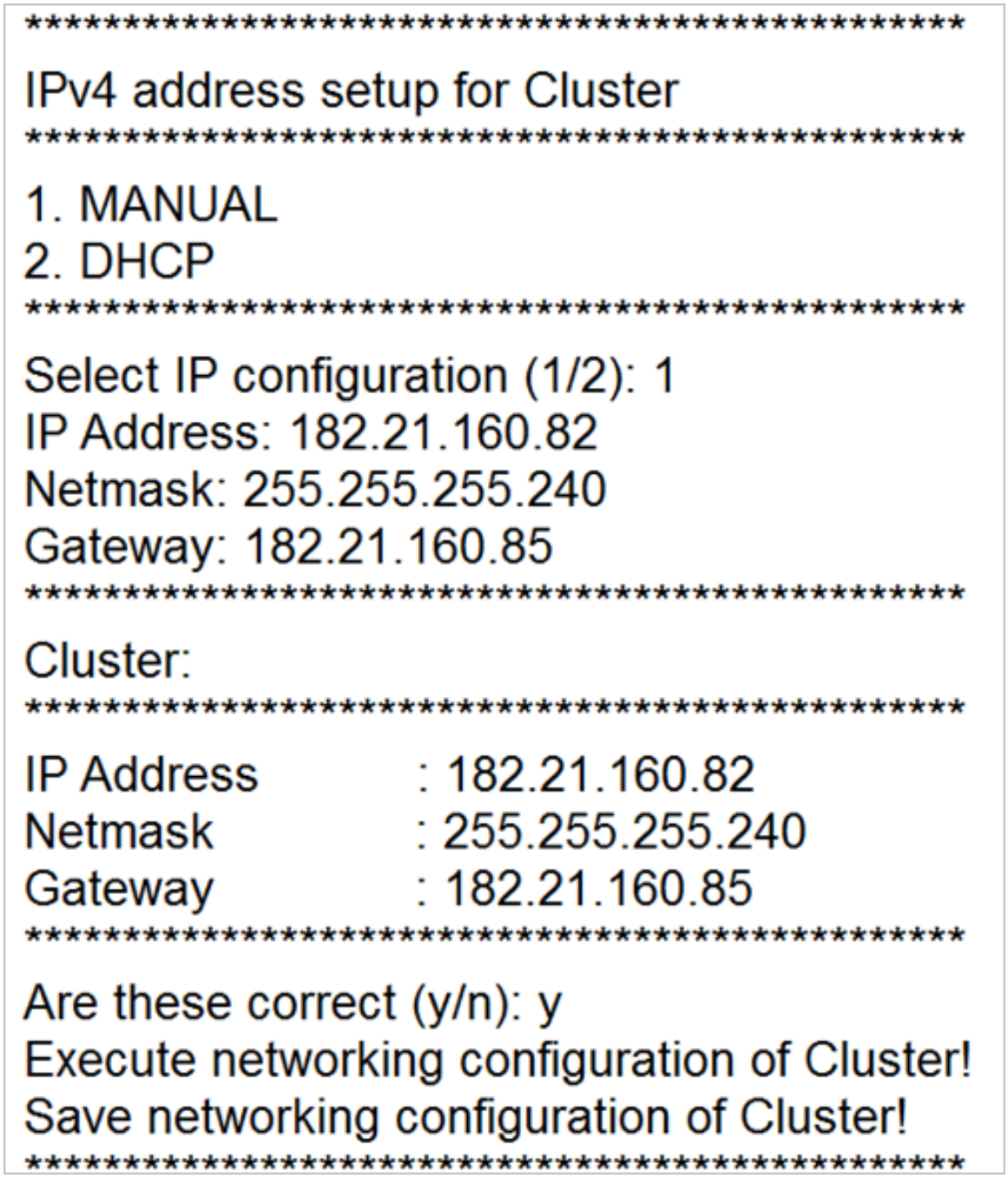


Figure 154: IPv4 Cluster Settings

i) Enter the setup for Management as either: **1. Manual 2. DHCP**
j) Enter the IP configuration as 2 (DHCP)
k) Enter following network settings as required: **IP address**, **Netmask**, and **Default gateway**
l) Save the networking configuration of **Management** settings

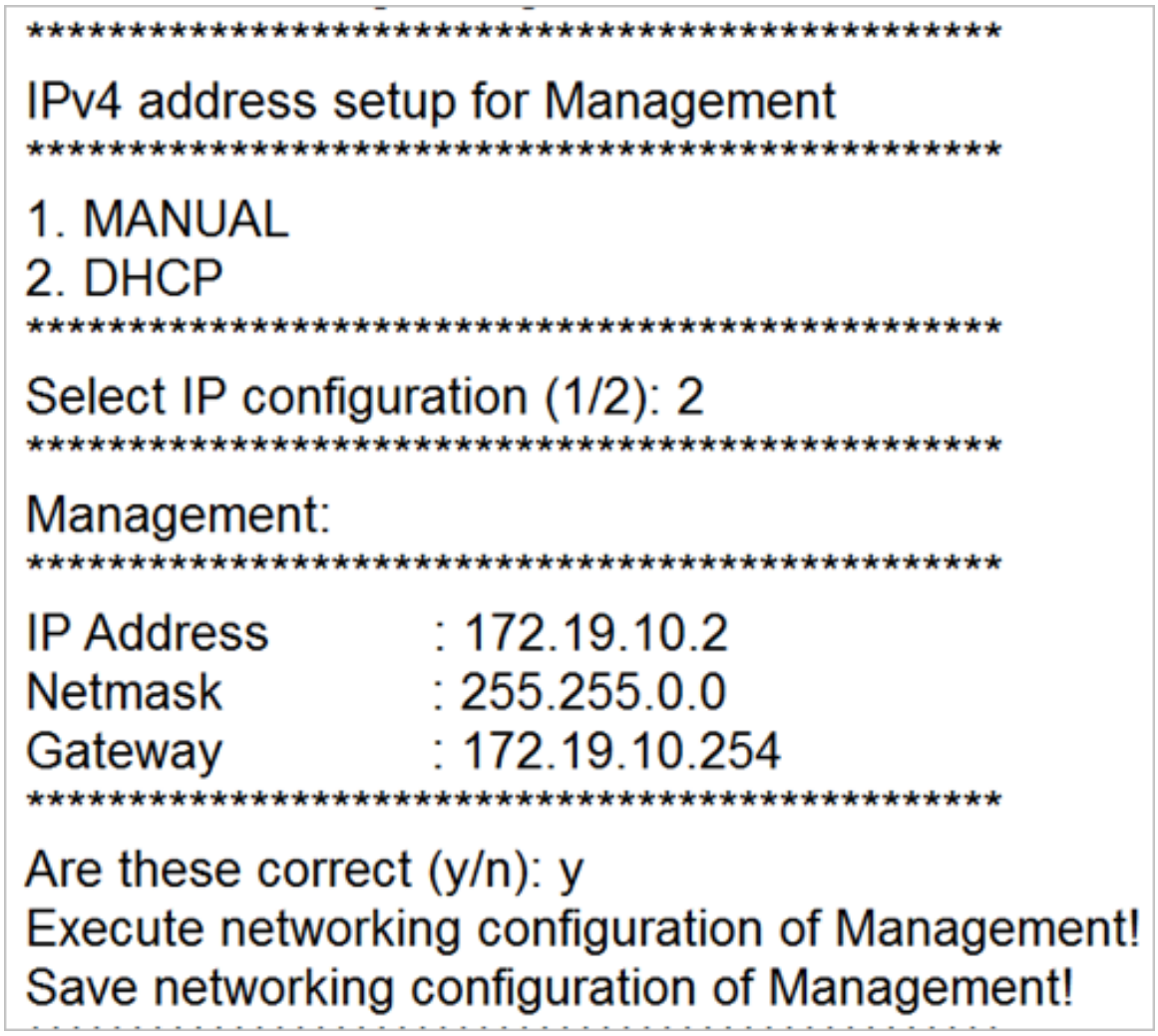


Figure 155: IPv4 Management Settings

The available gateway for Control, Cluster and Management will be displayed. You can select the system default gateway (see Figure 120).

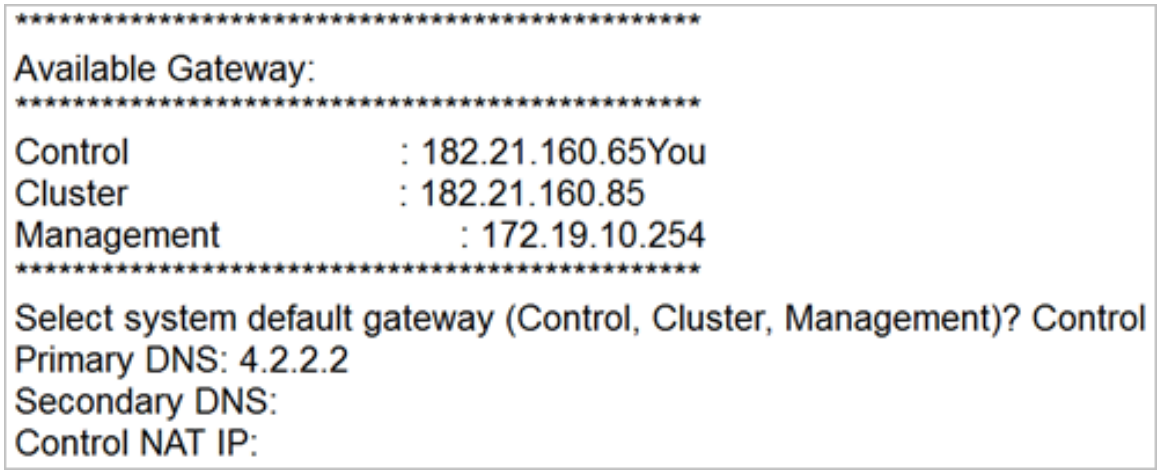


Figure 156: Default Gateway Settings

5. Add control NAT server IP address if the controller vSZ is behind the NAT server (see Figure 121)

```
Control NAT IP:
Network would be restarted. You could connect to vSZ back by using Management po
rt (10.20.110.8)!!
Enter "restart network" or press Enter to continue... restarrt network
```

Figure 157: NAT server IP address

6. Configure the IPv6 address settings that you want to assign to the AP/Data Plane interface, through which client traffic and configuration data are sent and received.

   IPv6 does not support cluster interface setting.

   a) Enter the setup for Control as either: **1. Manual 2. Auto Configuration**
   b) Enter the IP configuration as `1` (Manual).
   c) Enter following network settings as required: **IP address Default gateway**
   d) Save the networking configuration of **Control** settings.

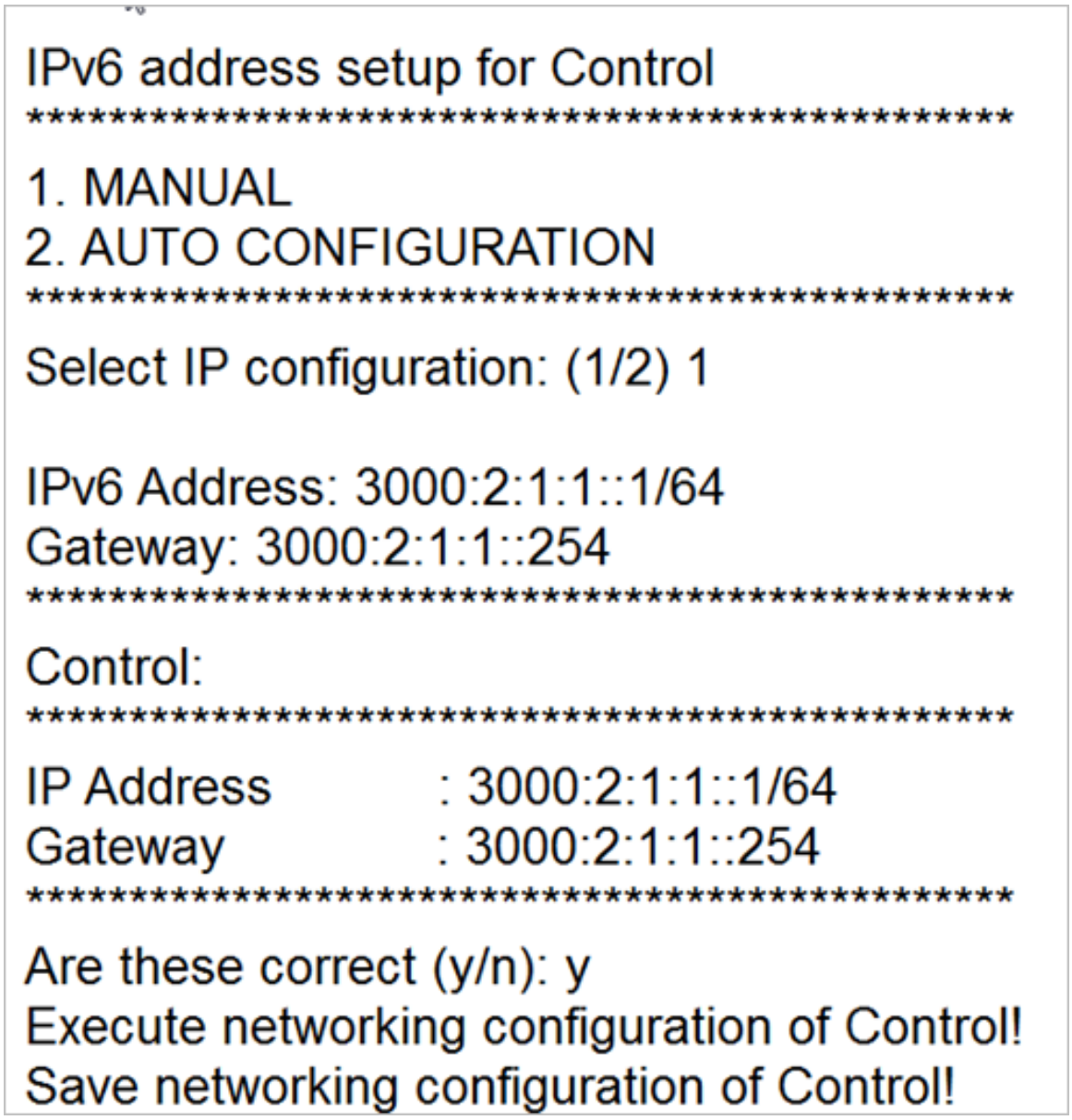


Figure 158: IPv6 Control Settings

e) Enter the setup for Management (see Figure 123) as either: 1. Manual2. Auto Configuration
f) Enter the IP configuration as `1` (Manual)
g) Enter following network settings as required: IP addressDefault gateway
h) Save the networking configuration of **Management** settings.

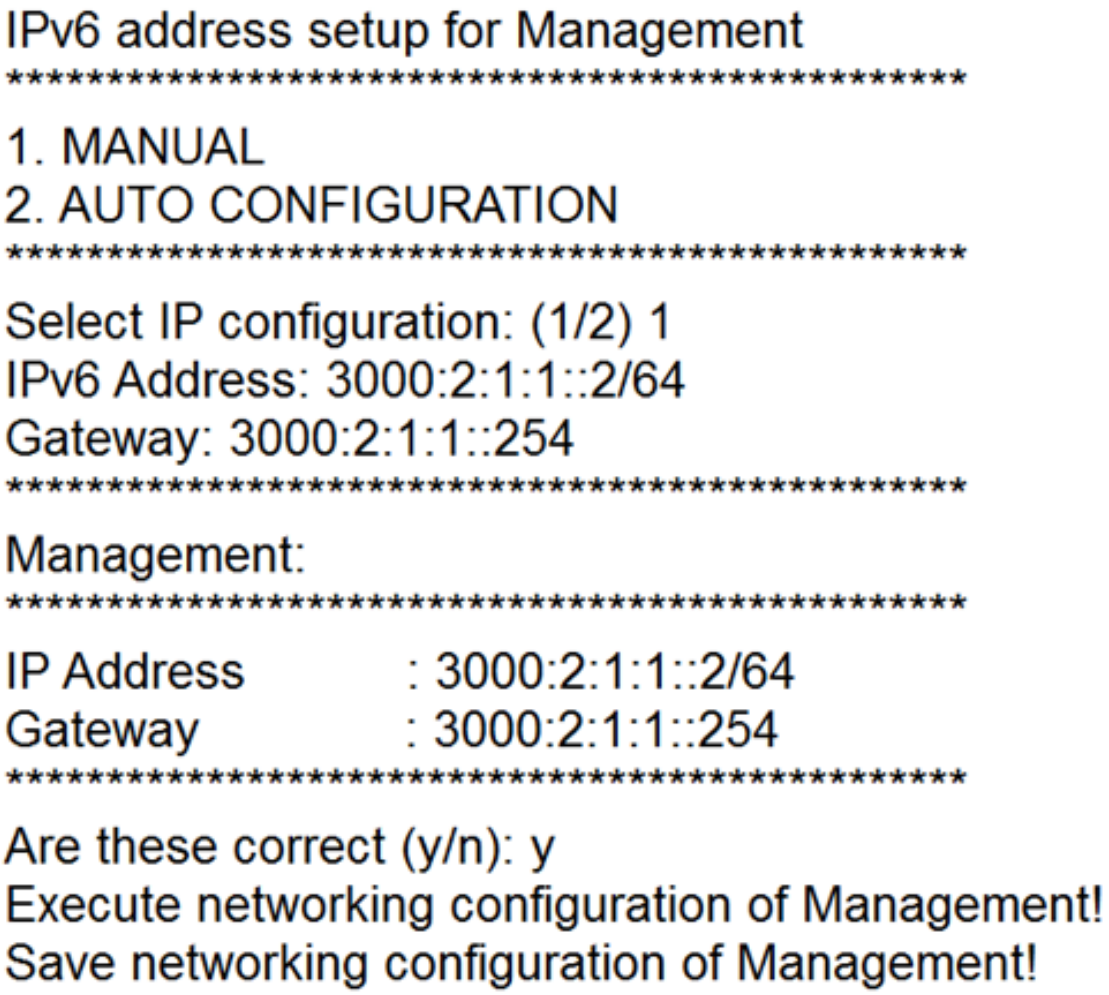


Figure 159: IPv6 Management Settings

The available gateway for Control and Management will be displayed. You can select the system default gateway.

