QUICK START GUIDE

Ruckus Virtual SmartZone Getting Started Guide

Supporting SmartZone Release 5.1

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Preface

Document Conventions

The following table lists the text conventions that are used throughout this guide.

TABLE 1 Text Conventions

Convention	Description	Example
`monospace`	Identifies command syntax examples	`device(config)# interface ethernet 1/1/6`
bold	User interface (UI) components such as screen or page names, keyboard keys, software buttons, and field names	On the **Start** menu, click **All Programs**.
italics	Publication titles	Refer to the *Ruckus Small Cell Release Notes* for more information.

Notes, Cautions, and Warnings

Notes, cautions, and warning statements may be used in this document. They are listed in the order of increasing severity of potential hazards.

NOTE
A NOTE provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

ATTENTION
An ATTENTION statement indicates some information that you must read before continuing with the current action or task.

CAUTION
A CAUTION statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

DANGER
A DANGER statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

Command Syntax Conventions

Bold and italic text identify command syntax components. Delimiters and operators define groupings of parameters and their logical relationships.

Convention	Description
bold text	Identifies command names, keywords, and command options.
italic text	Identifies a variable.
[ ]	Syntax components displayed within square brackets are optional. Default responses to system prompts are enclosed in square brackets.
{ **x** | **y** | **z** }	A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options.
x | **y**	A vertical bar separates mutually exclusive elements.
< >	Nonprinting characters, for example, passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, *member*[*member*...].
\	Indicates a "soft" line break in command examples. If a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.

Document Feedback

Ruckus is interested in improving its documentation and welcomes your comments and suggestions.

You can email your comments to Ruckus at ruckus-docs@arris.com.

When contacting us, include the following information:

- Document title and release number
- Document part number (on the cover page)
- Page number (if appropriate)

For example:

- Ruckus SmartZone Upgrade Guide, Release 5.0
- Part number: 800-71850-001 Rev A
- Page 7

Ruckus Product Documentation Resources

Visit the Ruckus website to locate related documentation for your product and additional Ruckus resources.

Release Notes and other user documentation are available at https://support.ruckuswireless.com/documents. You can locate the documentation by product or perform a text search. Access to Release Notes requires an active support contract and a Ruckus Support Portal user account. Other technical documentation content is available without logging in to the Ruckus Support Portal.

White papers, data sheets, and other product documentation are available at https://www.ruckuswireless.com.

Online Training Resources

To access a variety of online Ruckus training modules, including free introductory courses to wireless networking essentials, site surveys, and Ruckus products, visit the Ruckus Training Portal at https://training.ruckuswireless.com.

Contacting Ruckus Customer Services and Support

The Customer Services and Support (CSS) organization is available to provide assistance to customers with active warranties on their Ruckus products, and customers and partners with active support contracts.

For product support information and details on contacting the Support Team, go directly to the Ruckus Support Portal using https://support.ruckuswireless.com, or go to https://www.ruckuswireless.com and select **Support**.

What Support Do I Need?

Technical issues are usually described in terms of priority (or severity). To determine if you need to call and open a case or access the self-service resources, use the following criteria:

- Priority 1 (P1)—Critical. Network or service is down and business is impacted. No known workaround. Go to the **Open a Case** section.
- Priority 2 (P2)—High. Network or service is impacted, but not down. Business impact may be high. Workaround may be available. Go to the **Open a Case** section.
- Priority 3 (P3)—Medium. Network or service is moderately impacted, but most business remains functional. Go to the **Self-Service Resources** section.
- Priority 4 (P4)—Low. Requests for information, product documentation, or product enhancements. Go to the **Self-Service Resources** section.

Open a Case

When your entire network is down (P1), or severely impacted (P2), call the appropriate telephone number listed below to get help:

- Continental United States: 1-855-782-5871
- Canada: 1-855-782-5871
- Europe, Middle East, Africa, Central and South America, and Asia Pacific, toll-free numbers are available at https://support.ruckuswireless.com/contact-us and Live Chat is also available.
- Worldwide toll number for our support organization. Phone charges will apply: +1-650-265-0903

We suggest that you keep a physical note of the appropriate support number in case you have an entire network outage.

Self-Service Resources

The Ruckus Support Portal at https://support.ruckuswireless.com offers a number of tools to help you to research and resolve problems with your Ruckus products, including:

- Technical Documentation—https://support.ruckuswireless.com/documents

- Community Forums—https://forums.ruckuswireless.com/ruckuswireless/categories
- Knowledge Base Articles—https://support.ruckuswireless.com/answers
- Software Downloads and Release Notes—https://support.ruckuswireless.com/#products_grid
- Security Bulletins—https://support.ruckuswireless.com/security

Using these resources will help you to resolve some issues, and will provide TAC with additional data from your troubleshooting analysis if you still require assistance through a support case or RMA. If you still require help, open and manage your case at https://support.ruckuswireless.com/case_management.

About This Guide

About This Guide

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 Networks support website at https://support.ruckuswireless.com/documents.

Notice Conventions

The following table lists the notice conventions that are used throughout this guide.

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
WARNING!	Information that alerts you to potential personal injury

Installation Preparation

Obtaining the vSZ Distribution

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

Open Virtualization Format contains the following files:

- Description file (.ovf)
- Manifest file (.mf)
- Virtual machine state file (.vmdk)

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 3 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.

Virtual SmartZone Required Resources

Before upgrading vSZ to this release, verify that the virtual machine on which vSZ is installed has sufficient resources to handle the number of APs and wireless clients that you plan to manage. See the tables below for the **required** virtual machine system resources.

The values for vCPU, RAM, and Disk Size are linked together and cannot be changed individually. When changing one of these parameters, all three values need to **match exactly** with an existing Resource Level. Taking vSZ-H Resource Level 5 as an example: when adjusting the number of vCPU from 4 to 6, the amount of RAM needs to be adjusted to 22GB and the Disk Size needs to be adjusted to 300GB, thereby matching all of the values of Resource Level 6.

WARNING
These vSZ required resources may change from release to release. Before upgrading vSZ, always check the required resource tables for the release to which you are upgrading.

NOTE
When initially building up the network it is allowed to use a higher Resource Level than needed for the number of APs first deployed, as long as all the three parameters (vCPU, RAM and Disk Size) **match exactly** with that higher Resource Level.

ATTENTION
It is recommended that there should be only one concurrent CLI connection per cluster when configuring vSZ.

In the following tables the high scale resources are broken into two tables for easy readability. These tables are based on the *AP Count Range*.

TABLE 4 vSZ High Scale required resources

AP Count Range		Max Clients	Nodes per Cluster	AP Count per Node (without switch)	AP/Switch Capacity Ratio	Switch Per Node(without AP)
From	**To**			**Max**		**Max**
10,001	30,000	300,000	4	10,000	8 : 1	1,250
	20,000	200,000	3		8 : 1	1,250
5,001	10,000	100,000	1-2	10,000	8 : 1	1,250
2,501	5,000	50,000	1-2	5,000	8 : 1	625
1,001	2,500	50,000	1-2	2,500	8 : 1	312
501	1,000	20,000	1-2	1,000	5 : 1	200
101	500	10,000	1-2	500	5 : 1	100
1	100	2,000	1-2	100	5 : 1	20

TABLE 5 vSZ High Scale required resources

AP Count Range		vCPU	RAM	Disk Size	Preserved Events	Concurrent CLI Connection	Resource Level
From	**To**	**Logic Processor** [1][2][3]	**GB** [3]	**GB**	**Max**	**Max** (per node not per cluster)	
10,001	30,000	24	48	600	3 M	4	8
	20,000						
5,001	10,000	24	48	600	3 M	4	7

TABLE 5 vSZ High Scale required resources (continued)

AP Count Range		vCPU	RAM	Disk Size	Preserved Events	Concurrent CLI Connection	Resource Level
2,501	5,000	12	28	300	2 M	2	6.5
1,001	2,500	6	22	300	1.5 M	2	6
501	1,000	4	18	100	600 K	2	5
101	500	4	16	100	300 K	2	4
1	100	2	13	100	60 K	2	3

In the following tables the essential scale resources are broken into two tables for easy readability. These tables are based on the *AP Count Range*.

TABLE 6 vSZ Essentials required resources

AP Count Range		Maximum Clients	Nodes per Cluster	AP Count per Node	AP/Switch Capacity Ratio	Switch Per Node(without AP)
From	**To**			**Max**		**Max**
1025	3,000	60,000	4	1,024	5 : 1	200
	2,000	40,000	3		5 : 1	200
501	1,024	25,000	1-2	1,024	5 : 1	200
101	500	10,000	1-2	500	5 : 1	100
1	100	2,000	1-2	100	5 : 1	20

TABLE 7 vSZ Essentials required resources

AP Count Range		vCPU	RAM	Disk Size	Preserved Events	Concurrent CLI Connection	Resource Level
From	**To**	**Logic Processor** [1][2][3]	**GB** [3]	**GB**	**Max**	**Max** (per node not per cluster)	
1025	3,000	8	18	250	10 K	2	3
	2,000						
501	1,024	8	18	250	10 K	2	2
101	500	4	16	100	5 K	2	1.5
1	100	2	13	100	1 K	2	1

NOTE

Logic Processor [1] vCPU requirement is based on Intel Xeon CPU E5- 2630v2 @2.60 GHz.

Logic Processor [2] Azure with low CPU throughput unsupported. The vSZ with the lowest resource plan (2 core CPU, 13 GB memory) can NOT be supported due to the low CPU throughput on Azure.

Logic Processor [3] vSZ-H and vSZ-E have different report interval. For example, AP sends the status to vSZ-E every 90 seconds but to vSZ-H it is sent every 180 seconds, which means that vSZ-E need more CPU in scaling environment based on the resource level.

Clustering Limitations

The following are the limitations for vSZ-H and vSZ-E.

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 6.
- 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 1,024 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

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	6.7 and later
Windows	Windows Server Hyper-V	Windows Server Hyper-V (2012 R2)
KVM	CentOS	7.4 (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 6.7 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.

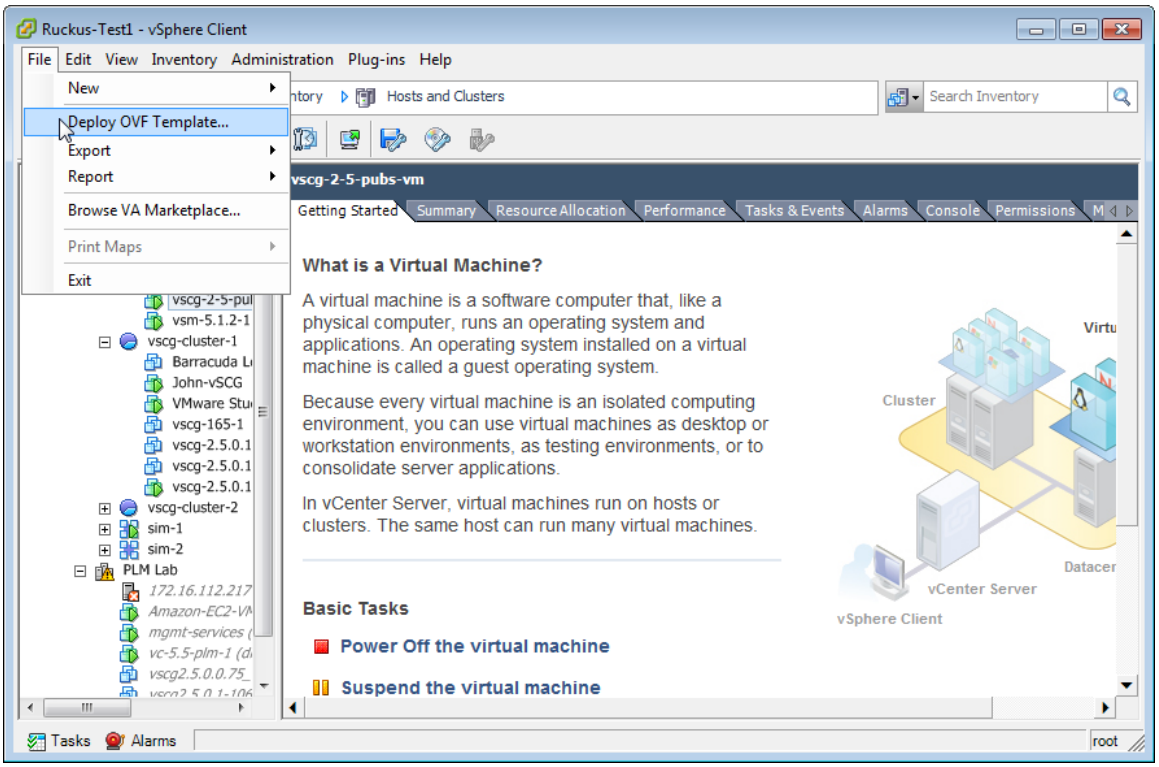
Before continuing, ensure you have already downloaded the vSZ distribution package. See Obtaining the vSZ Distribution for more information.

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.

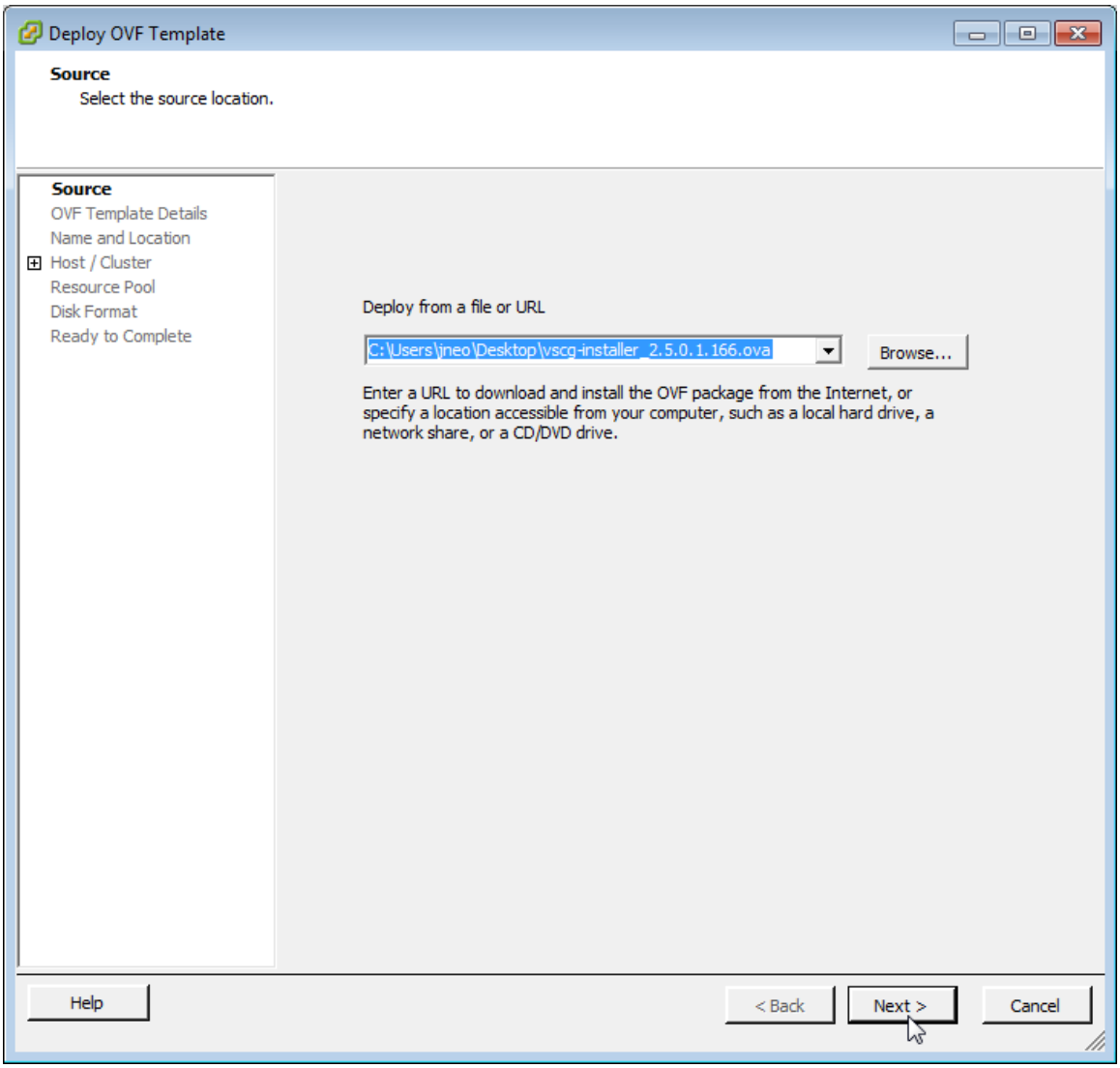
2. Click **File**> **Deploy OVF Template**. The Source screen of the **Deploy OVF Template** wizard appears.

FIGURE 1 Click Deploy OVF Template



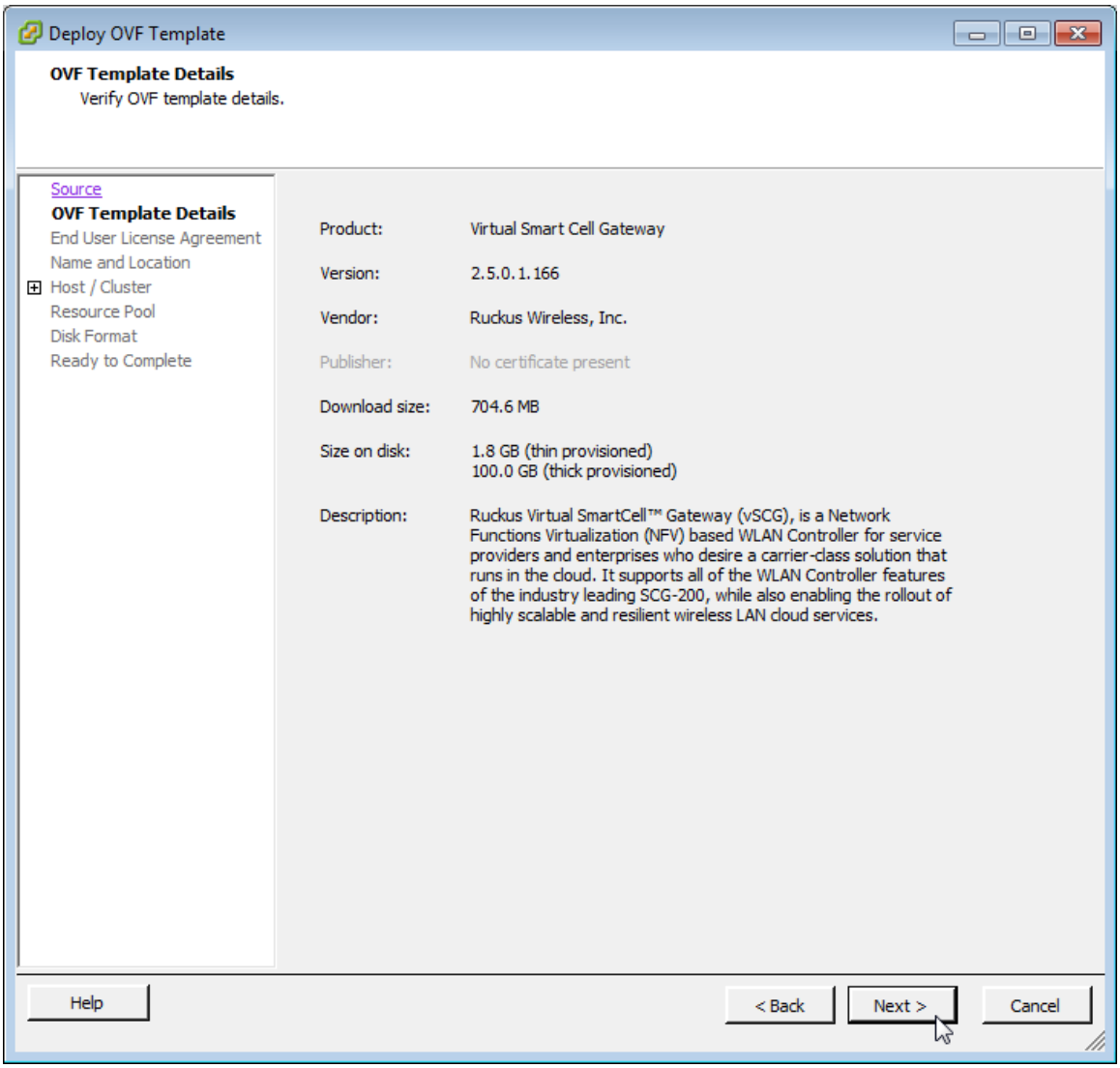
3. Click **Browse** to locate the .ova file that you downloaded earlier. Select the template.

FIGURE 2 Click Browse, and then locate and select .ova file



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

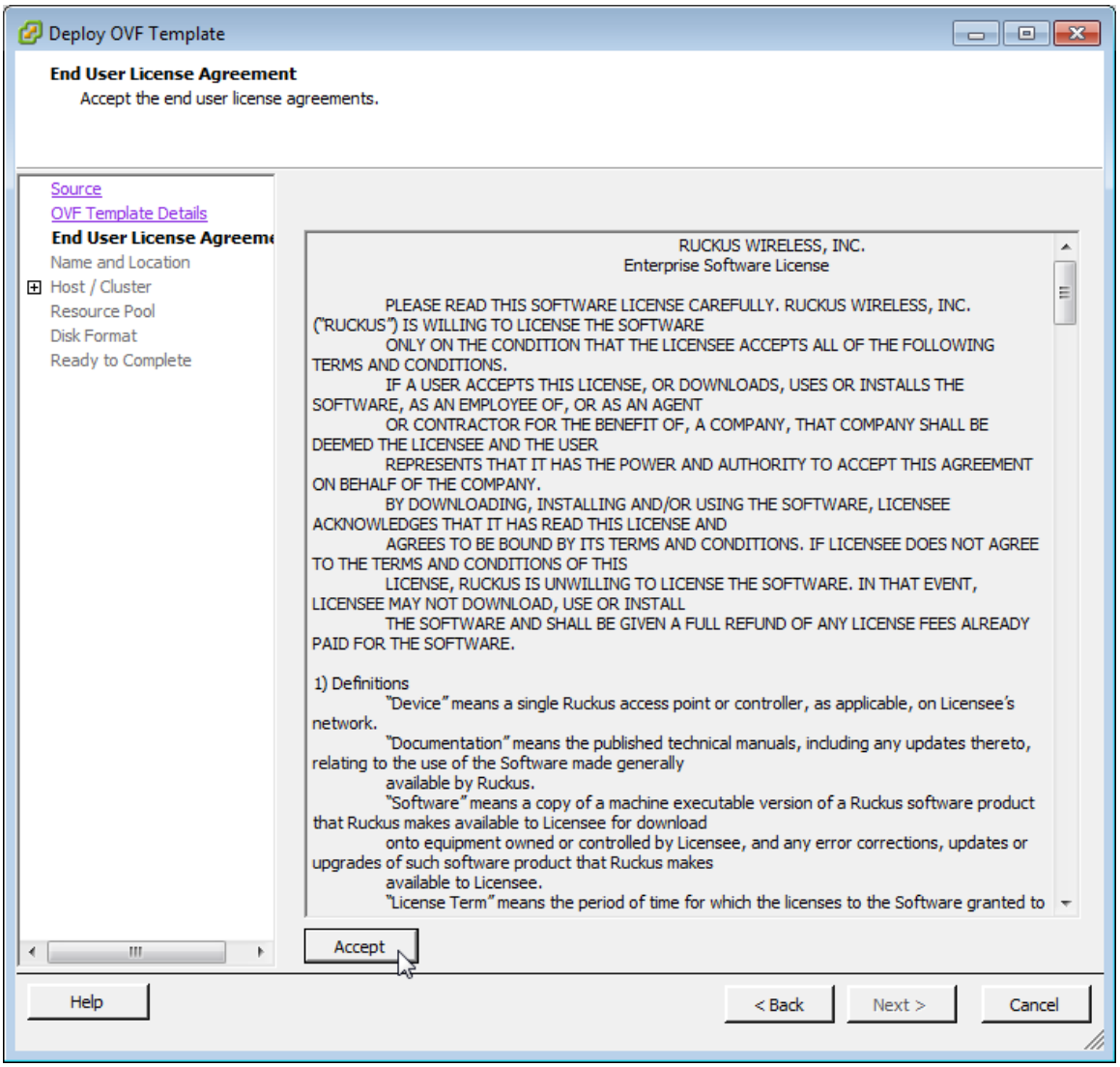
FIGURE 3 The OVF Template Details screen



5. Review the OVA virtual appliance details, and then click **Next**. The End User License Agreement (EULA) screen appears.

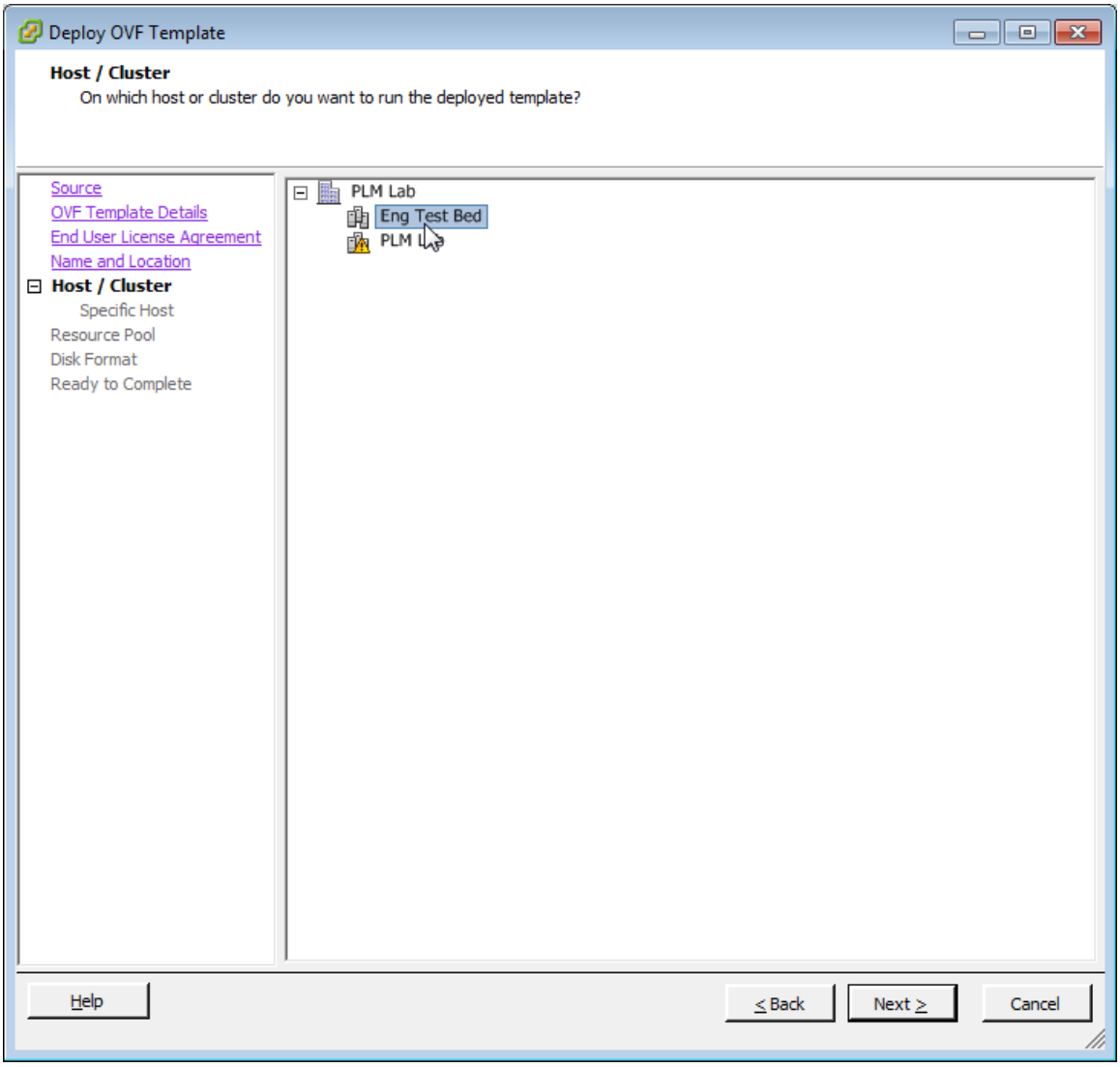
6. Click **Accept** to agree to the EULA terms, and then click **Next**. The **Host/Cluster** screen appears.

FIGURE 4 Accept the EULA for the vSZ OVA



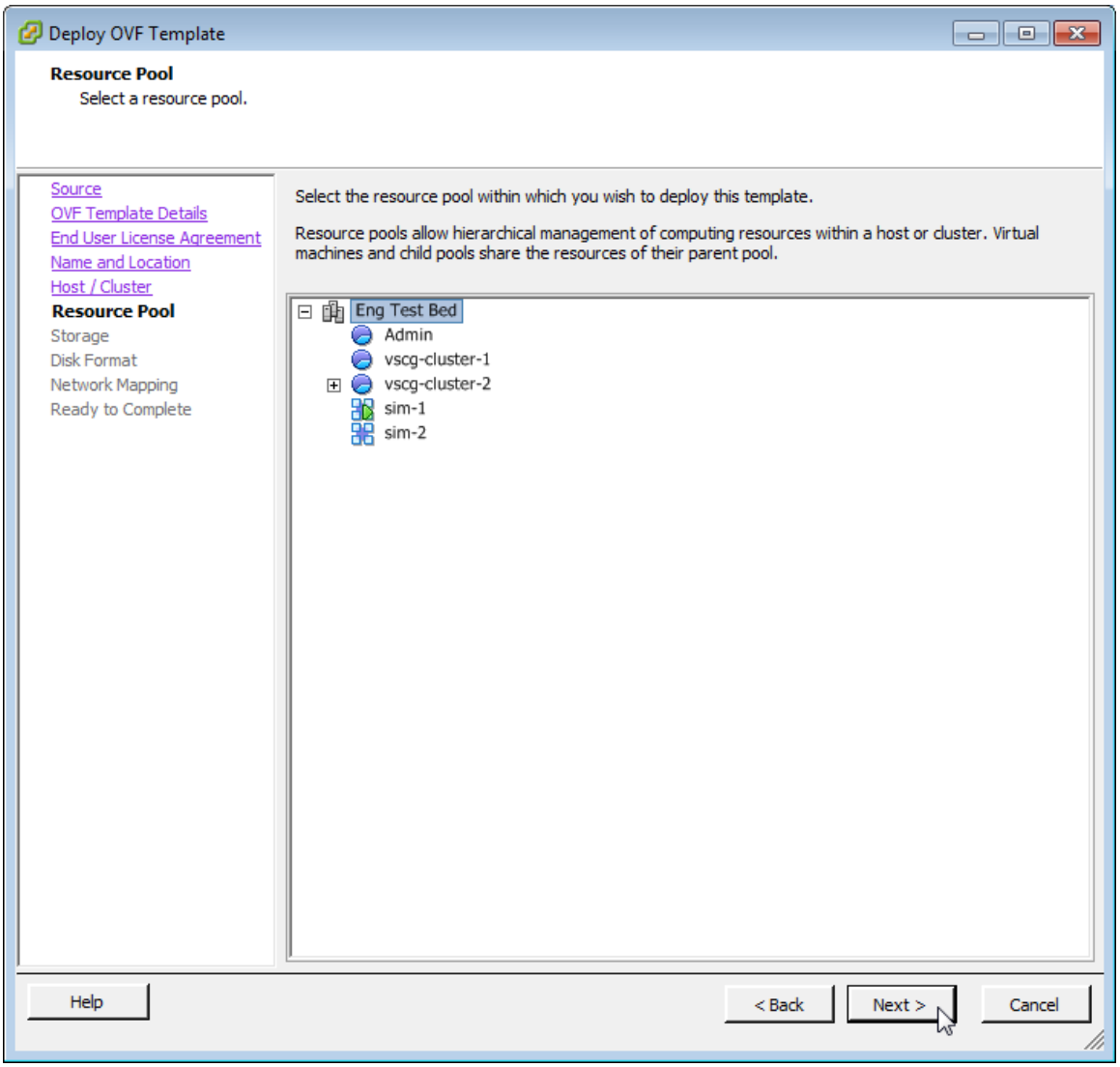
7. Select the host or cluster on which you want to run the deployed template, and then click **Next**. The **Resource Pool** screen appears.

FIGURE 5 Select the destination host or cluster



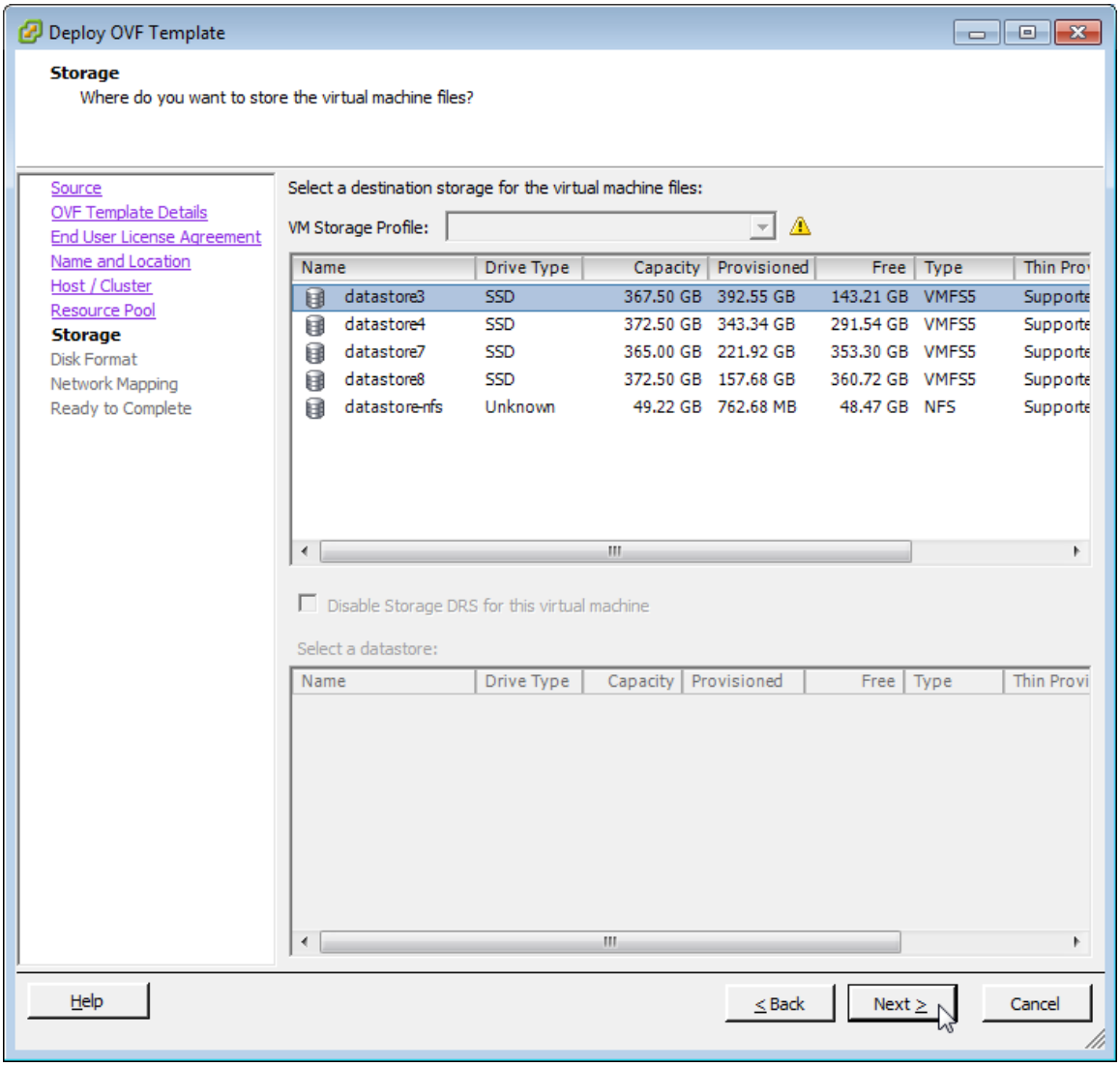
8. Select the resource pool within which you want to deploy the template, and then click **Next**. The storage screen appears.

FIGURE 6 Select the resource pool for the OVA template



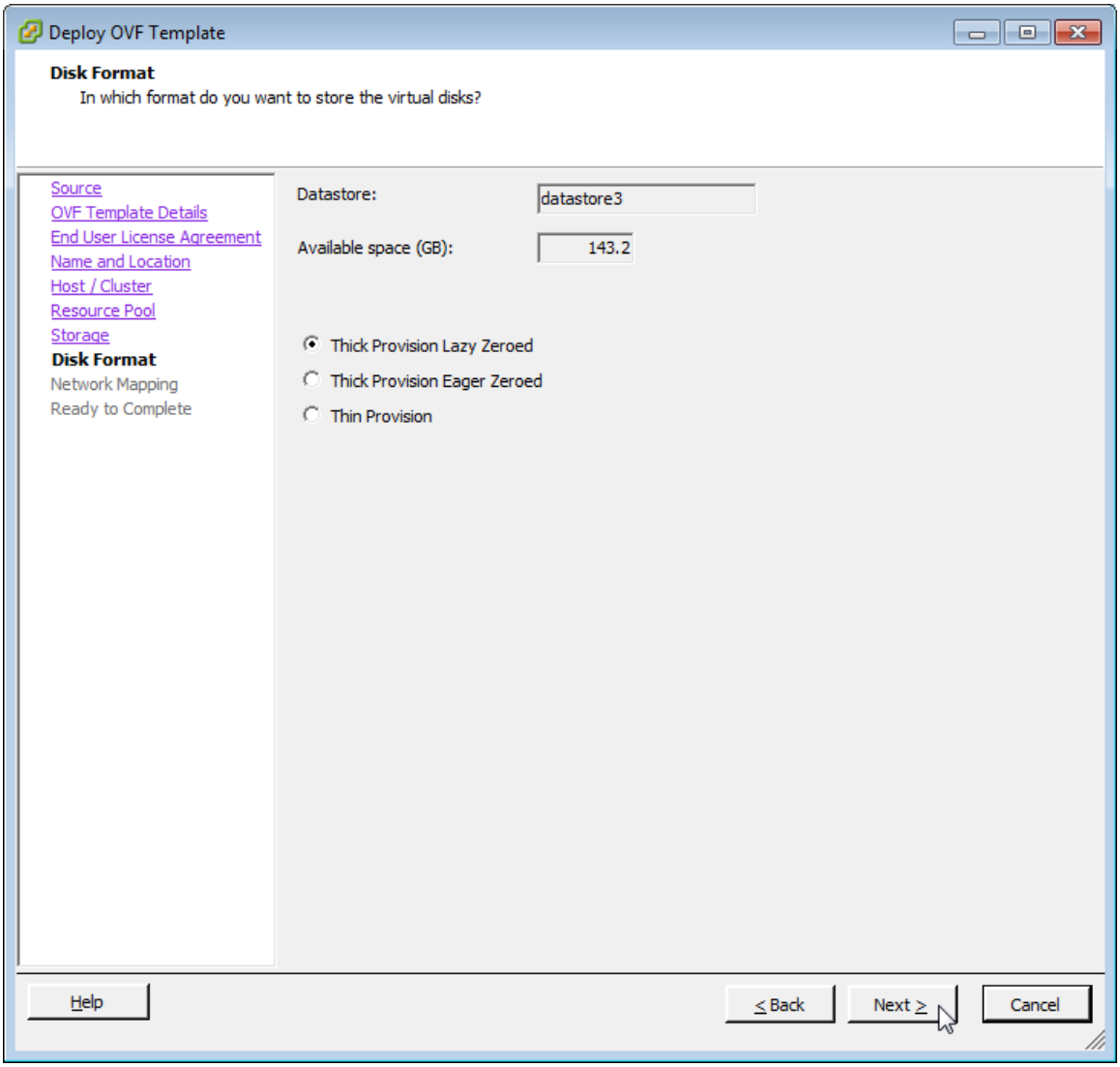
9. Select the destination storage (data store) for virtual machine files, and then click **Next**. The **Disk Format** screen appears.

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

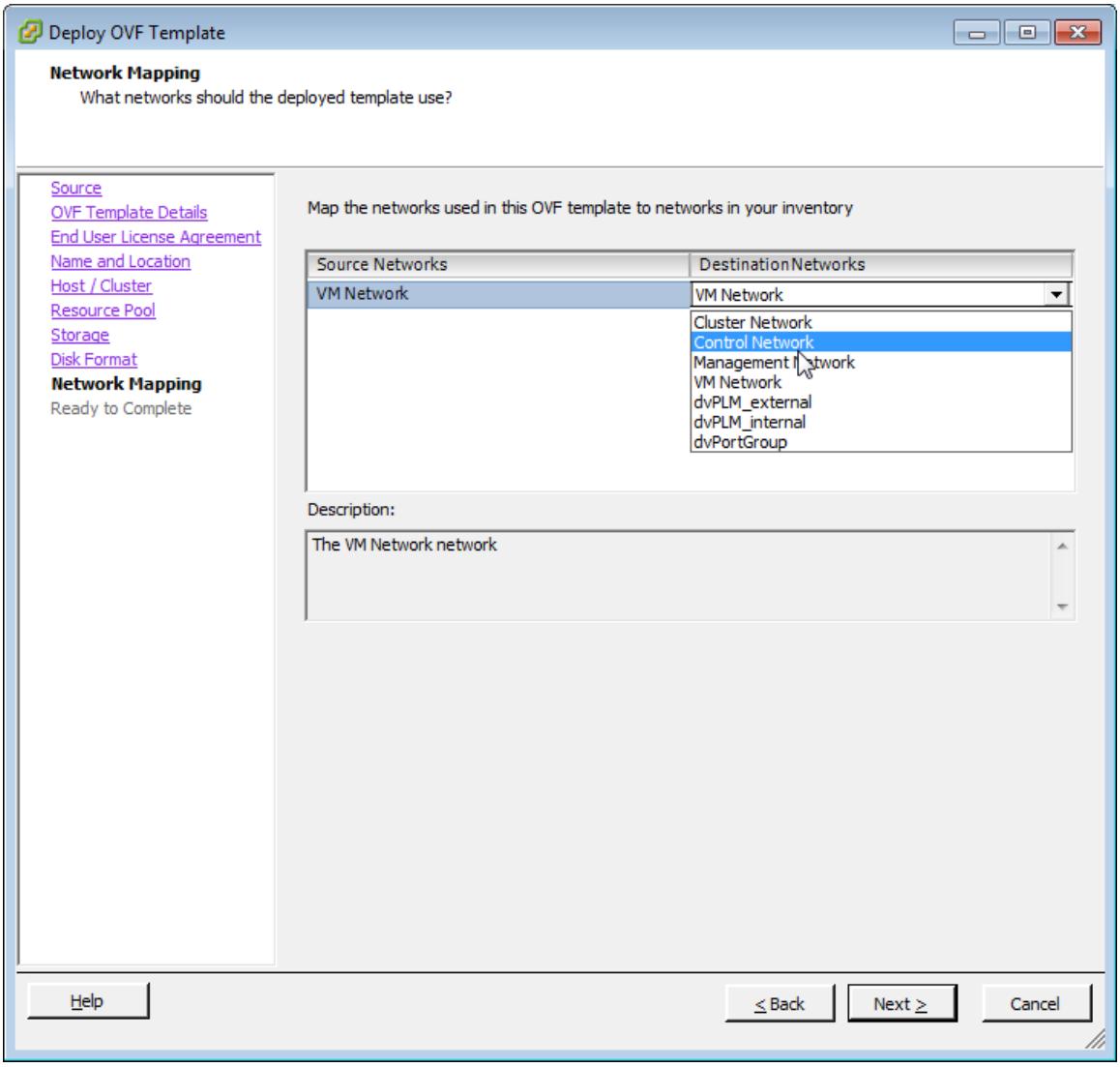


11. Click **Next**. The **Network Mapping** screen appears.

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.

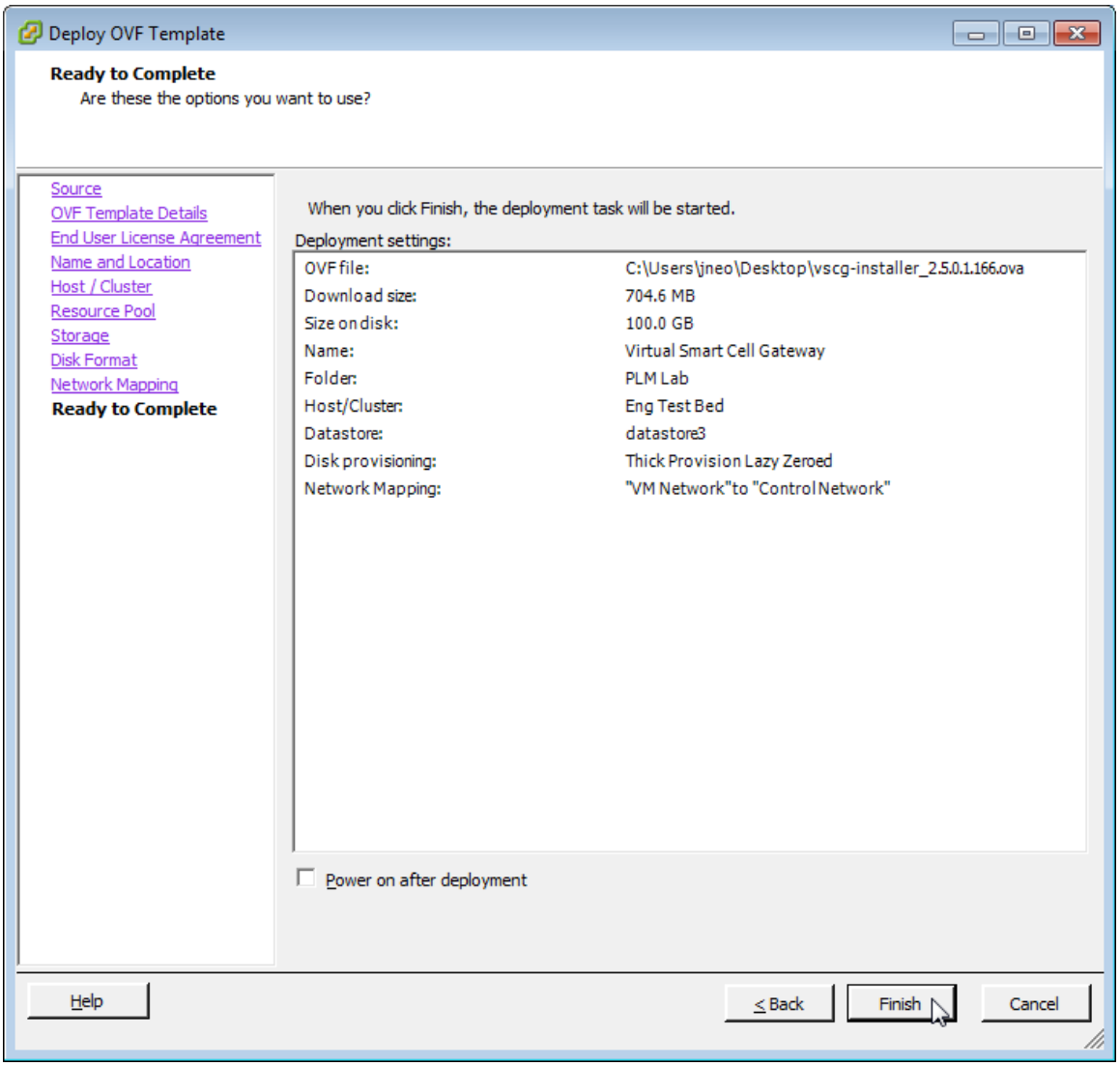
    The installation screen only allows you to select the virtual network interface for the control interface. After you complete the installation (and before you power on and set up the vSZ), you will need to adjust the cluster and management interfaces as appropriate.

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.

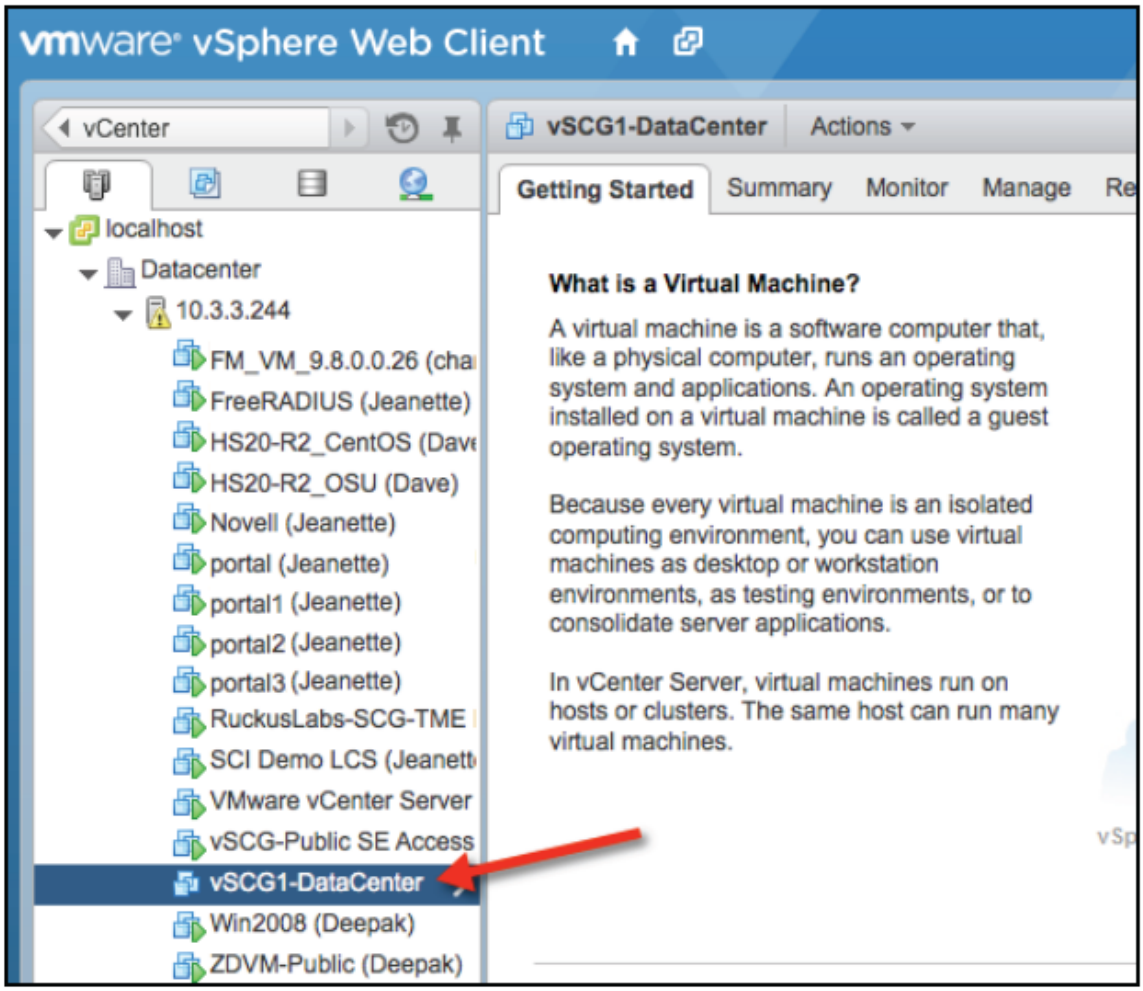
FIGURE 10 Review the settings that you have configured



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).

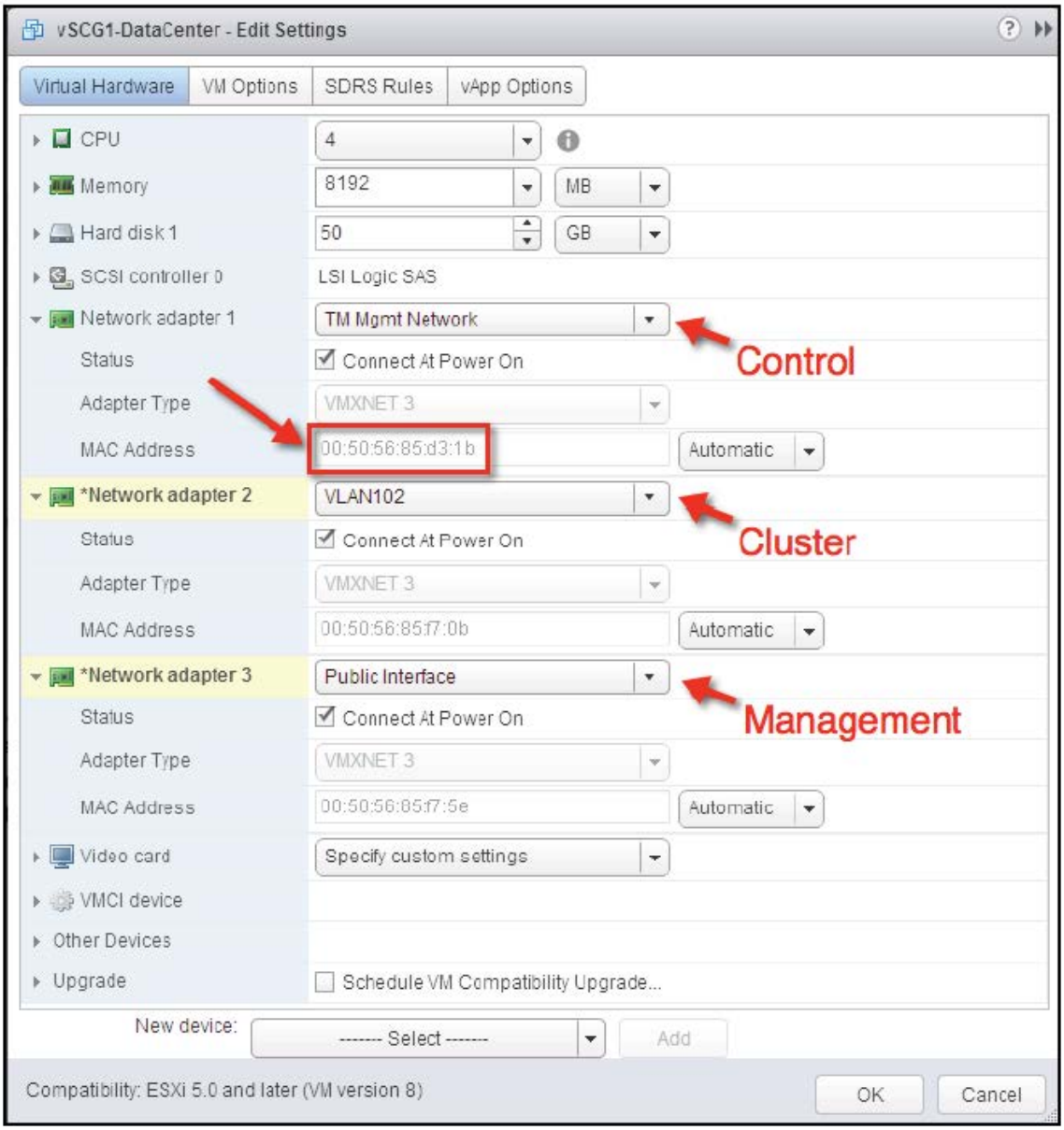
Ensure that you read steps 1-7 before starting the application.

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.

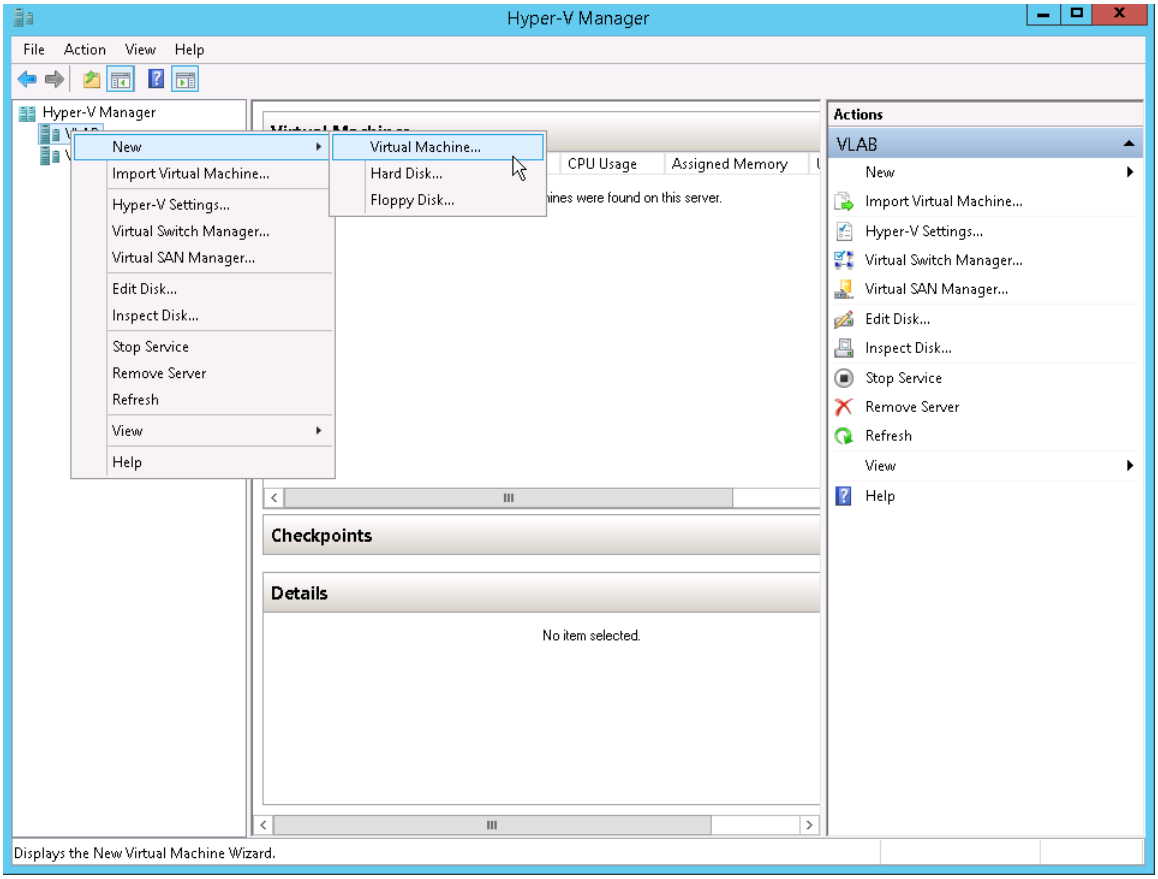
Installing the vSZ on Windows Server Hyper V

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**.

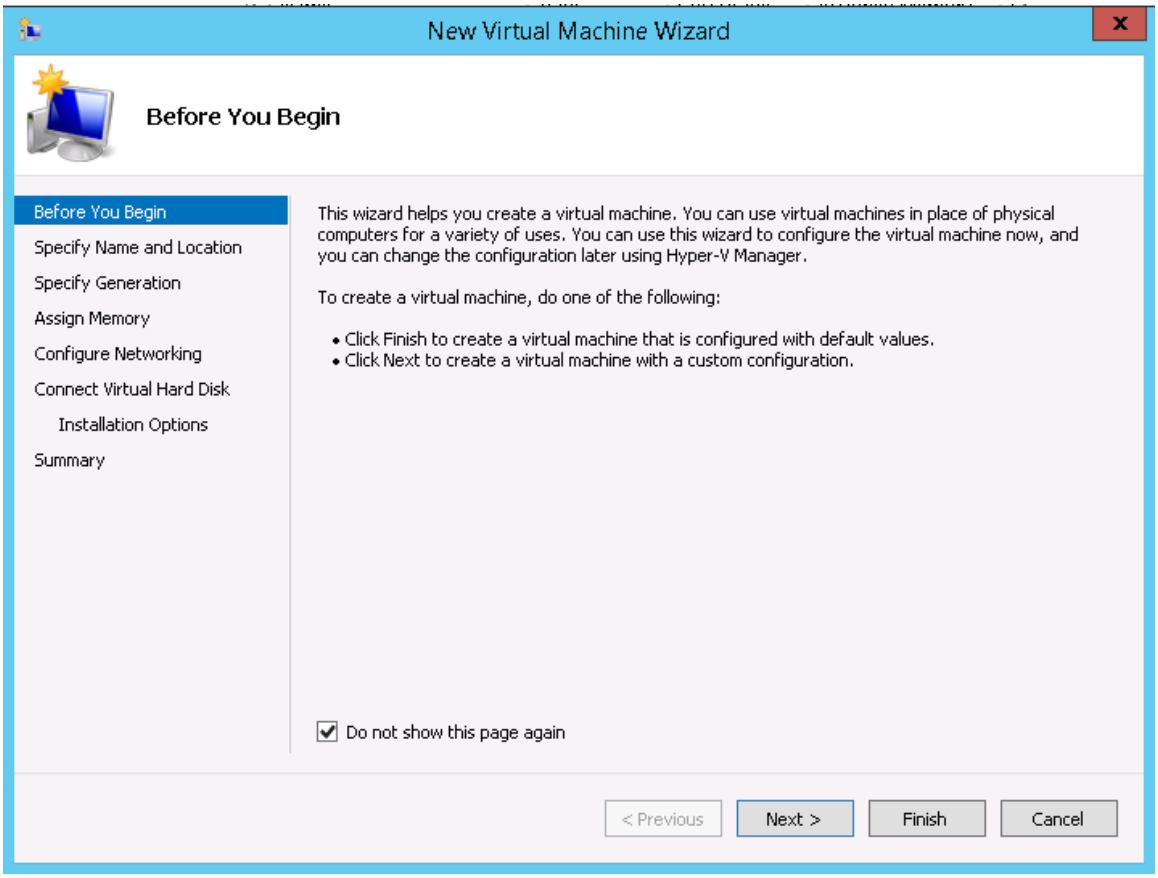
5. In the Hyper-V Manager, select the Hyper-V core for which you want to create a virtual machine and click **Virtual Machine** > **Action** > **New** > **New Virtual Machine Wizard**. The appears and displays the **Before You Begin** screen.

FIGURE 14 Click Action > New > Virtual Machine



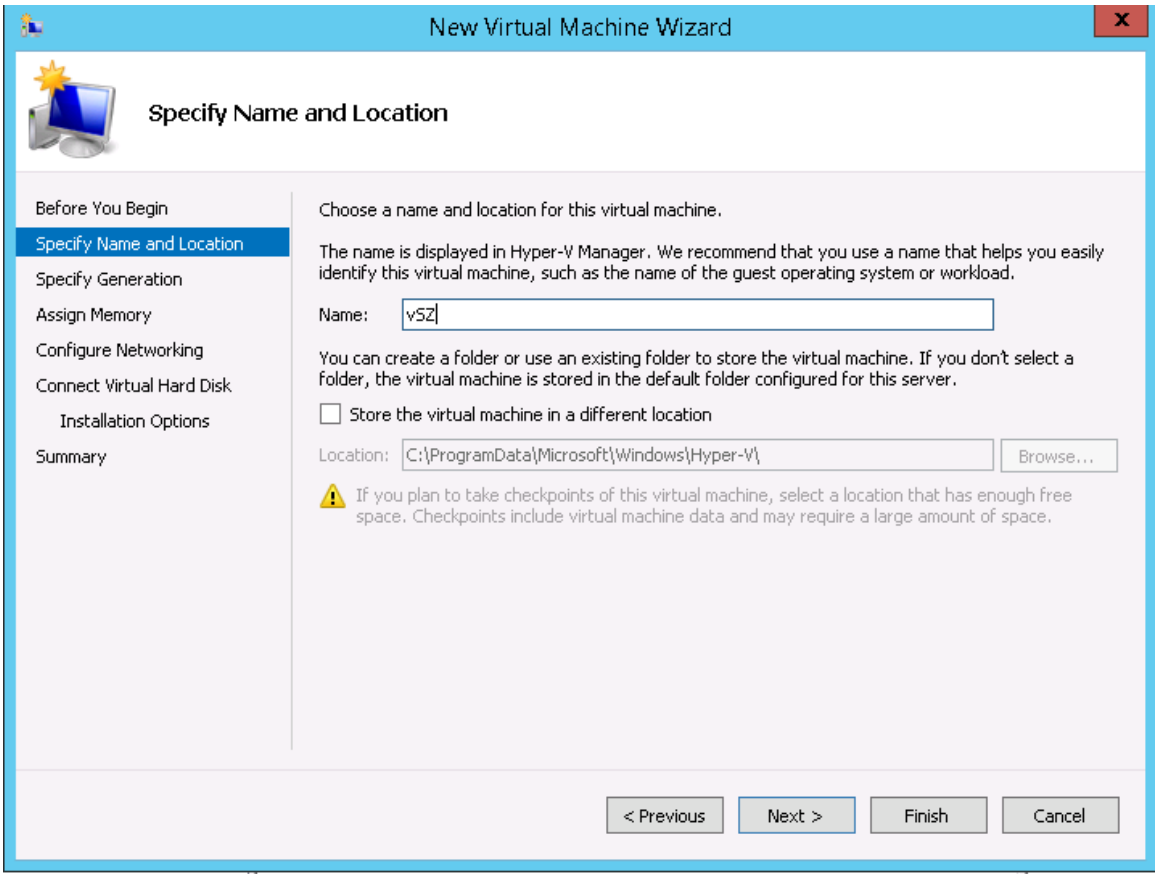
6. Click **Next**. The **Specify Name and Location** screen appears.

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).

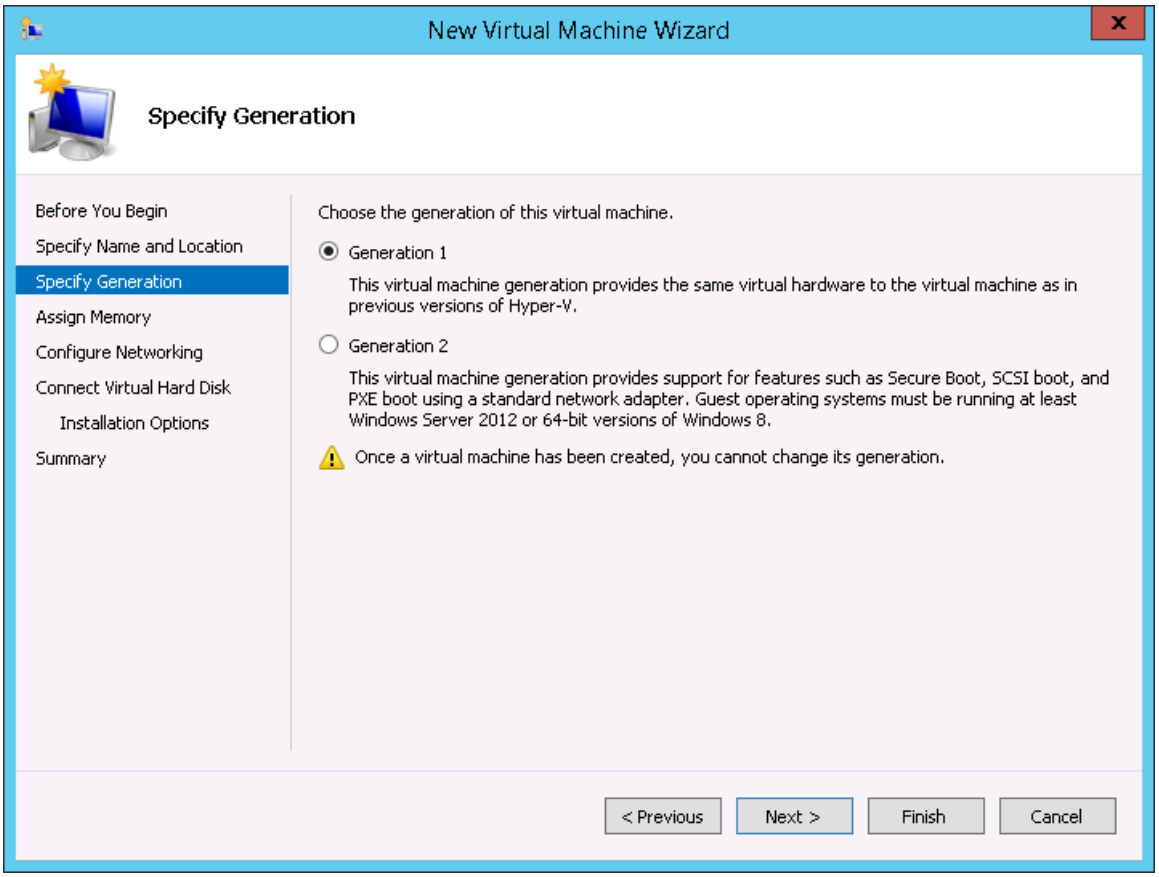
FIGURE 16 Specify Name and Location



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.

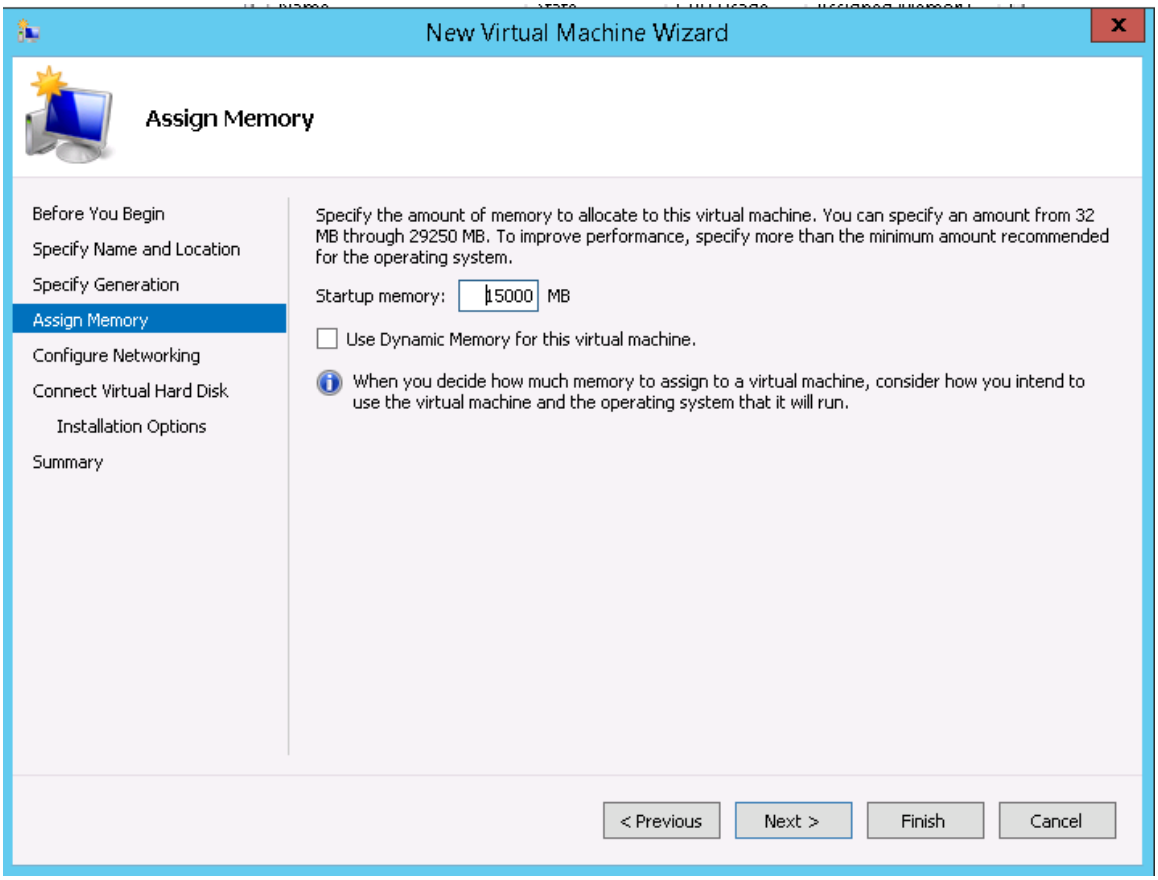
FIGURE 17 Specify Generation



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.

