Ruckus Wireless™ Virtual SmartZone™

Getting Started Guide for SmartZone 3.2

Part Number 800-71029-001 Rev B
Published January 2016

www.ruckuswireless.com

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Contents

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 Wireless Support website at

https://support.ruckuswireless.com/documents.

Document Conventions

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

Table 1. Text conventions

Convention	Description	Example
`monospace`	Represents information as it appears on screen	`[Device name]>`
`monospace bold`	Represents information that you enter	`[Device name]>` **`set ipaddr 10.0.0.12`**
default font bold	Keyboard keys, software buttons, and field names	On the **Start** menu, click **All Programs**.
italics	Screen or page names	Click **Advanced Settings**. The *Advanced Settings* page appears.

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

Related Documentation

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

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- Document title

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

For example:

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

Preparing to Install the vSZ

1

In this chapter:

Preparing a Hypervisor

Table 3 lists the hypervisors (and their release versions) on which you can install the vSZ.

Table 3. Hypervisors that the vSZ supports

Vendor	Hypervisor	Version
VMWare	ESXi	5.x
Windows	Windows Server Hyper-V	Windows Server Hyper-V
KVM	CentOS	7.0

The vSZ installation procedures for each of these hypervisors vary. For more information, see Installing the vSZ on a Hypervisor.

Obtaining the vSZ Distribution

From the vSZ download page on the Ruckus Wireless support website, download the .OVA file and documentation for the controller. The vSZ distribution package, which is based on the Open Virtualization Format (OVF) framework, consists of a virtual appliance containing the following files:

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

These three files are consolidated into a TAR archive file and distributed as an Open Virtual Appliance (OVA) package. This OVA package can be imported directly into your chosen hypervisor.

Preparing the vSZ Interface Settings to Use

The vSZ comes with the option to operate with either one (1) network interface or three (3) network interfaces (see Table 4). 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.

Before installing the vSZ, prepare the following required network settings:

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

Table 4. vSZ interfaces

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

Determining the System Resources That the Virtual Machine Requires

The number of APs and clients that vSZ can support depends on the system resources (CPU and memory) that the virtual machine running vSZ has. vSZ is capable of automatically scaling to and supporting a higher number of APs and clients if it determines, at system bootup, that there is sufficient CPU and memory on the virtual machine to support more APs and clients.

Table 5 (vSZ High-Scale profile configuration) and Table 6 (vSZ Essentials profile configuration) list the maximum recommended number of APs and clients that the vSZ can support based on the available vCPU and memory available on the virtual machine[1]. The first row in Table 5, for example, shows that to support up to 25 APs, the vSZ must have at least 2-core CPU and 8GB of RAM. Whenever the CPU or memory settings are changed, the virtual controller instance must be rebooted for the updated settings to be applied to it.

CAUTION! When either your AP count or wireless client count reaches the recommended maximum number in the tables below, you must also allocate additional system resources to the virtual machine. For example, if you initially allocated Level 1 resources to the VM to handle 25 APs and your AP count increases to 26, you must update the VM resources to Level 2 to prevent performance-related issues.

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

Table 5. High Scale profile configuration: Recommended system resources

AP Count	Client Count	Resource Level	Max Nodes per Cluster	Disk Size (GB)	vCPU (Core)	RAM (GB)	Physical Free RAM in MB (Threshold)	Max Preserved Events
25	500	1	2	100	2	8	8001 (7900)	15k
50	1000	2	2	100	2	8	8001 (7900)	30k
100	2000	3	2	100	2	8	8001 (7900)	60k
500	10000	4	2	100	4	9	9011(8900)	300k

1. These scalability figures have been observed on the vSZ for vSZ 3.2

Table 5. High Scale profile configuration: Recommended system resources

AP Count	Client Count	Resource Level	Max Nodes per Cluster	Disk Size (GB)	vCPU (Core)	RAM (GB)	Physical Free RAM in MB (Threshold)	Max Preserved Events
1000	20000	5	2	100	4	11	11031 (11000)	600k
2500	50000	6	2	300	6	15	15071(15000)	1500k
10000	100000	7	4	600	24	48	48401 (48000)	3000k

Table 6. Essentials profile configuration: Recommended system resources

AP Count	Client Count	Resource Level	Max Nodes per Cluster	Disk Size (GB)	vCPU (Core)	RAM (GB)	Physical Free RAM in MB (Threshold)	Max Preserved Events
100	2000	1	2	100	2	12	12041 (12000)	1k
1024	25000	2	4	250	8	20	20121 (20000)	10k

Clustering Limitations

If you are deploying the vSZ in clusters, take note of the following limitations:

- vSZ-H supports clustering of up to 4 nodes when using Resource Level 4. At 4 nodes, the maximum number of APs and clients that can be supported are 30,000 and 300,000 respectively.
- vSZ-E 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.

Installing the vSZ on a Hypervisor 2

In this chapter:

Installing the vSZ on VMWare™ vSphere Hypervisor

Follow these steps to install the vSZ on a VMWare vSphere hypervisor:

Before You Begin

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

- Verify that vSphere client is installed.
- You can deploy the vSZ only on hosts that are running ESXi version 5.1 or 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 thin-provisioned virtual disks that can grow to the maximum size of 600GB.

Creating a vSZ Instance from the OVA File

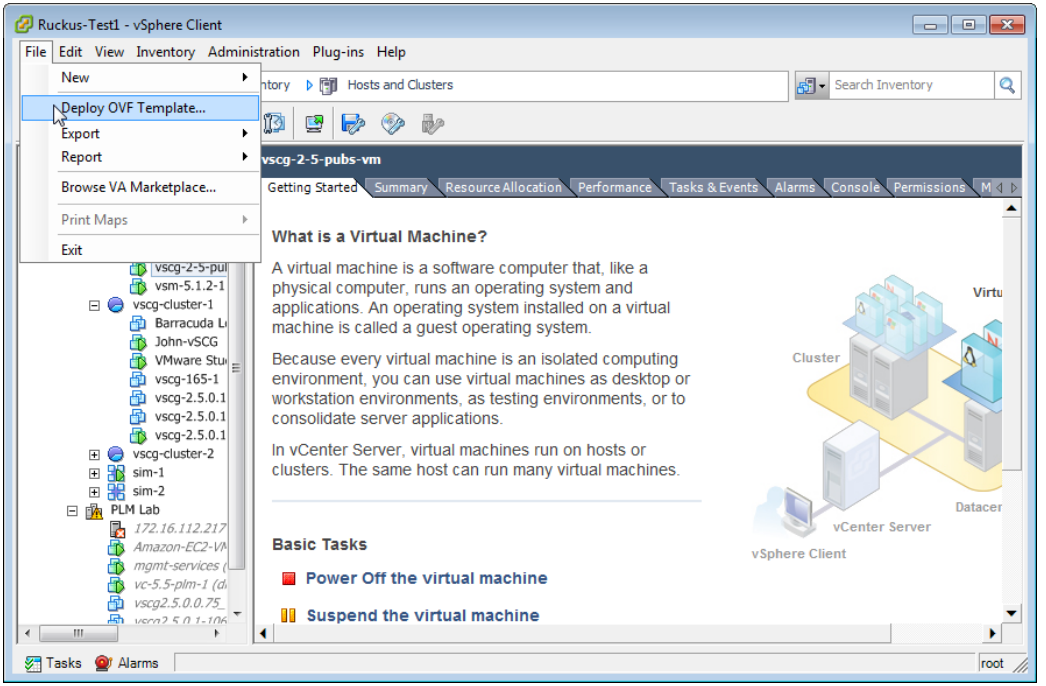
Before continuing, make sure you have already downloaded the vSZ distribution package from the Ruckus Wireless. See Obtaining the vSZ Distribution for more information.

NOTE: The following procedure describes how to create a vSZ instance using the vSphere Web Client.

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

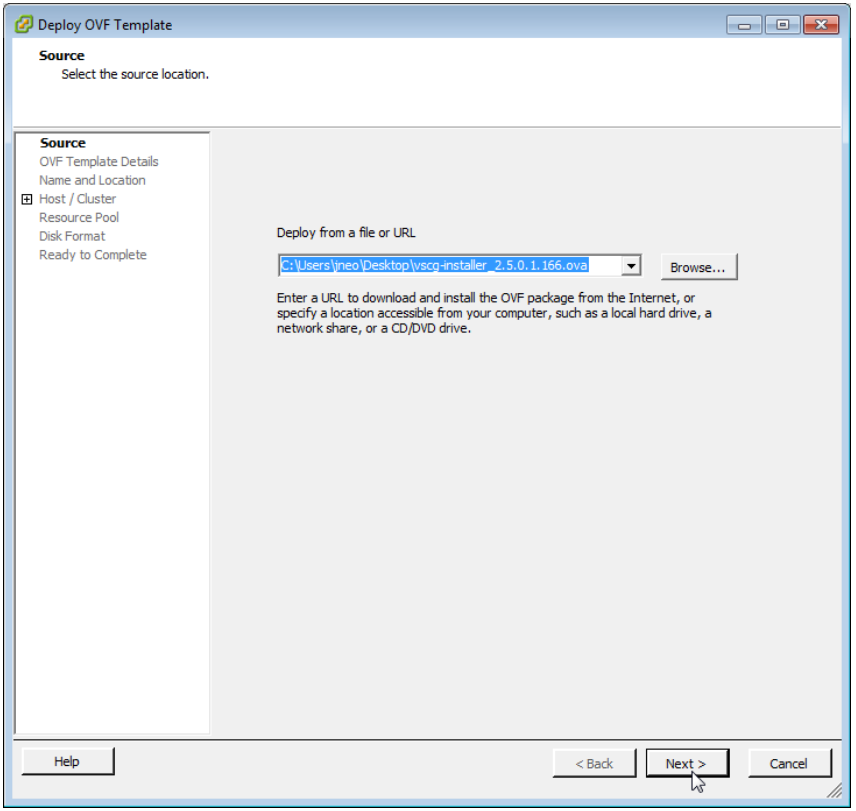
1. Use the VMWare vSphere client to log on to the ESXi management interface.
2. Click **File** > **Deploy OVF Template**. The *Source* screen of the *Deploy OVF Template* wizard appears.

Figure 1. Click Deploy OVF Template



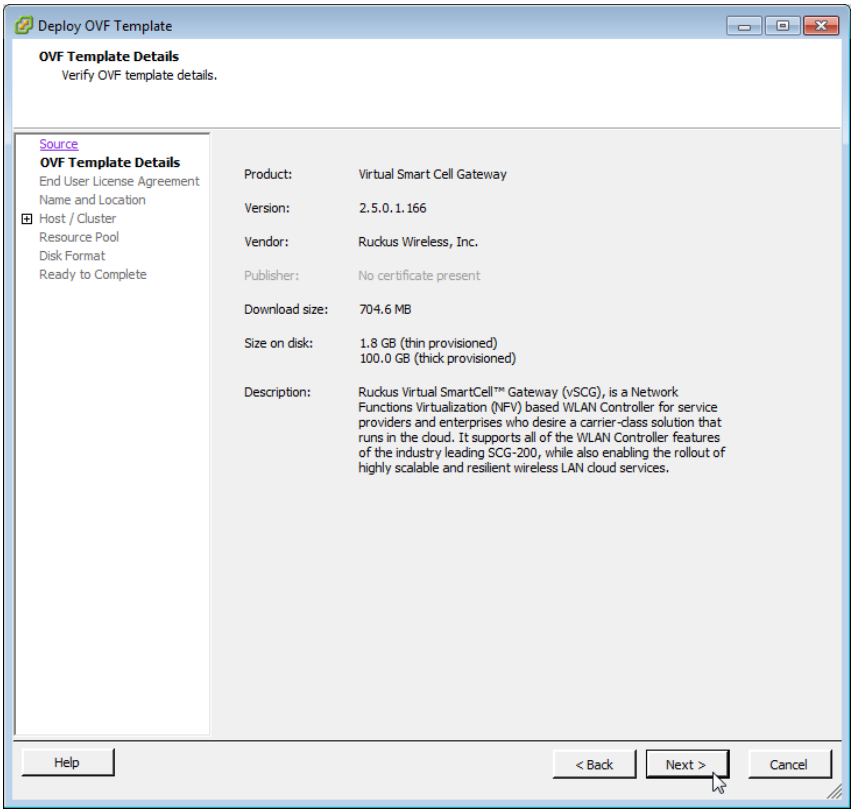
3 Click **Browse** to locate the `.ova` file that you downloaded earlier. Select the template.

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



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

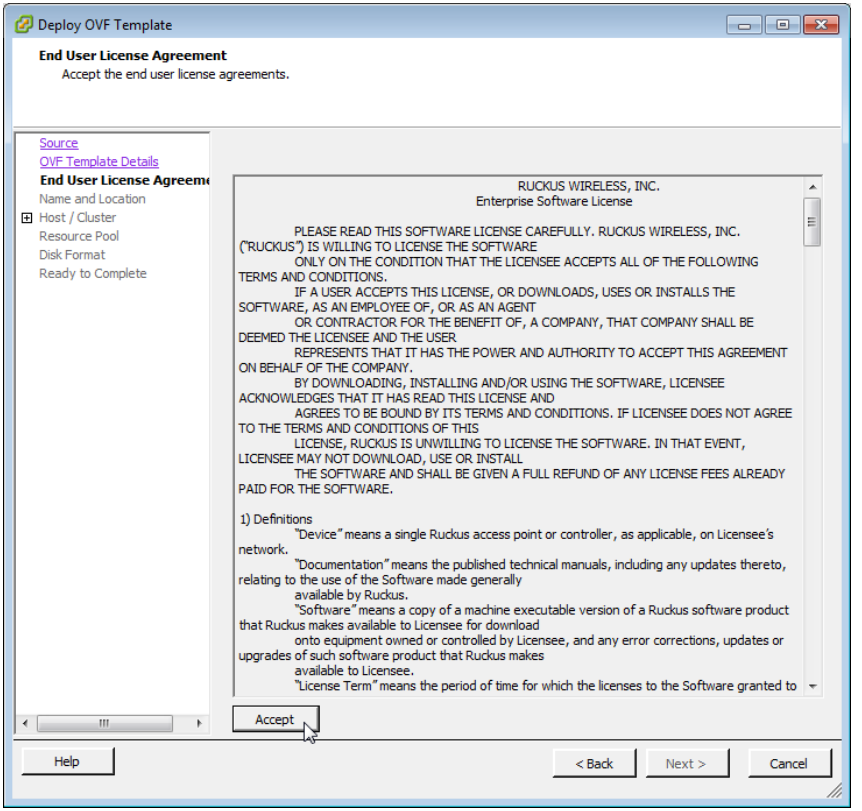
Figure 3. The OVF Template Details screen



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

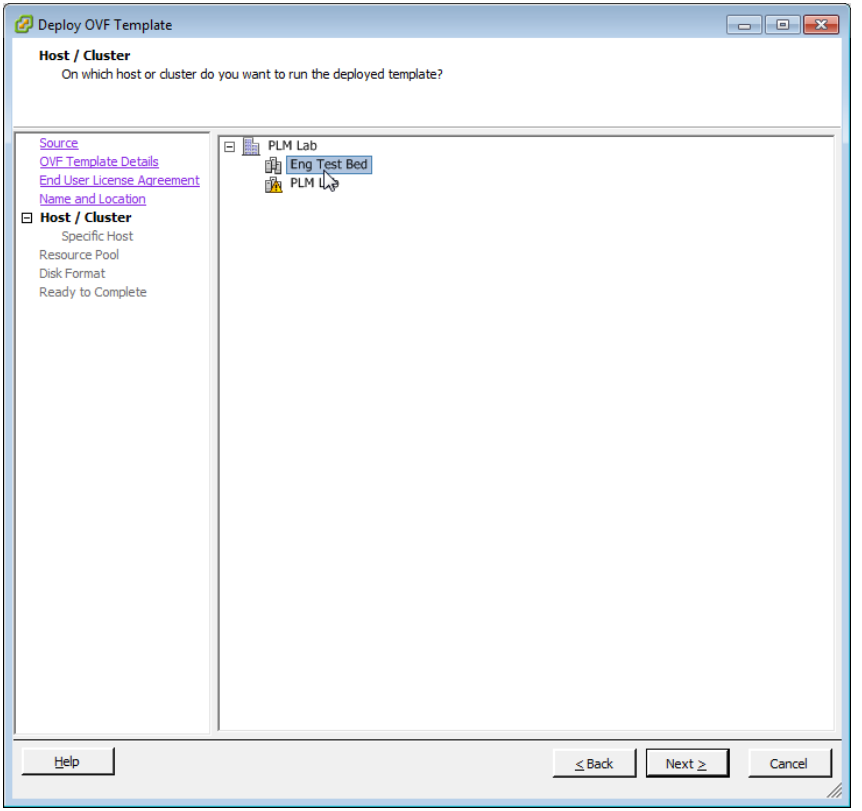
6 Click **Accept** to agree to the EULA terms, and then click **Next**. The *Host/Cluster* screen appears.

Figure 4. Accept the EULA for the vSZ OVA



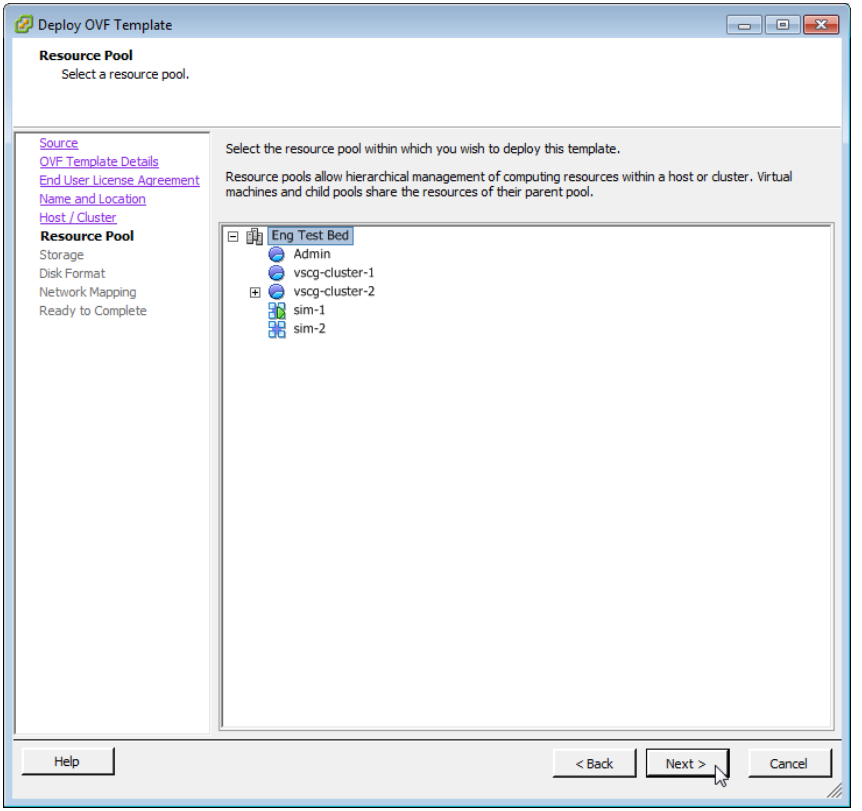
7 Select the host or cluster on which you want to run the deployed template, and then click **Next**. The *Resource Pool* screen appears.