Figure 160: Default Gateway Settings

7. Restart the network.
8. On navigating back to the controller web interface, Control Plane network settings displays the IPv4 and IPv6 settings.

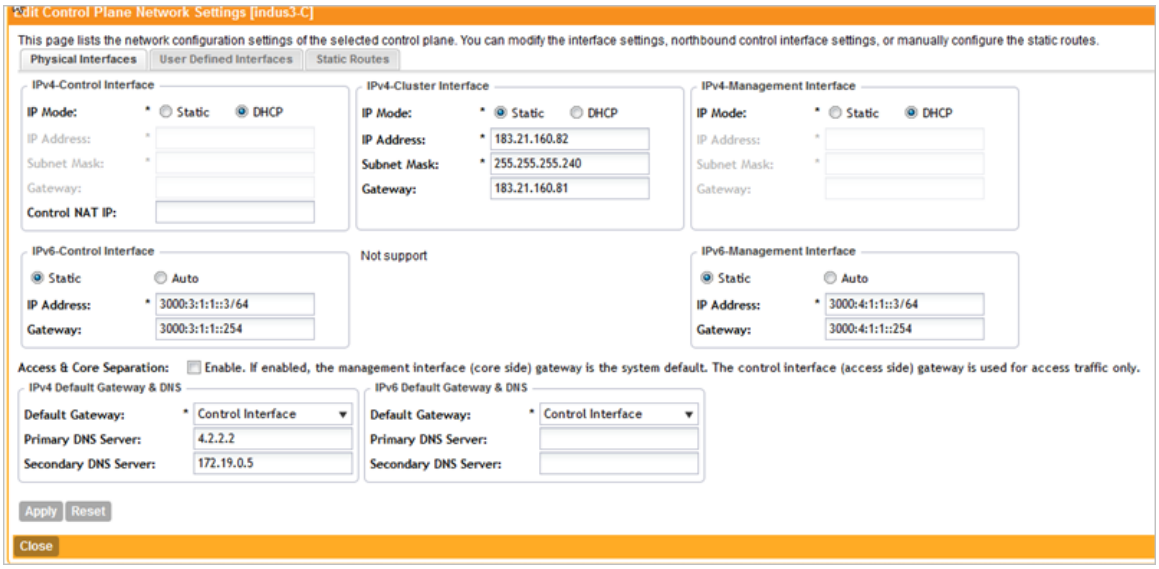


Figure 161: Control Plane Network Settings

9. Continue to Step 5: Configure the Cluster Settings

Step 5: Configure the Cluster Settings

The next step is to configure the vSZ cluster settings. The actions that you need to perform in this step depend on whether you are creating a new cluster (with this vSZ as the first node) or you are setting up this vSZ to join an existing cluster.

- If This vSZ Is Forming a New Cluster
- If This vSZ Is Joining an Existing Cluster

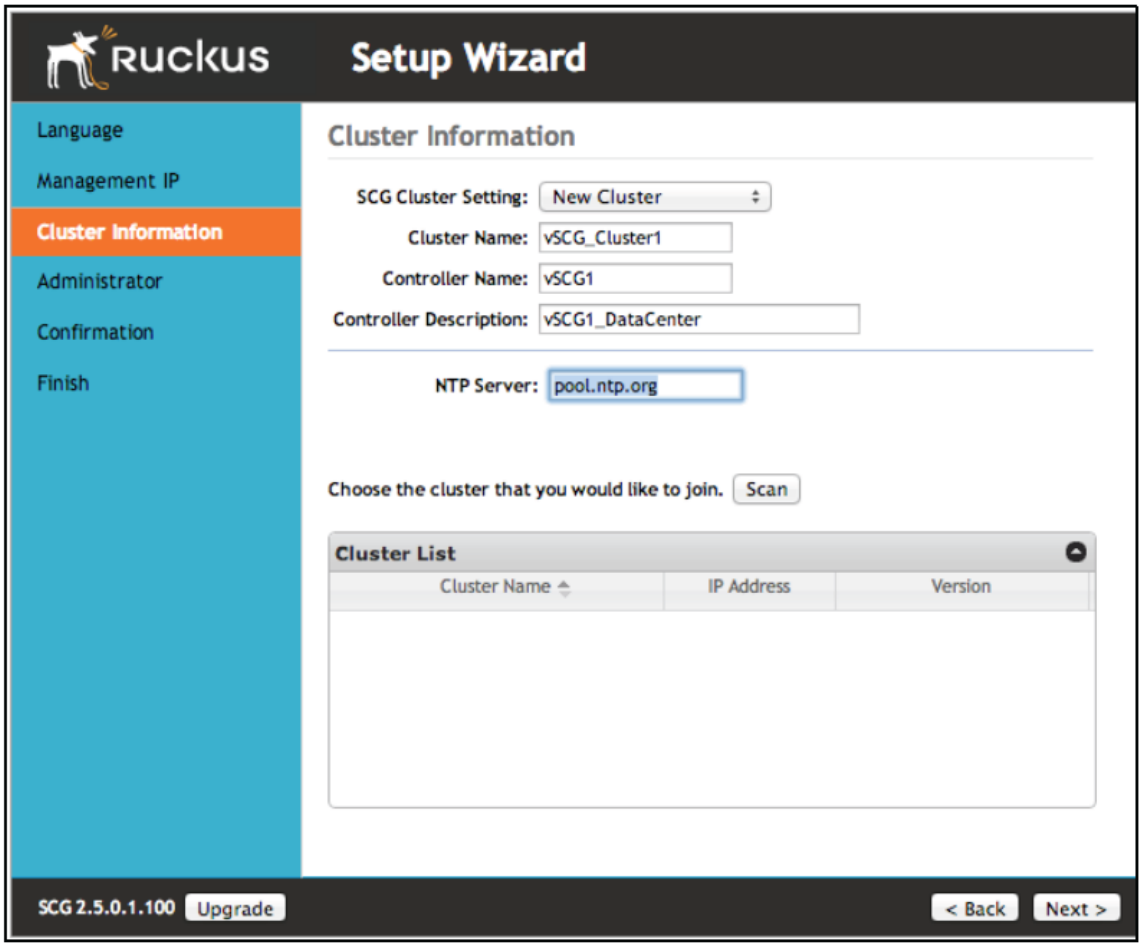


Figure 162: The Cluster Information page, showing the New Cluster option

If This vSZ Is Forming a New Cluster

Follow these steps if you want to use this vSZ to create a new cluster.

1. a) On the **Cluster Information** page, configure the following settings:
   b) In **vSZ Cluster Setting**, select **New Cluster**.

   The **Cluster Name** and **Controller Name** boxes only accept alphanumeric characters, hyphens (-), and underscores (_). They do not accept the space character or other special characters (for example, $, *, #, !)

   c) In **Controller Name**, type a name for the vSZ controller in this new cluster.
   d) In **Controller Description**, type a description for the vSZ controller.
   e) In **NTP Server**, type the address of the NTP server from which members of the cluster will obtain and synchronize time. The default NTP server is `pool.ntp.org`
2. Click **Next** to continue to the **Administrator** page (see Step 6: Set the Administrator Password).

If This vSZ Is Joining an Existing Cluster

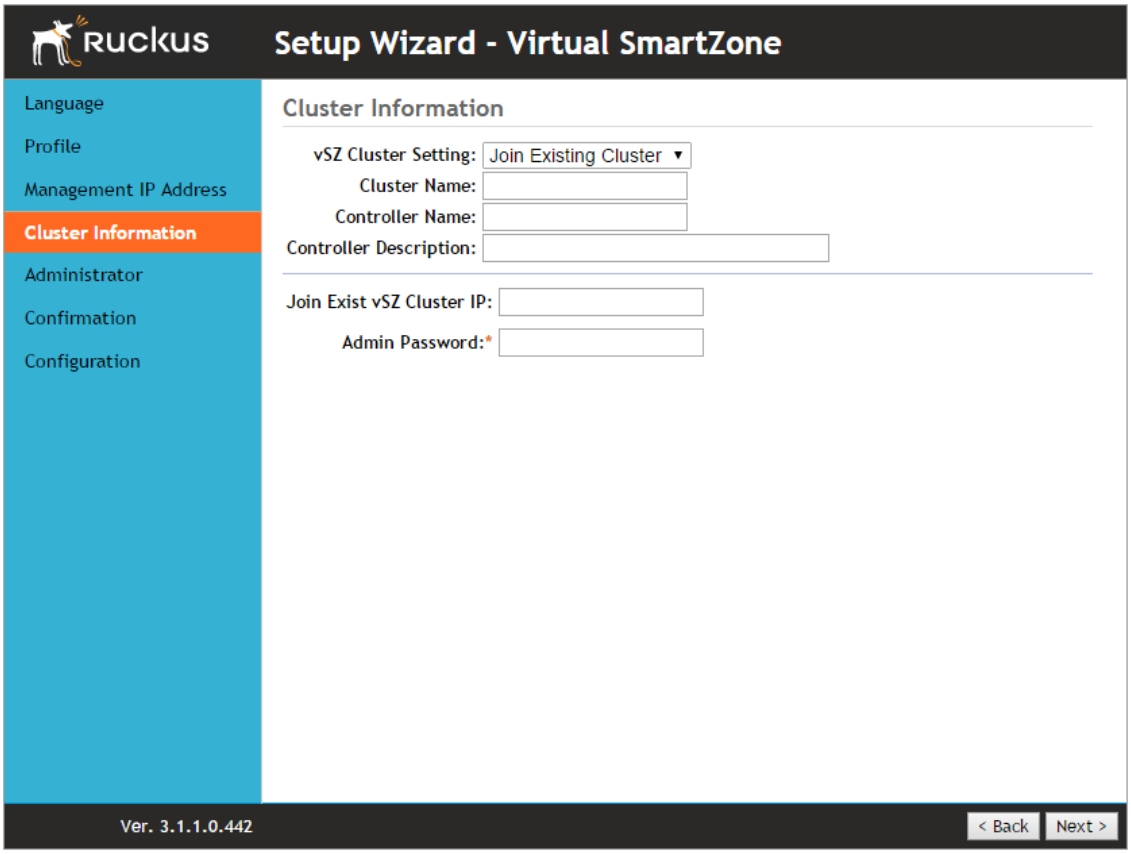
If this is not the first vSZ cluster on the network, you can set up this vSZ virtual appliance to join an existing cluster. Follow these steps to configure this to join an existing cluster.

A vSZ cluster supports a maximum of four nodes. If you are building a vSZ-E cluster with more than two nodes, two (2) additional cores must be added to each node to support the added search and replication capabilities.

1. In **vSZ Cluster Setting**, select **Join Existing Cluster**.
2. In **Cluster Name**, type the name of the cluster that this vSZ is joining.

   The **Cluster Name** and **Controller Name** boxes only accept alphanumeric characters, hyphens (-), and underscores (_). They do not accept the space character or other special characters (for example, $, *, #, !).
3. In **Controller Name (optional)**, type a name that you want to assign to this new controller.
4. In **Controller Description**, type a description for this new controller.
5. In **Join Exist vSZ Cluster IP**, type the IP address of the leader in the existing cluster.
6. In **Admin Password**, type the administrator password to the web interface of the leader node.
7. Click Next to continue to the **Administrator** page. See Step 6: Set the Administrator Password.

Figure 163: The Cluster Information page, showing the Join Existing Cluster



If the firmware version on this vSZ (shown in the lower left area of the Cluster Information page) does not match the firmware version of the cluster, a message appears and prompts you to upgrade the vSZ firmware. Click **Upgrade**, and then follow the prompts to perform the upgrade.

Step 6: Set the Administrator Password

1. On the **Administrator** page, configure the web interface and CLI passwords. All fields are required. `Admin Password` Type a password that you want to use to access the web interface. `Confirm Password` Retype the password above to confirm. `Enable Password` Type a password that you want to use to enable CLI access to the vSZ. `Confirmation Password` Retype the password above to confirm.

   The web interface and CLI passwords must be at least eight (8) characters and must include one number, one letter, and one special character (for example, $, *, #, !).

2. Click **Next** to continue. The **Confirmation** page appears and displays all the vSZ settings that you have configured using the Setup Wizard.

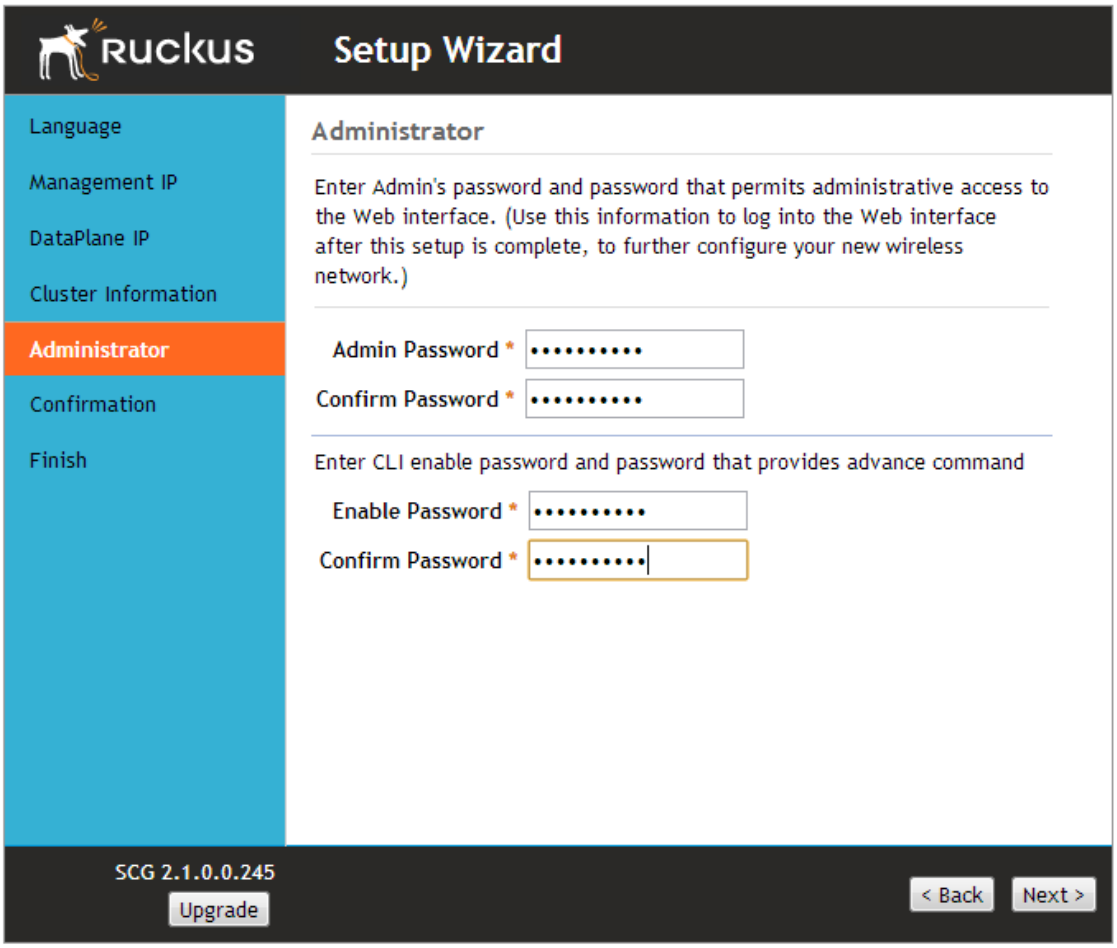


Figure 164: Set the web interface and CLI passwords

Step 7: Changing the Administrator Password

You can change the administrator password either using the web interface or using the CLI mode.

To change the password using the web interface follow the below steps:

1. Login as the administrator.
2. Navigate to **My Account**.
3. Click on **Change Password** to change the password.
4. Save the changes.

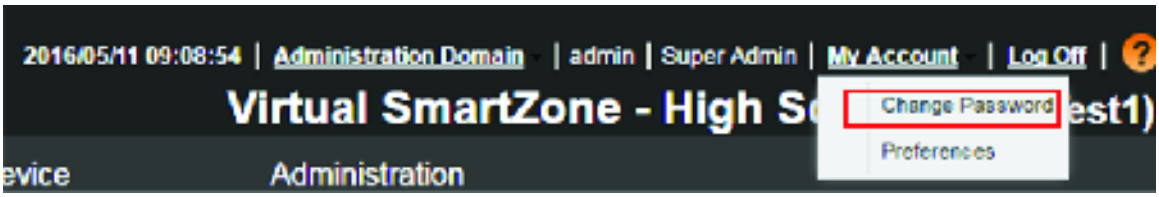


Figure 165: Changing the password using the web interface

To change the password using CLI mode:

Follow the below steps:

1. Login to CLI and change the prompt to enable mode.
2. Execute the following commands to change the password.

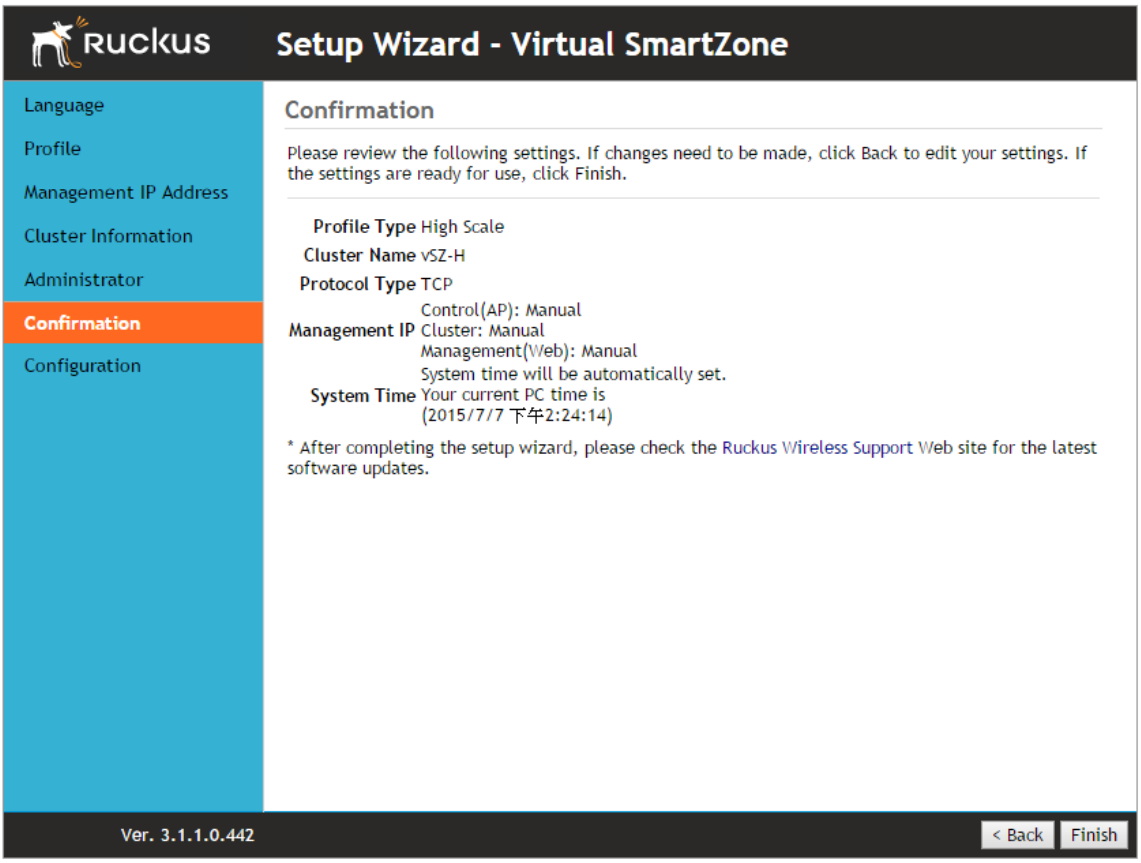
```
config
lab-controller# enable
Old Password: *********
New Password: ********
Retype: ********
```

3. Execute the following command to change the web interface password.

```
config
lab-controller# changepassword
```

Step 8: Verify the Settings

1. Verify that all the settings displayed on the **Confirmation** page are correct.
2. If they are all correct, click **Finish** to apply the settings and activate the vSZ on the network.