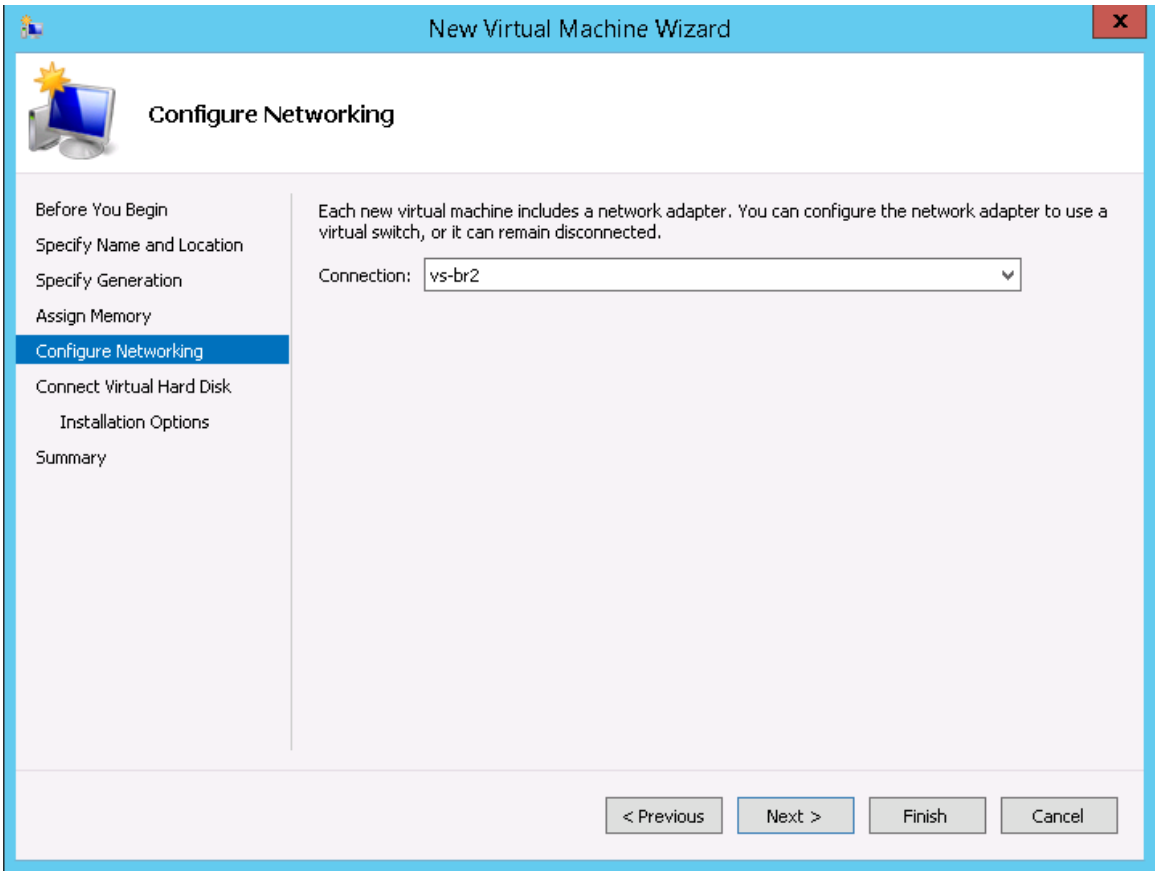
FIGURE 18 Assign Memory



12. In **Startup memory**, type 13GB for vSZ High Scale or 15GB for vSZ Essentials (as relevant), which are the minimum memory that Ruckus Networks 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**

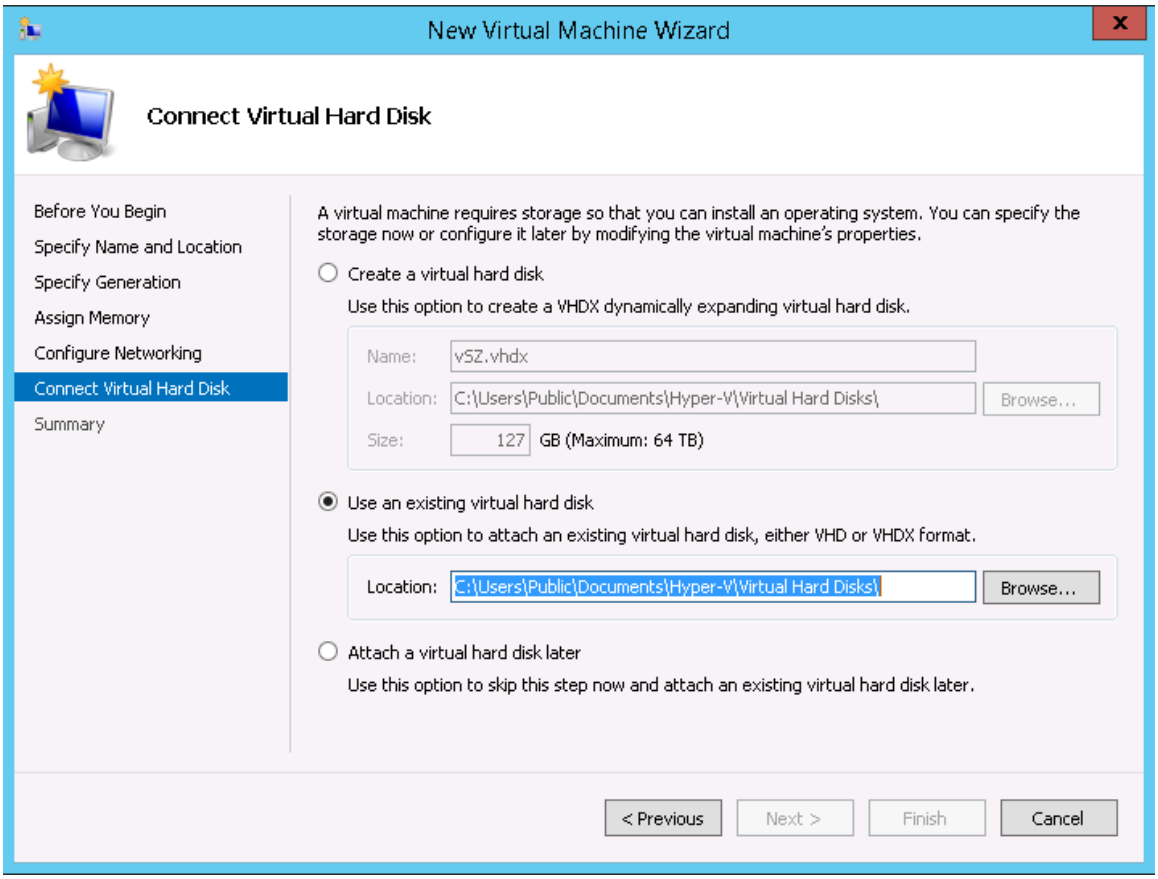
FIGURE 19 Configuring Network



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.

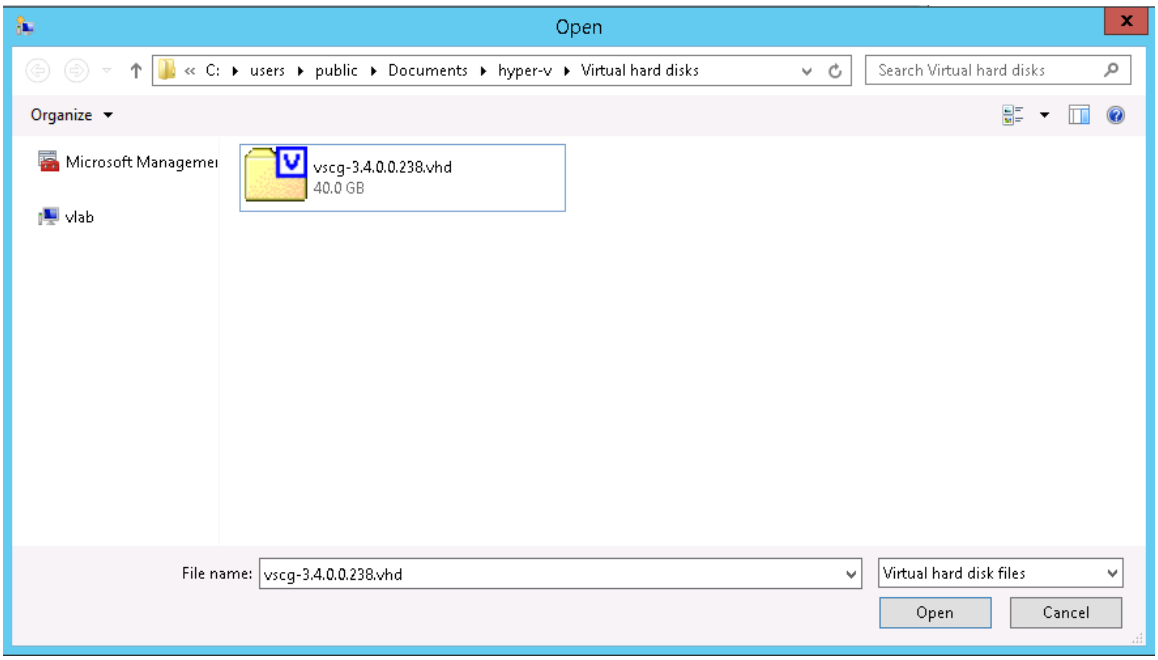
FIGURE 20 Connect Virtual Hard Disk



16. Select **Use an existing virtual hard disk**.

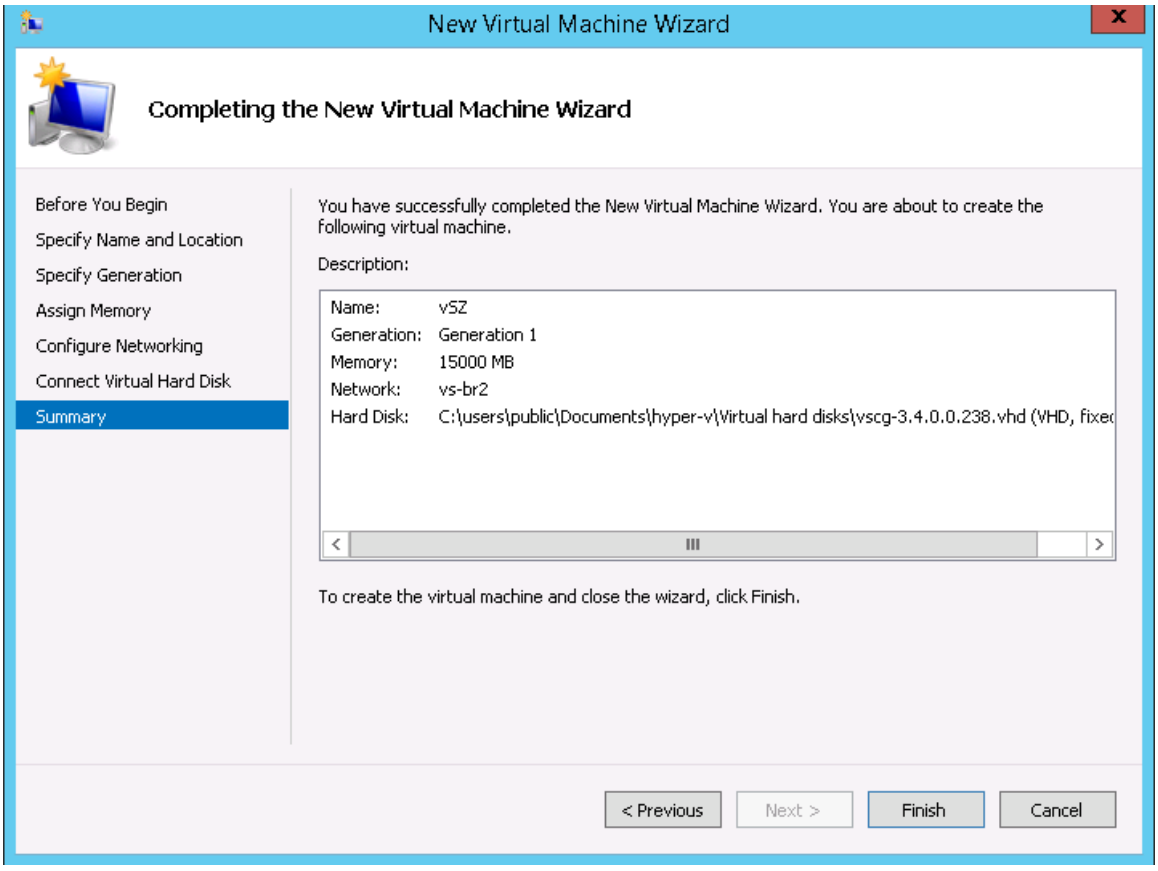
17. Click **Browse** to specify the location of the existing virtual hard disk for the virtual machine to use.

FIGURE 21 Selecting Virtual Hard Disk



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

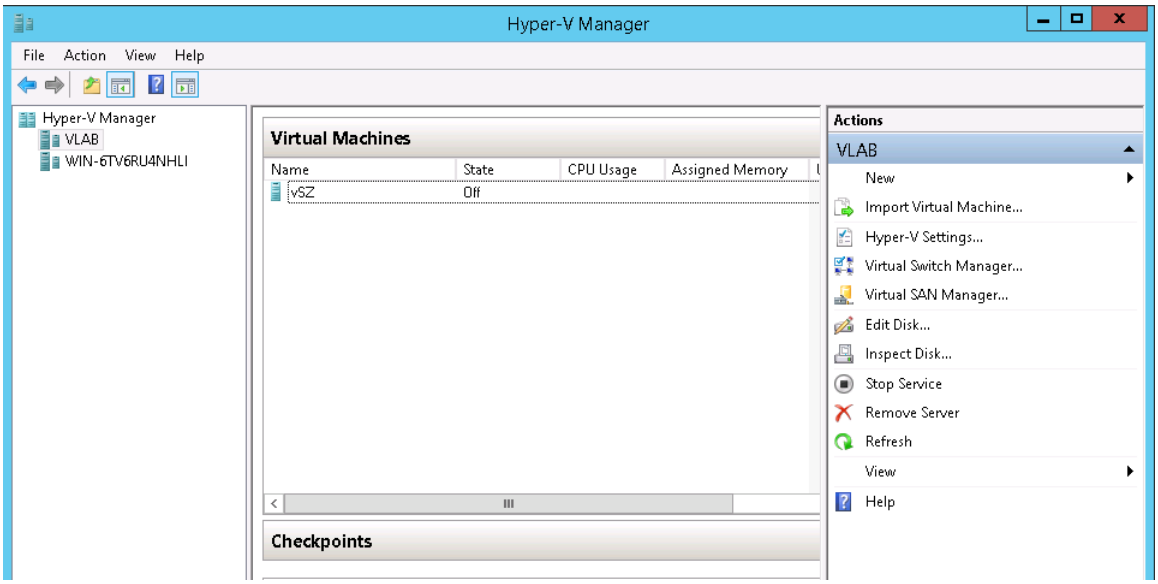
FIGURE 22 Completing New Virtual Machine Wizard



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.

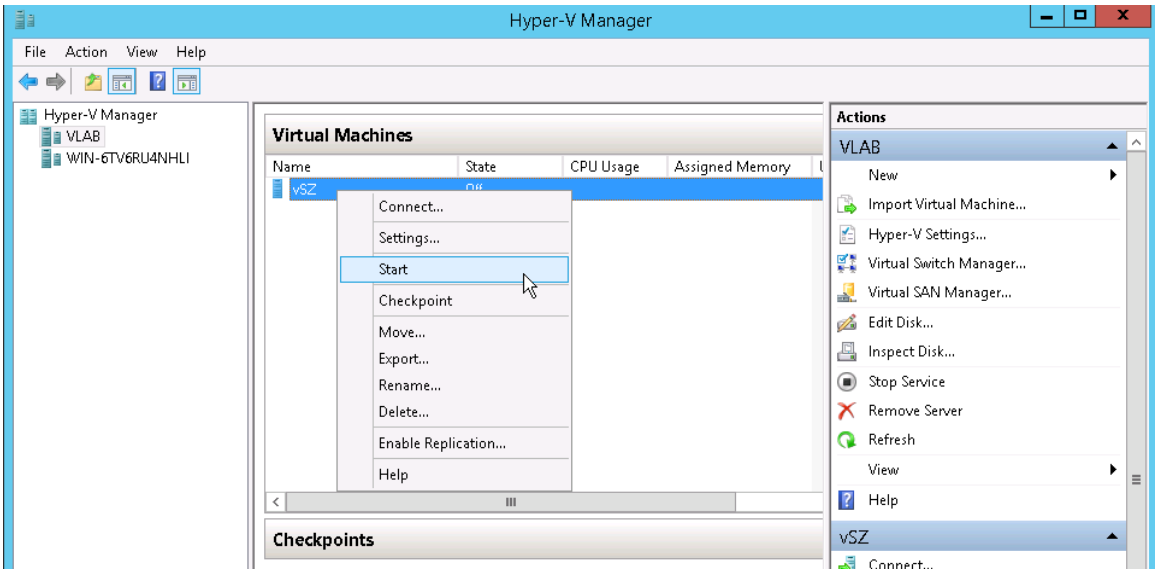
20. Click **Finish** to install the virtual machine. When Windows Server completes installing the virtual machine, the **New Virtual Machine Wizard** disappears and the virtual machine you installed appears on the list of virtual machines on Hyper-V Manager.

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



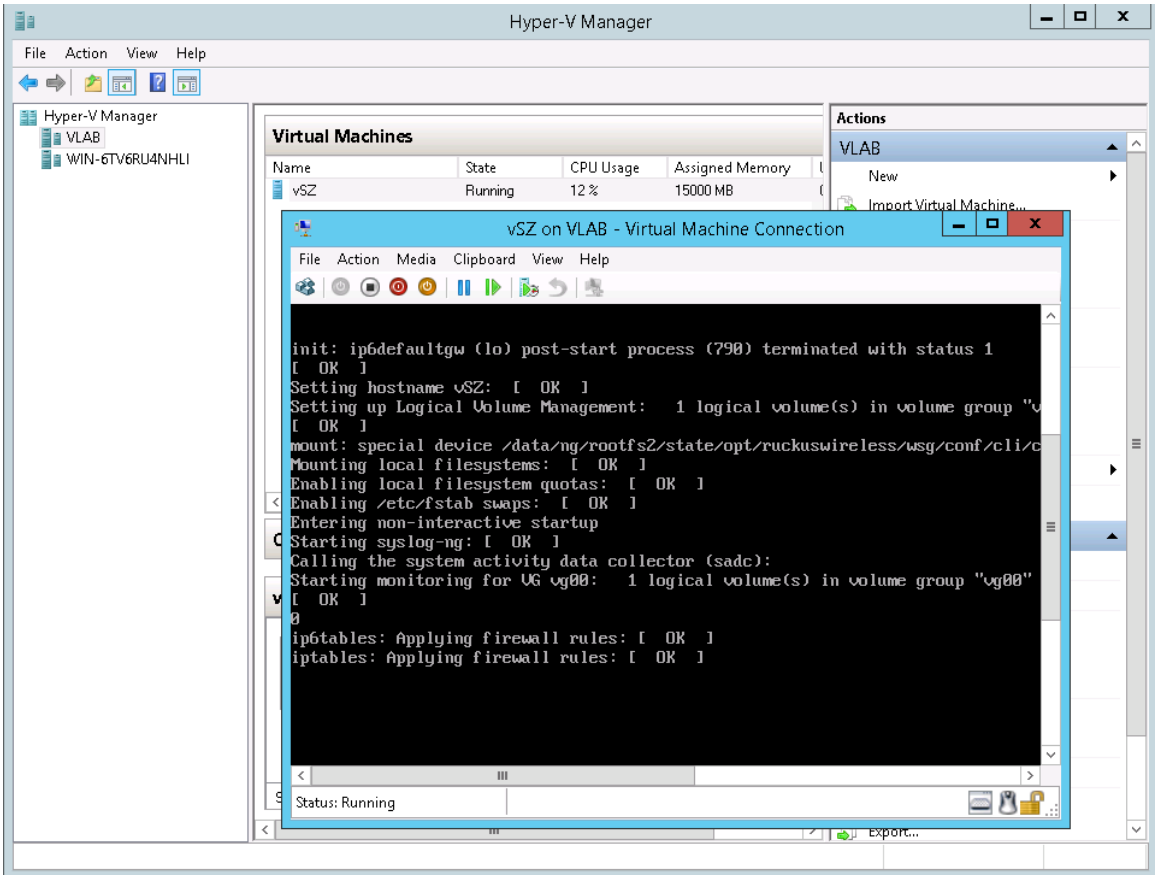
21. Right-click the virtual machine you installed, and then click **Start** to power on the virtual machine.

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.

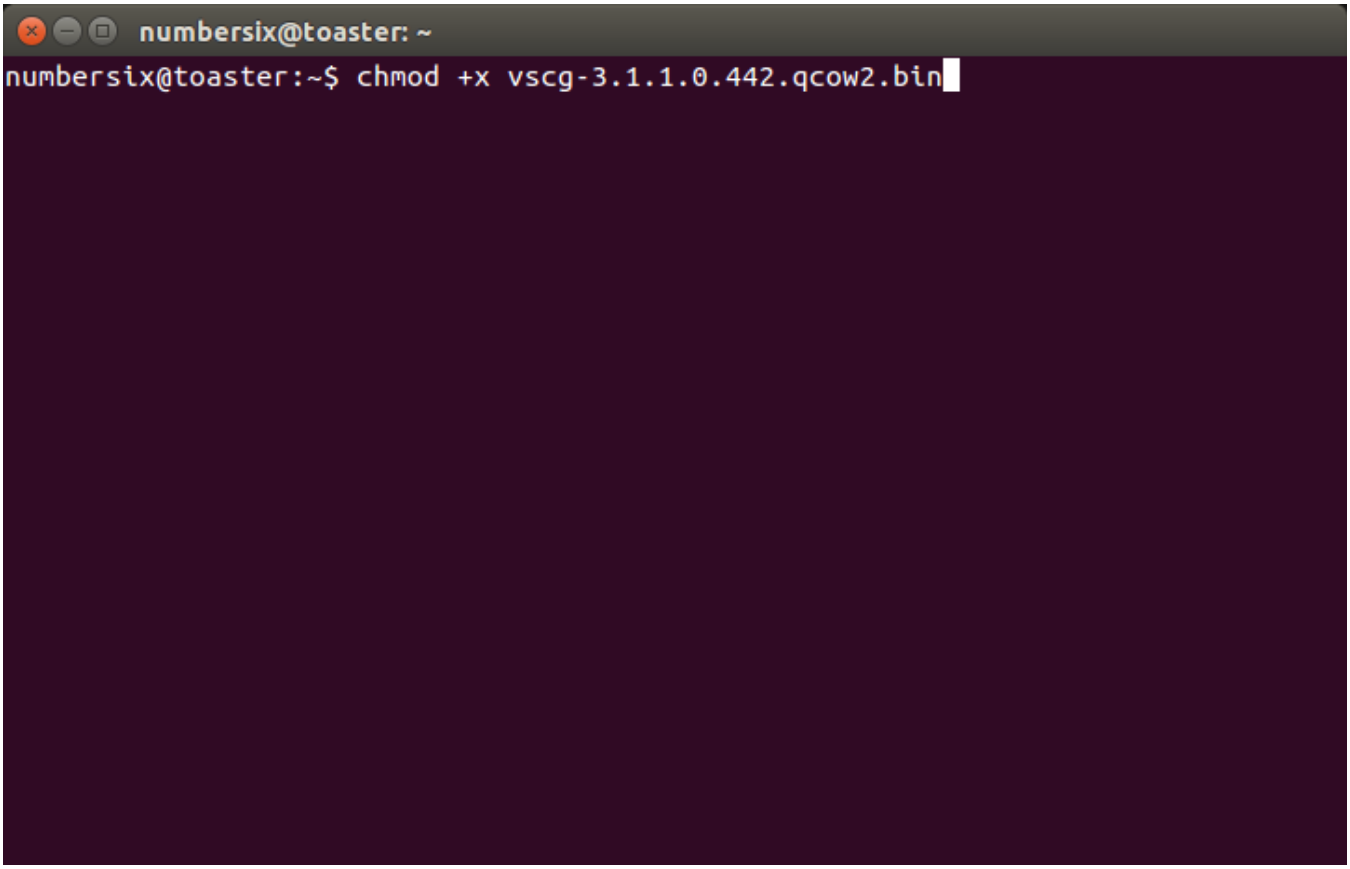
Extracting the vSZ Image

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.

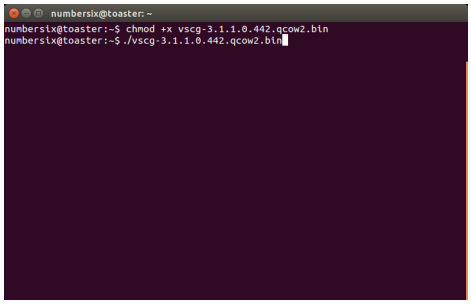
4. Make the image bin file executable by entering the following command: **chmod +x {file name of the controller QCOW bin}** See Figure for an example.

FIGURE 26 Make the bin file executable



5. Extract the contents of the QCOW2 bin file.

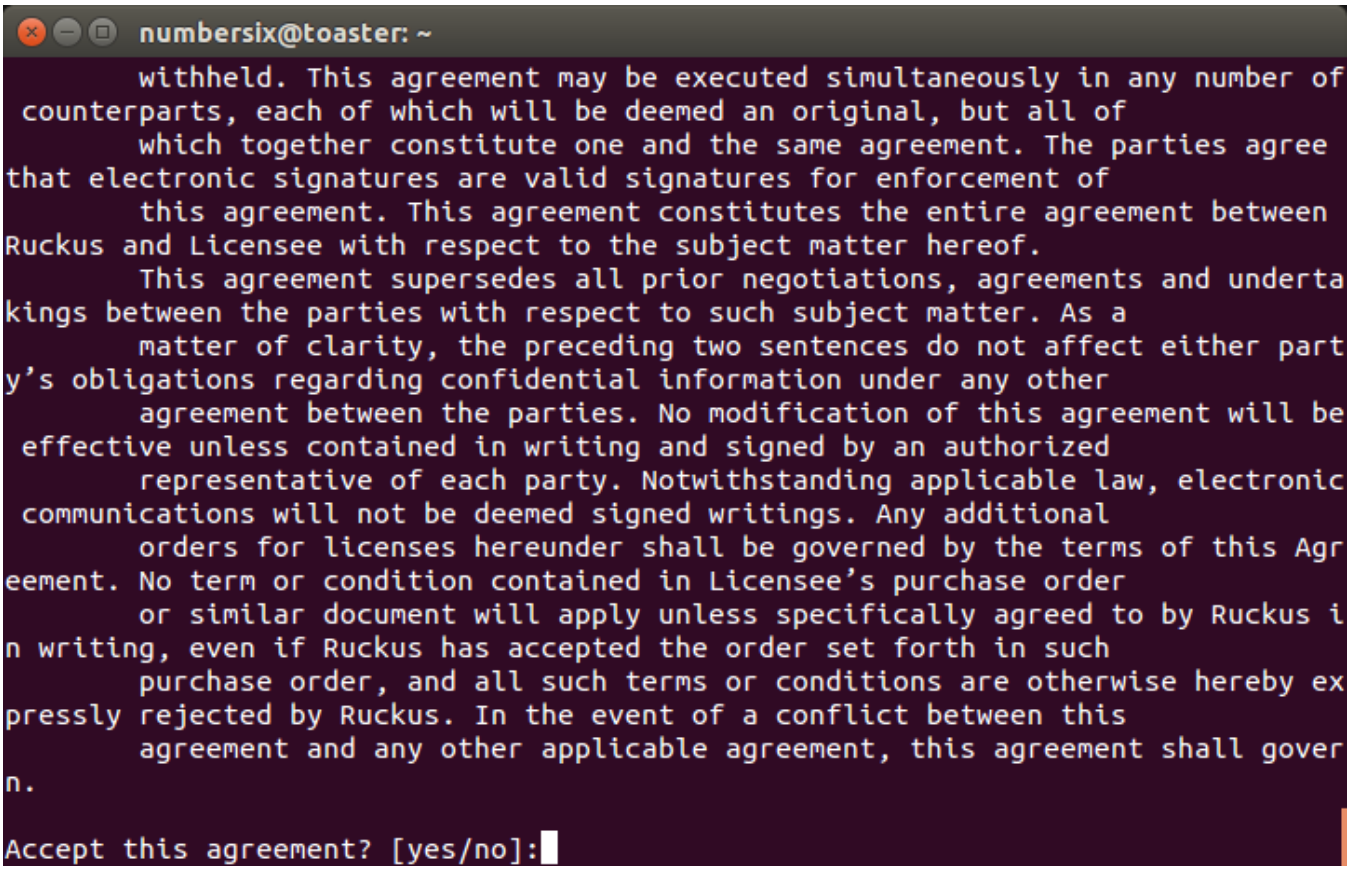
FIGURE 27 Extract the contents of the QCOW2 image



The end user license agreement appears on screen.

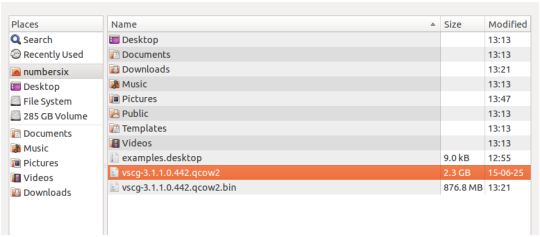
6. At the **Accept this agreement? [yes/no]** prompt, enter **yes**.

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.

FIGURE 29 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.

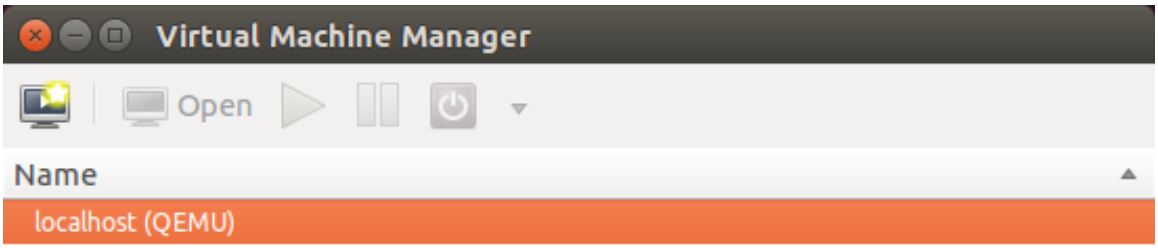
7. Resize the vSZ disk image, if necessary. By default, the vSZ disk size is 50GB. If you want to allocate more disk space to the vSZ, run the qemu-img command. The complete syntax is as follows: **qemu-img resize {file name of the controller QCOW bin} +size**

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.

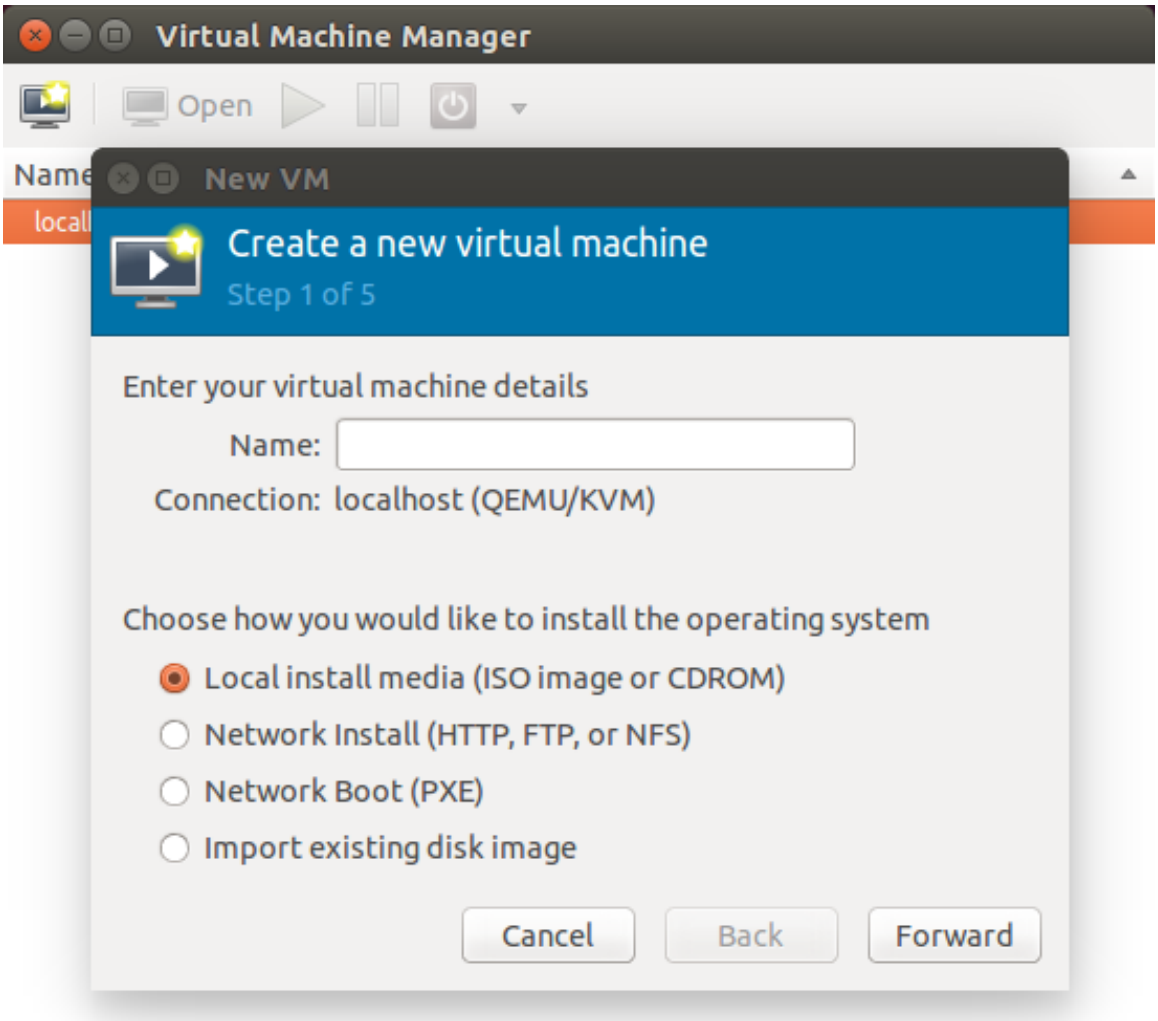
1. Start the Virtual Machine Manager by clicking Applications > System Tools > Virtual Machine Manager. Or double-click the Virtual Machine Manager icon if it appears on the desktop. The Virtual Machine Manager interface appears.

FIGURE 30 The Virtual Machine Manager interface



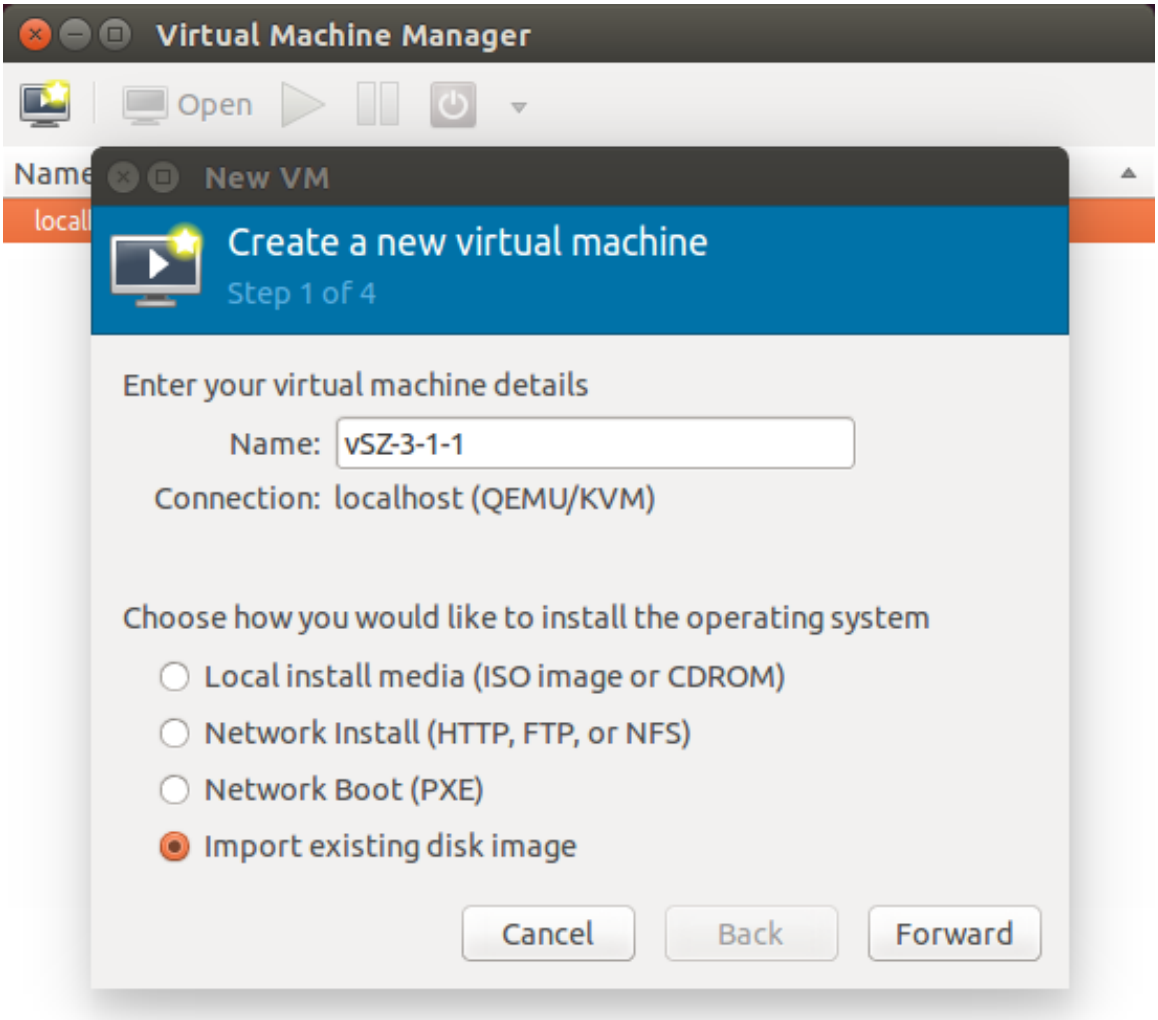
2. In **File**, click **Create New VM**. Or click the **New VM** icon. **The New VM** screen appears

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**.

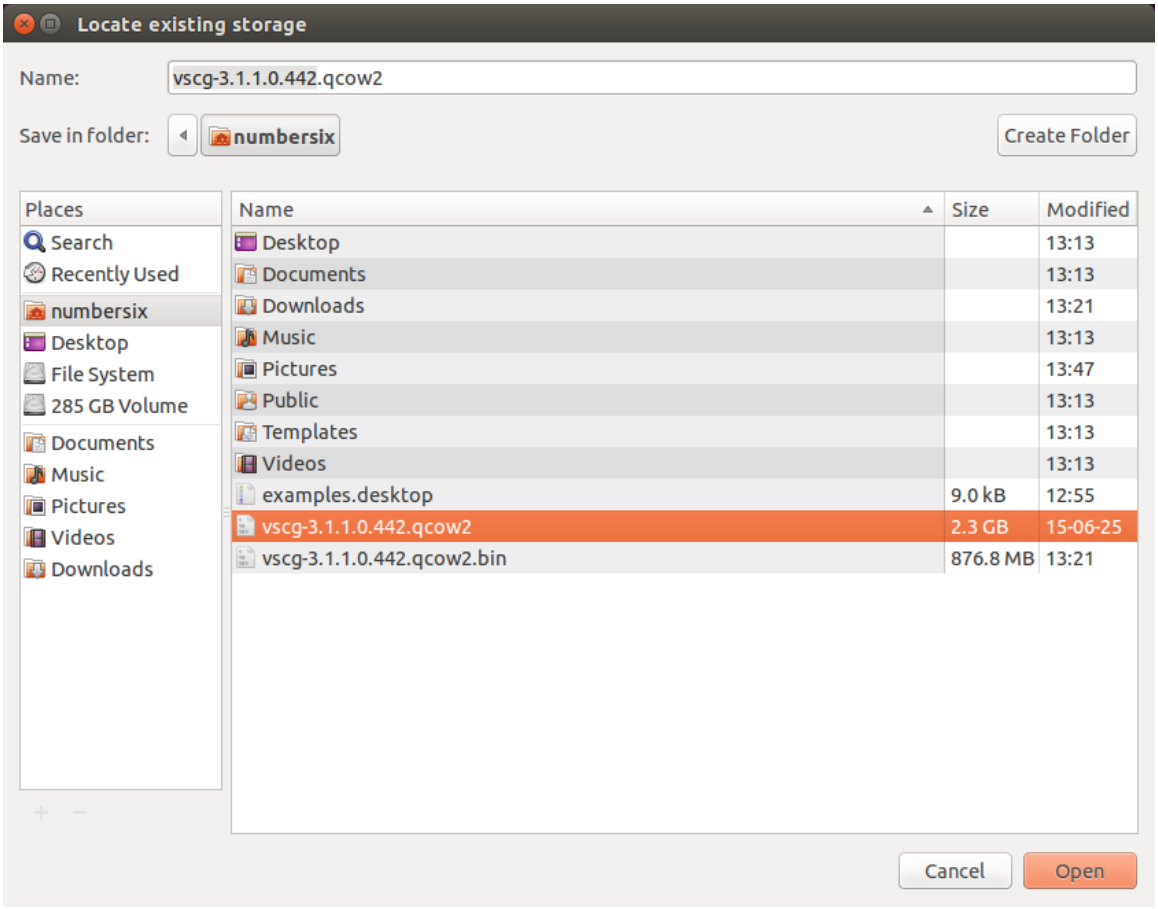
FIGURE 32 Type a name and select how you want to install the operating system



4. Click **Forward**. The **Locate Existing Storage** dialog box appears.

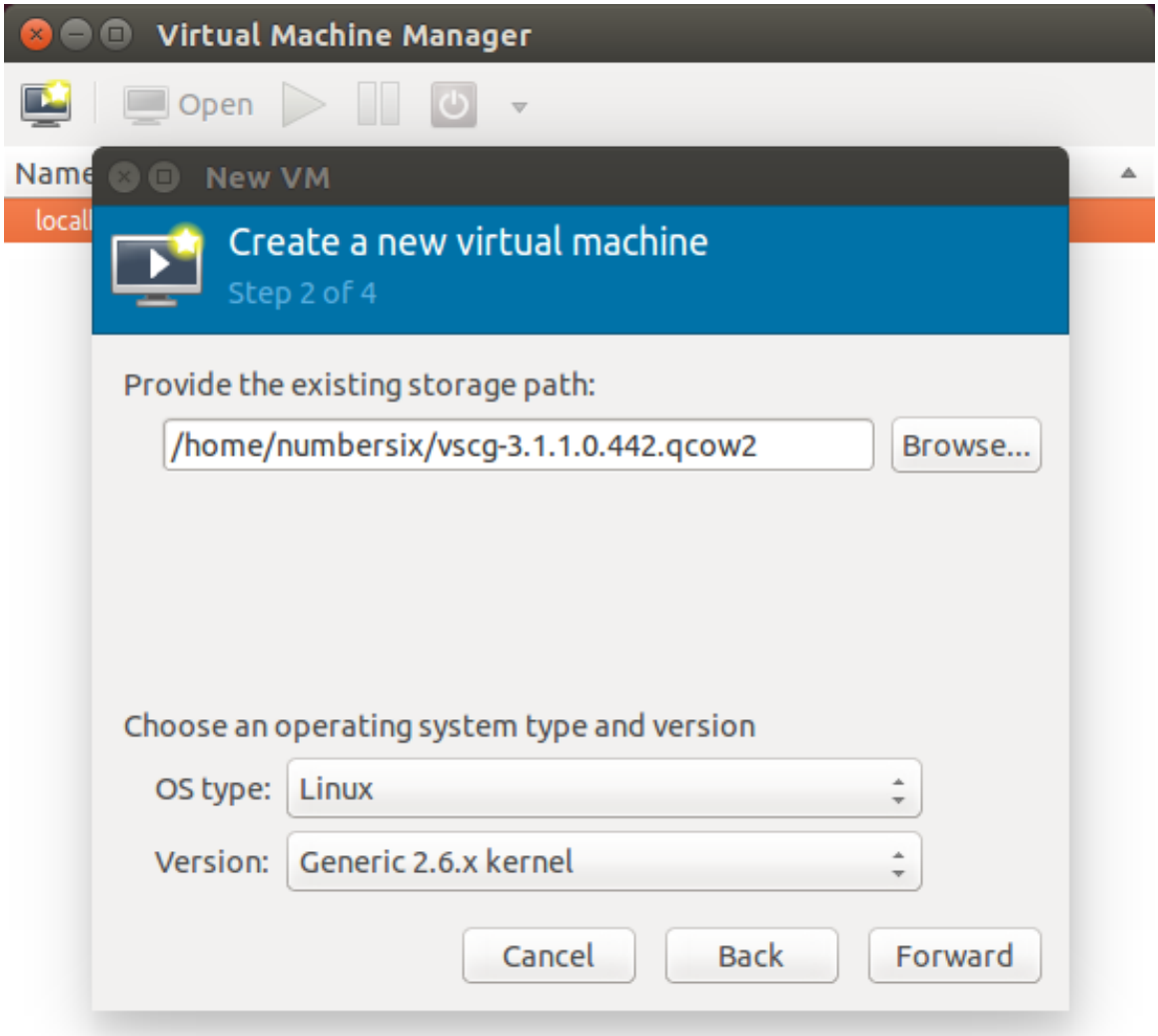
5. Browse to the location of the vSZ QCOW2 image, select the image file, and then click Open. The **New VM (Step 2 of 4)** screen reappears and displays the storage path to the QCOW2 image file that you selected.

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**.

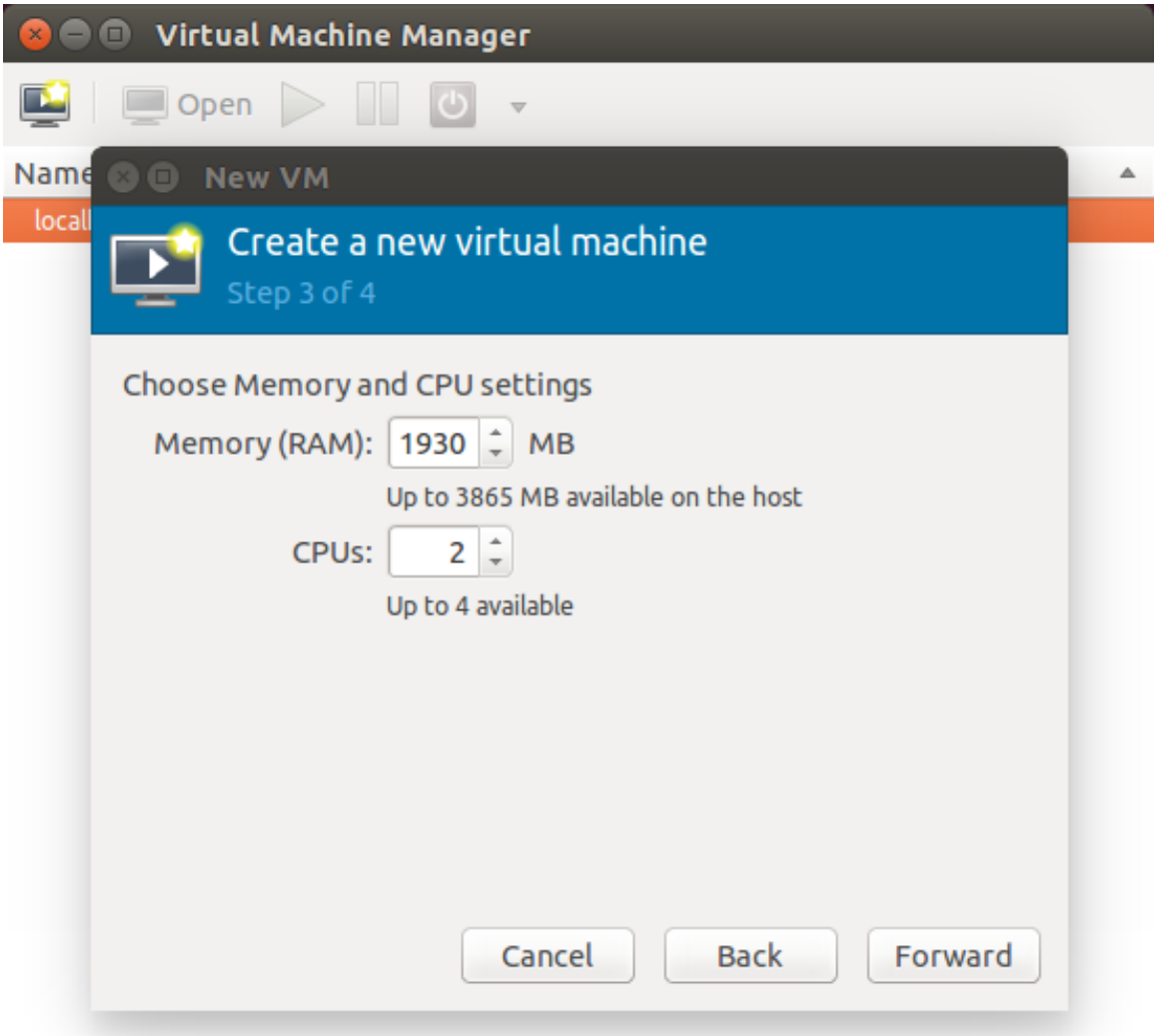
FIGURE 34 Select the operating system and version



7. Click **Forward**. The **New VM (Step 3 of 4)** screen appears.

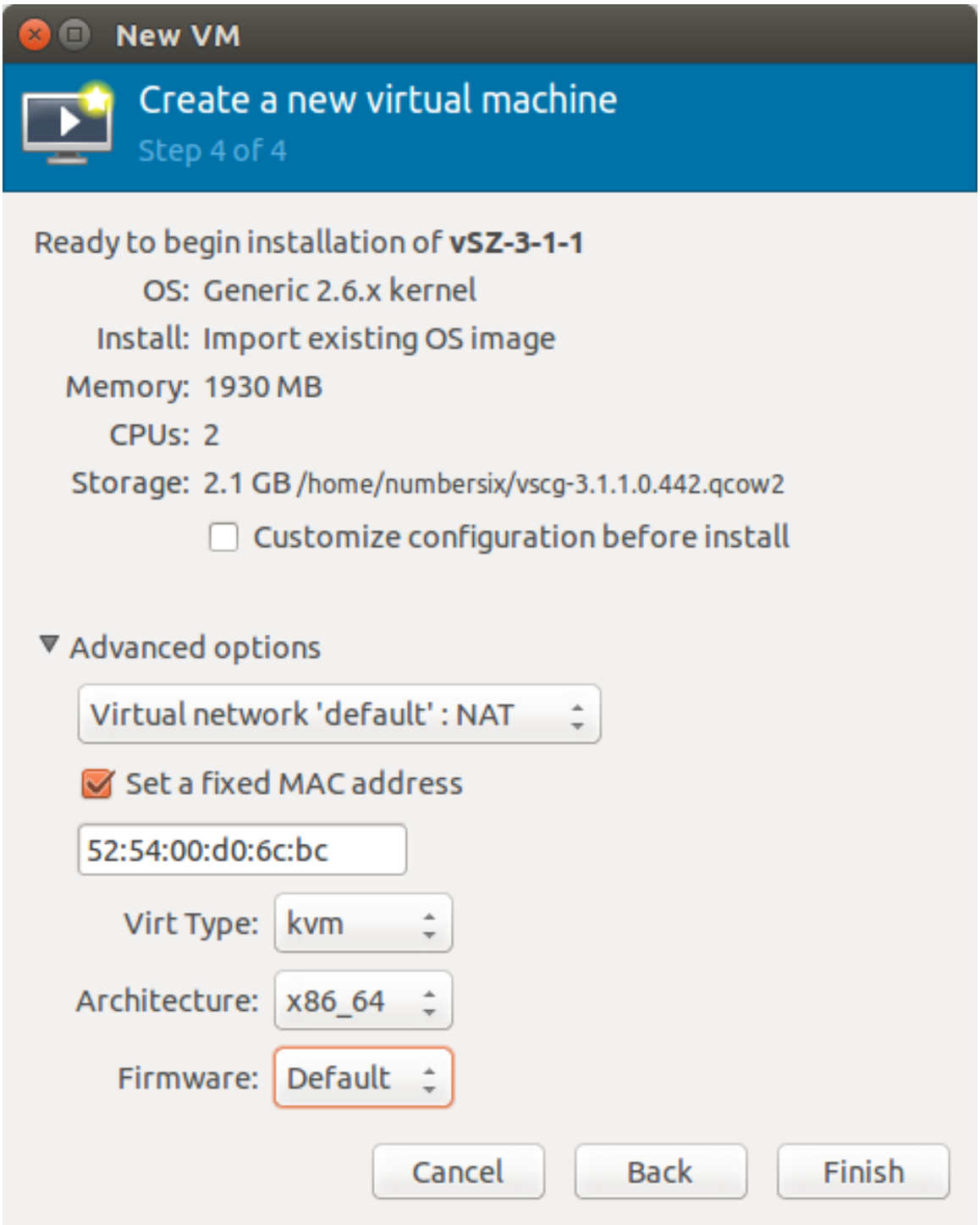
8. Configure the memory and CPU settings of the virtual machine.
   a) In **Memory (RAM)**, set to memory (in MB) that you want to allocate to the vSZ.
   b) In **CPU**, set the number of CPUs that you want to allocate to the vSZ.

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.

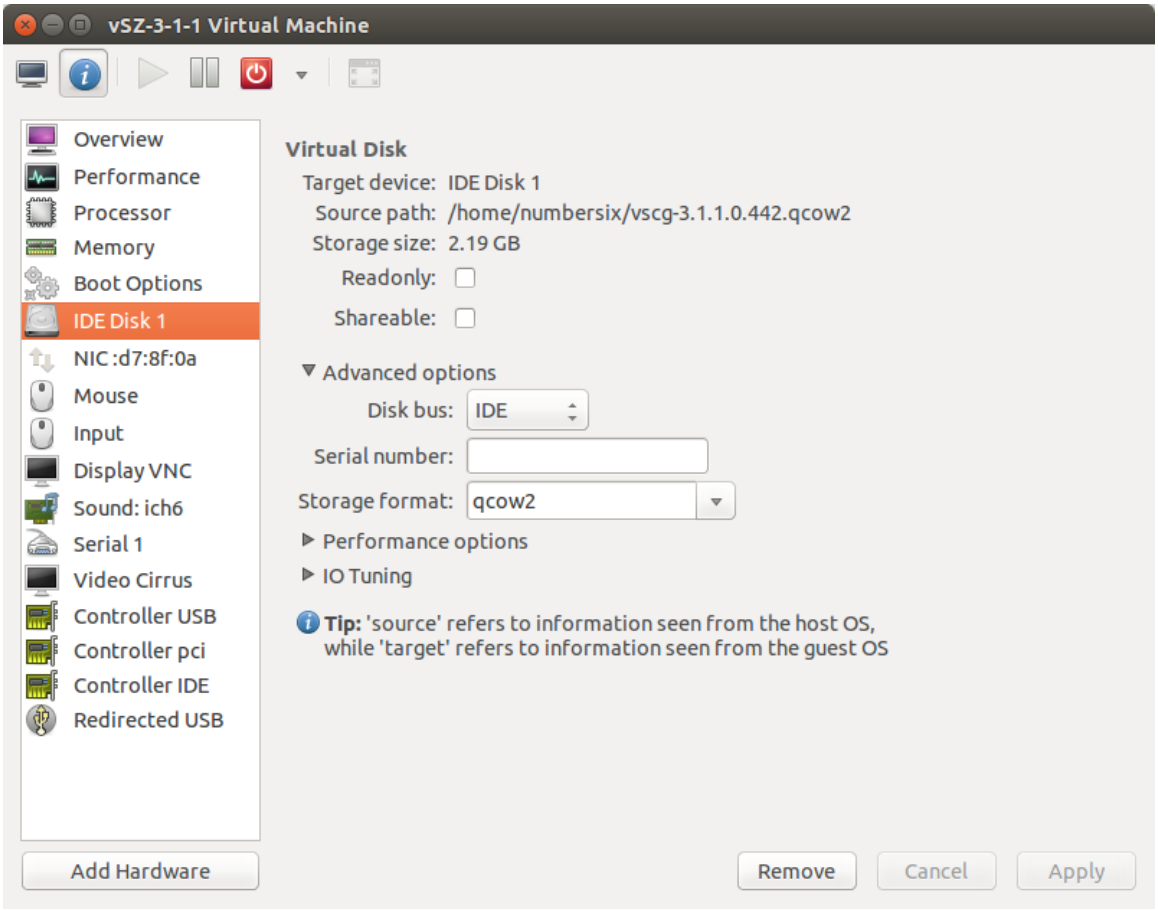
FIGURE 36 A summary of the settings you configured appears



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

Introduction

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 the tables in GUID-01F2862D-ABB3-4B66-9011-171D53EB555B in the Installation Preparation chapter.

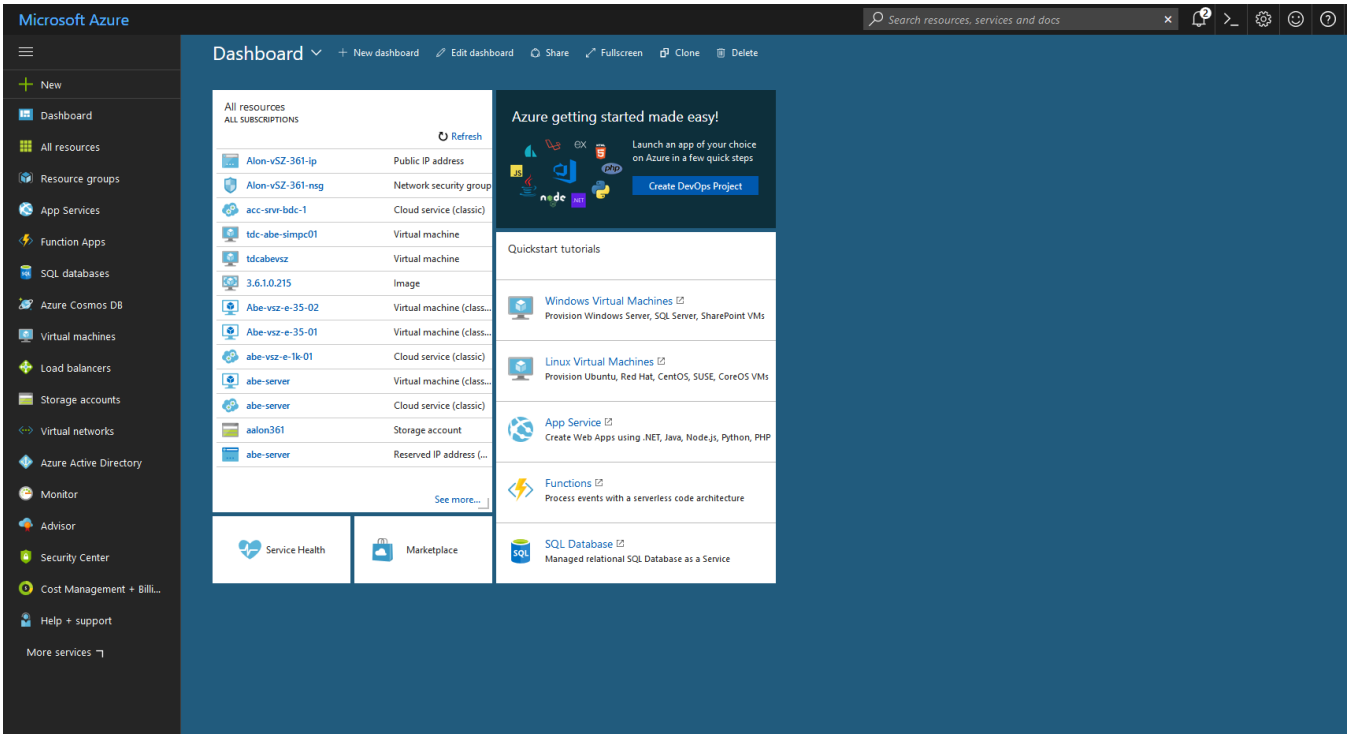
Logging into Microsoft Azure

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

Click https://portal.azure.com to access the **Microsoft Azure** site.

The Azure portal appears as shown in the following image.

FIGURE 38 Portal Tab

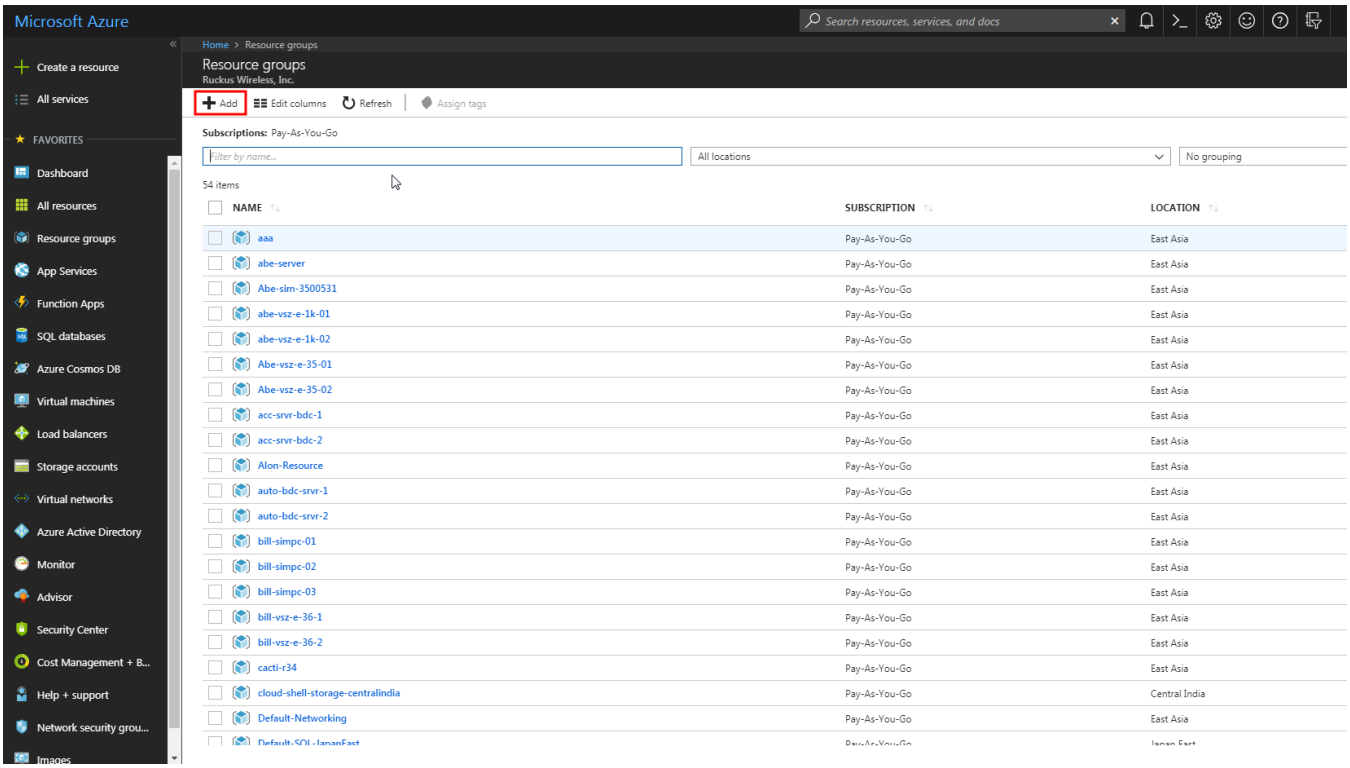


Creating a Resource Group

To create a resource group:

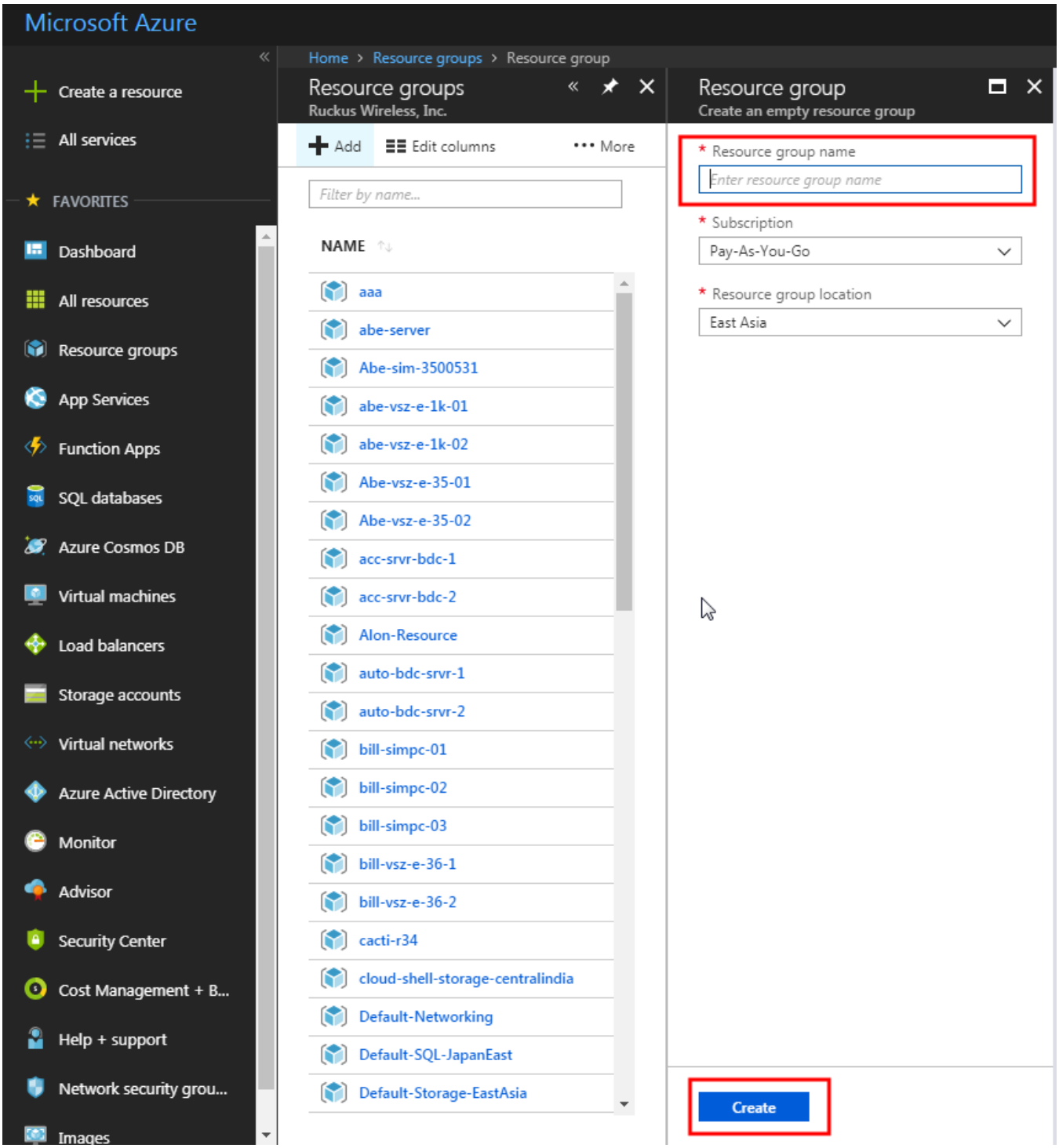
1. From the left pane of the **Microsoft Azure** page, click **Resource groups**. The **Resource groups** page appears with the list of existing resource groups as shown in the following image.

FIGURE 39 Resource Groups



2. Click the **Add +** button and enter the **Resource group name** as shown in the following image.

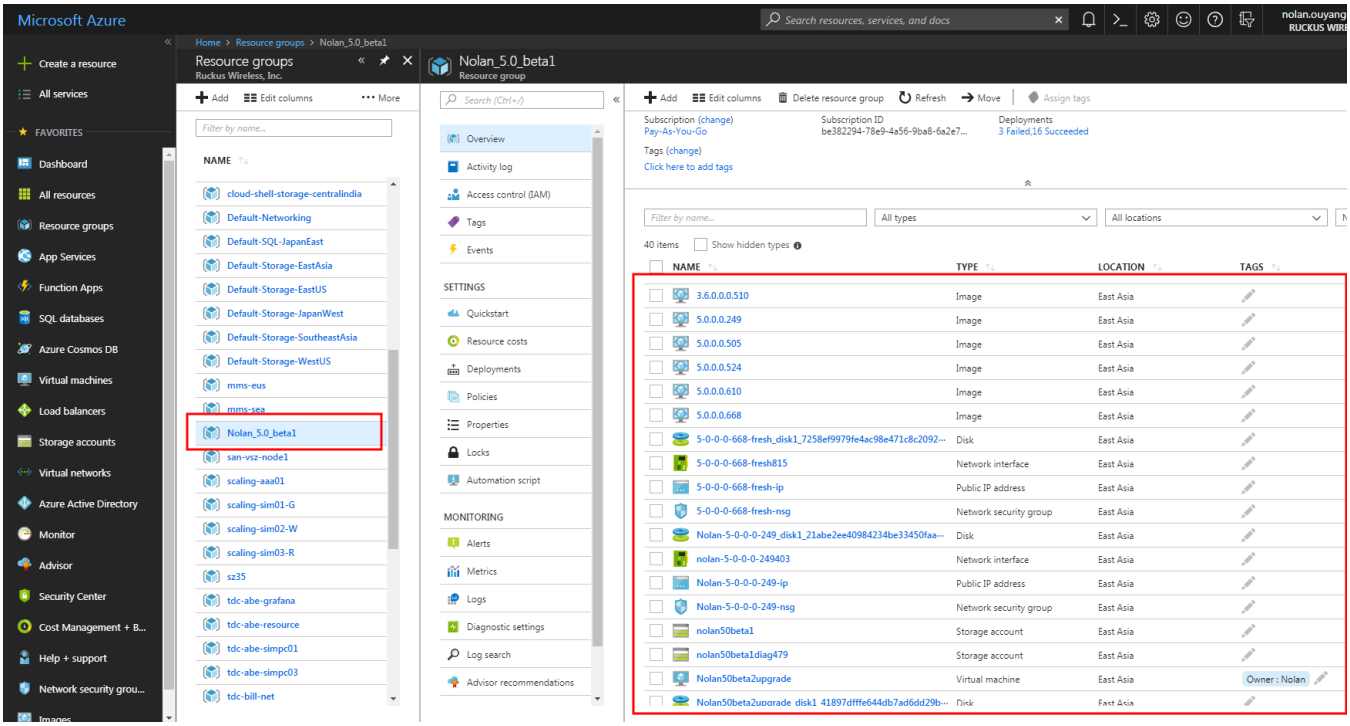
FIGURE 40 Adding Resource Group Name



3. Click **Create** and select the resource group from the list as shown in the following image.

   You can view the list of related components of the selected resource group.

FIGURE 41 Resource Group Components

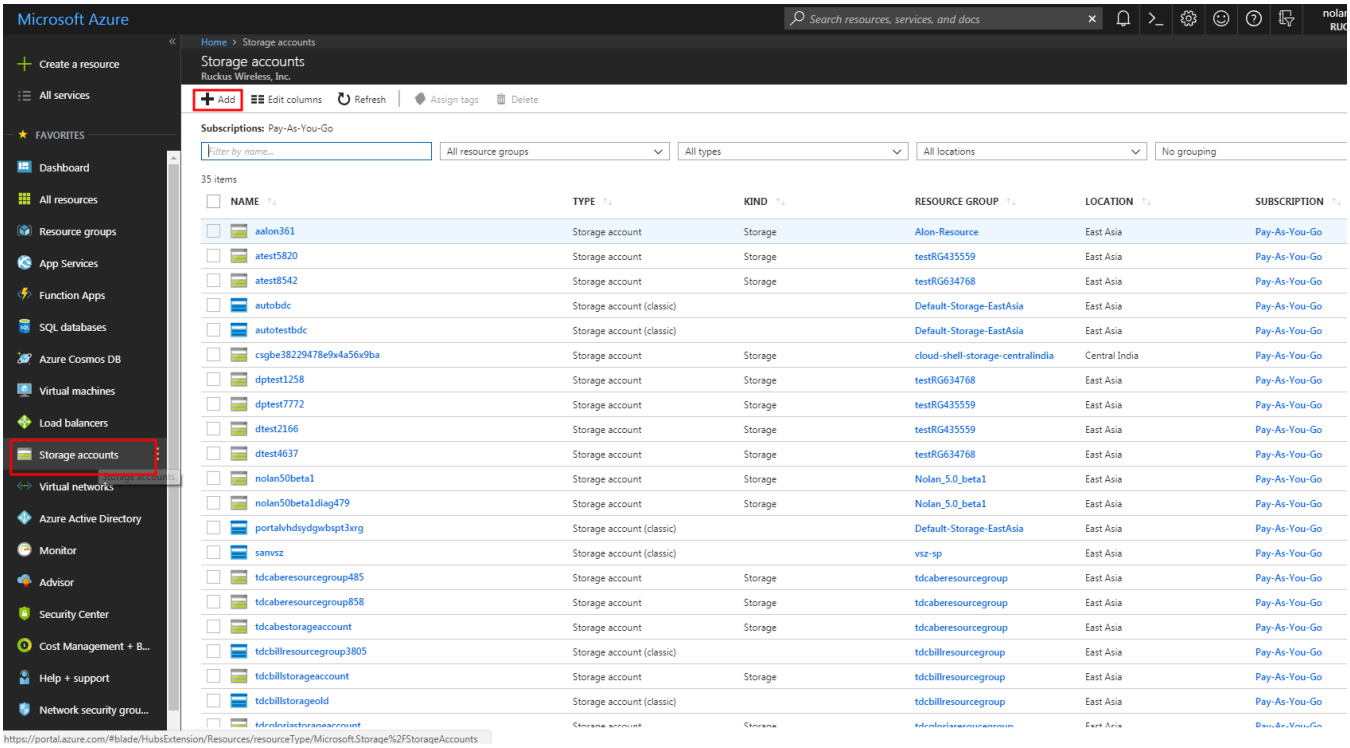


Creating a Storage Account and Container

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

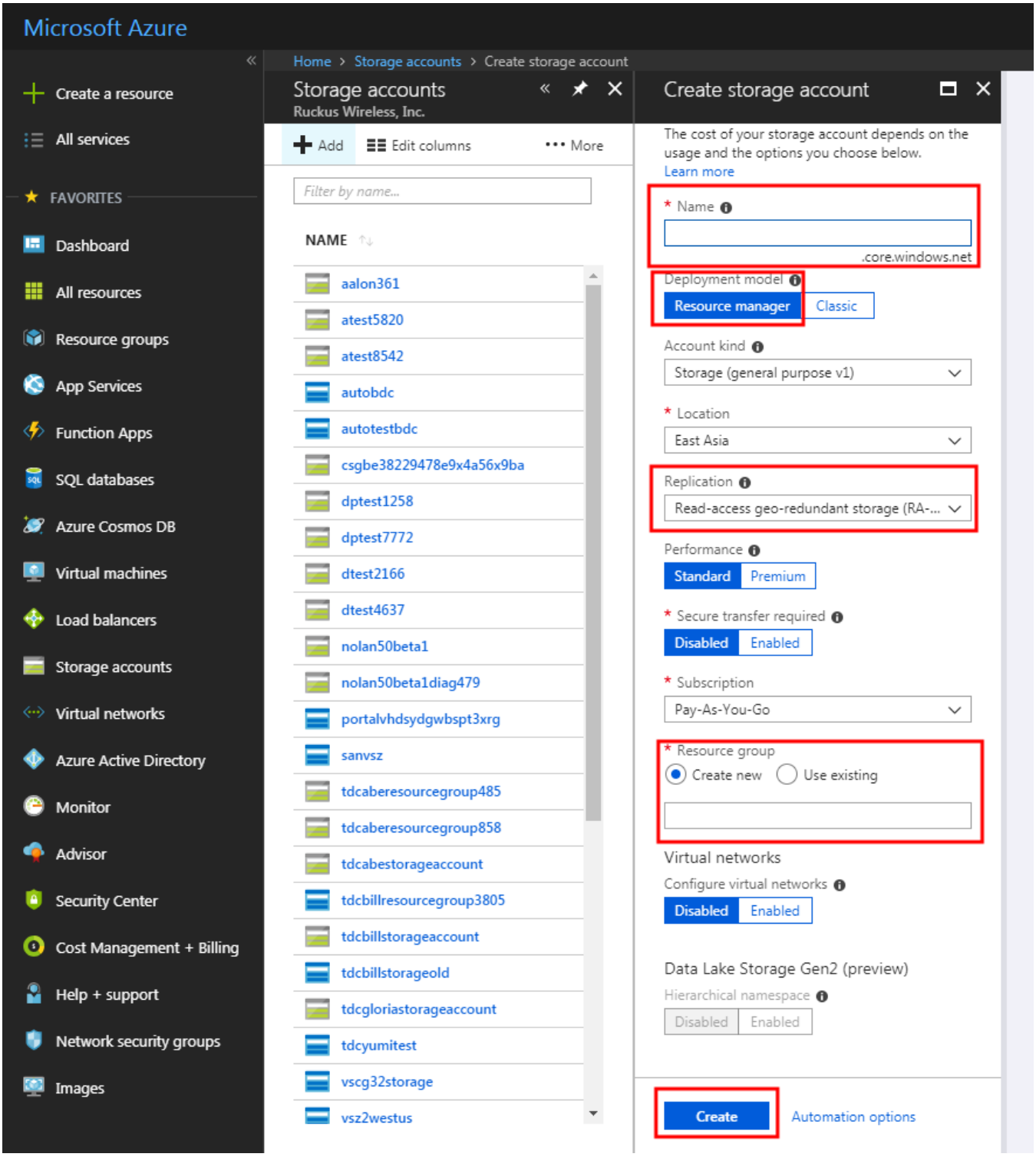
1. From the left pane of the **Microsoft Azure** page, click **Storage accounts**. The **Storage accounts** screen appears.