Figure 5. Select the destination host or cluster



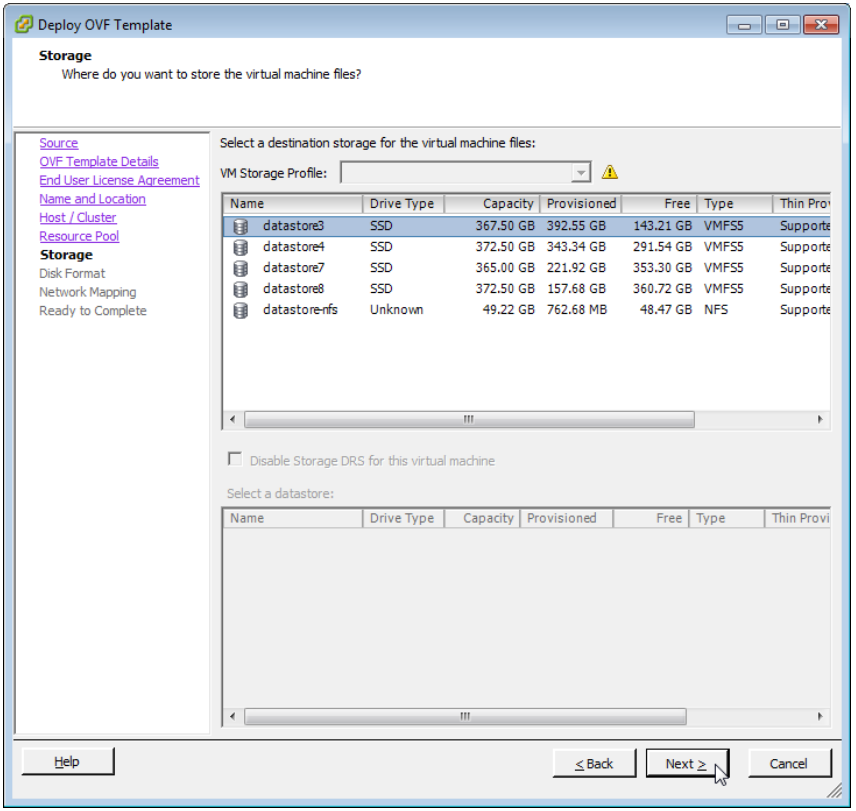
8 Select the resource pool within which you want to deploy the template, and then click **Next**. The storage screen appears.

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.

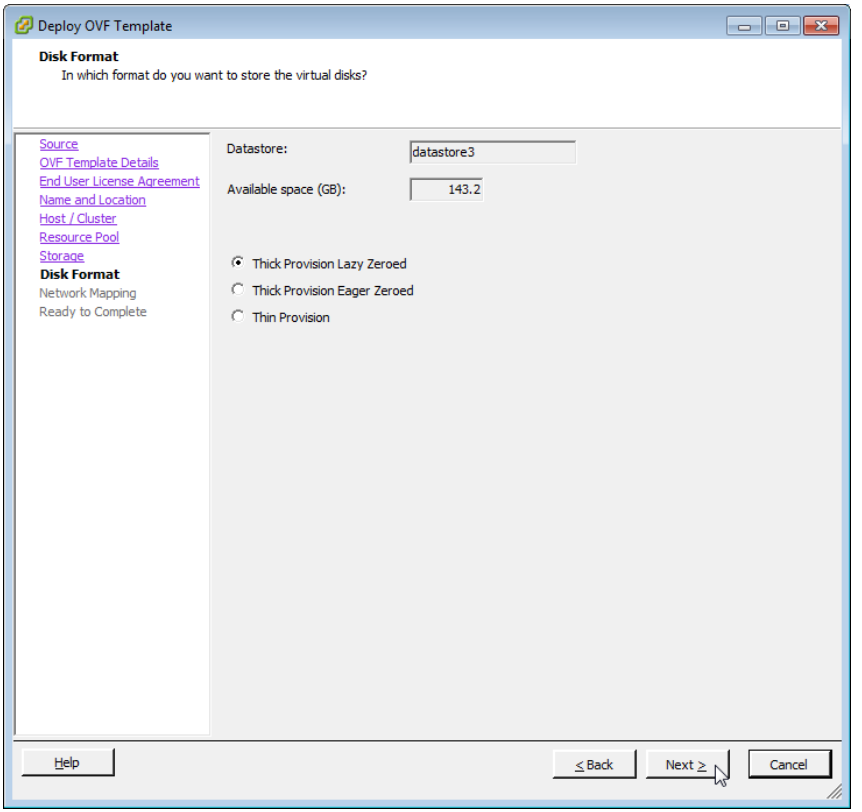
Figure 7. Select the data store for the virtual machine files



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

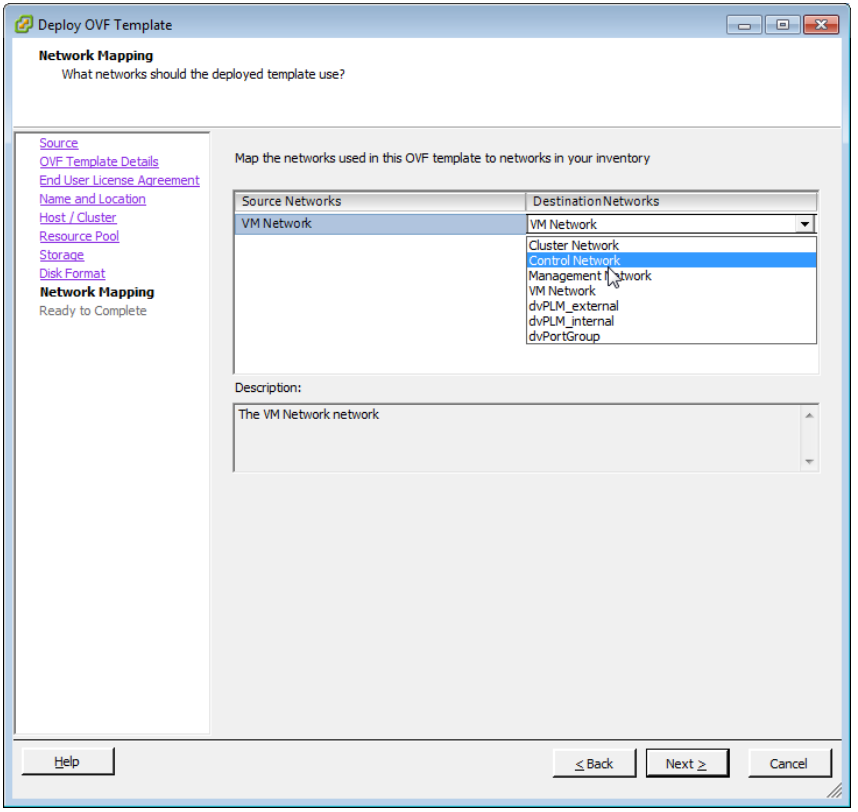


11 Click **Next**. The *Network Mapping* screen appears.

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. For more information see, Allocating Resources and Assigning Network Interfaces.

NOTE: 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.

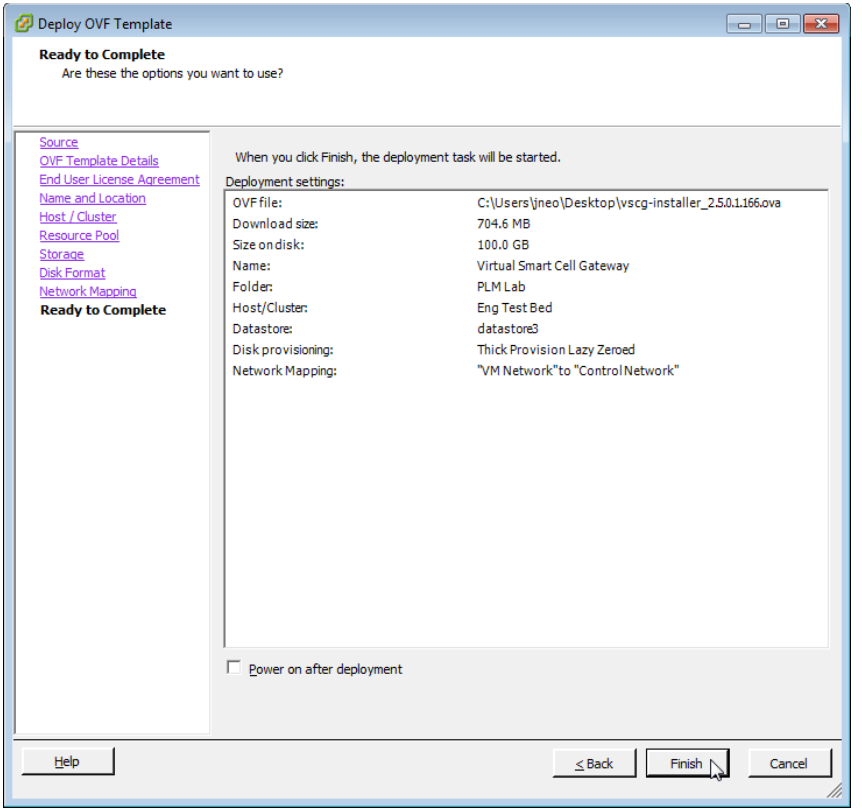
Figure 9. Select the virtual network interface that the template will use



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



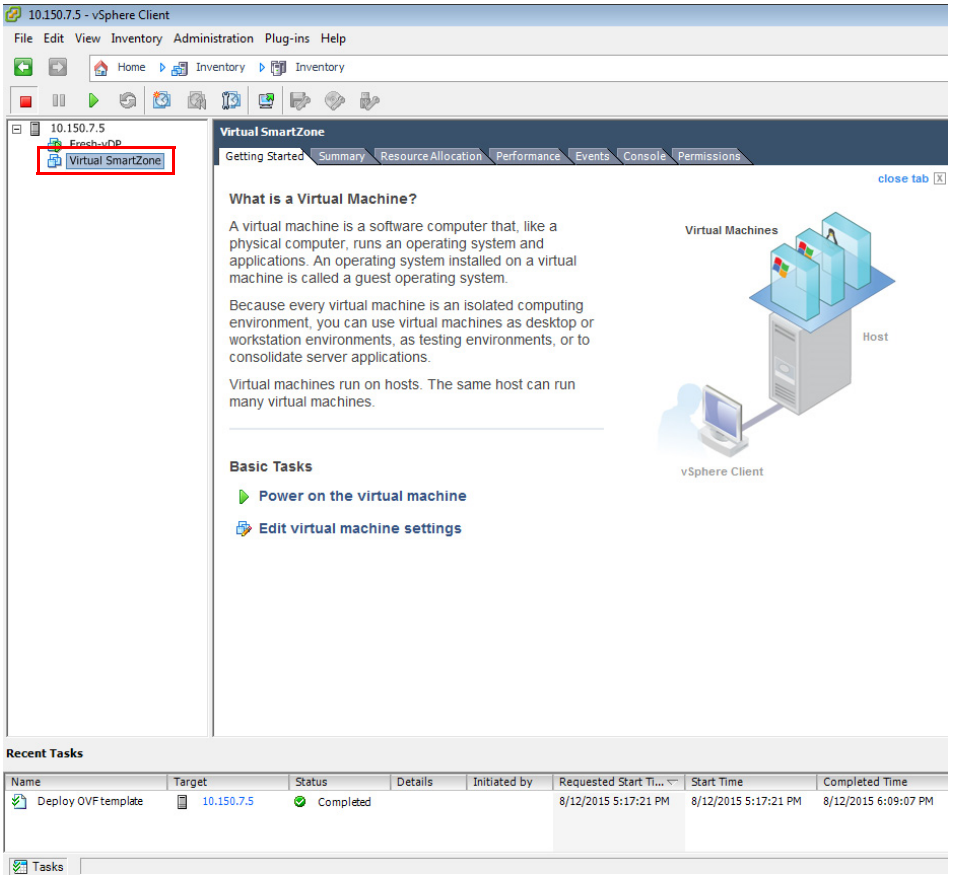
14 Make sure that the **Power on after deployment** check box is clear so you can adjust the network settings before the vSZ setup.

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).

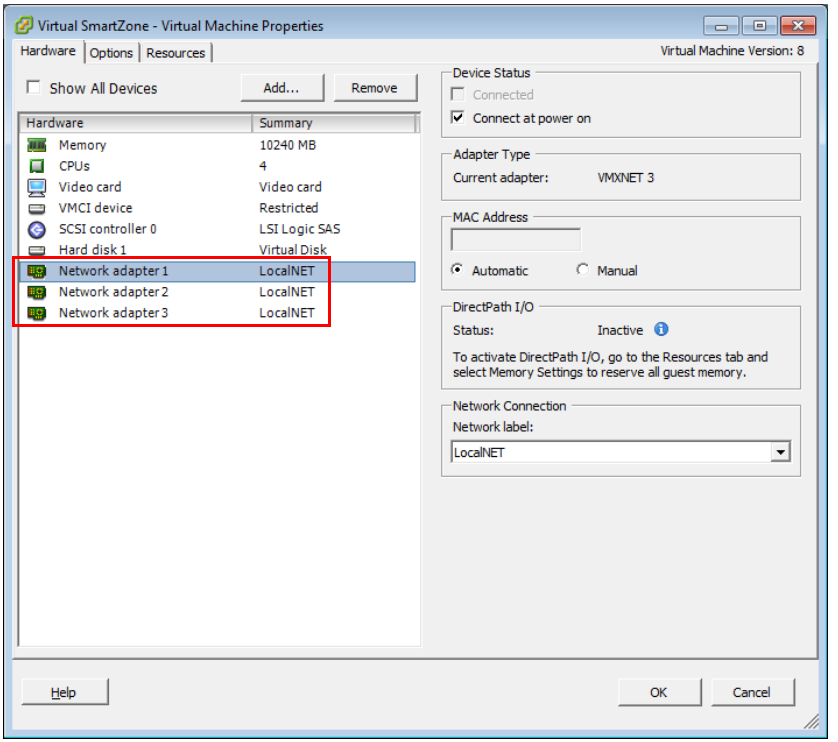
NOTE: Before continuing, review Determining the System Resources That the Virtual Machine Requires and determine the minimum resources that you need to allocate to the vSZ instance. If the setup program detects that the vSZ instance does not have sufficient resources, it will halt the setup process.

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.

NOTE: While assigning interfaces, ensure that each interface is in a different subnet.

Figure 12. Select the interfaces to use



7 Click **OK**.

You have completed allocating resources and assigning network interfaces to the vSZ.

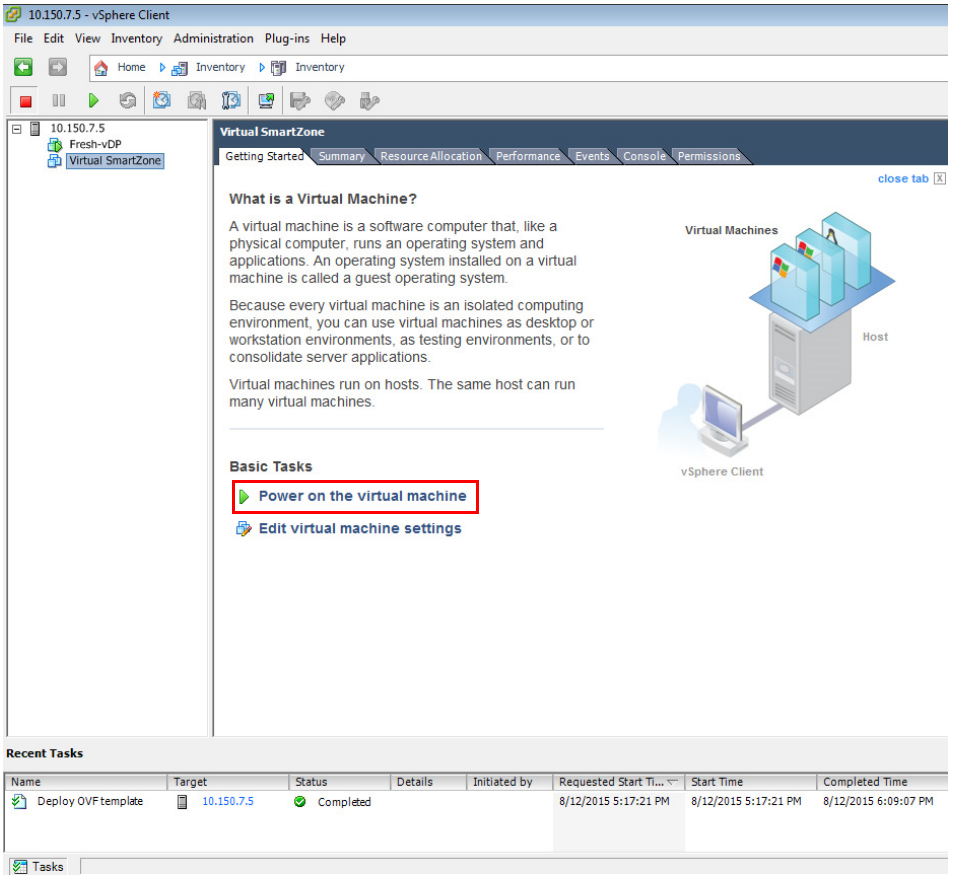
Powering on the vSZ Virtual Machine

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 **Console** tab.

After the vSZ completes its startup process, you are ready to configure its interfaces using a console connection to perform this task.

For information on how to configure the vSZ interface, see Configuring the Virtual Machine Interfaces.