NOTE: If you find an incorrect setting, click the Back button until you reach the related page, and then edit the settings. When you finish editing the settings, click the Next button until you reach the Confirmation page again.

Figure 166: The Confirmation page

A progress bar appears and displays the progress of applying the settings, starting the vSZ services, and activating the vSZ on the network.

When the process is complete, the progress bar shows the message 100% Done. The page also shows the IP address through which you can access the vSZ web interface to manage the appliance.

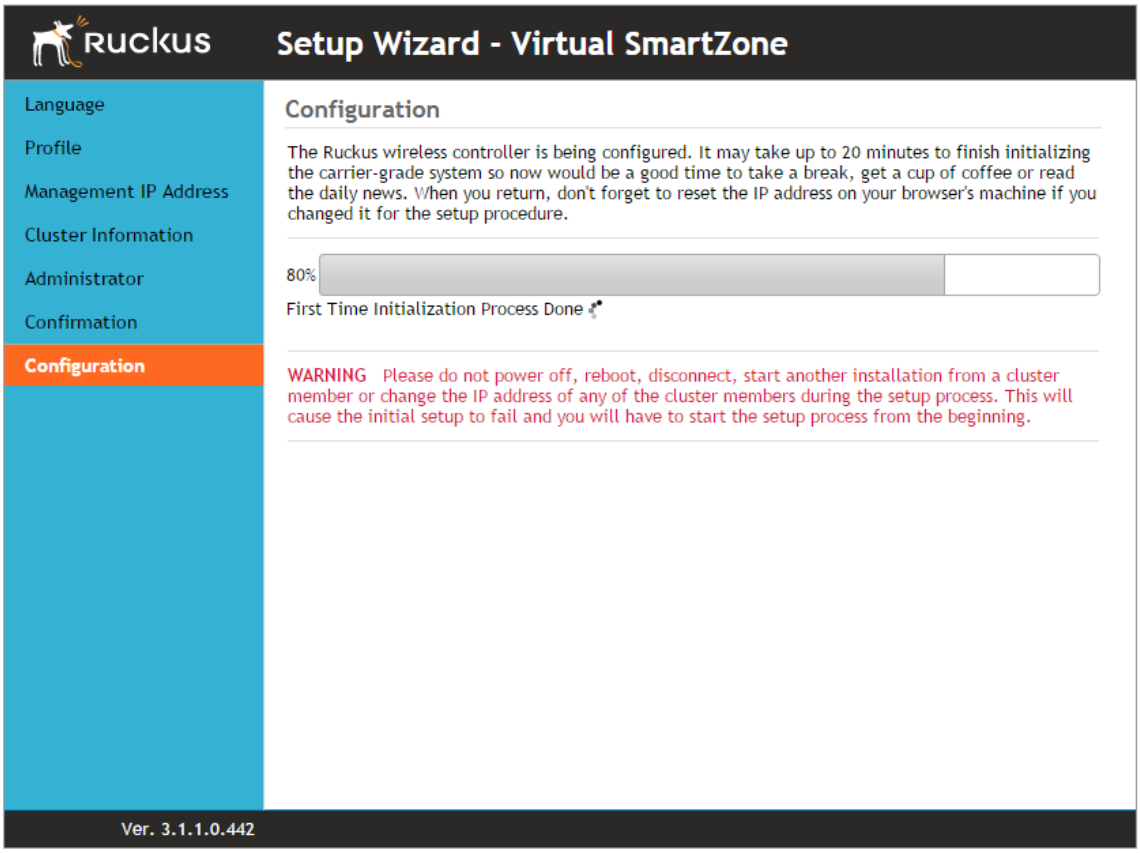


Figure 167: Setup is complete when the progress bar shows "100% Done"

Congratulations! You have completed the Setup Wizard. You are now ready to log on to the web interface. Go to `https://{management-IP-adddress}:8443`, and then log on with the user name and password that you assigned to the web interface.

Logging On to the Web Interface

You can access the web interface from any computer that is on the same subnet as the management (web) interface. Follow these steps to log on to the vSZ web interface.

1. On a computer that is on the same subnet as the Management (Web) interface, start a web browser.
2. In the address bar, enter the IP address that you assigned to the Management (Web) interface and append a colon and 8443 (vSZ management port number) at the end of the address. The vSZ web interface logon page appears.
   If the IP address that you assigned to the Management (Web) interface is 10.10.101.1, then you should enter: https://10.10.101.1:8443.

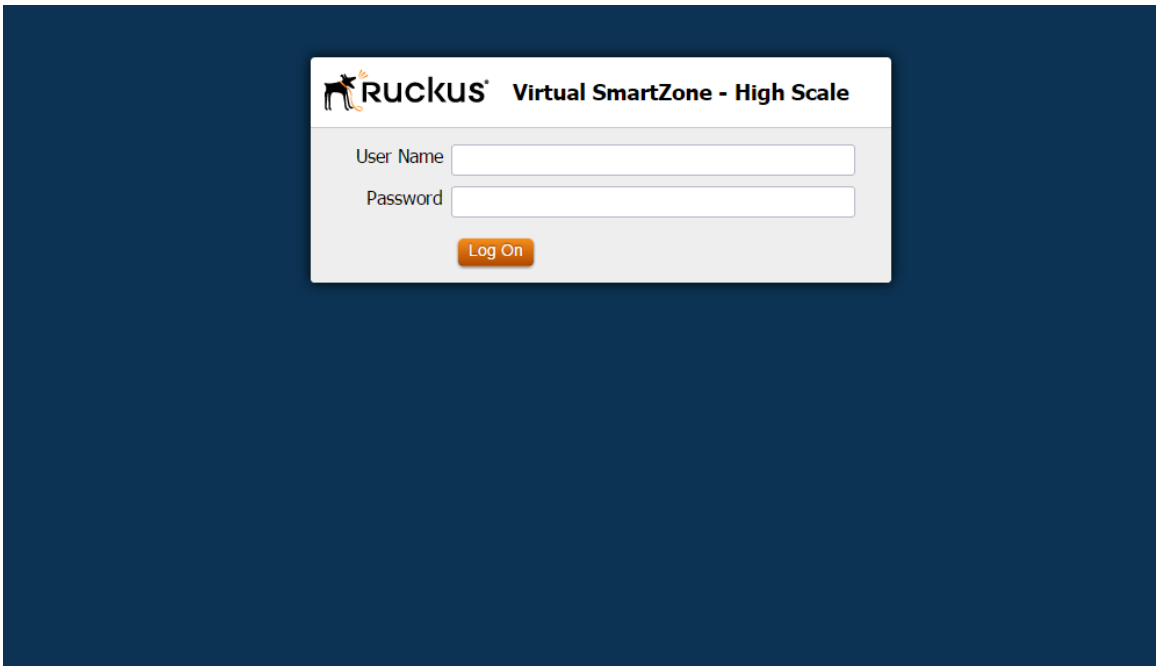


Figure 168: vSZ web interface logon page

3. Log on to the vSZ web interface using the following logon details: `admin` Password: `{the password that you set when you ran the vSZ Setup Wizard}`
4. Click **Log On**. The web interface refreshes, and then displays the vSZ dashboard page, which indicates that you have logged on successfully.

You are now ready to configure the vSZ.

Configuring the vSZ High Scale for the First Time 9

In this chapter:

- Creating an AP Zone
- Configuring AAA Servers and Hotspot Settings
- Creating a Registration Rule
- Defining the WLAN Settings of an AP Zone
- Configuring DHCP Option 43
- Verifying That Wireless Clients Can Associate with a Managed AP
- What to Do Next

This chapter describes the initial configuration tasks that Ruckus Wireless recommends you perform for the vSZ High-Scale. The initial configuration of the vSZ Essentials is more straightforward and, therefore, is not described here. For information on configuring the vSZ Essentials, refer to the vSZ Essentials Administrator Guide.

Creating an AP Zone

The first step in configuring the vSZs to create an AP zone. An AP zone functions as a way of grouping APs and applying a particular set of settings (including WLANs and their settings) to these groups of APs. Each AP zone can include up to six WLAN services.

NOTE: Any AP that registers with the vSZ that is not assigned a specific zone is automatically assigned to the **Staging Zone**. A zone called **Staging Zone** exists by default.

Follow these steps to create a new AP zone:

1. Click **Configuration** > **AP Zones**.
2. Click **Create New**.

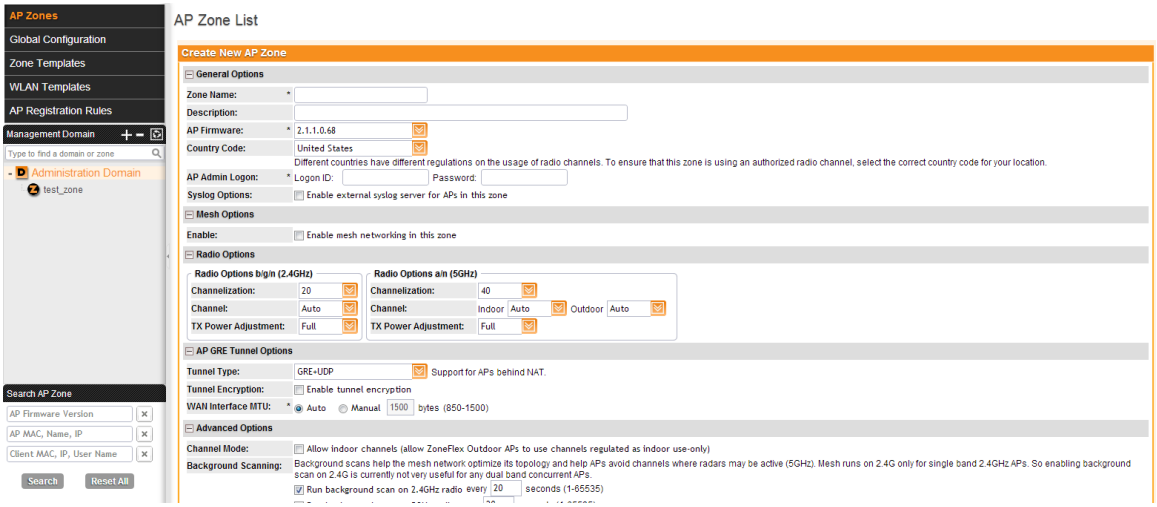


Figure 169: Creating a new AP zone

3. Configure the options listed in the Table.

Option	Description
Option	Description
Zone Name	Type a name that you want to assign to this new zone.
Description	Type a description for this new zone.
AP Firmware	Displays the latest AP firmware available on the vSZ. If you want this zone to use a different firmware, click Change, and then select a firmware from the list.
Country Code	Different countries and regions maintain different rules that govern which channels can be used for wireless communications. Set the country code to the proper regulatory region ensures that your vSZ network does not violate local and national regulatory restrictions.
AP Admin Logon	Specify the user name and password that administrators can use to log on directly to the managed access point's native web interface. The following boxes are provided: Logon ID: Type the admin user name. Password: Type the admin password.
Syslog Options	If you have a syslog server on the network and you want the vSZ to send syslog data to it, select the Enable external syslog server for APs in this zone check box. The following boxes are provided: IP Address: Type the IP address of the syslog server. Port: Type the port number that has been opened on the server for syslog data. The default port number is 514.
`Mesh Options`	
Enable	Select the Enable mesh networking in this zone check box if you want managed devices that belong to this zone to be able to form a mesh network automatically.
`Radio Options`	

Option	Description
Radio Options b/g/n (2.4GHz)	Configure the following 2.4GHz radio options: ChannelizationSelect either 20MHz or 40MHz channel width. Channel Select Auto or manually assign a channel for the 2.4GHz radio. TX Power Adjustment: Manually set the transmit power on all 2.4GHz radios (default is Full).
Radio Options a/n (5GHz)	Configure the following 5GHZ radio options: ChannelizationSelect either 20MHz or 40MHz channel width. Channel (Indoor and Outdoor) Select Auto or manually assign channels to the indoor and outdoor 5GHz radios. TX Power Adjustment Manually set the transmit power on all 5GHz radios (default is Full).
`AP GRE Tunnel Options`	
Tunnel Type	Select a protocol to use for tunneling WLAN traffic back to the vSZ. Options include Ruckus GRE and SoftGRE.
Tunnel Profile	Select the tunnel profile that you want to use. If you want to use Ruckus GRE tunneling for this AP zone, you can use the default tunnel profile or you can select a profile that you created. If you want to use Soft GRE tunneling, you must first create a Soft GRE tunnel profile. NOTE: Instructions for creating Ruckus GRE and Soft GRE tunnel profiles are provided in the Administrator Guide for this release.
`Advanced Options`	
Channel Mode	If you want to allow outdoor APs that belong to this zone to use wireless channels that are regulated as indoor use only, select the Allow indoor channels check box.
Background Scanning	If you want APs to automatically evaluate radio channel usage, enable and configure the background scanning settings on both the 2.4GHz and 5GHz radios. By default, background scanning is enabled on both radios and set to run every 20 seconds.
Client Load Balancing	Improve WLAN performance by enabling load balancing. Load balancing spreads the wireless client load between nearby access points, so that one AP does not get overloaded while another site idles. Load balancing must be enabled on a per-radio basis. To enable load balancing, select the Enable load balancing on [2.4GHz or 5GHz] check box, and then set or accept the default Adjacent Radio Threshold (50dB for the 2.4GHz radio and 43dB for the 5GHz radio).
Smart Monitor	To disable the WLANs of an AP (that belongs to this zone) whenever the AP uplink or Internet connection becomes unavailable, select the Enable check box. And then, configure the following options: Health Check Interval Set the interval (between 5 and 60 seconds) at which the vSZ will check the AP's uplink connection. The default value is 10 seconds. Health Check Retry Threshold Set the number of times (between 1 and 10 times) that the vSZ will check the AP's uplink connection. If the vSZ is unable to detect the uplink after the configured

Option	Description
	number of retries, the vSZ will disable the AP's WLANs. The default value is 3 retries. **NOTE:** When the vSZ disables the AP's WLANs, the AP creates a log for the event. When the AP's uplink is restored, the AP sends the event log (which contains the timestamp when the WLANs were disabled, and then enabled) to the vSZ.

4. Click **Create New** to finish creating your first AP Zone. When the vSZ completes creating the AP zone, the following confirmation message appears: `AP zone created successfully. Do you want to view the zone information?`
5. Click **Yes** to view the zone details, or click **No** to close the confirmation message and return to the zone list.

You have completed creating your first AP zone. You can create additional AP zones, if needed.

Configuring AAA Servers and Hotspot Settings

If you have an existing RADIUS (AAA) server on the network, you can set up hotspot services across the network using the Ruckus Wireless access points that the vSZ is managing. To provide hotspot services, you need to add at least one AAA server to the vSZ and create a hotspot service. AAA servers and hotspot settings must be configured on a per-AP zone basis.

If you do not have an AAA server on the network, skip this step.

Adding an AAA Server

Follow these steps to add an AAA server to an AP zone.

1. Go to **Configuration** > **AP Zones**.
2. Click the AP zone for which you want to add an AAA server. Alternatively, click the AP zone from the Management Domains tree.
3. Under the **AP Zones** menu on the sidebar, click **AAA**.
4. Click **Create New**. The **Create New RADIUS Server** form appears.
5. In the **General Options** section, configure the following settings: Name Type a name for the AAA server that you are adding. Description Type a description for the AAA server that you are adding. Type Click either RADIUS or RADIUS AccountingRADIUS server that you are using. Backup RADIUS If a backup RADIUS server exists on the network, you may enable RADIUS backup support by selecting the Enable backup RADIUS support check box.
6. Configure the options in the Health Check Policy section. These options define the health monitoring settings of the primary RADIUS server by the secondary RADIUS server. The secondary RADIUS is responsible for monitoring the health of the primary RADIUS and for periodically synchronizing its settings to match those of the primary RADIUS.
   - **Response Window** Set the time (in seconds) during which the secondary RADIUS must wait for a response from the primary RADIUS. If the secondary RADIUS does not receive

a response during the defined Response Window, the Zombie Period (see below) is started for the primary RADIUS. The default Response Window is 20 seconds.