FIGURE 42 Creating a storage account



2. Click **Add** and perform the following:
   - Enter a **Name** using lowercase alphanumeric characters.
   - In **Deployment model**, select Resource manager; it is new method to manage storage. If you select **Classic** mode, the vhd file allows to use only powershell to do upload.
   - In **Replication**, select Locally-redundant storage (LRS)
   - In **Resource** group, choose **Use Existing** and select the resource group from the drop-down.

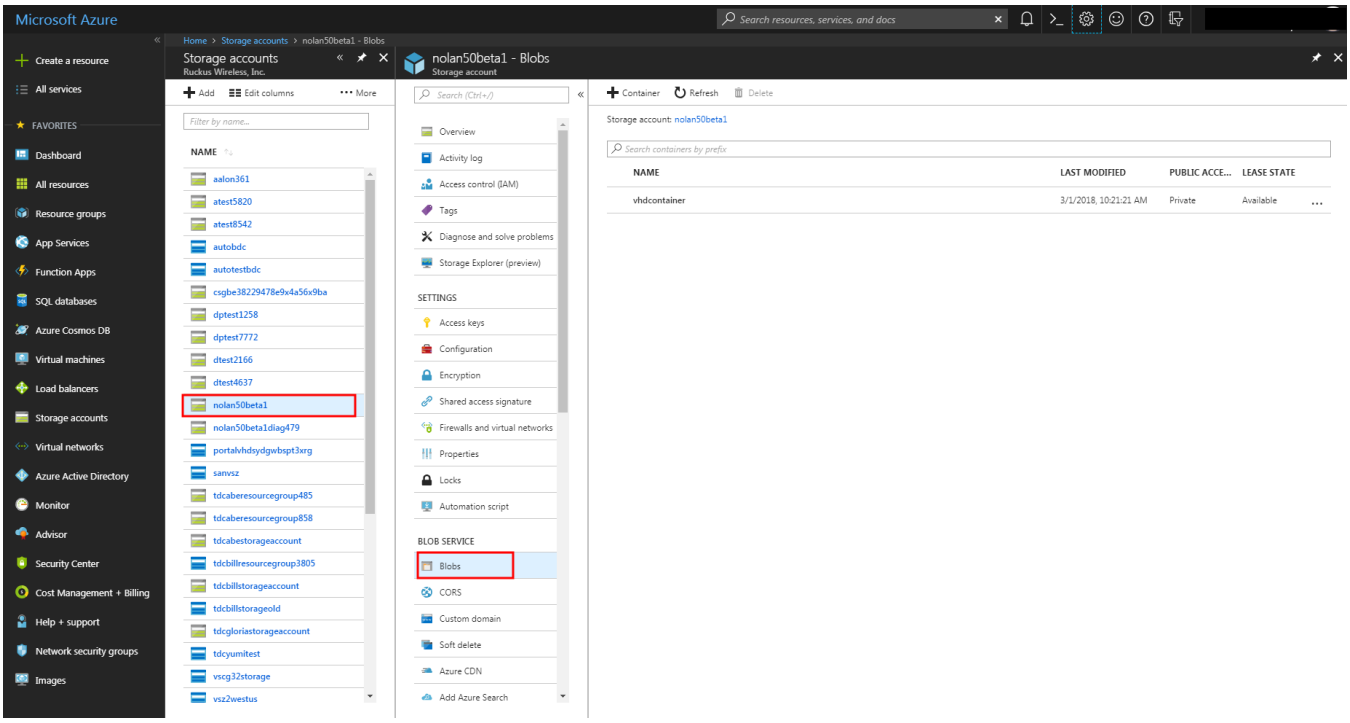
FIGURE 43 Storage Account



3. Click **Create**.

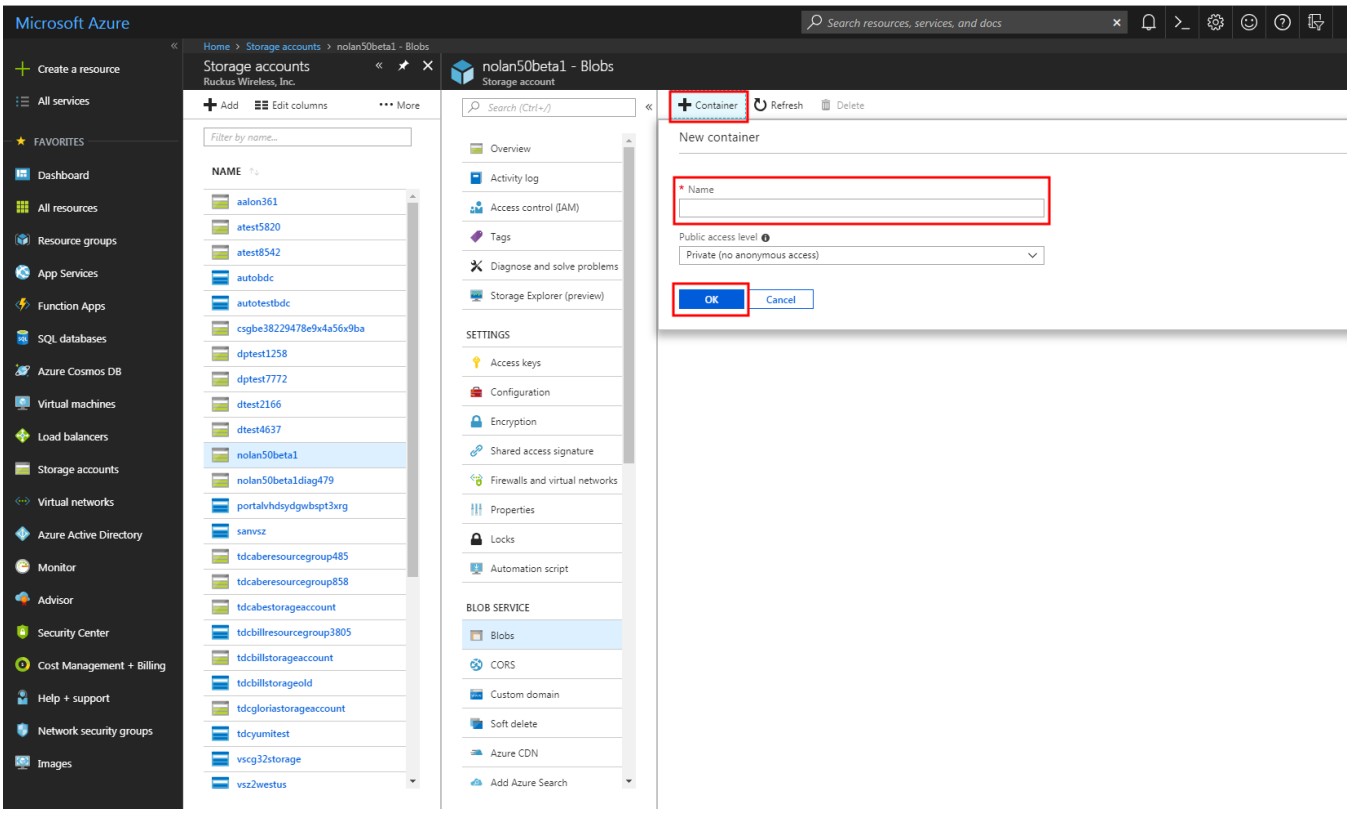
4. Select the storage account from the list and select **Blobs** for uploading the vhd file as shown in the following image.

FIGURE 44 Blobs for Uploading



5. Click **+ Container**, enter a **Name** and click **OK** as shown in the following image.

FIGURE 45 Adding Container



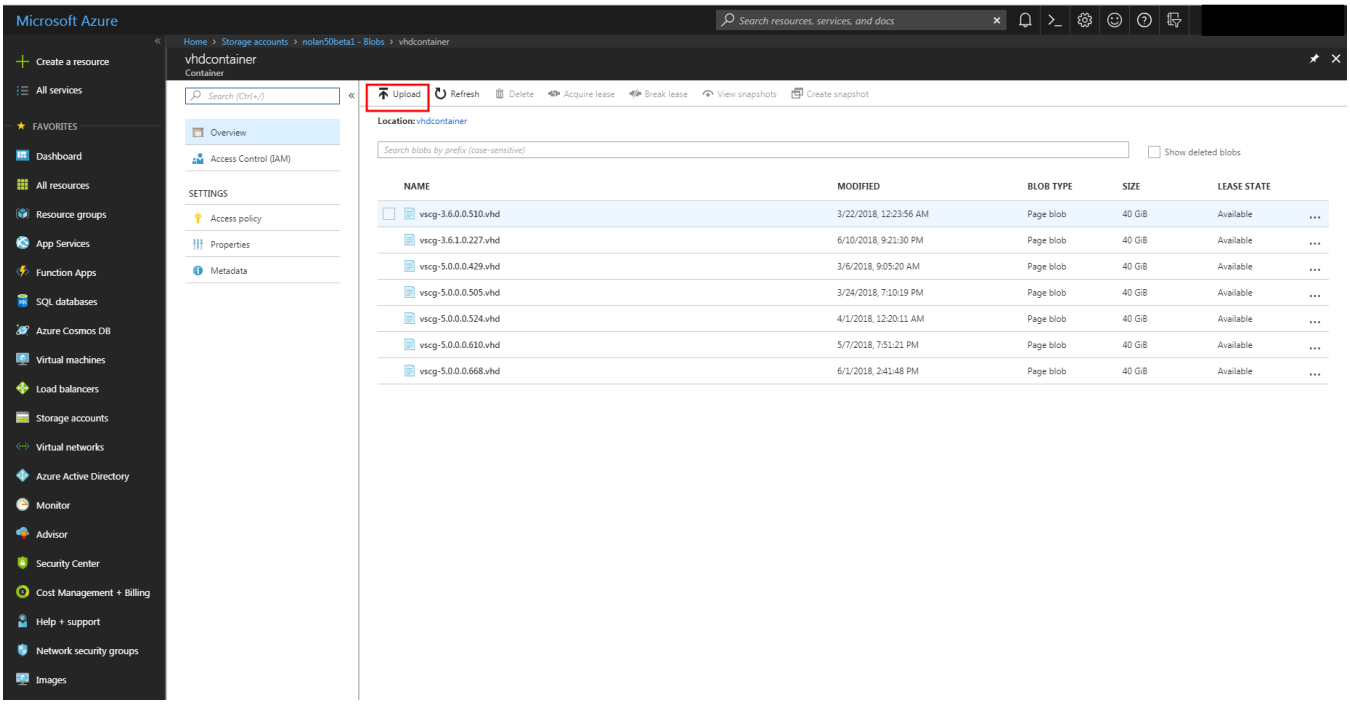
The new container is listed.

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.

1. Select the newly created container from the list and click **Upload** as shown in the following image.

FIGURE 46 Uploading the vSZ image



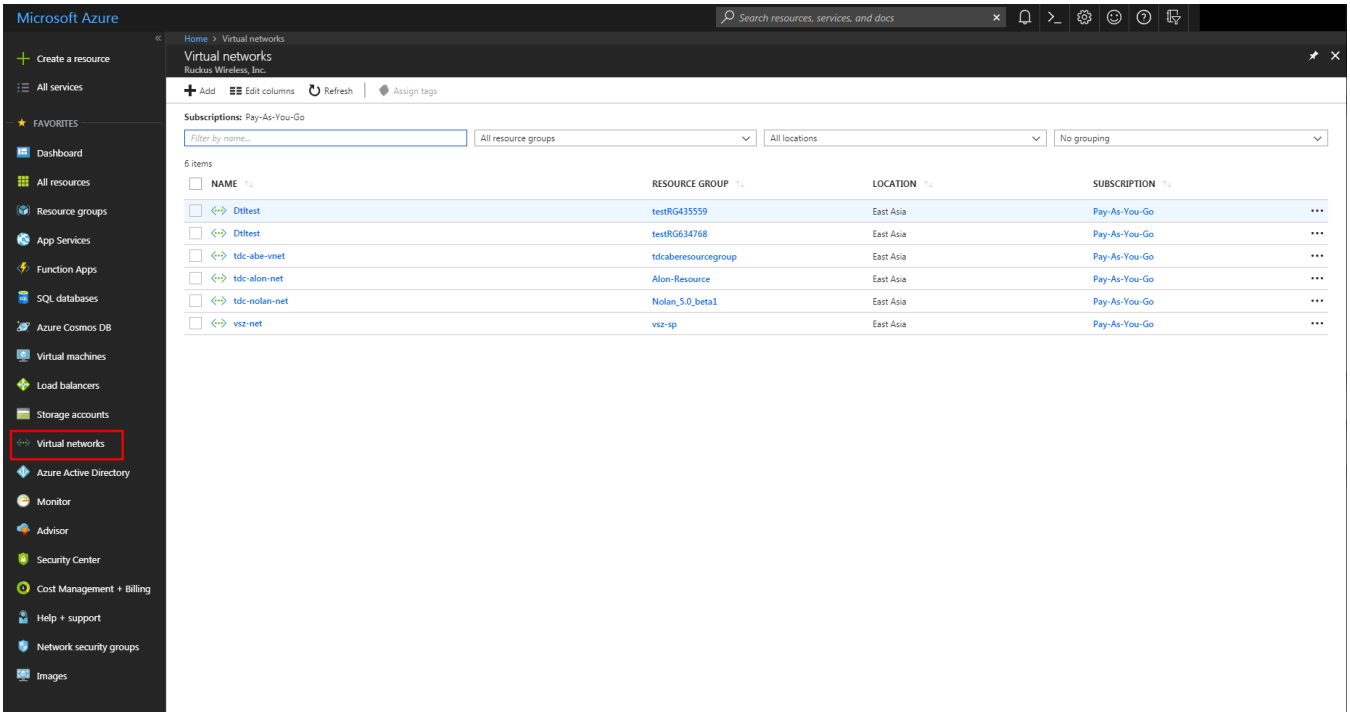
2. From the right pane, click the folder to choose the .vhd file from the local PC and click **Upload**.

Creating a Virtual Network

Follow these steps to create a virtual network.

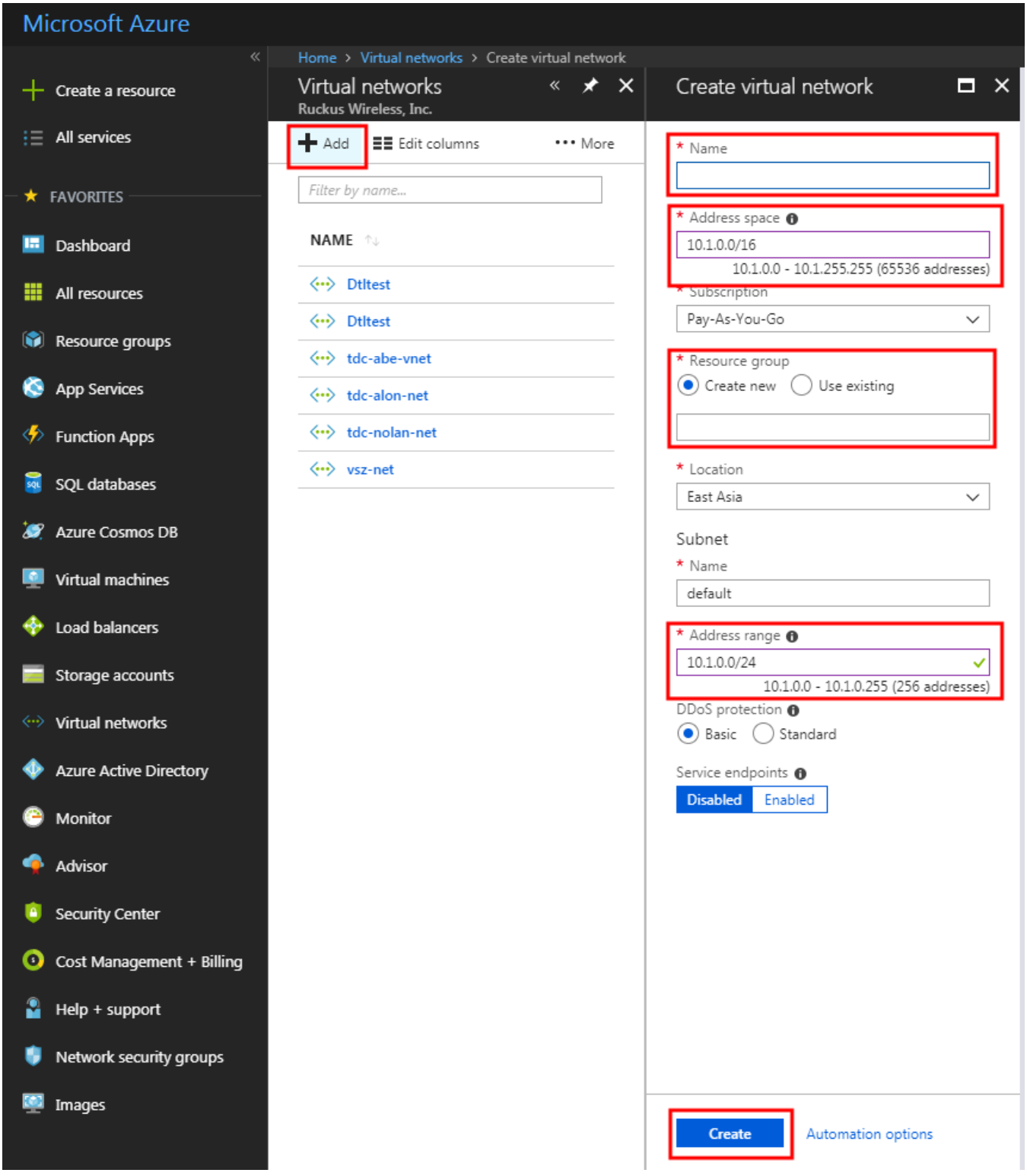
1. From the left pane of the **Microsoft Azure** page, click **Virtual Networks** as shown in the following image.

FIGURE 47 Creating a virtual network



2. Click **Add** and update the following:
   - **Name**: enter a name for the network
   - **Address space**: enter the network address
   - **Resource group**: choose the Use existing option and select the existing resource group from the drop-down.
   - **Address range**: enter the address range.

FIGURE 48 Virtual Network Details screen



3. Click **Create**, you have created a network.

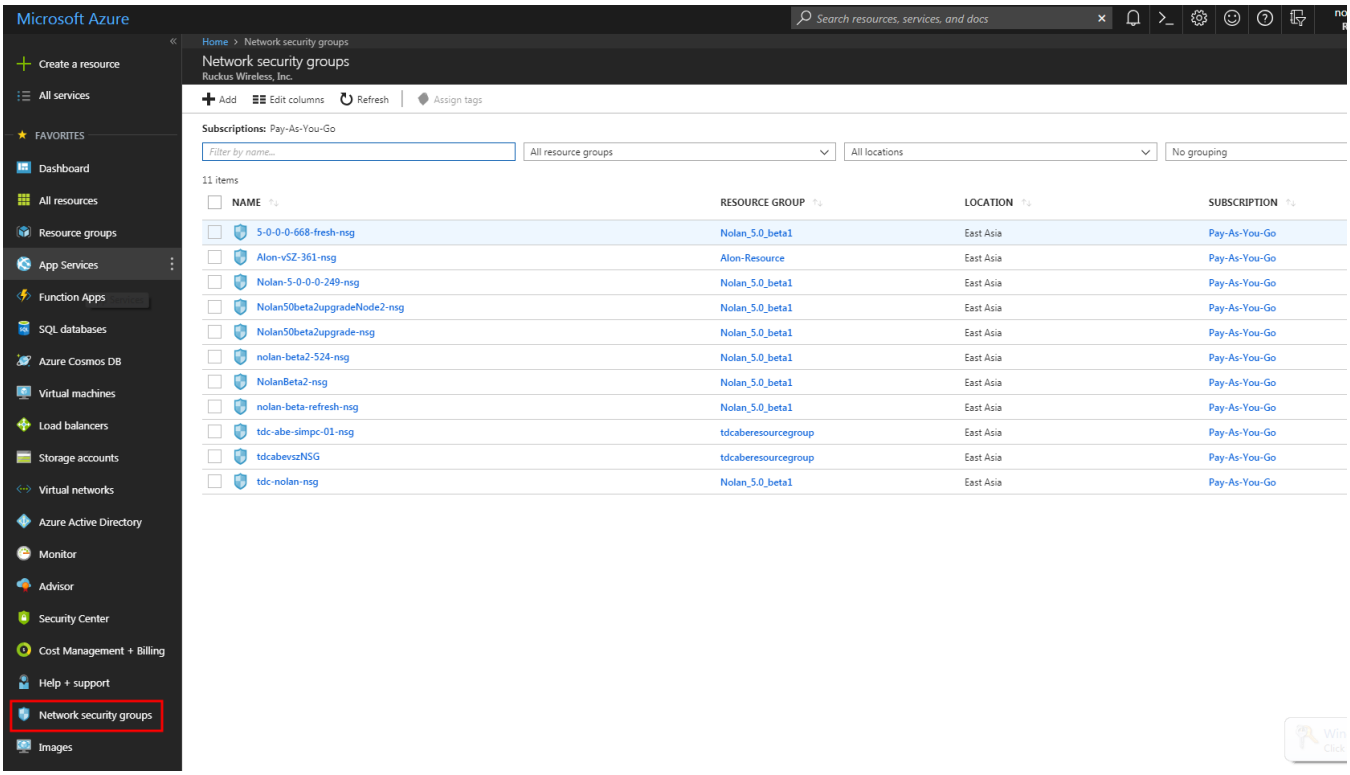
Creating Network Security Groups

Network security group is the Azure firewall rule. You can have different firewall rules for each vSZ instance.

To create a network security group:

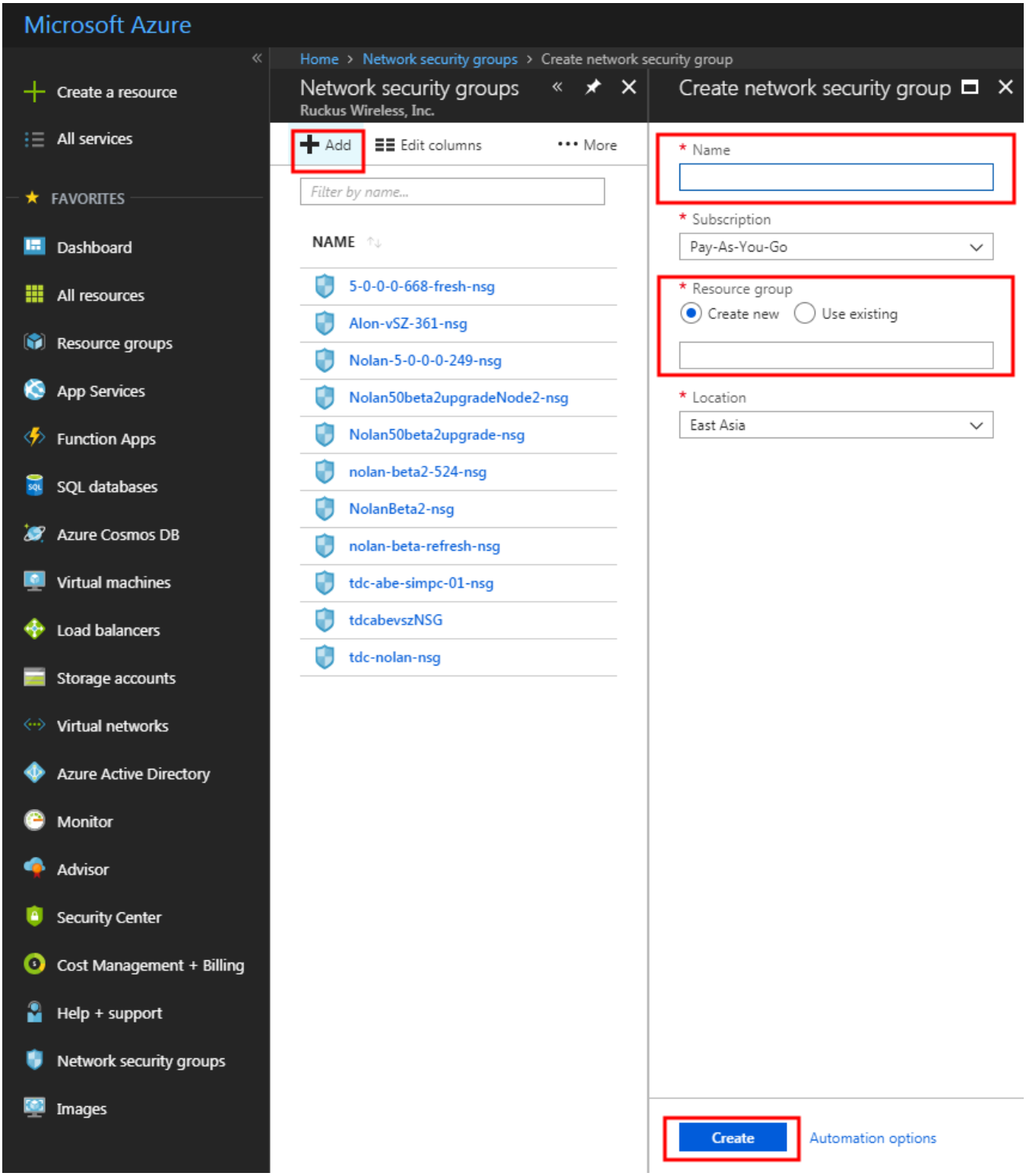
1. From the left pane of the **Microsoft Azure** page, click **Network security groups**. The **Network security groups** page appears with the list of existing resource groups as shown in the following image.

FIGURE 49 Network security Groups



2. Click **Add** and update the following:
   - **Name**: enter a name for the network
   - **Resource group**: choose the Use existing option and select the existing resource group from the drop-down.

FIGURE 50 Adding Resource Group Name

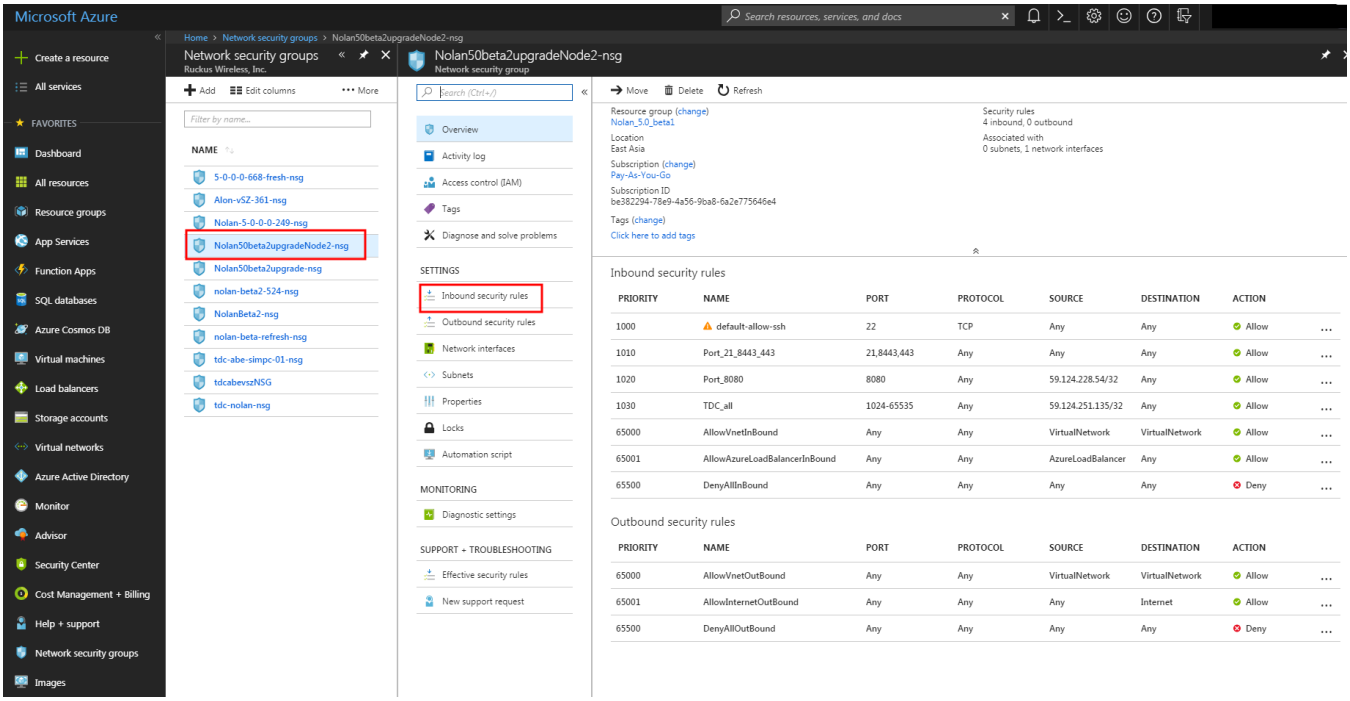


3. Click **Create** the **Network security groups** page appears.

4. Select the network security group from the list and click **Inbound security rules** as shown in the following image.

   The existing rules are listed.

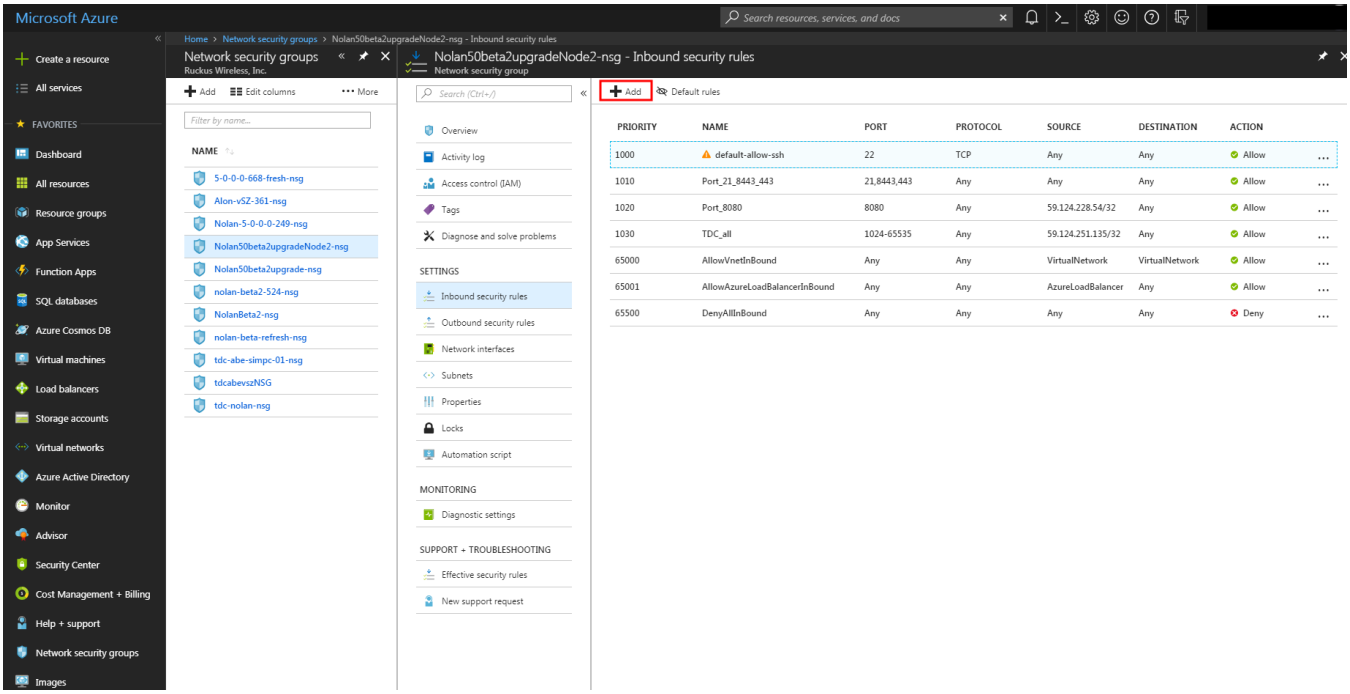
FIGURE 51 Inbound security rules



5. Click **Add** + to create a new rule as shown in the following image.

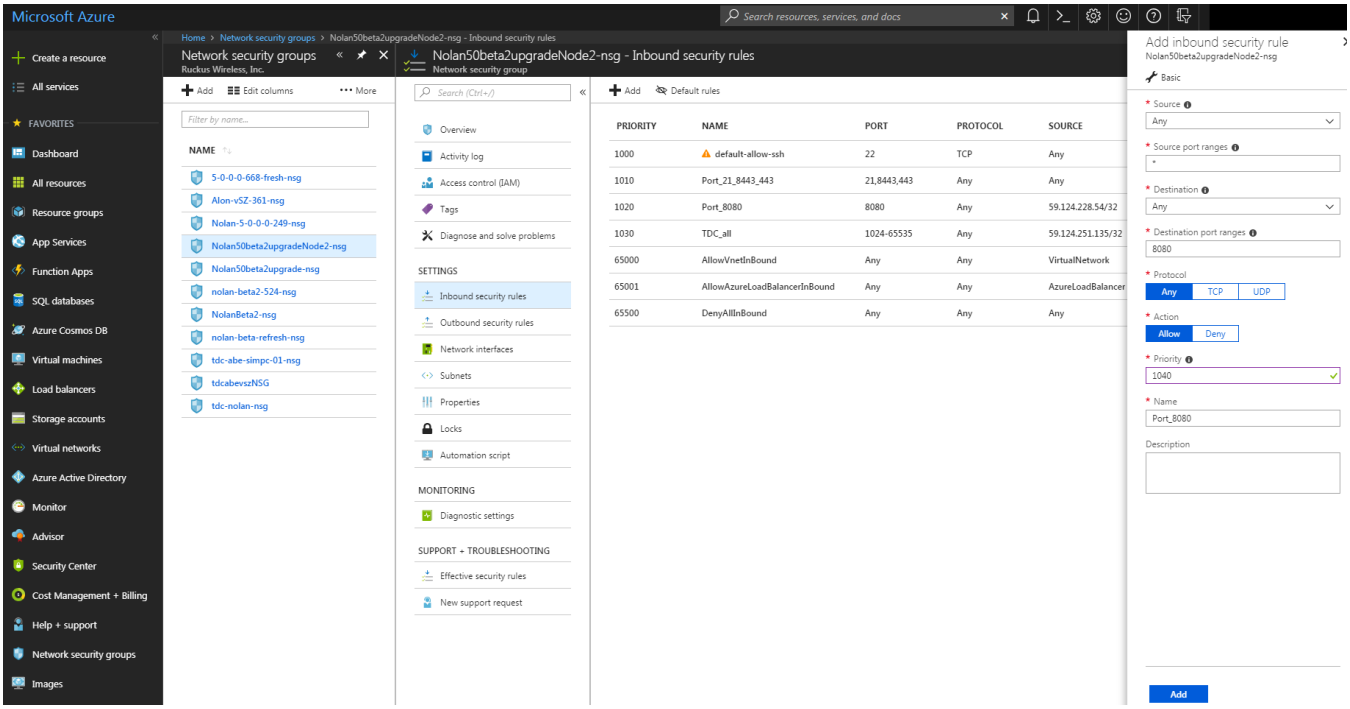
   The existing rules are listed.

FIGURE 52 Creating security rules



6. From the **Add inbound security rule** page update the following fields:
   - **Source**: select the source port.
   - Source port ranges: enter the source port range.
   - Destination: select the destination port.
   - Destination port ranges: select the destination port ranges.
   - Protocol: select one of the options—Any, TCP or UDP.
   - Action: select Allow or Deny.
   - Priority: enter the rule priority number.
   - Name: enter a name for the rule.
   - Description: enter a short description about the rule.

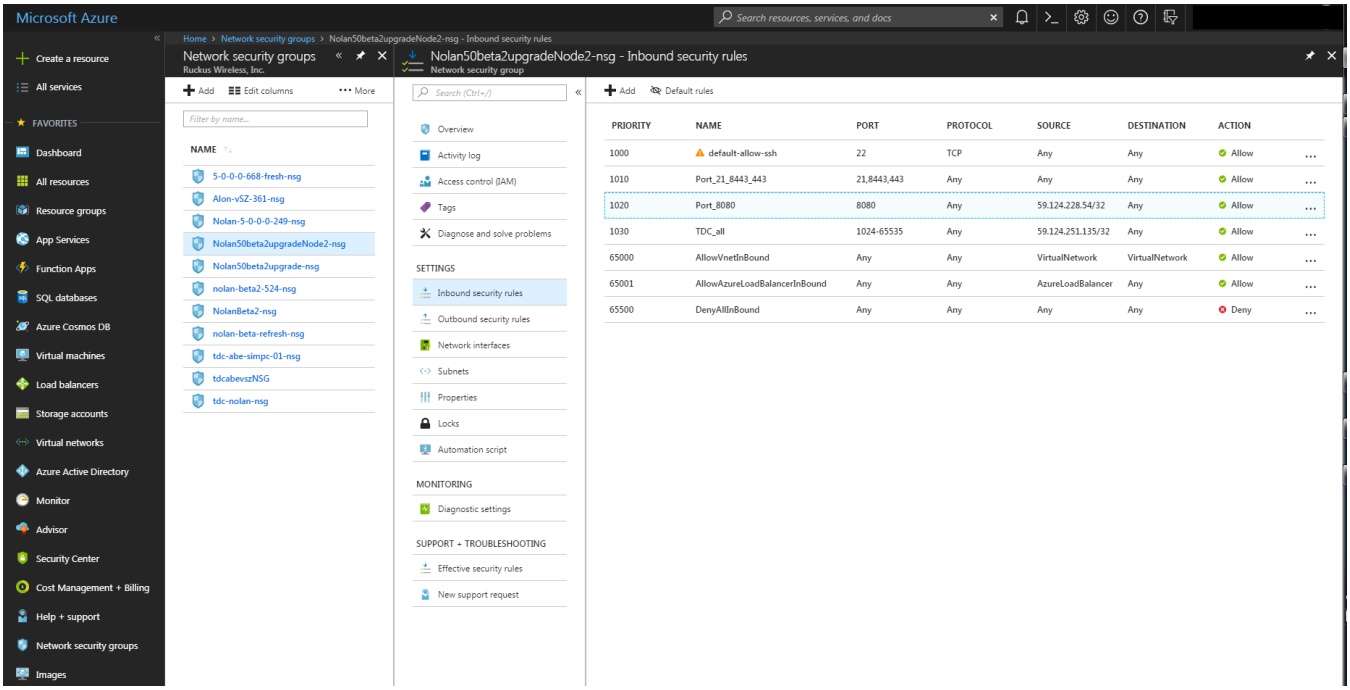
FIGURE 53 Adding Inbound Security Rule



7. Click **Add**, the new rule is added to the existing rule list as shown in the following image.

   The existing rules are listed.

FIGURE 54 Inbound Security Rule List



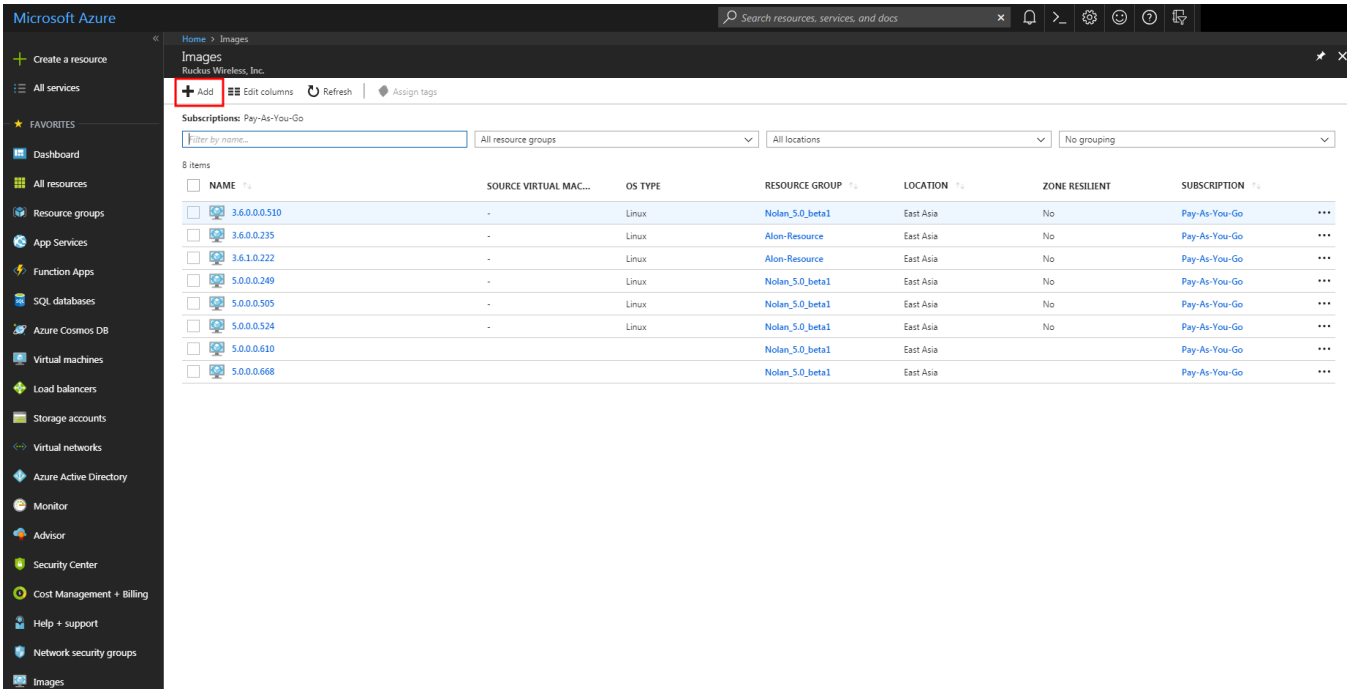
Creating a vSZ Image on Microsoft Azure

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

1. **NOTE**
   ssh is allowed by default, so add port 443 and 8443 for AP connection and Web access.

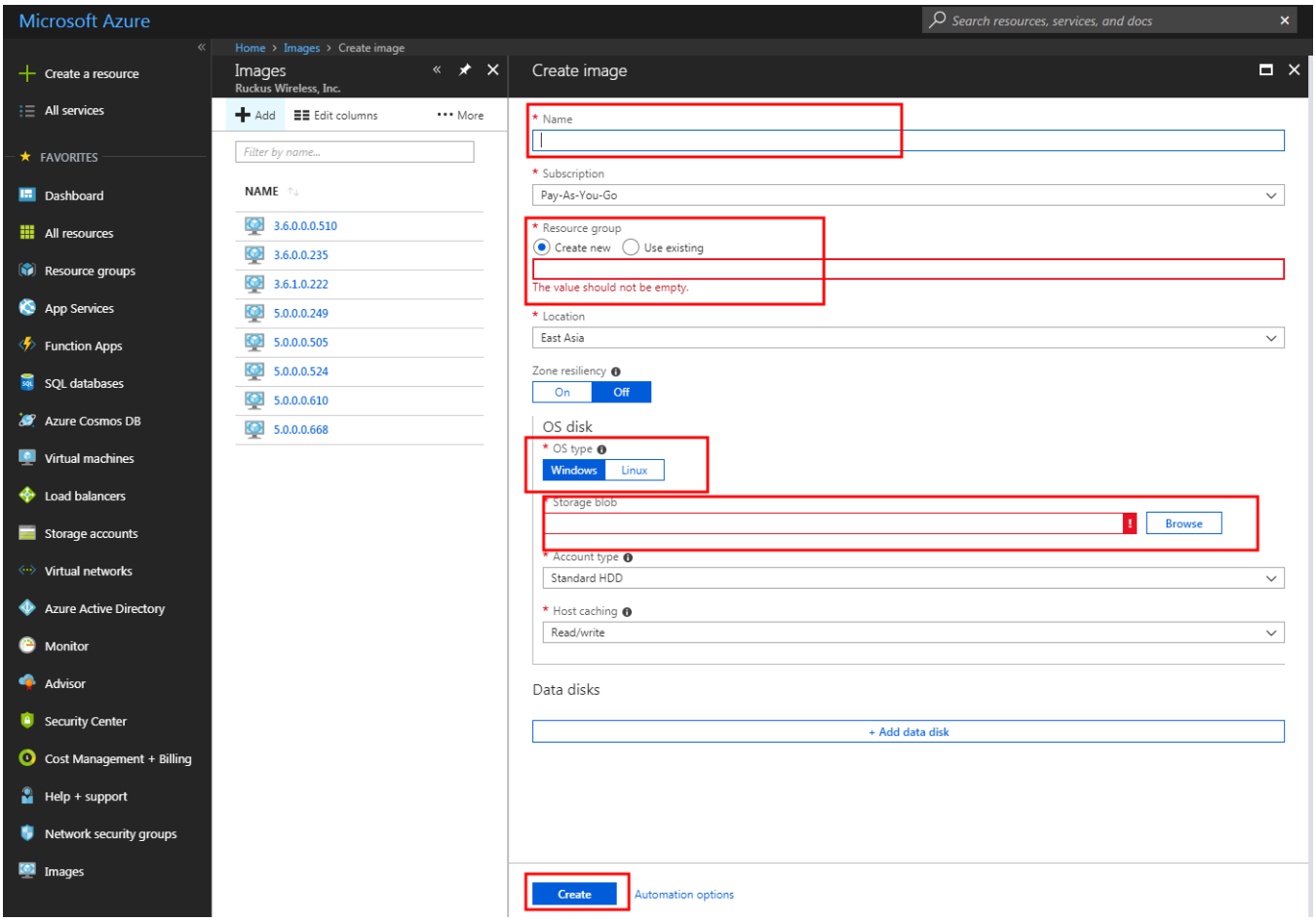
   From the **Microsoft Azure** page, click **Images**.

FIGURE 55 Creating an image



2. Click **Add**, the Create image page appears as shown in the following image.

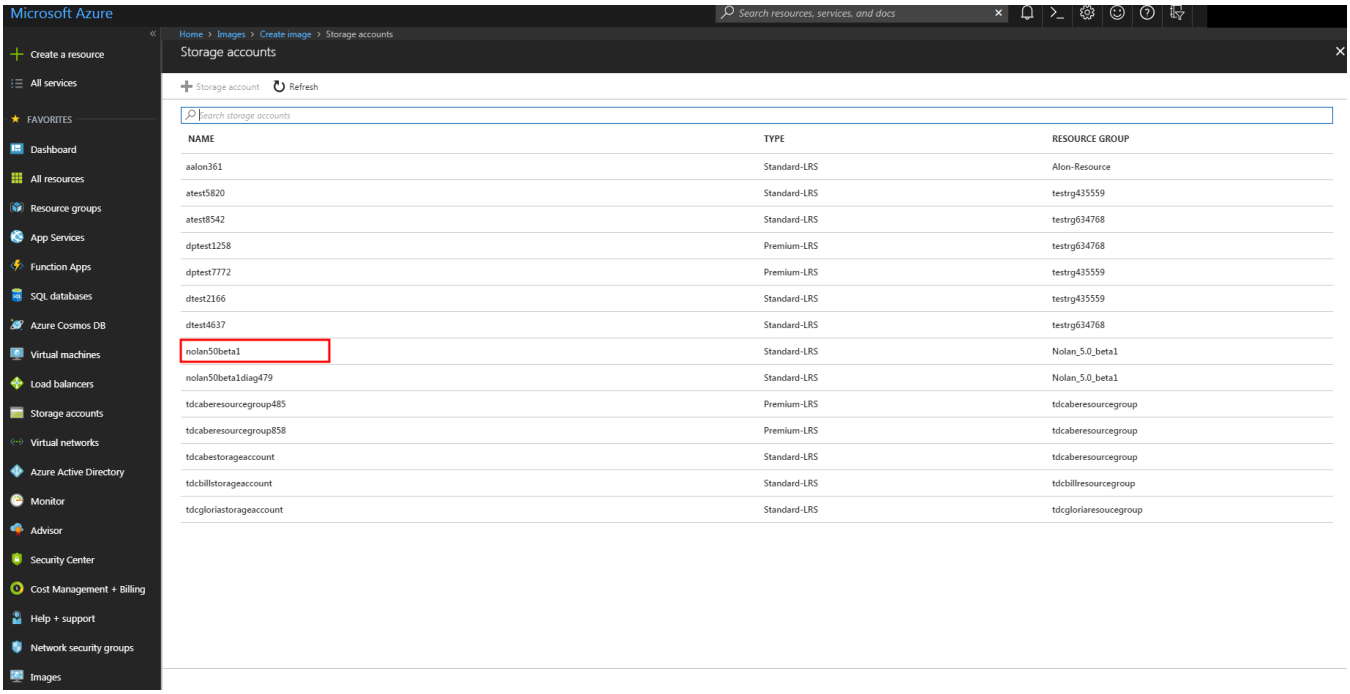
FIGURE 56 Create an Image from VHD



3. Update the following fields:
   - **Name**: enter a name for the image.
   - **Resource group**: choose Use existing and select the option from the drop-down.
   - **OS type**: choose Linux.
   - **Storage blob**: click **Browse** and select the file.

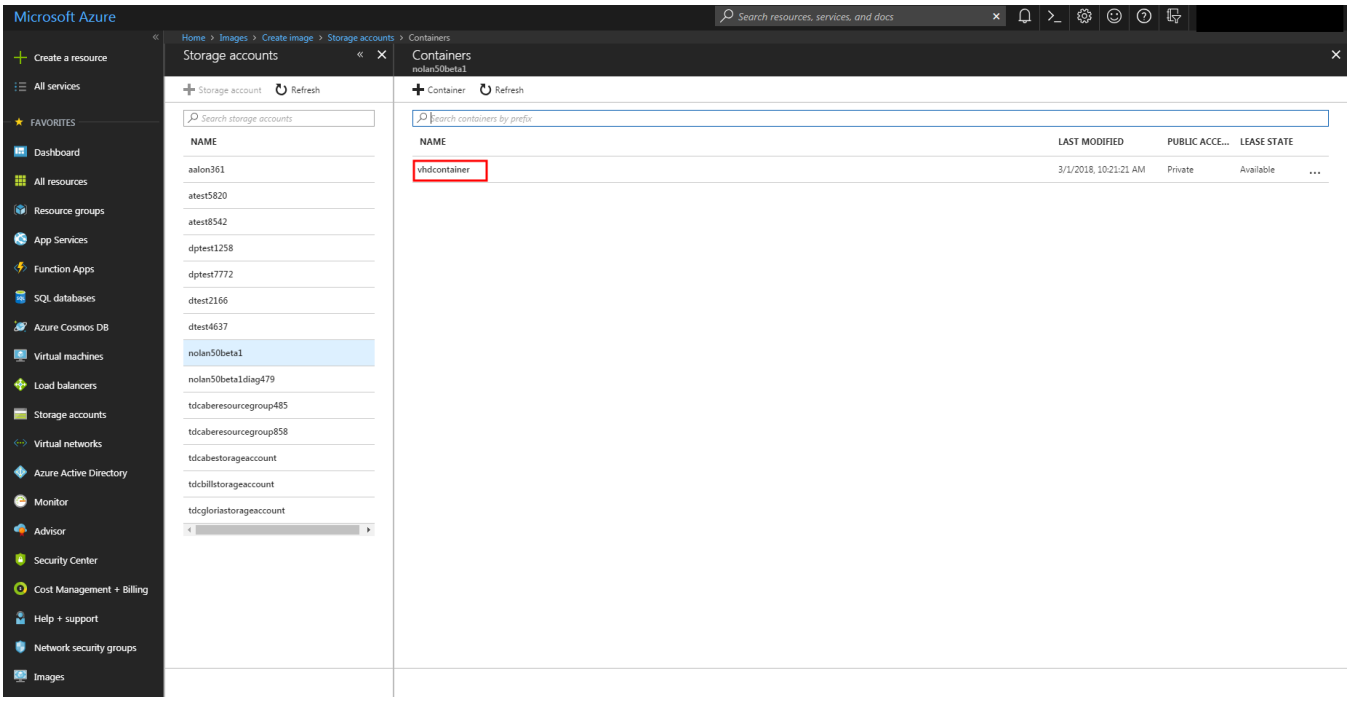
4. Click **Create**, the **Storage accounts** page appears as shown in the following image.

FIGURE 57 Storage Account List



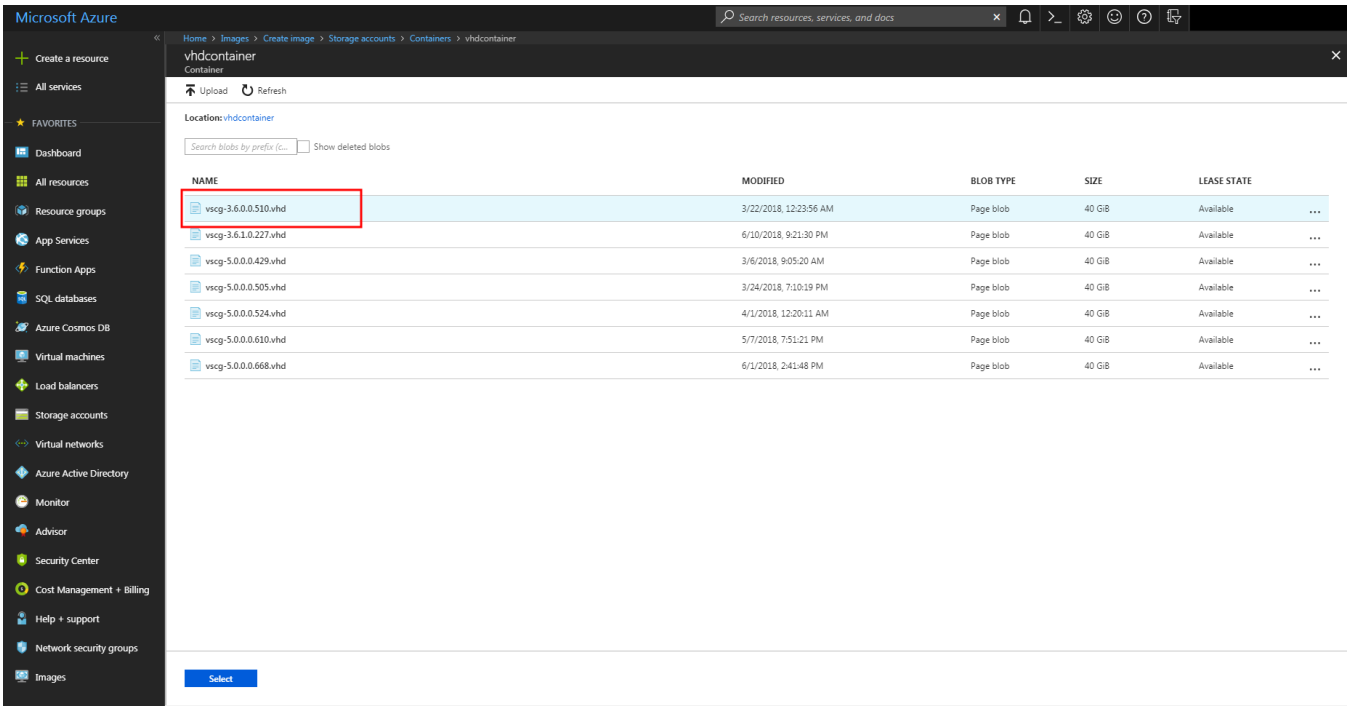
5. Select the Storage account from the list, the Containers page appears as shown in the following image.

FIGURE 58 Select the Container



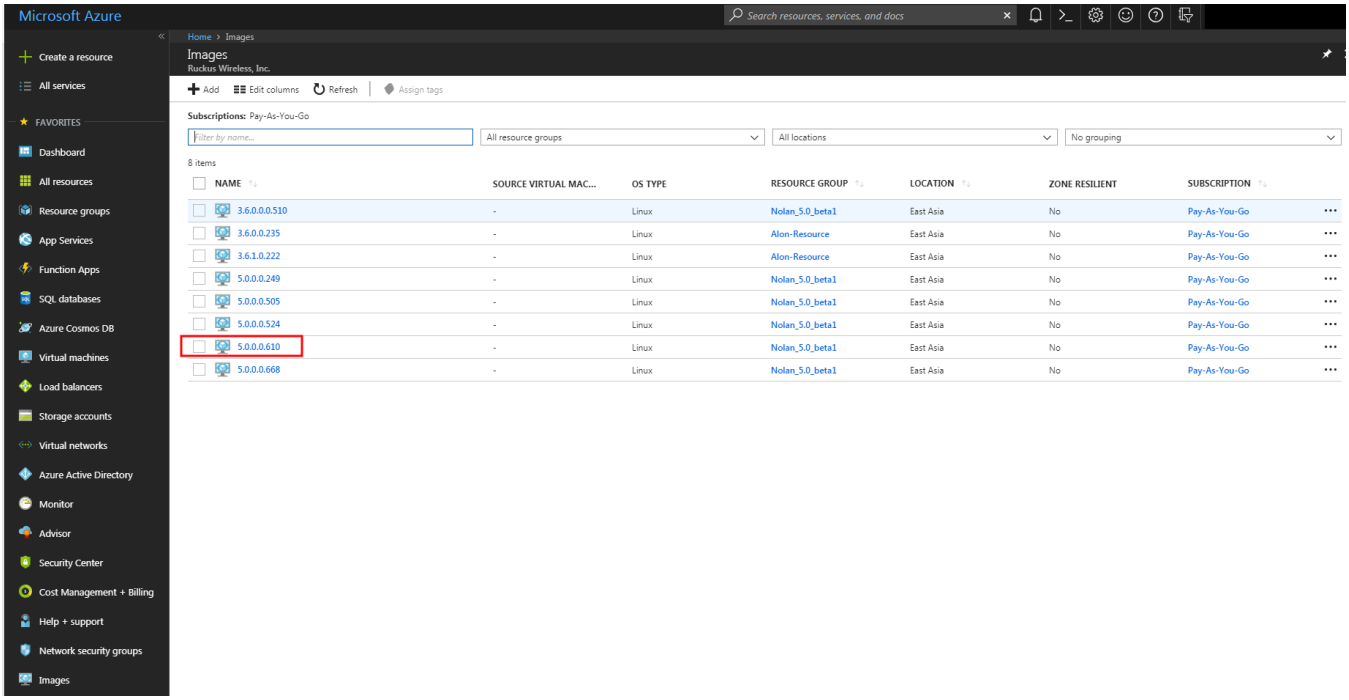
6. Select the Container from the list, the images in the container are listed as shown in the following image.

FIGURE 59 Images in the Container



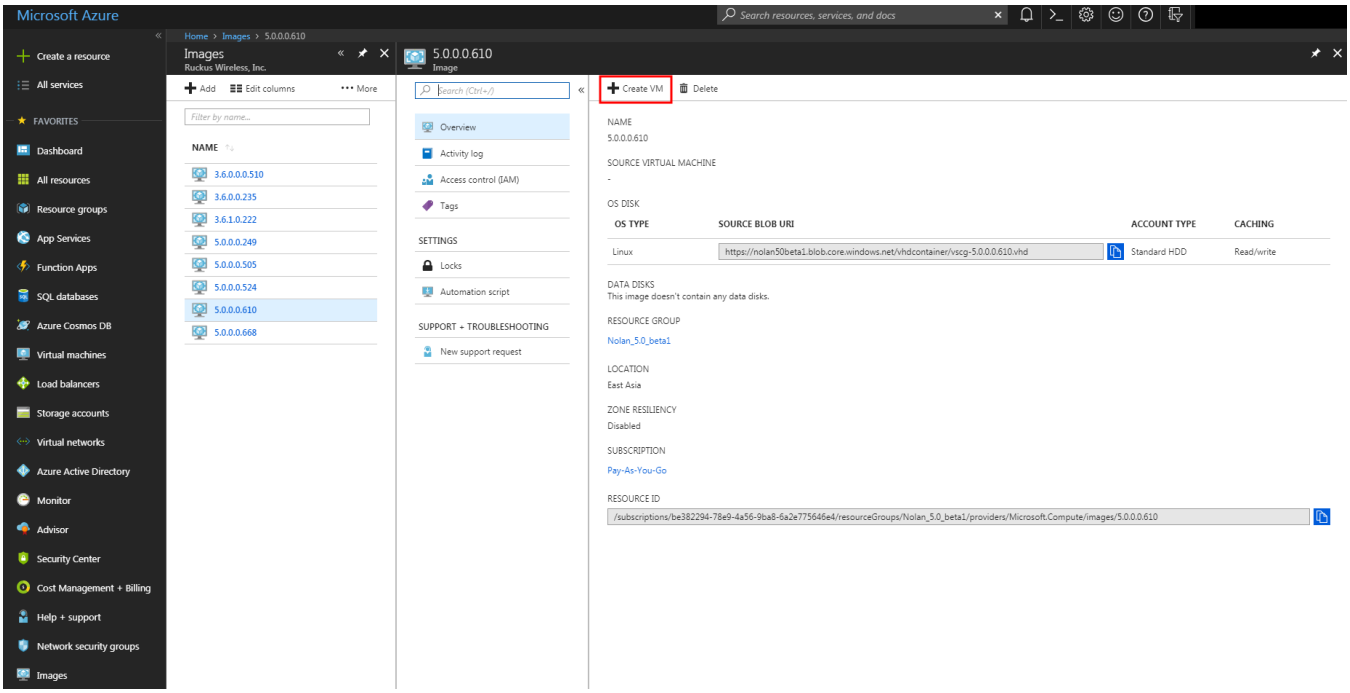
7. Select the image file from the list and click **Select**. The selected image is listed in the Images page as shown in the following image.

FIGURE 60 Images Page



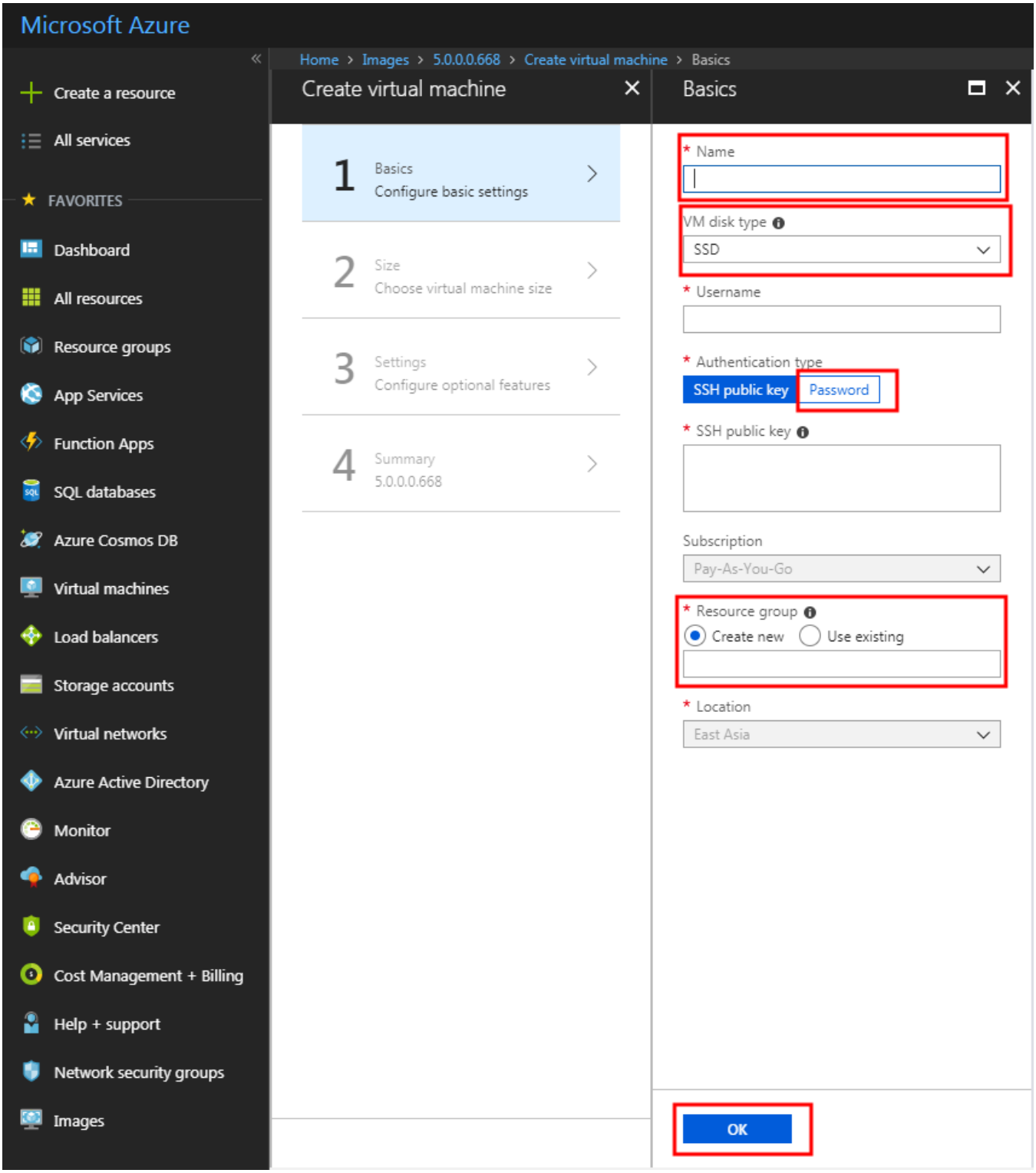
8. Select the image and click **Create VM** as shown in the following image

FIGURE 61 Create VM



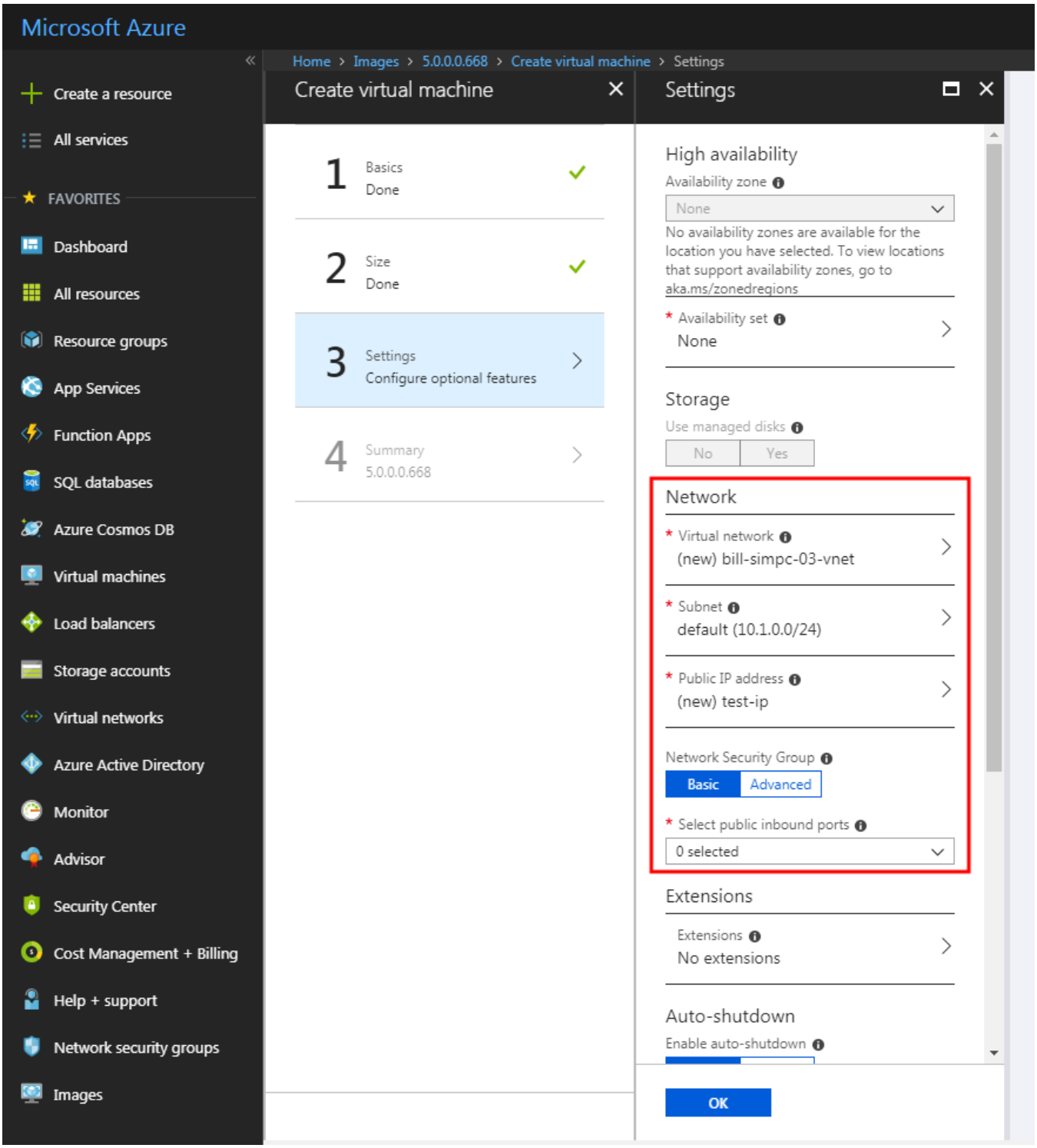
9. From the **Create virtual machine** page select the **Basics** tab and update the following:
   - **Name**: enter a name for the virtual machine.
   - **VM disk type**: select HDD form the drop-down as disk type.
   - **User name**: enter a username for the virtual machine.
   - **Authentication type**: choose the preferred authentication type.
   - **Password**: enter the password.
   - **Confirm password**: re-enter the password.
   - **Resource group**: choose Use existing and select the resource group from the drop-down.

FIGURE 62 Basics Information



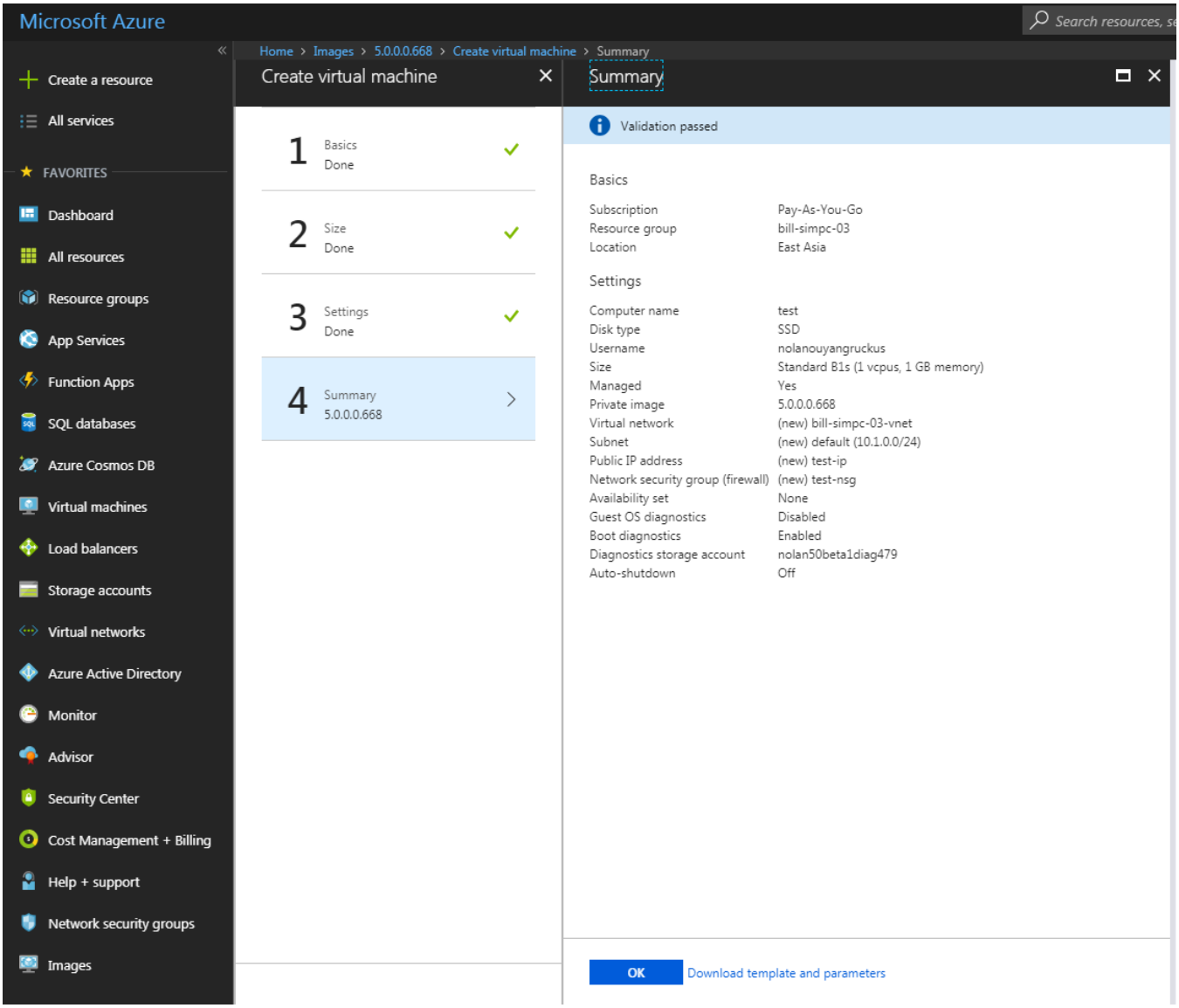
10. Click **OK**, the Settings tab page appears as shown in the following image.