Installing the vSZ on Windows Server Hyper-V

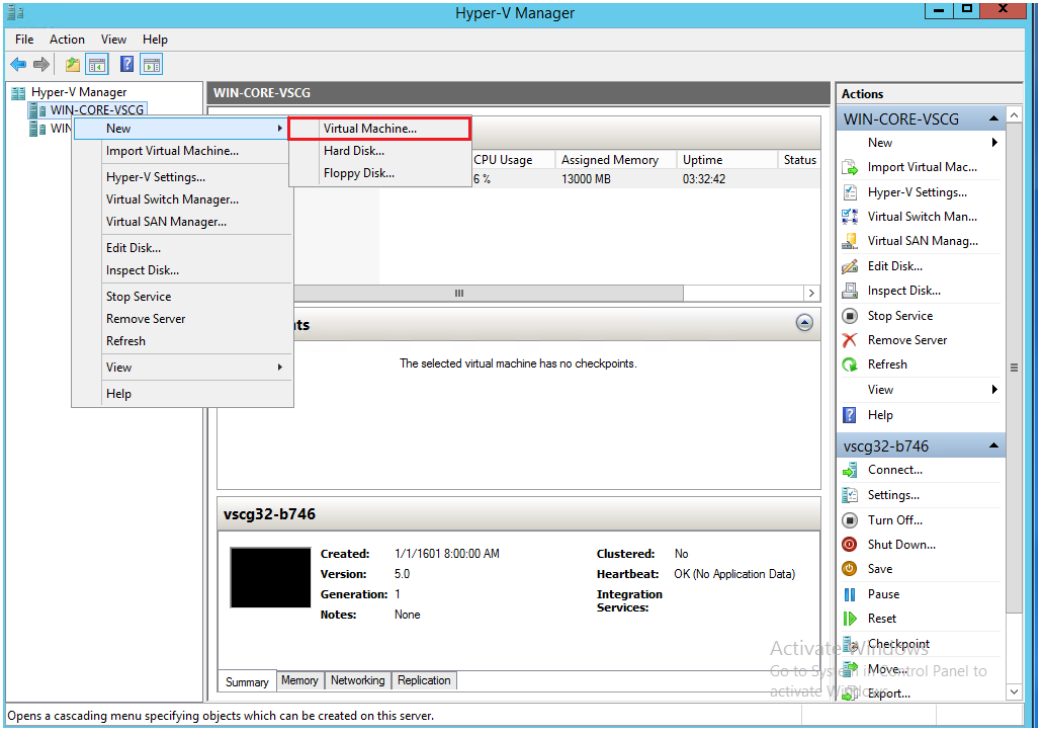
Before you begin, verify that Hyper-V is enabled on Windows Server.

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 **Action** > **New** > **Virtual Machine**.

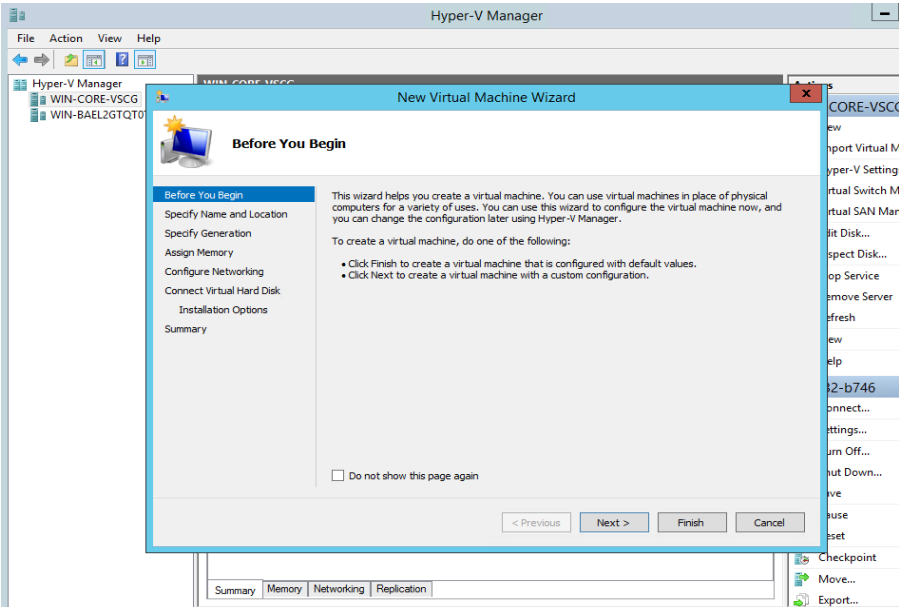
   The *New Virtual Machine Wizard* appears and displays the *Before You Begin* screen.

Figure 14. Click Action > New > Virtual Machine



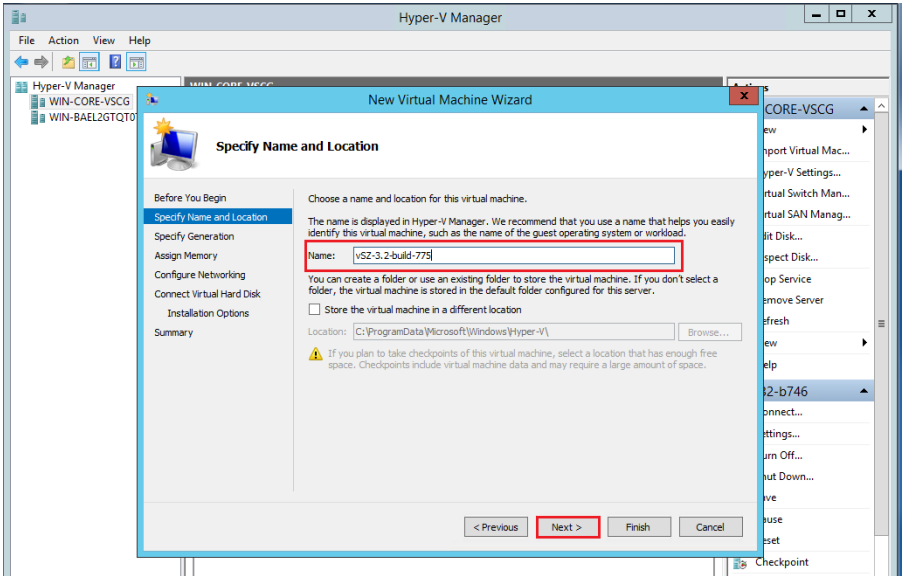
6. Click **Next**. The *Specify Name and Location* screen appears.

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

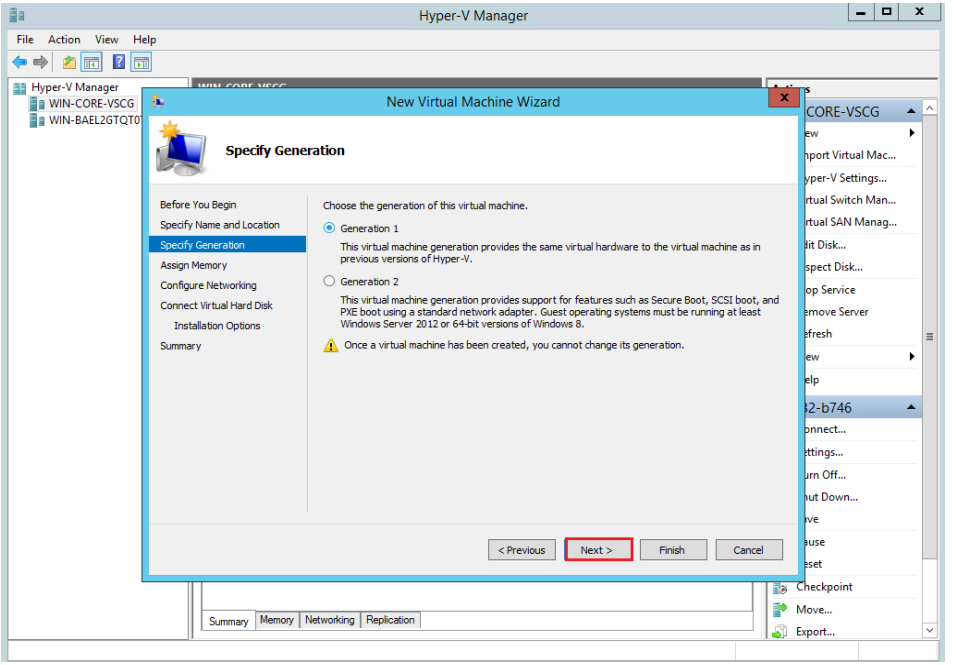


8 Specify the folder on the server where you want to install the virtual machine.

- 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.
- To install the virtual machine in a location other than the default, select the **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.

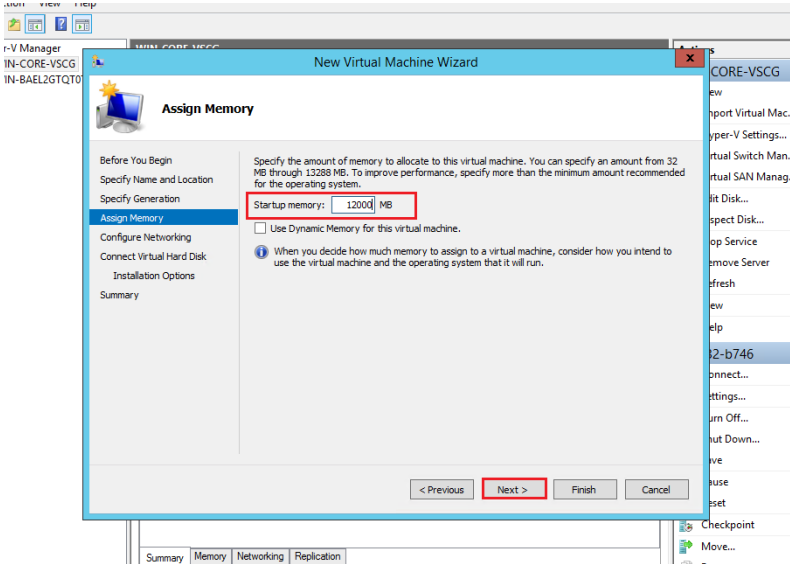
Figure 17. Specify Generation



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.

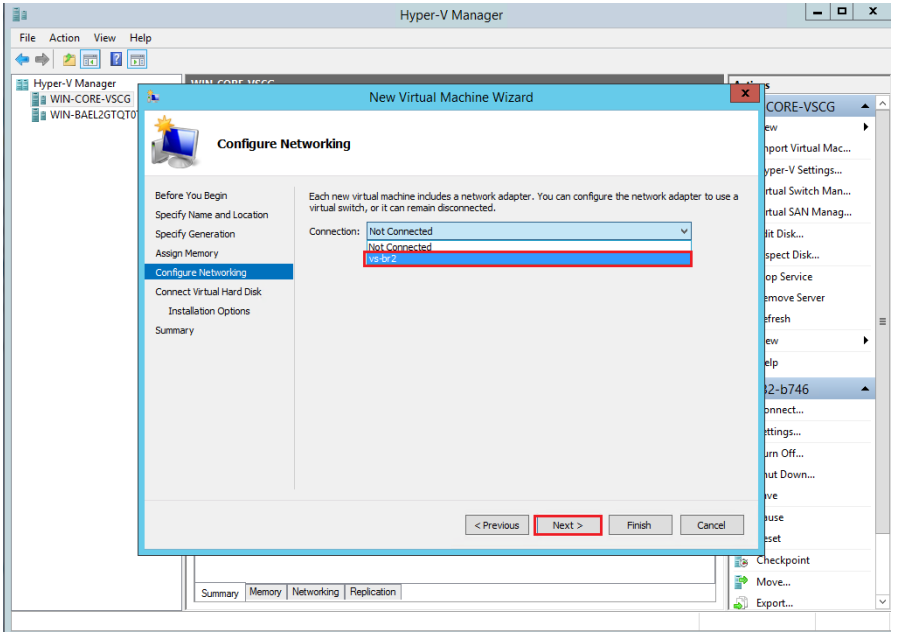
Figure 18. Assign Memory



12 In *Startup memory*, type `12000` MB which is the minimum recommended memory that Ruckus Wireless recommends for deploying vSZ. You can type a higher value if more memory is available on the server. For more information, see Table 5.

13 Click **Next**. The *Configure Networking* screen appears.

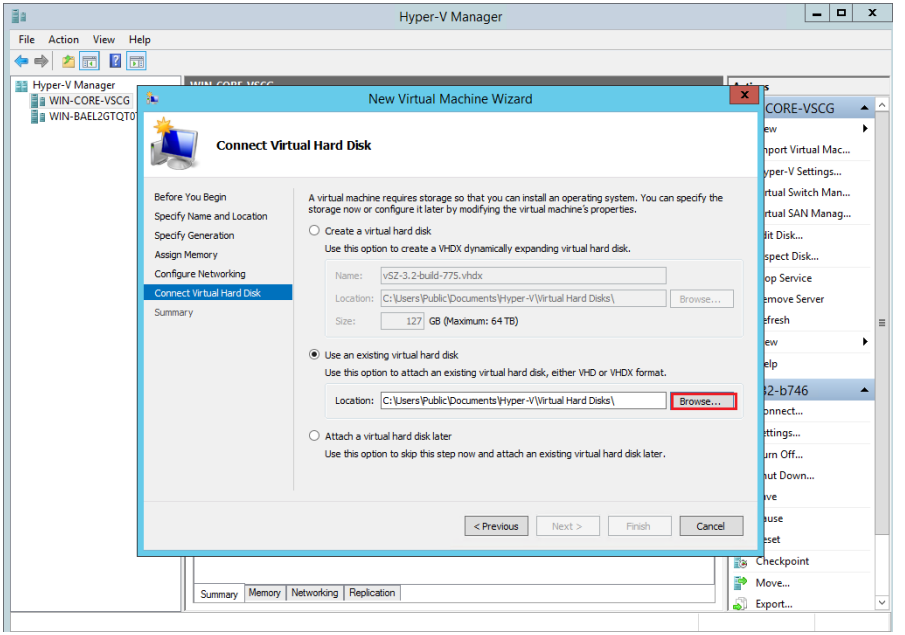
Figure 19. Configuring Network



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.

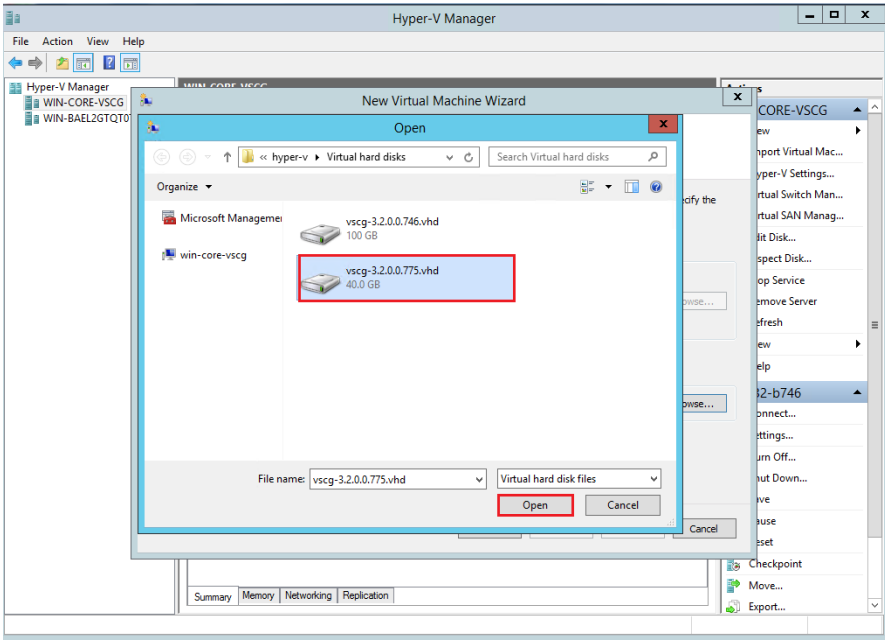
Figure 20. Connect Virtual Hard Disk



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

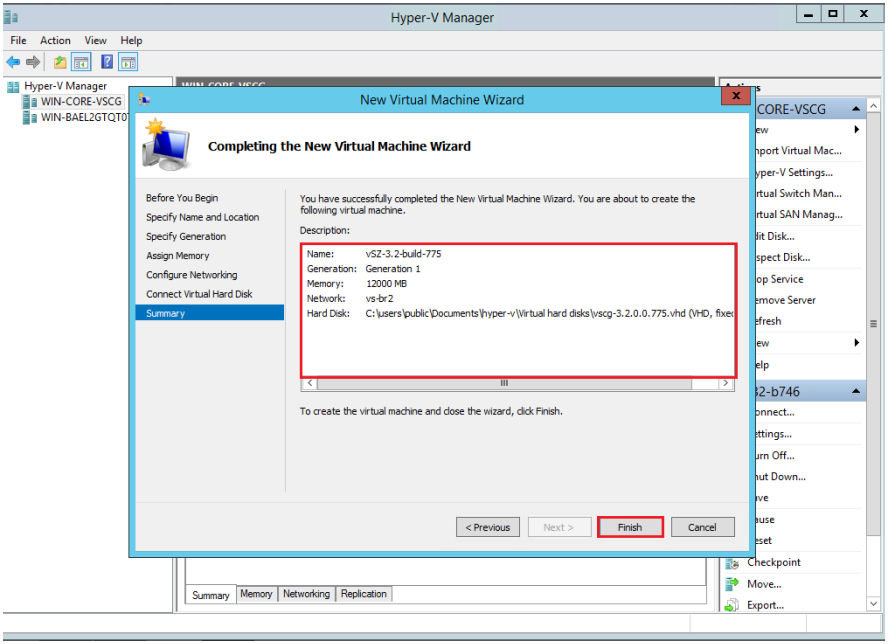
17 Click **Browse** to specify the location of the existing virtual hard disk for the virtual machine to use.

Figure 21. Selecting Virtual Hard Disk



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

Figure 22. Completing New Virtual Machine Wizard

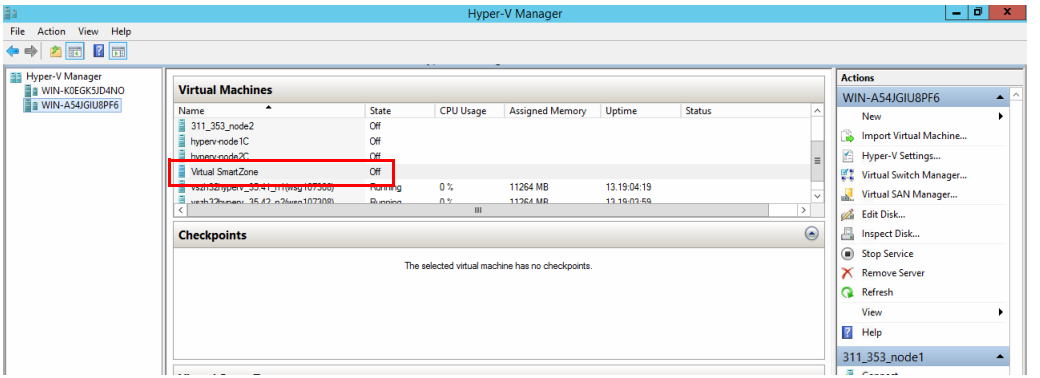


19 Review the settings that you can configure for the virtual machine.

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.