- **Zombie Period** Set the time (in seconds) during which the secondary RADIUS must wait for a response from the primary RADIUS before marking it as “down”. If the secondary RADIUS does not receive a response during the defined Zombie Period, the Revive Interval (see below) is started for the primary server. The default Zombie Period is 40 seconds. If the primary RADIUS still does not respond when the Zombie Period expires, it will be marked as down and the secondary RADIUS will start receiving new requests from the Network Access Server (NAS).
- **Revive Interval** Set the time (in seconds) during which the secondary RADIUS must wait for the primary RADIUS to start responding to requests again. If the primary RADIUS starts responding before the Revive Interval expires, new requests will be forwarded to the primary RADIUS again. The default Revive Interval is 120 seconds.
- **No Response Fail**
  - Click **Yes** to respond with a reject message to the NAS if no response is received from the RADIUS server.
  - Click **No** to skip sending a response.

7. In the **Primary Server** section, configure the following settings: IP Address Type the IP address of the AAA server. Port Type the AAA port number. The default AAA port number is 1812. Shared Secret Type the AAA shared secret Confirm Secret Retype the AAA shared secret that you typed above.
8. If you selected the **Enable backup RADIUS support** check box, the **Secondary Server** section is visible. Configure the following Secondary Server settings:
   - **IP Address** Type the IP address of the secondary AAA server
   - **Port** Type the AAA port number. The default AAA port number is 1812
   - **Shared Secret** Type the AAA shared secret
   - **Confirm Secret** Retype the AAA shared secret that you typed above
9. Click **Create New**. The following message appears to confirm that you have successfully added the AAA server to the vSZ: `Authentication server created successfully.` The page refreshes, and then the AAA server that you created appears under the AAA Servers Configuration section.

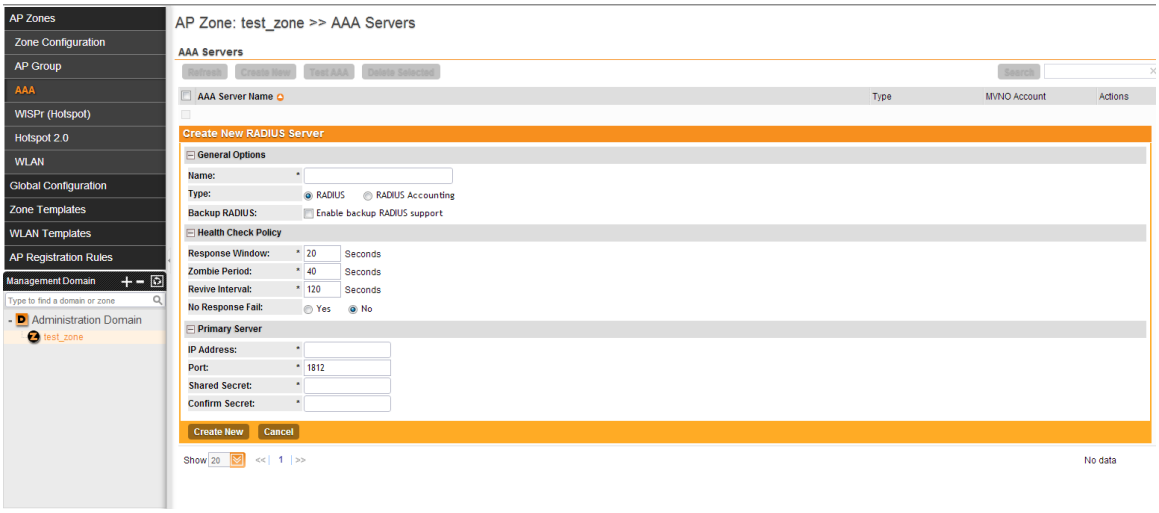


Figure 170: The Create New RADIUS Server form

Creating a Hotspot Service

A hotspot service requires an AAA server. Before creating a hotspot service, make sure you have already added an AAA server to the vSZ. For more information, refer to Adding an AAA Server.

Before creating a hotspot, you need to create a user defined interface. For Administrator Guide for release 2.5. If you do not want to provide a hotspot service to users, skip this step. Follow these steps to create a hotspot service for an AP zone.

1. Go to **Configuration** > **AP Zones** .
2. Click the AP zone for which you want to create a hotspot service. Alternatively, click the AP zone from the **Management Domains** tree.
3. Under the **AP Zones** menu on the sidebar, click **WISPr (Hotspot)**.
4. Click **Create New**. The **Create New Hotspot Service** form appears.
5. Configure the hotspot service settings listed in the Table.

Setting	Description
`General Options`	
Name	Type a name for this new hotspot service that you are creating.
Description	Type a description for this new hotspot service. Example: Main Office Lobby.
Type	Click **Registered Users** if you want only users with existing profiles on the vSZ to be able to connect to this hotspot. Click Guest-Access if you want guest users to be able to connect to this hotspot.
`Redirection`	
Smart Client Support	• **None**: Click to disable Smart Client support.

Setting	Description
	• **Enable**: Click to enable Smart Client support. • **Only Smart Client allowed**: Click to allow only Smart Clients to access this hotspot service.
Logon URL	Type the URL of the subscriber portal (the page where hotspot users can log in to access the service). For more information, see the section "Configuring the Logon URL" in the *Administrator Guide for release 2.5*.
Start Page	Set where users will be redirected after logging in successfully. You could redirect them to the page that they want to visit, or you could set a different page where users will be redirected (for example, your company website).
`User Session`	
Session Timeout	Set a time limit after which users will be disconnected from the hotspot service and required to log on again. Allowed session timeout range is between 2 and 14400 minutes. The default value is 1440 minutes.
Grace Period	Allow disconnected users a grace period after disconnection, during which clients will not need to re-authenticate. Allowed grace period range is between 1 and 14399 minutes. The default value is 60 minutes.
`Location Information`	
Location ID	Type a location ID for the hotspot, for example: **isocc=us,cc=1,ac=408,network=ACMEWISP_NewarkAirport**
Location Name	Type a location name for the hotspot, for example: **ACMEWISP,Gate_14_Terminal_C_of_Newark_Airport**
Walled Garden	Click **Create New** to add a walled garden, which is a limited environment to which an unauthenticated user is given access for the purpose of setting up an account. In the box provided, type a URL or IP address to which you want to grant unauthenticated user access. You can add up to 128 network destinations to the walled garden. Network destinations can be any of the following: • IP address (for example, `10.11.12.13`) • Exact website address (for example, http://www.ruckuswireless.com) • Website address with regular expression (for example, `*.ruckuswireless.com, *.com, *`)

Setting	Description
	After the account is established, the user is allowed out of the walled garden. URLs will be resolved to IP addresses. Users will not be able to click through to other URLs that may be presented on a page if that page is hosted on a server with a different IP address. Avoid using common URLs that are translated into many IP addresses (such as http://www.yahoo.com), as users may be redirected to re-authenticate when they navigate through the page.

6. Click **Create New**. The page refreshes, and then the hotspot that you created appears under the **WISPr (Hotspot) Configuration** section.

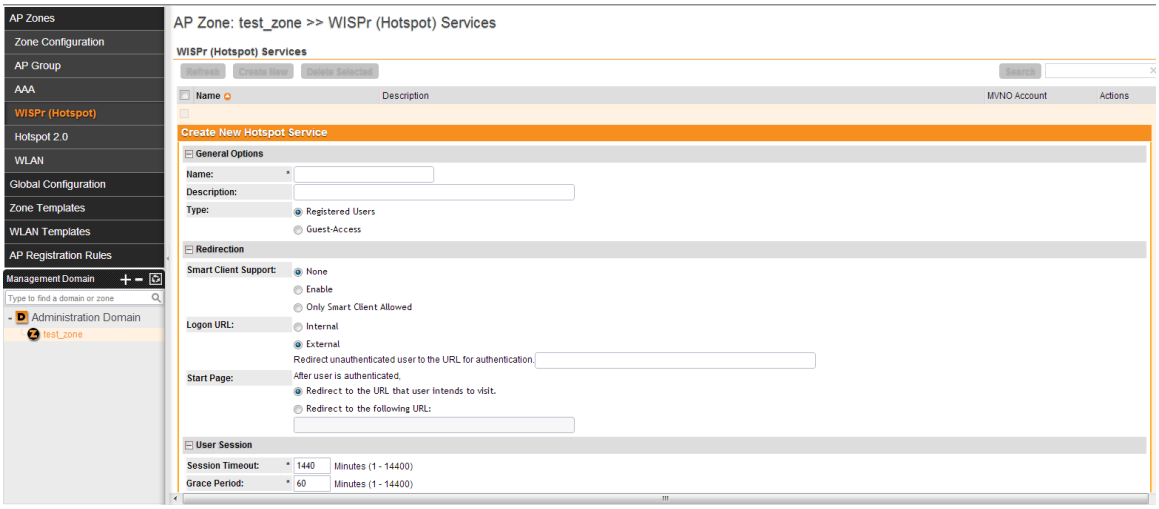


Figure 171: The Create New Hotspot Service form

Creating a Registration Rule

Registration rules enable the vSZ to assign an AP to an AP zone automatically based on the rule that the AP matches.

Follow these steps to create a registration rule.

1. Go to **Configuration** > **AP Zones**
2. On the sidebar on the left, click **AP Registration Rules**. The **AP Registration Rules** page appears.
3. Click **Create New**. A form appears.
4. In **Rule Description**, type a name that you want to assign to this rule.
5. In **Rule Type**, click the basis upon which you want to create the rule. Options include:
   - **IP Address** If you select this option, type the From (starting) and To (ending) IP address that you want to use.

- **Subnet Mask** If you select this option, type the IP address and subnet mask pair to use for matching
- **GPS Coordinates** If you select this option, type the GPS coordinates to use for matching. Access points that have been assigned the same GPS coordinates will be automatically assigned to the AP zone that you will choose in the next step.
- **Provision Tag** If the access points that are joining the vSZ have been configured with provision tags, click the Provision Tag option, and then type a tag name in the Provision Tag box. Access points with matching tags will be automatically assigned to the AP zone that you will choose in the next step.

Provision tags can be configured on a per-AP basis from the access point's command line interface.

6. In **Zone Name**, click the drop-down list to display available AP zones, and then click an AP zone to which APs that match this rule will be assigned
7. Click **OK**

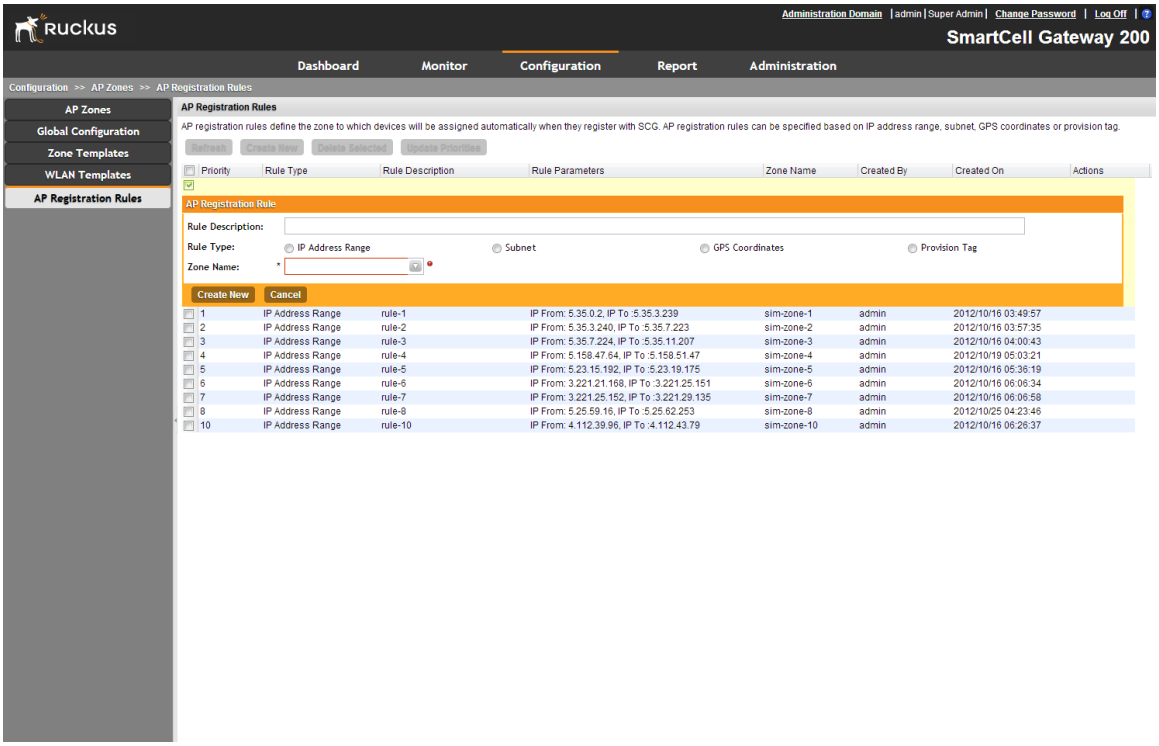


Figure 172: Creating an AP registration rule

You have completed creating an AP registration rule.

To create another registration rule, repeat the preceding steps. You can create as many registration rules as you need to manage access points on the network.

Configuring the Rule Priority

The vSZ applies registration rules in the same order as they appear in the AP Registration Rules table (highest to lowest priority). If you want a particular registration rule to have higher priority,

you must move it up the table. Once an AP matches a registration rule, the vSZ assigns the AP to the zone specified in the rule and stops processing the remaining rules.

Follow these steps to configure the rule priority.

1. Go to **Configuration** > **AP Zones**
2. On the sidebar on the left, click **AP Registration Rules**. The **AP Registration Rules** page appears and displays the rules that you have created.
3. Change the priority of each registration rule as required.

   To give a rule higher priority, move it up the table by clicking the (up-arrow) icon that is in the same row as the rule name

   To give a rule lower priority, move it down the table by clicking the (down-arrow) icon that is in the same row as the rule name.
4. When you finish configuring the rule priority, click **Update Priorities** to save your changes.

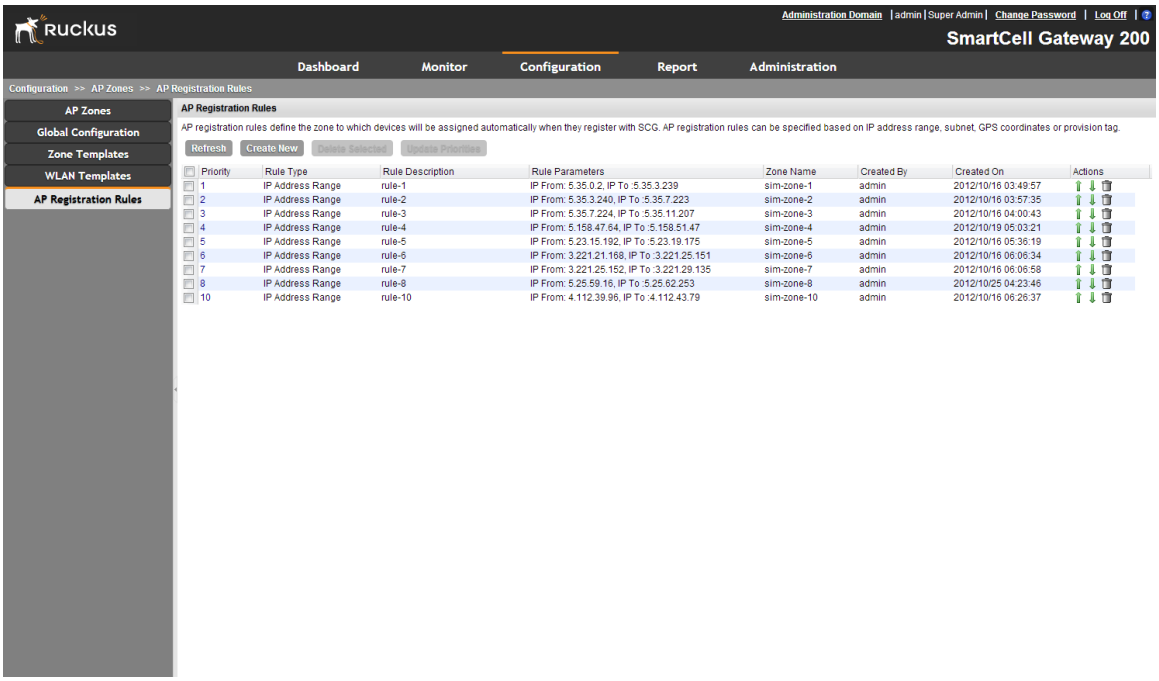


Figure 173: Change the rule priority by clicking the up-arrow or down-arrow

Defining the WLAN Settings of an AP Zone

Follow these steps to configure the WLAN settings of an AP zone.

1. Go to **Configuration** > **AP Zones**.
2. Click the AP zone for which you want to add the WLAN settings. Alternatively, click the AP zone from the **Management Domains** tree
3. Under the **AP Zones** menu on the sidebar, click **WLAN**.
4. Click Cr**Create New**. The **Create New WLAN Configuration** form appears.

5. Configure the WLAN settings listed in the Table. You can find a detailed description of each setting in the succeeding sections.

WLAN Setting	Description
General Options	Enter the WLAN name and description. See General Options.
WLAN Usage	Select the usage type (standard WLAN or hotspot). See WLAN Usage.
Authentication Options	Select an authentication method for this WLAN (open or 802.1X EAP). See Authentication Options.
Encryption Options	Select an encryption method (WPA, WPA2, WPA Mixed, and WEP), encryption algorithm (AES or TKIP) and enter a WPA passphrase/WEP key. See Encryption Options
Authentication & Accounting Service	This section only appears when certain authentication options are selected. See Authentication & Accounting Service.
Options	Select whether web-based authentication (captive portal) will be used, and which type of authentication server will be used to host credentials (local database, Active Directory, RADIUS, LDAP). Also, enable or disable Wireless Client Isolation, Zero-IT Activation, Dynamic PSK and Priority for this WLAN. See Options.
Advanced Options	Select an accounting server and configure ACLs, rate limiting, VLAN/dynamic VLAN settings, tunneling, background scanning, maximum client threshold, and service schedule. See Advanced Options.