FIGURE 63 Settings Tab



11. Select the Network and security group information and click **OK**. The Summary page appears as shown in the following image.

FIGURE 64 Summary

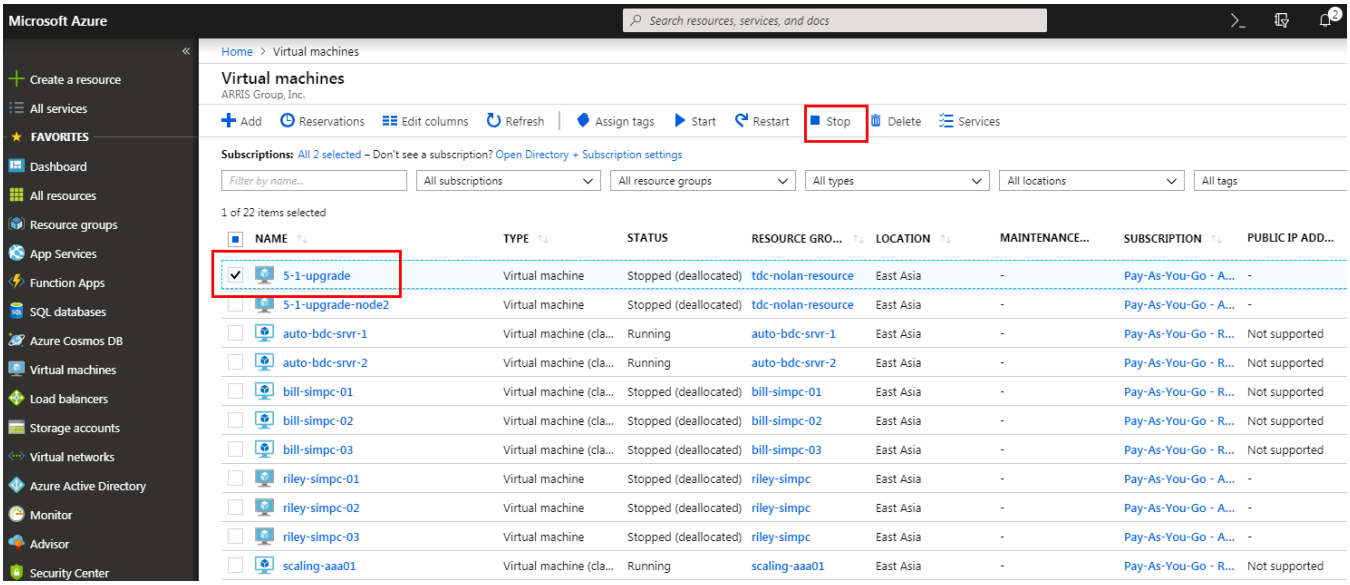


Updating the Disk Size According to Resource Plan

Follow these steps to update the disk size according to the resource plan:

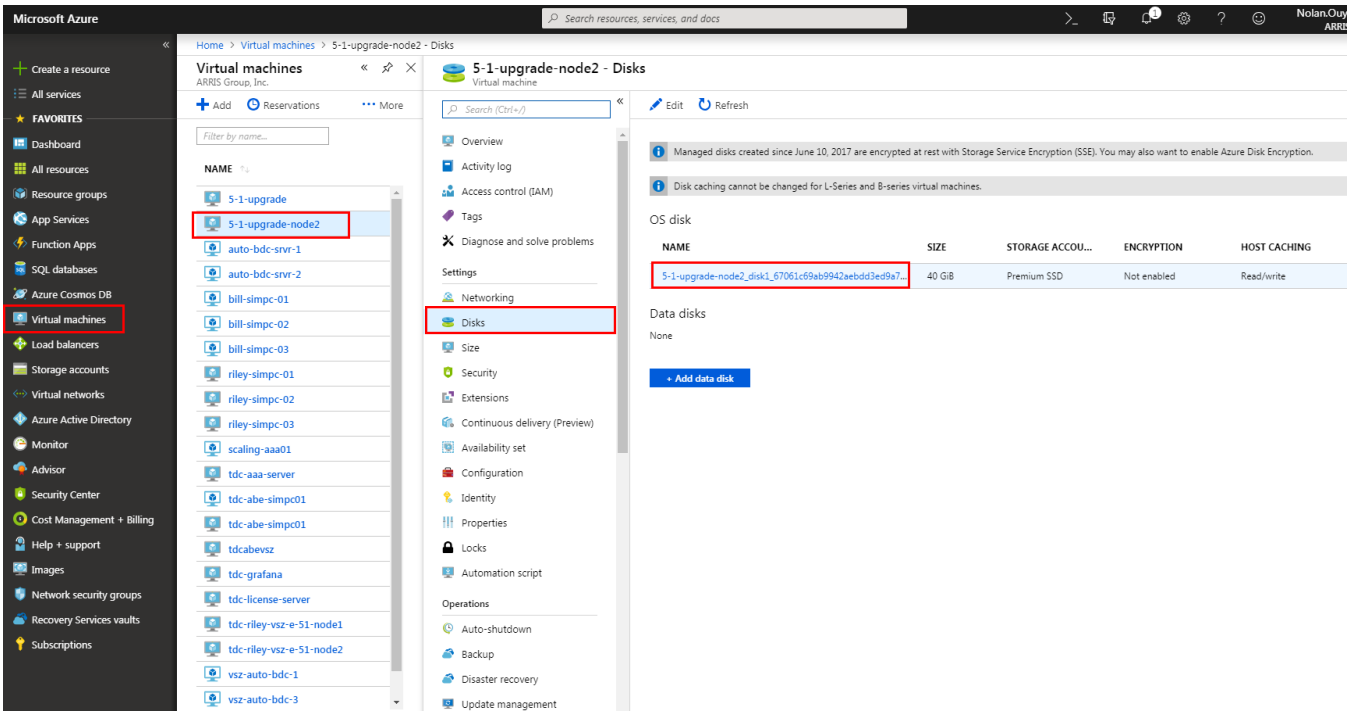
1. From the **Virtual Machines** page, select the Virtual Machine and click **Stop** ass shown in the following image.

FIGURE 65 Stopping the Virtual Machine



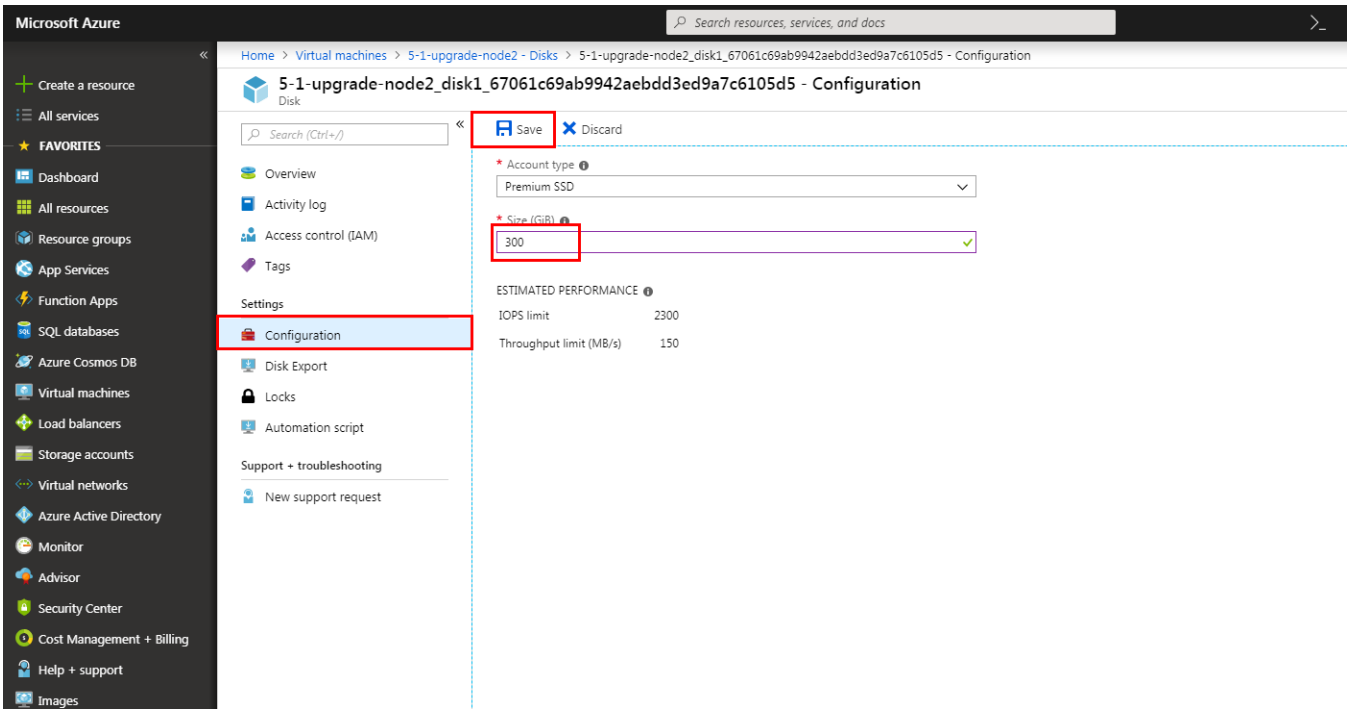
2. From the **Settings** area, select **Disks** and select the Virtual Machine as shown in the following image.

FIGURE 66 Disk Settings



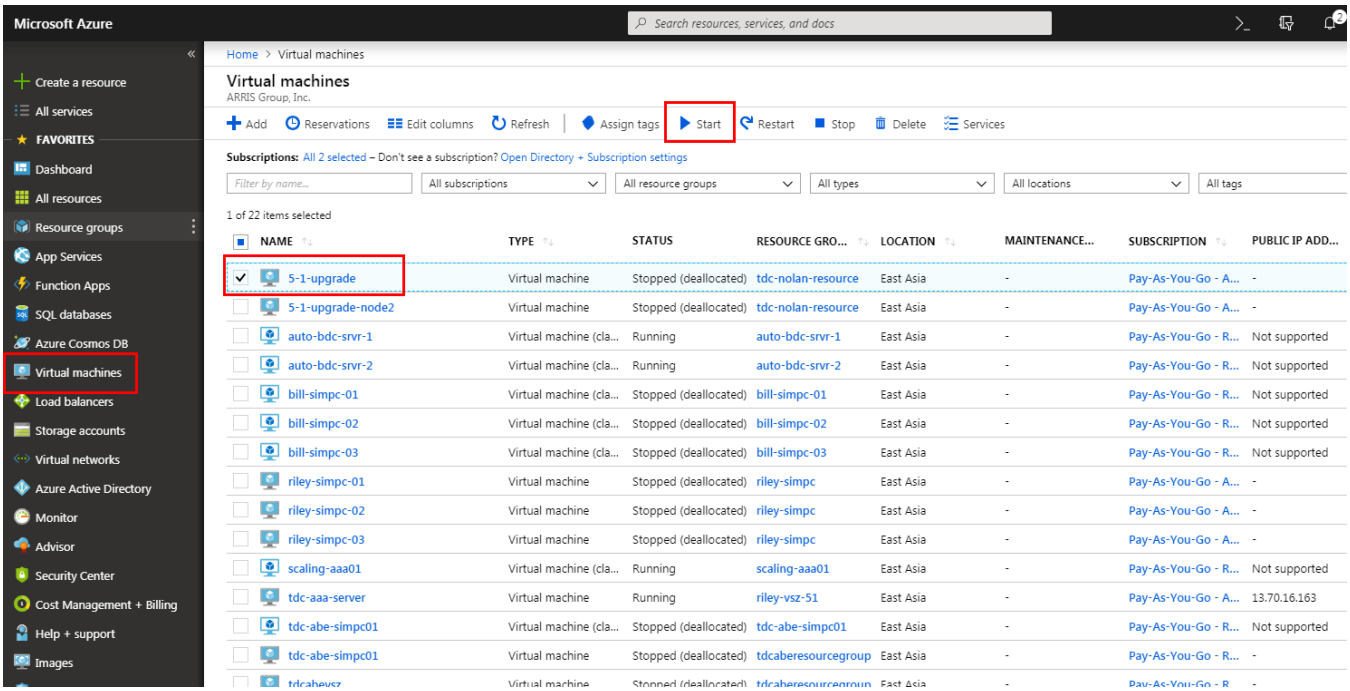
3. From the left pane select **Configuration**, enter the disk **Size (GB)** and click **Save** as shown in the following image.

FIGURE 67 Disk Size



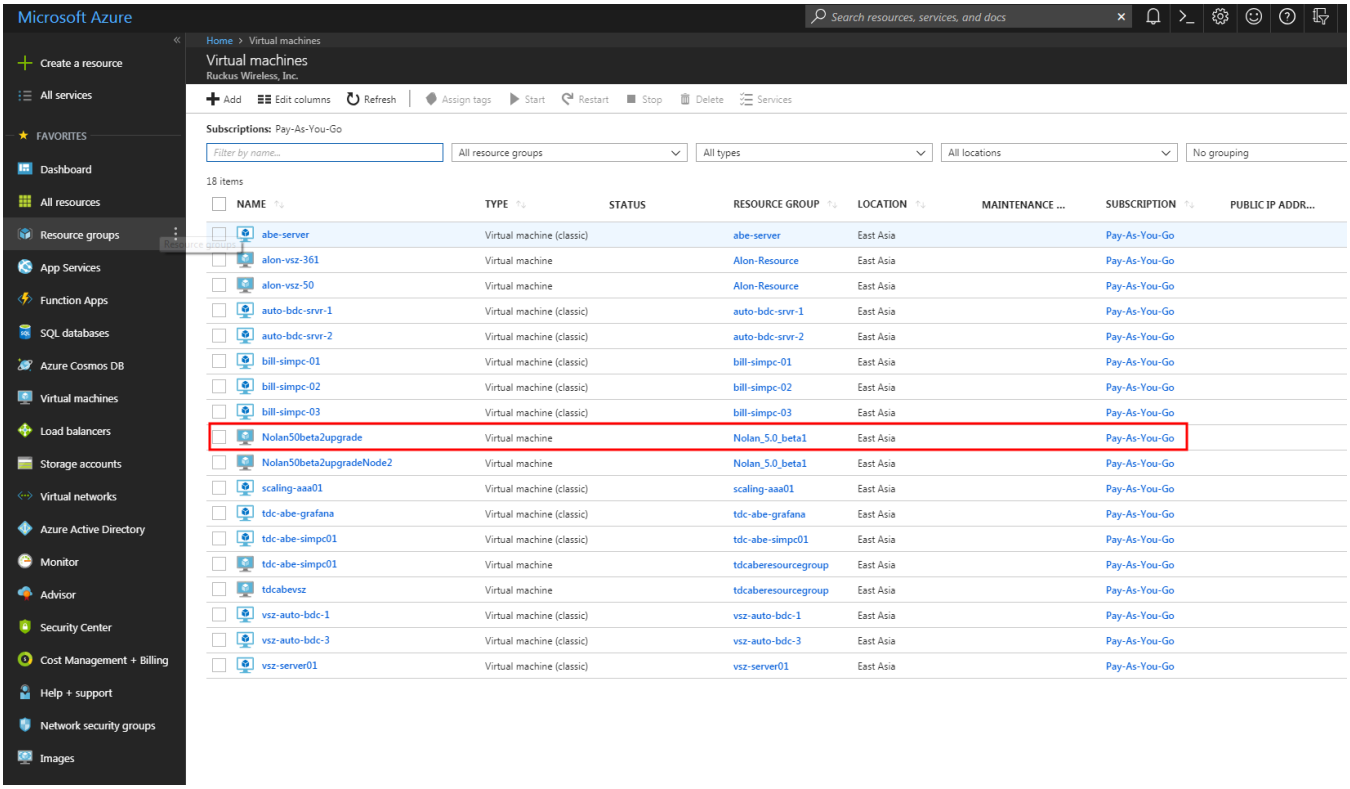
4. From the Virtual Machines page, select the Virtual Machine and click **Start**.

FIGURE 68 Starting the Virtual Machine



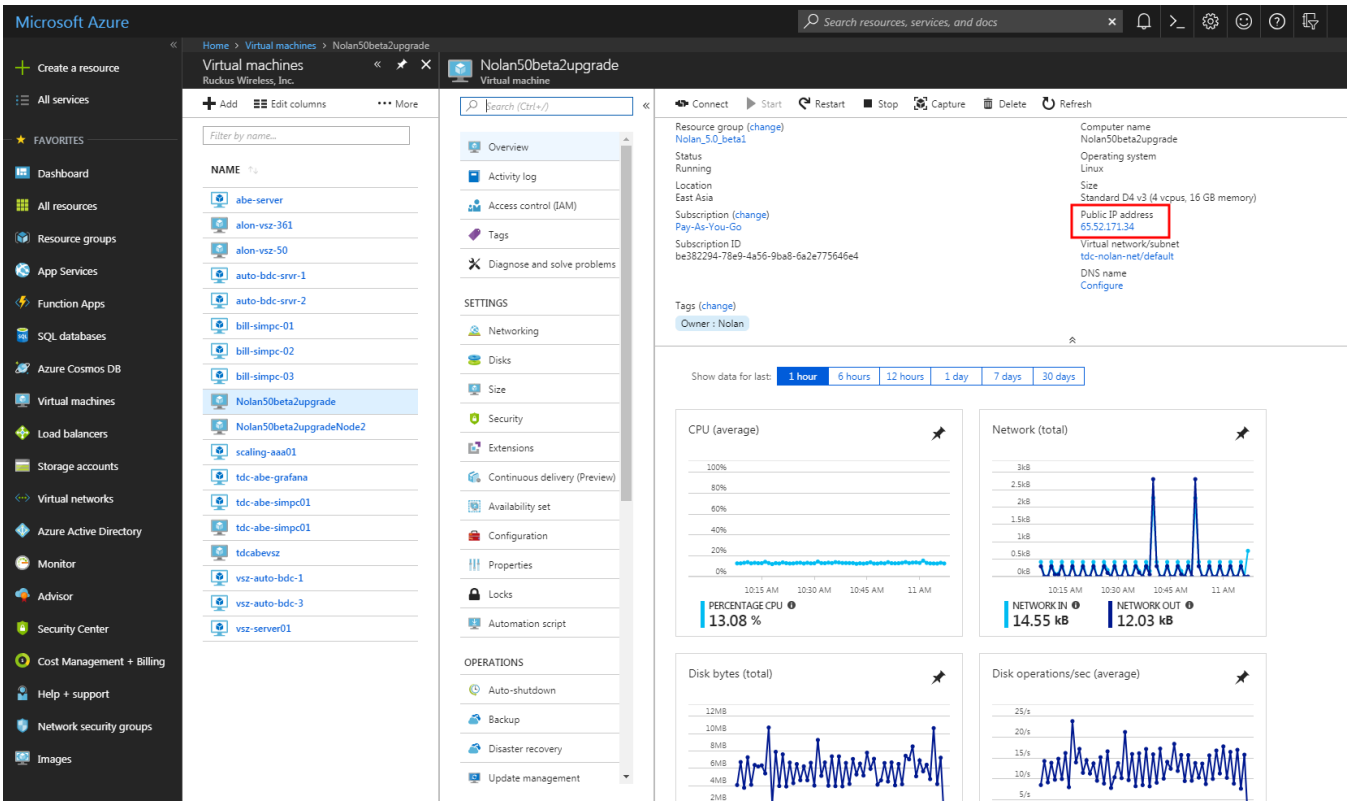
5. Verify the details and click **OK**. The new Virtual Machine is created and listed in the Virtual Machine page as shown in the following image.

FIGURE 69 Virtual Machines



6. Select the Virtual Machine, and get the Public IP address as shown in the following image.

FIGURE 70 Public IP Address



7. From the Linux PC or terminal use the Public IP address to run the ssh connection as shown in the following image.

FIGURE 71 SSH Connection

Installing vSZ on the Google Computing Engine

Introduction

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 the tables in GUID-4800DFDE-7381-4785-8D04-EB6D5EA2590B in the Installation Preparation chapter.

Logging into GCE and Selecting a Project

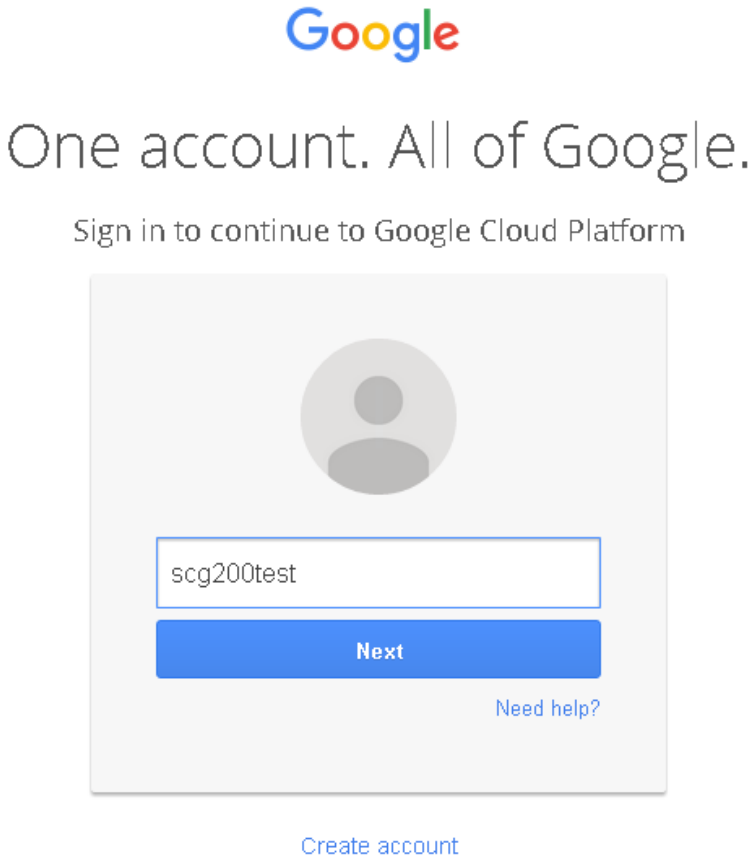
This section describes how to log into the GCE and select a project.

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.

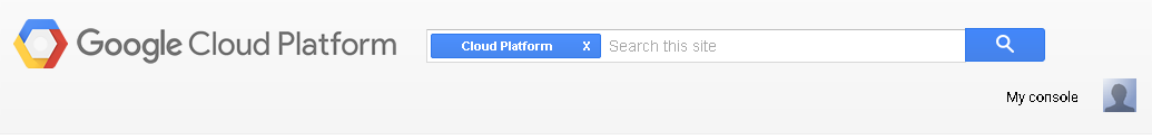
2. Log in using your user name and password.

FIGURE 72 Login with user credentials



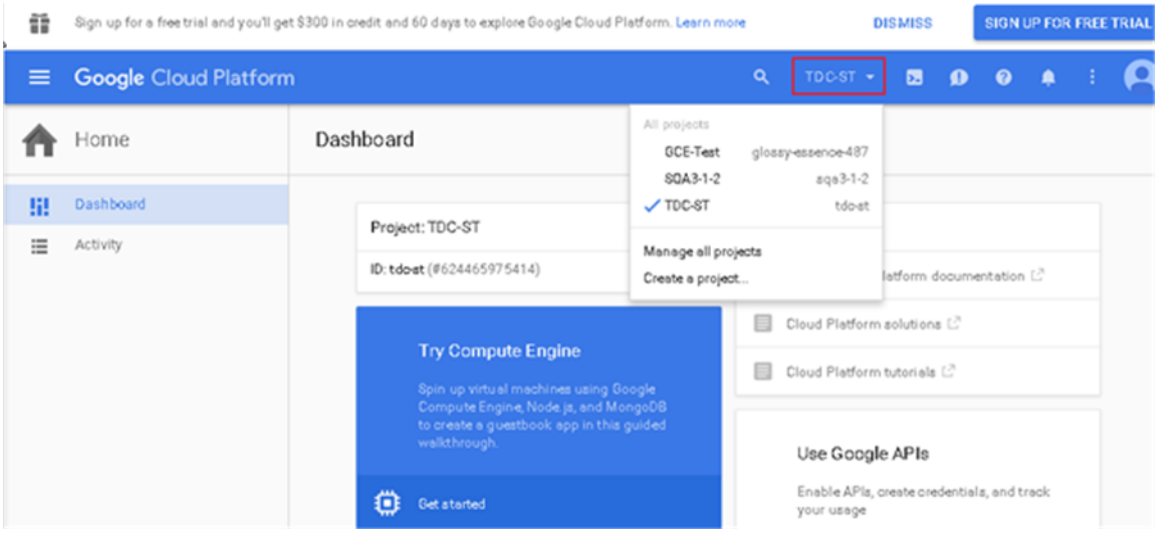
3. Select **My console** as shown.

FIGURE 73 GCE Page - My console



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

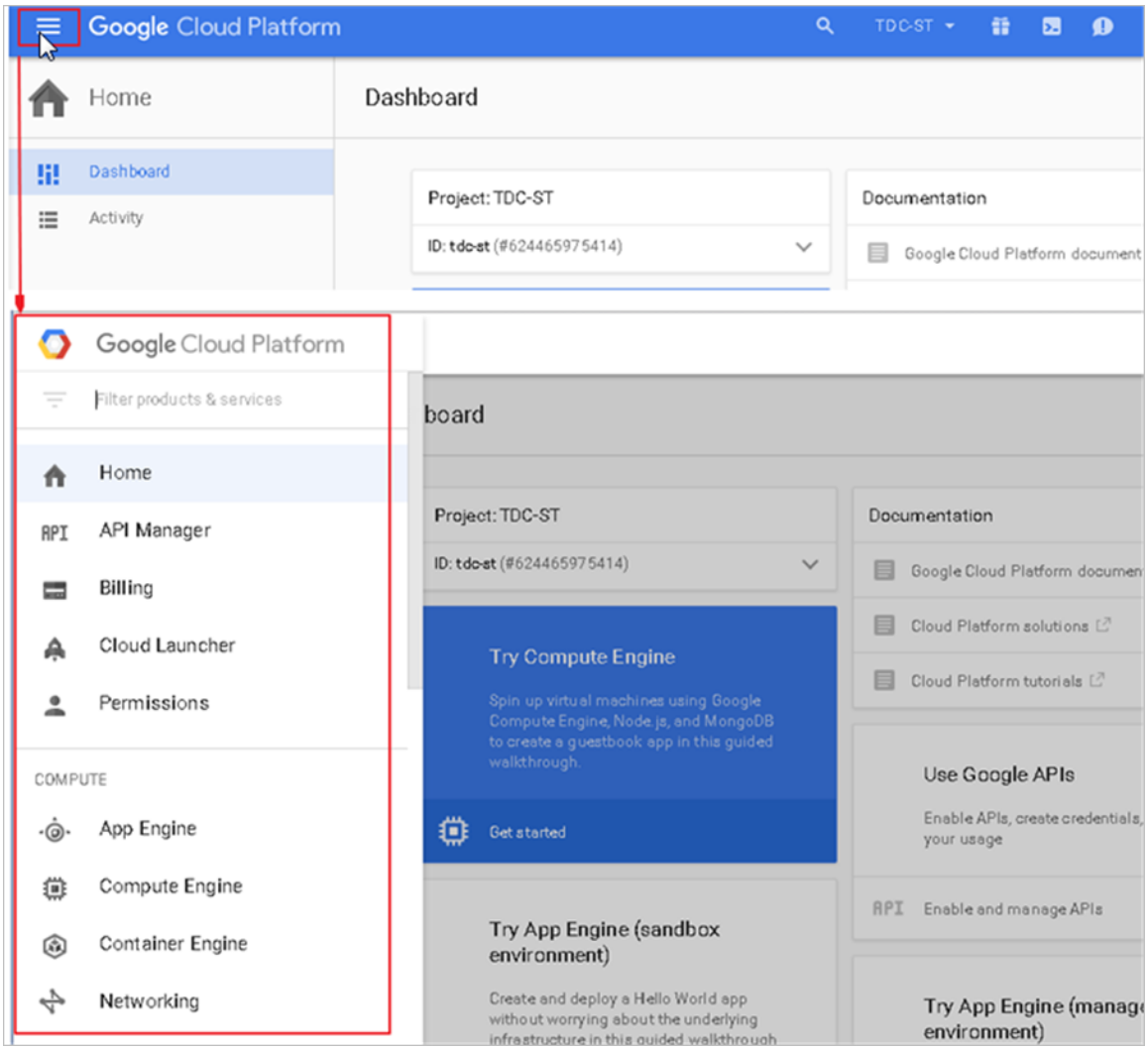
FIGURE 74 Choose the project



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 75 Selecting a Project

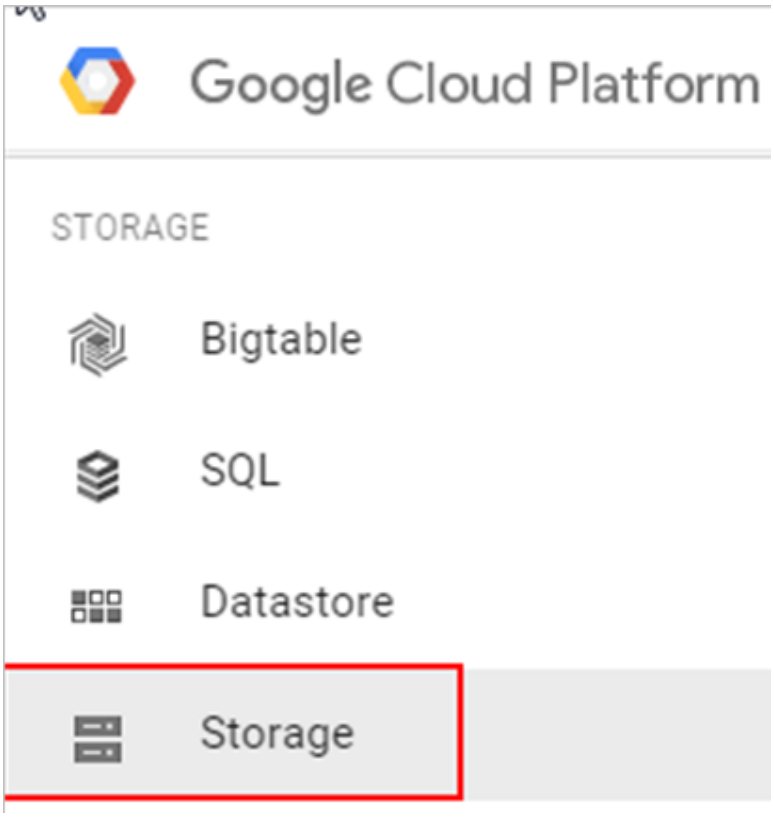


Creating a Storage Bucket

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

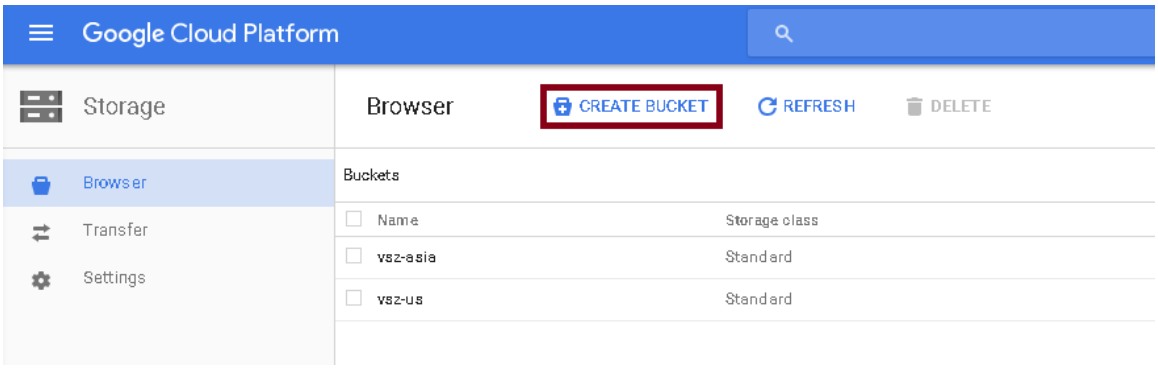
1. From **Google Developers Console**, click **Product and Services** icon > **Storage**. The **Cloud Storage Buckets** screen appears.

FIGURE 76 Storage Bucket Browser



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

FIGURE 77 Creating a Storage Bucket

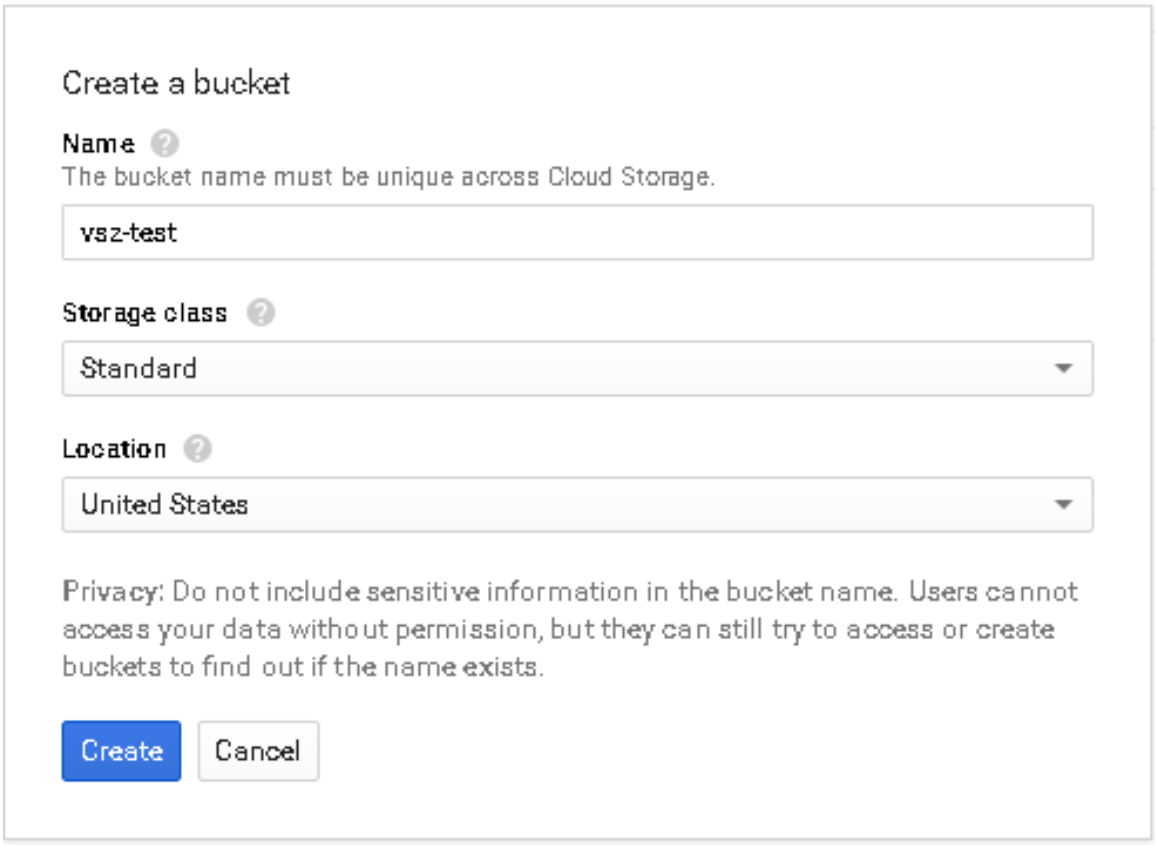


3. Complete the following fields,
   a) In **Name**, type the name of the storage bucket
   b) In **Storage class**, select the storage class you want. You can choose from **Standard**, **Durable Reduced Availability (DRA)** or **Cloud Storage Nearline** in the drop-down list. Use the below table to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

TABLE 9 Bucket Storage Location

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" storage that is archived and may or may not be needed at some future time.	Continental locations

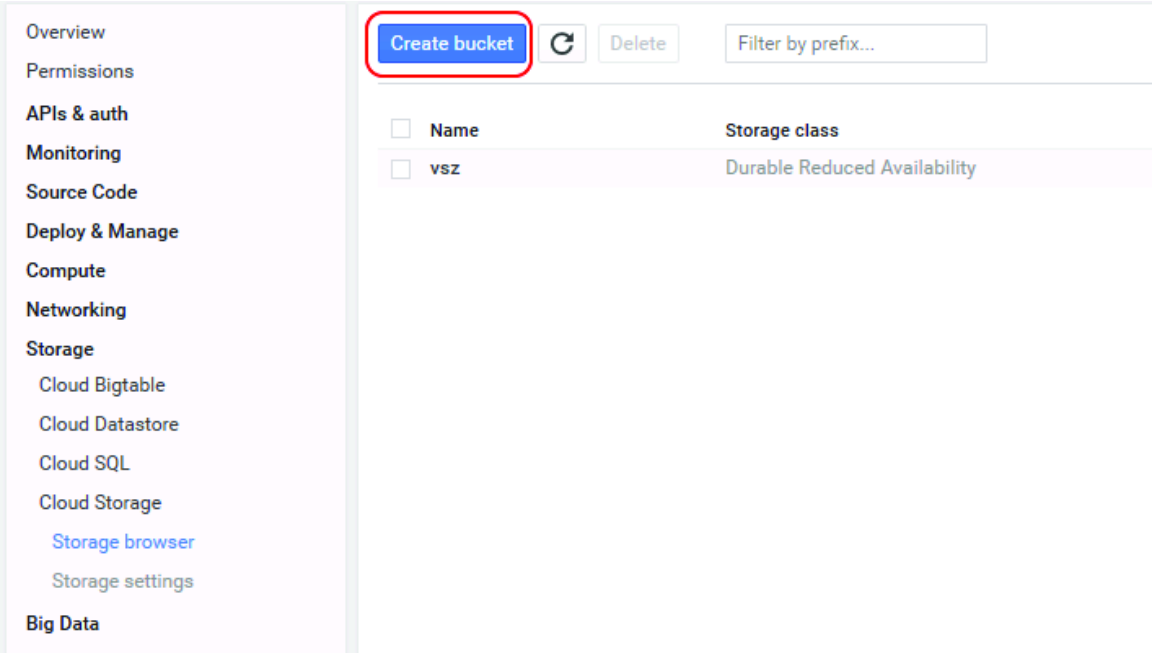
FIGURE 78 New Bucket Information



4. Click **Create**. The storage bucket you created is listed in the browser.

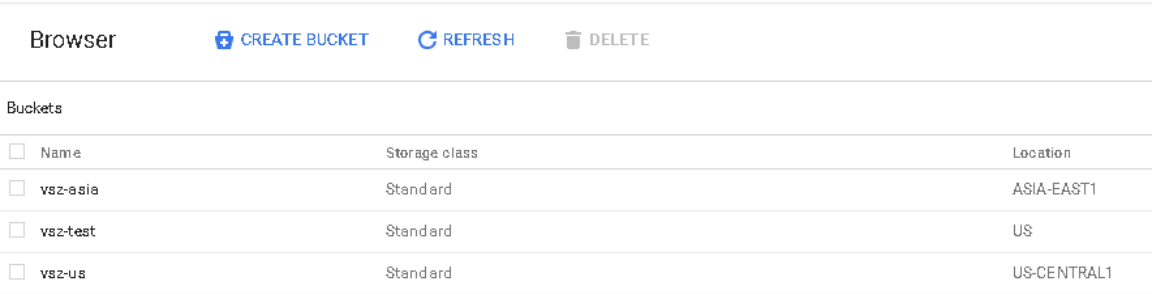
5. To create another storage, click **Create bucket** as shown.

FIGURE 79 Creating Another Storage Bucket



6. Verify that the storage bucket has been created.

FIGURE 80 Selecting the Storage Bucket



Uploading the vSZ Image to a Storage Bucket

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

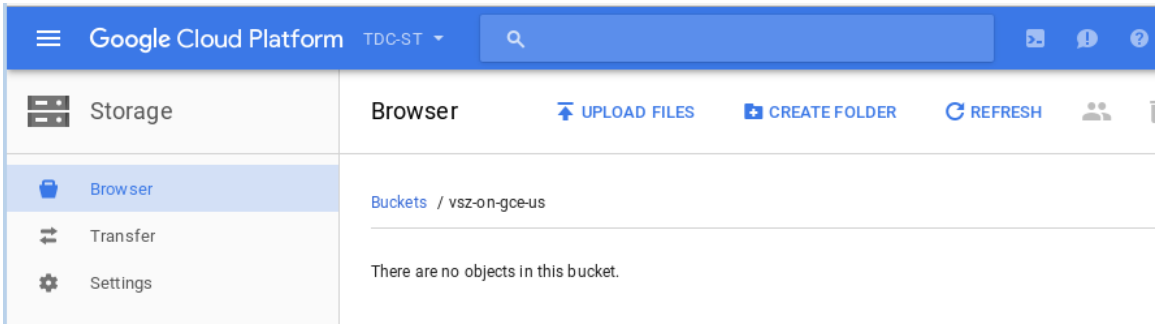
1. Extract the vSZ raw.bin file that you obtained from Ruckus Networks.

   NOTE
   - If the "`Permission denied`" error appears, execute the command "chmod +x vscg-3.5.0.0.808.raw.bin" before extracting the file.
   - If the "`uudecode: command not found`" error appears during the extraction process, install the "sharutils" package, and then try extracting the image again.

2. Read the Virtual SmartZone (vSZ) Software License agreement that appears when you extract the raw.bin file.
3. When the `Accept this agreement?` prompt appears, enter **yes** to accept the license agreement.

   When the extraction process is complete, a raw.tar.gz file appears.
4. On the GCE web interface, browse to the storage bucket where you want to upload the vSZ image file.

   FIGURE 81 Browse to the storage bucket

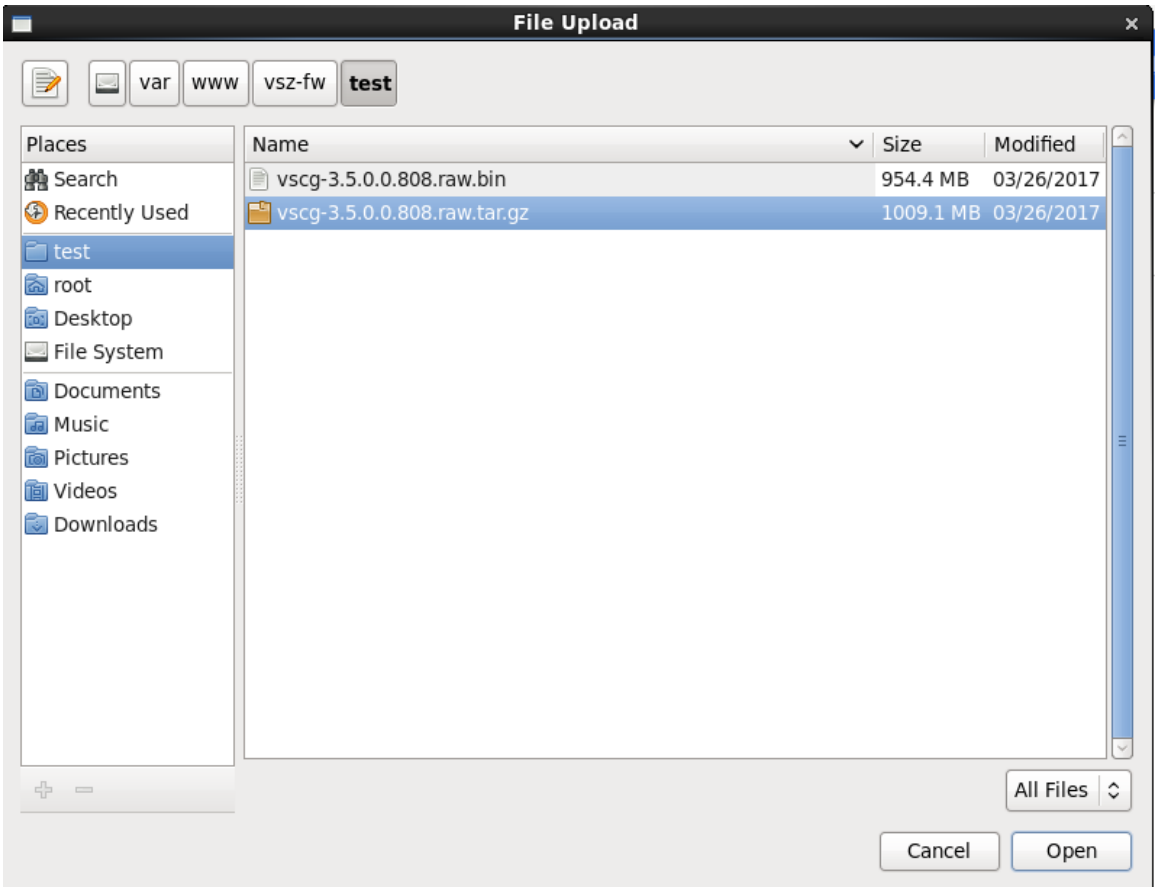


5. Click **Upload files**.

6. Browse to the location of the .raw.tar.gz image file that you extracted, and then select it.

   NOTE
   You can only select .raw.tar.gz files.

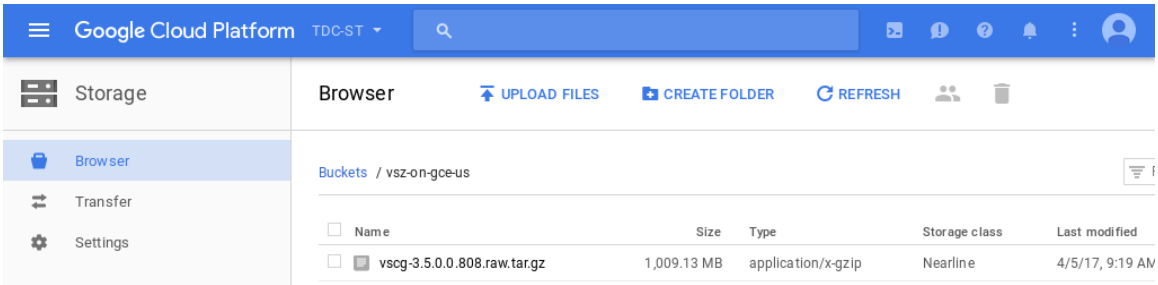
FIGURE 82 Select the .raw.tar.gz image file that you extracted



7. Click **Open** to upload the image file.

   Your browser displays the progress of the file upload process. After the upload process is complete, the image file appears in the storage bucket.

FIGURE 83 The image file appears in the storage bucket

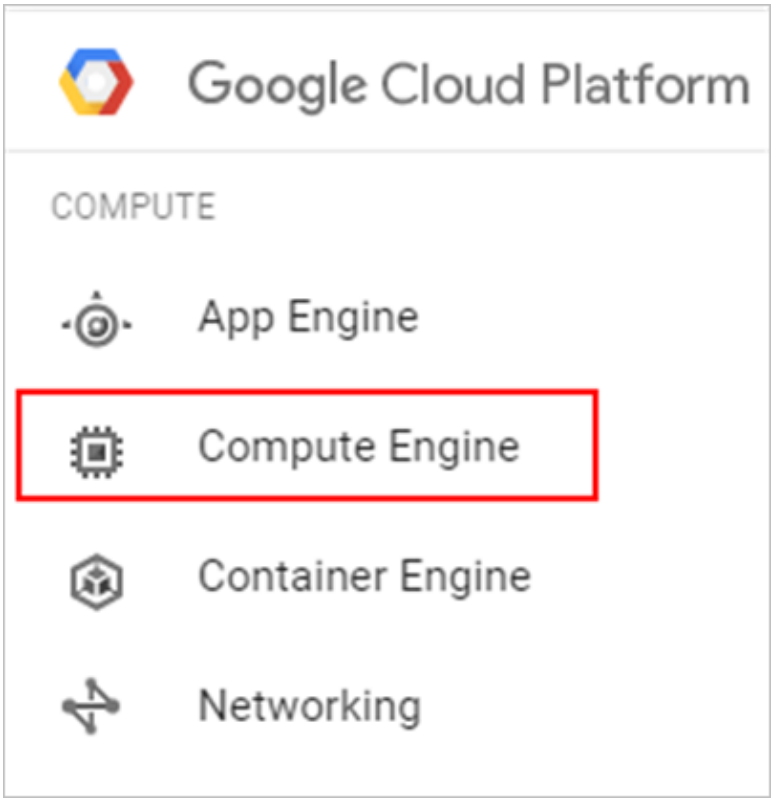


Creating a vSZ Image for Virtual Machines

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

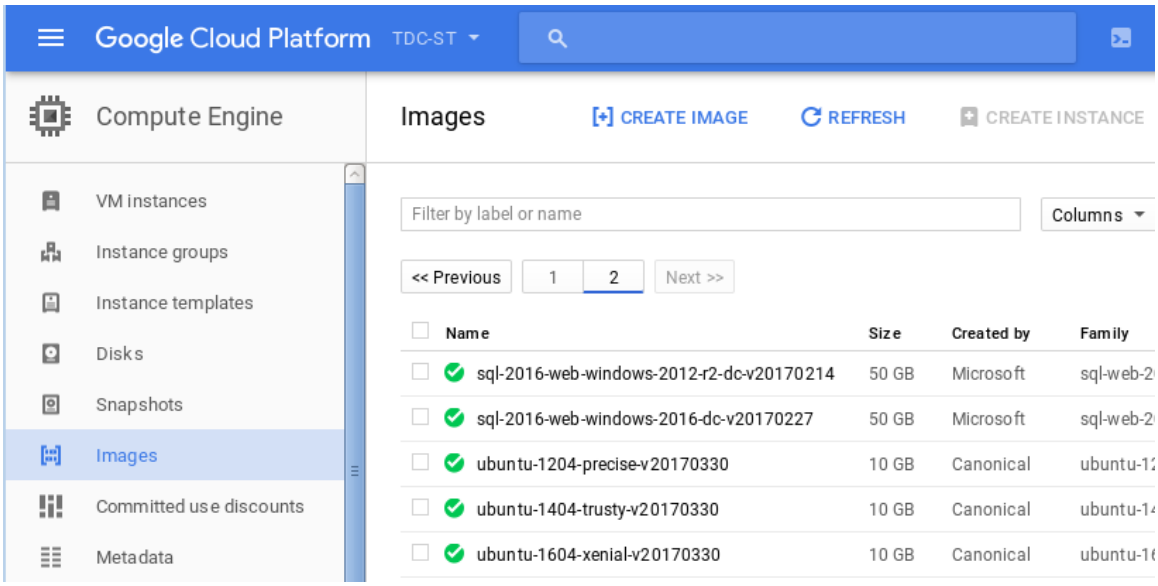
1. From **Google Developers Console**, click **Compute** > **Compute Engine**.

FIGURE 84 Select Compute Engine



2. On the menu, click **Images**, and then cllick **Create Image**.

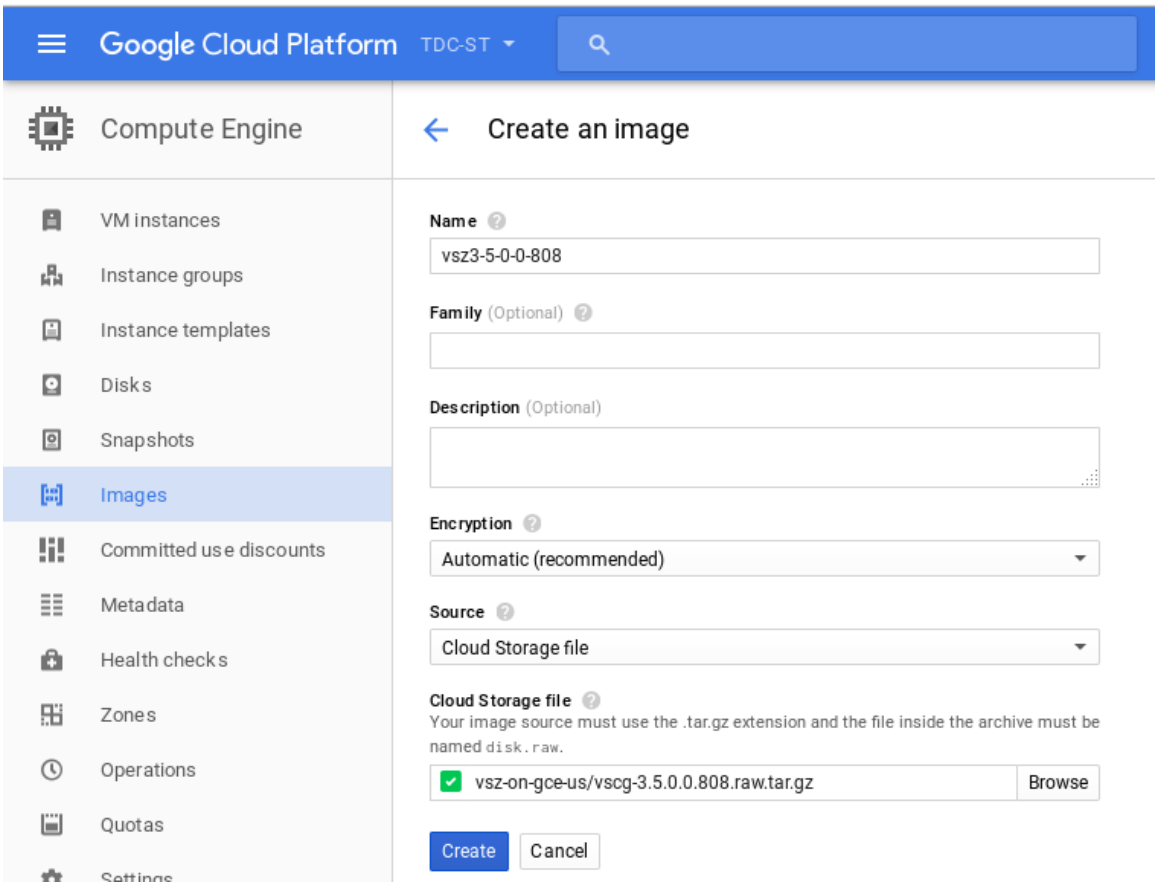
FIGURE 85 Click Create Image



The **Create an image** page appears.

3. Configure the properties of the new image by fillng out the boxes below.
   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**, and then select the .raw.tar.gz image file that you extracted previously.

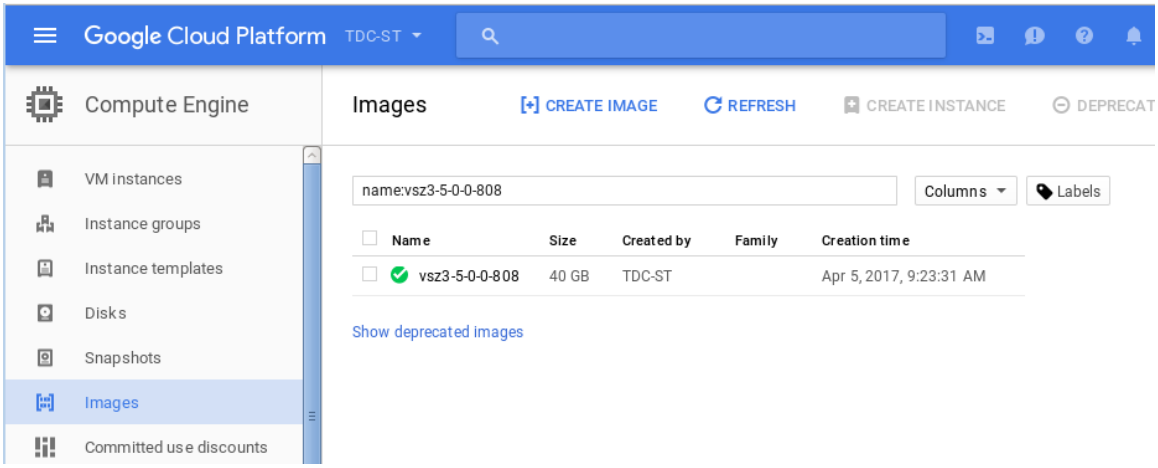
FIGURE 86 Creating an image



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

   GCE creates the new image. When the process is complete, the image you created from the .raw.tar.gz image file appears on the **Images** page.

   FIGURE 87 The new image you created appears on the Images page



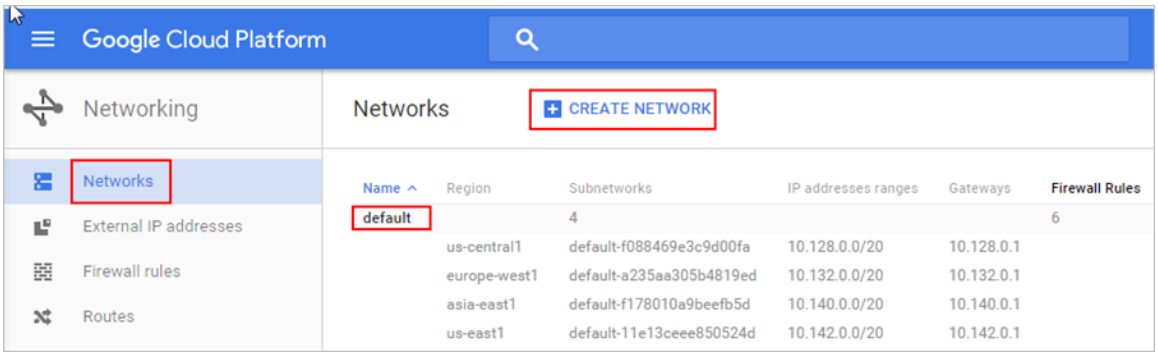
You have completed creating an image.

Creating a Network and Configuring Firewall Rules

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

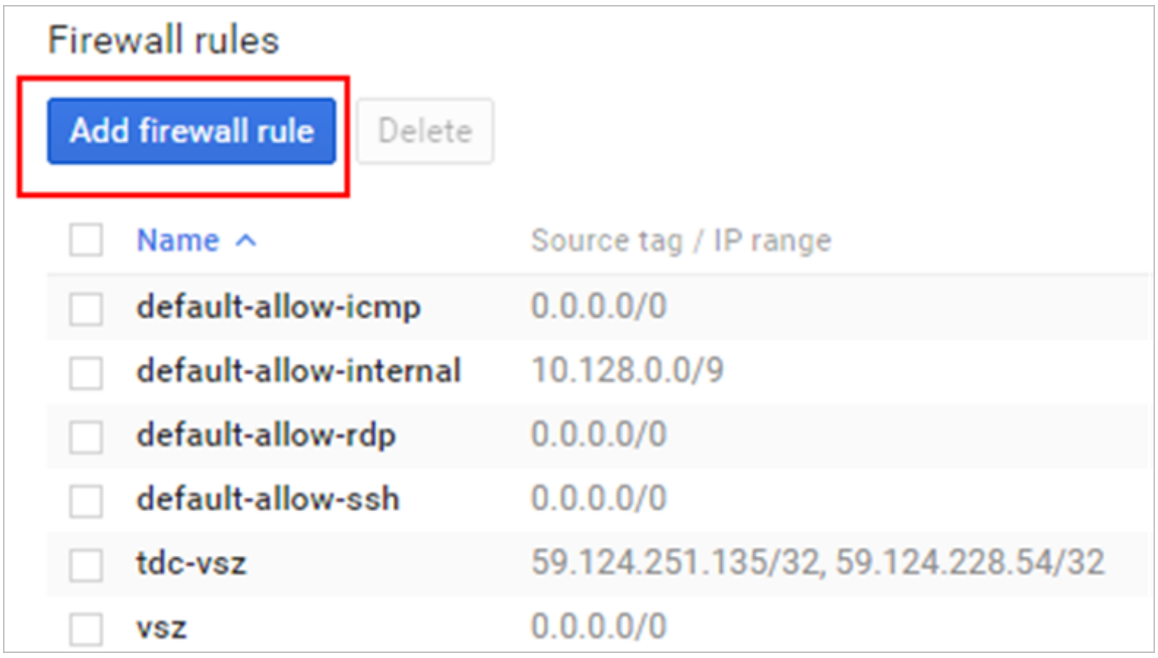
1. From **Google Developers Console**, click **Networking** > **Networks**. A page displaying a list of networks appears. Select the default network.

   FIGURE 88 List of networks



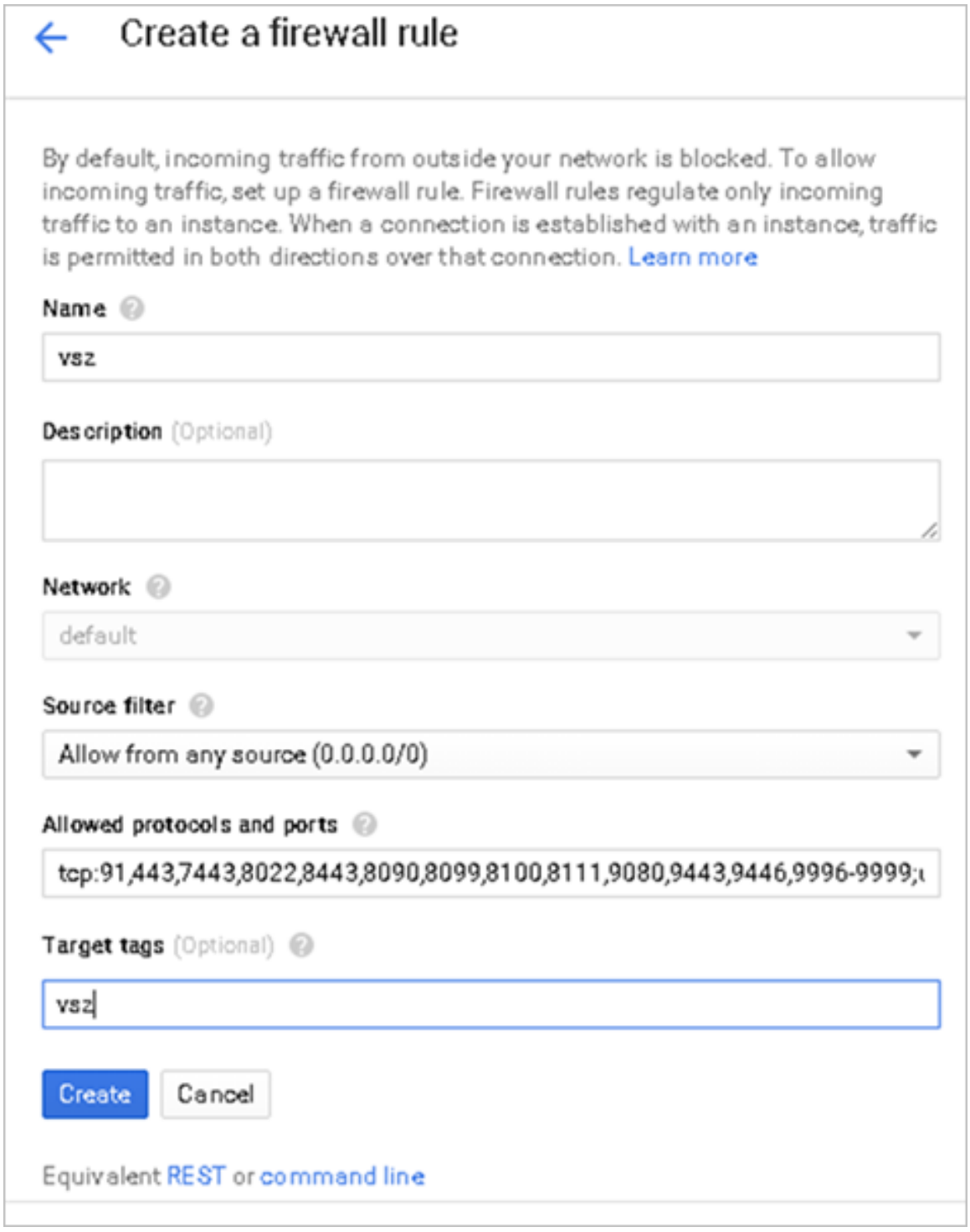
2. To create a firewall rule, click **Add a firewall rule**.

FIGURE 89 Add a Firewall Rule



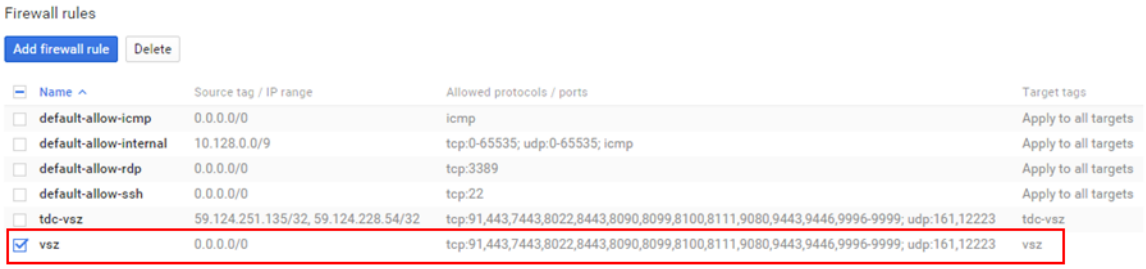
3. The **Create a firewall rule** screen appears.
   a) In **Name**, type the name of the rule
   b) In **Description**, provide a brief description about the rule.
   c) In **Network**, type the network address.
   d) In **Source filter**, select **Allow from any source**.
   e) In **Source IP ranges**, 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 90 Creating a Firewall Rule


Create a firewall rule
By default, incoming traffic from outside your network is blocked. To allow incoming traffic, set up a firewall rule. Firewall rules regulate only incoming traffic to an instance. When a connection is established with an instance, traffic is permitted in both directions over that connection. Learn more
Name
vsz
Description (Optional)
Network
default
Source filter
Allow from any source (0.0.0.0/0)
Allowed protocols and ports
tcp:91,443,7443,8022,8443,8090,8099,8100,8111,9080,9443,9446,9996-9999;
Target tags (Optional)
vsz
Create
Cancel
Equivalent REST or command line

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

FIGURE 91 Adding Firewall Rules



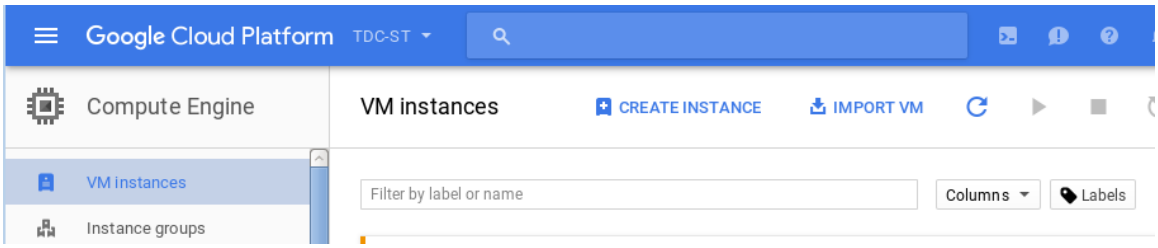
Creating a Virtual Machine Instance

Follow these steps to create a new virtual machine (VM_ instance.

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

   The **VM instances** page appears.

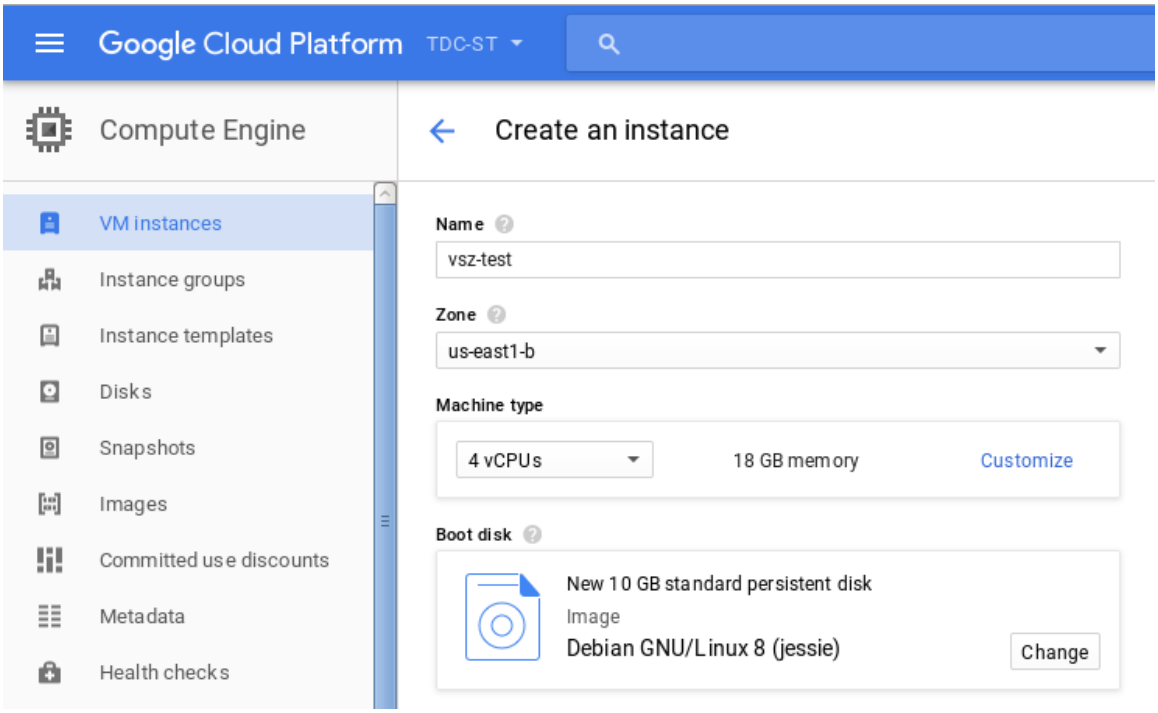
FIGURE 92 The VM instances page



2. Click **Create Instance**.

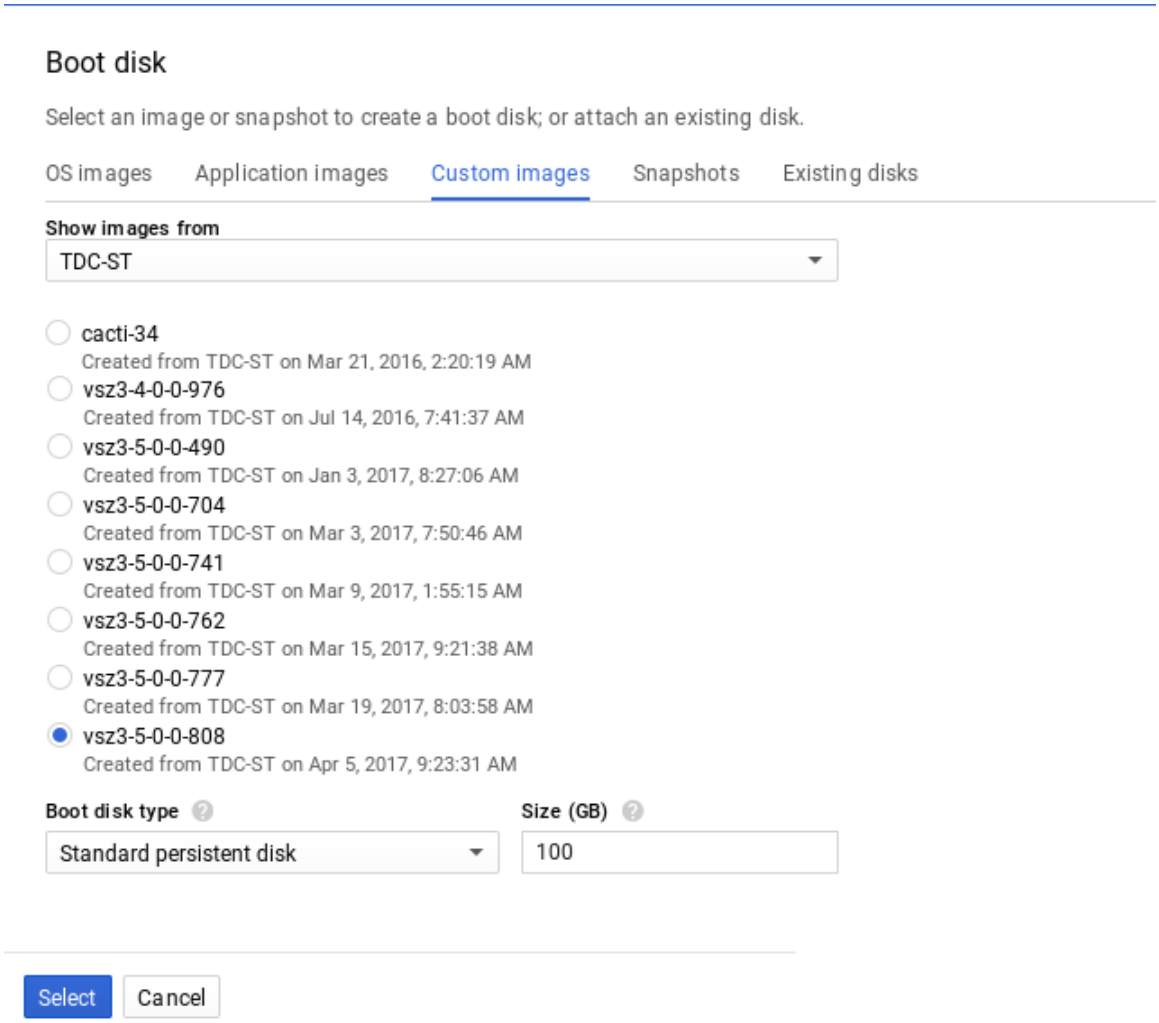
   The **Create an instance** page appears.

FIGURE 93 The Create an instance page



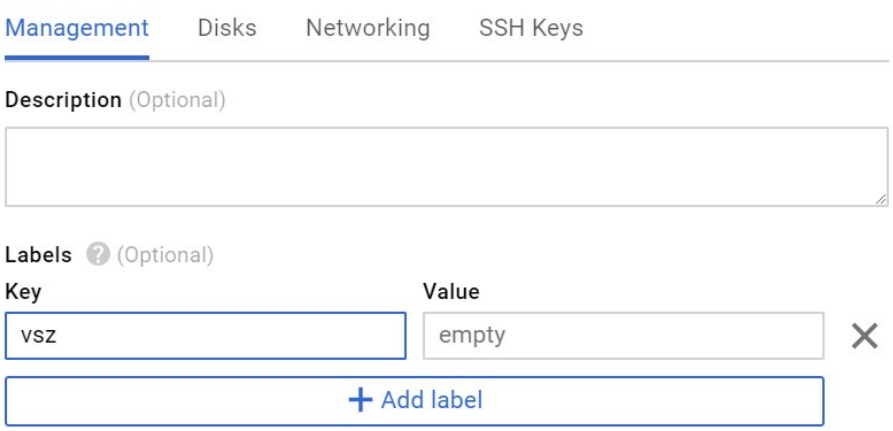
3. Configure the new VM instance that you are creating by filling out the boxes below.
   a) In **Name**, type the name of the VM instance.
   b) In **Zone**, select a zone from the drop-down list.
   c) In **Machine type**, accept or modify the default values for **vCPUs** and **Memory**.
   d) Under **Boot disk**, click **Change**. The **Boot disk** page appears. Click **Custom images**.In **Show images from**, select the storage bucket where you uploaded the controller image, and then select the image. Click **Select**.
   e) In **Project access**, allow API access as appropriate.