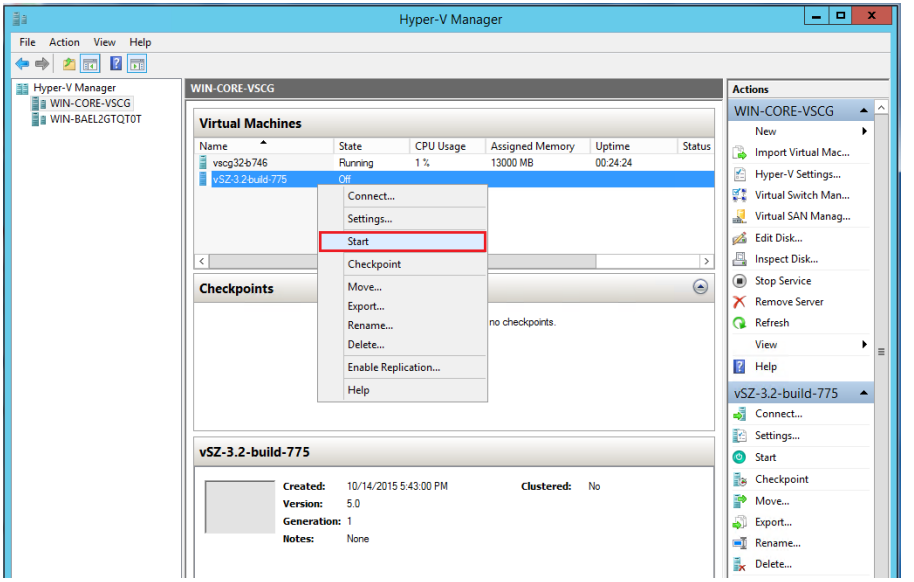
20 Click **Finish** to install the virtual machine. When Windows Server completes installing the virtual machine, the *New Virtual Machine Wizard* disappears and the virtual machine you installed appears on the list of virtual machines on Hyper-V Manager.

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



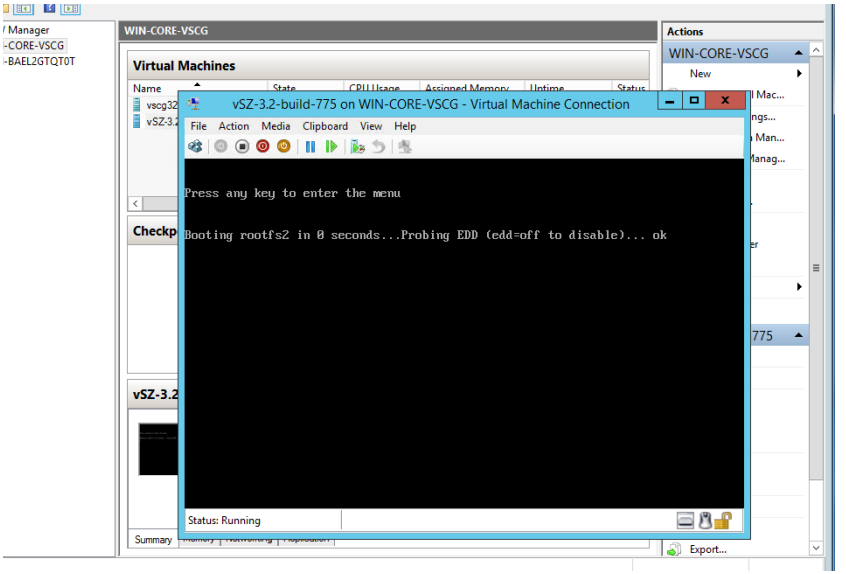
21 Right-click the virtual machine you installed, and then click **Start** to power on the virtual machine.

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



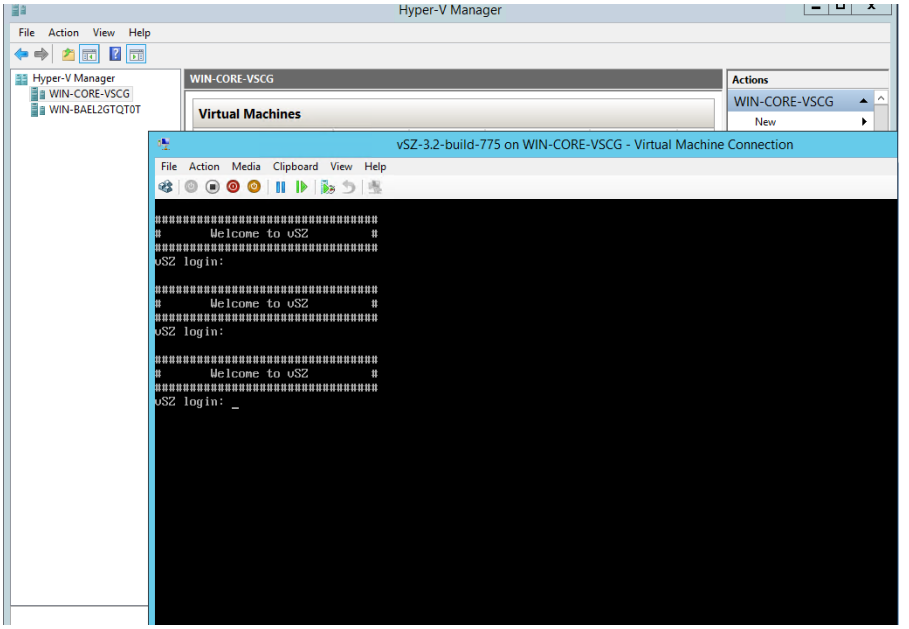
The *Virtual Machine Connection* screen appears.

Figure 25. Virtual Machine Connection



22 Login to the virtual machine with your credentials.

Figure 26. Login to the Virtual Machine



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
- Setting Up the vSZ

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.

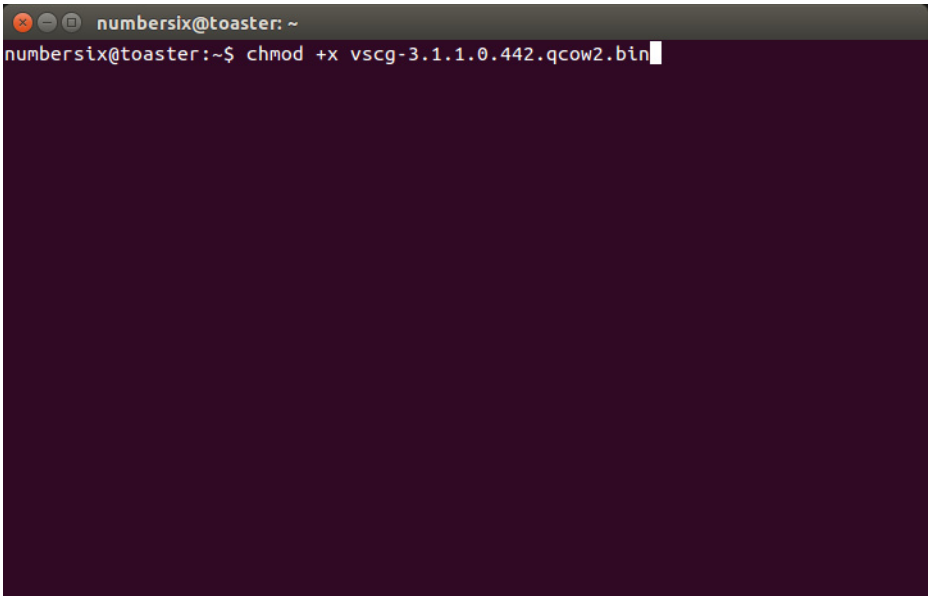
3 Open the terminal window.

4 Make the image bin file executable by entering the following command:

`chmod +x {file name of the controller QCOW bin}`

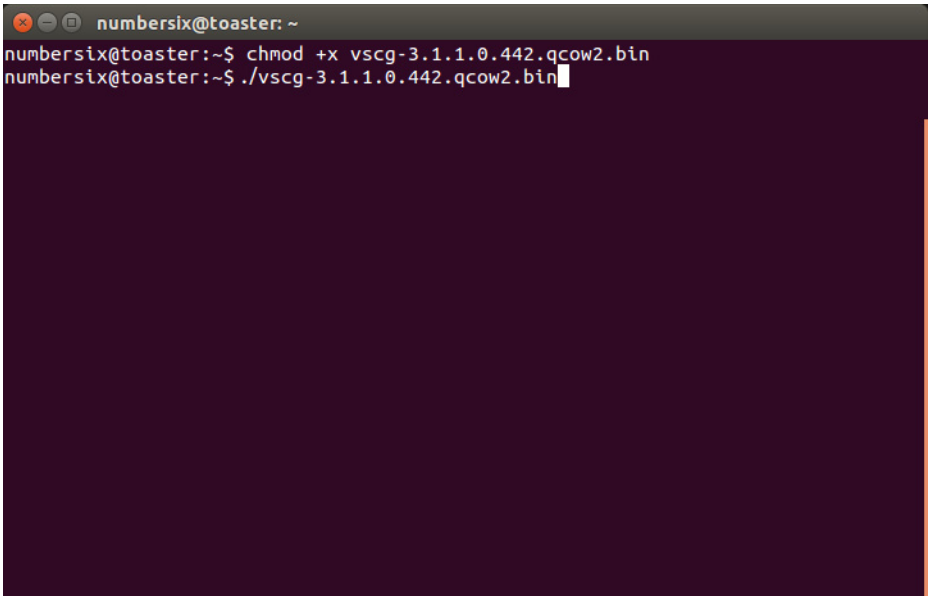
See Figure 27 for an example.

Figure 27. Make the bin file executable



5 Extract the contents of the QCOW2 bin file. See Figure 28.

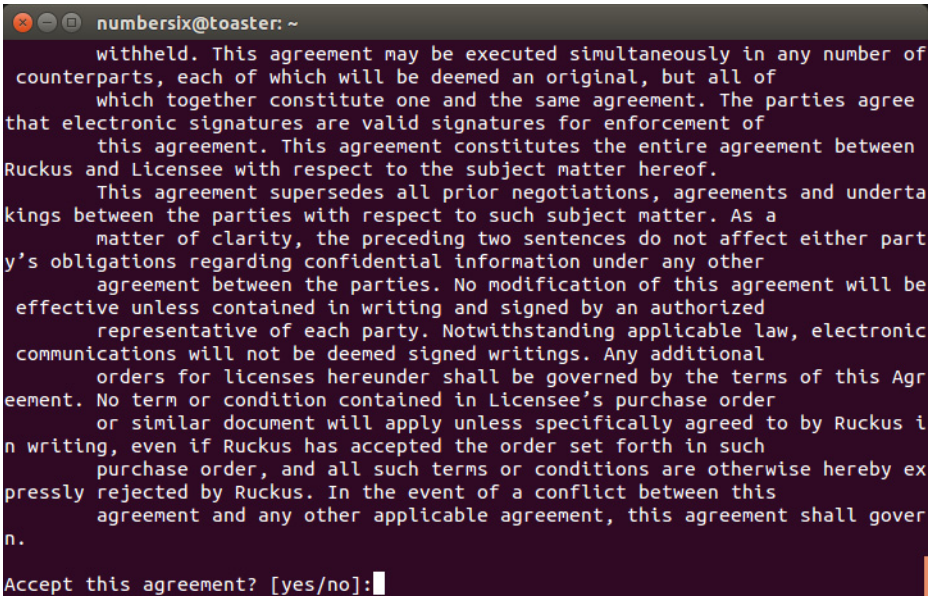
Figure 28. Extract the contents of the QCOW2 image



The end user license agreement appears on screen.

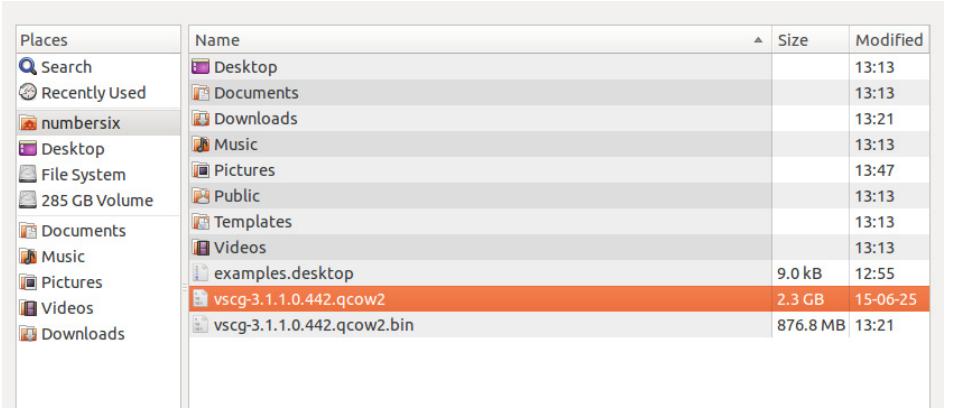
6 At the `Accept this agreement? [yes/no]` prompt, enter **`yes`**.