6. Click **OK** to finish creating the WLAN service.

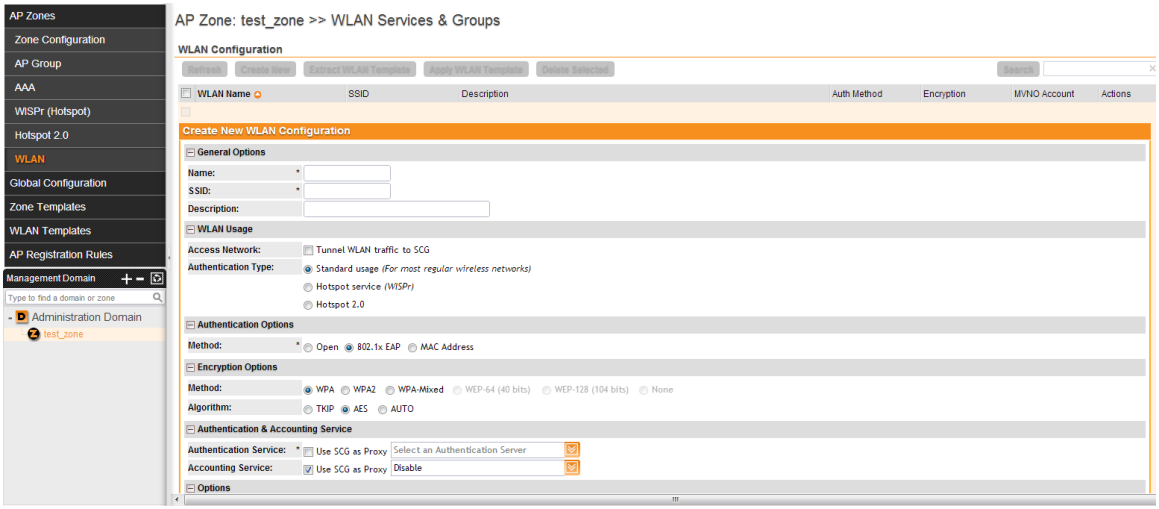


Figure 174: Configuring the WLAN settings of an AP zone

You have completed creating your first WLAN. To create another WLAN, repeat Step 4 to Step 6. You can create up to six WLANs per AP zone.

General Options

- **Name/ESSID**: Type a short name (2-31 characters) for this WLAN. In general, the WLAN name is the same as the advertised SSID (the name of the wireless network as displayed in the client's wireless configuration program). However, you can also first field, and a broadcast SSID in the second field. In this way, you can advertise the same SSID in multiple locations (controlled by the same vSZ) while still being able to manage the different WLANs independently. Each WLAN "name" must be unique within the vSZ, while the broadcast SSID can be the same for multiple WLANs.
- **Description**: Enter a brief description of the qualifications or purpose of this WLAN (for example, Engineering or Voice).

WLAN Usage

- In **Access Network**, select the Tunnel WLAN traffic to vSZ check box if you want to tunnel the traffic from this WLAN back to the vSZ. Tunnel mode enables wireless clients to roam across different APs on different subnets. If the WLAN has clients that require uninterrupted wireless connection (for example, VoIP devices), Ruckus Wireless recommends enabling tunnel mode. When you enable this option, you need to select core network for tunneling WLAN traffic back to the vSZ.
- In **Authentication Type**, click one of the following options:
  - **Standard usage (For most regular wireless networks)**: This is a regular WLAN suitable for most wireless networks.
  - **Hotspot service (WISPr)**: Click this option if want to use a hotspot (WISPr) service that you previously created.
  - **Hotspot 2.0**: Click this option if you want to use a Hotspot 2.0 profile that you want to use a Hotspot 2.0 profile that you previously created.
  - **Guest Access**: Click this option if you want to use this WLAN for guest access.

Authentication Options

Authentication defines the method by which users are authenticated prior to gaining access to the WLAN. The level of security should be determined by the purpose of the WLAN you are creating.

- **Open [Default]**: No authentication mechanism is applied to connections. If WPA or WPA2 encryption is used, this implies WPA-PSK authentication.
- **802.1X/EAP**: Uses 802.1X authentication against a user database.
- **MAC Address**: Uses the MAC address of a client for authentication. MAC address authentication requires a RADIUS server and uses the MAC address as the user logon name and password. You have two options for the MAC address format to use for authenticating clients:
  - Use user defined text as authentication password (default is device MAC address)
  - Set device MAC address in 802.1x format 00-10-A4-23-19-C0. The default is 0010a42319c0.

Encryption Options

Encryption choices include WPA, WPA2, WPA-Mixed, WEP and none. WPA and WPA2 are both encryption methods certified by the Wi-Fi Alliance and are the recommended encryption methods. The Wi-Fi Alliance will be mandating the removal of WEP due to its security vulnerabilities, and Ruckus Wireless recommends against using WEP if possible.

Method

- **WPA**: Standard Wi-Fi Protected Access with either TKIP or AES encryption.
- **WPA2**: Enhanced WPA encryption using the stronger AES encryption algorithm.
- **WPA-Mixed**: Allows mixed networks of WPA and WPA2 compliant devices. Use this setting if your network has a mixture of older clients that only support WPA and TKIP, and newer client devices that support WPA2 and AES.
- **WEP-64**: Provides a lower level of encryption, and is less secure, using 40-bit WEP encryption.
- **WEP-128**: Provides a higher level of encryption than WEP-64, using a 104-bit key for WEP encryption. However, WEP is inherently less secure than WPA.
- **None**: No encryption; communications are sent in clear text.

Algorithm (For WPA or WPA2 Encryption Only)

- **TKIP**: This algorithm provides greater compatibility with older client devices, but retains many of the security weaknesses of WEP. Therefore, if you select TKIP Alliance will be mandating the removal of TKIP, so it should not be used.
- **AES**: This algorithm provides enhanced security over TKIP, and is the only encryption algorithm supported by the 802.11i standard. Choose AES encryption if you are confident that all of your clients will be using 802.11i-compliant NICs.
- **Auto**: Automatically selects TKIP or AES encryption based on the client's capabilities. Note that since it is possible to have clients using both TKIP and AES on the same WLAN, only unicast traffic is affected (broadcast traffic must fall back to TKIP; therefore, transmit rates of broadcast packets from 11n APs will be at lower 11g rates).

NOTE: If you set the encryption algorithm to TKIP and you are using an 802.11n AP for the WLAN, the AP will operate in 802.11g mode.

NOTE: If you set the encryption algorithm to TKIP, the AP will only be able to support up to 26 clients. When this limit is reached, additional clients will be unable to associate with the AP. On the other hand, if you select AES or none, the AP will be able to support up to 256 clients (less if wireless mesh is also enabled on the same radio).

WEP Key or Passphrase

- **WEP Key**: WEP methods only. Click the Hex field, and then type the required key combination of 0-9, A-F). If it is for WEP 128 encryption, enter 26 hexadecimal characters (any combination of 0-9, A-F).
- **Passphrase**: WPA-PSK methods only. Click in this field and type the text of the 63 characters (or 64 hexadecimal characters).

Authentication and Accounting Service

- **Authentication Service**: This option appears only when 802.1x EAP is selected as the authentication method. Select the authentication server that you want to use for this WLAN. Only AAA servers that you previously added appear here.
- **Accounting Service**: This option appears only when 802.1x EAP is selected in Authentication method. Additionally, you must have added a RADIUS Accounting server previously. Select the RADIUS Accounting server from the drop-down list, as a proxy for vSZ.

Options

- **Wireless Client Isolation**: This option appears only when Standard Usage is selected as the WLAN usage type. Wireless client isolation enables subnet restrictions for connected clients. Click Enable if you want to prevent wireless clients associated with the same AP from communicating with each other locally. The default value is Disable.
- **Priority**: Set the priority of this WLAN to Low if you would prefer that other WLAN traffic takes priority. For example, if you want to prioritize internal traffic over guest WLAN traffic, you can set the priority in the guest WLAN configuration settings to “Low.” By default, all WLANs are set to high priority.

RADIUS Options

The RADIUS Options section only appears when Authentication TypeWLAN Usage) is set to Standard usage (For most regular wireless networks).

- **RADIUS NAS ID**:; Select how the RADIUS server will identify the AP:
  - WLAN BSSID
  - AP MAC
  - User-defined
- **RADIUS NAS Request Timeout**: Type the timeout period (in seconds) after, which an expected RADIUS response message is considered to have failed.
- **RADIUS NAS Max Number of Retries**: Type the number of failed connection attempts after which the vSZ will fail over to the backup RADIUS server.

- **RADIUS NAS Reconnect Primary**: If the vSZ fails over to the backup RADIUS server, this is the interval (in minutes) at which the vSZ will recheck the primary RADIUS server if it is available. The default interval is 5 minutes.
- **Call STA ID**: Use either WLAN BSSID or AP MAC as the station calling ID. Select one.

Advanced Options

- **Rate Limiting**: Rate limiting controls fair access to the network. When enabled, the network traffic throughput of each network device (client) is limited to the rate specified in the traffic policy, and that policy can be applied on either the uplink or downlink. Toggle the Uplink and/or Downlink drop-down lists to limit the rate at which WLAN clients upload/download data. The “Disabled” state means rate limiting is disabled; thus, traffic flows without prescribed limits.
- **Access VLAN**: By default, all wireless clients associated with APs that the vSZ is managing are segmented into a single VLAN (with VLAN ID 1). If you want to tag this WLAN traffic with a different VLAN ID, enter a valid VLAN ID (2-4094) in the box. Select the Enable Dynamic VLAN check box to allow the vSZ to assign VLAN IDs on a per-user basis. Before enabling dynamic VLAN, you need to define on the RADIUS server the VLAN IDs that you want to assign to users.
- **Hide SSID**:Click this option if you do not want the ID of this WLAN advertised at any time. This will not affect performance or force the WLAN user to perform any unnecessary tasks.
- **Proxy ARP**: When enabled on a WLAN, the AP provides proxy service for stations when receiving neighbor discovery packets (for example, ARP requests and ICMPv6. When the AP receives a broadcast ARP/Neighbor Solicit request for a known host, the AP replies on behalf of the host. If the AP receives a request for an unknown host, it forwards the request at the rate limit specified.
- **Max Clients**: Limit the number of clients that can associate with this WLAN per AP (default is 100). You can also limit the total number of clients that a specific AP (or radio, on dual radio APs) will manage.
- **802.11d**: The 802.11d standard provides specifications for compliance with additional regulatory domains (countries or regions) that were not defined in the original 802.11 standard. Enable this option if you are operating in one of these additional regulatory domains.
- **DHCP Option 82**: When this option is enabled and an AP receives a DHCP request from a wireless client, the AP will encapsulate additional information (such as VLAN ID, AP name, SSID and MAC address) into the DHCP request packets before forwarding them to the DHCP server. The DHCP server can then use this information to allocate an IP address to the client from a particular DHCP pool based on these parameters.
- **Client TX/RX Statistics**': Select the Ignore statistics from unauthorized clients check box if you do not want the vSZ to monitor traffic statistics for unauthorized clients.
- **Inactivity Timeout**: Select the check box and enter a value in minutes (6 to 600 minutes) after which idle clients will be disconnected.
- **Client Fingerprinting**: If you select this check box, the vSZ wclient devices by their operating system, device type, and host name, if available. This makes identifying client devices easier on the Dashboard, Monitor and Client Details pages.
- **Disable WLAN**: Select this option to disable this WLAN service.

Configuring DHCP Option 43

To enable the vSZ to manage an AP, the AP must be able to locate the vSZ on the network successfully and register with it. The easiest way to ensure that APs can successfully locate the vSZ on the network is by configuring DHCP Option 43 on your DHCP server.

DHCP Option 43 enables the DHCP server on your network to provide the vSZ server address – either IP address or FQDN– (specifically, the IP address assigned to the vSZ's control plane or cluster plane interface) to DHCP clients, including APs that are connected to the network. The procedure for configuring DHCP option 43 varies, depending on the DHCP server that you are using. Refer to the documentation provided with your DHCP server software for information on how to configure DHCP option 43. Follow these steps to configure DHCP option 43 on a Linux server.

NOTE: The following procedure describes how to configure DHCP option 43 on a Linux server (Fedora). If your DHCP server is running on a different platform, refer to the DHCP server documentation for the relevant instructions.

1. Log on to your DHCP server via a console terminal (for example, PuTTY).
2. Go to `/etc` directory.
3. Run `vi dhcpd.conf`. This command opens the DHCP configuration file for editing.
4. At the beginning of the DHCP configuration file, insert the following lines:`option space VendorInfo; option VendorInfo.WSG code 6 = text;` OR `option space VendorInfo; option VendorInfo.SCG code 6 = text;`

   Make sure that space characters exist in "6 = text". Omitting these space characters could result in AP connectivity issues.
5. Under the subnet section, insert the following lines:`Vendor-option-space VendorInfo; option VendorInfo.WSG "{control-ip-address-or-fqdn}"` OR `Vendor-option-space VendorInfo; option VendorInfo.SCG "{control-ip-address-or-fqdn}"`

   `{control-ip-address-or-fqdn}` must be the IP address or FQDN of the control plane (br0).

   Remember to remove the curly brackets ({ }) that enclose the IP addresses or FQDNs. If the control plane IP addresses are mapped to proper names on the DNS server, you could also use FQDN host names instead of IP addresses. The vSZ supports two formats for vendor information:

   - Plain IP address or FQDN (for example, `10.2.0.87` or `server.company.com`)
   - URL-based IP address or FQDN (for example, `https://10.2.0.87/wsg/ap or https://server.company.com/wsg/ap)` where `10.2.0.87` or `server.company.com` is the IP address or FQDN of the control plane interface, respectively.

   Inserting Multiple IP Addresses or URLs If you want to insert multiple IP addresses or URLs, use any of the following formats:

- **URL format** `option VendorInfo.WSG "https://10.2.0.87/wsg/ap,https://10.2.0.88/wsg/ap"`, OR `option VendorInfo.SCG "https://10.2.0.87/wsg/ap,https://10.2.0.88/wsg/ap"`
- **P address format** `option VendorInfo.WSG "10.2.0.87,10.2.0.88",` OR `option VendorInfo.SCG "10.2.0.87,10.2.0.88"`

  NOTE: Take care not to insert any space characters before or after the comma (,) character that separates the multiple IP addresses or URLs

6. Save the changes.
7. Restart the DHCP server to apply the new settings.

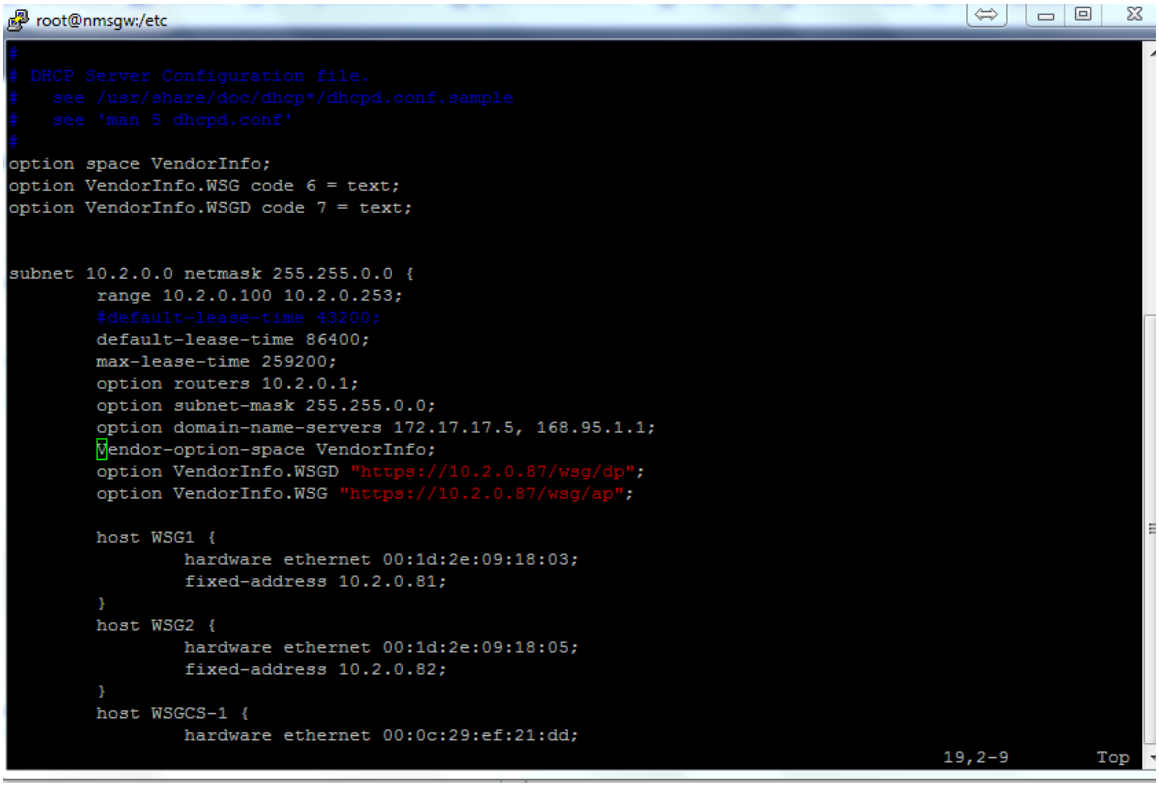


Figure 175: Editing dhcpd.conf

You have completed configuring DHCP option 43 on a Linux server.

Verifying That Wireless Clients Can Associate with a Managed AP

The last step in the setup process is to verify that APs can register with the vSZ and that wireless clients can associate with the APs successfully.

Follow these steps to verify that wireless clients can connect to the network.

1. Verify that the vSZ is connected to the backbone network.

2. Physically connect an AP to the same network as the vSZ. If DHCP option 43 was configured correctly, this AP should be able to locate the vSZ on the network and to register with it successfully.
3. Check the vSZ Dashboard. The AP zone that you created earlier should have at least one member AP (the AP that you connected to the network in Step 2). The AP count appears green, which indicates that it is online.
4. Associate a wireless client with the AP. The following describes the procedure if you are using a Windows-based wireless client.
   a) In the system tray, right-click the  (Wireless Network Connection) icon, and then click View Available Wireless Networks.
   b) In the list of available wireless network, click the wireless network name (SSID) that you configured on the AP.
   c) Click **Connect**.Your wireless client connects to the wireless network. After the wireless client connects to the wireless network successfully, the wireless client icon in the system tray changes to  .
5. Start your web browser, and then enter http://www.ruckuswireless.com in the address bar.

If you are able to connect to the Ruckus Wireless website, you have completed setting up vSZ on the network. Congratulations!

What to Do Next

For more information on configuring and managing the vSZ, refer to the Administrator Guide for your vSZ platform, which is available for download on the Ruckus Wireless Support website at: https://support.ruckuswireless.com/documents

NOTE: For a complete list of documentation that is available for your vSZ profile configuration, refer to the *Release Notes*.