FIGURE 94 Creating a new VM instance



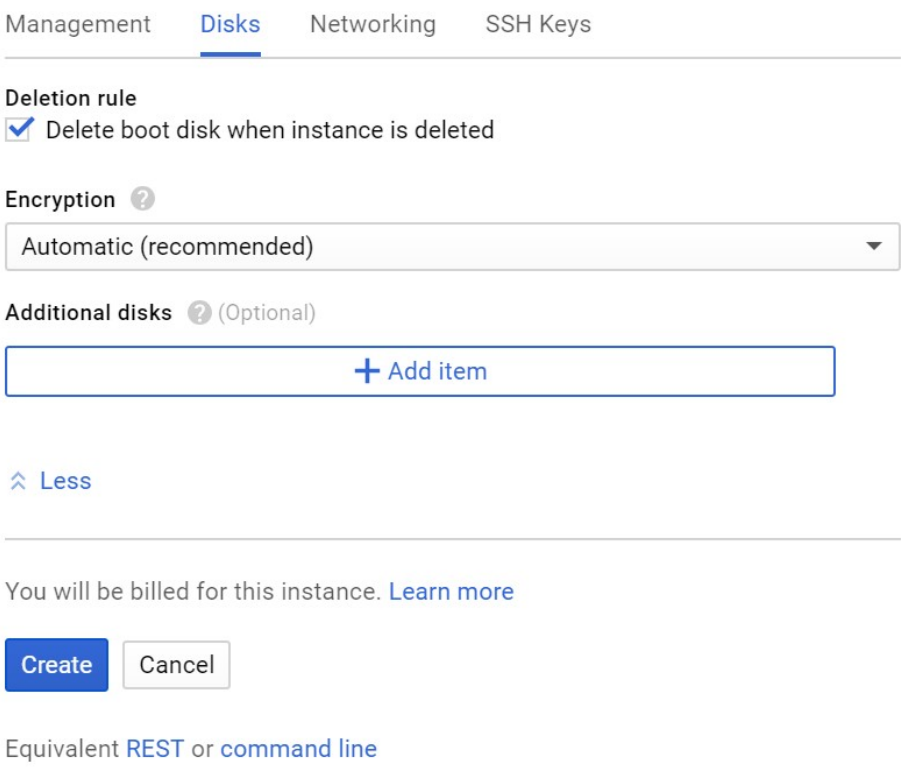
   f) In **Firewall**, select the options as appropriate.
   g) In **Project access**, allow API access as appropriate.
   h) In **Management**, ensure that the tag provided is the same as the one provided while creating a firewall rule. This ensures port mapping happens correctly.

FIGURE 95 Management Tab



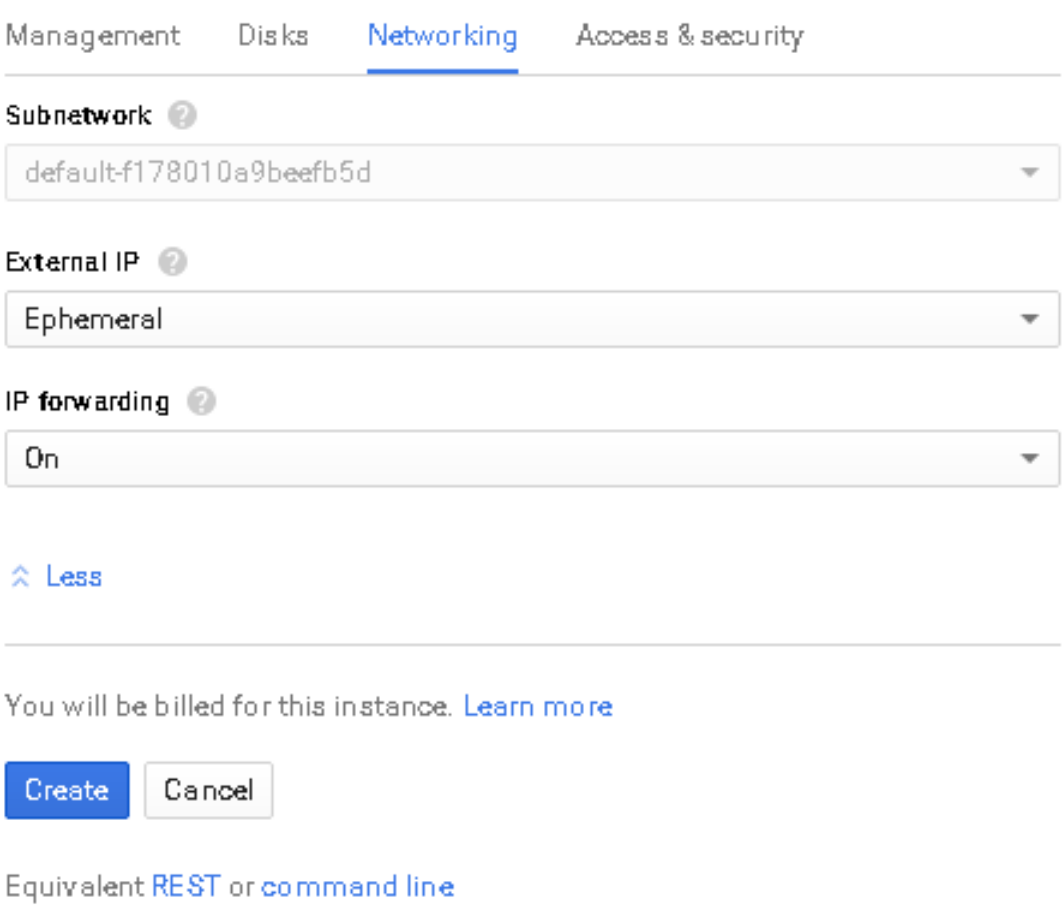
i) In **Disk**, select the options as appropriate.

FIGURE 96 VM Disk Configuration



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

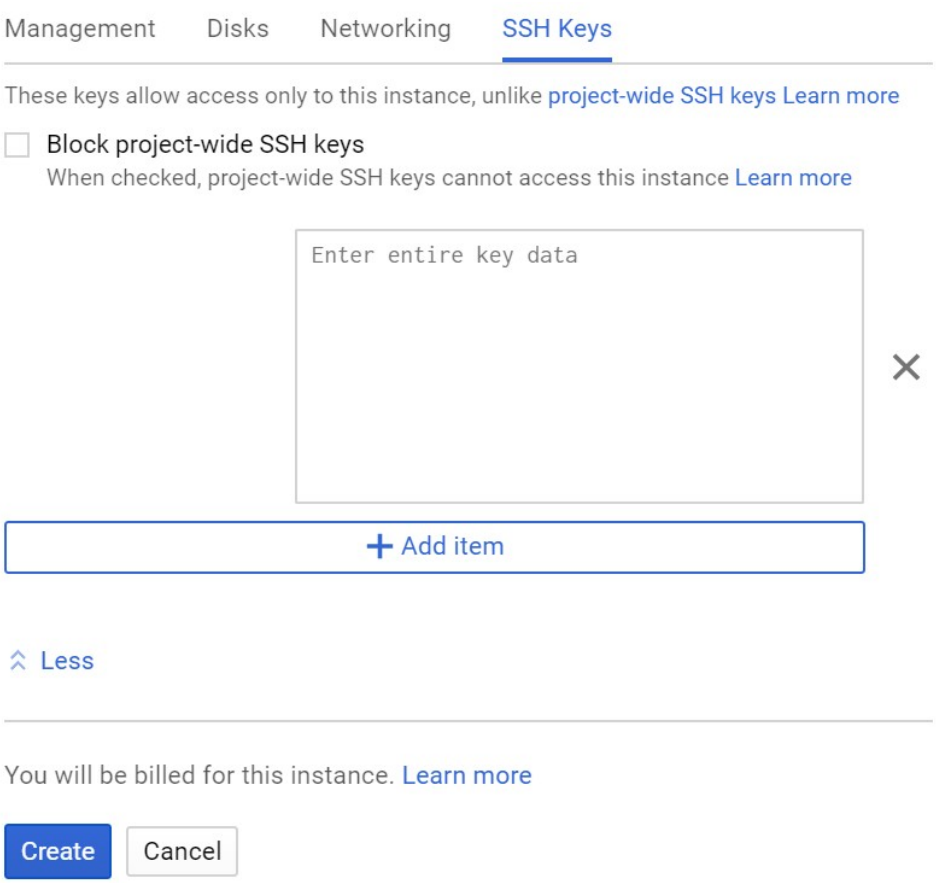
FIGURE 97 Networking



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

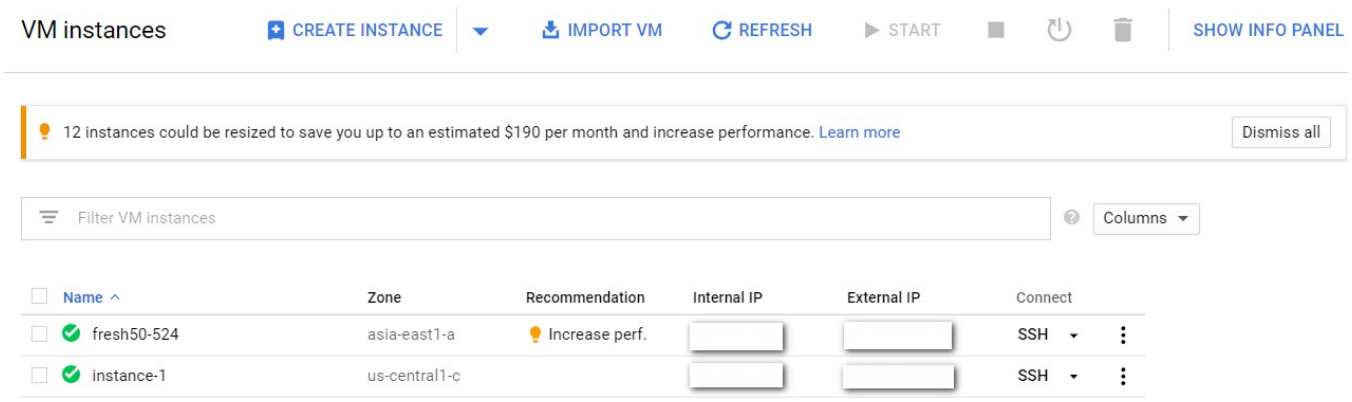
k) In **SSH Keys**, select the options as appropriate.

FIGURE 98 SSH Keys



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

FIGURE 99 The new VM appears on the list of VMs



You have completed creating a virtual machine instance.

Installing vSZ on Amazon Web Services

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
```

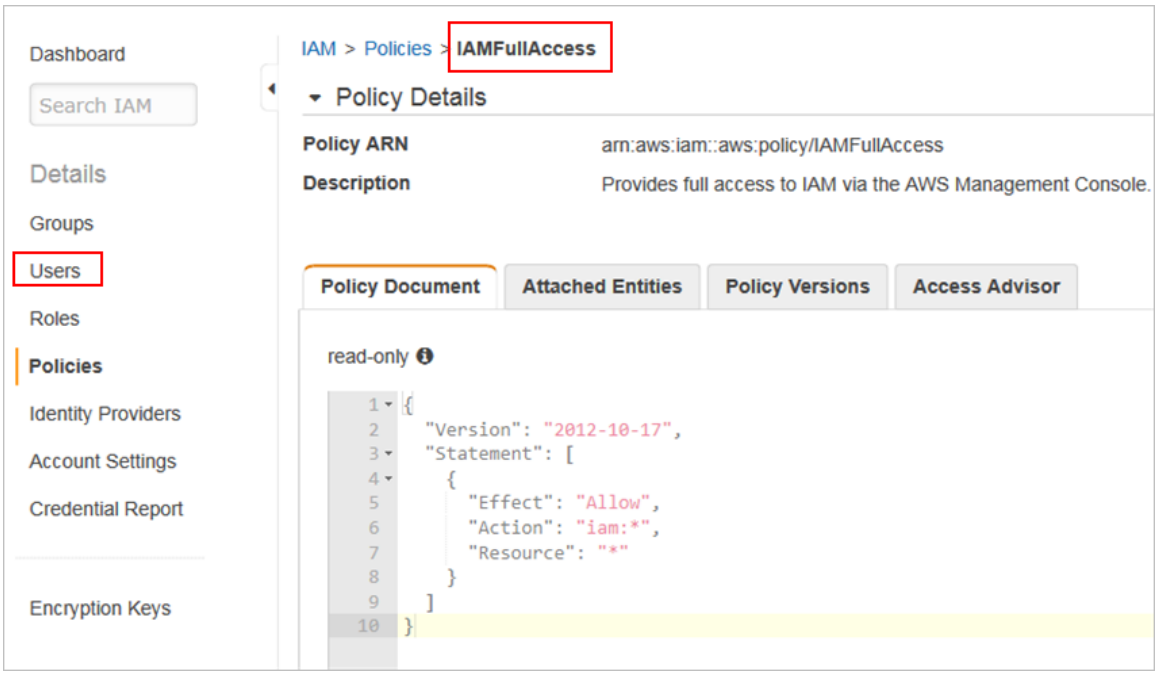
6. The default region should be the same as the bucket region. Refer to Table for the mapping details. In addition refer to you can also refer to latest version.

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)
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 100 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.

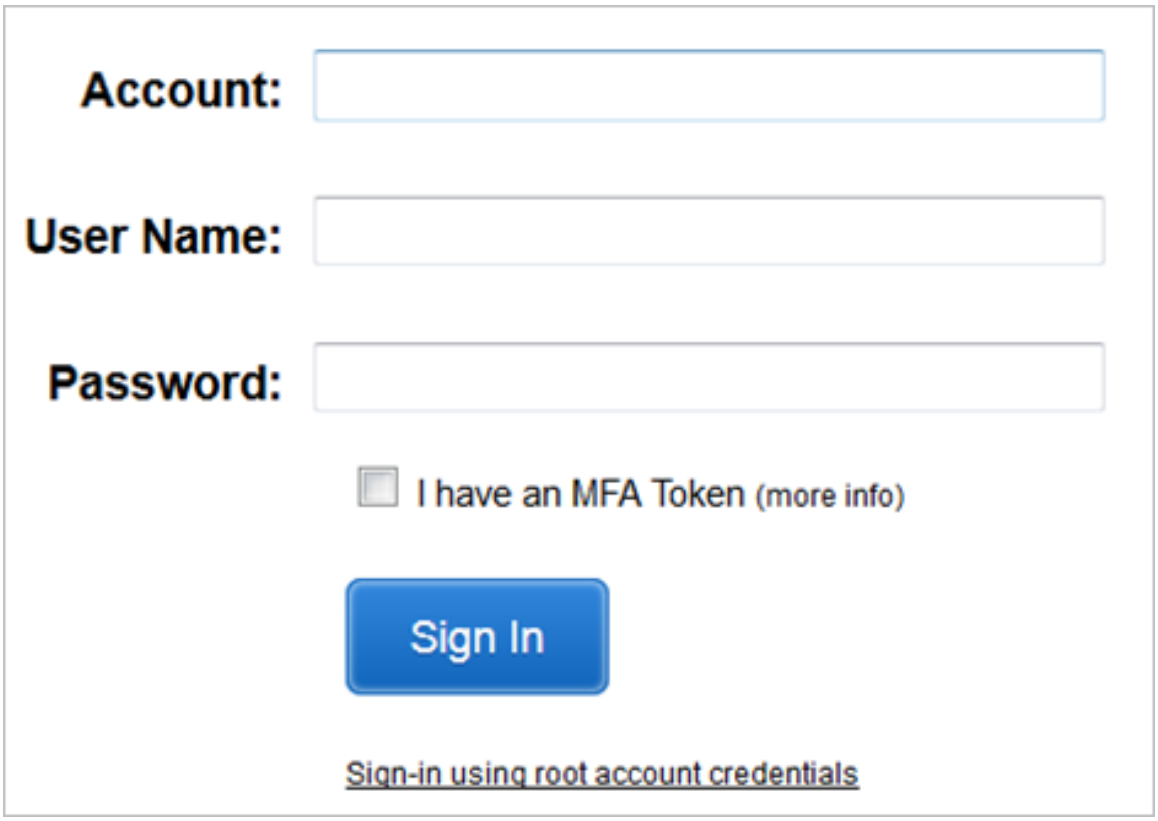
Logging into AWS

Follow these steps to login to the AWS site.

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

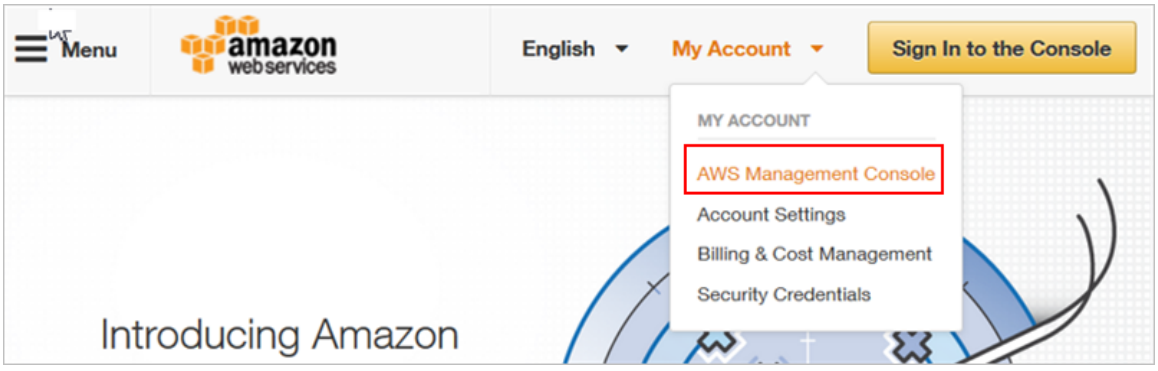
2. Login with your user credentials of user name and password.

FIGURE 101 Login with user credentials



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

FIGURE 102 AWS management console

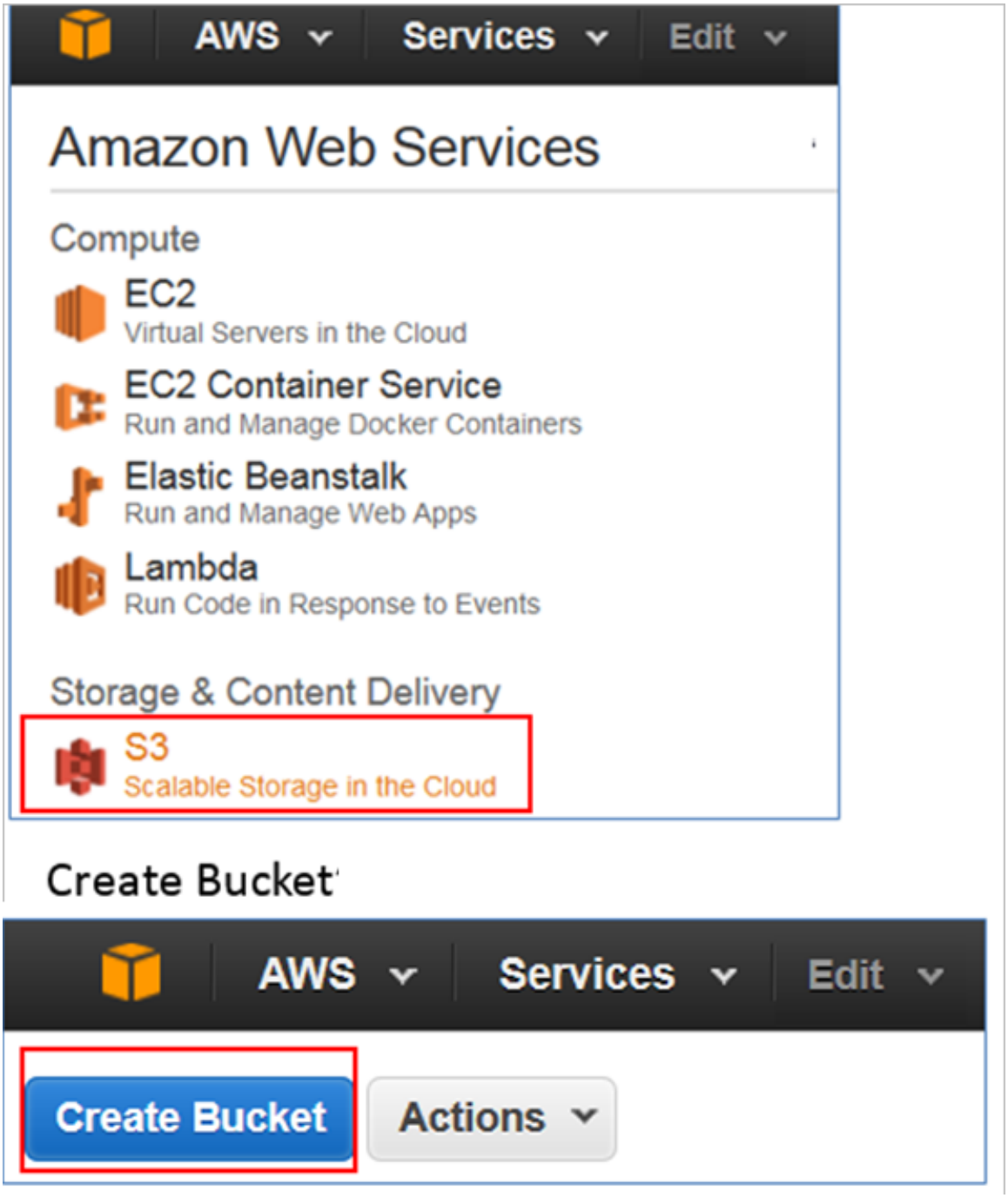


Creating a Storage Bucket

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

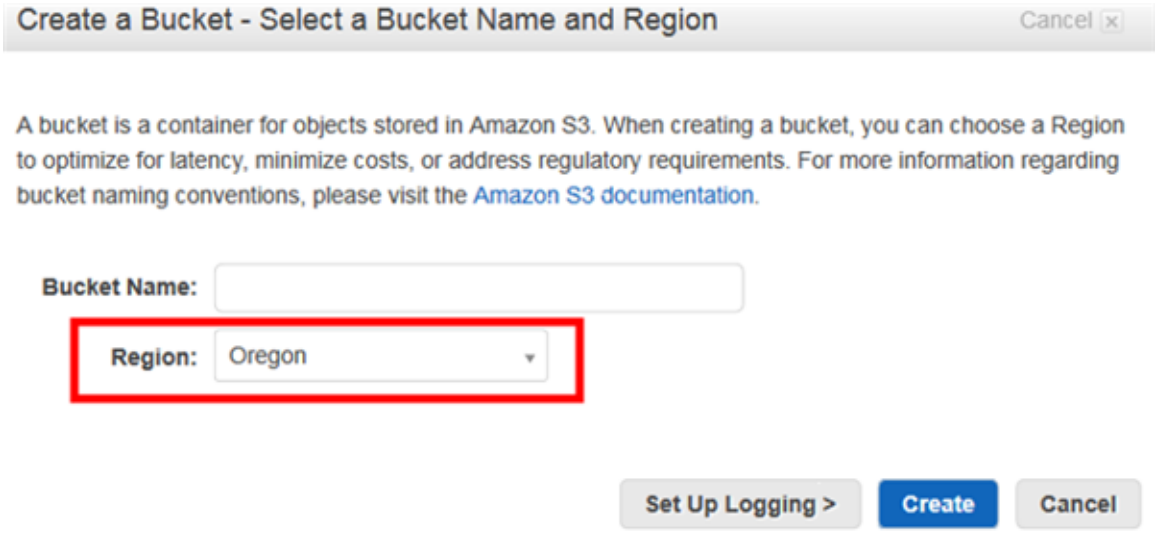
1. Navigate to **Amazon Web Services** > **Storage and Content Delivery** > **S3**, click **Create Bucket** as shown.

FIGURE 103 Create Bucket



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

FIGURE 104 Selecting regional endpoint



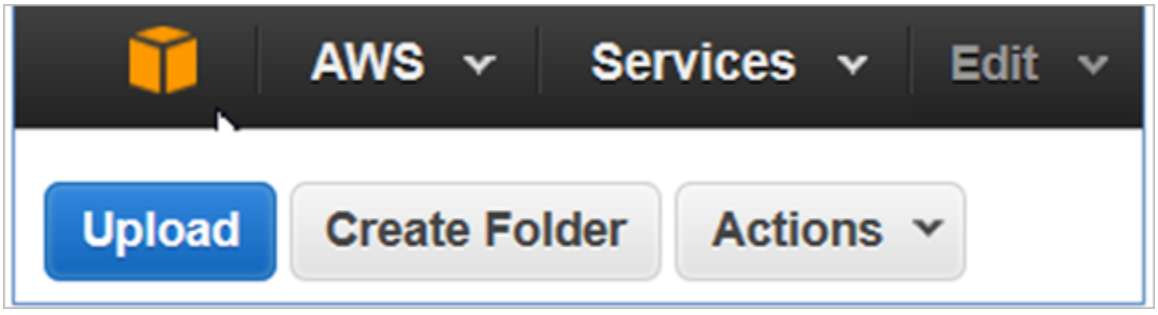
3. Click **Create**. The storage bucket you created is listed in the browser.
4. Check the storage bucket has been created.

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.

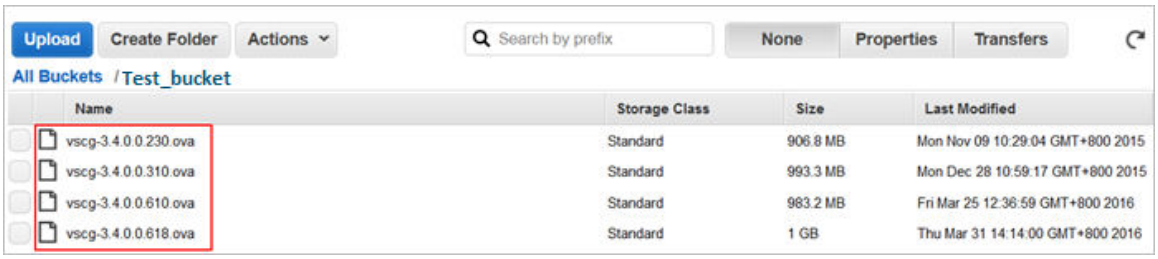
FIGURE 105 Selecting the Storage



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 106 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 (for example, 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 the AWS CLI by following the instructions at http://docs.aws.amazon.com/cli/latest/userguide/installing.html
2. Enter the following command in the AWS CLI **#sudo pip install awscli**.
3. Get the access key for the AWS CLI by following the instructions on the AWS website.
4. Add the access key details to the AWS 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 the vSZ Image

Follow these steps to import the 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 **vscg-3.4.0.0.750.ova**.

```
{
    "Description": "Import vSZ",
    "DiskContainers": [
        {
            "Description": "vSZ 3.4.0.0.750",
            "UserBucket":{
                "S3Bucket": "<bucket-name>",
                "S3Key": "vscg-3.4.0.0.750.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.