Figure 29. 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 30. 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
```

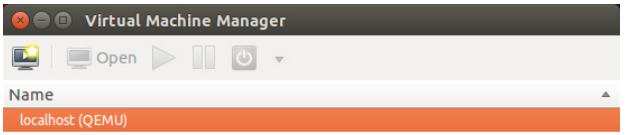
Setting Up the vSZ

This section describes how to 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.

Follow these steps to set up the vSZ on the Virtual Machine Manager.

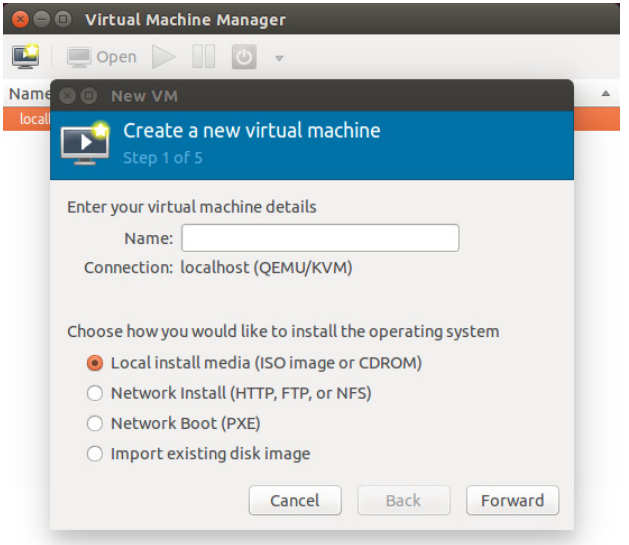
1 Start the Virtual Machine Manager by clicking **Applications** > **System Tools** > **Virtual Machine Manager**. Or double-click the Virtual Machine Manager icon if it appears on the desktop. The Virtual Machine Manager interface appears.

Figure 31. The Virtual Machine Manager interface



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

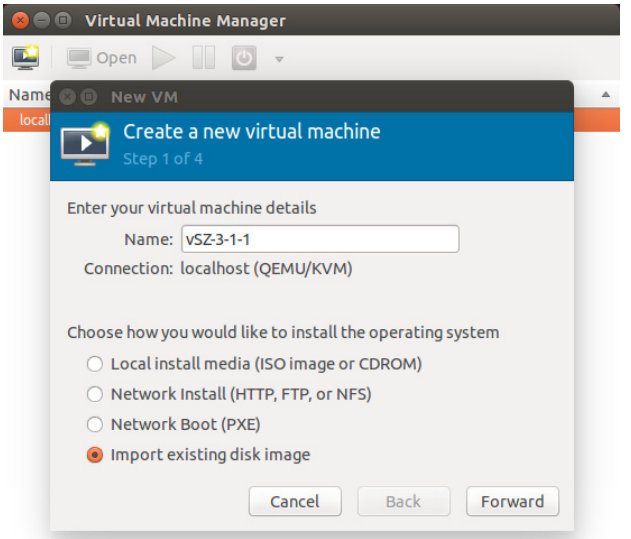
Figure 32. After you click Create New VM, the New VM screen appears



3 Configure the options on the *New VM (Step 1 of 4)* screen.

- In *Name*, type a name that you want to assign to the virtual machine.
- In *Choose how you would like to install the operating system*, click **Import existing disk image**.

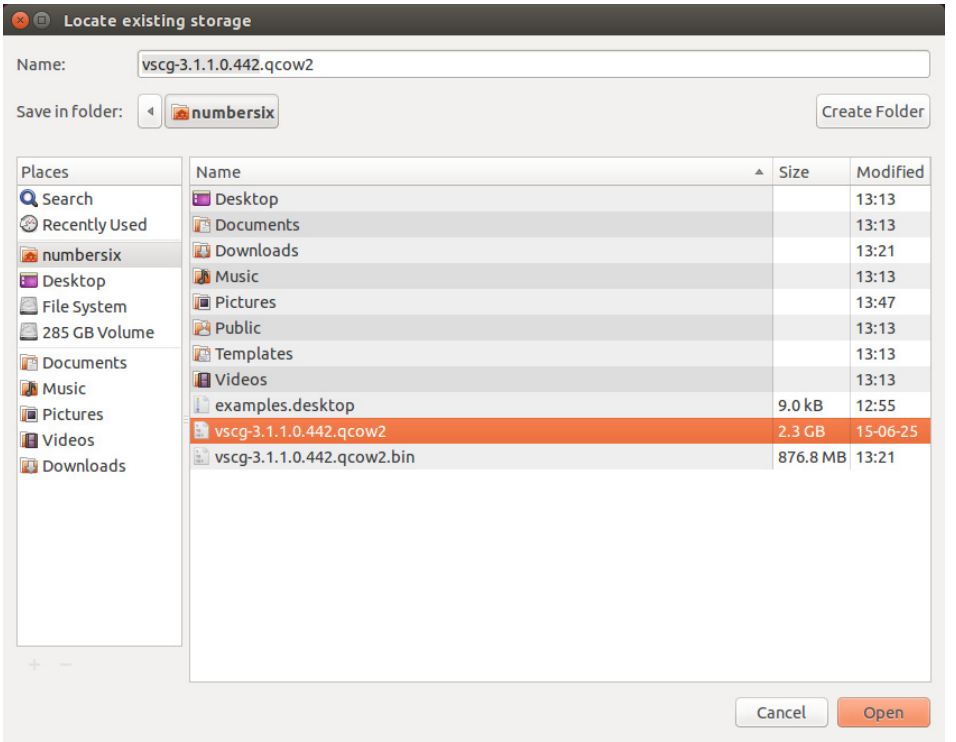
Figure 33. Type a name and select how you want to install the operating system



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.

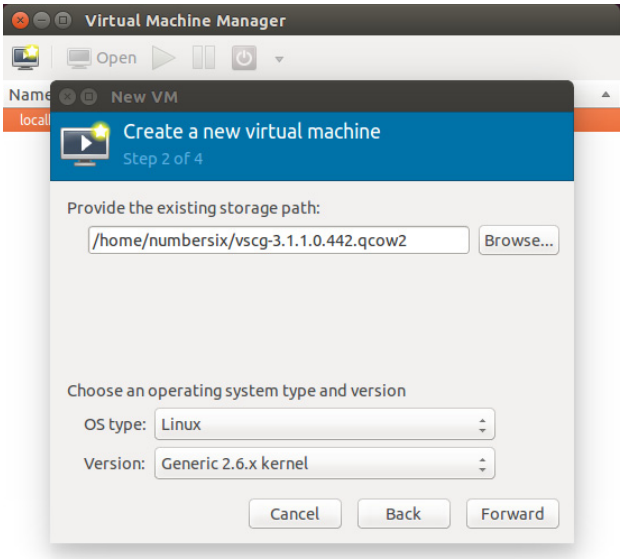
Figure 34. Browse to the vSZ QCOW2 image



6 In the lower portion of the *New VM (Step 2 of 4)* screen, select the operating system type and version.

- In *OS type*, select **Linux**.
- In *Version*, select **Generic 2.6.x kernel**.

Figure 35. Select the operating system and version



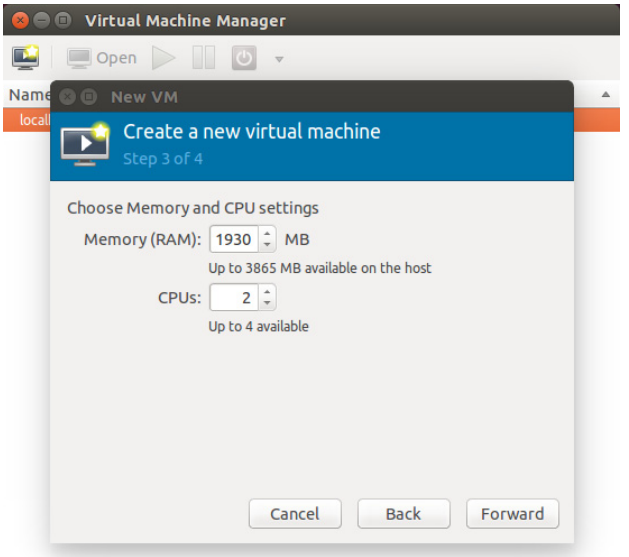
7 Click **Forward**. The *New VM (Step 3 of 4)* screen appears.

8 Configure the memory and CPU settings of the virtual machine.

- In *Memory (RAM)*, set to memory (in MB) that you want to allocate to the vSZ.
- In *CPU*, set the number of CPUs that you want to allocate to the vSZ.

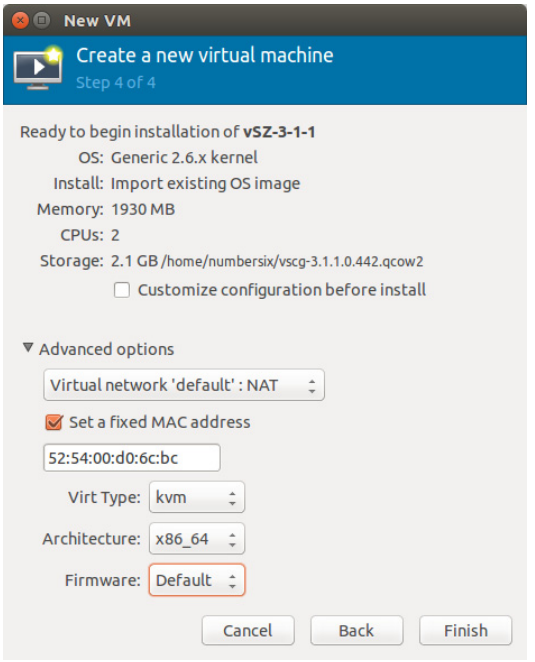
For more information see, Table 5

Figure 36. 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 37. 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.

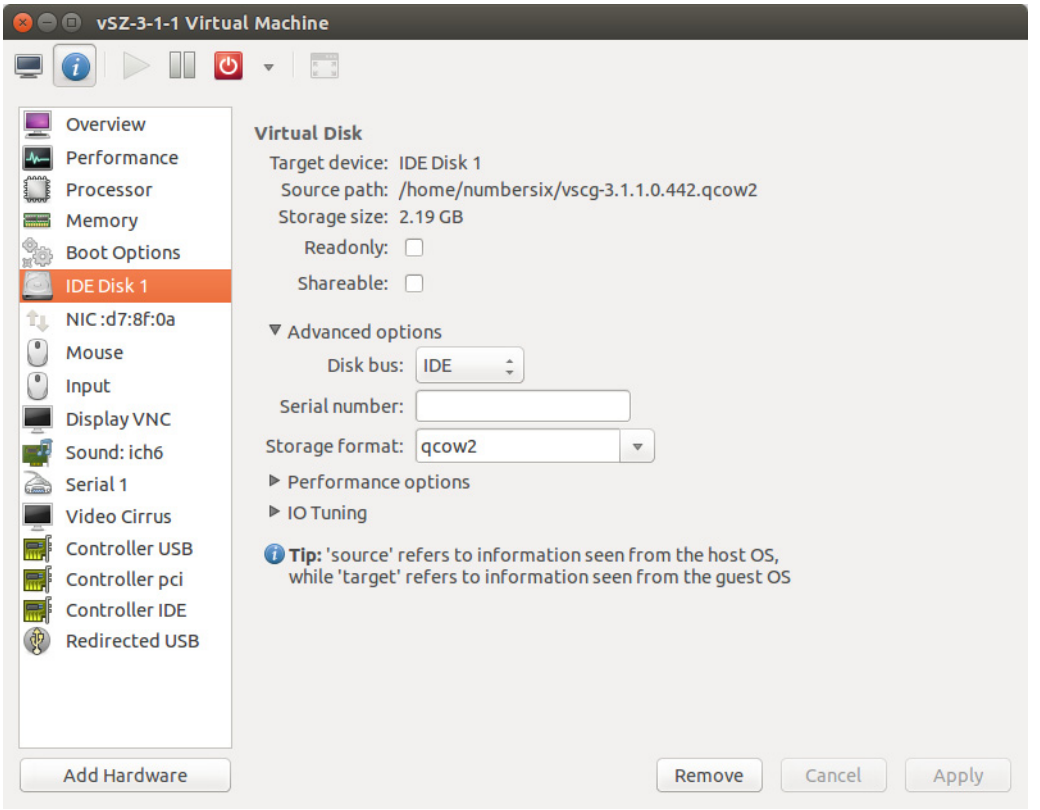
11 Click **Finish** to install the vSZ on the virtual machine.

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.

CAUTION! 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 38. 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

3

In this chapter:

This section describes how to install the vSZ on Microsoft Azure.

Logging into Microsoft Azure

Follow these steps to login to Microsoft Azure:

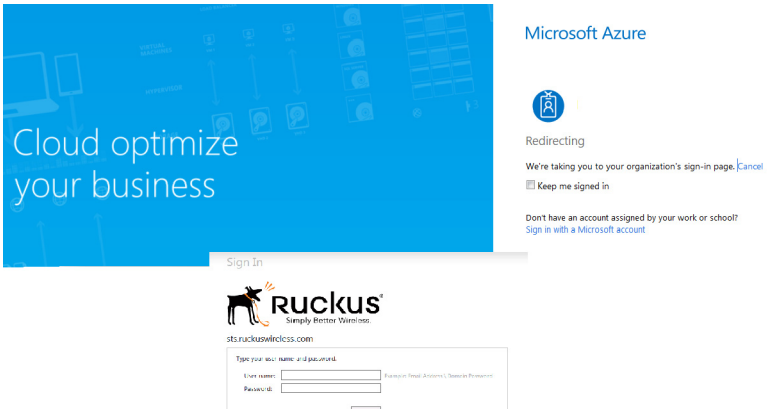
1 Click http://azure.microsoft.com/en-us/ to access the *Microsoft Azure* site.

2 Click the **Portal** tab as show in the figure.

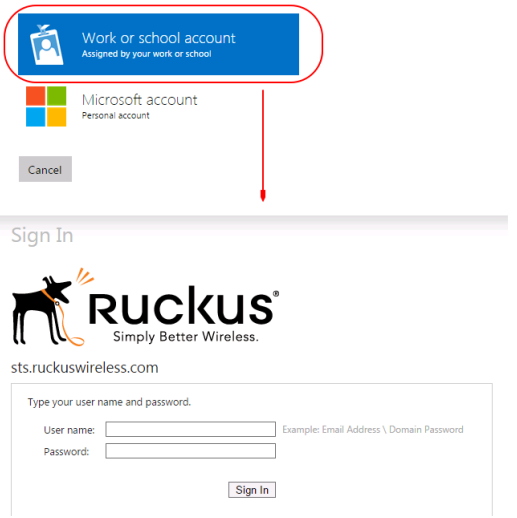
Figure 39. Portal tab

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

Figure 40. Microsoft Azure login page



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



The *Ruckus Wireless login* page appears.

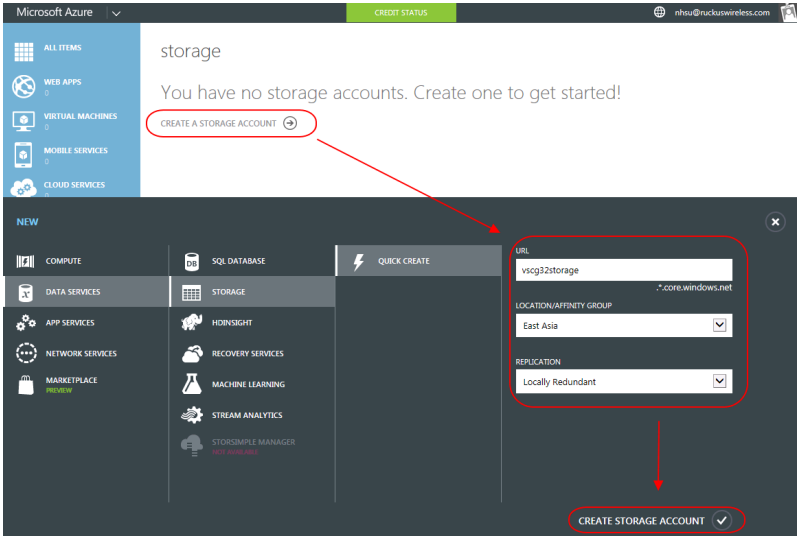
4 Enter your *User name* and *Password* to login.

Creating a Storage Account and Container

To create a Microsoft Azure storage account, perform the following steps:

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

Figure 41. Creating a storage account



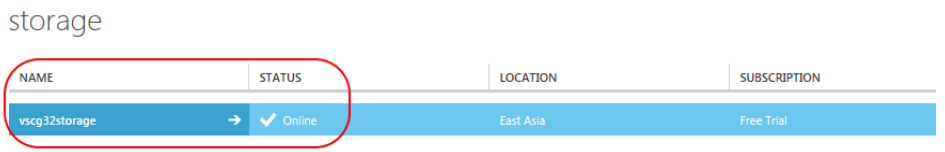
2 In *URL*, type the URL.

3 In *Location/Affinity Group*, type the location of the storage.

4 In *Replication*, select an option from the drop-down list.

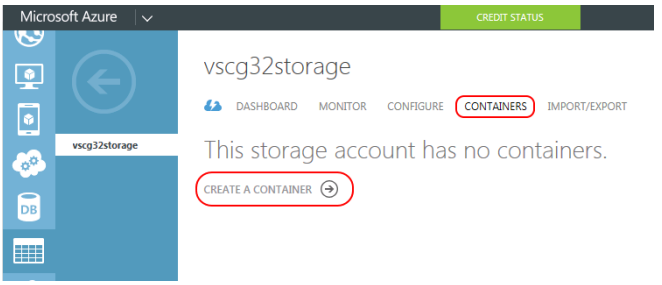
5 Click **Create Storage Account**. The *Storage* screen appears listing the new storage account.

Figure 42. New storage account listed



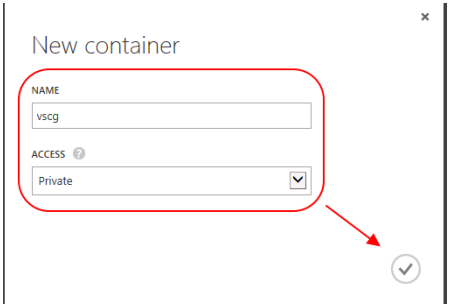
6 Select the storage account and click **Containers > Create a Container**.

Figure 43. Creating a storage container



The *New Container* screen appears.

Figure 44. New container

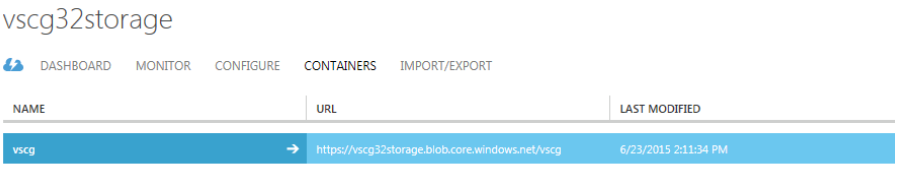


7 In *Name*, type the name of the storage container.

8 In *Access*, select an option from the drop-down list.

9 Click the icon. The new container is listed in the *Containers* tab.

Figure 45. New container listed



Uploading the vSZ Image to Microsoft Azure

Before you Begin

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

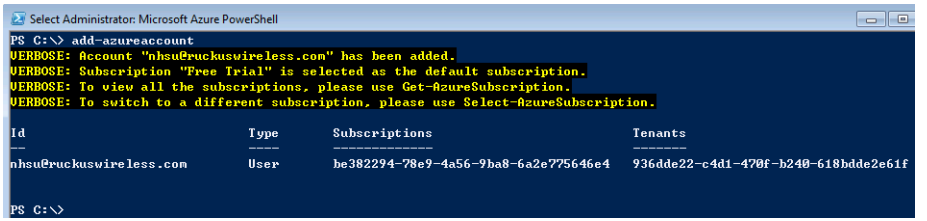
Follow these steps to upload the vSZ image to Microsoft Azure:

1 Open Microsoft Azure PowerShell and type the **`add-azureaccount`** command. The *Microsoft Azure Login* screen appears.

2 Type the *User name* and *Password*.

3 Click **Sign in**. A success message appears confirming your Microsoft Azure account is added.

Figure 46. Account creation success message



4 Type command **`add-azurevhd`** to initiate uploading the image.