Ensuring That APs Can Discover the Controller on the Network

10

In this chapter:

- Is LWAPP2SCG Enabled on the Controller
- Method 1: Perform Auto Discovery of the Controller Using the SmartLicense Server
- Method 2: Perform Auto Discovery on Same Subnet then Transfer the AP to Intended Subnet
- Method 3: Register the Controller with the DNS Server
- Method 4: Configure DHCP Option 43 on the DHCP Server
- Method 5: Manually Configure the Controller Address on the AP's Web Interface
- What to Do Next
- Bandwidth Consumption During AP Upgrade on vSZ

Before the controller can start managing an AP, the AP must first be able to discover the controller on the network when it boots up. This chapter describes procedures that you can perform to ensure that APs can discover and register with the controller on the network.

Is LWAPP2SCG Enabled on the Controller

All of the controller discovery methods described in this chapter require LWAPP2SCG (the application that enables APs to discover and be managed by a controller) to be installed and enabled on the controller. See Table 15 to check if your controller release includes the LWAPP2SCG application and whether it is enabled or disabled by default.

Controller Release	LWAPP Discovery	Default Setting	AP Compatibility
SCG 1.1.2, 2.1.2	Application installed by administrator. See Obtaining the LWAPP2SCG Application	Disabled	• ZF-AP Release 9.6.x – 9.8.x
SCG 2.5.x	Enabled by administrator. See, Enabling LWAPP2SCG	Disabled	• AP Release 100.0.x and later
SCG 2.6.x	Enabled by administrator. See Enabling LWAPP2SCG	Disabled	• ZF-AP Release 9.7.x – 9.8.x
Release 3.0.x and later	Enabled by default	Enabled	• AP Release 100.0.x and later

Obtaining the LWAPP2SCG Application

If your controller release does not have the LWAPP2SCG application pre-installed, contact Ruckus Wireless Support to obtain a copy of the LWAPP2SCG application files and installation instructions.

Enabling LWAPP2SCG

If the LWAPP2SCG application is pre-installed but disabled in your controller release, do the following to enable it.

1. Log on to the controller's console.
2. Enter `en` to enable privileged mode.
3. Enter `config`.
4. Enter `lwapp2scg`.
5. Enter `policy accept-all`.

You have completed enabling the LWAPP2SCG application on the controller.

Method 1: Perform Auto Discovery of the Controller Using the SmartLicense Server

This guide assumes that you have already activated the controller's licenses on the SmartLicense server. If you have not activated the controller's licenses, see the Virtual SmartZone Quick Setup Guide for this release for more information.

The Ruckus Wireless SmartLicense registration server is a cloud-based, HTTPS-enabled web server that allows an access point to query information about its parent controller by sending its serial number and base MAC address.

After you ensure that the controller's licenses have been activated on the SmartLicense connectivity, and then reboot the AP. Upon reboot, the AP will automatically attempt to discover its parent controller by sending the following HTTPS query to ap-registrar.ruckuswireless.com (the SmartLicense server URL):
https://ap-registrar.ruckuswireless.com/controller?ap_mac=APMAC&ap_serial=APSERIAL

Where APMAC is the AP's MAC address (for example, APMAC: 74:91:1A:20:59:90) and APSERIAL (for example, APSERIAL: 311003001685) is the AP's serial number, both of which are printed on the AP's product label.

If the AP is unable to discover its parent controller after the first attempt, it will continue to do so:

- Once every 5 minutes for up to 60 minutes (12 queries)
- Once every hour for the remaining day (23 queries)
- Once every 24-hour for the remaining two weeks (12 queries)

If the AP is still unable to discover its parent controller after two weeks of uptime, this cloud-based controller discovery method will be disabled permanently. You will need to reset the AP to factory default settings to re-enable this controller discovery method.

Method 2: Perform Auto Discovery on Same Subnet then Transfer the AP to Intended Subnet

If you are deploying the AP and the controller on different subnets, let the AP perform auto discovery on the same subnet as the controller before moving the AP to another subnet. To do this, connect the AP to the same network as the controller. When the AP starts up, it will discover and attempt to register with the controller.

Approve the registration request if auto approval is disabled. After the AP registers with the controller successfully, transfer it to its intended subnet. It will be able to find and communicate with the controller once you reconnect it to the other subnet.

NOTE: If you use this method, make sure that you do not change the IP address of the controller after the AP discovers and registers with it. If you change the controller's IP address, the AP will no longer be able to communicate with it and will be unable to rediscover it.

Method 3: Register the Controller with the DNS Server

If you register the controller with your DNS server, supported APs that request IP addresses from your DHCP server will also obtain DNS related information that will enable them to discover controllers on the network. Using the DNS information they obtained during the DHCP request, APs will attempt to resolve the controller IP address using RuckusController.{DNS domain name} and zonedirector.{DNS domain name}.

To register the controller with the DNS server, do the following.

1. Open the DNS zone file, and then add two records with the following information.
   - **Record Key#1**: RuckusController
   - **Type**: A (IPv4 Domain Name Translation)
   - **Value**: (IP address of the controller)
   - **Record Key#2**: zonedirector
   - **Type**: A (IPv4 Domain Name Translation)
   - **Value**: (IP address of the controller)

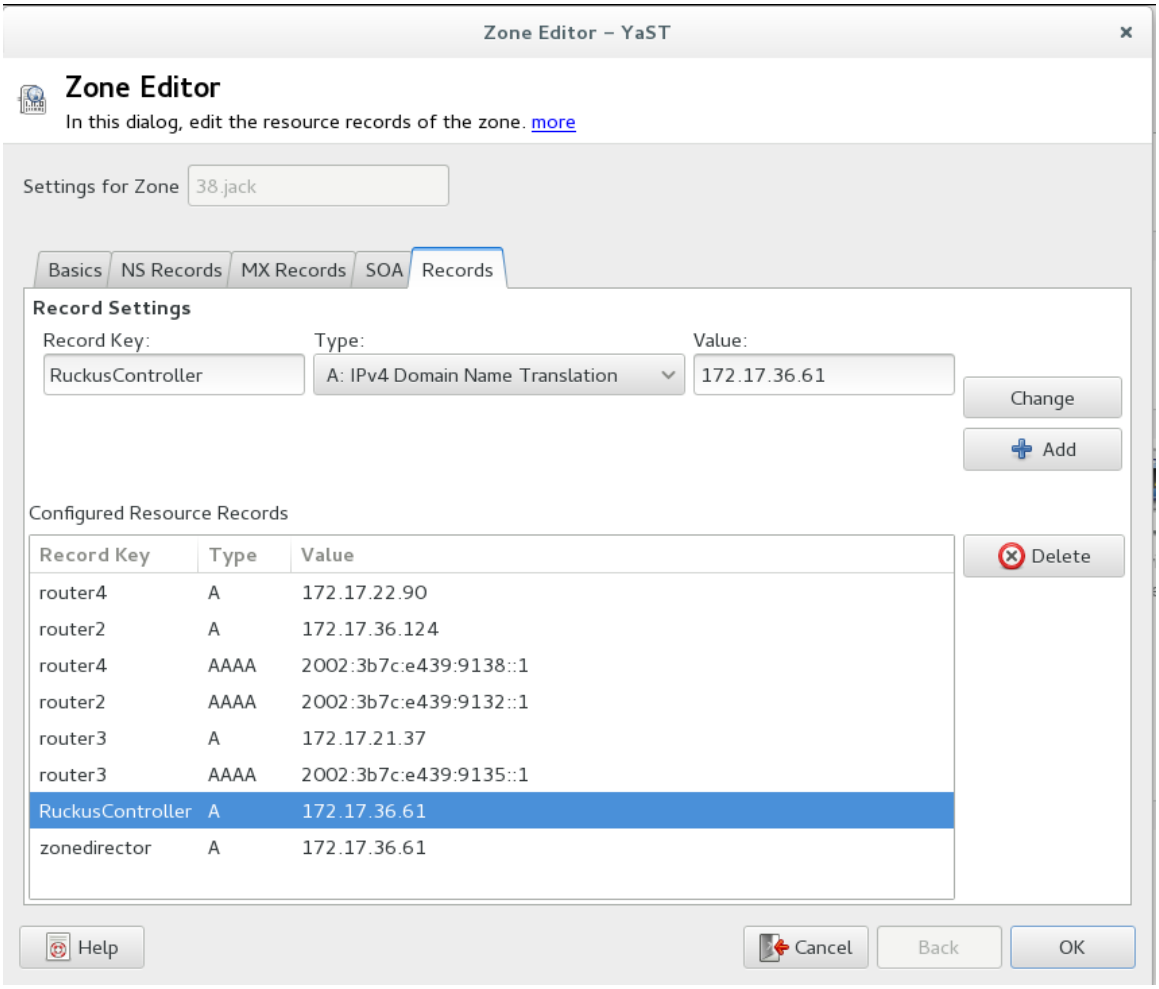


Figure 176: Add records for "RuckusController" and "zonedirector" to the DNS

2. Save the zone file.
3. Open the DHCP configuration file, and then insert the DNS domain name in the DHCP configuration file. For example, if the DNS domain name is "38.jack", insert the following line into the DHCP configuration file: `option domain-name "38.jack"`

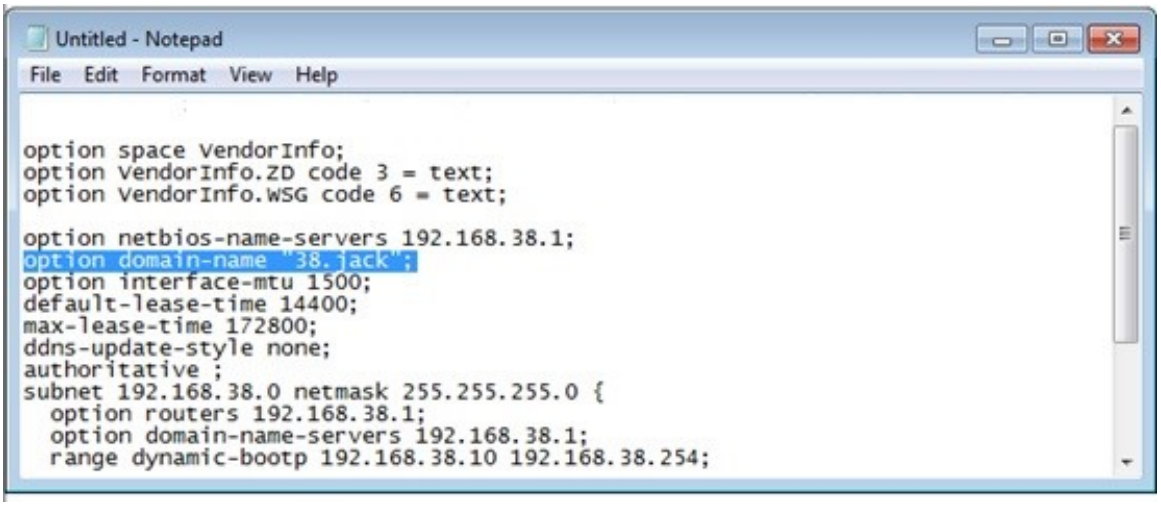


Figure 177: Insert option domain-name “38.jack

4. Save the DHCP configuration file. When the AP obtains the DNS domain name from the DHCP server (using “Domain Name option 15” in the DHCP-offer packet), it will resolve “RuckusController.{domain-name}” and “zonedirector.{domain-name}” through the DNS server, and then it will obtain the controller’s IP address from the DNS server’s response.

   If the AP uses a static IP address or it cannot obtain the DNS domain name from the DHCP server, the AP will attempt to resolve “RuckusController” and “zonedirector” without a domain name from the DNS server as the FQDN of controller's control interface.

You have completed registering the controller with the DNS server.

Method 4: Configure DHCP Option 43 on the DHCP Server

Another method for the AP to discover the controller on the network automatically is to configure the DHCP server on the network. To do this, you will need to configure DHCP Option 43 (043 Vendor Specific Info) with the IP address of the controller on the network. When an AP requests an IP address from the DHCP server, the DHCP server will send a list of controller IP addresses to the AP. If there are multiple controller devices on the network, the AP will automatically select a controller to register with from this list of IP addresses.

DHCP Option 43 enables the DHCP server on your network to provide the controller’s server address – either IP address or FQDN– (specifically, the IP address assigned to the controller’s control plane or cluster plane interface) to DHCP clients, including APs that are connected to the network.

The procedure for configuring DHCP option 43 varies, depending on the DHCP server that you are using. Refer to the documentation provided with your DHCP server software for information on how to configure DHCP option 43.

NOTE: The following procedure describes how to configure DHCP option 43 on a Linux server (Fedora). If your DHCP server is running on a different platform, refer to the DHCP server documentation for the relevant instructions.

NOTE: If you have a ZoneDirector controller on the network and you do not want APs to be managed by this ZoneDirector controller, you must disable auto approval on the ZoneDirector web interface. Log on to the ZoneDirector web interface, and then go to Configure > Access Points > Access Points Policies page, and then clear the Approval check box.

Follow these steps to configure DHCP option 43 on a Linux server.

1. Log on to your DHCP server via a console terminal (for example, PuTTY).
2. Go to `/etc` directory.
3. Run `vi dhcpd.conf`. This command opens the DHCP configuration file for editing.
4. At the beginning of the DHCP configuration file, insert the following lines:`option VendorInfo.WSG_sub6 code 6=text; option VendorInfo.WSG_sub3 code 3=text; option VendorInfo.WSG_sub6 "<Controller IP>"; option VendorInfo.WSG_sub3 "<Controller IP>";`
   For example, if you only have one controller on the network and its IP address is 120.0.0.3, then these lines in the DHCP configuration file should look like in Figure 141Sample DHCP Option 43 configuration.

```
option space VendorInfo;
option VendorInfo.WSG code 6 = text;
option VendorInfo.ZD code 3 = text;

Vendor-option-space VendorInfo;
option VendorInfo.WSG "120.0.0.3";
```

Figure 178: Sample DHCP Option 43 configuration

   If you have a two-node controller cluster on the network, use a comma to separate the control interface IP addresses in option VendorInfo.WSG, for example: option VendorInfo.WSG “120.0.0.3,120.0.0.4” where 120.0.0.3 is the control interface IP address of the first controller and 120.0.0.4 is the control interface IP address of the second controller

5. Save the DHCP configuration file.
6. Restart the DHCP server to apply the new settings.
7. Verify that the LWAPP2SCG application is enabled on the controller. To verify, log on to the controller’s CLI, and then enter the following command: `show running-config lwapp2scg` If LWAPP2SCG is enabled, the value for ACL Policy should show as **Accept all**.

```
sz30# show running-config lwapp2scg
   LWAPP2SCG Configuration
   ------------------------------------------------
   ACL Policy                                : Accept all
   Dynamic Data Transmission Port Range      : Not specified
   ACL APs                                   :
```

Figure 179: "Accept all" indicates that LWAPP2SCG is enabled

NOTE: If LWAPP2SCG is disabled, do the following to enable it.

1. Enter `config`
2. Enter `lwapp2scg`
3. Enter `policy`
4. Enter one of the following commands:
   - `Accept {MAC address}` : Enter this command if you only want specific APs to be managed by the controller.
   - `accept-all`: Enter this command if you want all APs that discover the controller to be managed by it.

```
Sol-SZ1(config)# lwapp2scg
  <cr>

Sol-SZ1(config)# lwapp2scg

Sol-SZ1(config-lwapp2scg)# policy
  accept          Accept by ACL AP List
  accept-all      Accept All
  deny            Deny by ACL AP List
  deny-all        Deny All

Sol-SZ1(config-lwapp2scg)#
```

Figure 180: Options that appear after you enter the "policy" command

```
Sol-SZ1(config-lwapp2scg)# policy accept

Sol-SZ1(config-lwapp2scg)# acl-ap
  mac         AP MAC Address
  serial      AP Serial Number

Sol-SZ1(config-lwapp2scg)# acl-ap mac 6C:AA:B3:3D:66:90

Sol-SZ1(config-lwapp2scg)# acl-ap serial
  <SerialNumber>     AP Serial Number(s). Please seperate with comma e.g 123456789012,987654321021

Sol-SZ1(config-lwapp2scg)# acl-ap serial
```

Figure 181: Enter accept {MAC address} if you only want specific APs to be managed by the controller

8. Reset the AP to factory default settings, and then connect it to a network subnet where it can communicate with the controller.
9. Reboot the AP.

After the AP reboots, it will obtain an IP address and the IP address of its parent controller from the DHCP server. Once the AP registers with the controller, it will download and install the latest SmartZone AP firmware. You have completed the task.

Method 5: Manually Configure the Controller Address on the AP's Web Interface

1. Log on to the AP's web interface.
2. Go to the **Administration** > **Management page**
3. In Primary Controller Address, type the IP address of the controller that you want to manage the AP.
4. In Secondary Controller Address, type the IP address of a backup controller that you want to manage the AP if the primary controller is unavailable.
5. Click **Apply**.

You have completed manually configuring the controller's IP address on the AP's web interface.