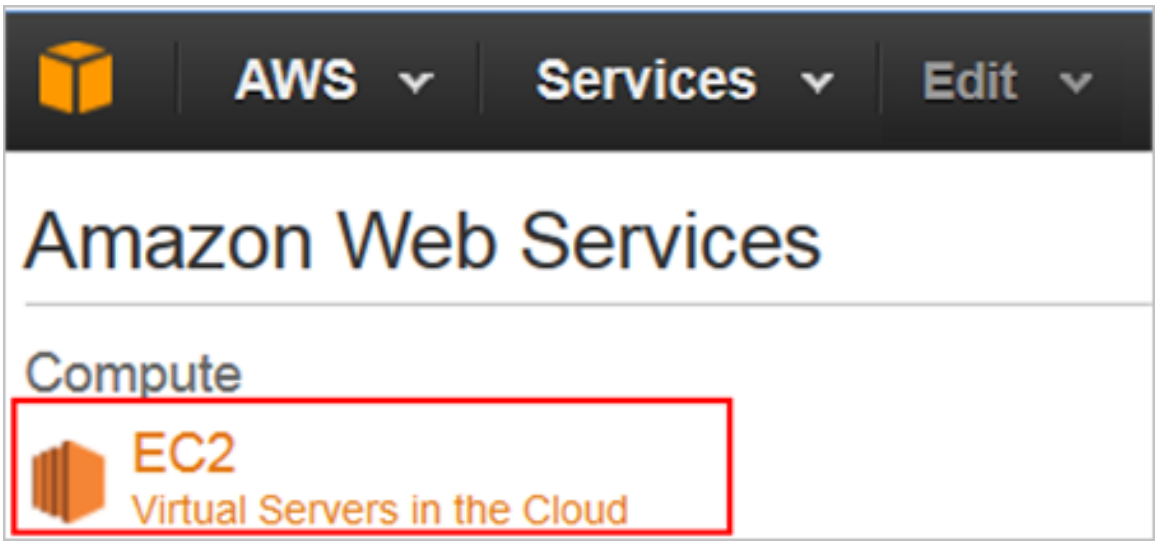
```
{
    "ImportImageTasks": [
        {
            "Status": "active",
            "Description": "vSZ test",
            "Progress": "28",
            "SnapshotDetails": [
                {
                    "UserBucket": {
                        "S3Bucket": "<bucket-name>",
                 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

Creating the vSZ Instance

Follow these steps to create a vSZ instance on AWS.

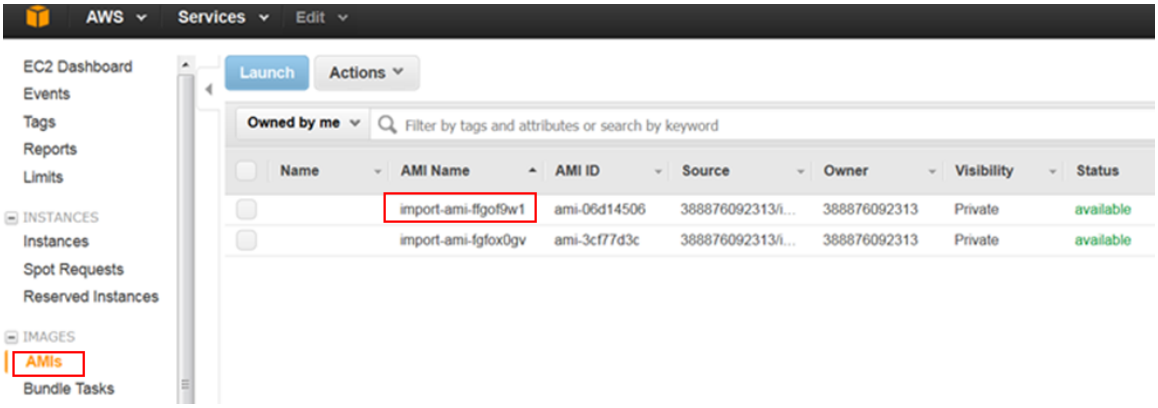
1. From **Amazon Web Service**, click **Compute** > **EC2**.

FIGURE 107 Select EC2



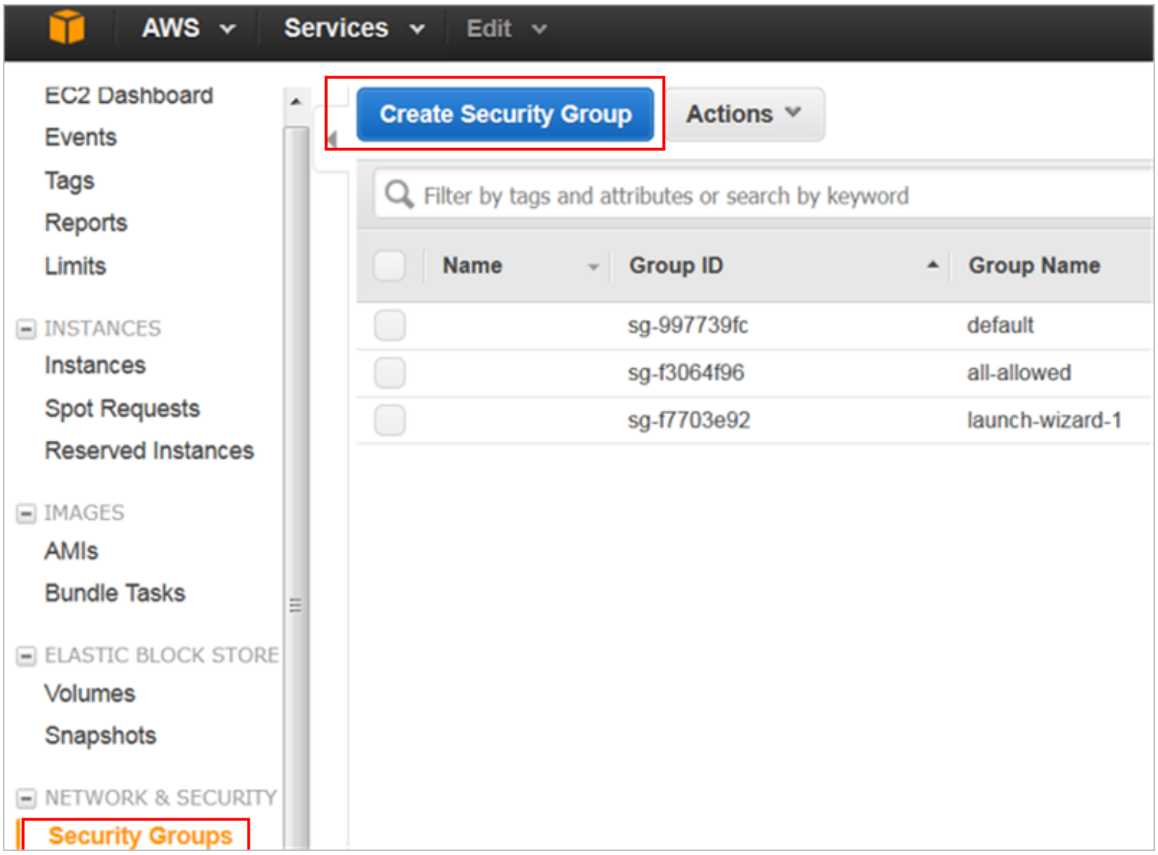
2. Navigate to **Images** > **AMIs** to ensure that the imported **Amazon Machine Image (AMI)** exists. In this example the AMI file is **import-ami-ffgof9w1**.

FIGURE 108 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.

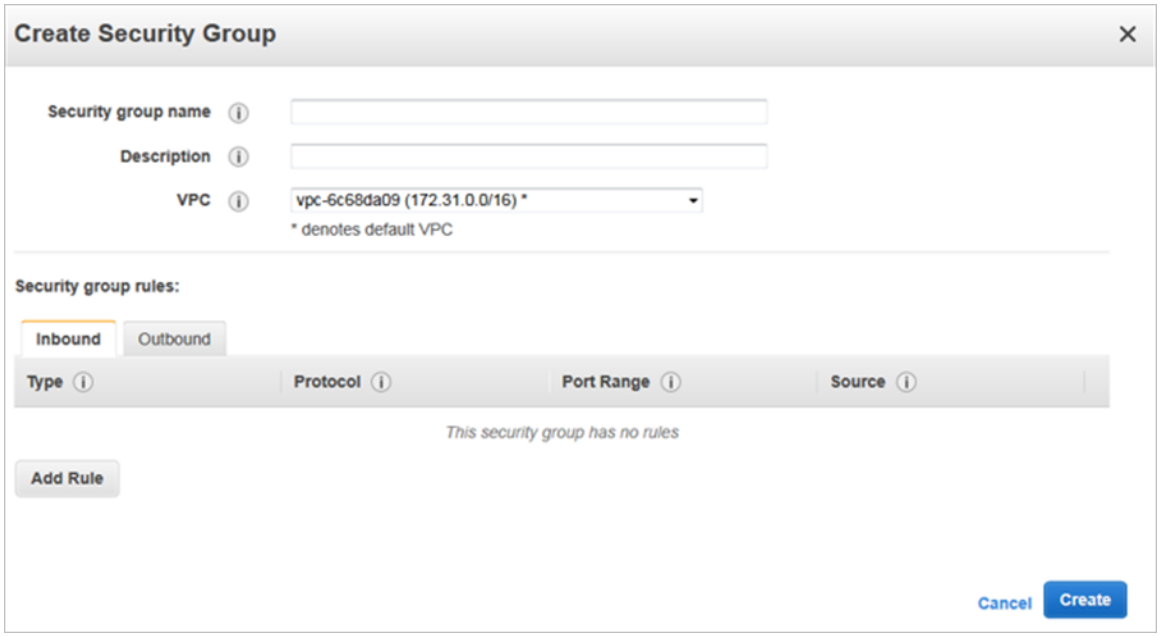
FIGURE 109 Create Security Group



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.

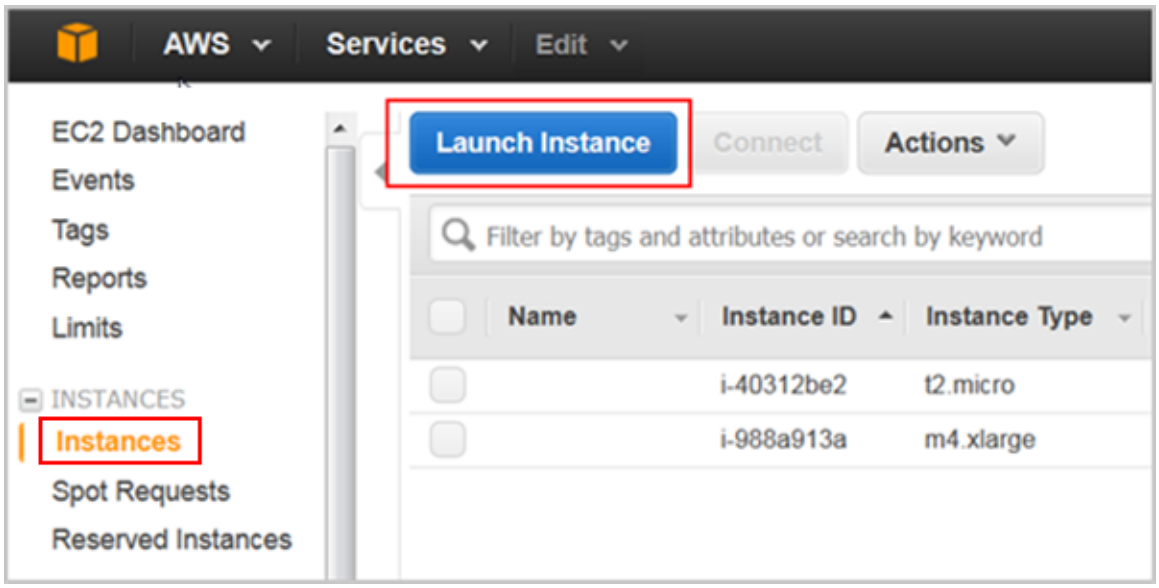
Port Number	Description
UDP	
161	SNMP
12223	ZD AP forward update using FTP (control connection)
TCP	
21	ZD AP forward update using FTP (control connection)
22	AP SSH
91	AP forward update using HTTP
443	Allows AP get SSH private key and do AP FW udpate via HTTPs
7443	Public API
8022	SSH for management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



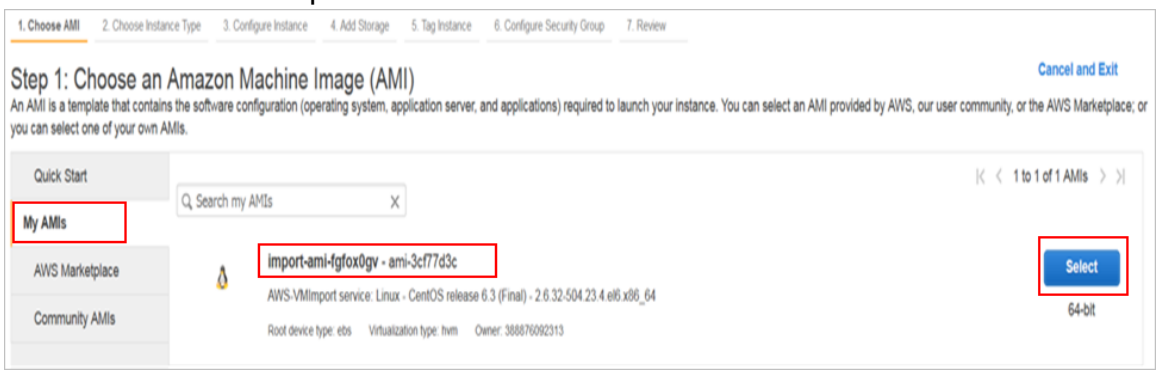
5. Navigate to **Instances** and click on **Launch Instances**. Follow these steps.
   a) Launch Instance

FIGURE 111 Launch instances



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

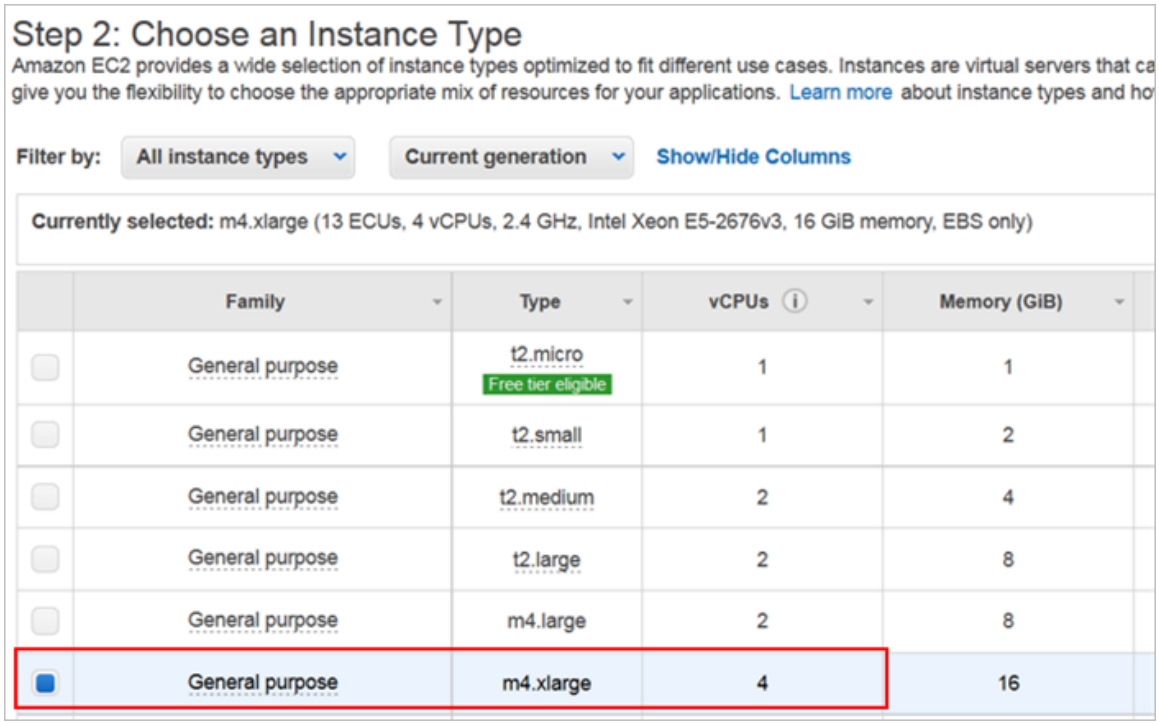
FIGURE 112 Choose the imported AMI



   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 113 Choose the instance type

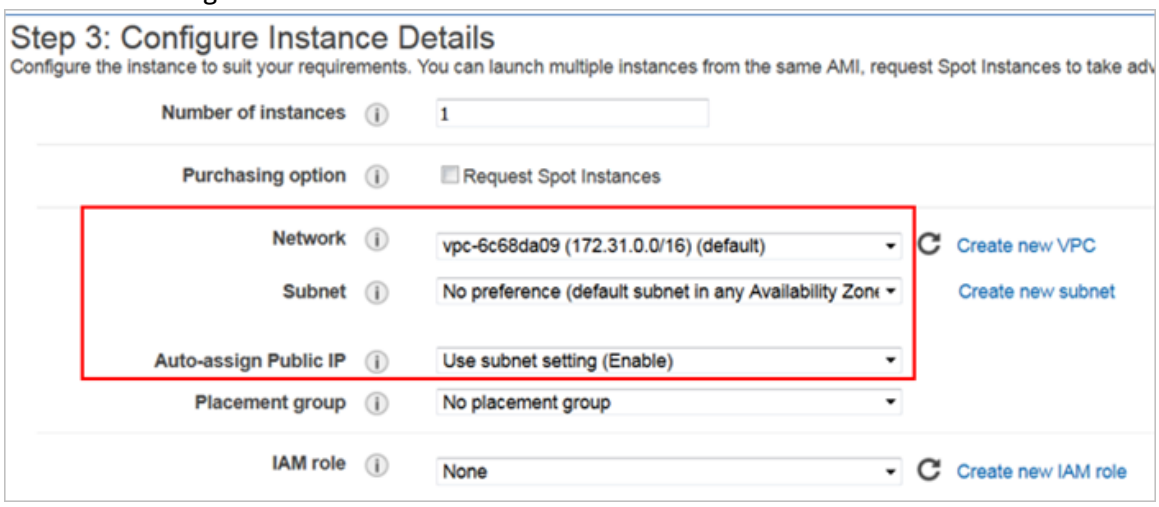


e) Click **Next**.

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

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

FIGURE 114 Configure the instance



g) Click **Next**.

h) Change the size of storage as required.

FIGURE 115 Change the storage size

i) Click **Next**.

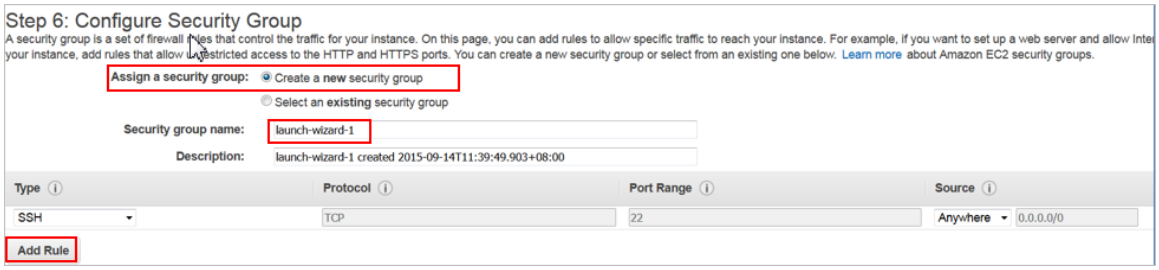
j) Specify the vSZ instance by giving it a name.

FIGURE 116 Specify the vSZ instance

k) Click **Next**.

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

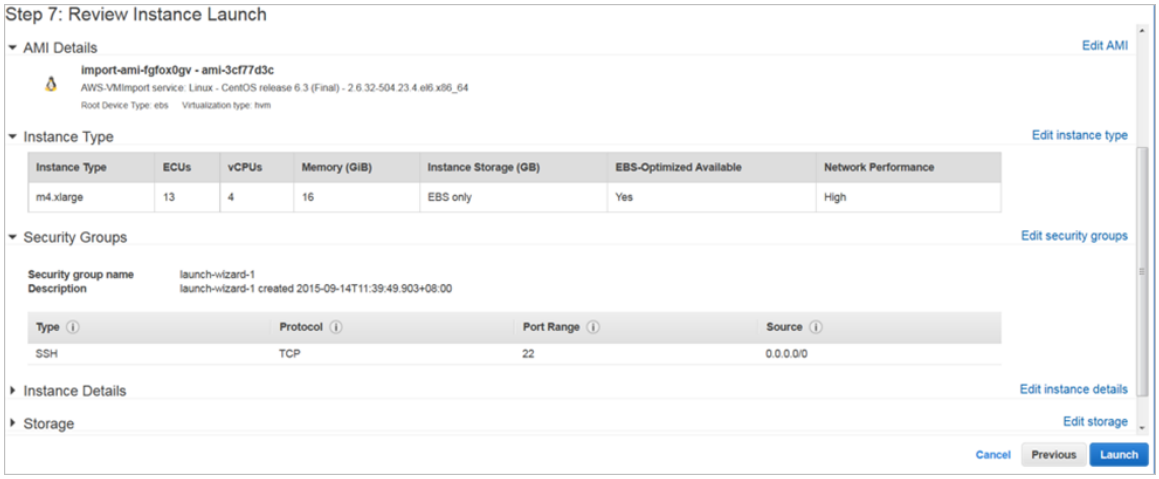
FIGURE 117 Specify the security group



m) Click **Next**.

n) Review the configuration settings.

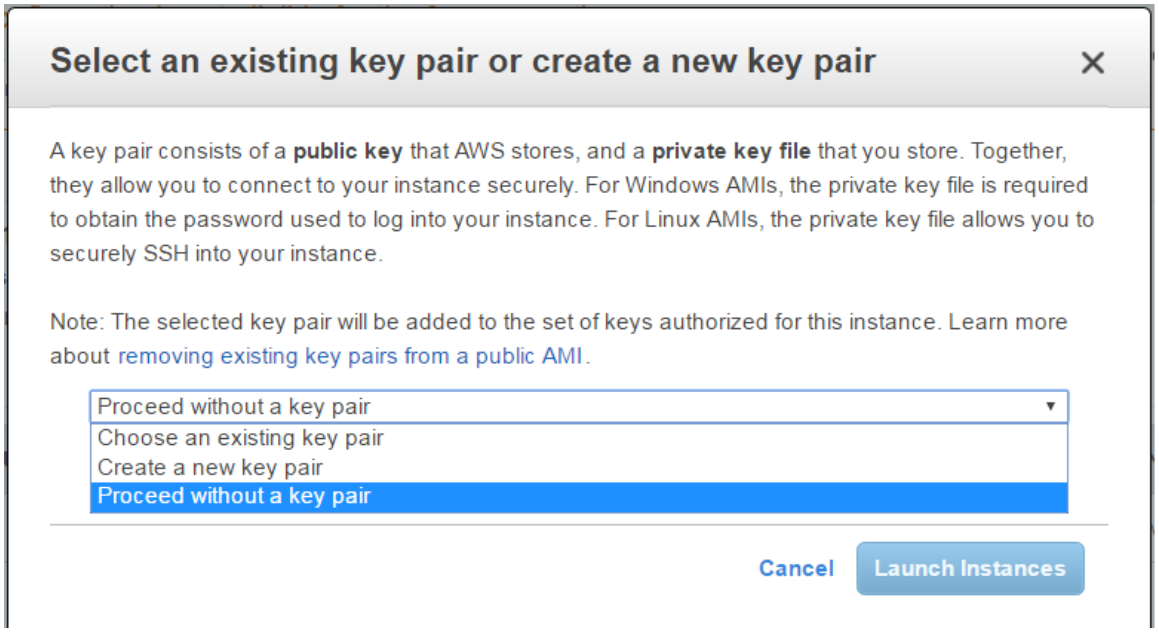
FIGURE 118 Review the configuration settings



o) Click **Launch**

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

FIGURE 119 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

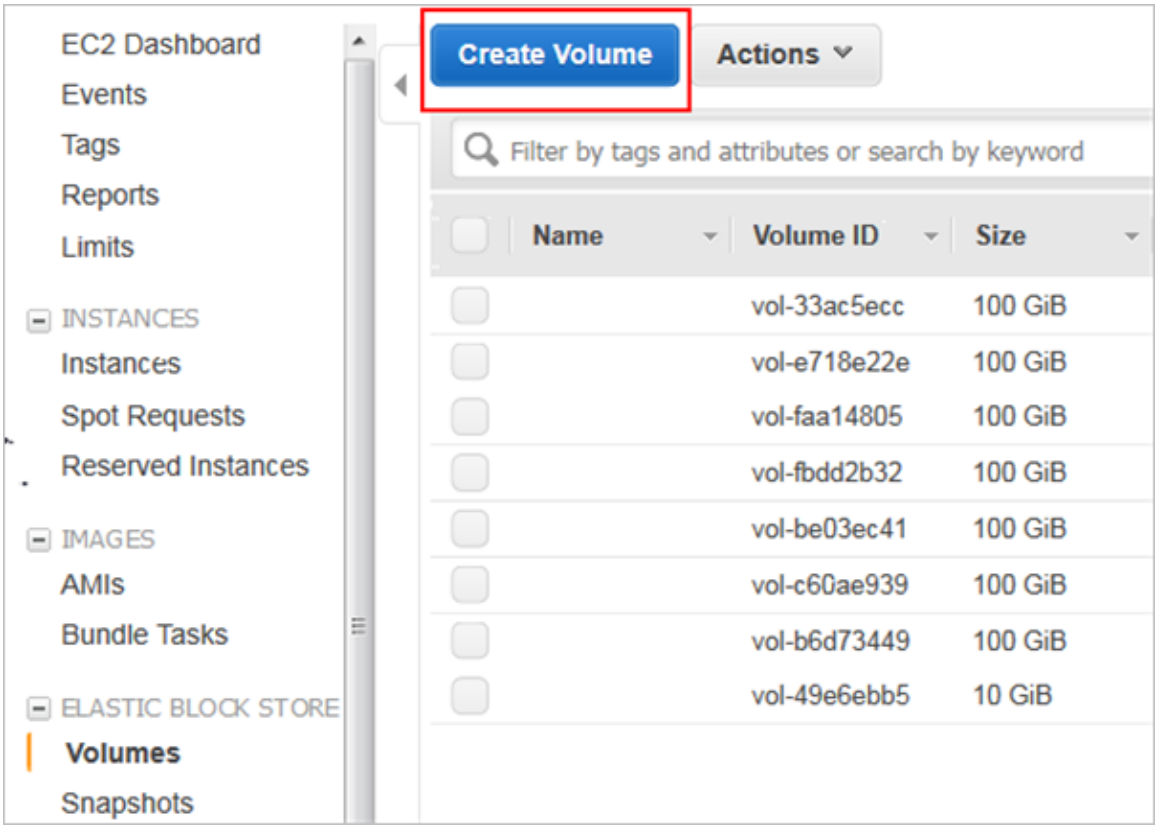
Follow these steps to configure AWS for creating and launching a vSZ instance.

Attach a New Disk Volume

Follow these steps to add a new disk volume.

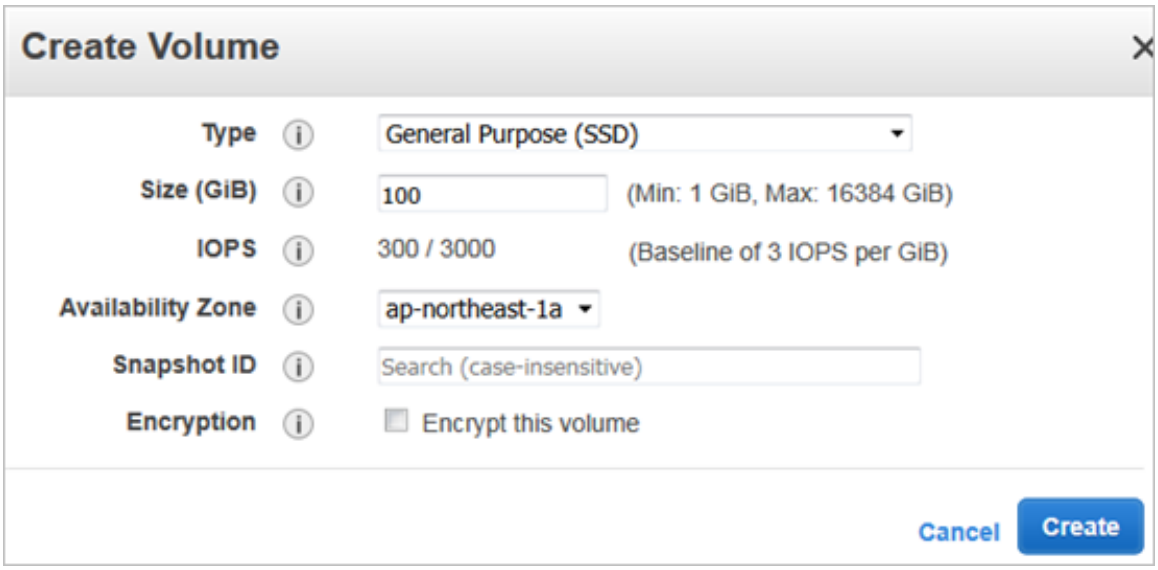
1. Navigate to **EC2 Dashboard** > **Elastic Block Store** > **Volumes** and click **Create Volume** as shown.

FIGURE 120 Create Volume



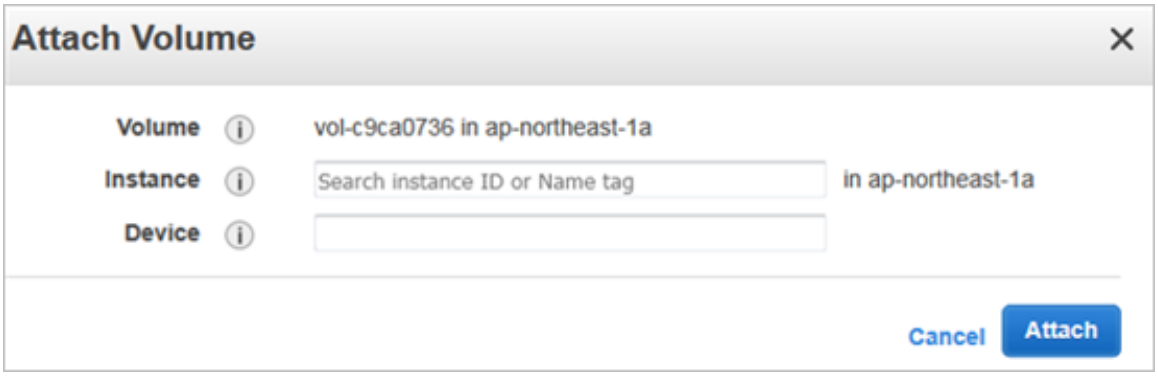
2. Enter the required disk type, size and availability zone.

FIGURE 121 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 122 Attach Volume



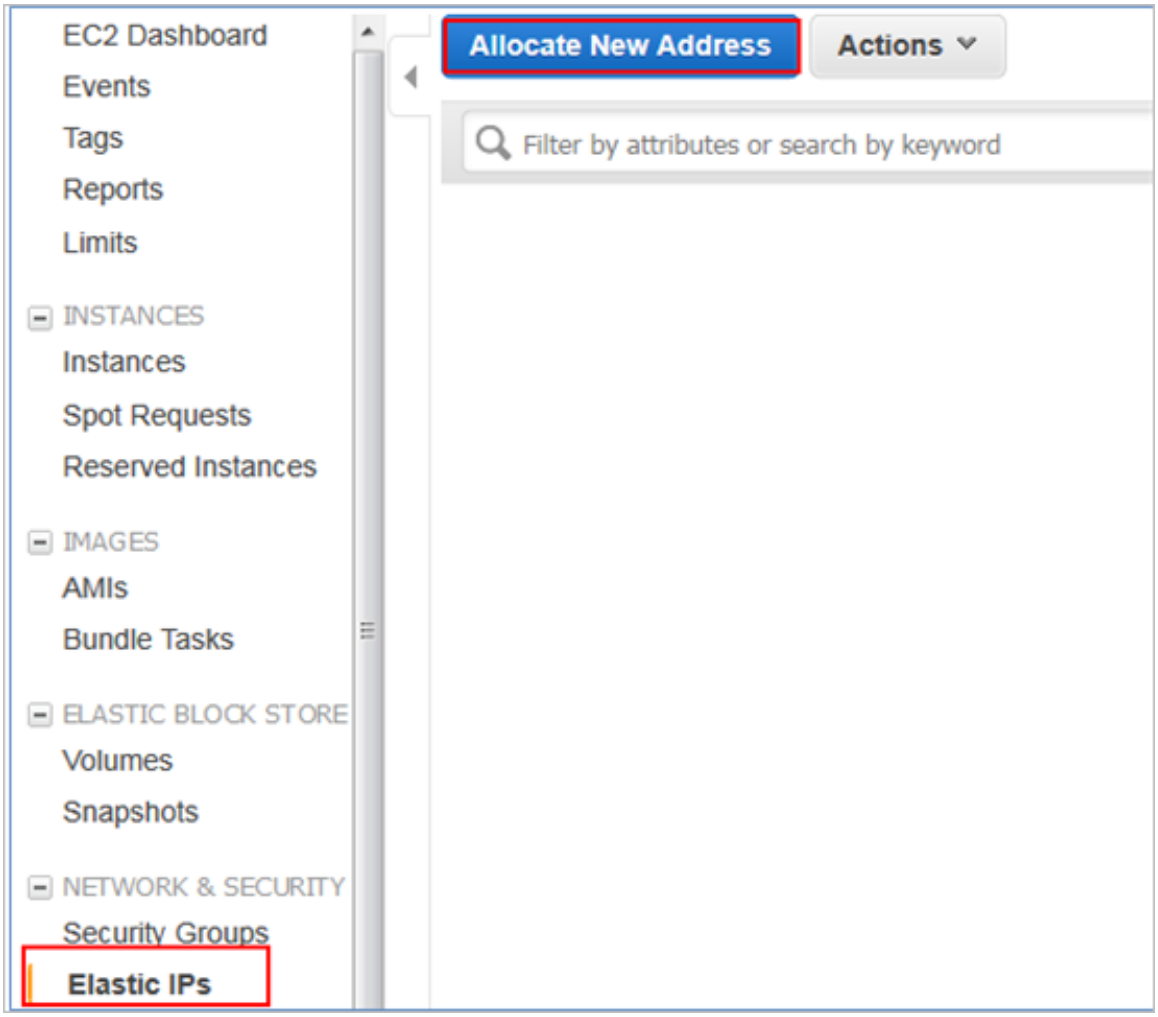
5. Click **Attach**.

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.

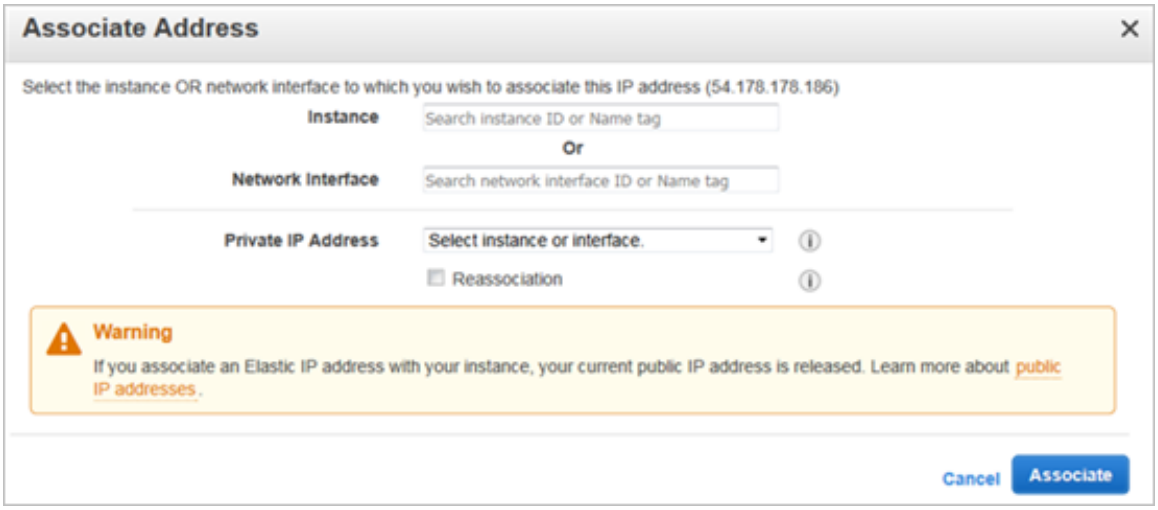
   FIGURE 123 Allocate New IP Address



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 124 Associate Address



4. Click **Associate**.

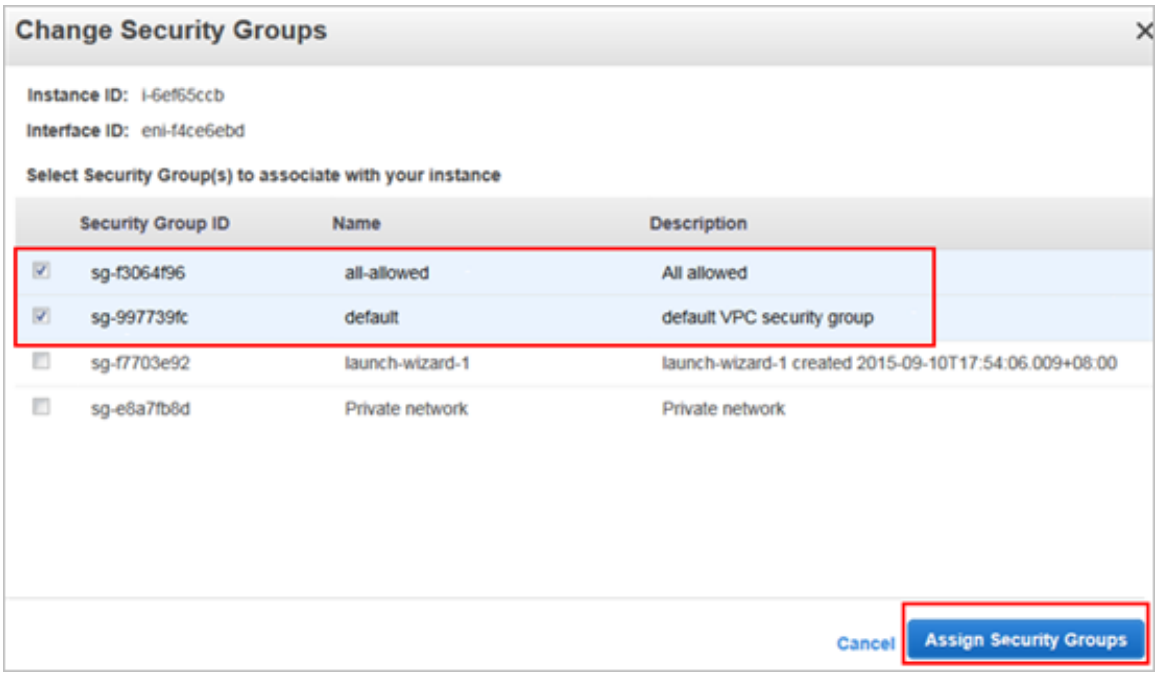
Change Security Group

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 125 Allocate New IP Address



4. Click **Assign Security Groups**.

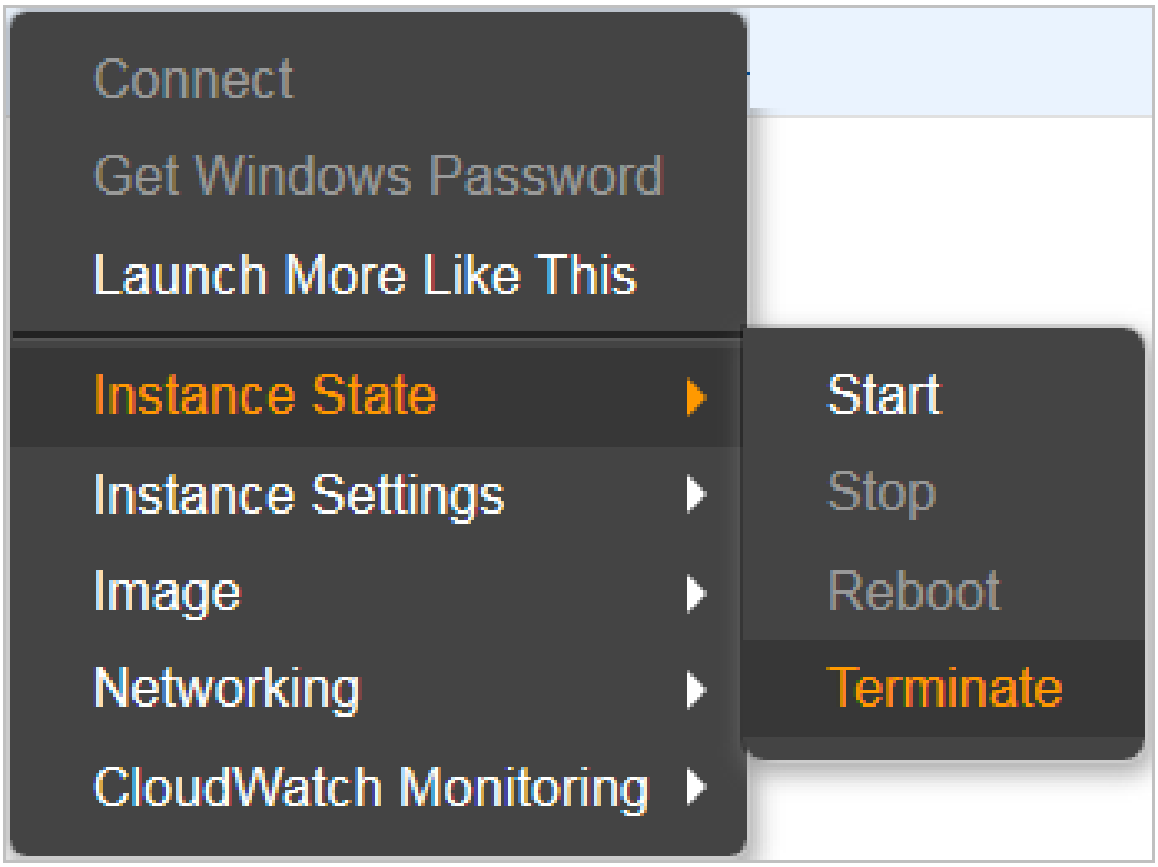
Deleting a vSZ Instance

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.

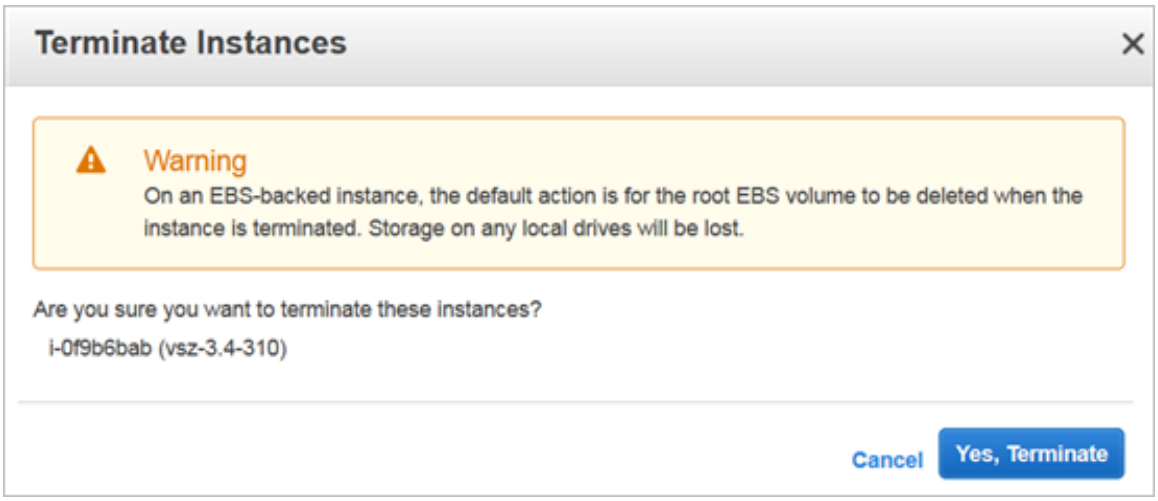
2. Select **Instance State** > **Terminate**.

FIGURE 126 Select terminate



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

FIGURE 127 Confirm termination of vSZ instance



Configuring the Virtual Machine Interfaces

Configuring the Virtual Machine Interfaces

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 on page 141
- Setting Up the vSZ with Three Interfaces on page 153

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.

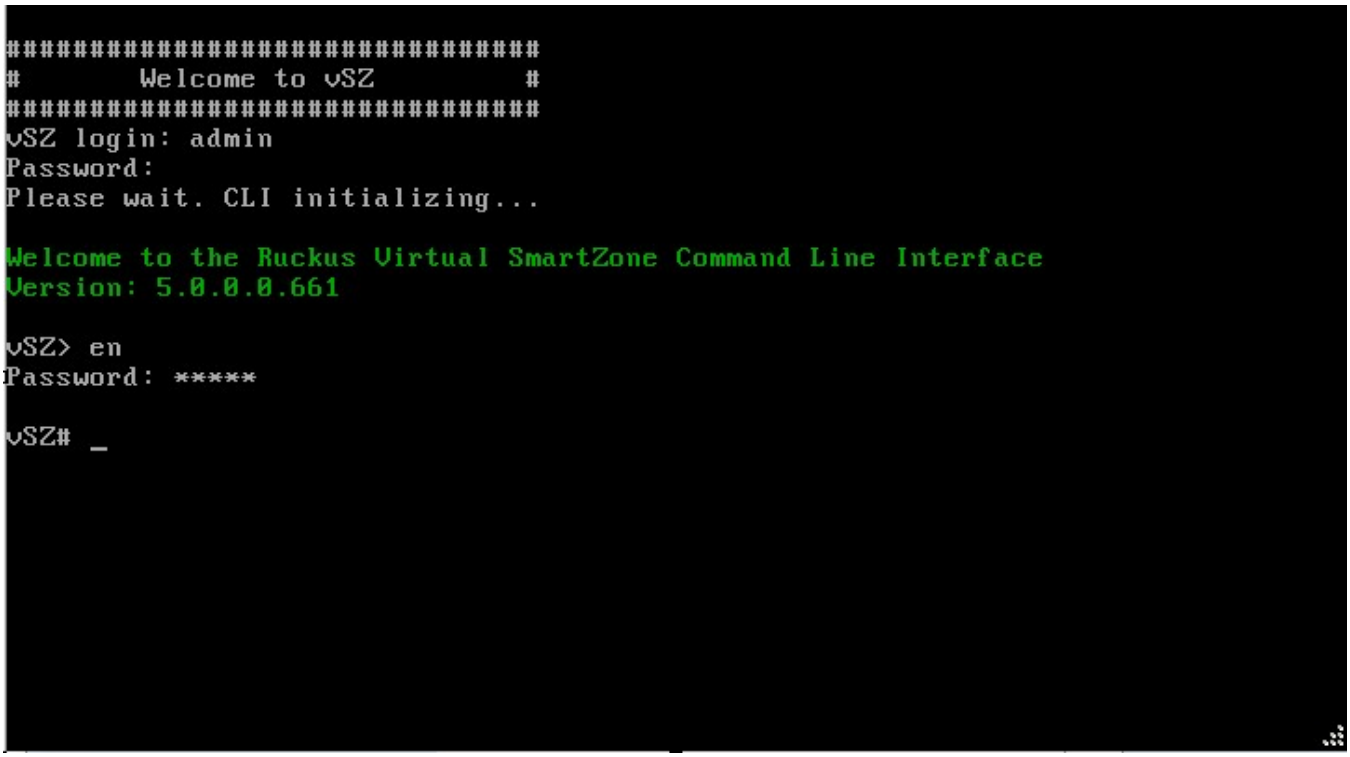
Setting Up the vSZ with One Interface

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.

FIGURE 128 At the vSZ> prompt, enter setup

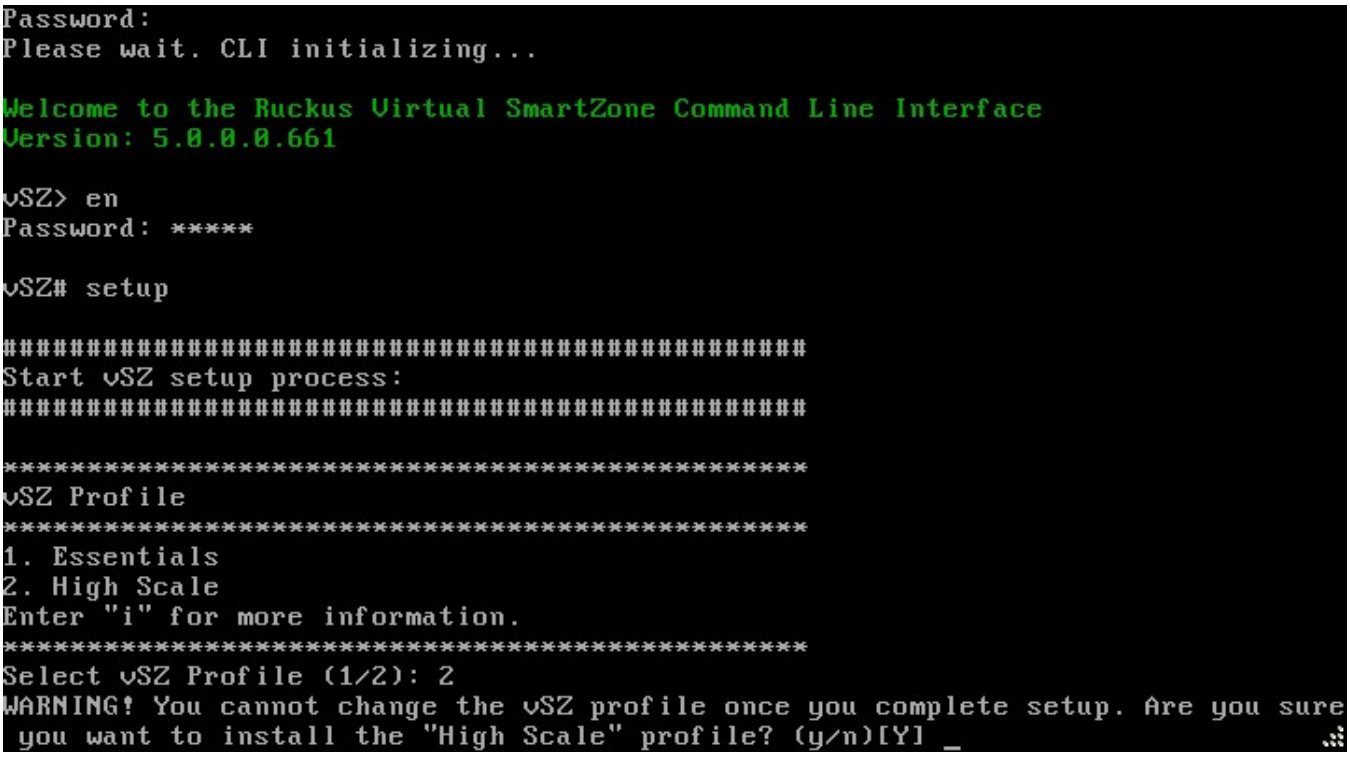


4. Enter **setup**. The console displays the current network settings (if any), and then displays the following prompt: **Do you want to setup network? [YES/no]**
5. Enter **YES**. The next screen prompts you to select the profile configuration that you want to use for this instance of vSZ. The options include: **(1) High-Scale (2) Essentials**

6. Enter the number that corresponds to the profile configuration that you want to deploy.

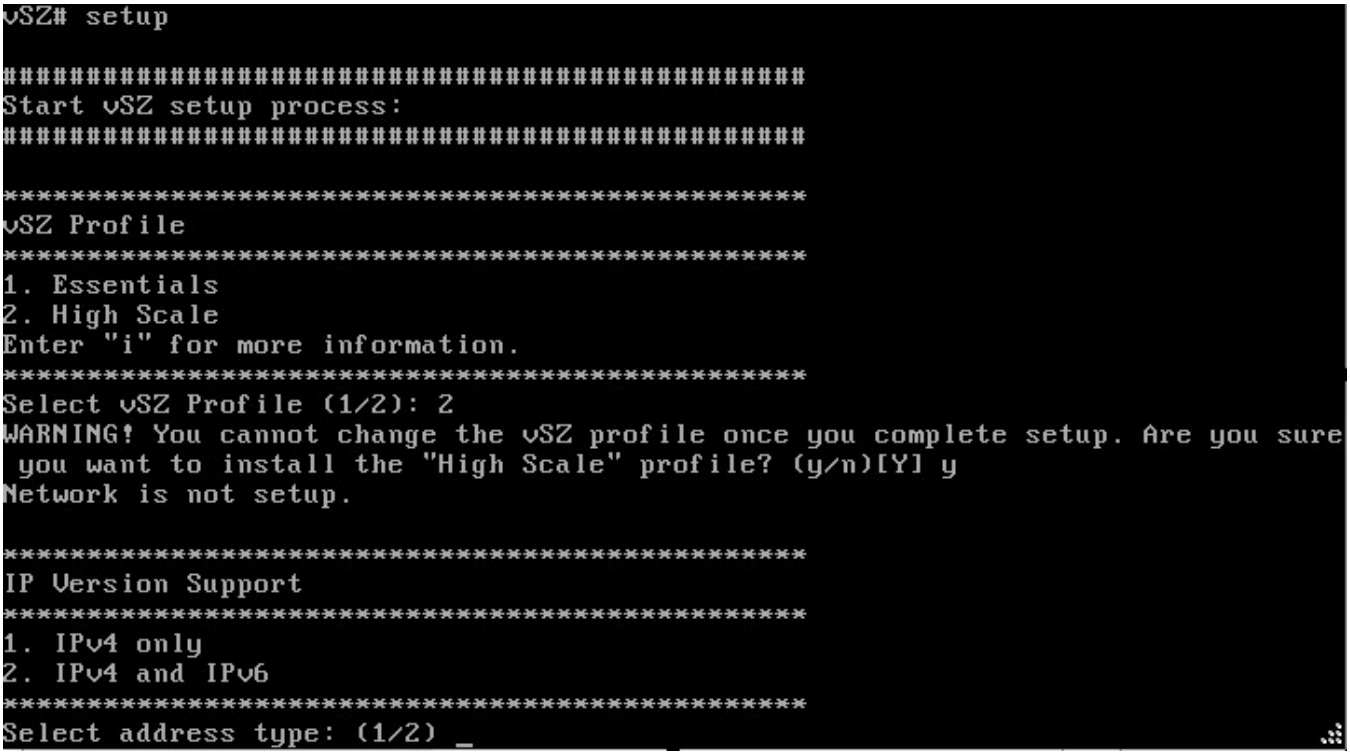
   If you selected Essentials and the virtual machine has insufficient memory resources available (for example, the VM has only 8GB of RAM when the minimum RAM requirement is 12GB), you will be unable to continue with the setup process.

   FIGURE 129 Enter the number that corresponds to the profile that you want to deploy



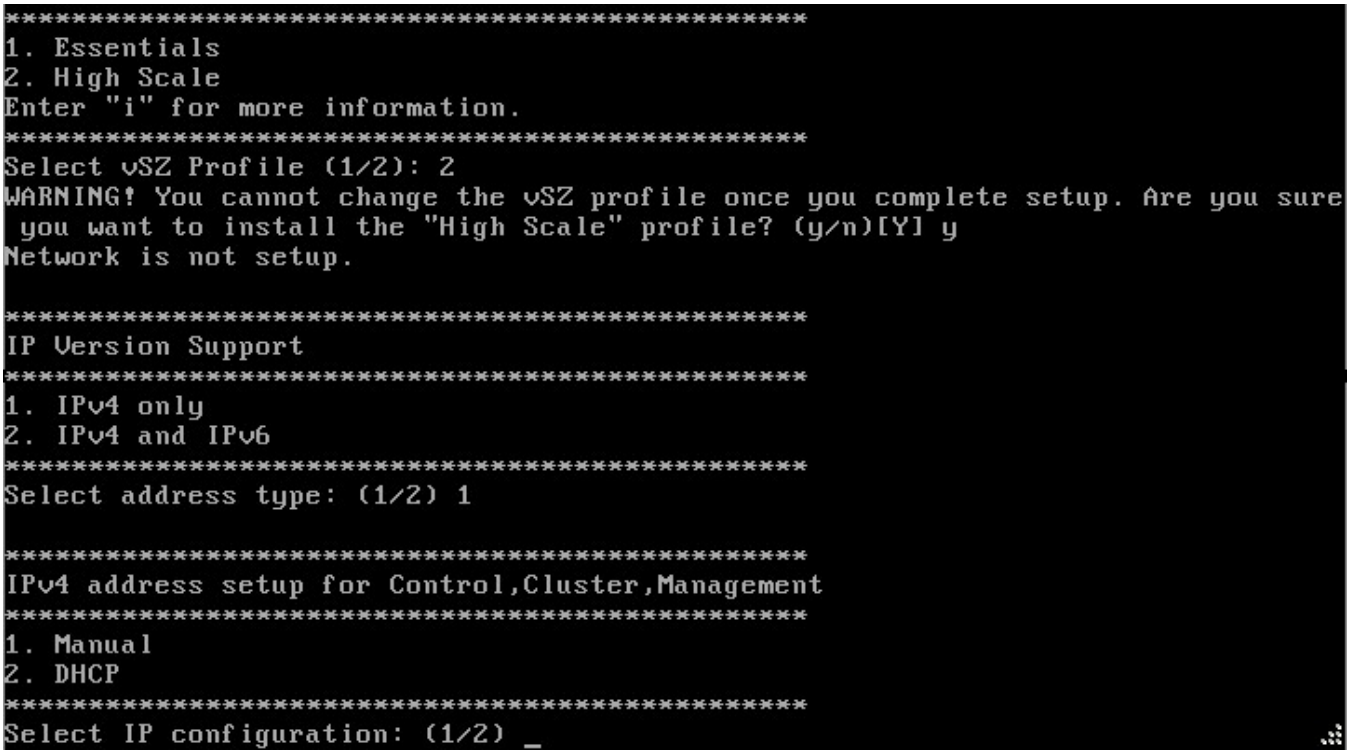
7. Enter **Y** for confirmation. At the **IP Version Support** prompt, enter one of the following options: **1: IPv4 Only 2: IPv4 and IPv6**.

FIGURE 130 Configure the IP address settings of the single interface



8. The **IPv4 address setup for Control, Cluster, Management** option appears. At the **Select IP configuration** prompt, enter **1** for Manual and **2** for DHCP.

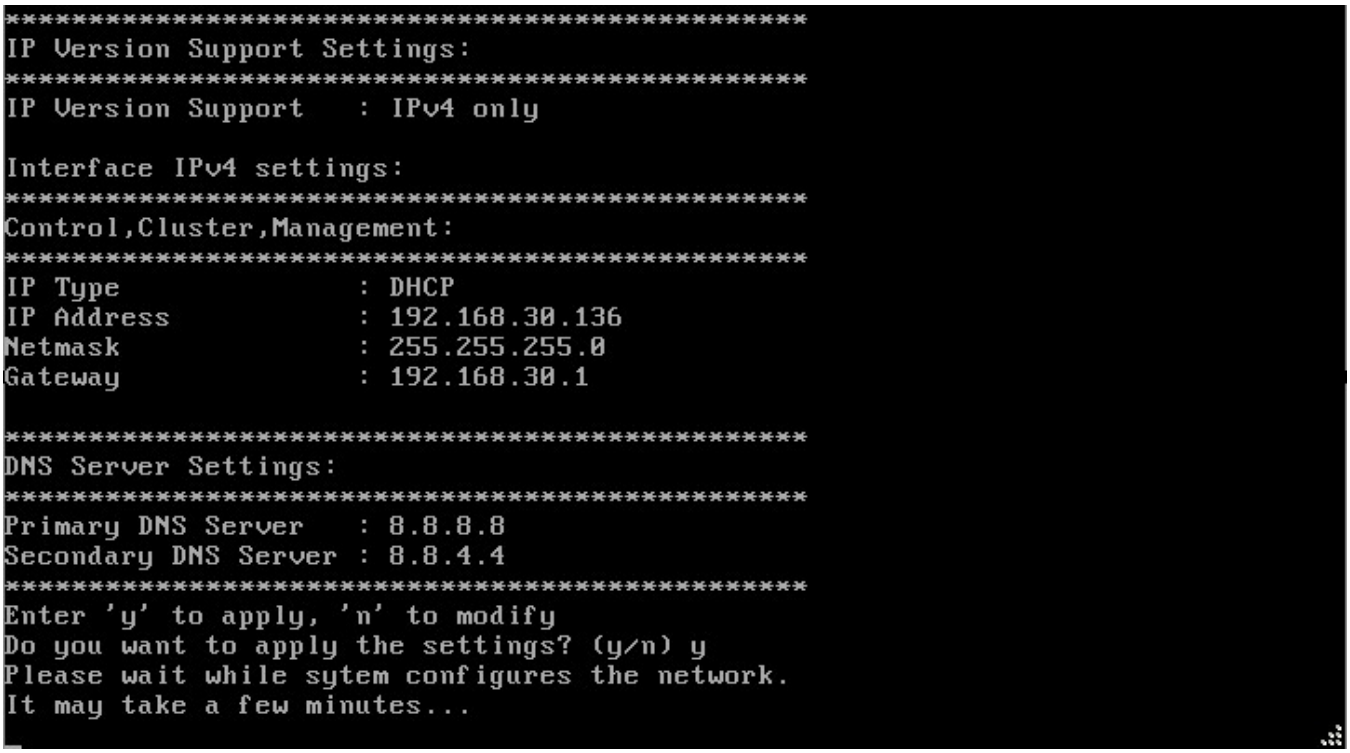
   FIGURE 131 Configure the IP version setup



9. At the **Primary DNS Server** prompt, enter the primary DNS server on the network.
10. At the **Secondary DNS Server** prompt, enter the secondary DNS server (if any) on the network.

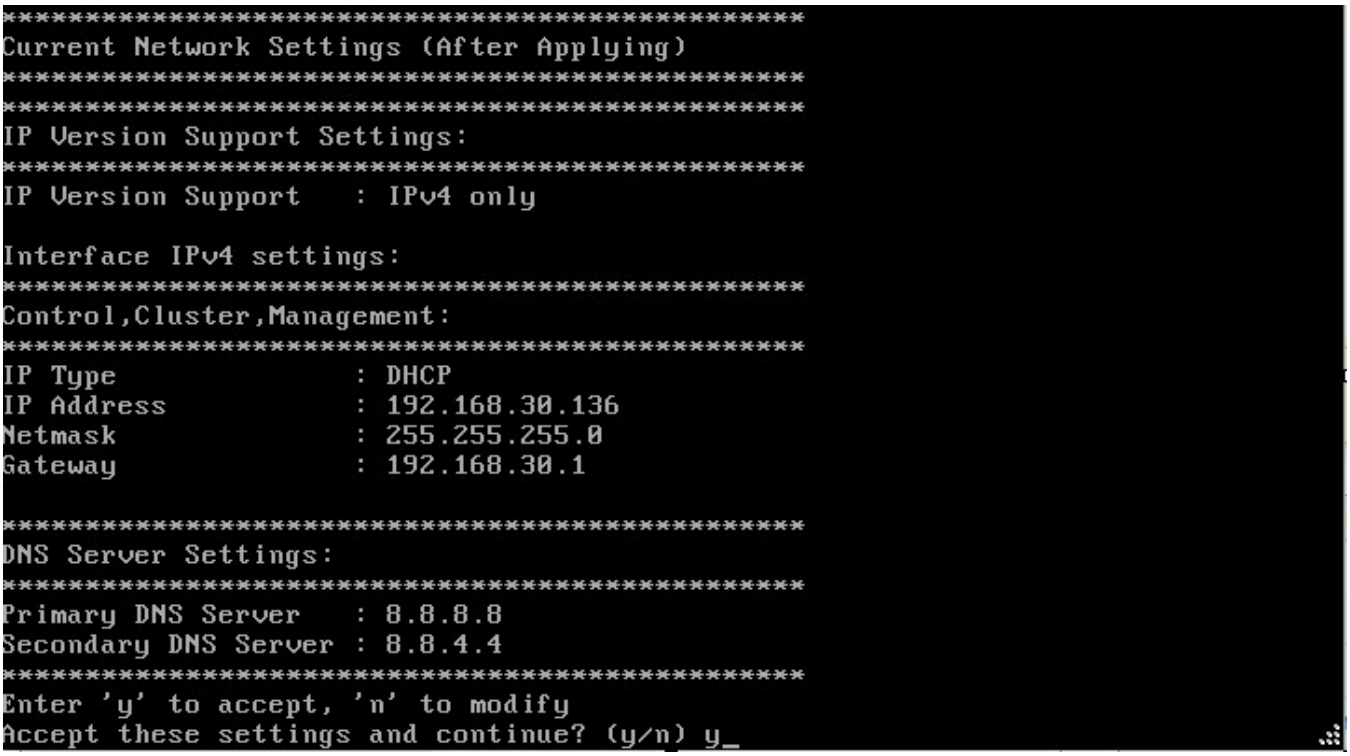
11. Enter **y** to apply settings.

FIGURE 132 Apply Settings



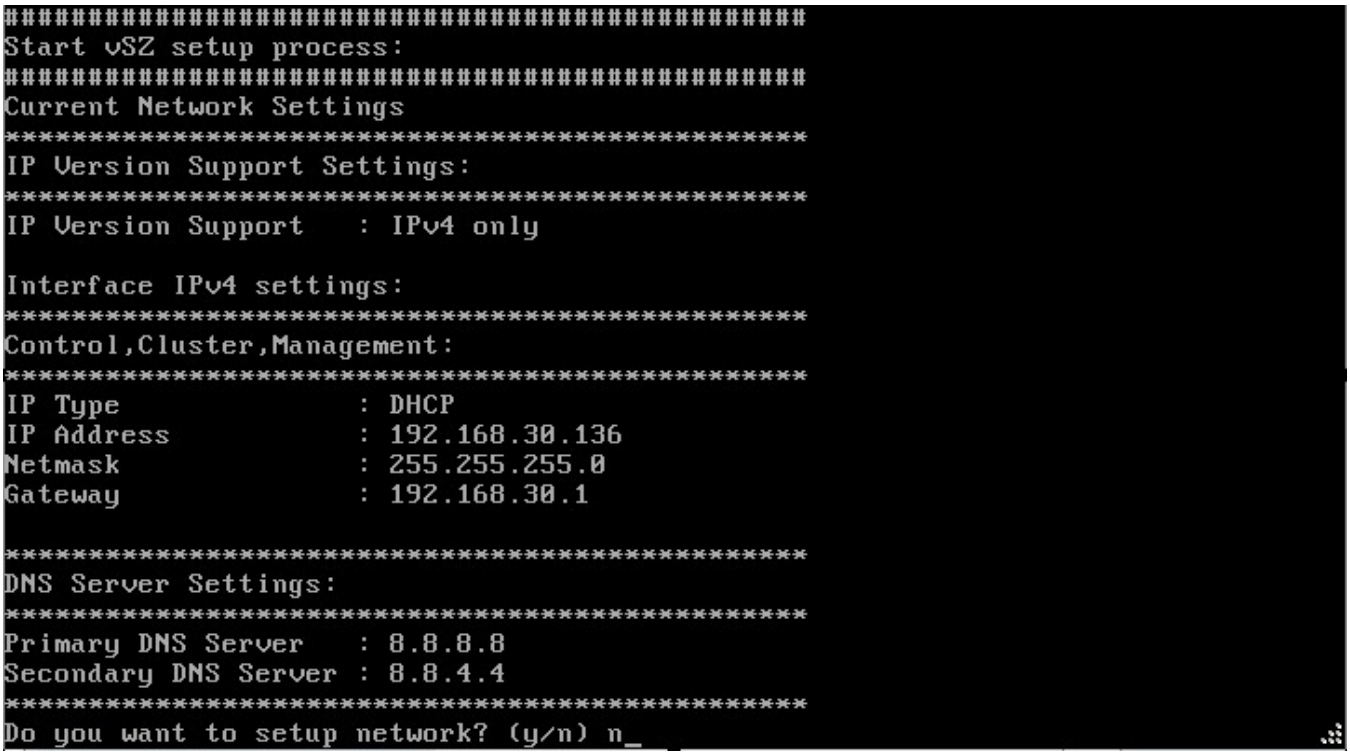
12. To accept settings enter **y**. Else, enter **n**

FIGURE 133 Accept Settings



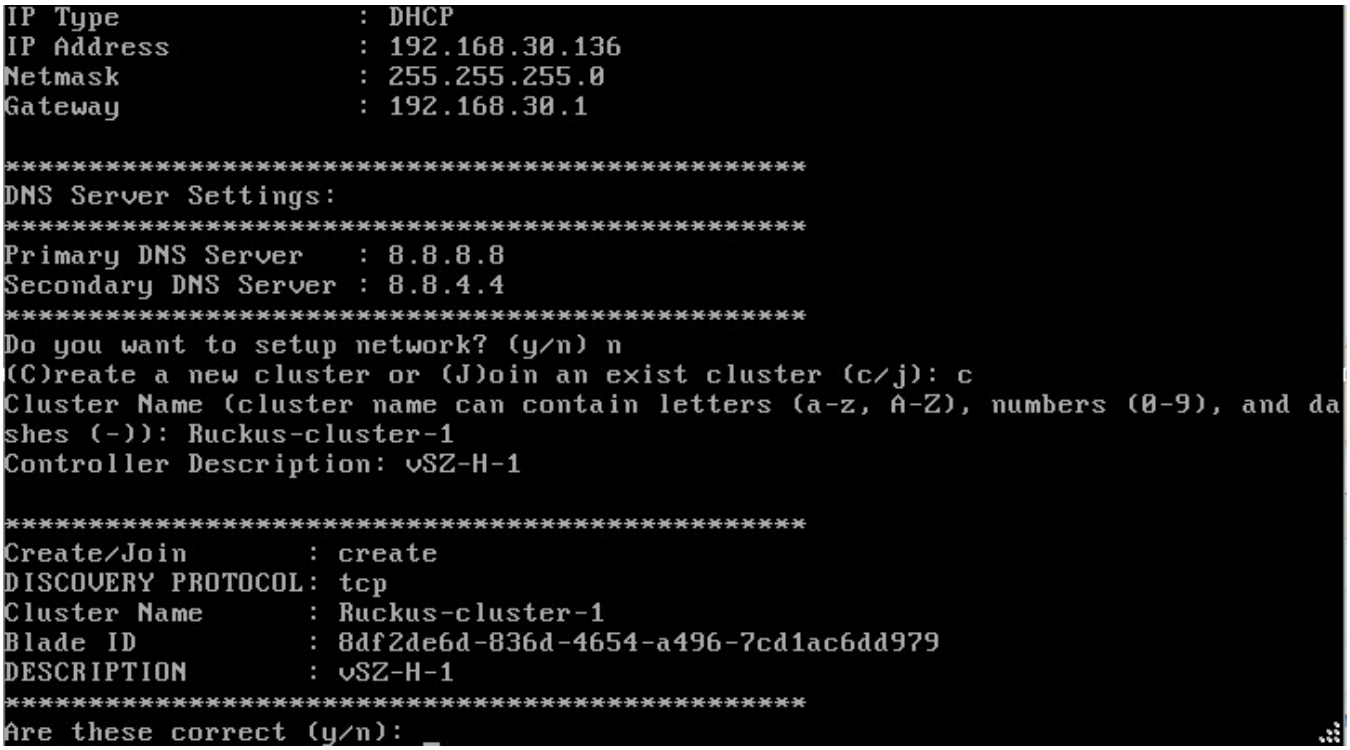
13. To setup a network, enter **y**. Else, enter **n**.

FIGURE 134 Network Setup



14. Choose the option for cluster setup. Enter **c** to create a new cluster or **j** to join an existing cluster.

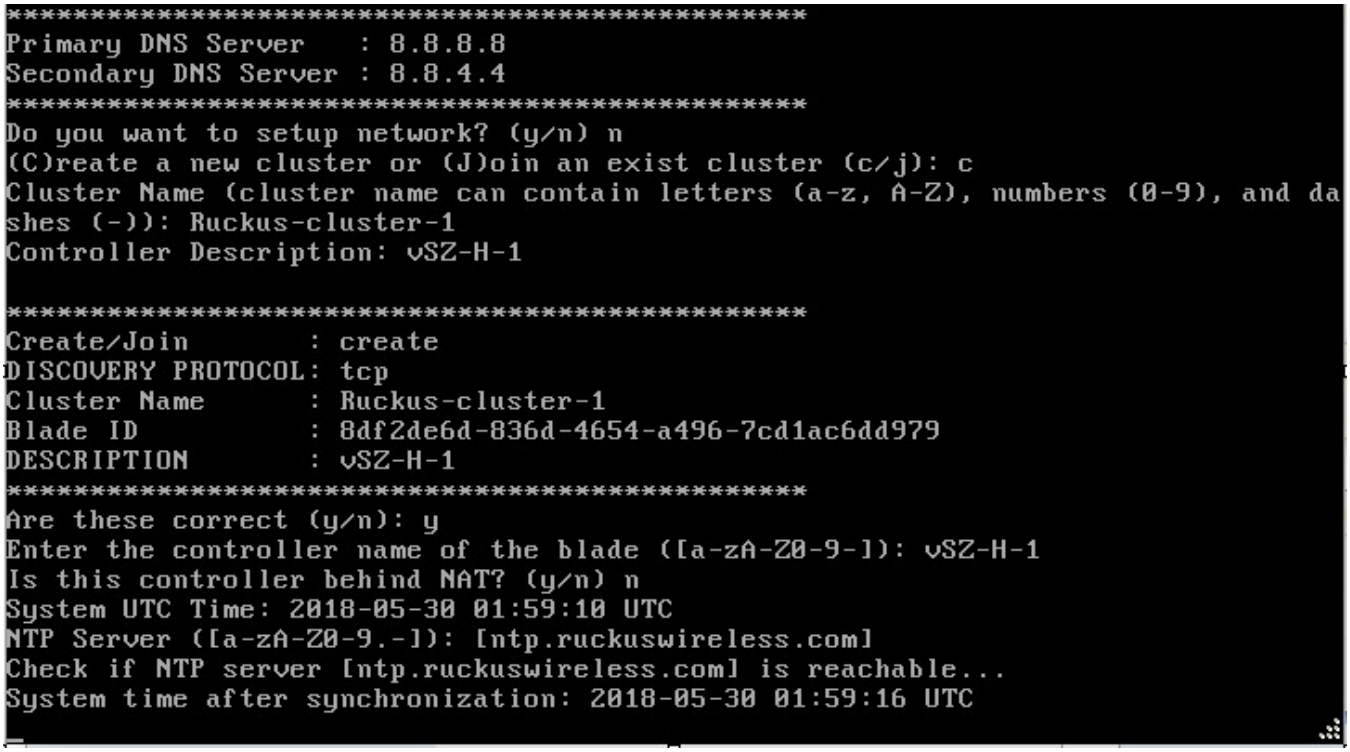
FIGURE 135 Cluster Setup



15. Enter the following information:
    - **Cluster Name**
    - **Controller Description**
    - **Create/Join** cluster
    - **DISCOVERY PROTOCOL**
    - **Cluster Name**
    - **Blade ID**
    - **DESCRIPTION**

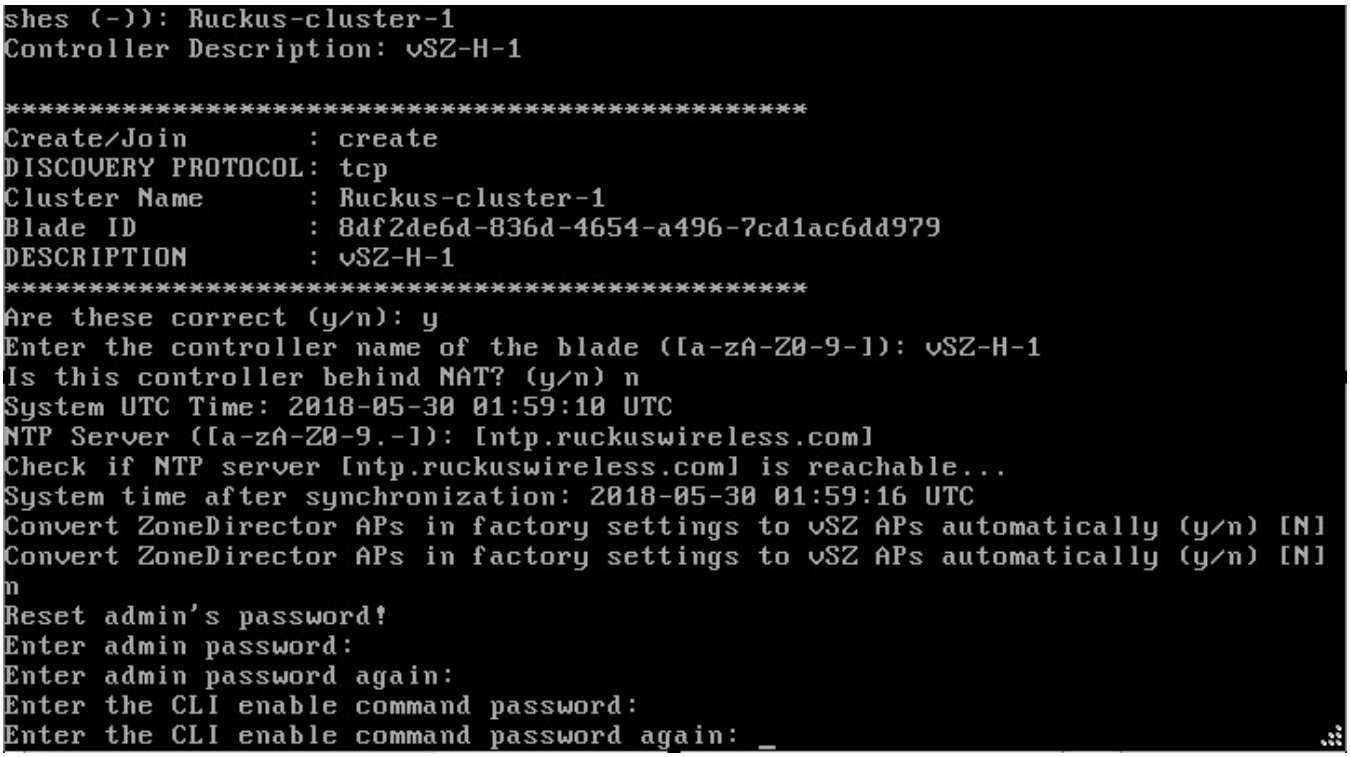
16. When the prompt **Are these correct? (y/n)** appears, enter **y** to confirm the cluster setup. Enter the controller name of the blade and enter **y** to specify if the controller is behind NAT. Else, enter **n**.

FIGURE 136 Configure Cluster Setup



17. To Convert ZoneDirector APs in factory settings to vSZ APs to vSZ APs automatically, enter **y**, else enter **n**.

FIGURE 137 Converting Factory Settings to vSZ Settingsl

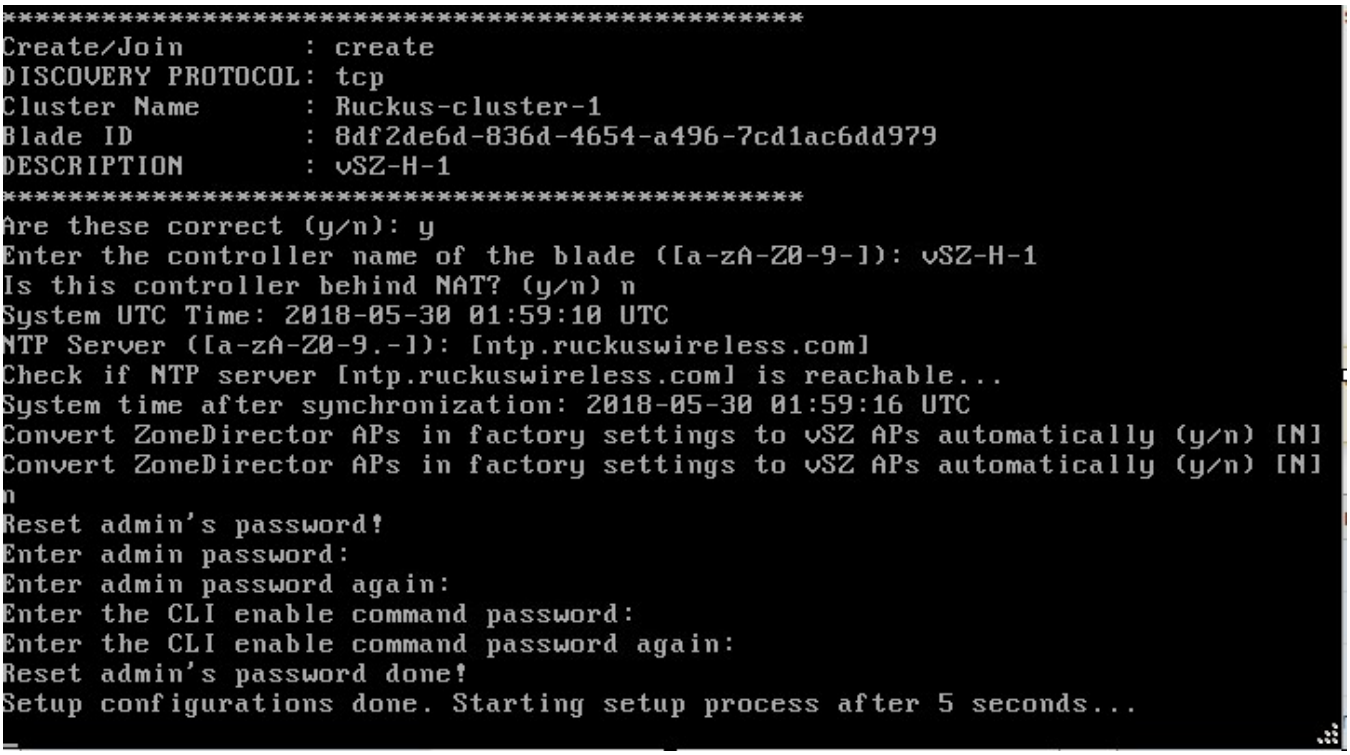


18. In **Reset admin's password**, press **<Enter>**.

19. Enter the following information:
    - **Enter the admin password**
    - **Enter the admin password again**
    - **Enter the CLI enable command password**
    - **Enter the CLI enable command password again**

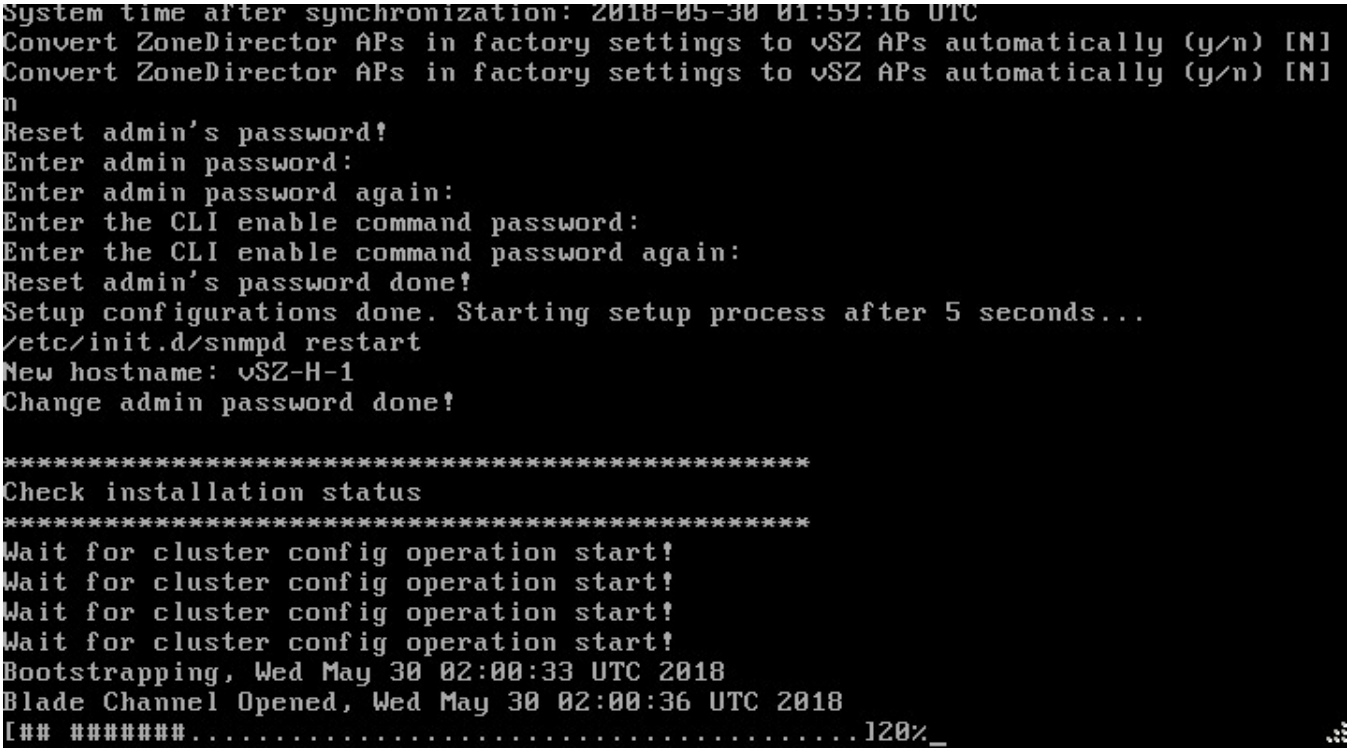
    The password reset confirmation appears and starts setup process.

    FIGURE 138 Admin Password Reset



20. The setup process begins.

FIGURE 139 Setup Process Begins



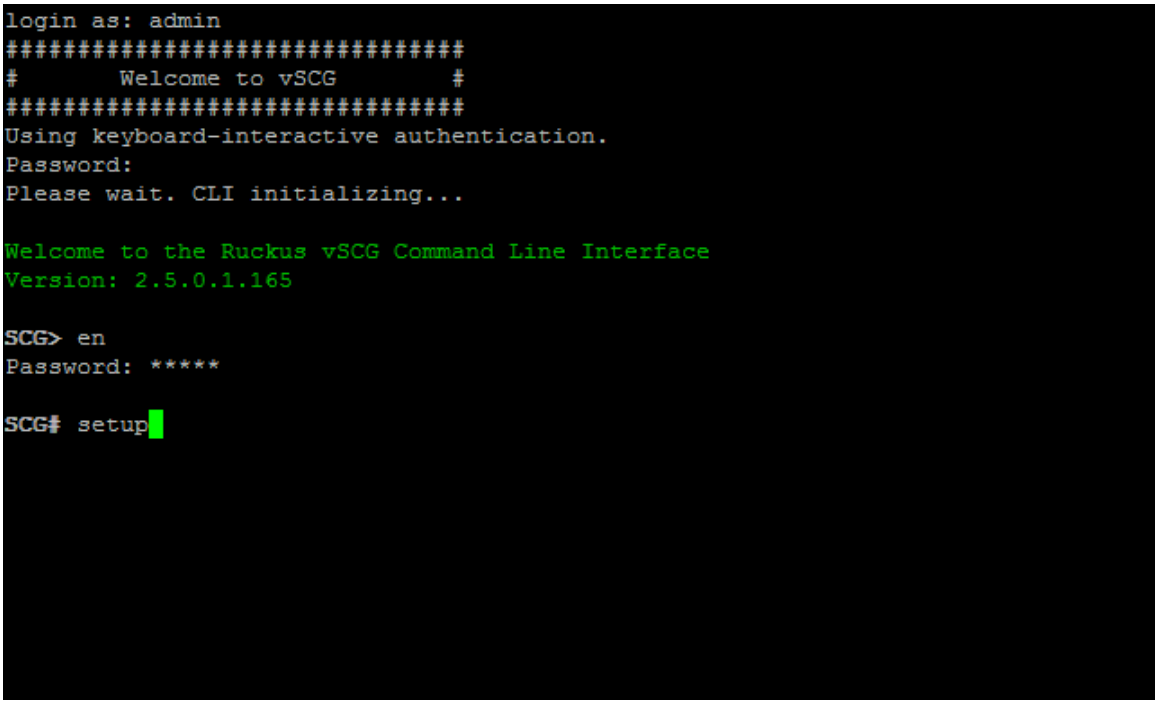
You have completed configuring the vSZ interfaces. You are now ready to run the vSZ Setup Wizard. See Using the Setup Wizard to Install vSZ.

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.

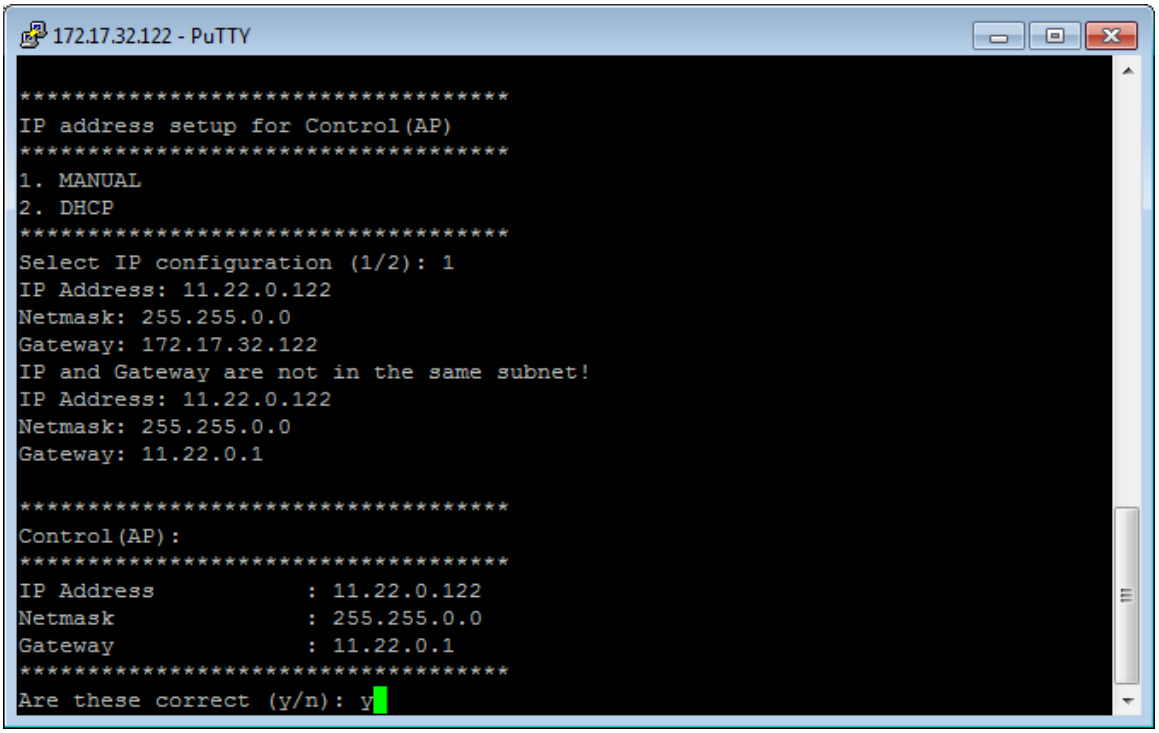
4. Enter **setup**. The console displays the current network settings (if any), and then displays the prompt: **Do you want to setup network? [YES/no]**

FIGURE 140 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 141 Configure the IP address settings of the control interface



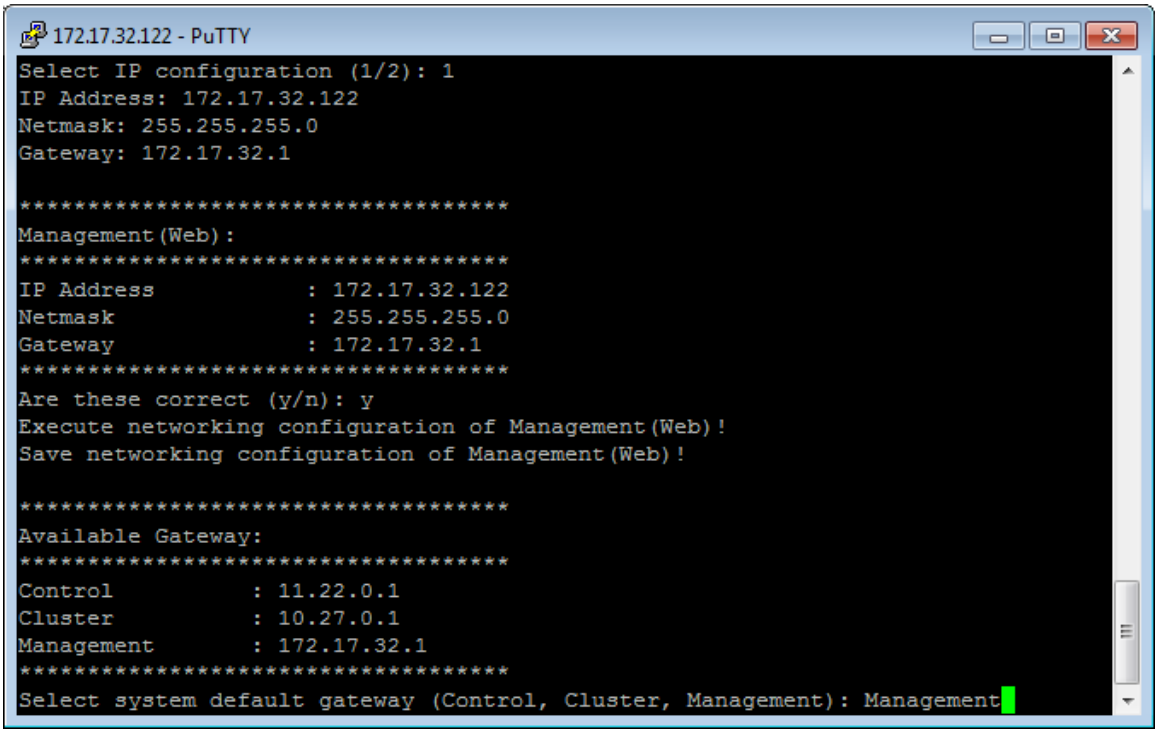
6. At the **Select IP configuration** prompt, enter **1** to set up the cluster interface manually.
   a) Configure the IP address, netmask, and gateway of the *cluster interface*, and then press **<Enter>**. The IP address configuration that you entered appears.
   b) When the message **Are these correct?** 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 on page 156).

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

   FIGURE 142 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 on page 157.

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

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 Networks Support.

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

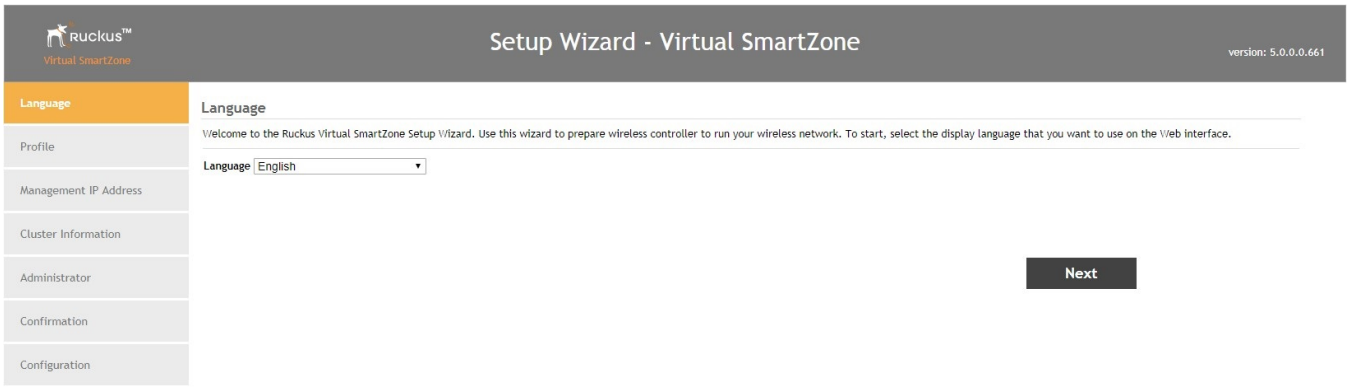
- Start the Setup Wizard and Set the Language
- Select the Profile Configuration That Corresponds to Your vSZ License
- Configure the Management IP Address Settings
- Configure Dual Mode IP Address Settings Using CLI
- Configure the Cluster Settings
- Set the Administrator Password
- Verify the Settings

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 143 The Language page



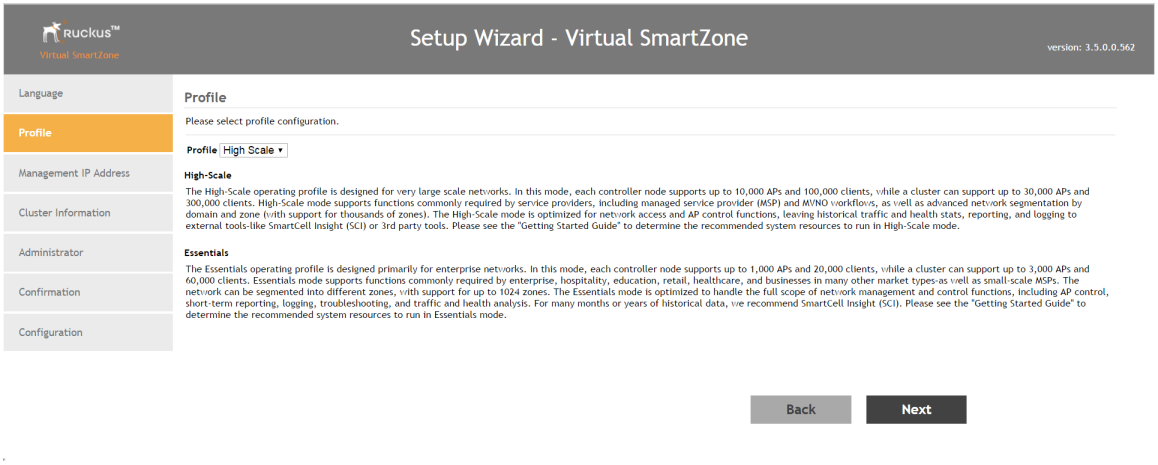
2. Select your preferred language for the vSZ web interface. Available options include:
   - English
   - Traditional Chinese
   - Simplified Chinese
3. Click **Next**. The **Profile** page appears.

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:
   - High Scale
   - Essentials

2. Click **Next**. The Confirmation message appears. Once you accept the confirmation, the **Management IP** page appears.

FIGURE 144 Select a profile configuration that matches your vSZ license



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.

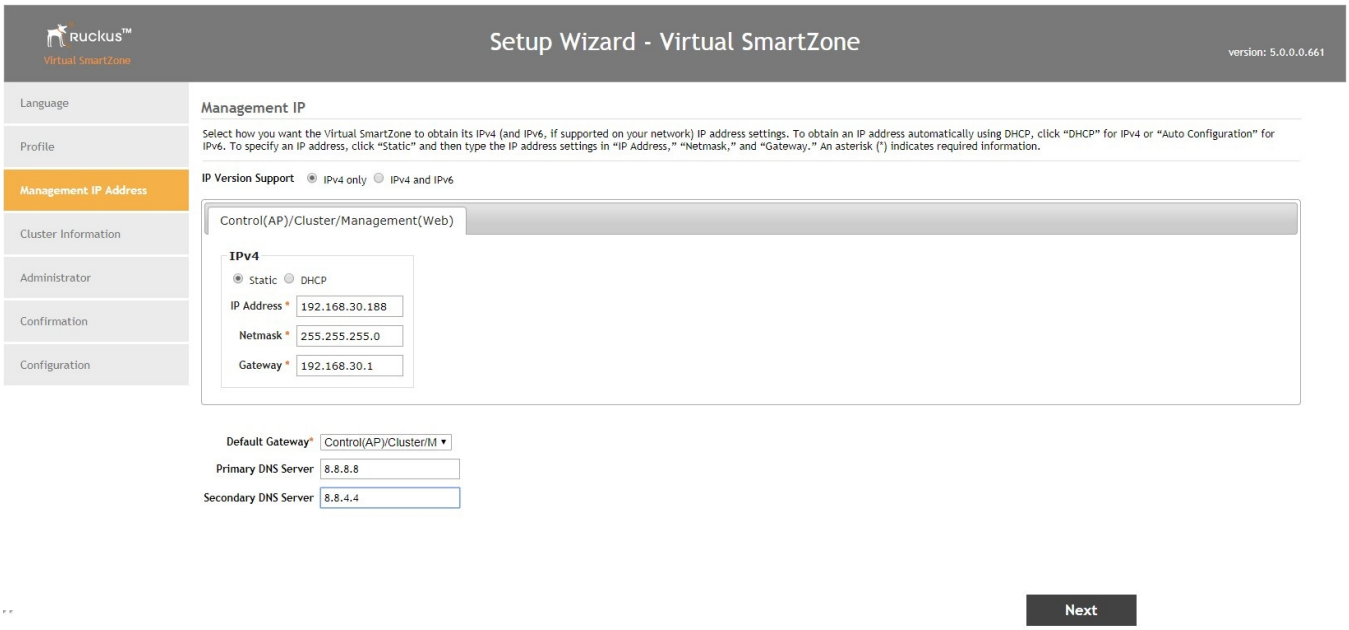
If the vSZ that you are installing comes with three network interfaces, you must configure each of the three interfaces to be on three different subnets. Failure to do so may result in loss of access to the web interface or failure of system functions and services.

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 145 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 Networks strongly recommends assigning a static IP address to this interface.The following network settings are required (others are optional):

      - IP address
      - Netmask
      - 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**
3. 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 **Default Gateway**, **Primary DNS Server** address and **Secondary DNS Server** Address.

   The appropriate interface to use as the default system gateway depends on the topology of your network. See Important Notes About Selecting the System Default Gateway on page 156 for more information.
4. Check the network settings that you have configured.
5. Click the **Next** to continue. The controller validates and applies the network settings that you have configured. Continue to Step 5: Configure the Cluster Settings on page 171

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.

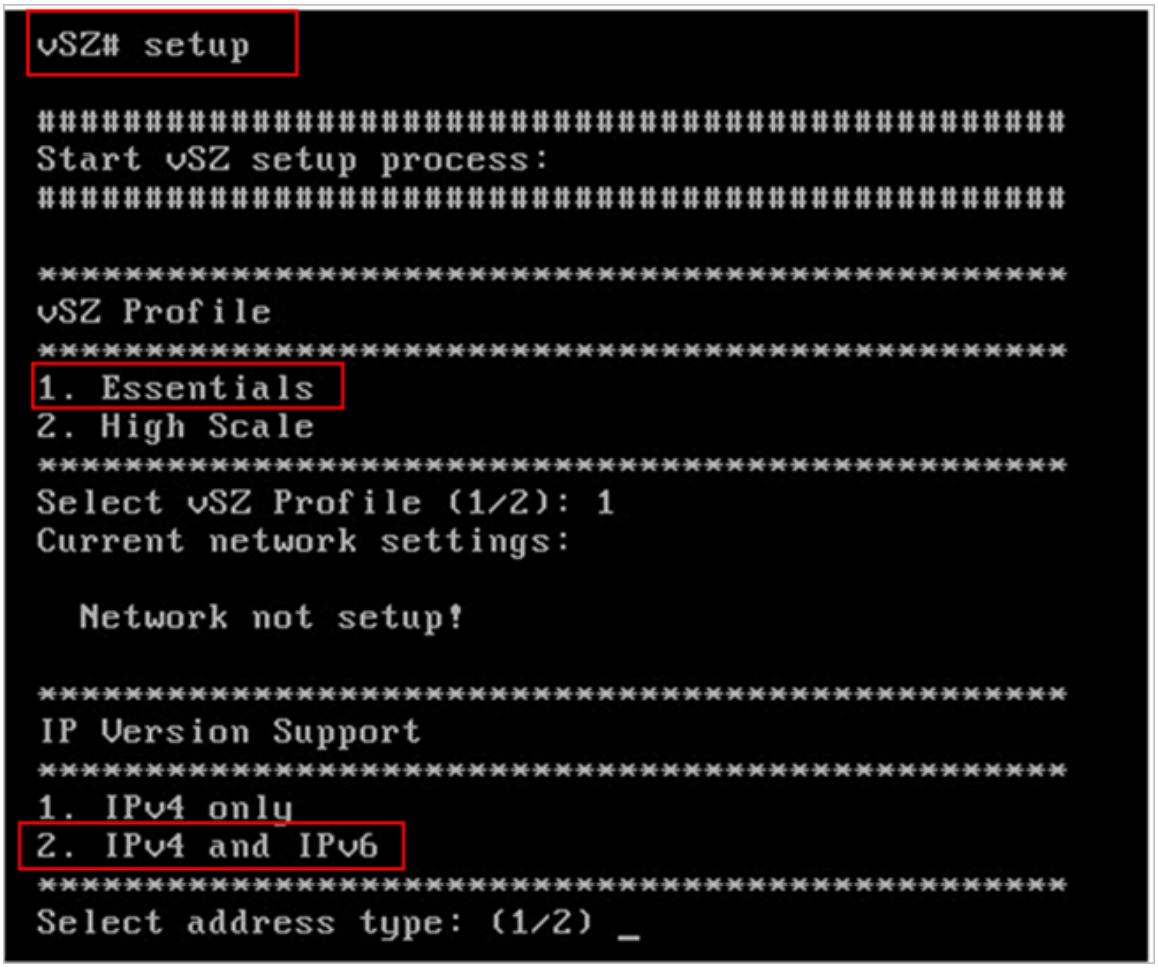
Step 4: Configure Dual Mode IP Address Settings Using CLI

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 **vSZ Profile,** choose either **1. Essentials** or **2. High Scale**.

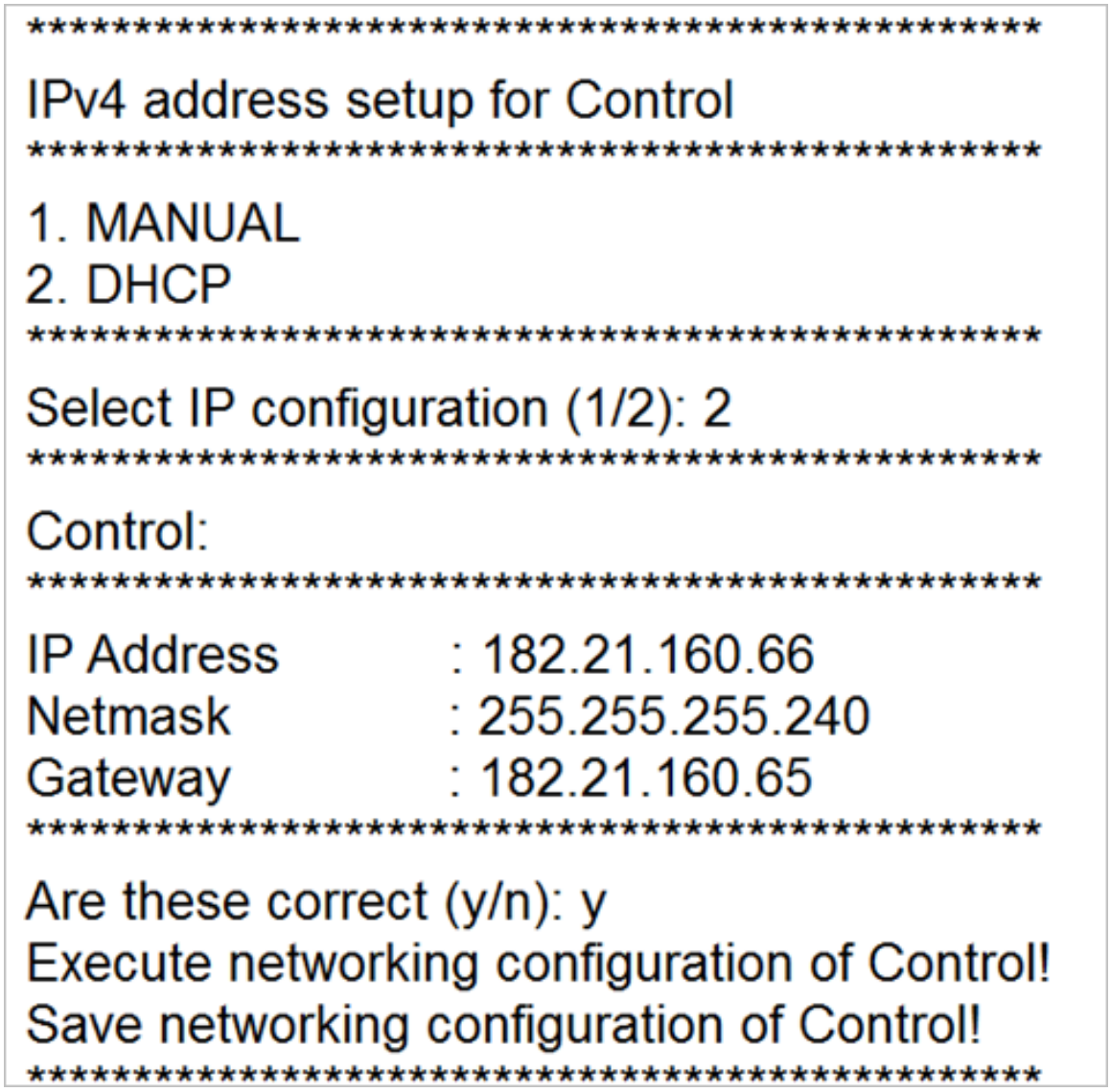
3. In **IP Version Support**, choose **2. IPv4 and IPv6**.

FIGURE 146 Choose 2. IPv4 and IPv6 to use dual mode IP addresses



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** 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 147 IPv4 Control Settings



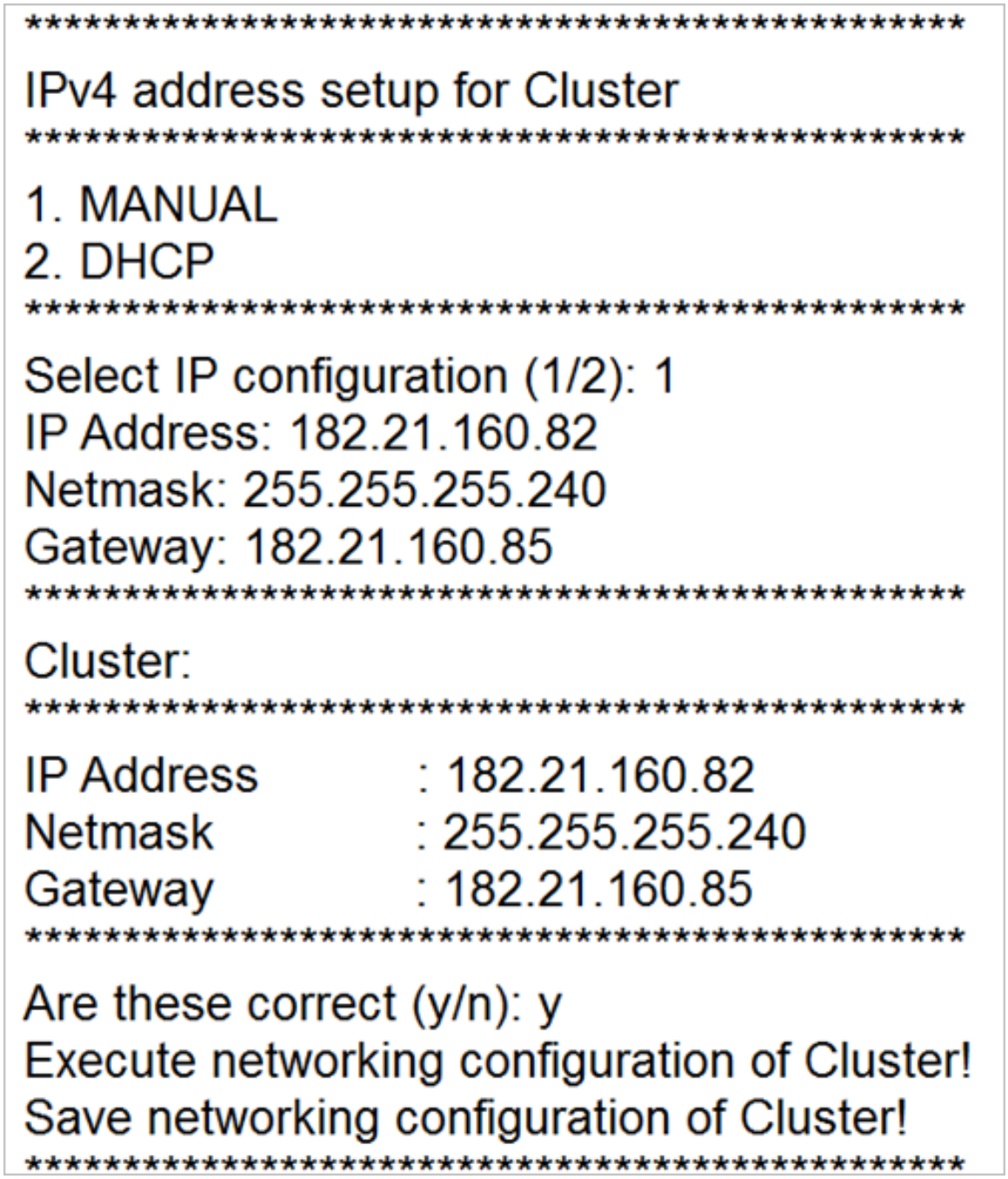
e) Enter the setup for Cluster as either: **1. Manual 2. DHCP**

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 148 IPv4 Cluster Settings



i) Enter the setup for Management as either: **1. Manual 2. DHCP**

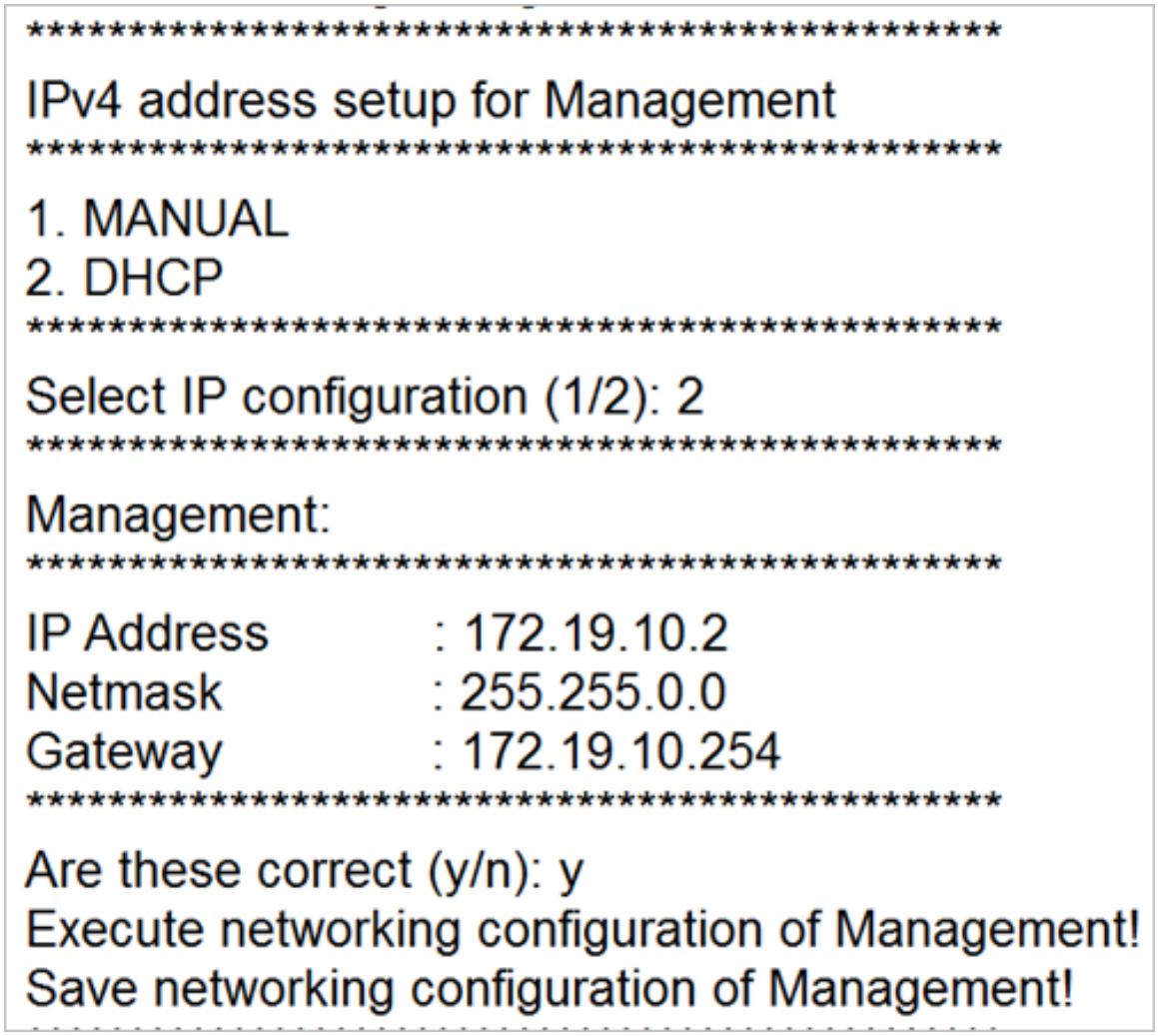
j) Enter the IP configuration as **2** (DHCP)

k) Enter following network settings as required:

- IP Address
- Netmask
- Gateway

l) Save the networking configuration of **Management** settings

FIGURE 149 IPv4 Management Settings



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

FIGURE 150 Default Gateway Settings