NOTE: Ensure that the URL in *Destination* and *Microsoft Azure storage* are the same.

Figure 47. Verifying URLs match

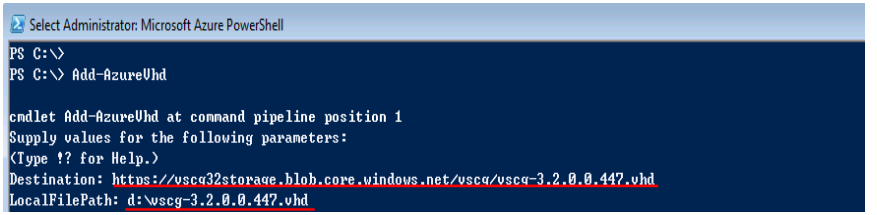
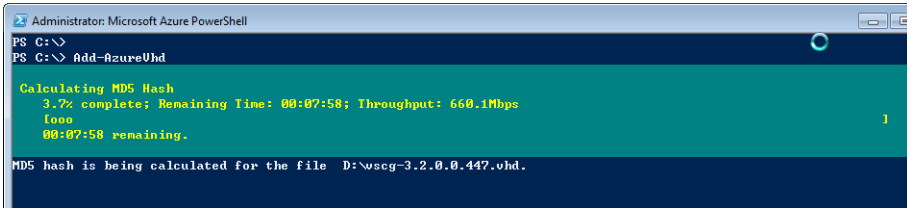
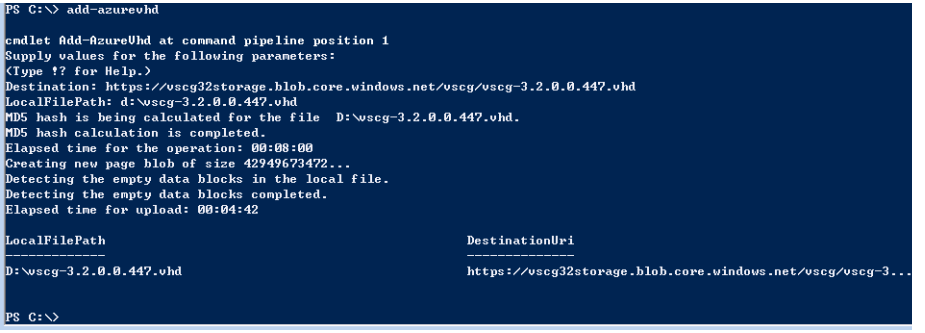


Figure 48. Uploading the vSZ image



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

Figure 49. vSZ message indicating image upload is complete

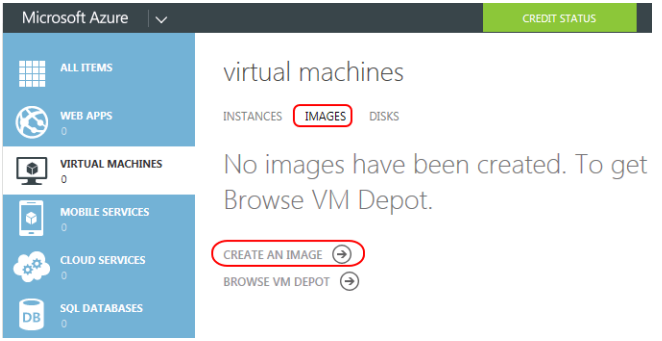


Creating a vSZ Image on Microsoft Azure

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

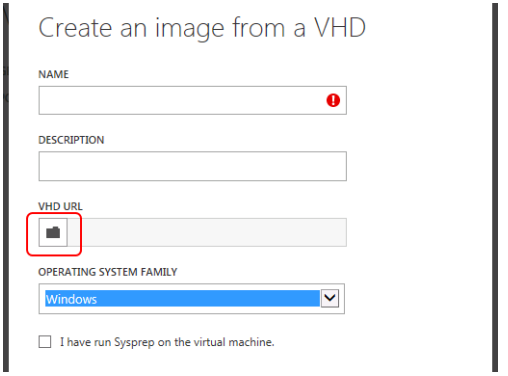
1 From the *Microsoft Azure* page, click **Virtual Machines > Images**.

Figure 50. Creating an image



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

Figure 51. Creating an image from VHD



3 In *Name*, type the name of the image.

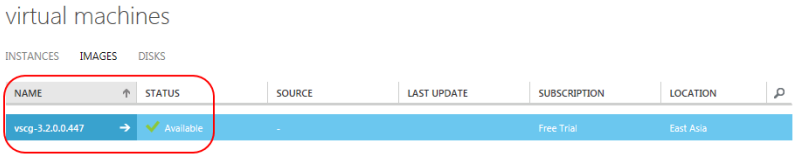
4 In *Description*, provide a brief description about the image.

5 Click **VHD URL** and browse to the cloud storage to select the VHD file.

6 In *Operating System Family*, select an option from the drop-down list.

7 Click the icon. The new image is listed in the *Images* tab.

Figure 52. A new vSZ image is created

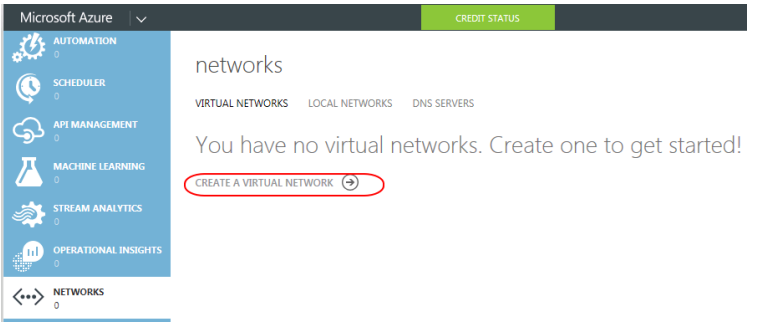


Creating a Network

Follow these steps to create a virtual network:

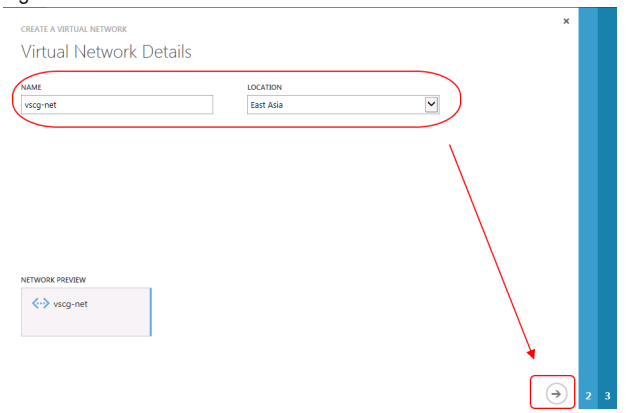
1 From the *Microsoft Azure* page, click **Networks > Virtual Networks**.

Figure 53. Creating a virtual network



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

Figure 54. Virtual Network Details screen

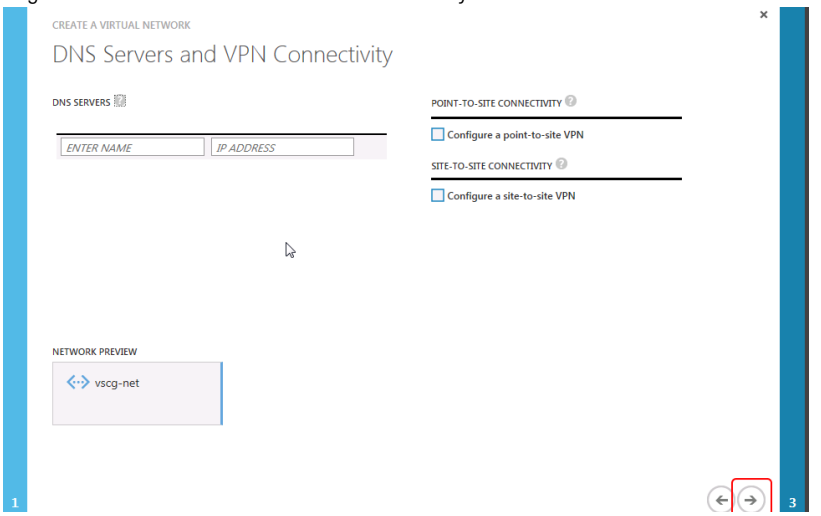


3 In *Name*, type the name of the virtual network.

4 In *Location*, select a location from the drop-down list.

5 Click the icon. The *DNS Servers and VPN Connectivity* screen appears.

Figure 55. DNS Servers and VPN Connectivity screen

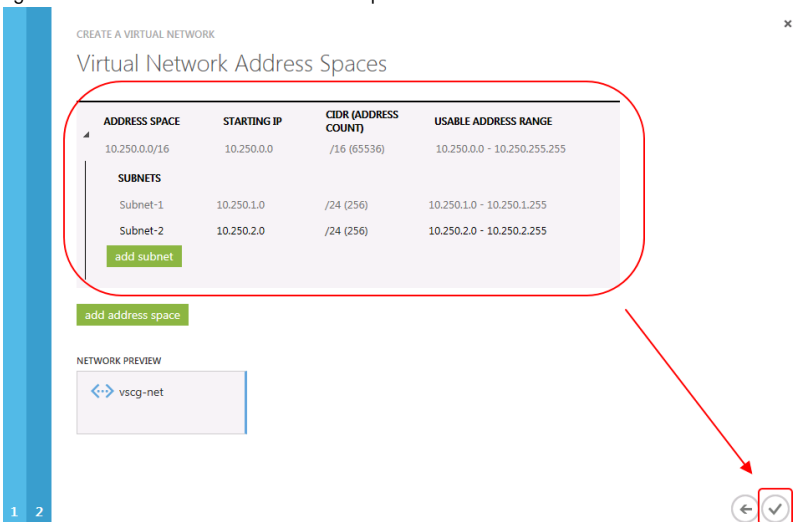


6 In *DNS Server*, type the name of the server and IP address.

7 Configure the VPN connectivity. You can choose between a point-to-site or site-to-site connectivity.

8 Click the icon. The *Virtual Network Address Spaces* screen appears.

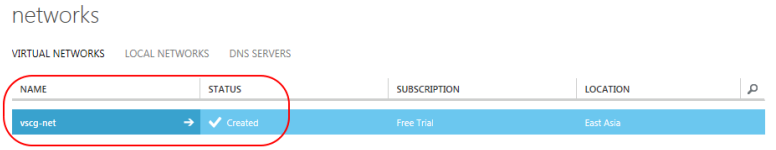
Figure 56. Virtual Network Address Spaces screen



9 Type the address space and subnet information as appropriate.

10 Click the icon. The virtual network is created and listed in the *networks* page.

Figure 57. The new virtual network is added and listed in the Networks page

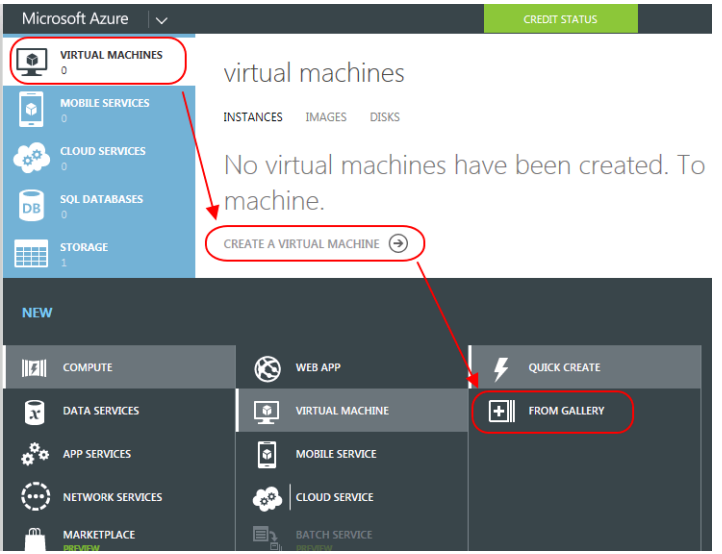


Creating a vSZ Virtual Machine

Follow these steps to create a vSZ virtual machine:

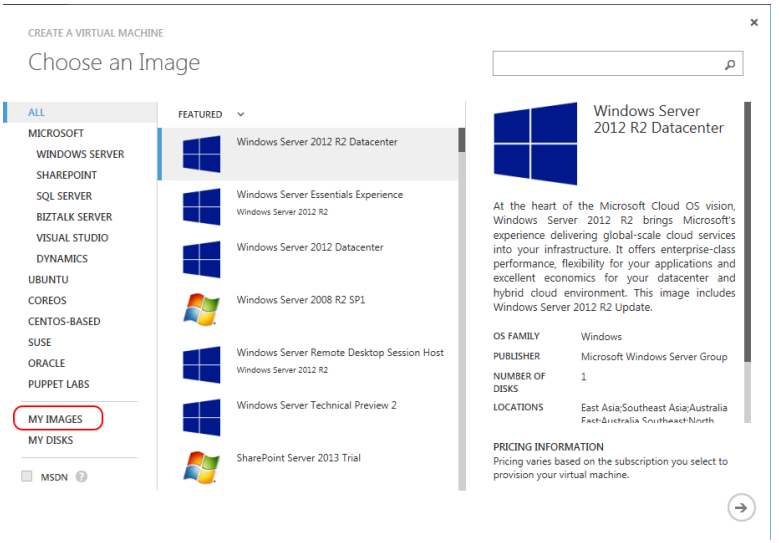
1 From the *Microsoft Azure* page, click **Virtual Machines > Instances**. The *New* screen appears.

Figure 58. New screen



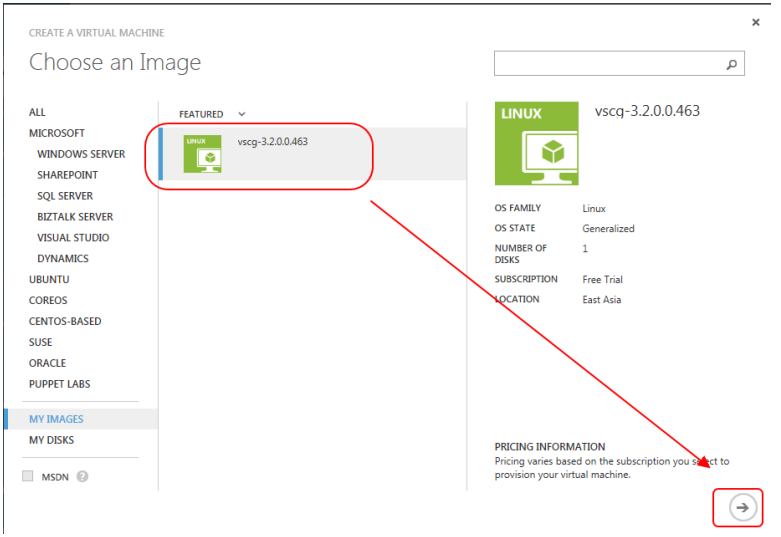
2 Click **Compute > Virtual Machine > Quick Create > From Gallery.** The *Choose an Image* screen appears.

Figure 59. Choosing an image



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

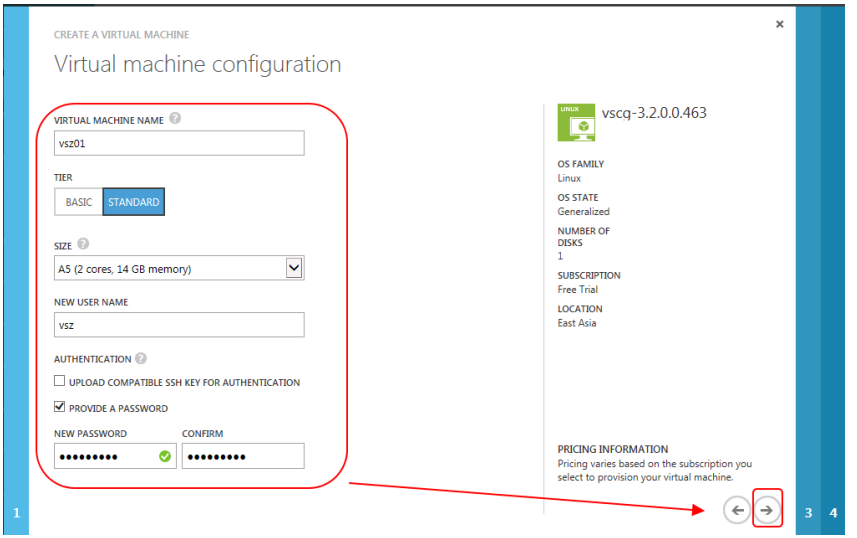
Figure 60. A list of images



4 Select and image.

5 Click the → icon. The *Virtual Machine Configuration* screen appears.

Figure 61. Virtual machine configuration - screen 1



6 In *Virtual Machine Name*, type the name of the VM.

7 In *Tier*, select *Standard*.

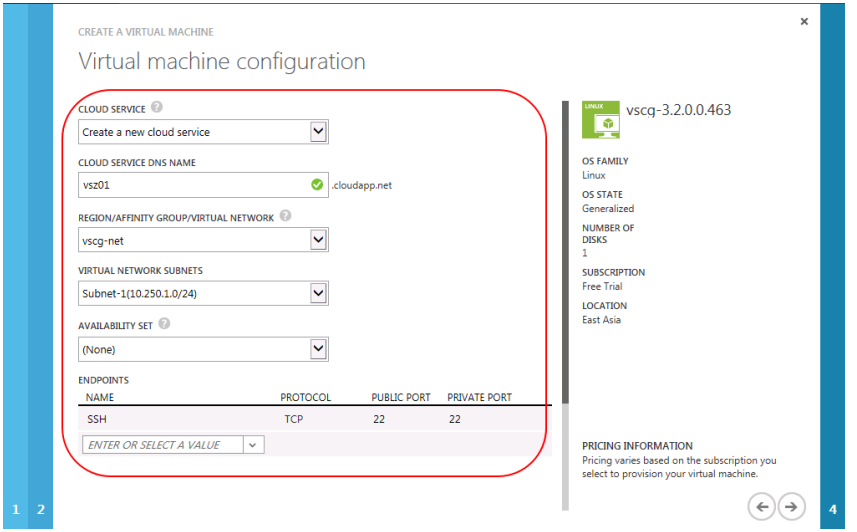
8 In *Size*, select an option from the drop-down list.

9 In *New User Name*, type the user name.

10 In *Authentication*, select the *Provide a Password* option. Type the new password and confirm.

11 Click the icon. The next configuration screen appears.

Figure 62. Virtual machine configuration - screen 2



12 In *Cloud Service*, select a service from the drop-down list.

13 In *Cloud Service DNS Name*, type the DNS name.

14 In *Region/Affinity Group/Virtual Network*, select an option from the drop-down list.

15 In *Virtual Network Subnets,* select an option from the drop-down list.

16 In *Availability Set*, select an option from the drop-down list.

17 In *End Points*, type the values as appropriate.

Additionally, you can configure the following ports:

Table 7. Port numbers to configure virtual machines

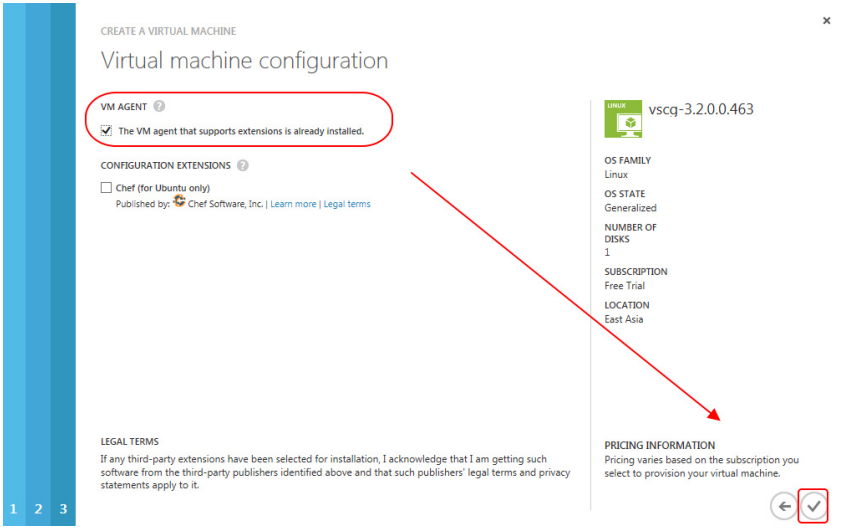
Feature	Port Number
vscg_ftp	21
vscg_ap-fw	91
vscg_ap-key	443
vscg_gui	8443
vscg_wispr01	8090
vscg_wispr02	8099
vscg_wispr03	8100

Table 7. Port numbers to configure virtual machines

Feature	Port Number
vscg_wispr04	8111
vscg_wispr05	9998
vscg_nbi01	9080
vscg_nbi02	9443
vscg_lwapp	12223

18 Click the  icon. The next configuration screen appears.

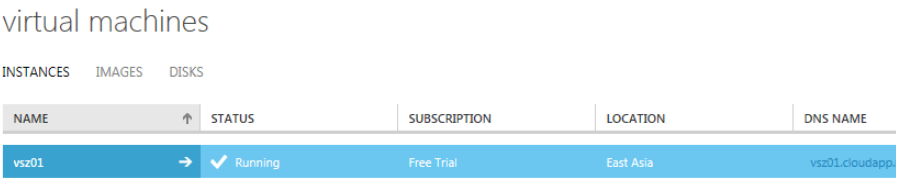
Figure 63. Virtual machine configuration - screen 3



19 In *VM Agent*. select the check-box to enable VM agent.

20 Click the  icon. The new VM is listed in the *Virtual Machines* page.