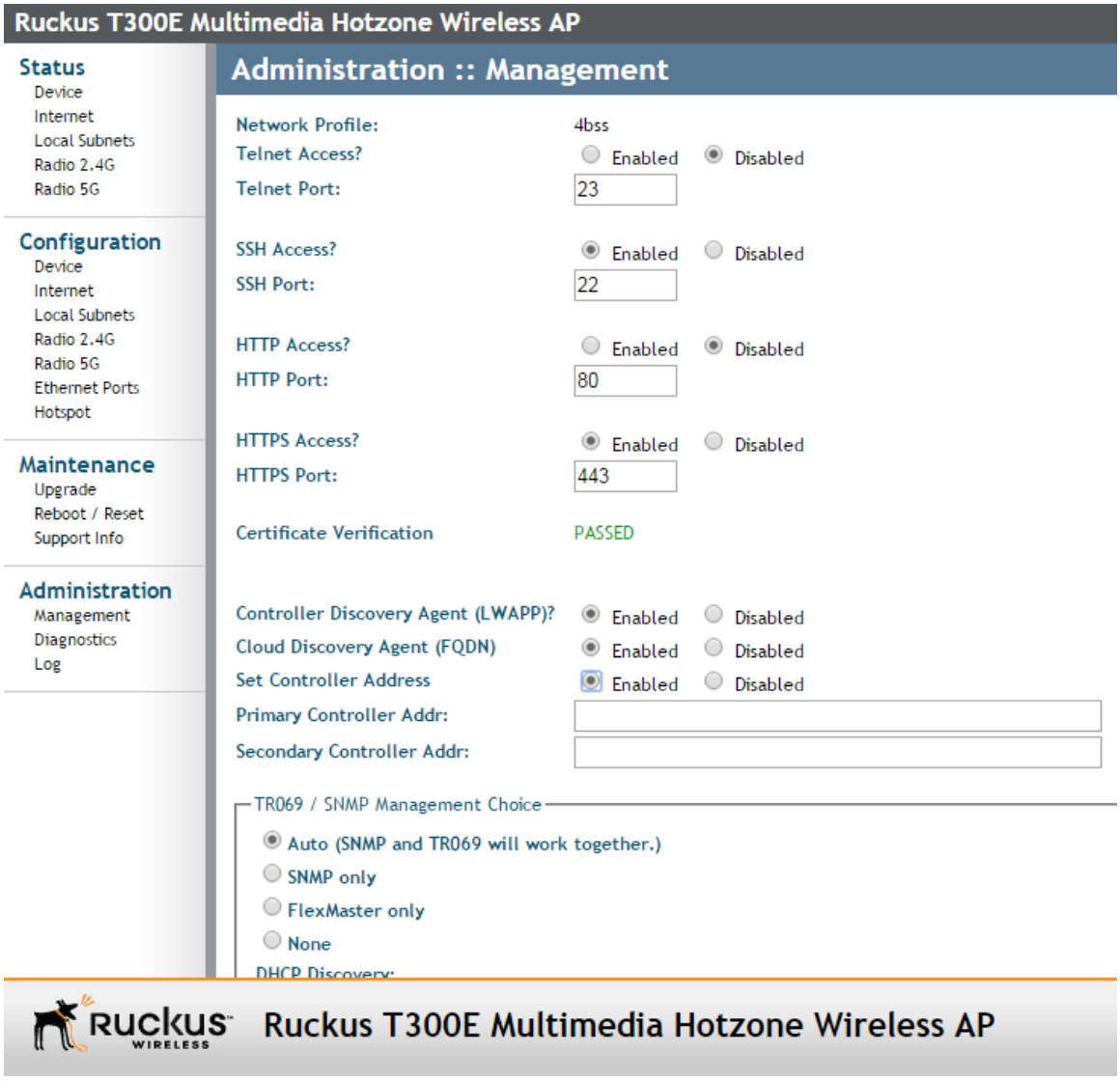


Figure 182: Set the IP addresses of the primary and secondary controllers that you want to manage the AP

What to Do Next

For more information on configuring and managing the vSZ, refer to the Administrator Guide for your vSZ platform, which is available for download on the Ruckus Wireless Support website at: https://support.ruckuswireless.com/documents

NOTE: For a complete list of documentation that is available for your vSZ profile configuration, refer to the *Release Notes*.

Bandwidth Consumption During AP Upgrade on vSZ

During a version upgrade all APs are upgraded at same time, and average AP image size is 10MB. This means that the bandwidth consumption will be multiplication of AP image size with number of APs.

The vSZ-E (Essentials) acts more like the ZoneDirector or SZ100, meaning that when you upgrade the controller all APs will also be upgraded with it. Even though eventually all APs lose connection to the controller while it is being upgraded, the controller will not allow more than a certain number of APs to upgrade their firmware in parallel. APs will be upgraded in batches of X number of APs, say 20 at a time, then the next 20, and the next, where X=300.

The vSZ-H (High-Scale) acts more like the SCG-200, where APs are member of an AP Zone. In this configuration the controller is upgraded, and the system administrator decides at a later stage if/when/which AP Zone will be upgraded to a different firmware release. Same applies here, APs will be instructed to upgrade firmware in batches of X, all depending on how much parallel sessions the controller can handle (X=300).

11 Upgrading the Controller for Microsoft Azure, AWS, and GCE Platforms

In this chapter:

- Performing the Upgrade
- Verifying the Upgrade
- Rolling Back to a Previous Software Version

Ruckus Wireless may periodically release controller software updates that contain new features, enhancements, and fixes for known issues.

These software updates may be made available on the Ruckus Wireless support website or released through authorized channels.

CAUTION: Although the software upgrade process has been designed to preserve all controller settings, Ruckus Wireless strongly recommends that you back up the controller cluster before performing an upgrade. Having a cluster backup will ensure that you can easily restore the controller system if the upgrade process fails for any reason.

CAUTION: Ruckus Wireless strongly recommends that you ensure that all interface cables are intact during the upgrade procedure.

CAUTION: Ruckus Wireless strongly recommends that you ensure that the power supply is not disrupted during the upgrade procedure.

NOTE: If you are managing a vSZ, you can also perform system configuration backup, restore, and upgrade from the controller command line interface.

Performing the Upgrade

This section outlines the procedure to upgrade the controller software for Microsoft Azure, Amazon Web Services, Google Computing Engine platforms.

Follow these steps to upgrade the controller software.

CAUTION: Ruckus Wireless® strongly recommends backing up the controller cluster before performing the upgrade. If the upgrade process fails for any reason, you can use the latest backup file to restore the controller cluster.

NOTE: Before starting this procedure, you should have already obtained a valid controller software upgrade file from Ruckus Wireless® Support or an authorized reseller.

1. Copy the software upgrade file that you received from Ruckus Wireless® to the computer where you are accessing the controller web interface or to any location on the network that is accessible from the web interface.
2. Go to **Administration** > **Upgrade**.
3. In the **Patch File Upload** section, click the **Browse** button, and then browse to the location of the software upgrade file.

   Typically, the file name of the software upgrade file is `scg-installer_{version}.ximg`.

   NOTE: Select the **Run Pre-Upgrade Validations** check box to verify if the data migration was successful. This option allows you to verify data migration errors before performing the upgrade. If data migration was unsuccessful, the following error is displayed: `Exception occurred during the validation of data migration. Please apply the system configuration backup and contact system administrator.`

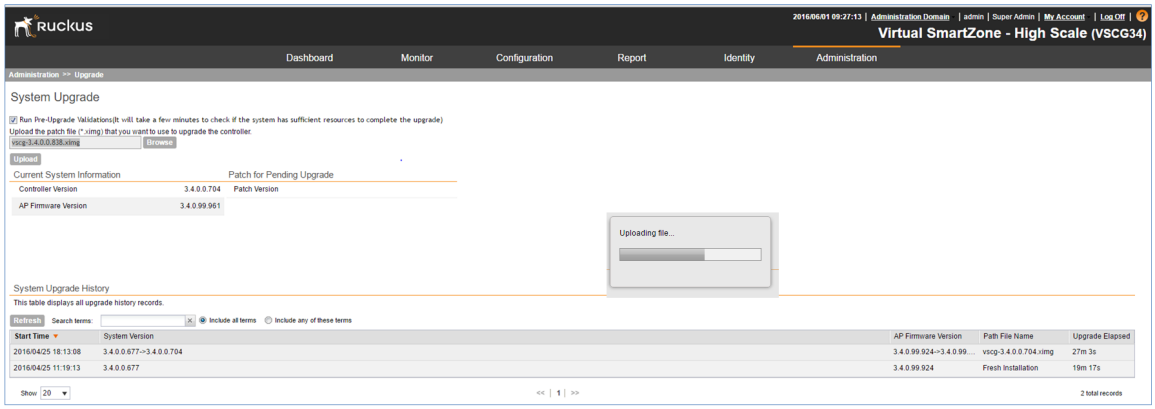


Figure 183: Pre-upgrade validation

4. Select the software upgrade file, and then click **Open**.
5. Click **Upload** to upload the software upgrade file. The controller uploads the file to its database, and then performs file verification. After the file is verified, the **Upgrade Pending Patch Information** section is populated with information about the upgrade file.

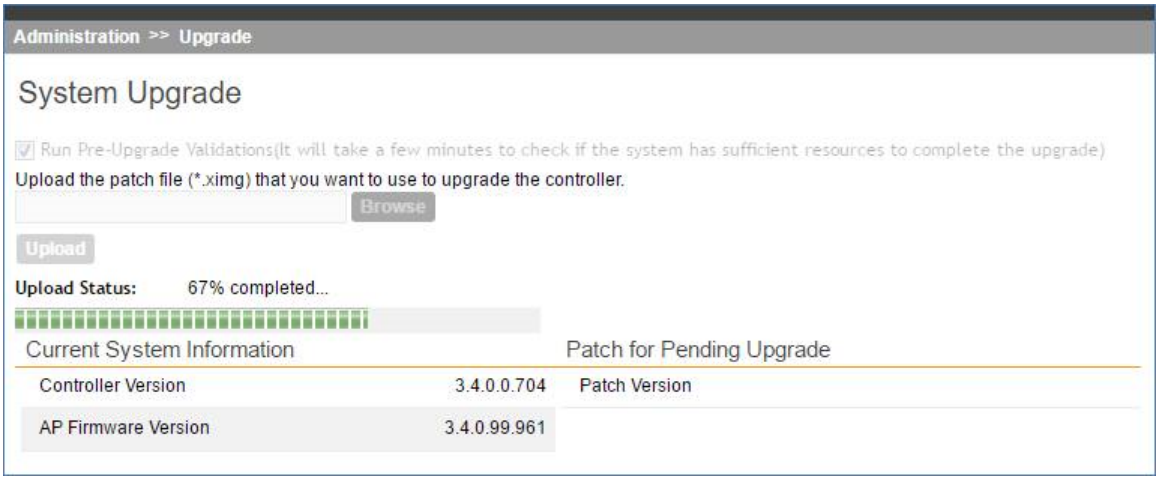


Figure 184: Upload the software upgrade file

6. Start the upgrade process by clicking one of the following buttons:
   - **Upgrade**: Click this button to start the upgrade process without backing up the current controller cluster or its system configuration.
   - **Backup & Upgrade**: Click this button to back up the controller cluster and system configuration before performing the upgrade.

     CAUTION: Ruckus Wireless® strongly recommends usage of backup and upgrade icon while performing the upgrade. If the upgrade process fails for any reason, you can use the latest backup file to restore the controller cluster.

   A confirmation message appears.
7. Click **Yes**.

   The controller starts the process that you selected. The screens that appear next will depend on the process that you selected to upgrade immediately or to back up and then upgrade the controller.

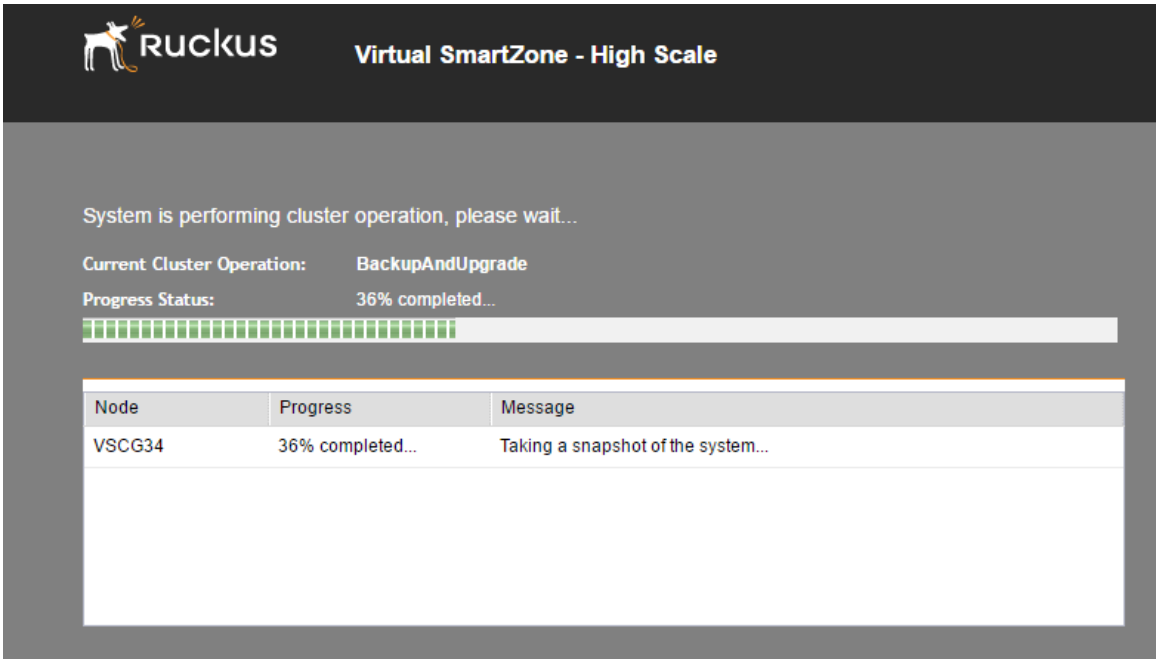


Figure 185: The System Upgrade page displays the status of the upgrade process

When the upgrade (or backup-and-upgrade) process is complete, the controller logs you off the web interface automatically. Wait for a few minutes until the web interface log on page appears.

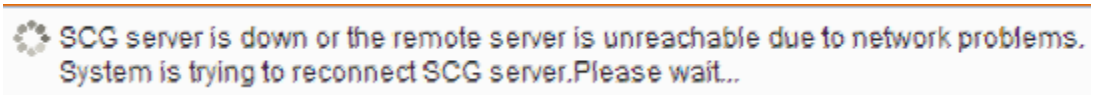


Figure 186: The controller web interface may display the following message as it completes the upgrade process

When the controller log on page appears again, you have completed upgrading the controller.

Continue to Verifying the Upgrade to check if the upgrade was completed successfully.

Verifying the Upgrade

Follow these steps to verify that the controller upgrade was completed successfully.

1. Log on to the controller web interface.
2. Go to **Administration** > **Upgrade**.
3. In the **Current System Information** section, check the value for Controller Version.

   If the firmware version is newer than the firmware version that controller was using before you started the upgrade process, then the upgrade process was completed successfully.

   NOTE:

   APs periodically send scheduled configuration requests to the controller, including the firmware version. Therefore, when an AP joins a zone for the first time, the firmware version is verified by the controller. If the firmware version is different from that which is configured for the zone, the controller responds with a request to upgrade it, after which the AP initiates a request to upgrade the firmware using HTTP.

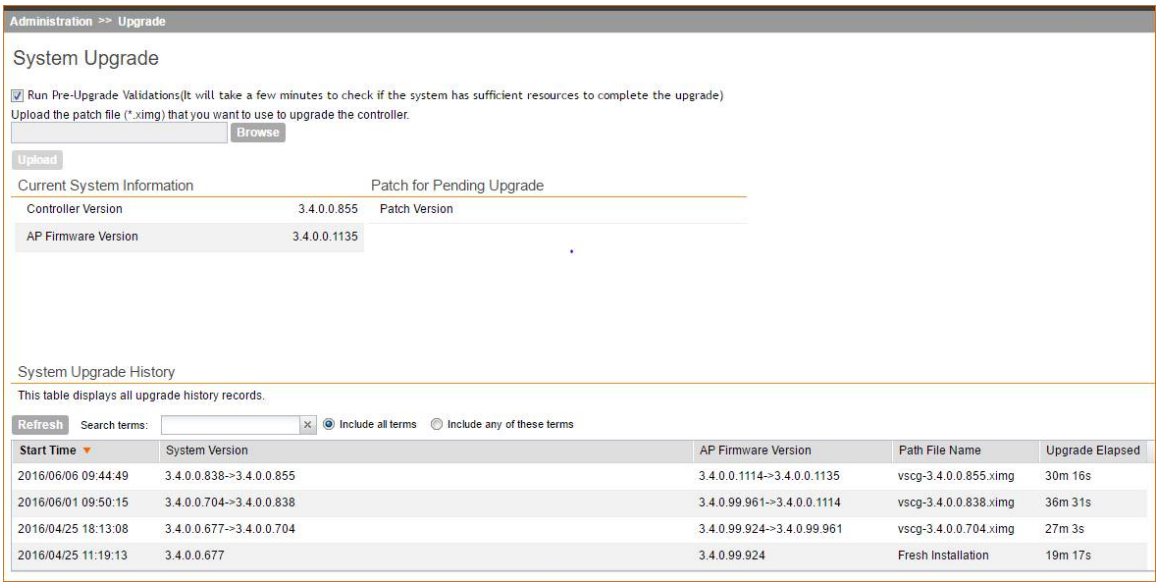


Figure 187: Check the value for Controller Version

Rolling Back to a Previous Software Version

There are two scenarios in which you may want to roll back the controller software to a previous version:

1. You encounter issues during the software upgrade process and the controller cannot be upgraded successfully. In this scenario, you can only perform the software rollback from the **CLI** using the restore local command. If you have a two-node controller cluster, run the restore local command on each of the nodes to restore them to the previous software before attempting to upgrade them again.
2. You prefer a previous software version to the newer version to which you have upgraded successfully. For example, you feel that the controller does not operate normally after you upgraded to the newer version and you want to restore the previous software version, which was more stable. In this scenario, you can perform the software rollback either from the web interface or the **CLI**. If you have a two-node controller cluster, you must have cluster backup on both of the nodes.

To ensure that you will be able to roll back to a previous version, Ruckus Wireless® strongly recommends the following before attempting to upgrade the controller software:

- Always back up the controller before attempting a software upgrade. If you are managing a multi-node cluster, back up the entire cluster, and then verify that the backup process completes successfully. See Creating a Cluster Backup on page 190 for more information.
- If you have an FTP server, back up the entire cluster and upload the backup files from all the nodes in a cluster to a remote FTP server.

Backing Up and Restoring Clusters

Back up the controller cluster periodically to ensure that you can restore the control plane, data plane, and AP firmware versions as well as the system configuration in the cluster if is a system failure occurs.

This section covers the following topics:

NOTE: You can also perform these procedures from the vSZ command line interface. Note, however, that you will need to execute the commands on each node.

Creating a Cluster Backup

Follow these steps to back up an entire controller cluster.

1. Take note of the current system time.

   You can view the **General System Settings** page under **Configuration** > **System**.