```
**************************************************
Available Gateway:
**************************************************
Control                 : 182.21.160.65You
Cluster                 : 182.21.160.85
Management                 : 172.19.10.254
**************************************************
Select system default gateway (Control, Cluster, Management)? Control
Primary DNS: 4.2.2.2
Secondary DNS:
Control NAT IP:
```

5. If the controller is behind a NAT server, add the control NAT server IP address, and then hit Enter.

FIGURE 151 NAT server IP address

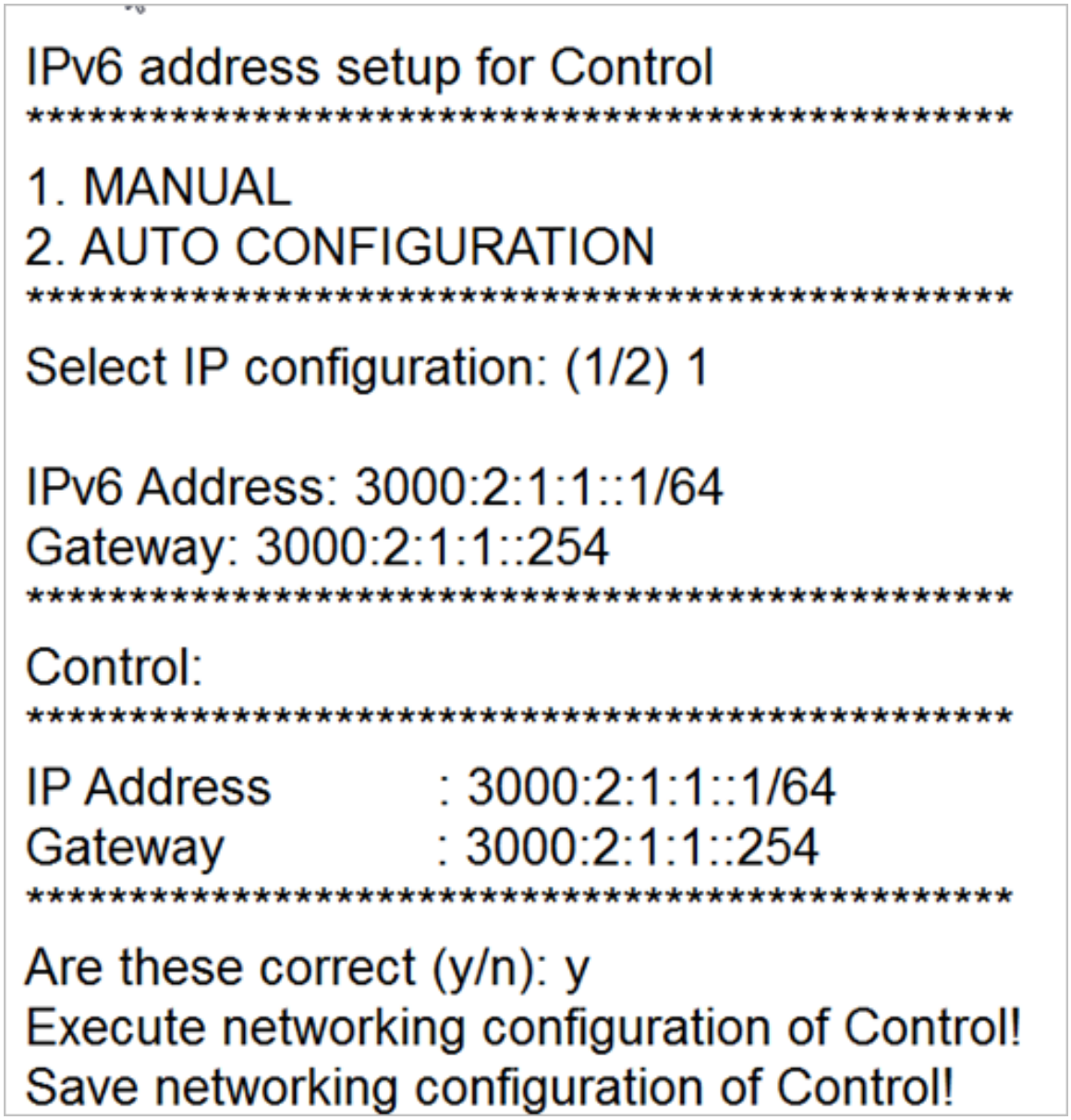
```
Control NAT IP:
Network would be restarted. You could connect to vSZ back by using Management po
rt (10.20.110.8)!!
Enter "restart network" or press Enter to continue... restarrt network
```

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.

   NOTE
   The cluster interface setting does not support IPv6 addresses.

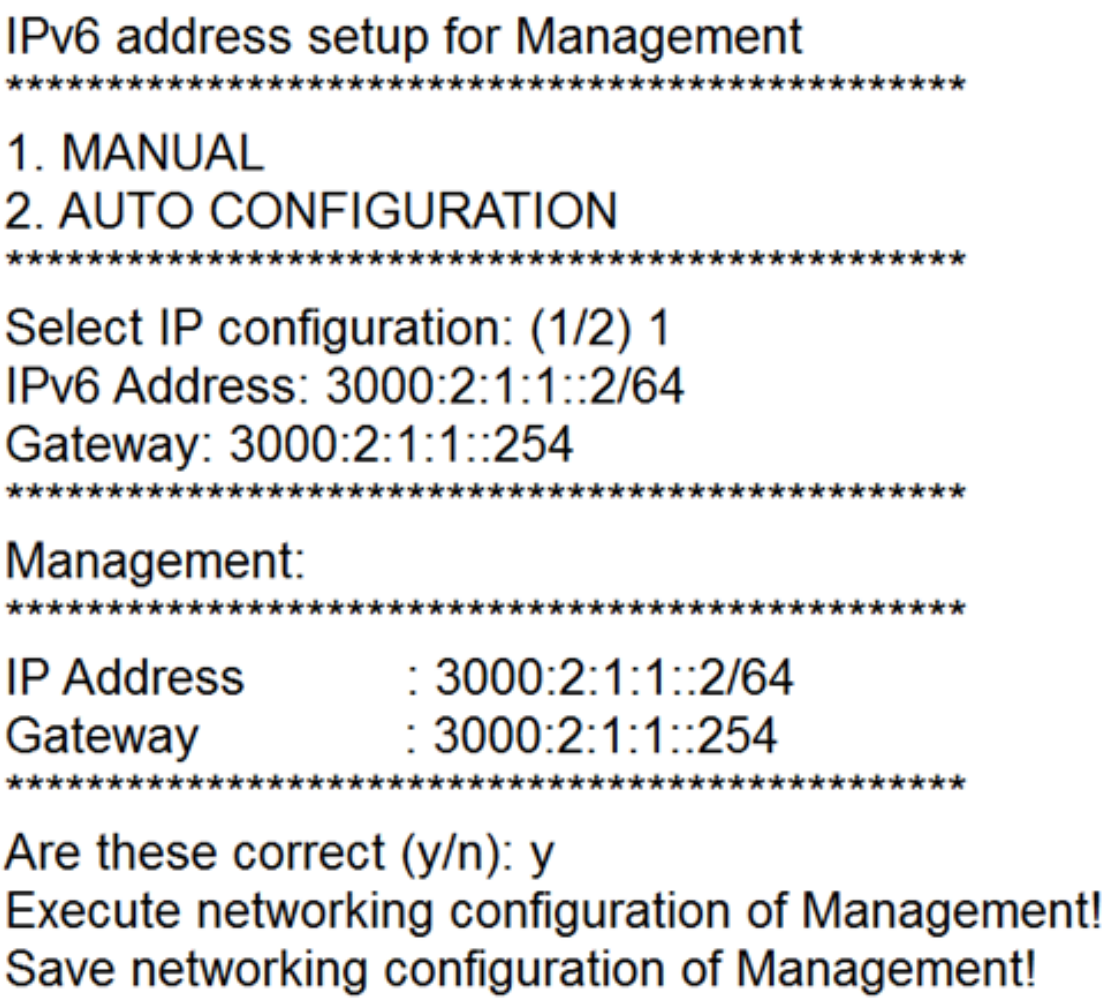
   a) Enter the setup for Control as either: **1. Manual 2. Auto Configuration**
   b) Enter the IP configuration as **1** (Manual).
   c) Enter following network settings as required:
      - IPv6 Address
      - Gateway
   d) Save the networking configuration of **Control** settings.

   FIGURE 152 IPv6 Control Settings



e) Enter the setup for Management 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 153 IPv6 Management Settings



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

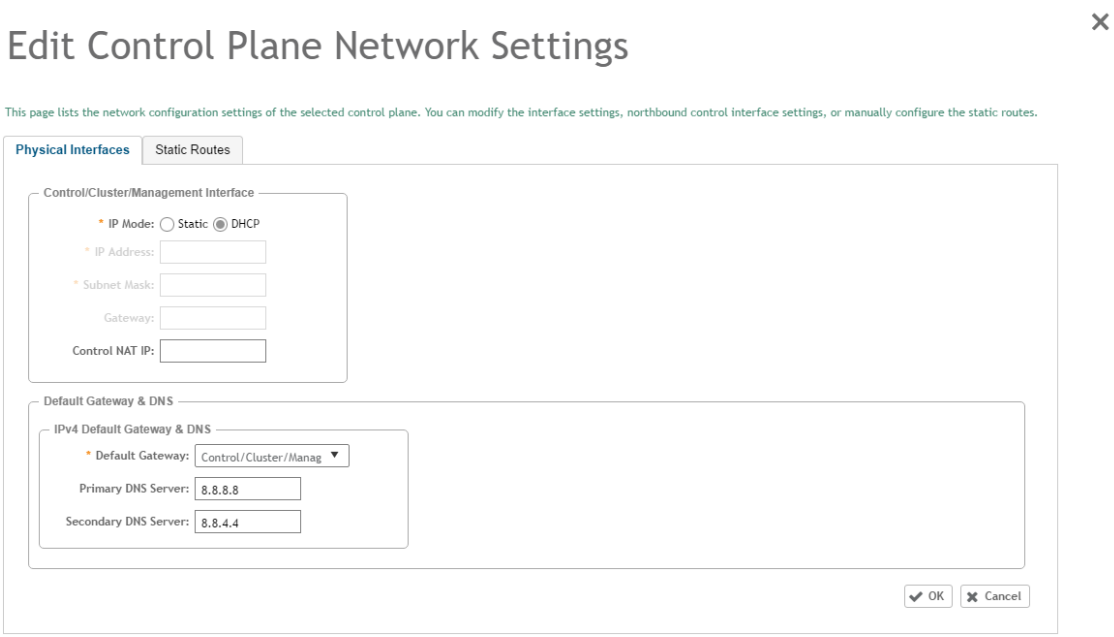
FIGURE 154 Default Gateway Settings

7. Enter "restart network".

8. Go back to the controller's web interface, and then go to **System** > **Cluster** > **Control Planes**. Then, expand the node, select the Cluster plane, and click **Configure**.

   The **Edit Control Plane Network Settings** page appears.

FIGURE 155 Control Plane Network Settings



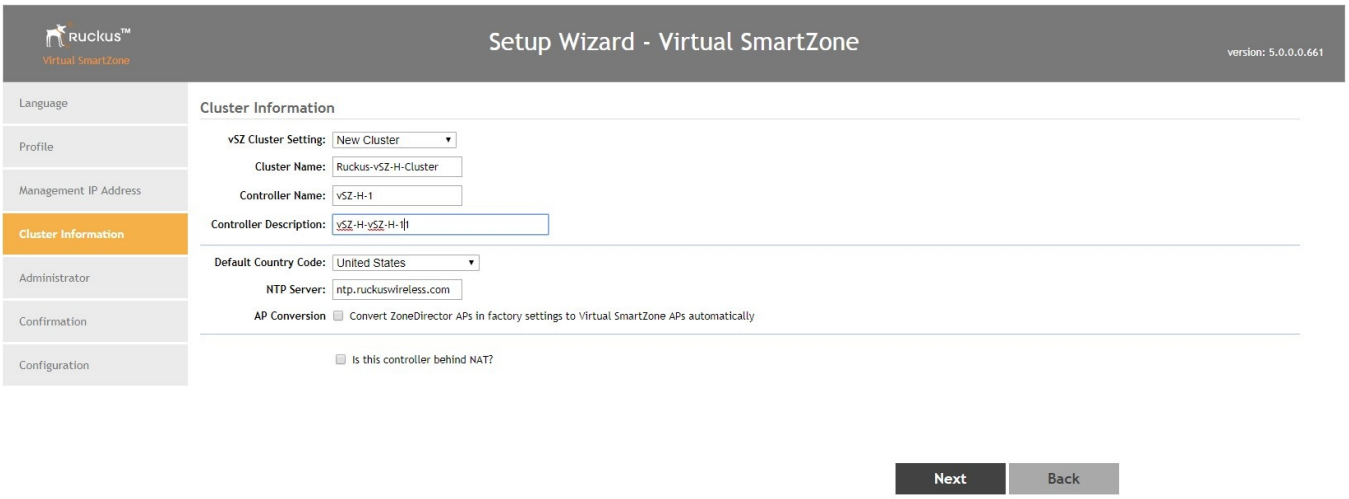
9. Verify that the Control Plane network settings display the IPv4 and IPv6 addresses that you configured.
10. Continue to Step 5: Configure the Cluster Settings on page 171

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 on page 172
- If This vSZ Is Joining an Existing Cluster on page 172

FIGURE 156 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.

On the **Cluster Information** page, configure the following settings:

1. In **vSZ Cluster Setting**, select **New Cluster**.
2. In **Cluster Name**, type a name for the new cluster that you are creating.

   NOTE
   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**, type a name for the vSZ controller in this new cluster.
4. In **Controller Description**, type a brief description for the vSZ controller.
5. In **Default Country Code**, select the country.
6. 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**ntp.ruckuswireless.com**
7. If you want ZoneDirector APs that are in factory default settings to be converted to SmartZone APs automatically, select the **AP Conversion** check box.
8. If the controller is behind NAT, select the check box and enter the **Controller NAT IP**.
9. Click **Next** to continue to the **Administrator** page.

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.

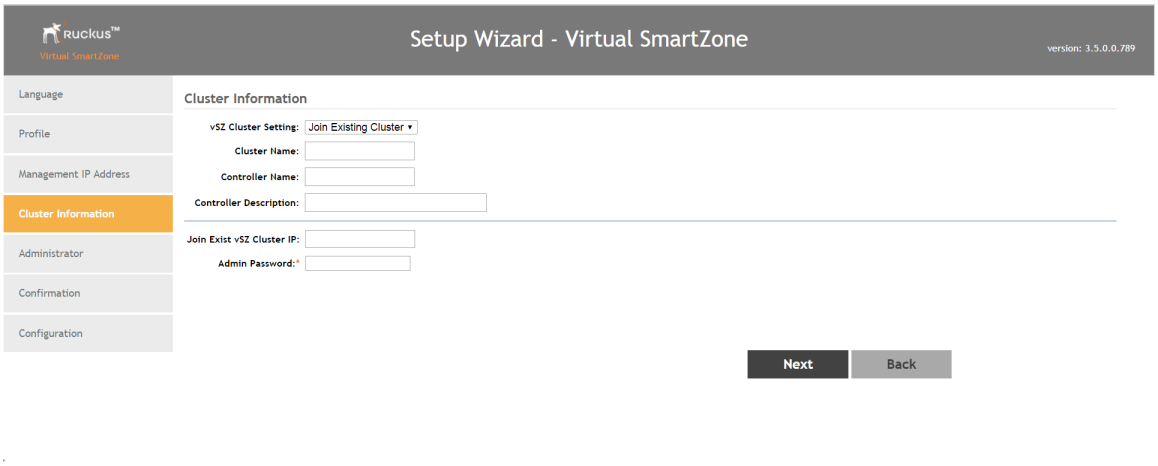
A vSZ cluster supports a maximum of four nodes. If you are building a vSZ-E cluster with more than two nodes, two (2) additional cores must be added to each node to support the added search and replication capabilities.

NOTE
To add this vSZ to an existing cluster, the entire target cluster must be in a healthy state (no node must be in "out of service" state). If any member node is out of service, the join request will fail. You will need to remove any out-of-service node from the cluster before you can add a new node successfully.

Follow these steps to configure this to join an existing cluster.

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 on page 173.

FIGURE 157 The Cluster Information page, showing the Join Existing Cluster option



If the firmware version on this vSZ (shown in the bottom-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

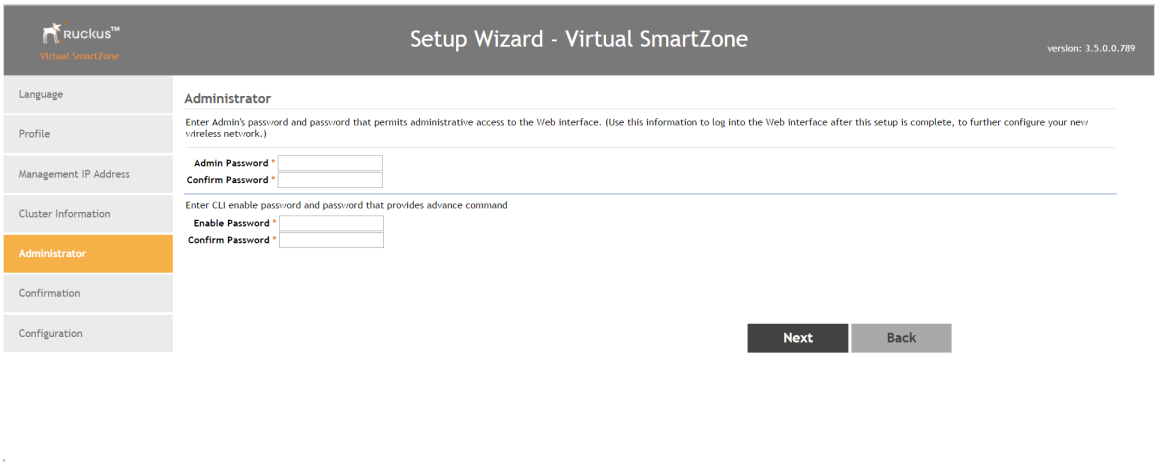
Set the administrator passwords for the web interface and command line interface (CLI).

Follow these steps to set the web interface and CLI passwords.

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

1. In **Admin Pasword**, type a password that you want to use to access the web interface.
2. In **Confirm Password**, retype the password above to confirm.
3. In **Enable Password**, type a password that you want to use to enable CLI access to the vSZ.
4. In **Confirm Password**, retype the password above to confirm.
5. Click **Next** to continue. The **Confirmation** page appears and displays all the controller settings that you have configured using the Setup Wizard.

FIGURE 158 Set the web interface and CLI passwords



Step 7: Verify the Settings

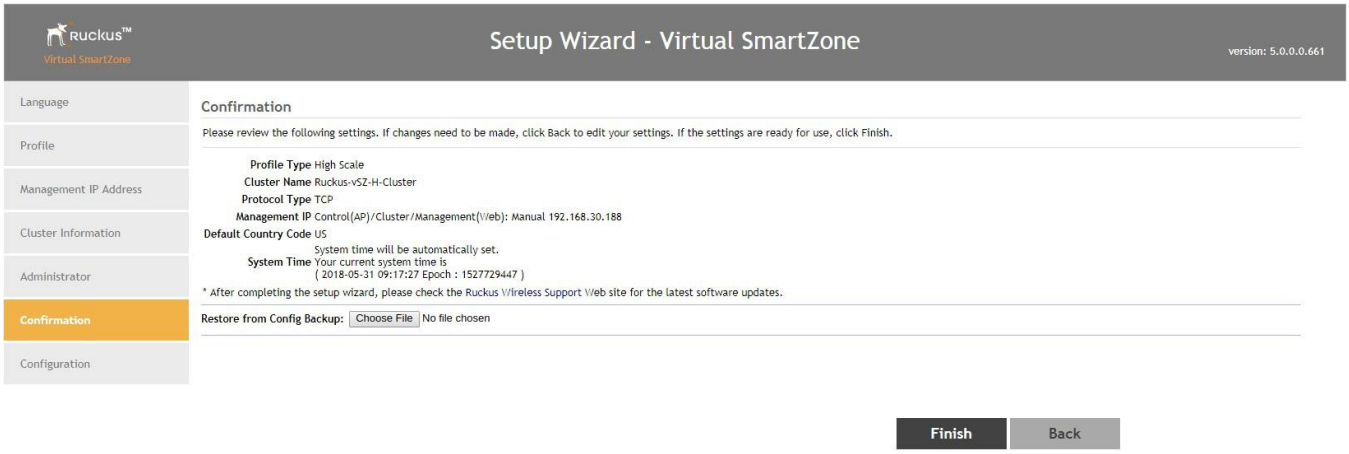
After you complete setting the web interface and CLI passwords, check the **Confirmation** page and review all of the controller settings that you have configured using the Setup Wizard.

Follow these steps to verify the controller settings that you have configured.

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 controller on the network.

FIGURE 159 The Confirmation page

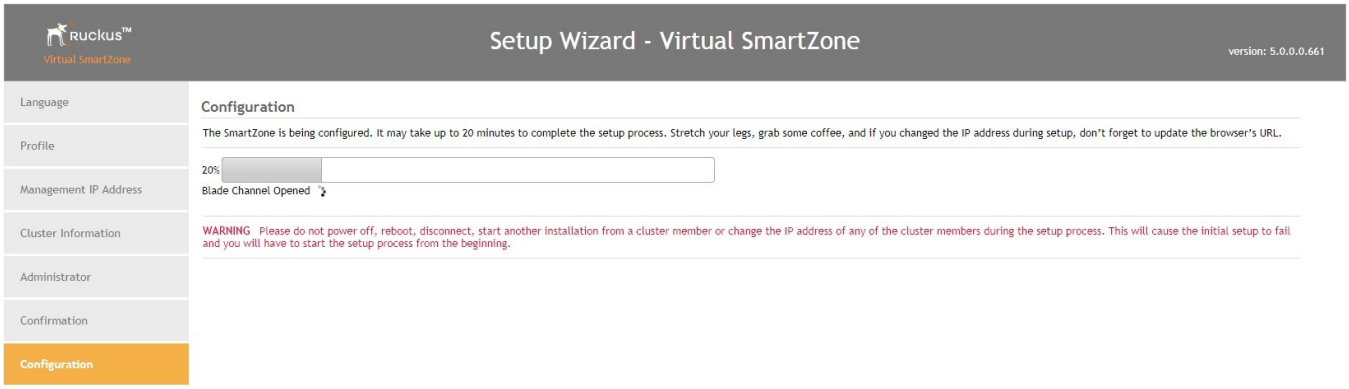


NOTE
If you find an incorrect setting, click the **Back** button until you reach the related page, and then edit the settings. When you finish editing the settings, click the **Next** button until you reach the **Confirmation** page again.

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 controller.

FIGURE 160 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.

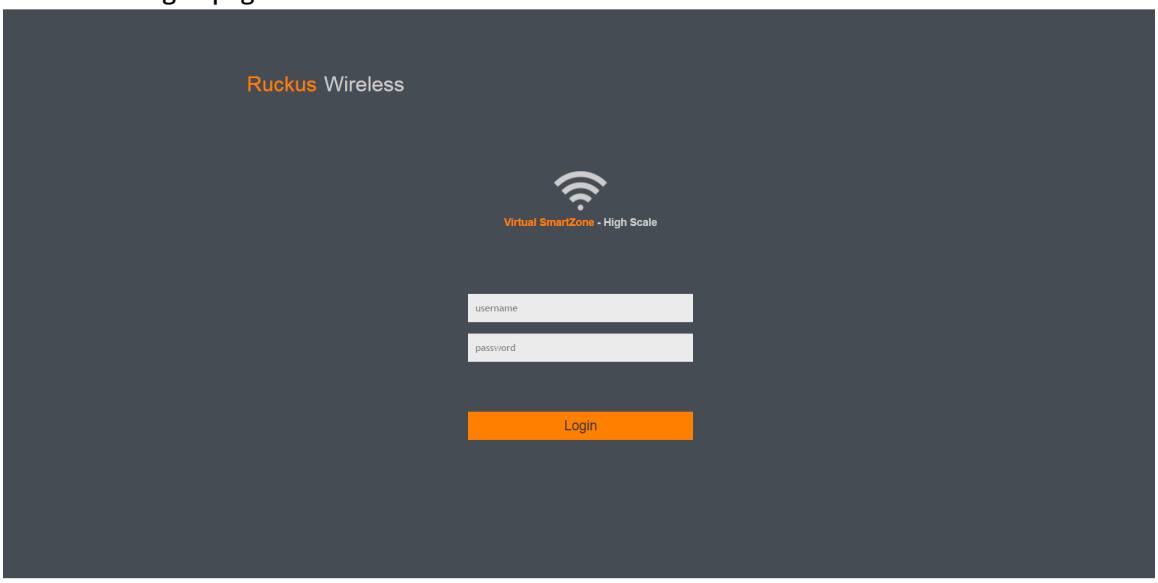
1. On a computer that is on the same subnet as the Management (Web) interface, start a web browser.
2. In the address bar, enter the IP address that you assigned to the Management (Web) interface and append a colon and 8443 (vSZ management port number) at the end of the address. The vSZ web interface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

   The vSZ logon page appears.

   FIGURE 161 The vSZ logon page



3. In **User Name**, type **admin**.
4. In **Password**, type the administrator password that you assigned to the web interface earlier.
5. 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 controller. For information on how to configure the controller, refer to the **Administrator Guide** for the controller platform that you have installed.

Deployment of vSZ

Deploy vSZ on ESXi Server

Hardware Requirement and Prerequisite for ESXi Server

The following are the hardware and prerequisite for deploying vSZ on ESXi 5.0

Hardware Requirement

1. DELL Inc. PowerEdge R530
2. ESXi Server License 6.5
3. Broadcom NetXtreme BCM5720 Gigabit Ethernet 4 Ports
4. Intel Ethernet 10G 2P X520
5. CPU minimum 8 cores
6. vSphere ESXi Server 6.7 or later
7. 1 or 3 vNICs
8. 16 GB memory
9. 256 GB Hard disk

Prerequisite

- A hypervisor on ESXi to install vSZ. Recommended version is ESXi 6.7 and later.
- Download the vSZ package (.OVA file) from Ruckus support .
- The IP addresses, netmask, gateway, DNS, DHCP and NAT support for vSZ.
- Ensure that the vSZ license that you have, is a high-capacity mode or an essential mode.
- Ensure the number of physical network interfaces. Choose the interface group, 3 or 1, that would be used implement for vSZ. vSZ-E mode supports only 1 interface group. vSZ-H mode supports both 3 and 1 interface groups.
- Before you power on vSZ, ensure that the networking is configured on ESXi.
- Recommended to use static network addresses that are assigned to vSZ during setup.

  NOTE
  Due to different servers and NIC, the deployment procedure mentioned in this section is for reference.

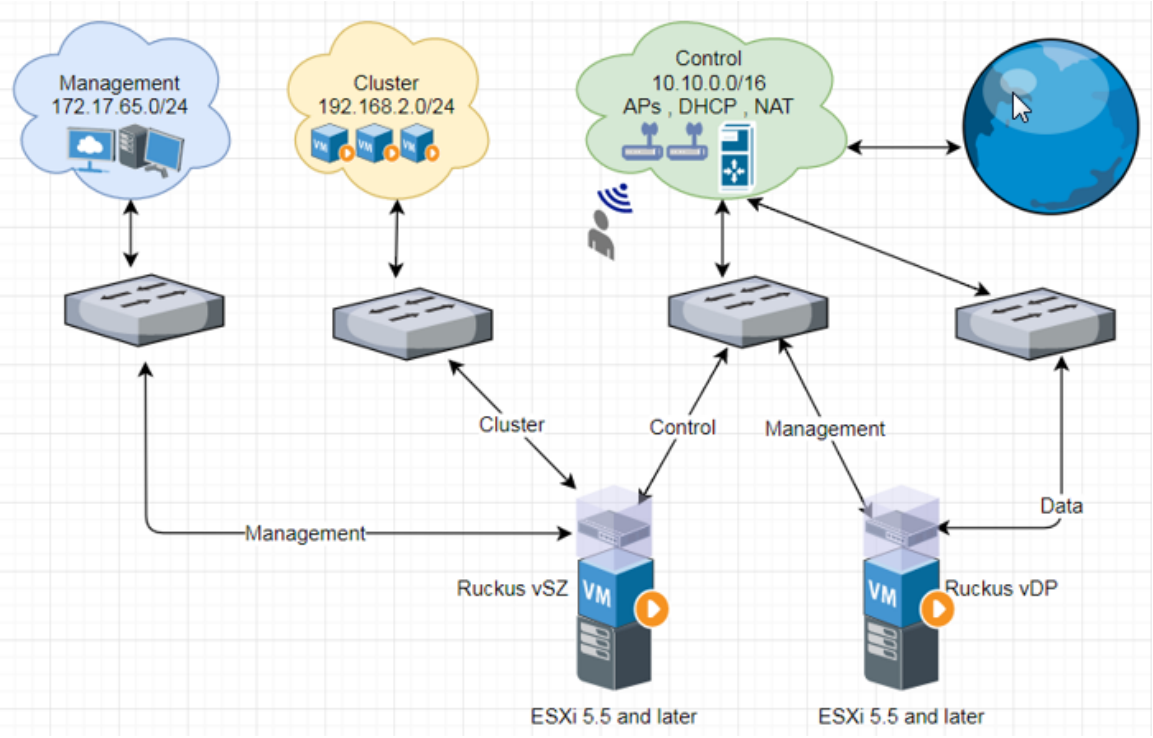
Topology for vSZ Deployment on ESXi 5.0 Server

The network topologies for vSZ deployment on ESXi 5.0 server.

The following are basic topologies for setting up vSZ. Based on your requirement you can choose any of the alternatives for deployment.

- High-Scale mode with three group interfaces.

  FIGURE 162 vSZ-H with Three Group Interfaces



- Essentials mode with one group interface.

FIGURE 163 Example 1: vSZ-E with one Group Interface

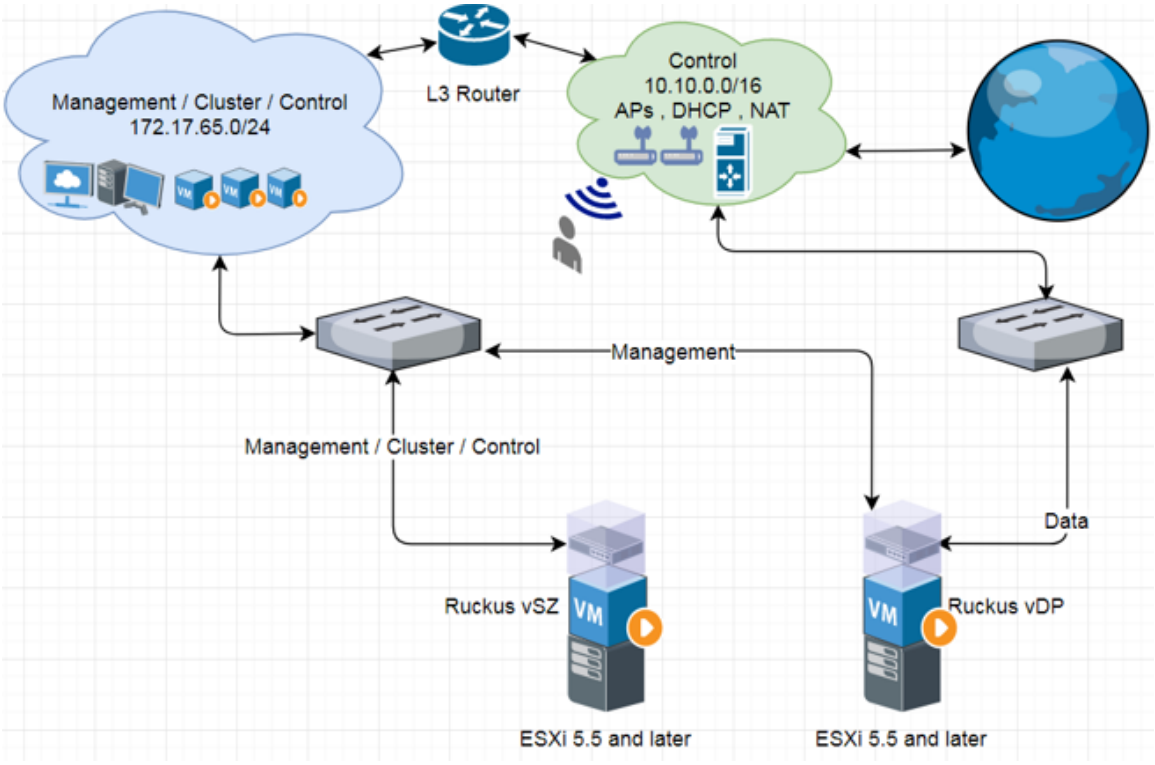
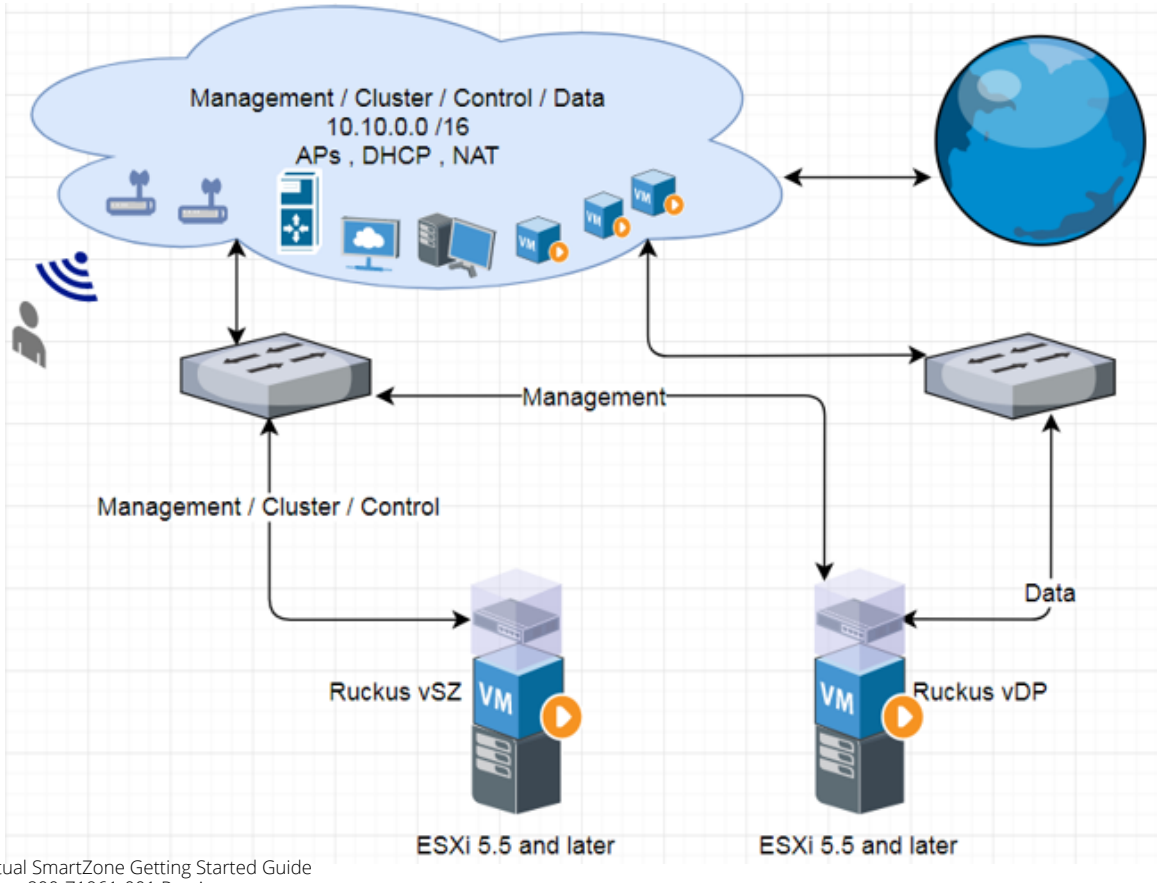


FIGURE 164 Example 2: vSZ-E with one Group Interface



Deployment Procedure on the ESXi Server

The following are basic instructions for setting up vSZ on the ESXi server.

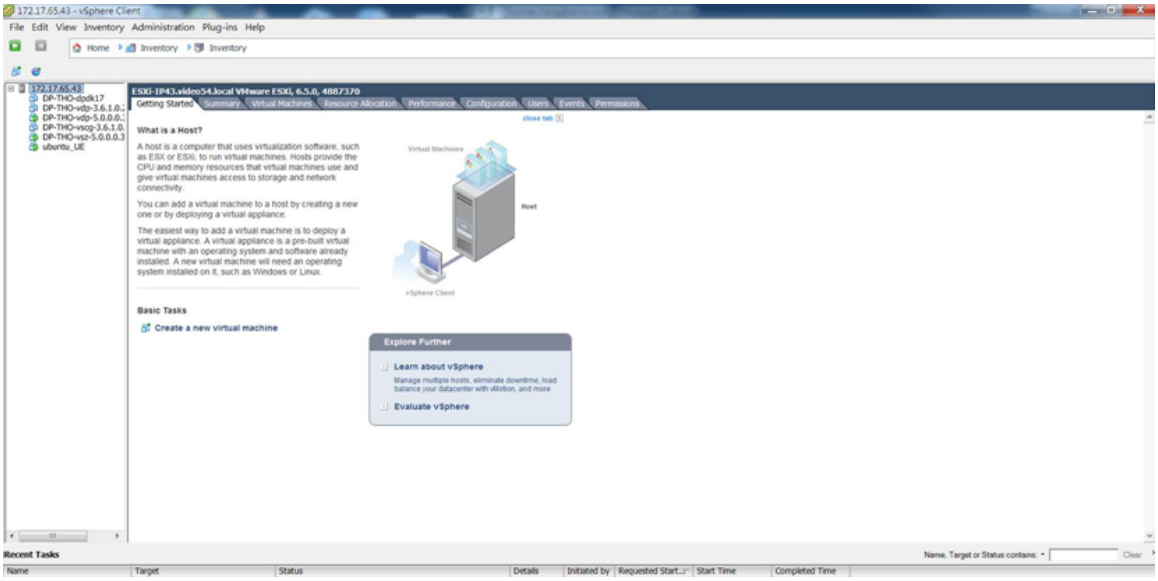
VMware ESXi 6.7 is installed and working.

1. Login to the server through vSphere client tool as seen below.

FIGURE 165 Login to vSphere

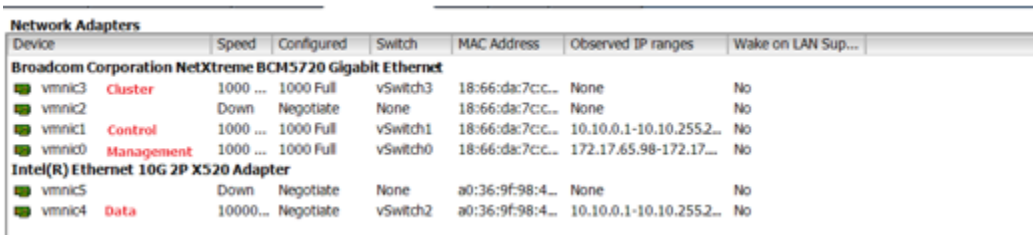
The vSphere Client management page appears as shown in the following figure.

FIGURE 166 vSphere Client management page



2. Navigate to **Configuration** > **Network Adapters**. Ensure the physical ports are linked to the correct port speed as seen below.

FIGURE 167 Define network adapters

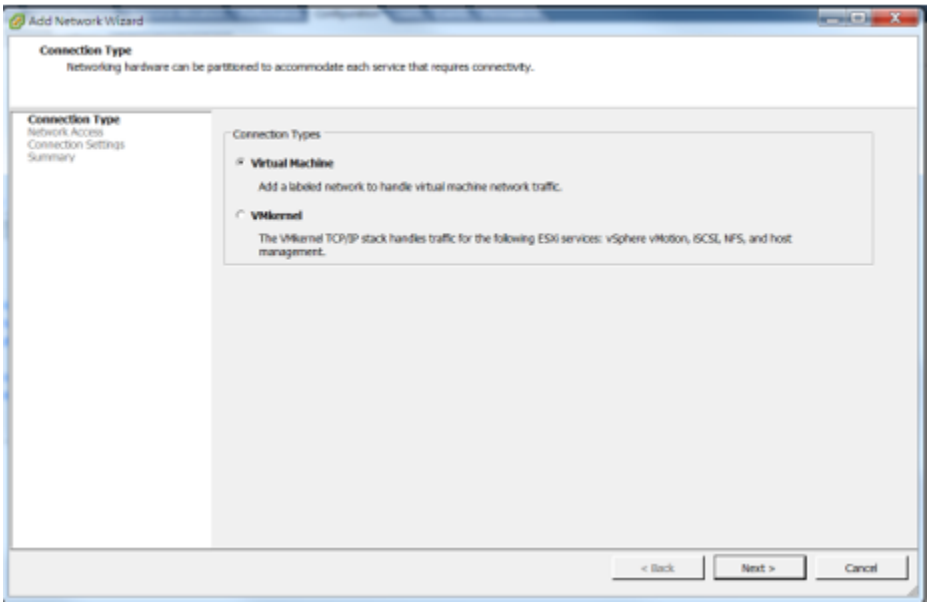


Network Adapters

Device	Speed	Configured	Switch	MAC Address	Observed IP ranges	Wake on LAN Sup...
Broadcom Corporation NetXtreme BCM5720 Gigabit Ethernet						
vmnic3 Cluster	1000 ...	1000 Full	vSwitch3	18:66:da:7c:c...	None	No
vmnic2	Down	Negotiate	None	18:66:da:7c:c...	None	No
vmnic1 Control	1000 ...	1000 Full	vSwitch1	18:66:da:7c:c...	10.10.0.1-10.10.255.2...	No
vmnic0 Management	1000 ...	1000 Full	vSwitch0	18:66:da:7c:c...	172.17.65.98-172.17....	No
Intel(R) Ethernet 10G 2P X520 Adapter						
vmnic5	Down	Negotiate	None	a0:36:9f:98:4...	None	No
vmnic4 Data	10000...	Negotiate	vSwitch2	a0:36:9f:98:4...	10.10.0.1-10.10.255.2...	No

3. Create each vSphere standard switch (vSwitch) using the physical network adapters since vSZ requires three interfaces for management, cluster, and control. Navigate to **Configuration** > **Networking** > **Add Networking**. Select the option **Virtual Machine** to choose the connection type.

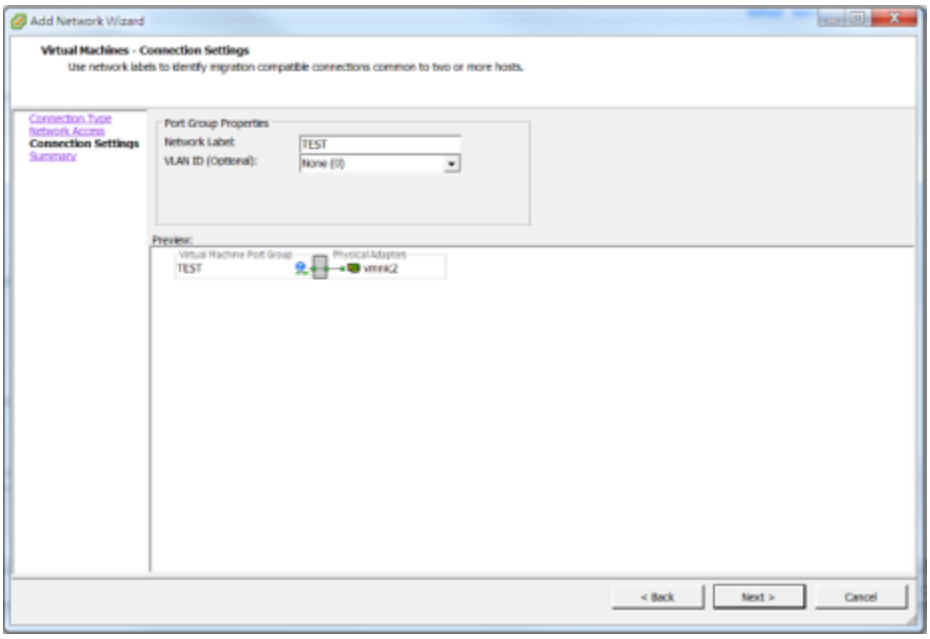
FIGURE 168 Define connection type



4. Click **Next.**
5. Select the Network Adapter from the list and click **Next**.

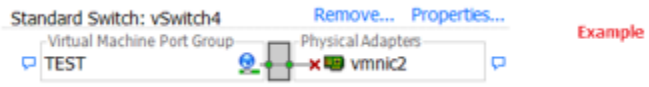
6. Enter the **Network Label** and click **Next** as shown in the following figure.

FIGURE 169 Define the Network Adapter



7. Click **Finish**.
8. View the created vSwitch as seen below.

FIGURE 170 View created vSwtich

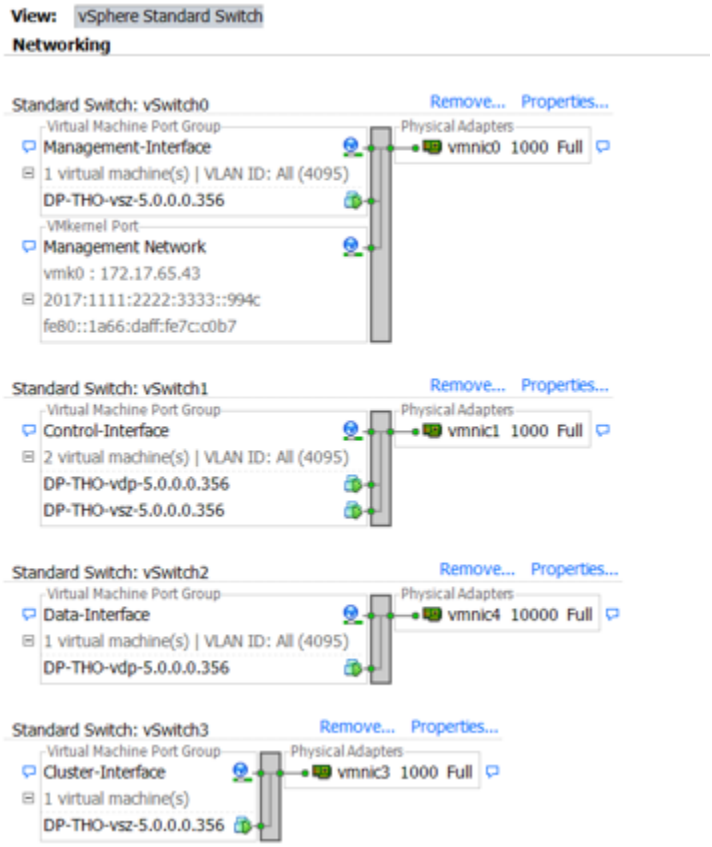


Example

9. Repeat step 3 to step 6 to create three vSwitch for vSZ. View the created vSwitch as seen below.

   NOTE
   vSZ management interface is associated to the Control-IP-Domain.

FIGURE 171 View vSwitch for management and data interfaces

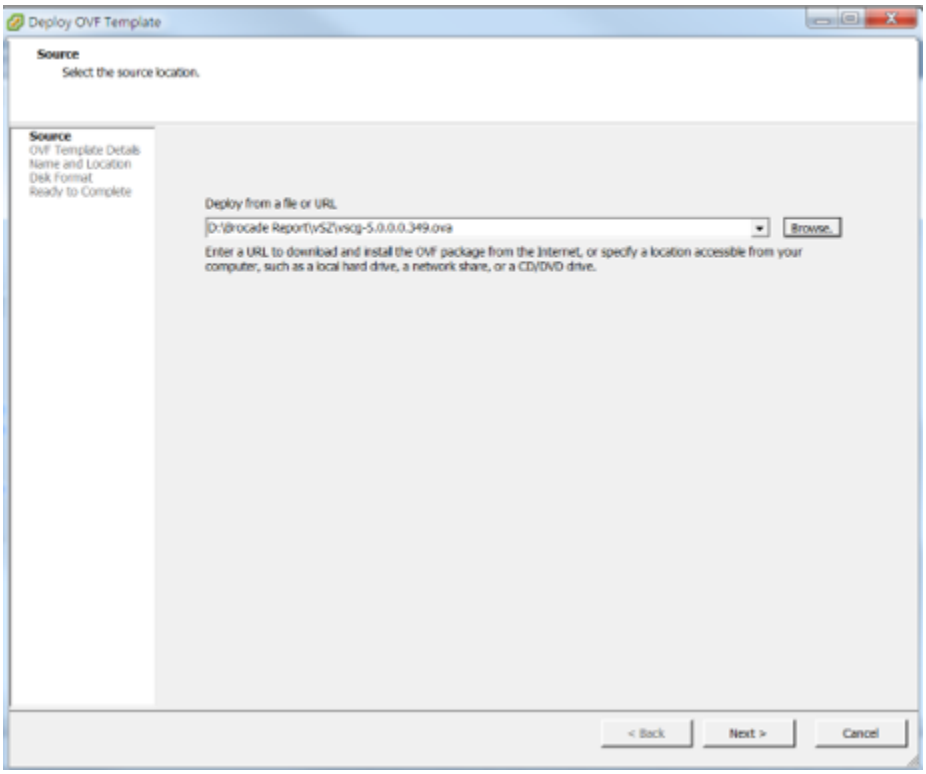


10. Download the vSZ (.ova file) from the Ruckus Website.
11. Click **File** > **Deploy OVF Template**.

    The Deploy OVF Template form appears.

12. Click **Browse** to select the source location to install the OVF package as shown in the following figure.

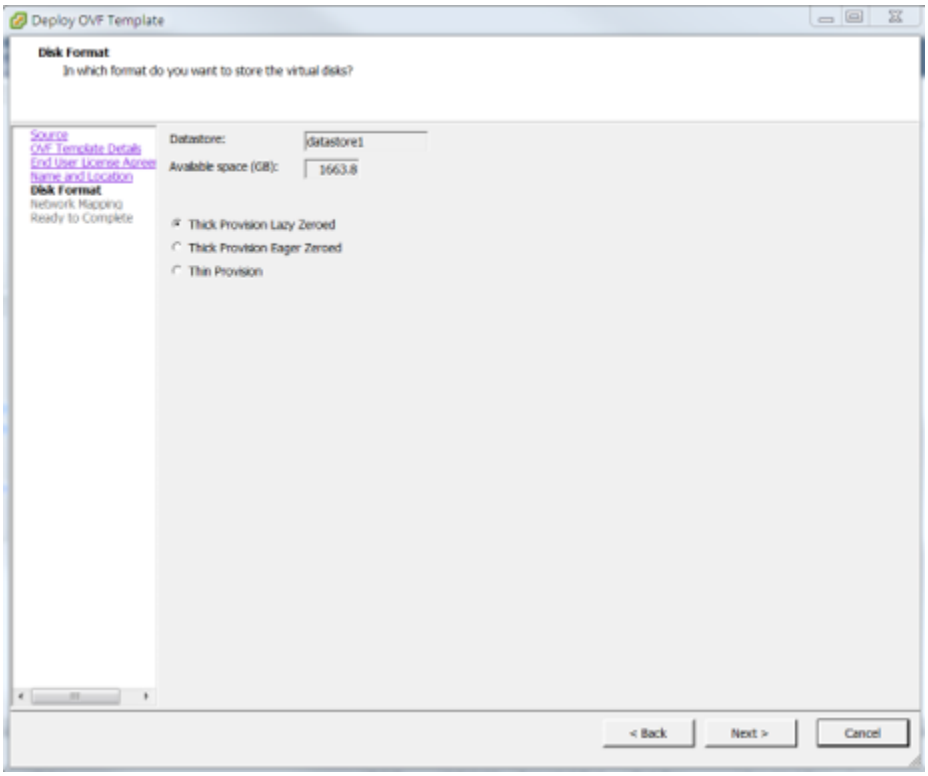
FIGURE 172 Deploy the file



13. Click **Next.**

14. Enter the vSZ datastore name and choose the disk format as seen below.

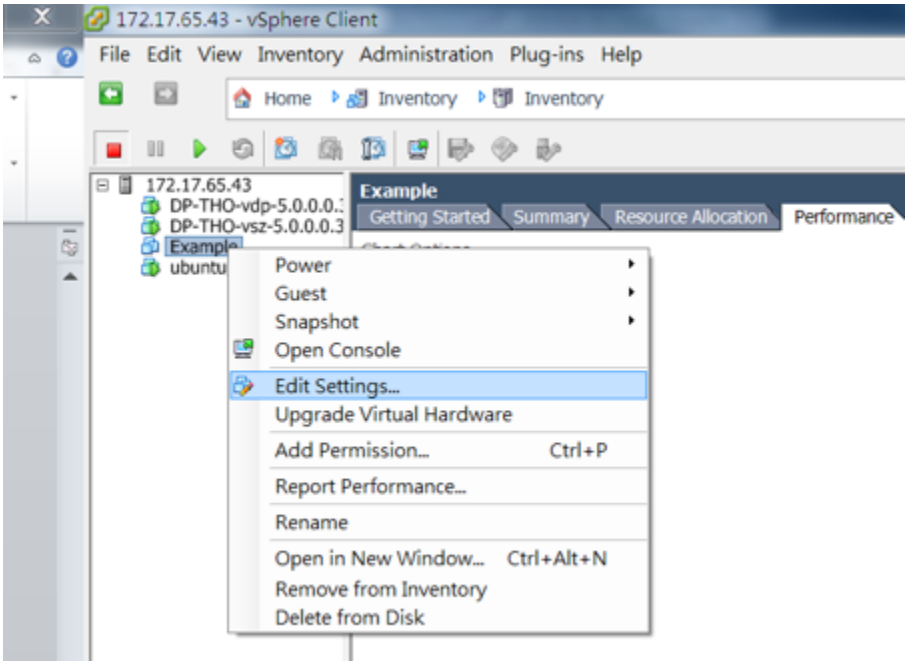
FIGURE 173 Choose the disk format



15. Click **Next** and wait for deploying.

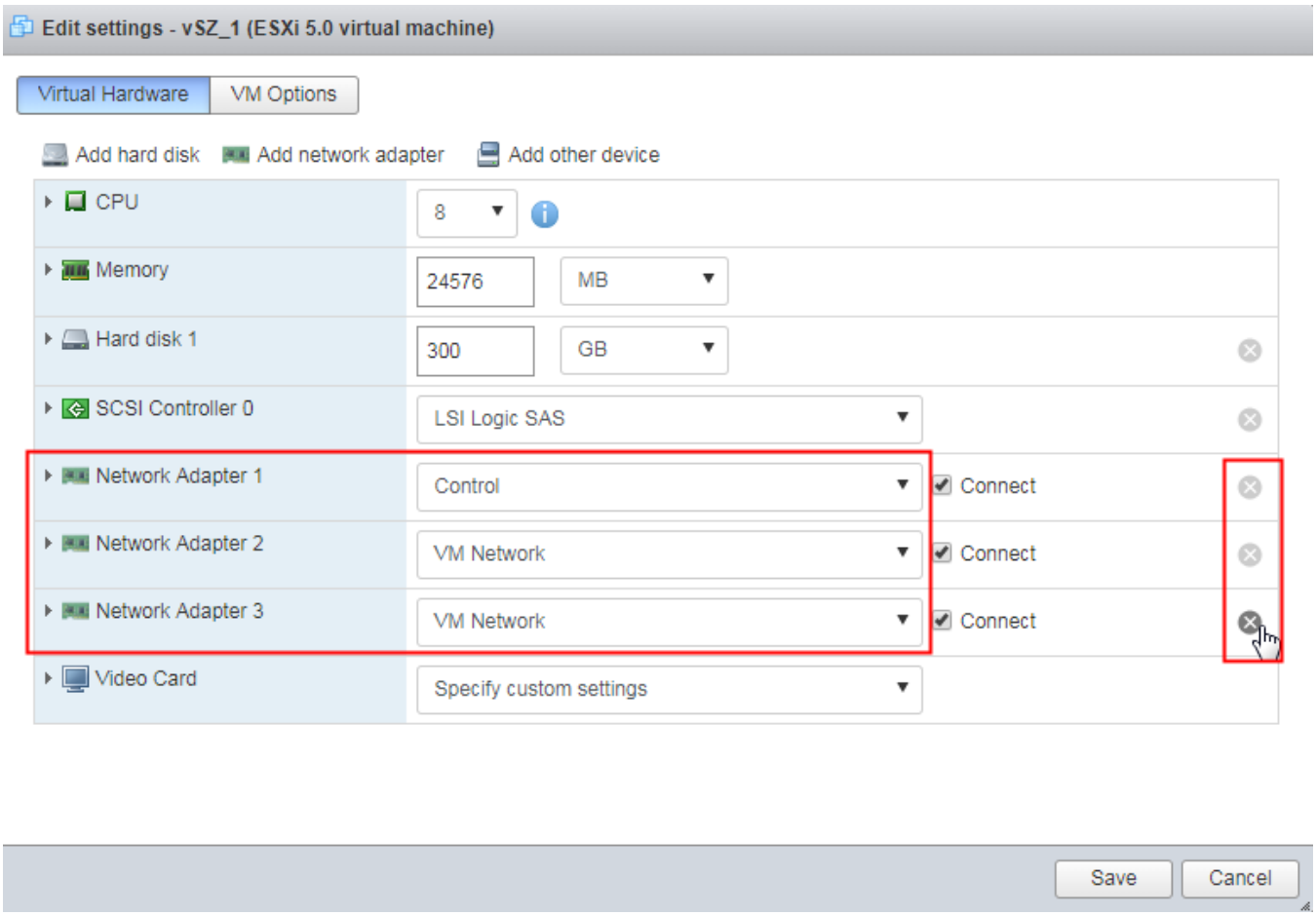
16. From the vSphere client, select **Edit Settings** to change network interface settings for vSZ-H and vSZ-E as shown in the following figure.

FIGURE 174 Edit Settings



17. By default, vSZ supports three network interfaces as shown in the figure.

FIGURE 175 vSZ-H Mode Running Three Interfaces



NOTE

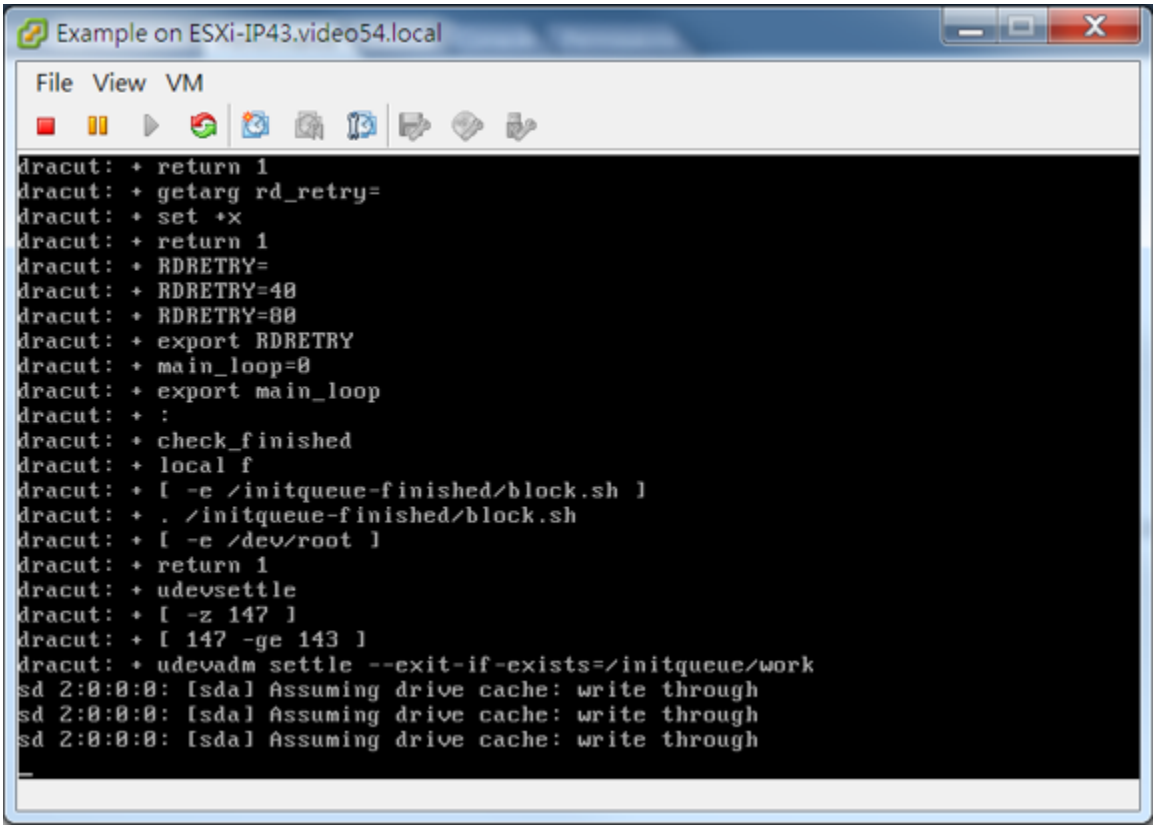
If your vSZ is running as Essential mode, select two interfaces and click the **Remove** button.

Connect to vSZ Using CLI on ESXi Server

Follow the below procedures to connect to vSZ.

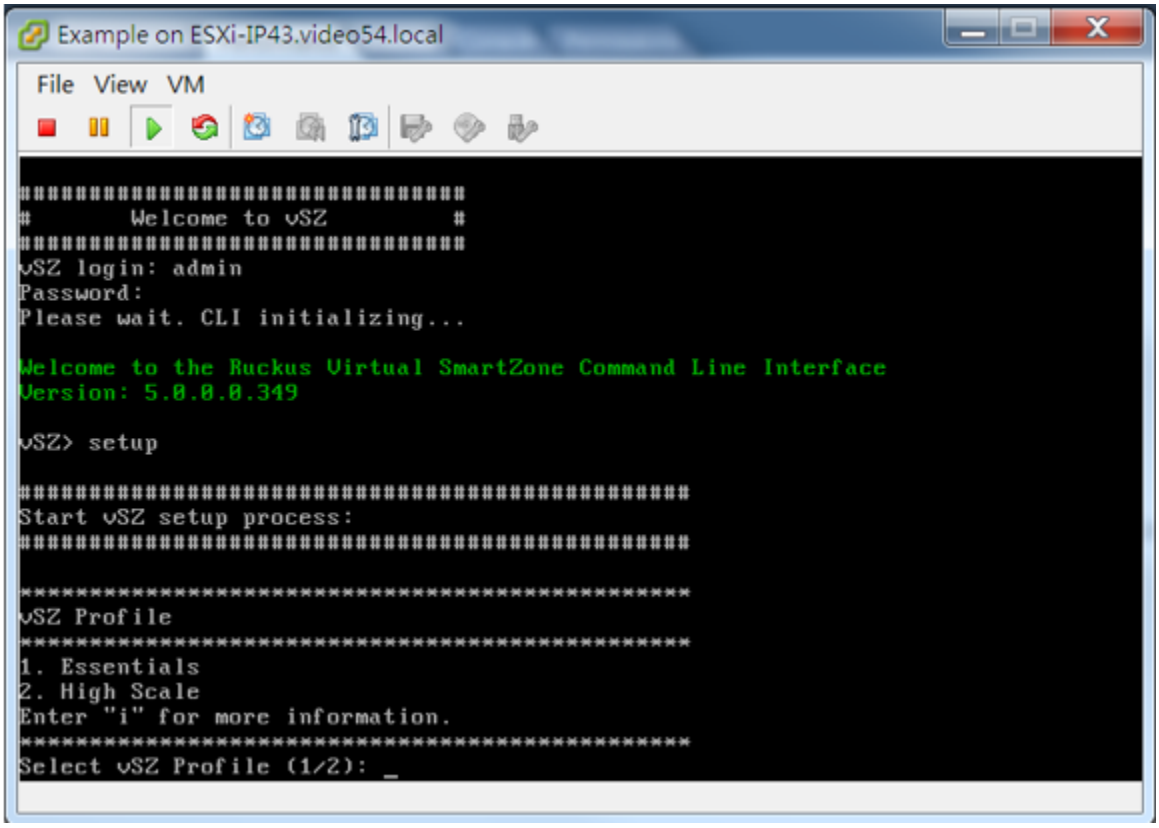
Open a CLI console window to run the deployed vSZ.

FIGURE 176 Run vSZ on the console



1. At the login prompt, login using **administrator** credentials of username and password. Run the **setup** command to initialize vSZ as shown in the figure below.

FIGURE 177 Login and Privileged mode

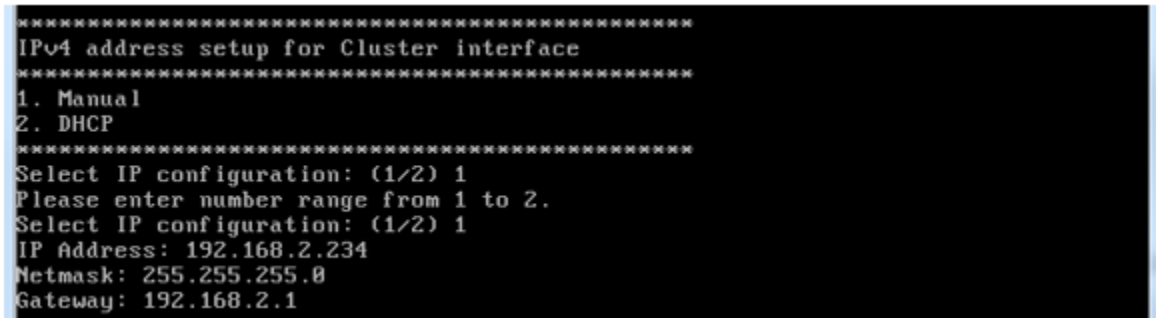


2. Enter **2** for High-Scale mode and press **Y** to continue.
3. Enter static IP address for control interface as shown in the figure below.

FIGURE 178 Static IP Address for Control Interface

4. Enter static IP address for cluster interface as shown in the figure below.

FIGURE 179 Static IP Address for Cluster Interface



5. Enter static IP address for management interface as shown in the figure below.

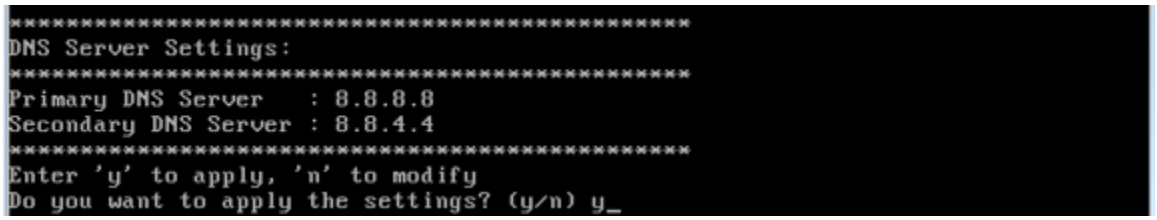
FIGURE 180 Static IP Address for Management Interface

6. Select the default gateway interface. Enter **1** for control interface, **2** for cluster interface, and **3** for management interface as shown in the figure below.

FIGURE 181 Default Gateway Interface

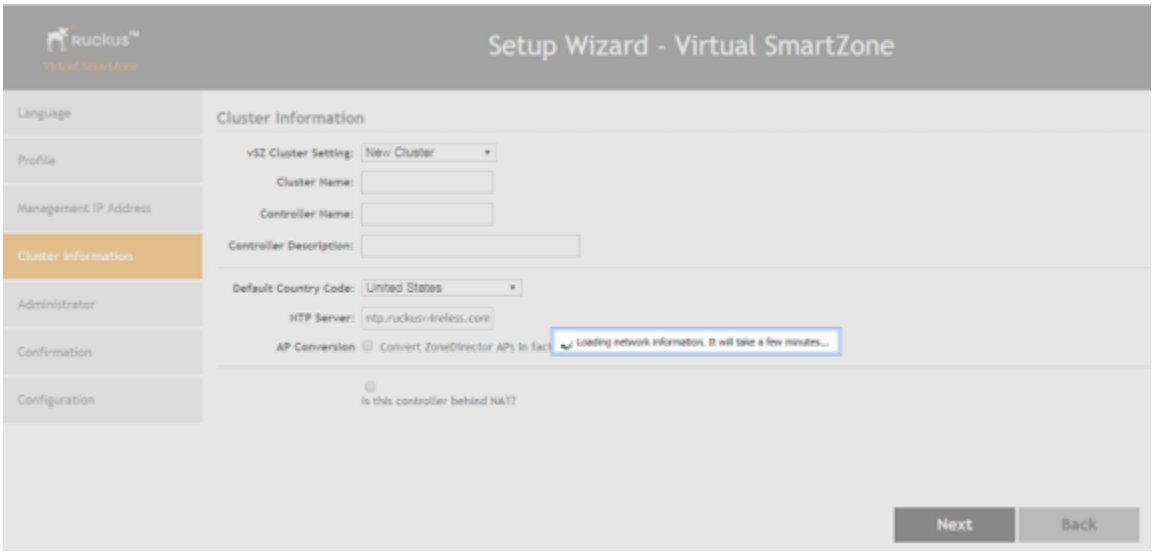
7. Enter the DNS server setting and press **Y** to apply all setting.

FIGURE 182 DNS Server Settings



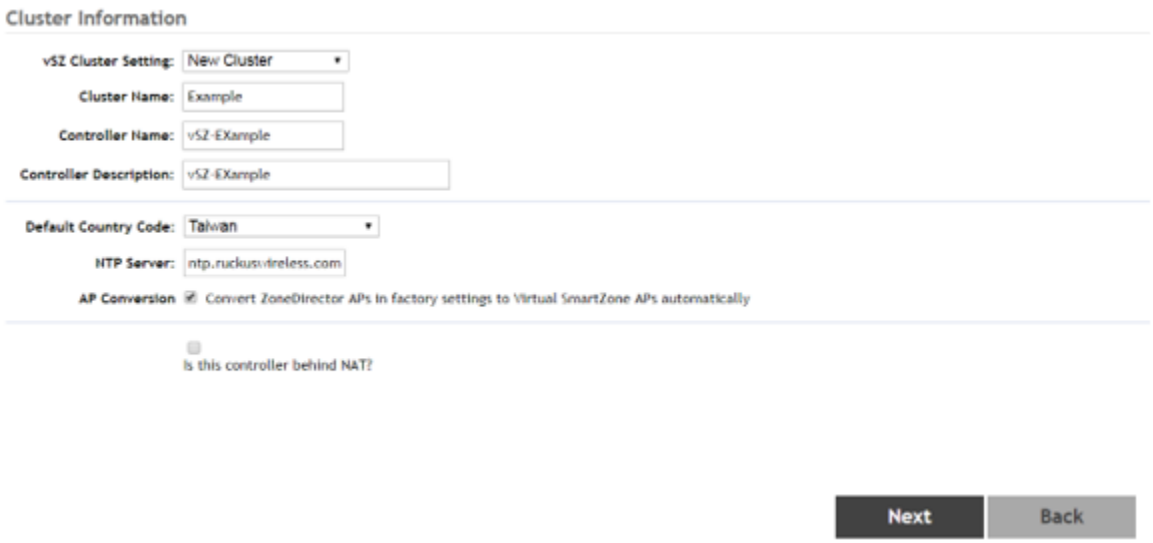
8. Access the web link http://172.17.65.234:8443 to continue other setting as shown in the figure below.

FIGURE 183 vSZ Web UI



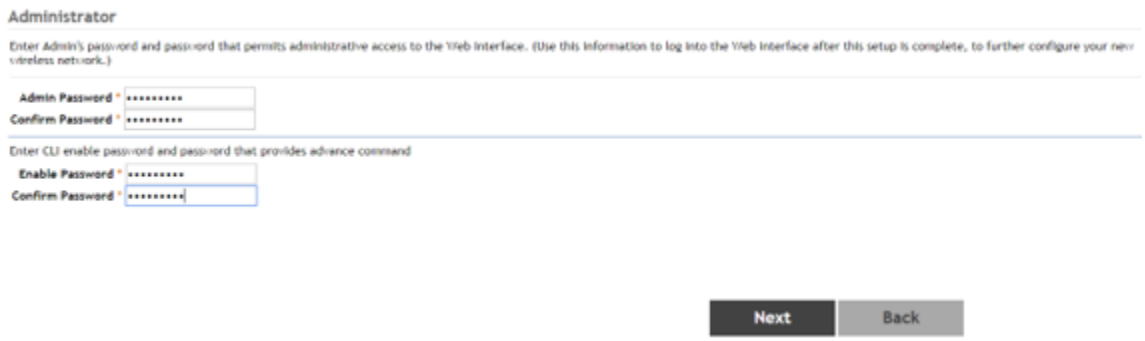
9. Enter your **Cluster Information** and click **Next** as shown in the following figure.

FIGURE 184 Cluster Information



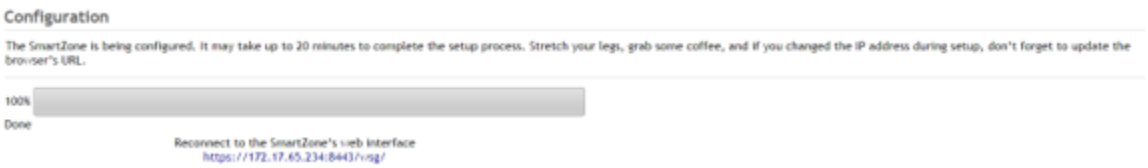
10. Enter your vSZ Administrator password requirements and click **Next** as shown in the following figure.

FIGURE 185 vSZ Administrator Password



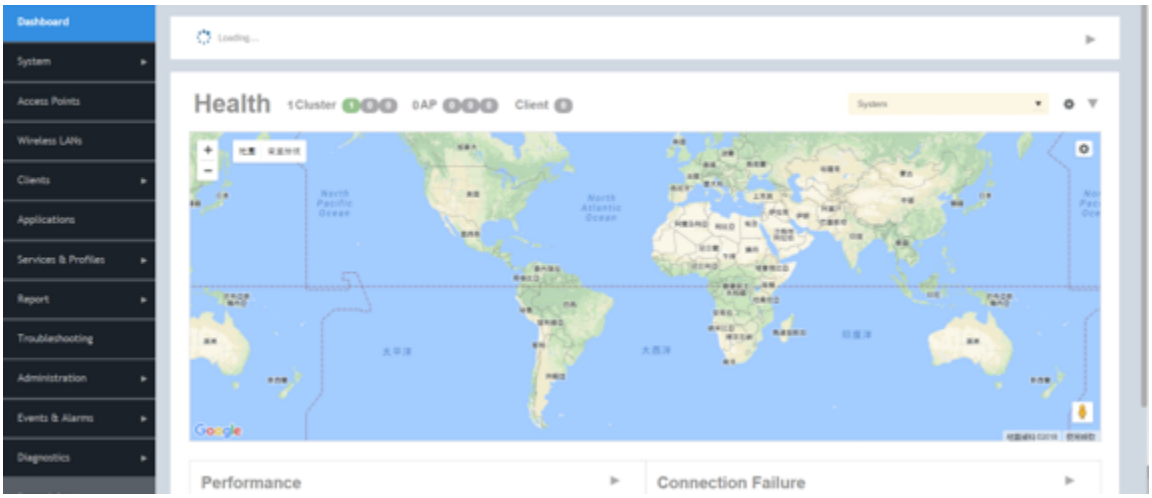
11. Click **Finish** and wait until vSZ is configured.
12. After vSZ is configured, reconnect to vSZ web as shown in the following figure.

FIGURE 186 vSZ Configuration



13. Enter **Username** and **Password** to access vSZ as shown in the following figure.

FIGURE 187 vSZ Homepage



Deploy vSZ on Linux Server

Hardware Requirement and Prerequisite for LINUX CentOS 7

The following are the hardware and prerequisite for deploying vSZ on LINUX CentOS 7.

Hardware Requirement

1. DELL Inc. PowerEdge R320
2. Linux CentOS 7
3. Broadcom NetXtreme BCM5720 Gigabit Ethernet 2 Ports
4. Intel Ethernet 10G 2P X520

Prerequisite

- A Linux host enabled KVM which to install vSZ VM. Prefer CentOS 7 and later.
- Download the vSZ package (.qcow2 file) from Ruckus support .
- The IP addresses, netmask, gateway, DNS, DHCP and NAT support for vSZ.
- Ensure if the vSZ license that you have, is a high-capacity mode or an essential mode.
- 1Ensure the number of physical network interfaces. Choose the interface group, 3 or 1, that would be used implement for vSZ. vSZ-E mode supports only 1 interface group. vSZ-H mode supports both 3 and 1 interface groups.
- Before you power on vSZ, ensure that the networking is configured on LINUX.
- Recommended to use static network addresses that are assigned to vSZ during setup.
- Using CentOS 7, install KVM package with the **yum** command.

```
root@localhost ruckusvnc]# yum -y install qemu-kvm qemu-img virt-manager virt-viewer virt-install
libvirt libvirt-phthon libvirt-client
```

- Ensure KVM is active and running the following command.

```
[root@localhost ruckusvnc]# systemctl status libvirtd
```

- Edit the following commands and file.