Figure 64. The new VM is created and listed

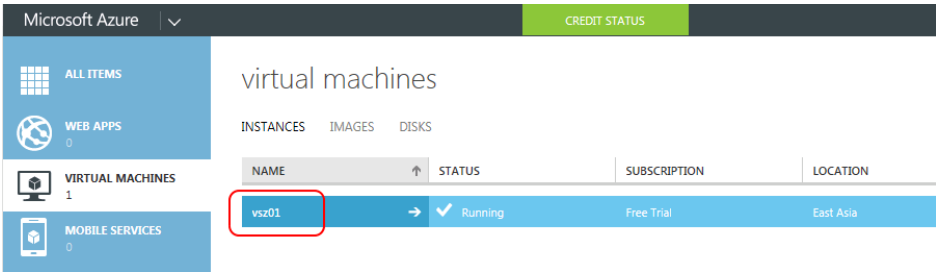


Configuring Port Numbers for Virtual Machines

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

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

Figure 65. Selecting a VM

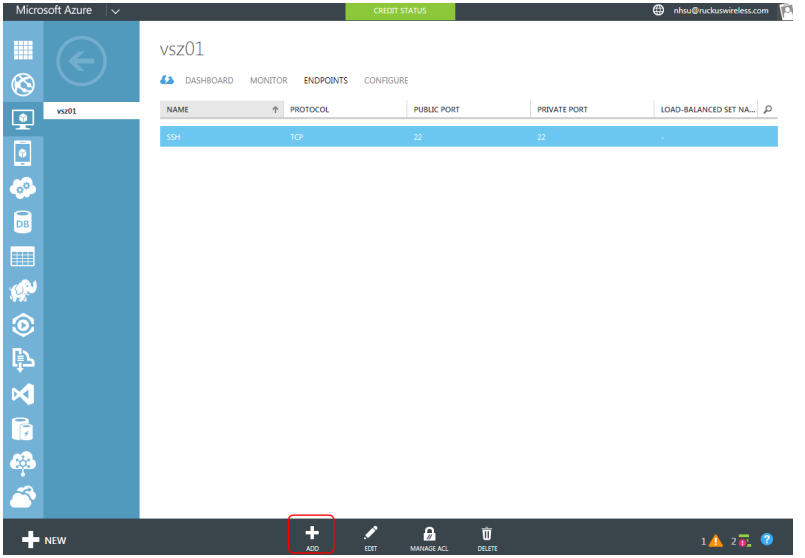


2 Select the virtual machine to configure the ports.

3 Click *Endpoints*.

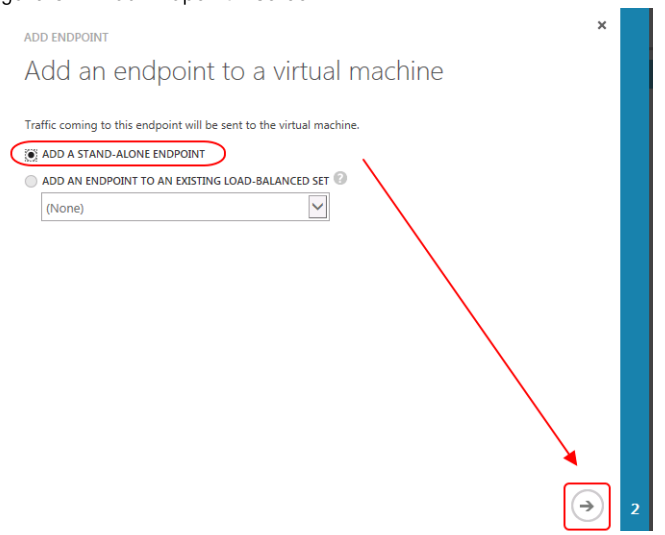
4 Select **Add Endpoint**.

Figure 66. Adding endpoints



The *Add Endpoint* screen appears.

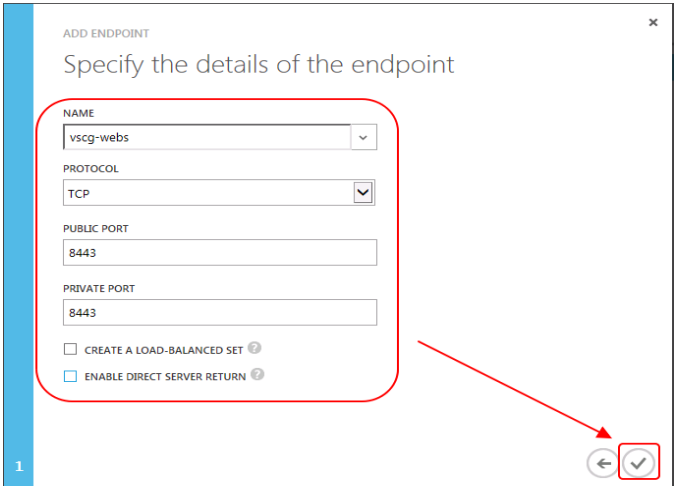
Figure 67. Add Endpoint - screen 1



5 Select *Add a stand-alone end point*.

6 Click the  icon. The next configuration screen appears.

Figure 68. Adding Endpoint - screen 2



7 In *Name*, type the name of the endpoint.

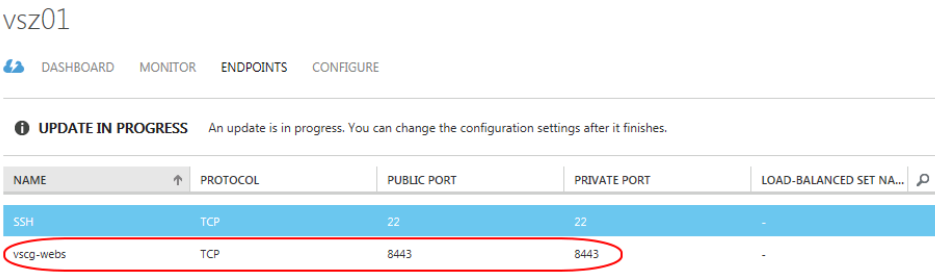
8 In *Protocol*, select the protocol from the drop-down list.

9 In *Public Report*, type 8443.

10 In *Private Report*, type 8443.

11 Click the icon. The endpoint is created and listed in the *Endpoints* tab for the VM.

Figure 69. A new endpoint for the VM is created and listed



Assigning a Static Internal IP Address to a Virtual Machine

A Virtual machine in a network is assigned an internal IP address. These addresses change when the VM is restarted. Some scenarios such as the following might require VMs to have a static internal IP address that does not change:

- If the VM is an internal DNS server.
- If the VM is a node within a cluster.
- If the VM is part of a site-to-site VPN connection.

Before You Begin

Ensure that a vSZ virtual machine is created using Microsoft Azure.

Also, ensure that you assign an internal IP for the VM before configuring the virtual network.

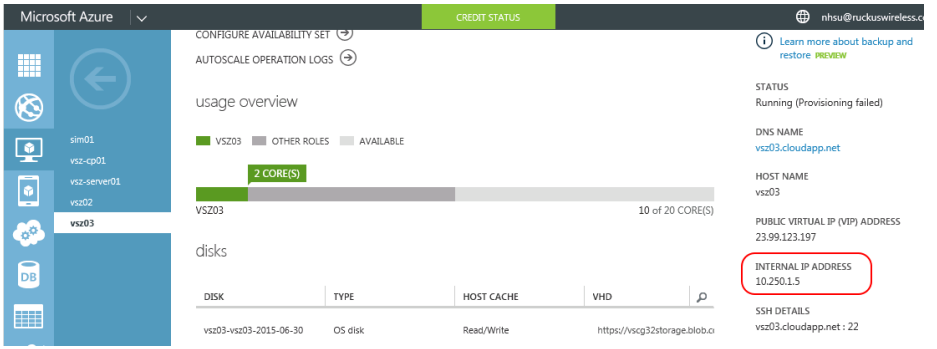
Follow these steps to assign an static internal IP to a VM:

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

2 From the *Virtual Machines* page, select the VM.

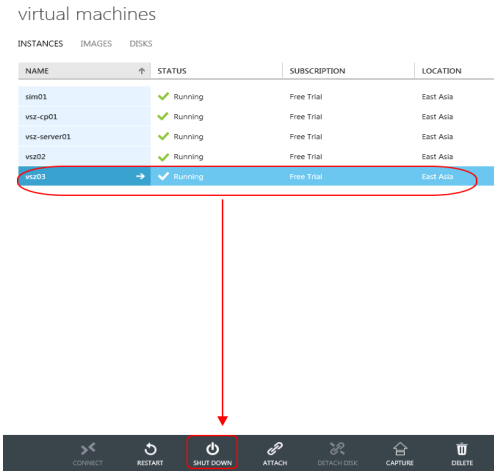
NOTE: An internal IP is assigned to the VM by default when it is created.

Figure 70. Default IP assigned to the VM



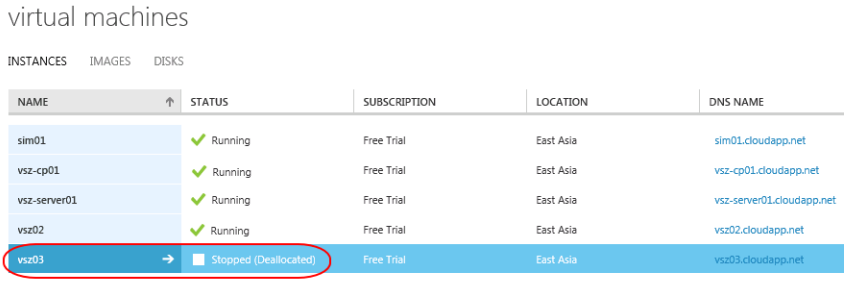
3 Click **Shutdown**.

Figure 71. Shutting down the VM



4 Verify that the VM has stopped running.

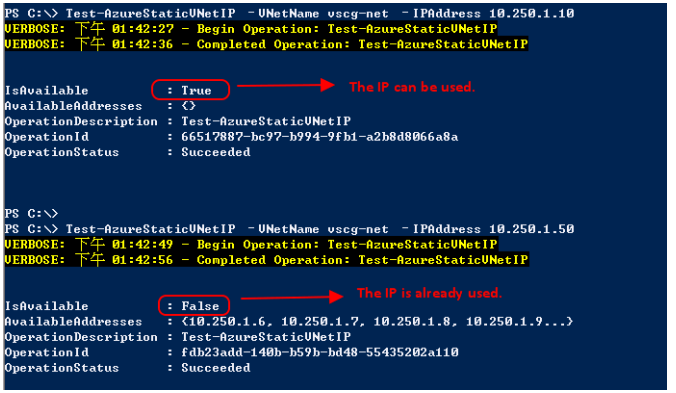
Figure 72. Verifying VM has stopped running



5 Open command prompt.

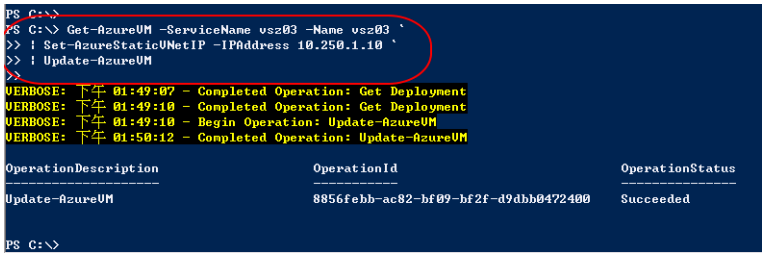
6 Enter the **`Test-AzureStaticVnetIP -VnetName <name> -IPAddress <test IP address>`** command to verify that the IP address is available to assign to the VM.

Figure 73. Verifying IP address availability



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

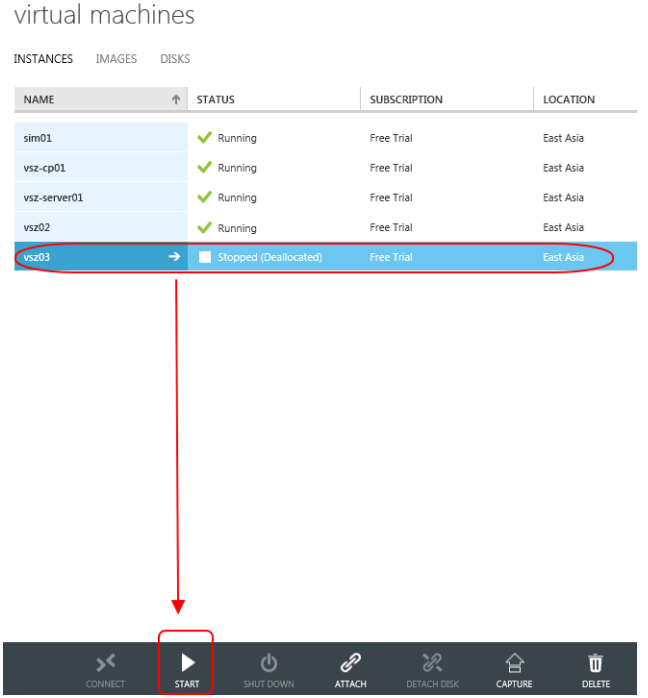
Figure 74. Assigning the static IP to the VM



8 From the *Virtual Machines* page, select the VM.

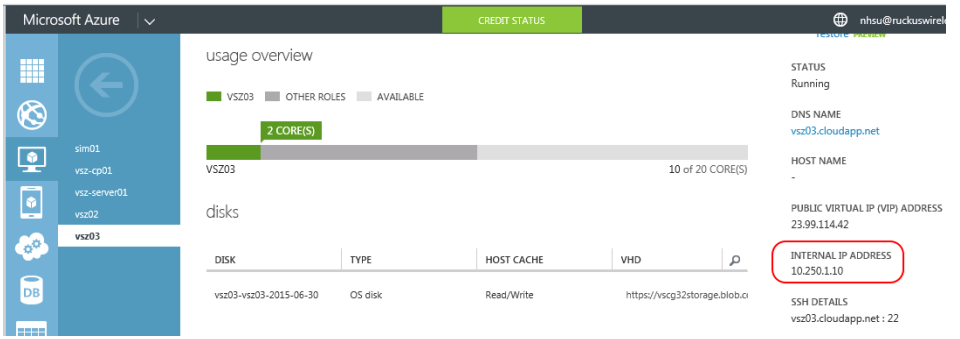
9 Click **Start**.

Figure 75. Starting the VM



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

Figure 76. Verifying static IP address is assigned to the VM



Assigning a Static Public IP Address to a VM

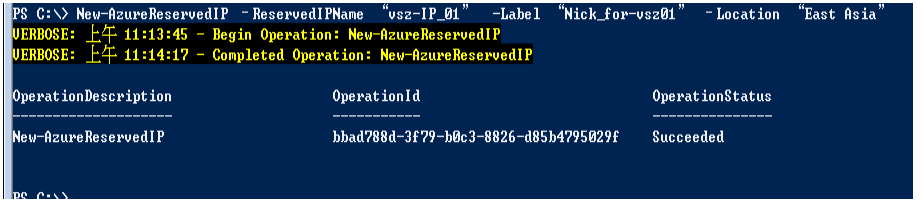
Microsoft Azure assigns a dynamic IP address to a VM when it is created. In addition, a static public IP address must be assigned to a VM as DNS names cannot be configured in a vSZ; resulting in changes to the public IP address.

NOTE: Microsoft Azure currently only supports assigning static public IP addresses to VMs through the command line interface (CLI).

Follow these steps to assign a static public IP address to a VM:

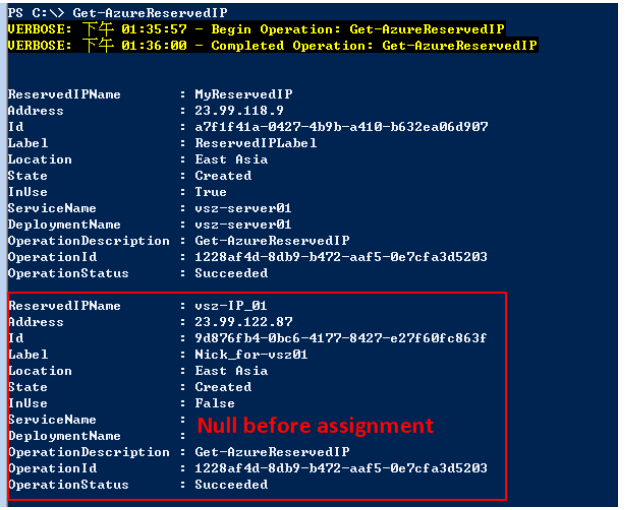
1 Open the command prompt and create a static IP by typing the **`New-AzureReservedIP-ReservedIPName <name>-Label <label name>-Location <location name>`** command.

Figure 77. Creating a static IP address



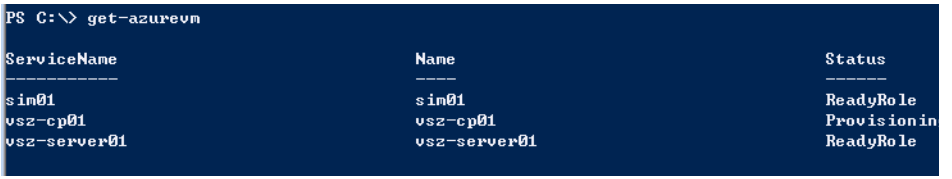
2 Verify that the static IP address is created by typing the **`Get-AzureReservedIP`** command.

Figure 78. Verifying static IP address is created



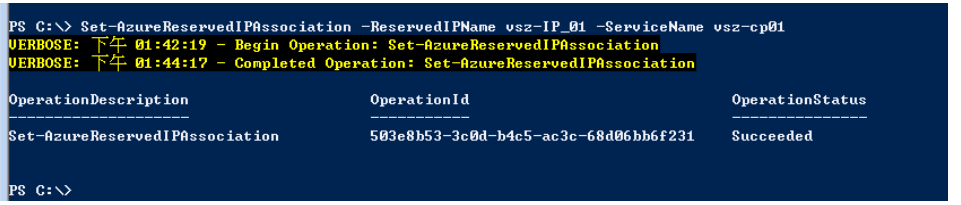
3 Select a VM to assign the static public IP by typing the **get-azurevm** command.

Figure 79. Selecting the VM to assign a static IP address



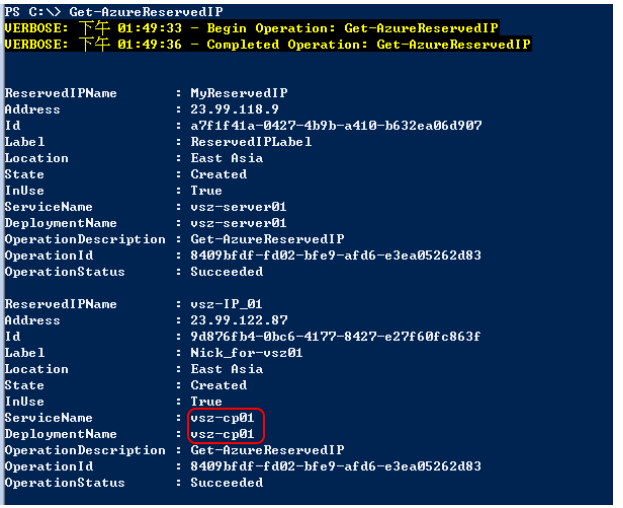
4 Set the IP address to the VM by typing the **Set-AzureReservedIPAssociation-ReservedIPName <name>-ServiceName <name>** command.

Figure 80. Setting the IP address



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

Figure 81. Verifying that the IP address is assigned

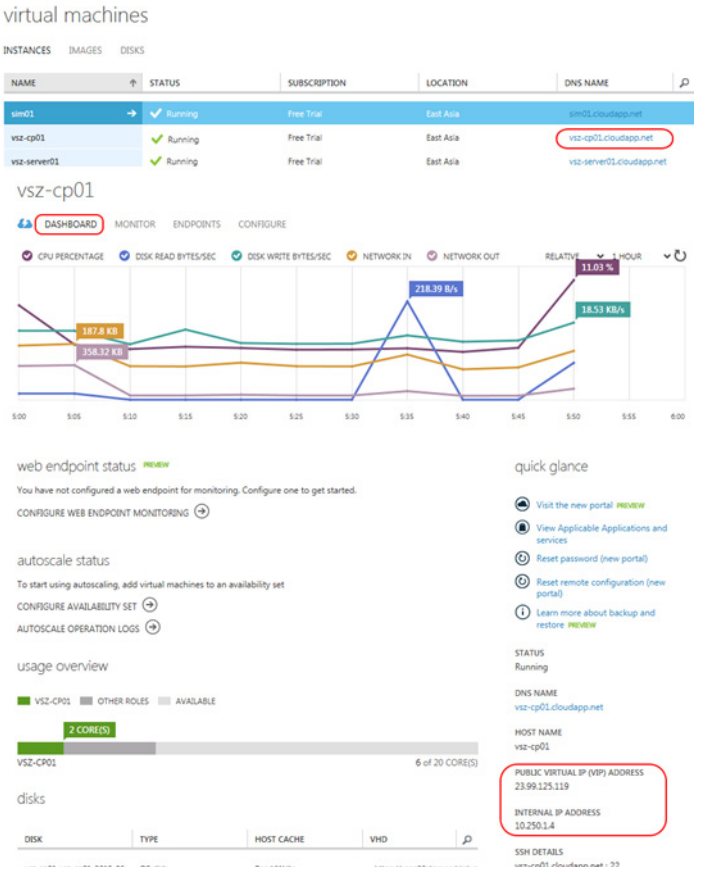


6 From the *Microsoft Azure* page, click **Virtual Machines > Instances** and verify that DNS Name.

7 Select the VM.

8 Click the **Dashboard** tab. Verify that you are able to see the updated Public IP address.