2. Go to **Administration** > **Cluster Backup and Restore**.
3. Click **Back Up Entire Cluster**.

   The following confirmation message appears: `Are you sure you want to back up the cluster?`

4. Click **Yes**.

   The following message appears: `The cluster is in maintenance mode. Please wait a few minutes.`

When the cluster backup process is complete, a new entry appears in the **Cluster Backups** section with a Created On value that is approximate to the time when you started the cluster backup process.

NOTE: If you have an FTP server, back up the entire cluster and upload the backup files from all the nodes in a cluster to a remote FTP server.

You have completed backing up the controller cluster.

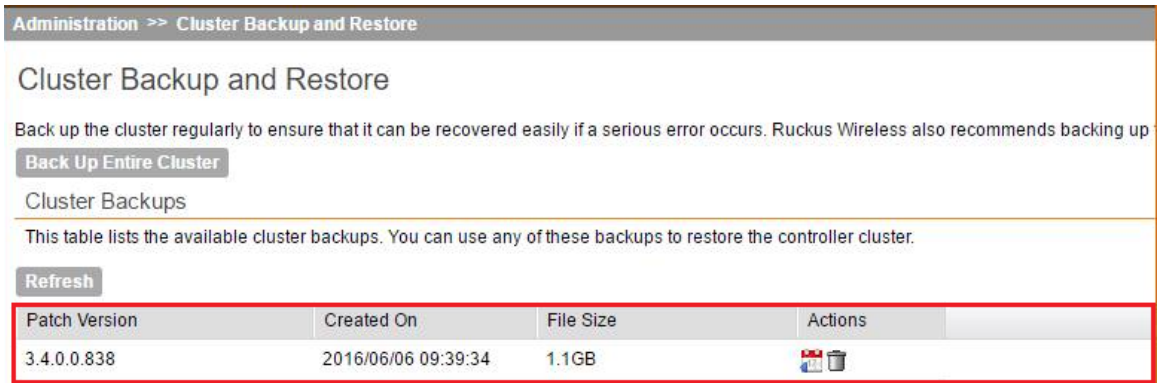


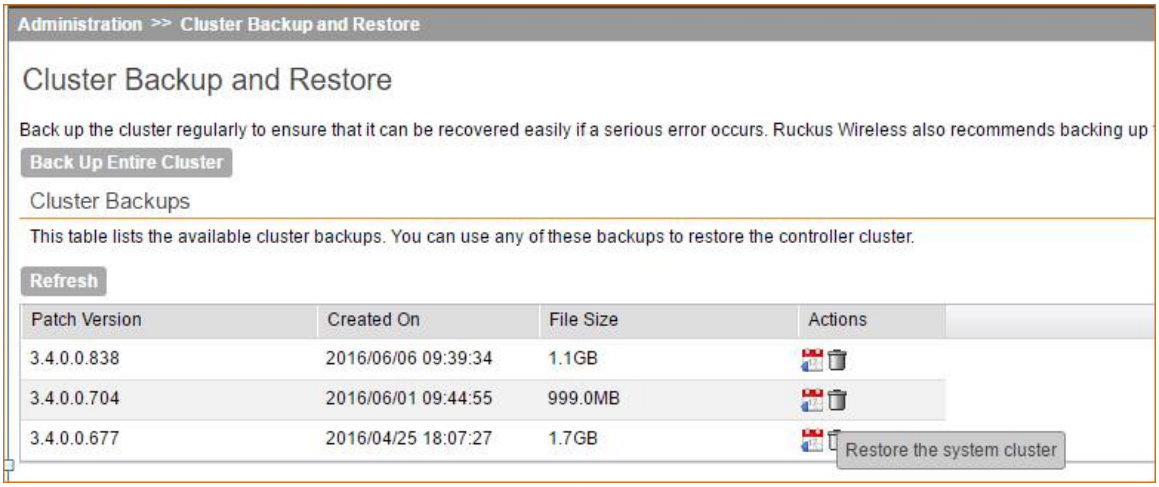
Figure 188: A new entry appears in the Cluster Backups section

Restoring a Cluster Backup

Follow these steps to restore a cluster backup.

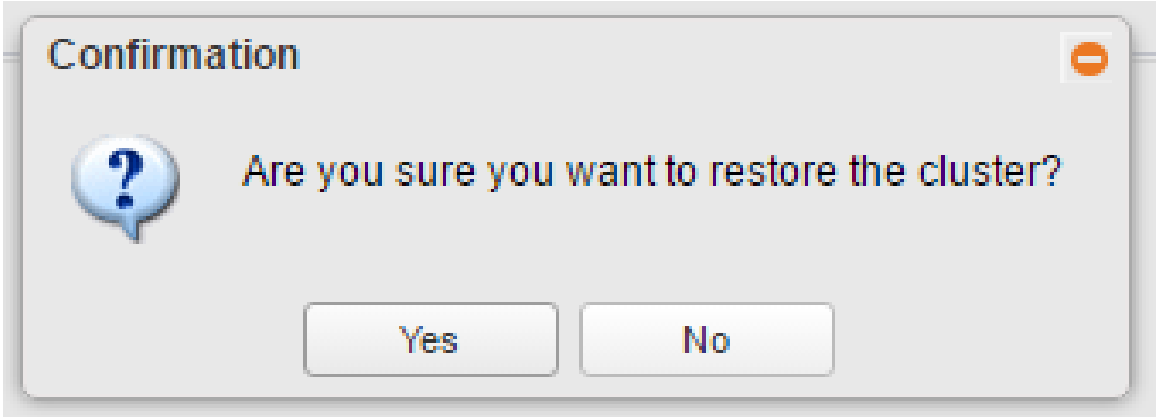
1. Go to **Administration** > **Cluster Backup and Restore**.
2. In the **Cluster Backups** section, locate the cluster backup that you want to restore.
3. Click the icon that is in the same row as the cluster backup.

Figure 189: Under Actions, click the calendar icon to start the cluster restore process



4. The following confirmation message appears: `Are you sure you want to restore the cluster?`. Click **Yes**.

Figure 190: Confirm Restore



The page refreshes, and then the following message appears: `System is restoring! Please wait...`

NOTE: The cluster restore process may take several minutes to complete.

When the restore process is complete, the controller logs you off the web interface automatically.

Do not refresh the controller web interface while the restore process is in progress. Wait for the restore process to complete successfully.

5. Log back on to the controller web interface.

   NOTE: If the web interface displays the message `Cluster is out of service. Please try again in a few minutes.` appears after you log on to the controller web interface, wait for about three minutes. The dashboard will appear shortly. The message appears because the controller is still initializing its processes.

6. Go to **Administration** > **Upgrade**, and then check the **Current System Information** section and verify that all nodes in the cluster have been restored to the previous version and are all in service.
7. Go to **Administration** > **Diagnostics**, and then click **Application Logs & Status** on the sidebar.
8. Check the **Health Status** column and verify that all of the controller processes are online.

   (See #unique_110/unique_110_Connect_42_ID-2649-00000068 on page 193).

You have completed restoring the cluster backup. After the upgrade is complete, go to the **Application Logs & Status** page and verify that all of the controller processes are online

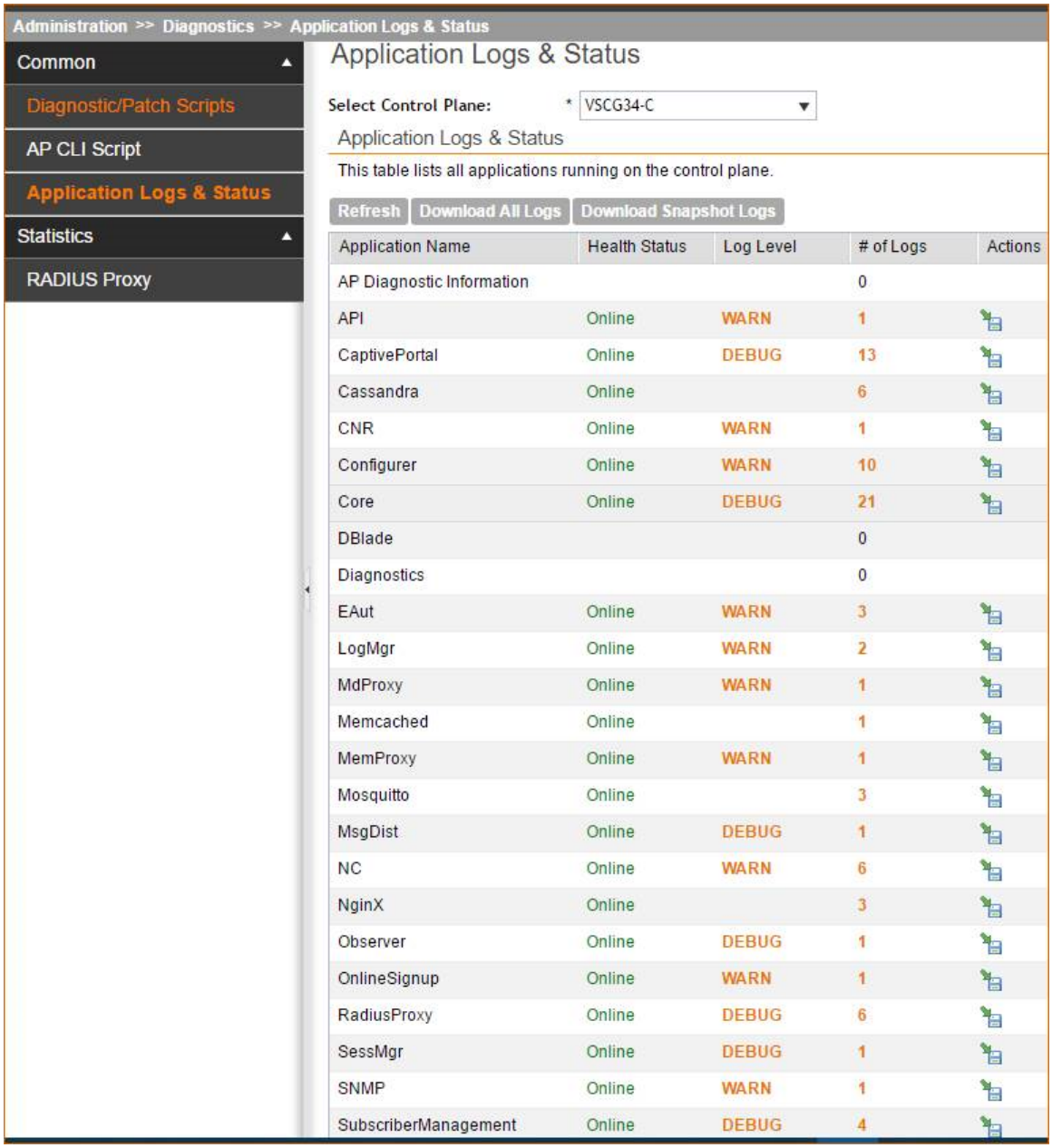


Figure 191: Application Logs & Status

To Restore a Cluster Backup Using CLI

1. Enter the Ruckus Virtual SmartZone: High Scale Command Line Interface.
2. Enter the following command and enter the password to log into the CLI.

```
VSCG34> en
Password:
```

3. Enter the following command to restore a cluster backup:

```
VSCG34> restore
```

   All the cluster backups are listed in an order of the cluster backup created date.

4. Specify the number mentioned against the cluster backup that you wish to restore.

You have restored the cluster backup.

Figure 192: Cluster Backup Restore Using CLI

Deleting a Cluster Backup

Follow these steps to delete a cluster backup.

1. Go to **Administration** > **Cluster Backup and Restore**.
2. In the **Cluster Backups** section, locate the cluster backup that you want to delete.
3. Click the icon that is in the same row as the cluster backup.

   The following confirmation message appears: `Are you sure you want to delete the selected resource?`

4. Click **Yes**.

   The page refreshes and the row is deleted from the **Cluster Backups** list.

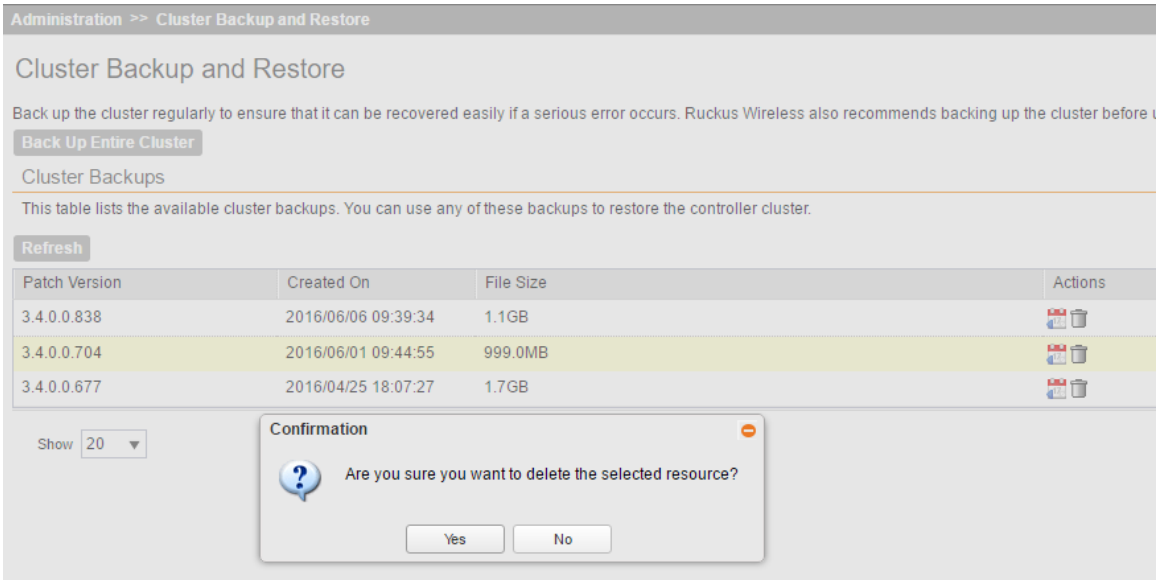


Figure 193: A confirmation message appears after you click the trash bin icon

AP-SCG/SZ/vSZ/vSZ-D Communication

The table below lists the ports that must be opened in the network firewall to ensure that the SCG/vSZ-D/SZ/vSZ (controller), managed APs, and RADIUS servers can communicate with each other successfully.

Table 9: Ports to open for AP-SCG/SZ/vSZ/vSZ-D communication

Port Number	Layer 4 Protocol	From (Sender)	To (Listener)	Configurable from Web Interface?	Purpose
21	TCP	AP	vSZ control plane	Yes	FTP upload of reports, statistics, and configuration backups
22	TCP	• AP • vSZ-D	vSZ control plane	No	SSH tunnel
49	TCP	TACACS+ server	vSZ control plane	Yes	TACACS+ based authentication of controller administrators
Port 91 (AP firmware version 2.0 to 3.1.x) and 11443 (AP firmware version 3.2 and later)	TCP	AP	vSZ control plane	No	AP firmware upgrade **NOTE:** Starting in release 3.2, the controller uses an HTTPS connection and an encrypted path for the firmware download. The port used for AP firmware downloads has also been changed from port 91 to 11443 to distinguish between the two methods. To ensure that all APs can be upgraded successfully to the new firmware, open both ports 11443 and 91 in the network firewall.
123	UDP	AP	vSZ control plane	No	NTP sync up Not required in 2.1.2, 2.1.3, 2.5.1, 2.6, 3.0

Port Number	Layer 4 Protocol	From (Sender)	To (Listener)	Configurable from Web Interface?	Purpose
					Required in1.x, 2.1, 2.1.1, 2.5
443	TCP	• AP • vSZ-D	vSZ control plane	No	Access to the SCG/vSZ/SZ control plane over secure HTTPS
6868	TCP	vSZ-D	vSZ	No	Internal communication port
8443	TCP	Any	vSZ management plane	No	Access to the SCG/vSZ/SZ web interface via HTTPS
23232	TCP	AP	SCG (data plane)	No	GRE tunnel **NOTE:** Only applicable to SCG.
23233	UDP and TCP	AP	Data plane	Yes	GRE tunnel (required only when tunnel mode is GRE over UDP) **NOTE:** On the vSZ-D, this port is used for both data and control in both UDP and TCP.
12222/12223	UDP	AP	vSZ control plane	No	LWAPP discovery **NOTE:** If your AP is within the same subnet as the controller, disable nat-ip-translation to establish a connection between the AP and the controller so that AP firmware upgrade progresses. If your AP is on the side of the NAT server and if the NAT server does not

Port Number	Layer 4 Protocol	From (Sender)	To (Listener)	Configurable from Web Interface?	Purpose
					support PASV-Mode FTP, enable nat-ip-translation. If the NAT server supports PASV-Mode FTP, then disable nat-ip-translation for AP firmware upgrade to progress
1812/1813	UDP	AP	Radius servers (s)	Yes	AAA authentication and accounting
8022	No (SSH)	Any	Management interface	Yes	CLI (Command Line Interface) access to the vSZ
8090	TCP	Any	vSZ control plane	No	Allows unauthorized UEs to browse to an HTTP website
8099	TCP	Any	vSZ control plane	No	Allows unauthorized UEs to browse to an HTTPS website
8100	TCP	Any	vSZ control plane	No	Allows unauthorized UEs to browse using a proxy UE
8111	TCP	Any	vSZ control plane	No	Allows authorized UEs to browse using a proxy UE
9080	HTTP	Any	vSZ control plane	No	Northbound Portal Interface for hotspots
9443	HTTPS	Any	vSZ control plane	No	Northbound Portal Interface for hotspots
9998	TCP	Any	vSZ control plane	No	Hotspot WISPr subscriber portal login/logout over HTTPSl
3333	TCP	Controller	License server	No	Local license server
443	HTTPS	Controller	License server	No	Cloud license server

Port Number	Layer 4 Protocol	From (Sender)	To (Listener)	Configurable from Web Interface?	Purpose
9996	TCP	Client	Controller interface	No	HotSpot 2.0 portal for onboarding and remediation
9999	TCP	Client	Controller interface	No	HotSpot 2.0 trust CA verification
8200	TCP	Client	Controller interface	No	HotSpot 2.0 Oauth in HTTP
8222	TCP	Client	Controller interface	No	HotSpot 2.0 Oauth in HTTPS

NOTE: The destination interfaces are meant for three interface deployments. In a single interface deployment, all the destination ports must be forwarded to the combined management/control interface IP address.

NOTE: Communication between APs is not possible across NAT servers.