```
sudo yum install grub2-common

gedit /etc/default/grub
GRUB_TIMEOUT=5
GRUB_DISTRIBUTOR="$(sed 's, release .*$,,g' /etc/system-release)"
GRUB_DEFAULT=saved
GRUB_DISABLE_SUBMENU=true
GRUB_TERMINAL_OUTPUT="console"
GRUB_CMDLINE_LINUX="crashkernel=auto rd.lvm.lv=centos/root rd.lvm.lv=centos/swap rhgb quiet
intel_iommu=on"
GRUB_DISABLE_RECOVERY="true"

sudo grub2-mkconfig -o /boot/grub2/grub.cfg
```

- Reboot Linux host.

NOTE
Due to different servers and NIC, the deployment procedure mentioned in this section is for reference.

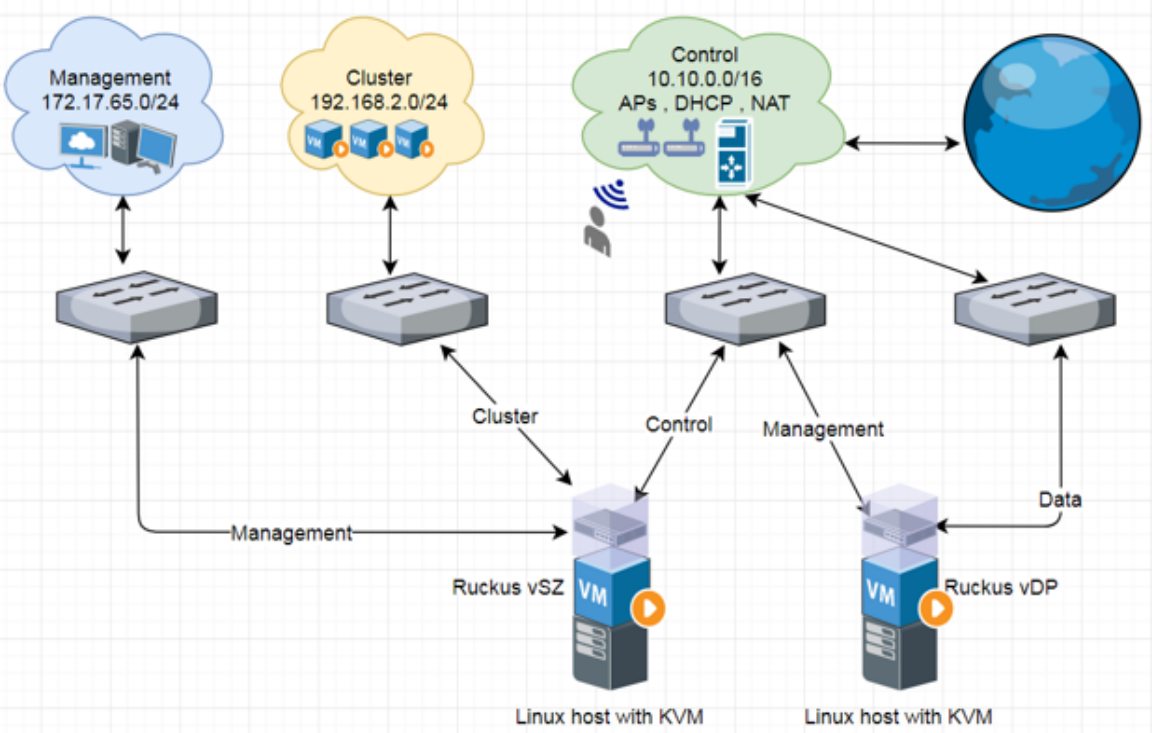
Topology for vSZ Deployment on LINUX CentOS7

The network topologies for vSZ deployment on LINUX CentOS 7.

The following are basic topologies for setting up vSZ. Based on your requirement you can choose any of the alternatives for deployment.

- High-Scale mode with three group interfaces.

FIGURE 188 vSZ-H with Three Group Interfaces



- Essentials mode with one group interface.

FIGURE 189 Example 1: vSZ-E with one Group Interface

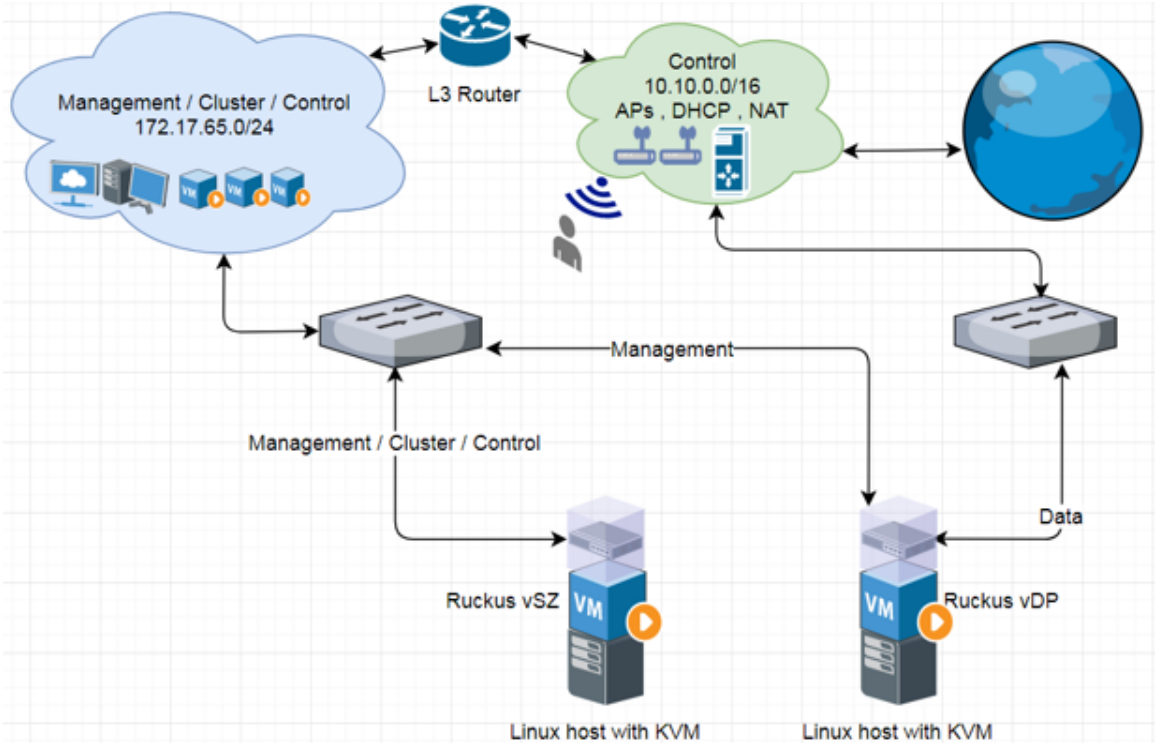
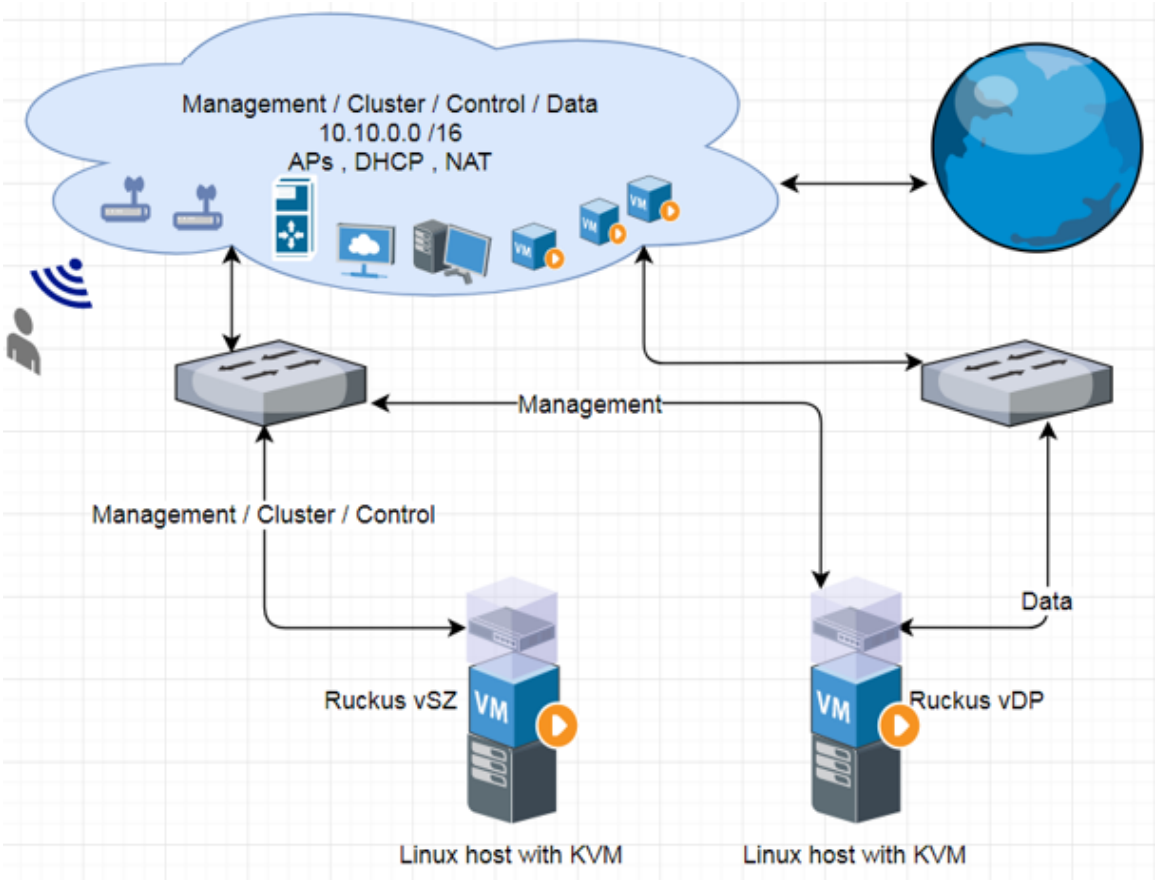


FIGURE 190 Example 2: vSZ-E with one Group Interface



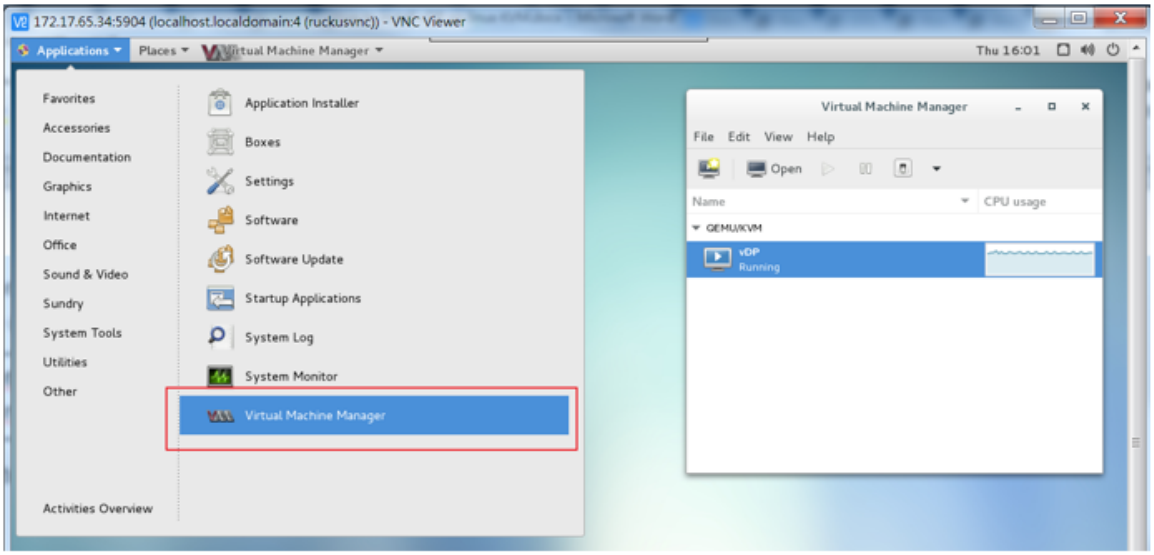
Deployment Procedure on the LINUX Server

The following are basic instructions for setting up vSZ on LINUX KVM.

LINUX CentOS 7 KVM Package is installed and working.

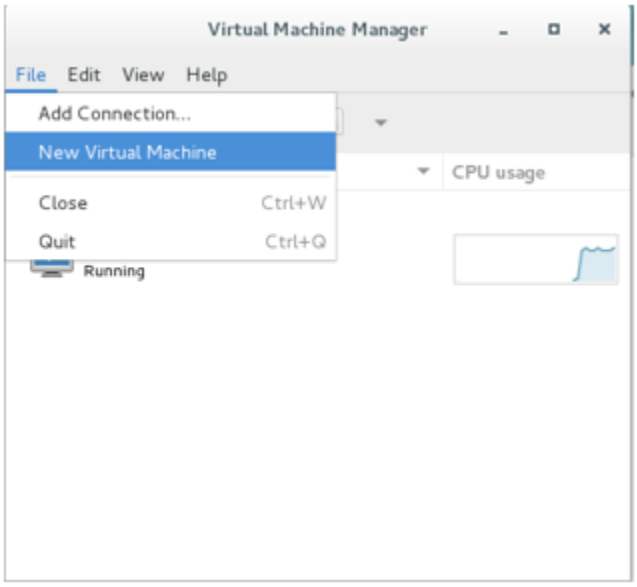
1. Download vSZ package (.qcow2 file) from Ruckus website.
2. From VNC Viewer, click **System Tools** and open the **Virtual Machine Manager** tool. The vSZ status must appear Running as shown in the following figure.

FIGURE 191 Virtual Machine Manager



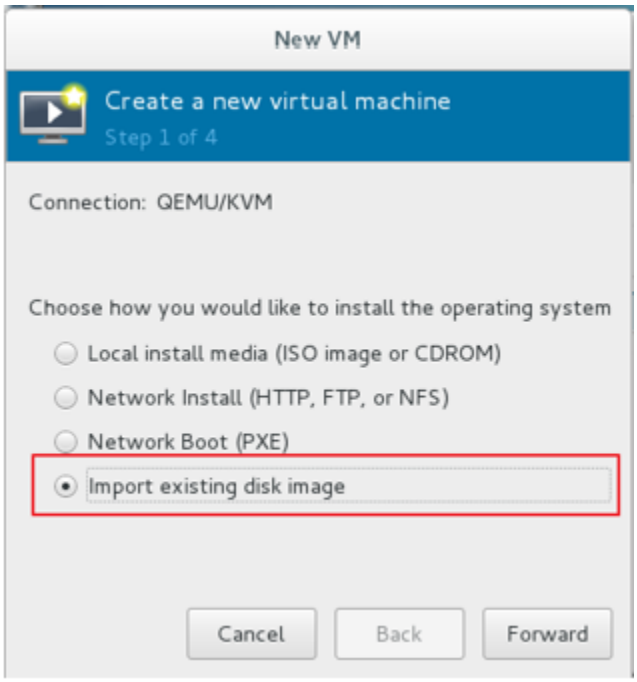
3. Create a new VM.
   a) Click **File** and select **New Virtual Machine** as shown in the following figure.

FIGURE 192 Creating a Virtual Machine



   b) In the New VM dialog box, choose the disk format option as shown in the following figure.

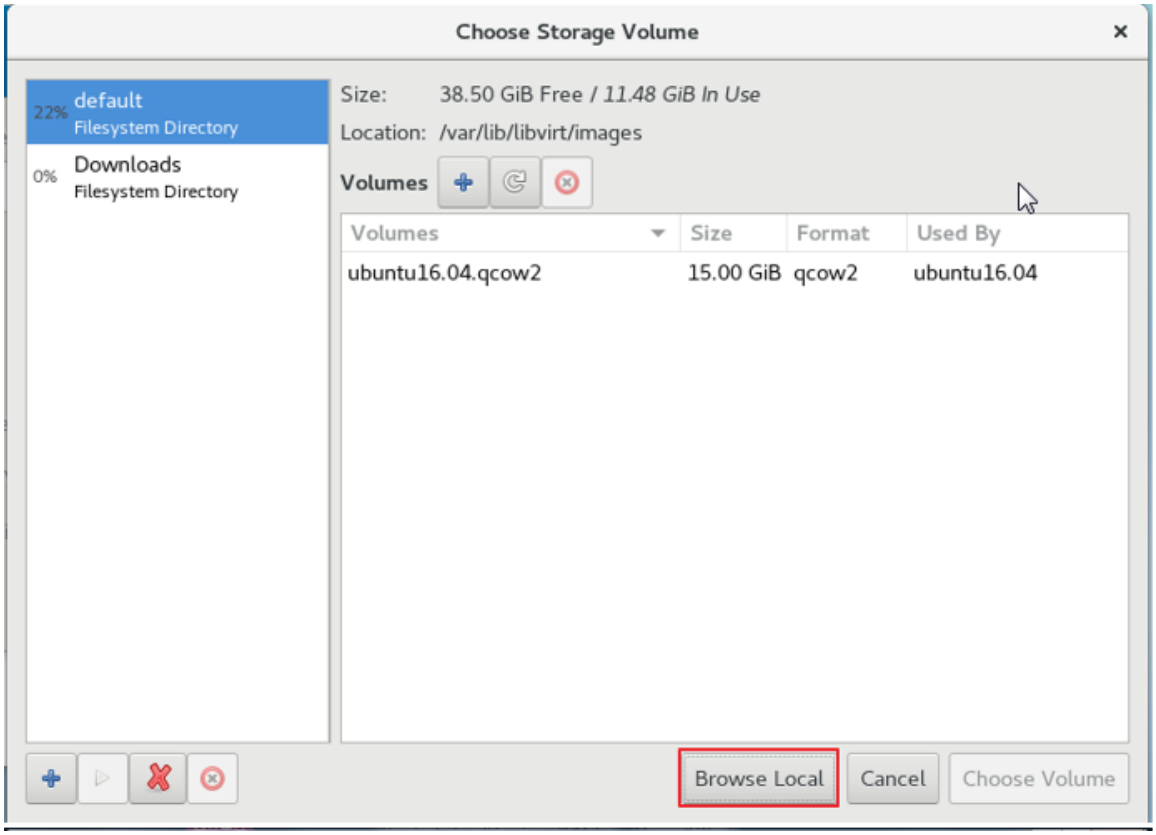
FIGURE 193 Disk Format



c) Click **Forward**.

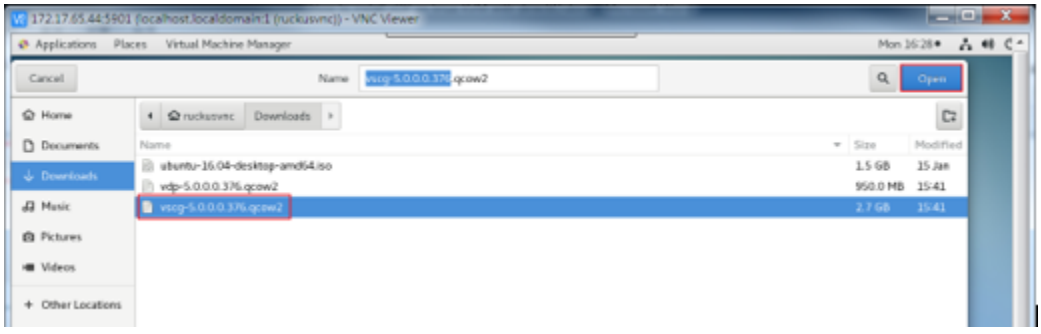
d) Choose destination storage path and storage volume. Click **Browse Local** as show in the following figure.

FIGURE 194 Storage Volume



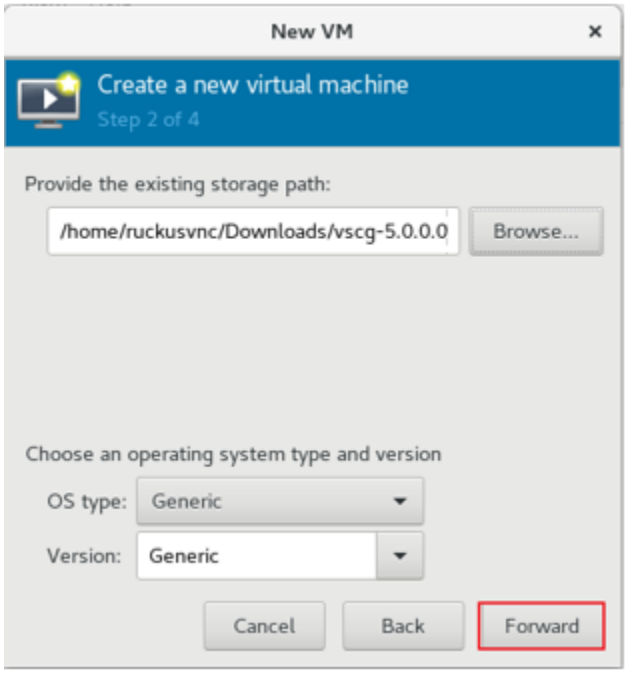
e) Select the vSZ file and click **Open** as shown in the following figure.

FIGURE 195 vSZ File



f) To select the storage path, click **Browse** as shown in the following figure.

FIGURE 196 Storage Path

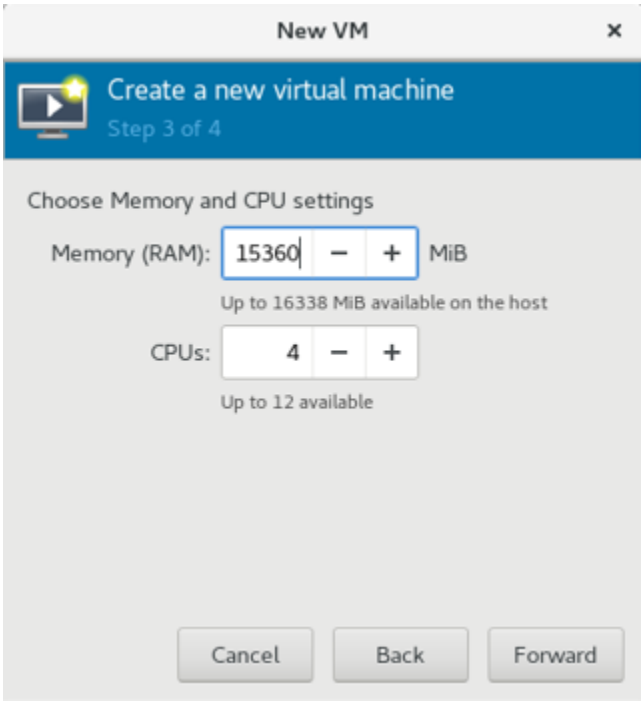


g) Click **Forward**.

h) Enter the **Memory (RAM)** and **CPUs** setting as shown in the following figure.

NOTE
Memory (RAM) must be 15GB and CPUs must be 4 cores.

FIGURE 197 Memory and CPU Settings

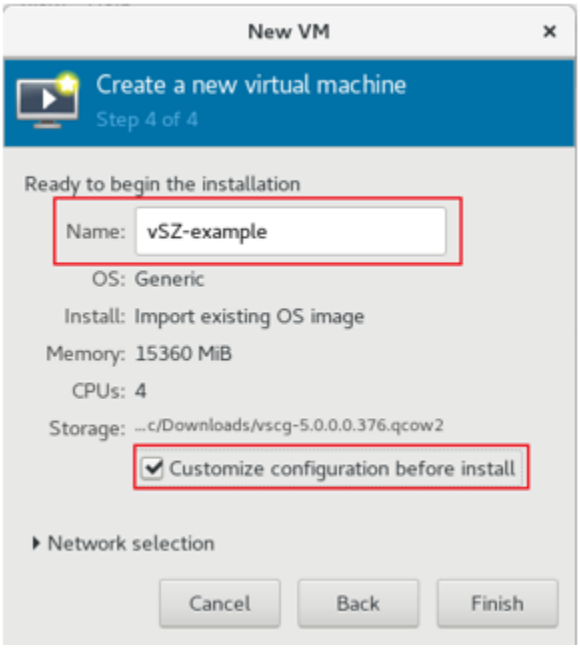


i) Click **Forward**.

j) To confirm the installation process, click **Finish** as shown in the following figure.

NOTE
The sequence for Network interfaces must first be Management and the Data.

FIGURE 198 Installation Confirmation



4. From the VNC Viewer, click **Add Hardware**, select the NIC and choose the **Device model** to update the Control, Cluster and Management interface associate as shown in the following figures.

   NOTE
   vSZ needs three interfaces; Control, Cluster, and Management.

   NOTE
   For Essential mode, you need not add two NICs.

FIGURE 199 Control Interface

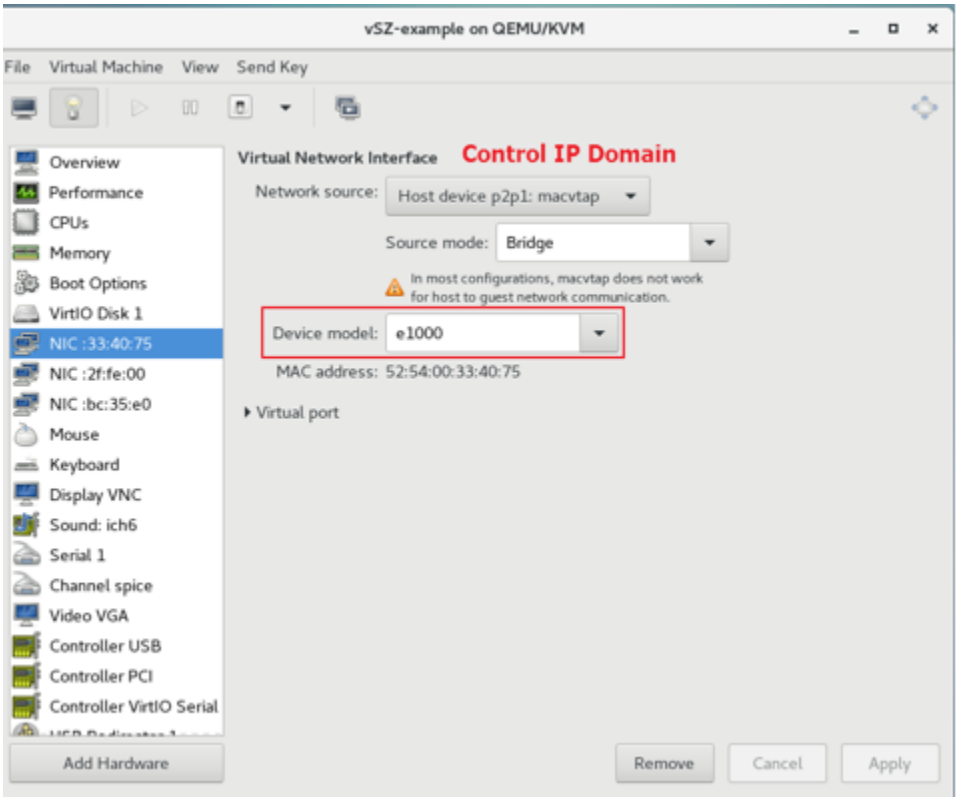


FIGURE 200 Cluster Interface

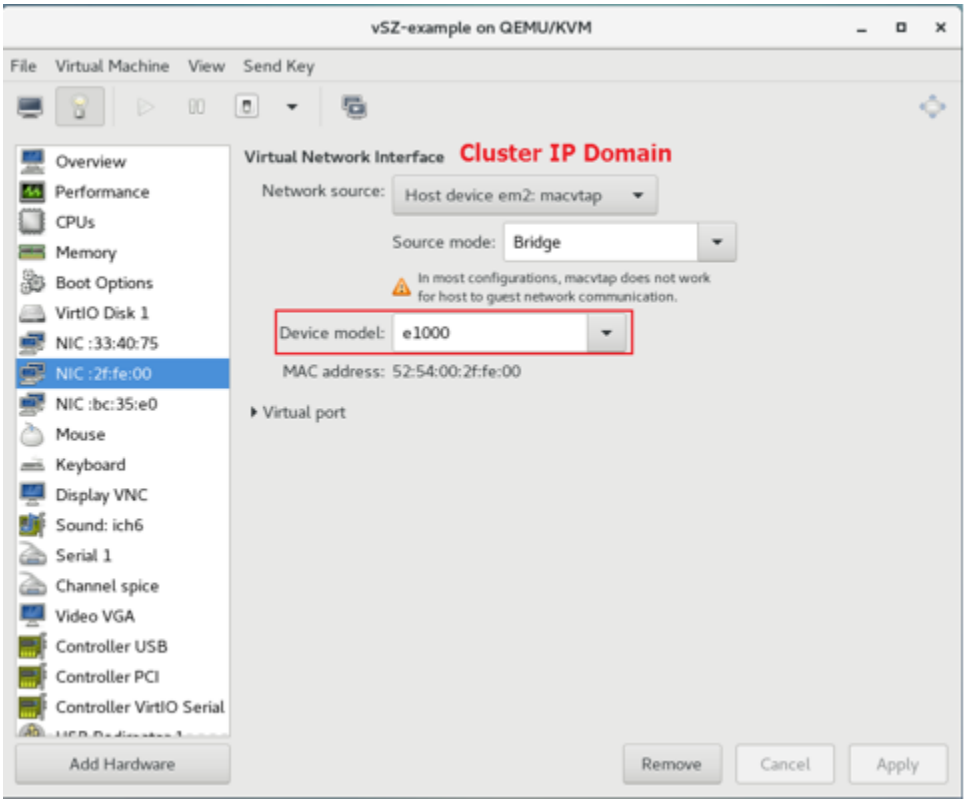
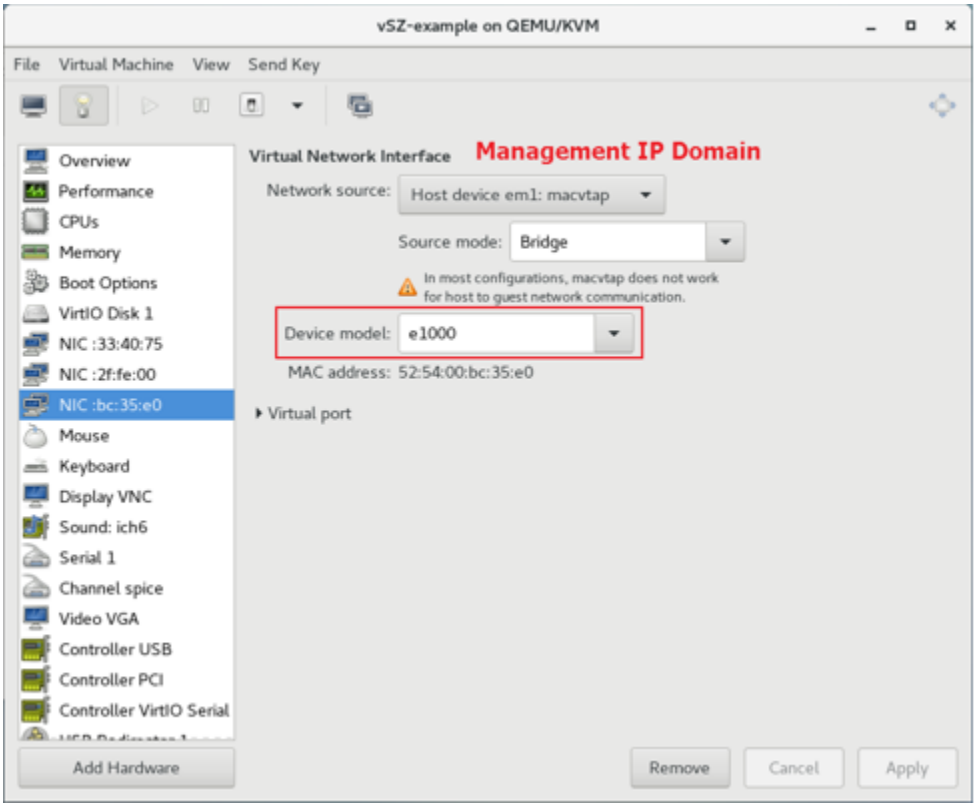
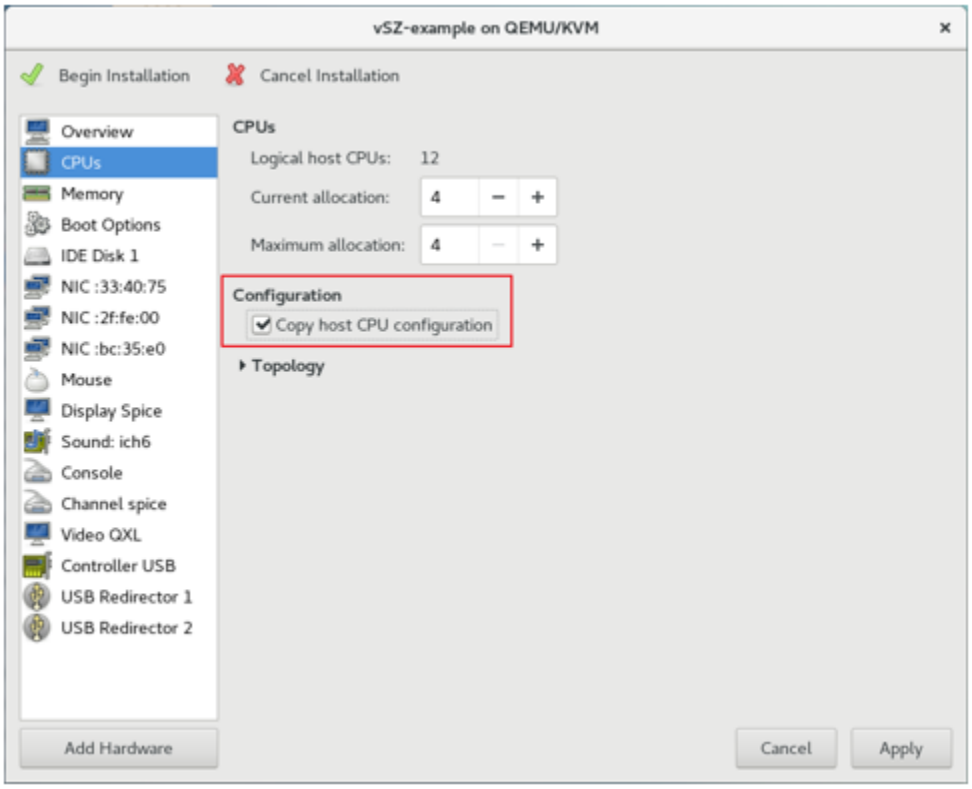


FIGURE 201 Management Interface



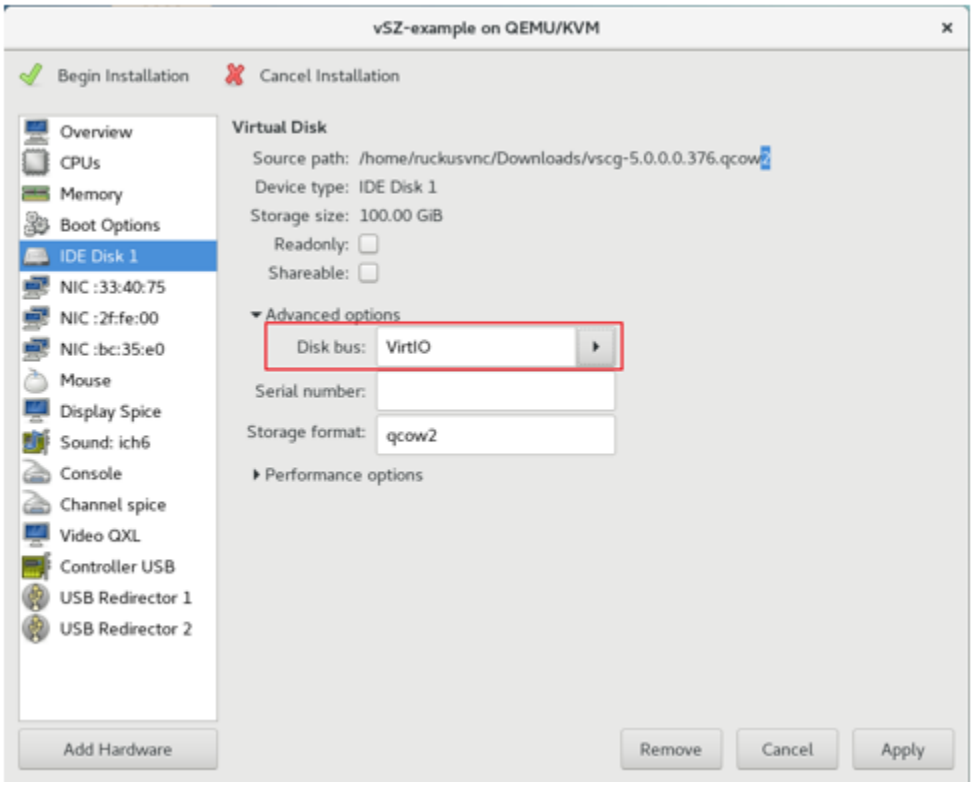
5. Define the CPU Configuration. Select the **Copy host CPU configuration** check box as shown in the following figure.

FIGURE 202 CPU Configuration



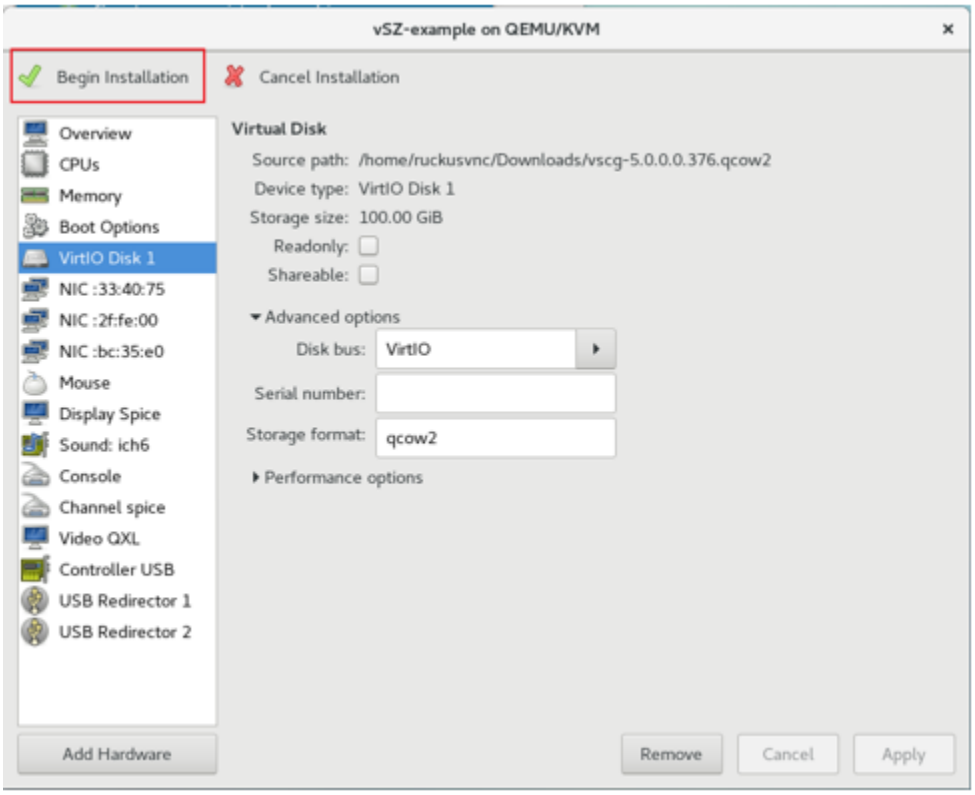
6. Define the IDE Disk Configuration. Choose the **Disk bus** option as shown in the following figure.

FIGURE 203 IDE Disk Configuration



7. Select **Begin Installation** as shown in the following figure.

FIGURE 204 Begin Installation

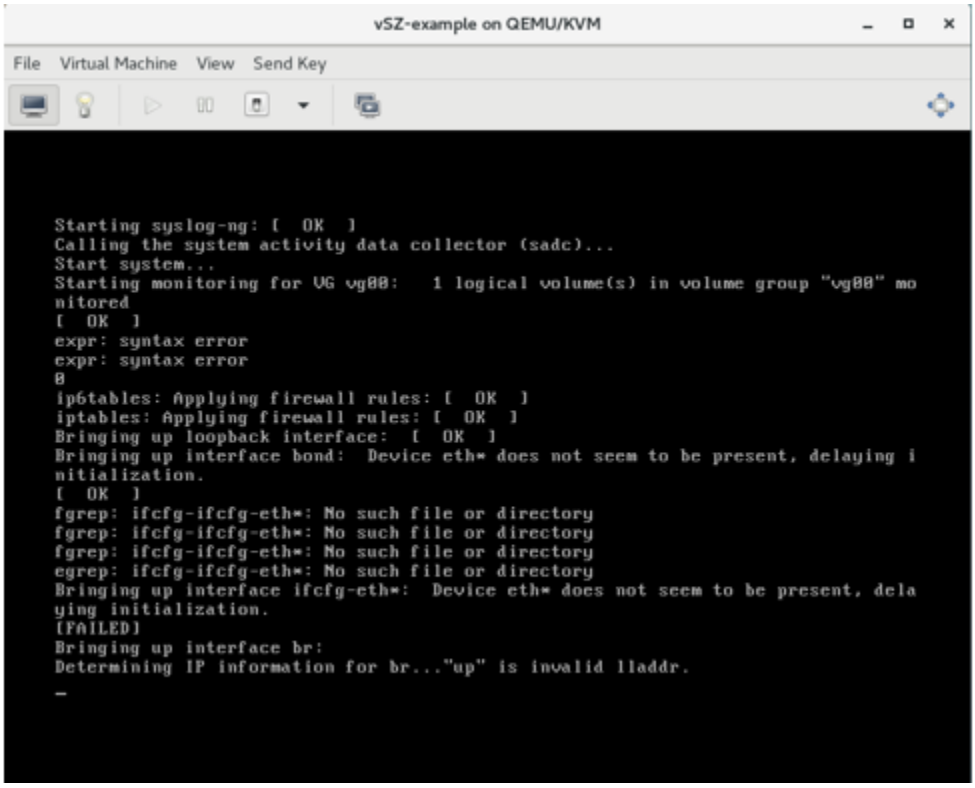


Connect to vSZ Using CLI on LINUX Server

Follow the below procedures to connect to vSZ.

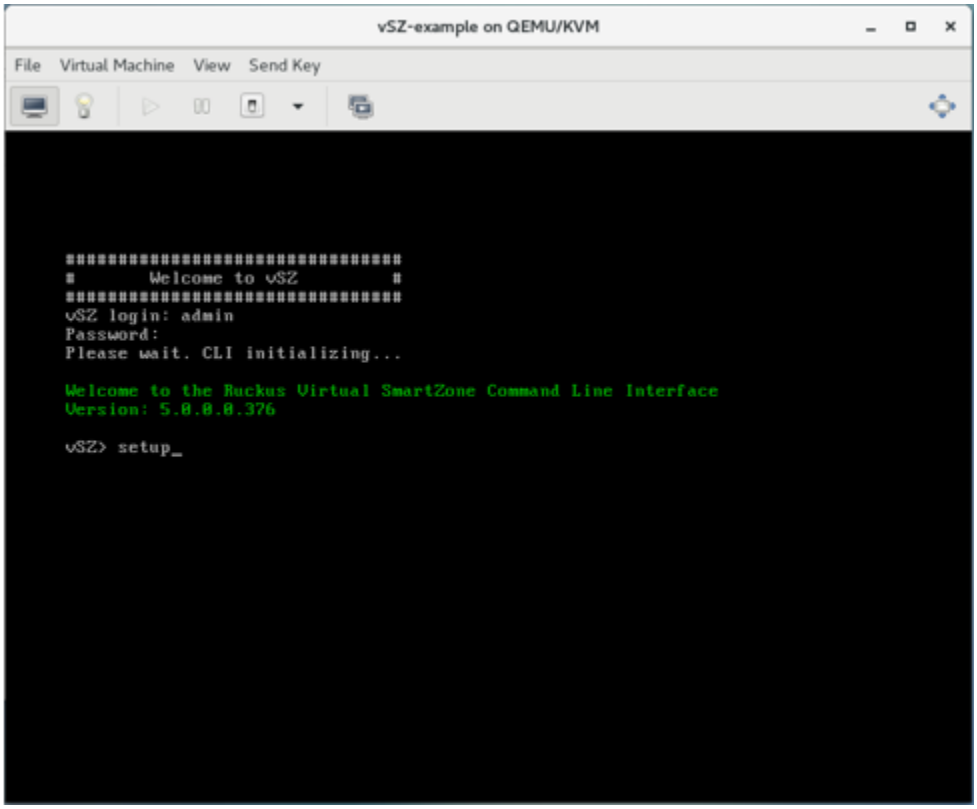
Open a CLI console window to run the deployed vSZ.

FIGURE 205 Run vSZ on the console



1. At the login prompt, login using **administrator** credentials of username and password. Run the **setup** command to initialize vSZ as shown in the figure below.

FIGURE 206 Login and Privileged mode

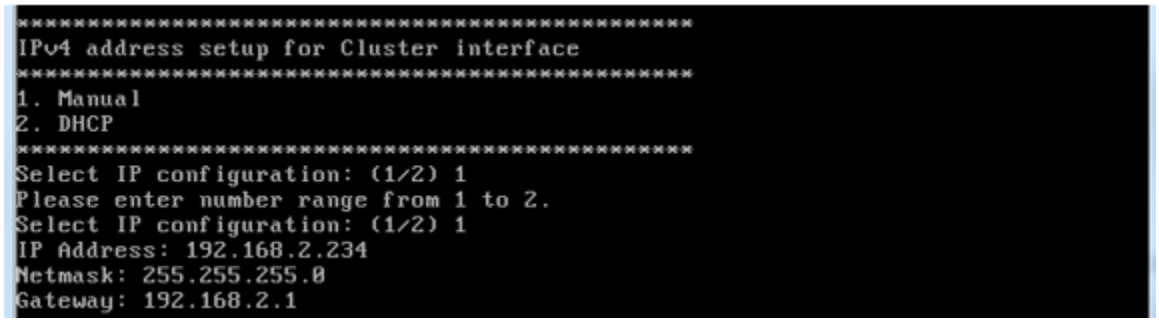


2. Enter **2** for High-Scale mode and press **Y** to continue.
3. Choose IP version **IPv4 only** or **IPv4 and IPv6**. For example, press **1** for **IPv4**.
4. Enter static IP address for control interface as shown in the figure below.

FIGURE 207 Static IP Address for Control Interface

5. Enter static IP address for cluster interface as shown in the figure below.

FIGURE 208 Static IP Address for Cluster Interface



6. Enter static IP address for management interface as shown in the figure below.

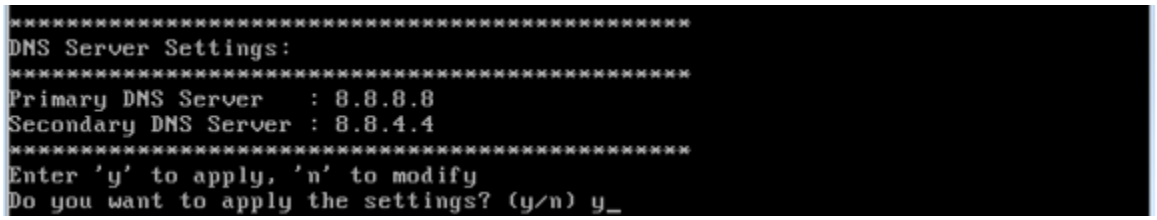
FIGURE 209 Static IP Address for Management Interface

7. Select the default gateway interface. Enter **1** for control interface, **2** for cluster interface, and **3** for management interface as shown in the figure below.

FIGURE 210 Default Gateway Interface

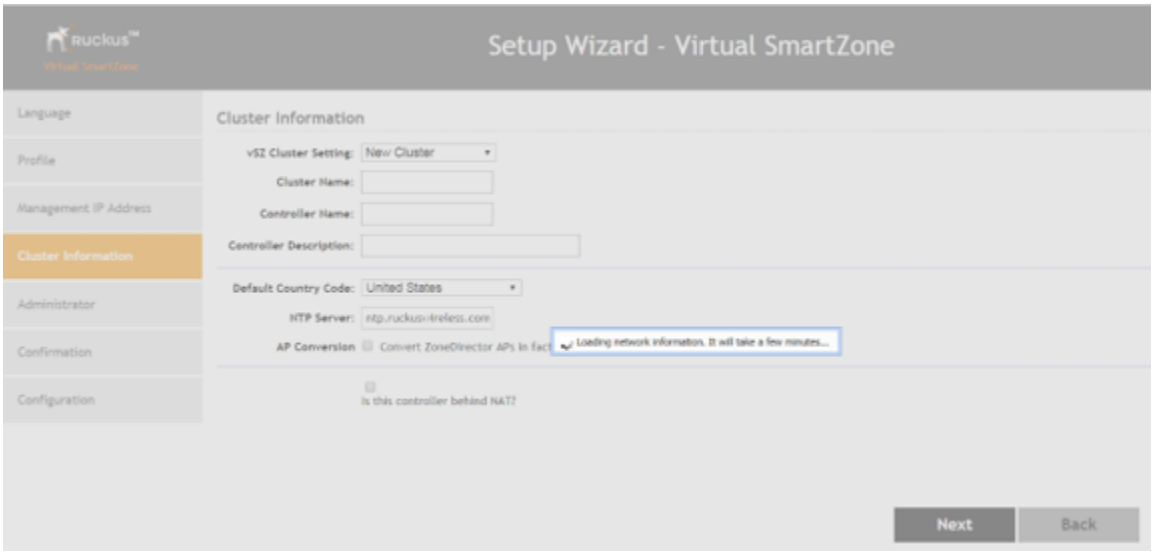
8. Enter the DNS server setting and press **Y** to apply all setting.

FIGURE 211 DNS Server Settings



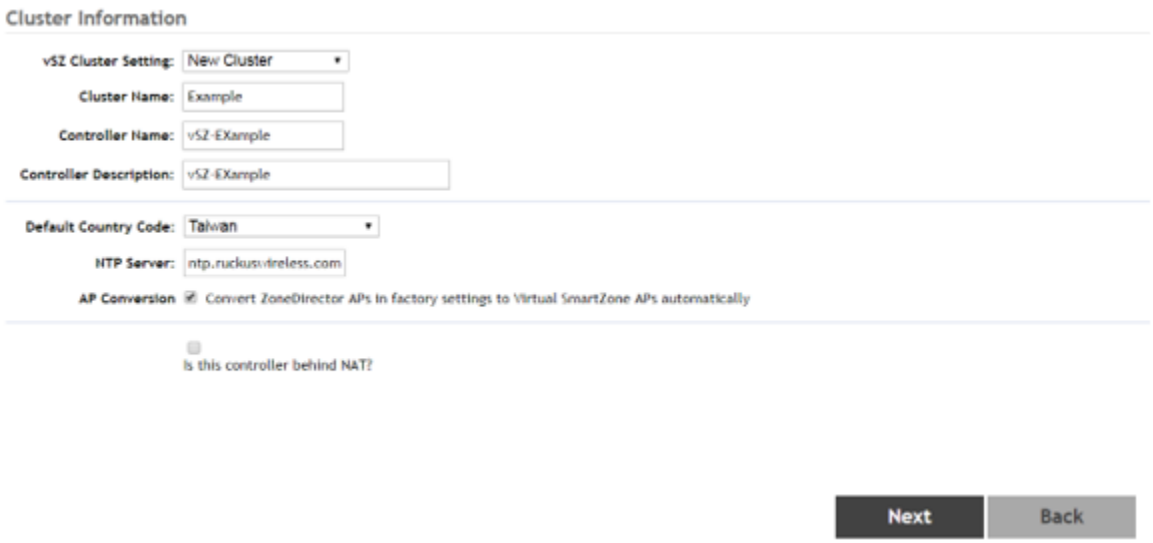
9. Access the web link http://172.17.65.234:8443 to continue other setting as shown in the figure below.

FIGURE 212 vSZ Web UI



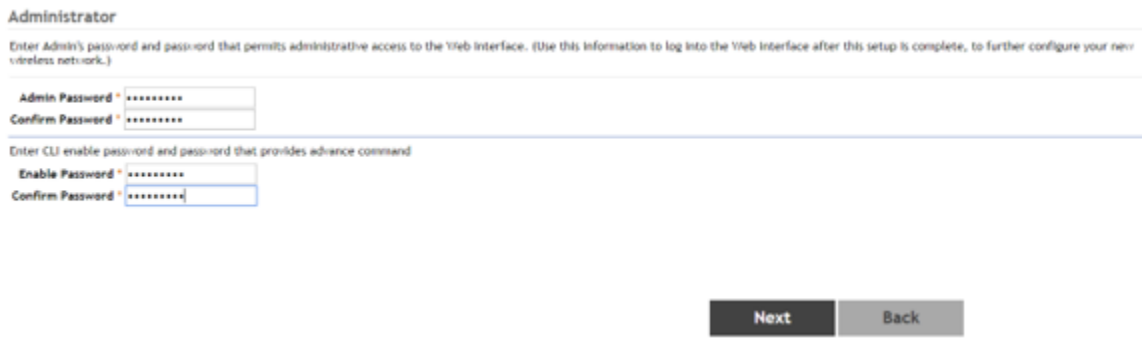
10. Enter your **Cluster Information** and click **Next** as shown in the following figure.

FIGURE 213 Cluster Information



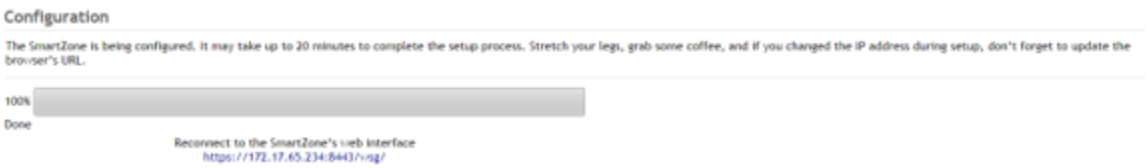
11. Enter your vSZ Administrator password requirements and click **Next** as shown in the following figure.

FIGURE 214 vSZ Administrator Password



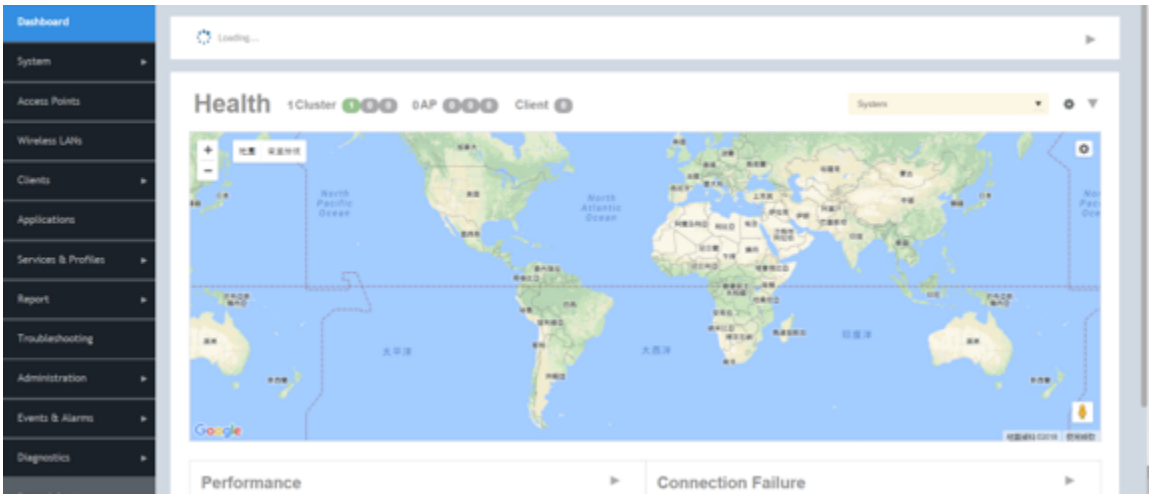
12. Click **Finish** and wait until vSZ is configured.
13. After vSZ is configured, reconnect to vSZ web as shown in the following figure.

FIGURE 215 vSZ Configuration



14. Enter **Username** and **Password** to access vSZ as shown in the following figure.

FIGURE 216 vSZ Homepage



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

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

Ruckus Networks 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 Networkssupport website or released through authorized channels.

CAUTION
Although the software upgrade process has been designed to preserve all controller settings, Ruckus Networks 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 Networks strongly recommends that you ensure that all interface cables are intact during the upgrade procedure.

CAUTION
Ruckus Networks 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.

Upgrading the Controller Software

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 Networks 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 Networks Support or an authorized reseller.

vSZ supports APs starting version 3.4. You must first upgrade the vSZ. Only a new vSZ can handle an old vDP. During the vSZ upgrade, all tunnels will stay up except the main tunnel which moves to the vSZ.

Upgrade to 5.0 does not support data migration (statistics, events, administrator logs). Existing system and network configuration is preserved. For further clarification, Contact Ruckus support.

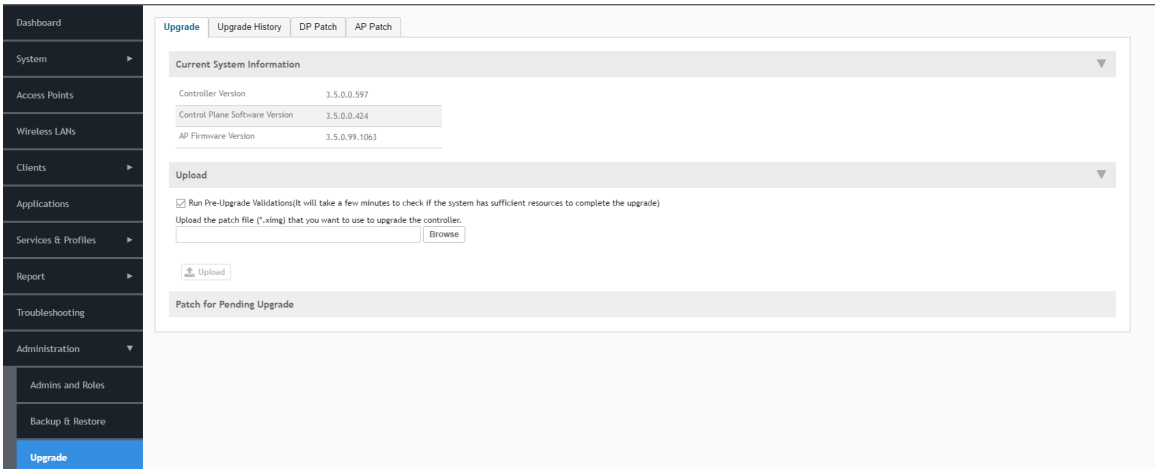
To Upgrade:

1. Copy the software upgrade file that you received from Ruckus Networks 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 **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`.

   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 217 Click Browse in the Upload section to upload the software upgrade file



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.

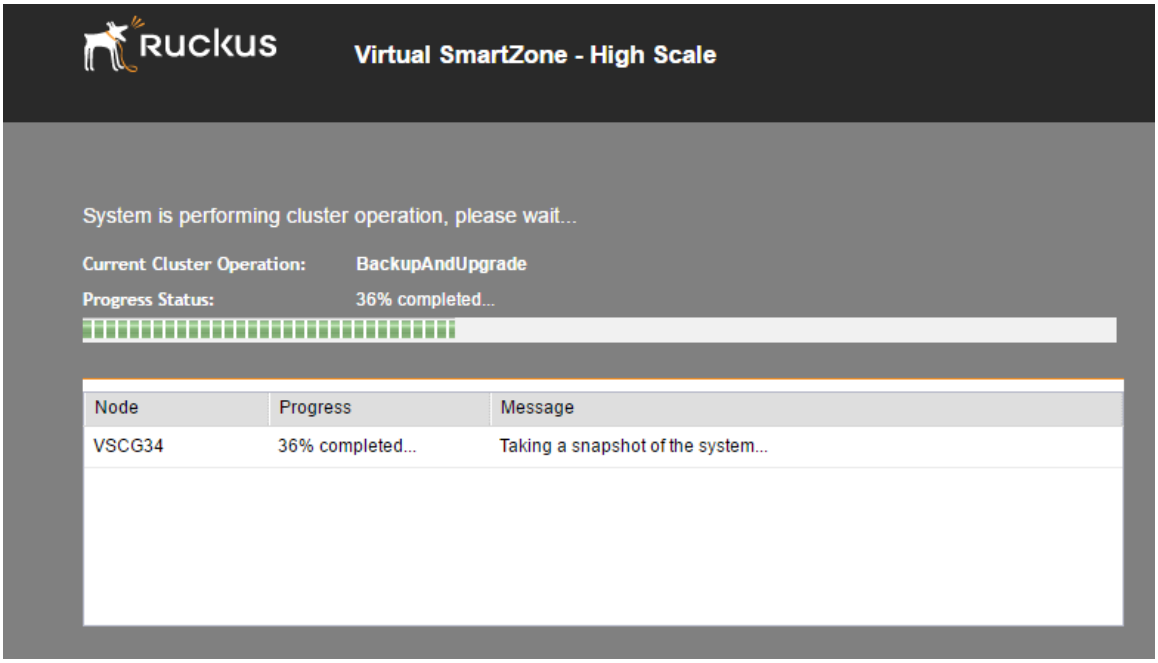
6. Start the upgrade process by clicking one of the following buttons:
   - **Upgrade**: Click this button to start the upgrade process without backing up the current controller cluster or its system configuration.
   - **Backup & Upgrade**: Click this button to back up the controller cluster and system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

     CAUTION
     Ruckus Networks strongly recommends using Backup & Upgrade when 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**.

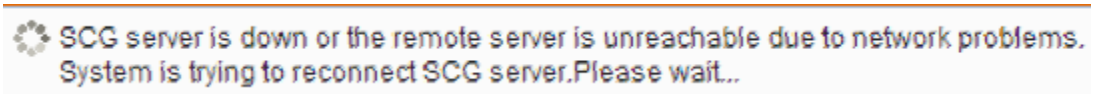
   The controller starts the process that you selected. The screens that appear next will depend on the process that you selected to upgrade immediately or to back up and then upgrade the controller.

FIGURE 218 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 219 The controller web interface may display the following message as it completes the upgrade process



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

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

Verifying the Upgrade

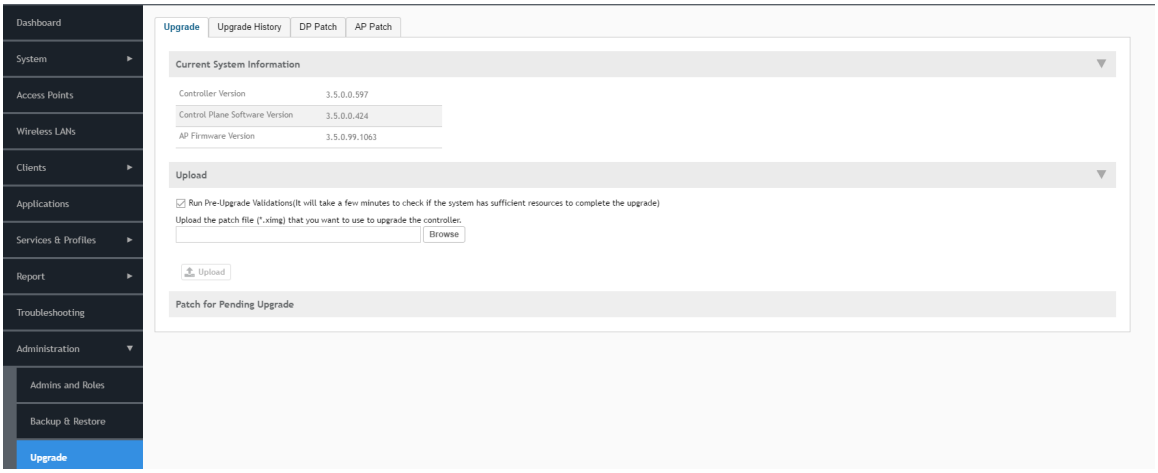
Follow these steps to verify that the controller upgrade was completed successfully.

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 220 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 Networks 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 221 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.

   To view the current system time, go to **System** > **General Settings** > **Time**.
2. Go to **Administration** > **Backup & Restore**.
3. Click **Backup Entire Cluster**.

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

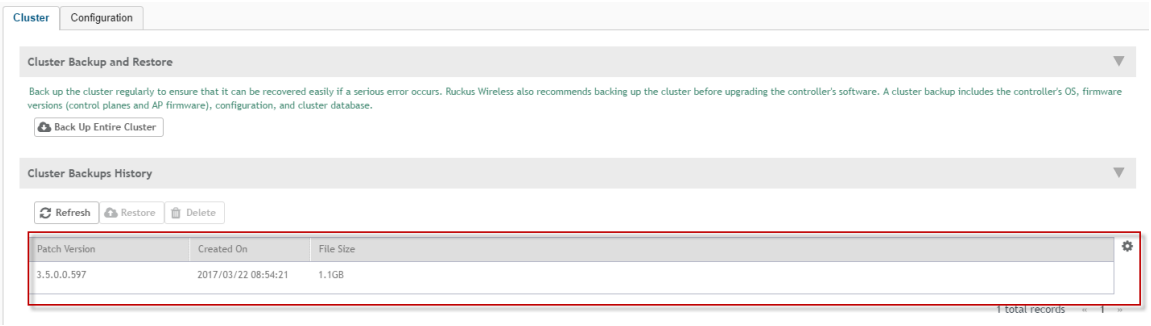
   The following message appears: `The cluster is in maintenance mode. Please wait a few minutes.`

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 221 A new entry appears in the Cluster Backups section



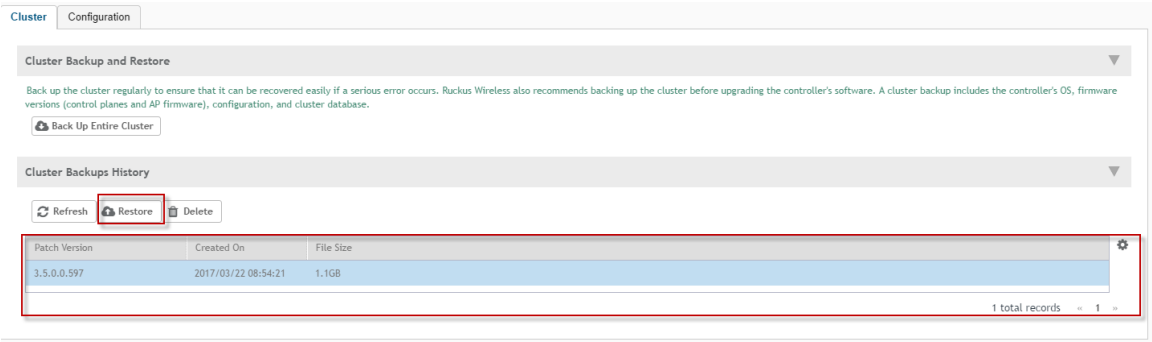
Restoring a Cluster Backup

When restoring a cluster backup, remember that you must perform the restore procedure on the exact same node which you generated the cluster backup.

Follow these steps to restore a cluster backup

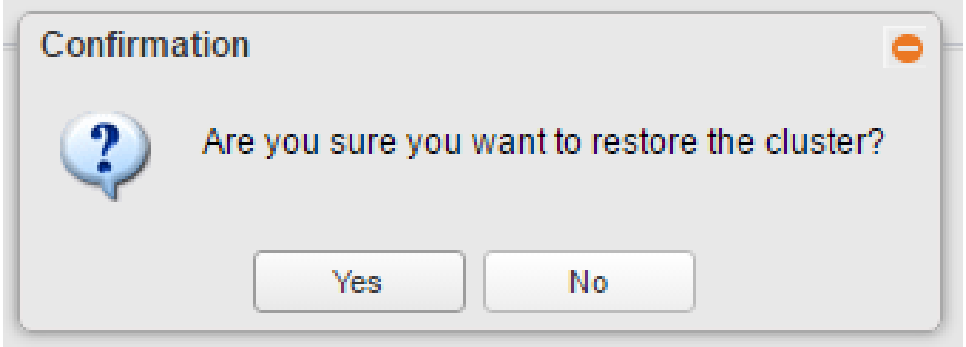
1. Go to **Administration** > **Backup & Restore**.
2. In the **Cluster Backups History** section, locate the cluster backup that you want to restore.
3. Select the backup file that you want to restore, and then click **Restore**.

FIGURE 222 Select the backup file, and then click Restore



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

FIGURE 223 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.

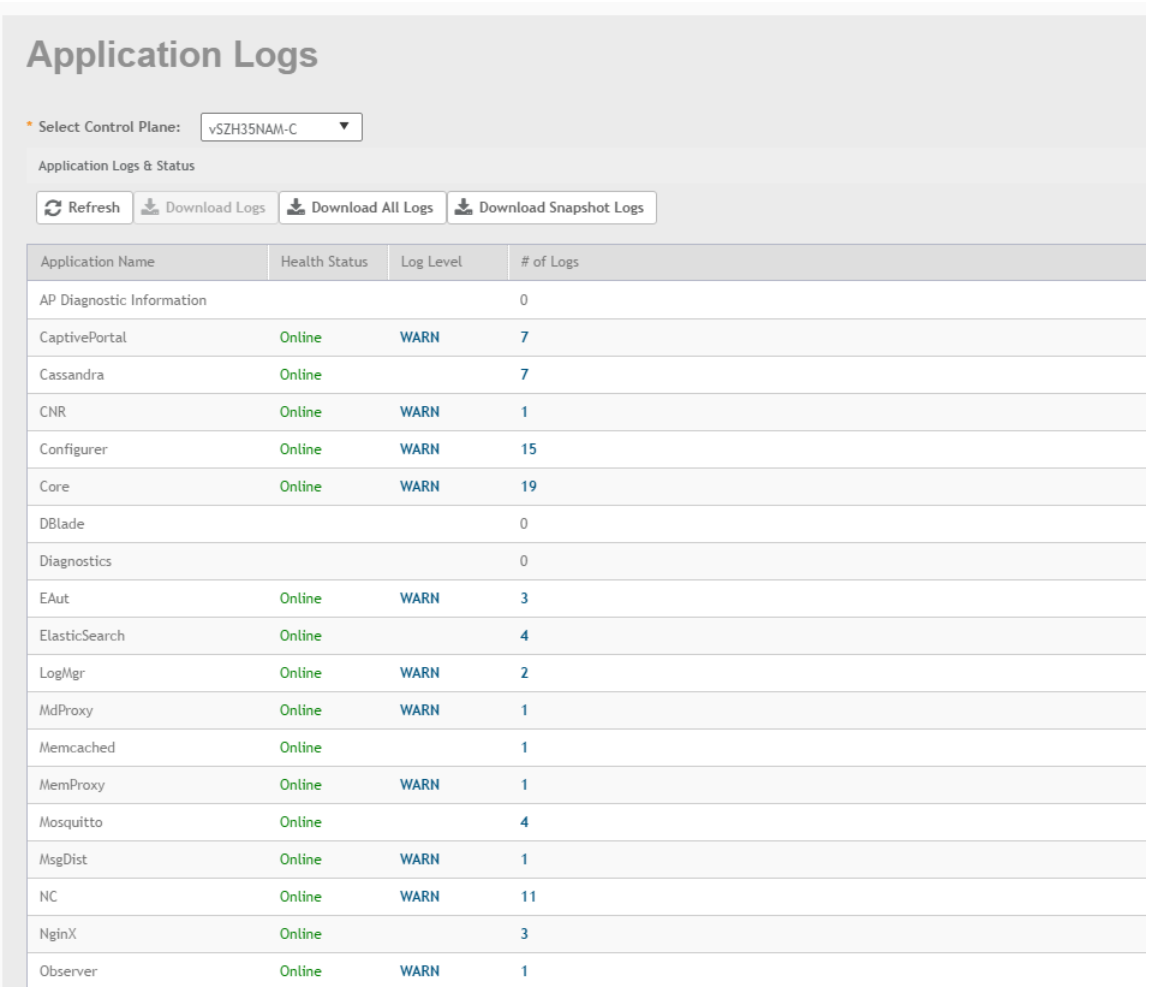
5. Log back on to the controller web interface.

> **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 **Diagnostics** > **Application Logs** .
8. Check the **Health Status** column and verify that all of the controller processes are online.

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

FIGURE 224 On the Application Logs page, verify that all controller processes are online



Restoring a Cluster Backup Using the CLI

Follow these steps to restore a cluster backup using the CLI.

1. Enter the vSZ CLI.
2. Enter the following command and enter the password to log into the CLI.

```
VSCG35> en
Password:
```

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

```
VSCG35> 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.

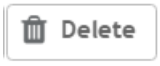
FIGURE 225 Cluster Backup Restore Using CLI

```
Welcome to the Ruckus Virtual SmartZone - High Scale Command Line Interface
Version: 3.4.0.0.855

VSCG34> en
Password: ********

VSCG34# restore
config     local      network

VSCG34# restore
   No.   Created on                  Patch Version               File Size
   ----- --------------------------- --------------------------- ----------------------------
   1     2016-04-25 12:37:27 GMT     3.4.0.0.677                 1.7GB
   2     2016-06-01 04:14:55 GMT     3.4.0.0.704                 999MB
   3     2016-06-06 04:09:34 GMT     3.4.0.0.838                 1GB

Please choose a backup to restore or 'No' to cancel: 2
Please make sure the restore backup version available in all nodes in the cluster, otherwise restore process will fail
This action will reboot the system. Do you want to restore whole cluster system (or input 'no' to cancel)? [yes/no] yes
```

Deleting a Cluster Backup

Follow these steps to delete a cluster backup.

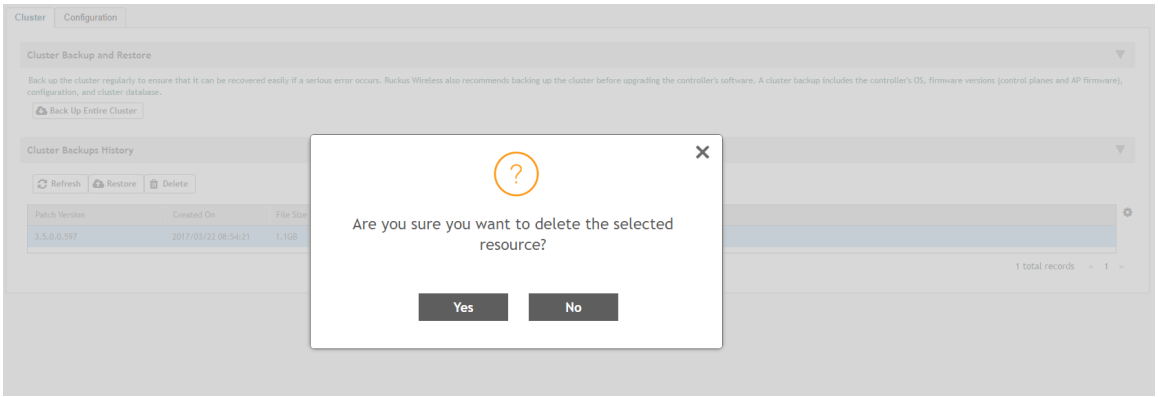
1. Go to **Administration** > **Backup & Restore**.
2. In the **Cluster Backups History** section of the **Cluster** tab, locate the cluster backup that you want to delete, and then click it.

   The cluster backup becomes highlighted, which indicates that you have selected it.
3. Click 

.

   A confirmation message appears.

   FIGURE 226 After you click the Delete button, a confirmation message appears



4. Click **Yes**.

   The page refreshes, and then the cluster backup that you deleted disappears from the **Cluster Backups History** section.

You have completed deleting a cluster backup.

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