Figure 82. Verifying the DNS name and static public IP address changes



Installing the vSZ on the Google Computing Engine

4

In this chapter:

This section describes how to install the vSZ on a GCE.

Before you begin

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

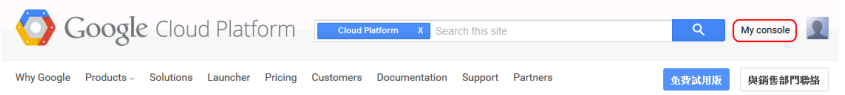
Logging into GCE and Selecting a Project

Follow these steps to login to the GCE site:

1 Click http://cloud.google.com to access the *Google Cloud Platform* website.

2 Select **My console** as shown.

Figure 83. GCE Page - My console



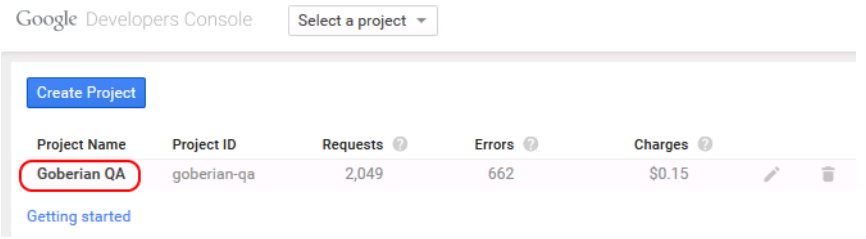
3 Login to the account with your user name and password.

4 Click **Sign in**. A list of projects you created is displayed.

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

5 Click **Select a project** to choose a project as shown.

Figure 84. Selecting a Project



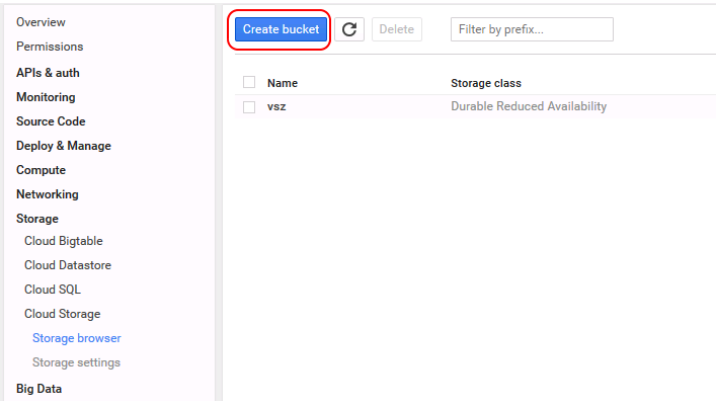
Creating a Storage Bucket

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

1 From *Google Developers Console*, click **Storage > Cloud Storage > Browser**. The *Cloud Storage Buckets* screen appears.

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

Figure 85. Creating a Storage Bucket

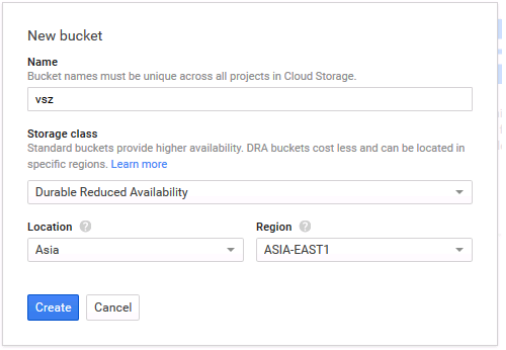


3 In *Name*, type the name of the storage bucket

4 In *Storage class*, select the storage class you want. You can choose from *Standard, DRA,* and *Nearline* in the drop-down list.

5 In *Location,* select the location from the drop-down list.

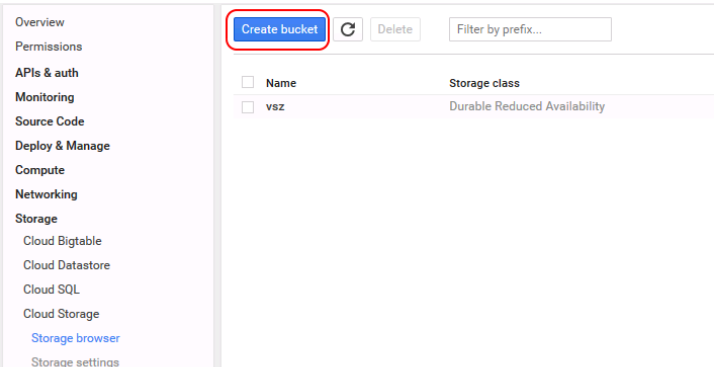
Figure 86. New Bucket Information



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

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

Figure 87. Creating Another Storage Bucket

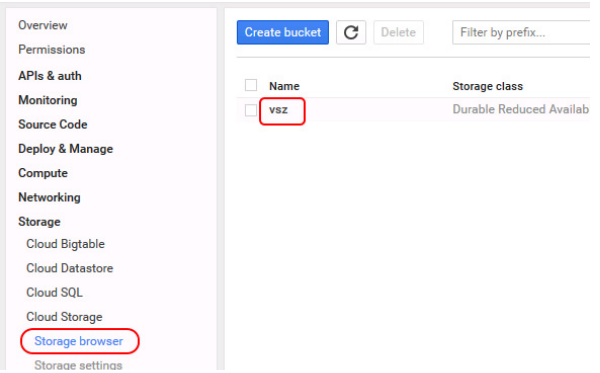


Uploading the vSZ image to a Storage

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

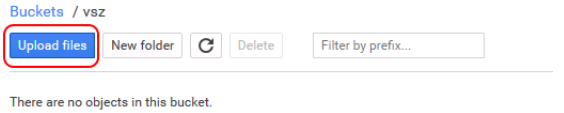
1 Select the storage bucket to upload the vSZ image as shown.

Figure 88. Selecting the Storage



2 Click **Upload files**.

Figure 89. Uploading the vSZ Image

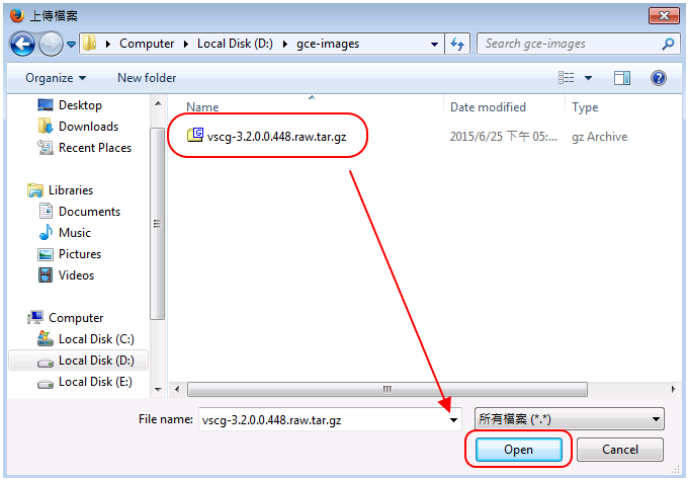


3 Browse to the location of the vSZ image and select it.

NOTE: Only images with file-type *.raw.tar.gz can be selected.

4 Click **Open**.

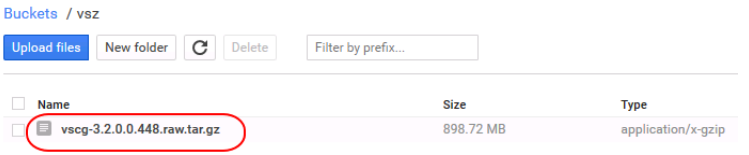
Figure 90. Selecting the vSZ Image



The status of the upload process is displayed.

5 The image is listed in the storage bucket after the image is uploaded.

Figure 91. vSZ Image Uploaded to Storage Bucket

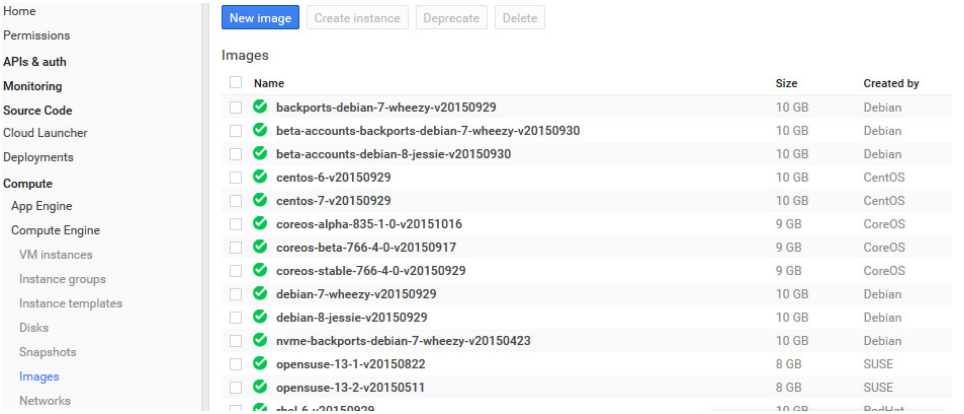


Creating a vSZ Image for Virtual Machines

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

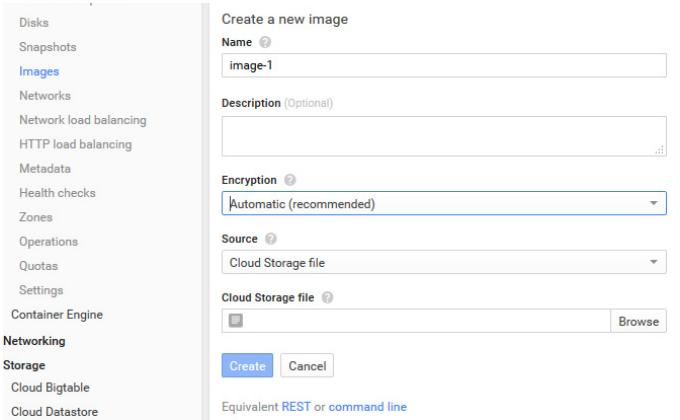
1 From *Google Developers Console*, click **Compute > Compute Engine > Images**. A page displaying a list of images appears.

Figure 92. Creating a New Image



2 Click **New Image**. The *Create a new image* screen appears.

Figure 93. Create a New Image Screen



3 In *Name*, type the name of the image.

4 In *Description*, provide a brief description about the image.

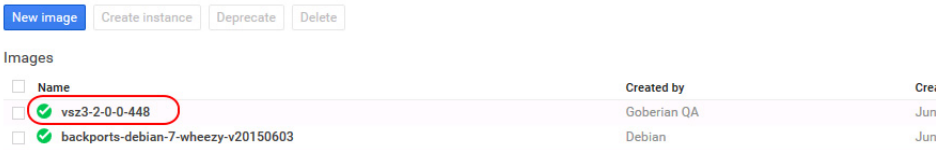
5 In *Encryption*, select an option from the drop-down list containing Automatic (recommended) and Customer supplied.

6 In *Source*, select *Cloud storage file*.

7 In *Cloud Storage file*, click *Browse* to select the file.

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

Figure 94. The New Image is Listed

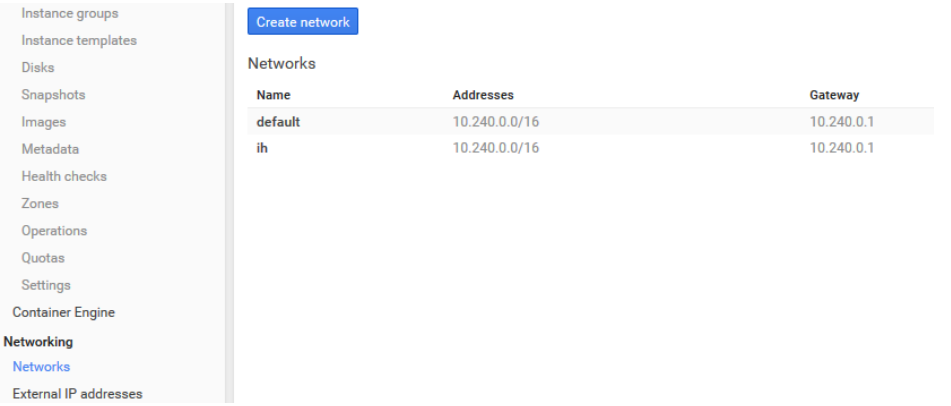


Creating Networks and Configuring Firewall Rules

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

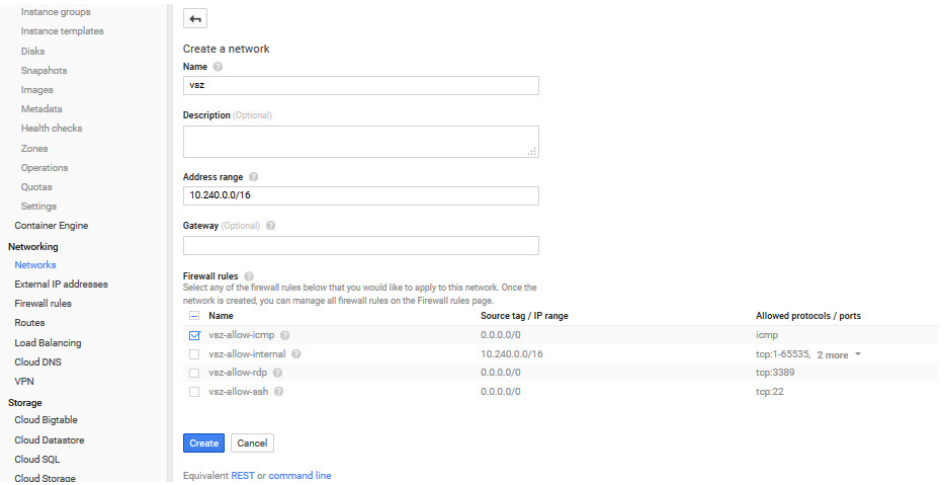
1 From *Google Developers Console*, click **Networking > Networks**. A page displaying a list of networks appears.

Figure 95. List of Networks



2 Click **Create network**. The *Create a network* screen appears.

Figure 96. Creating a Network



3 In Name, type the name of the network.

4 In *Description*, provide a brief description about the network.

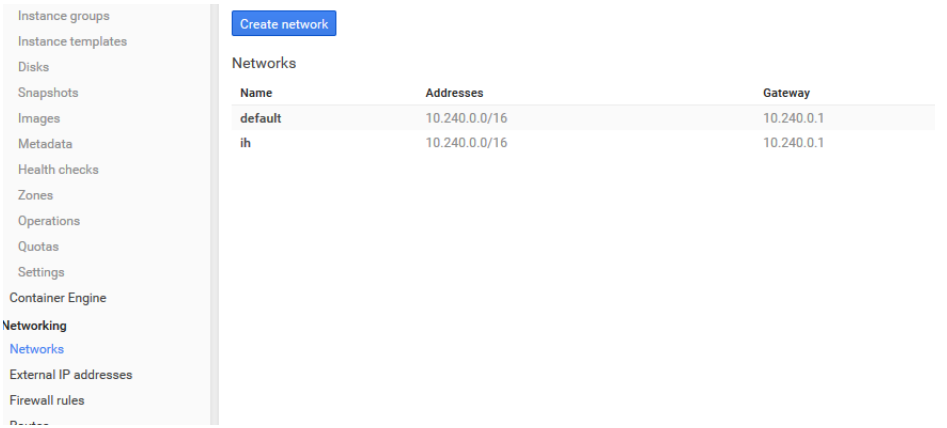
5 In *Address range*, specify the address range for the network.

6 In *Gateway*, type the gateway address.

7 Under *Firewall rules*, select the rule you want to apply to the network.

8 Click **Create**. A page including the new network appears.

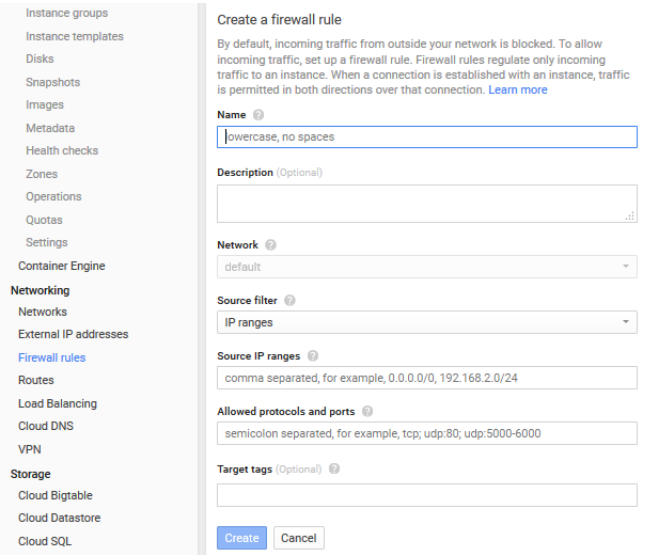
Figure 97. The New Network is Created



9 From the network list, select a network for which you want to add or configure firewall rules.

10 To add a firewall rule, click **Add firewall rule**. The *Create a firewall rule* screen appears.

Figure 98. Creating a Firewall Rule



11 In *Name*, type the name of the rule.

12 In *Description*, provide a brief description about the rule.

13 In *Network*, type the network address.

14 In *Source filter*, select *Allow from any source*.

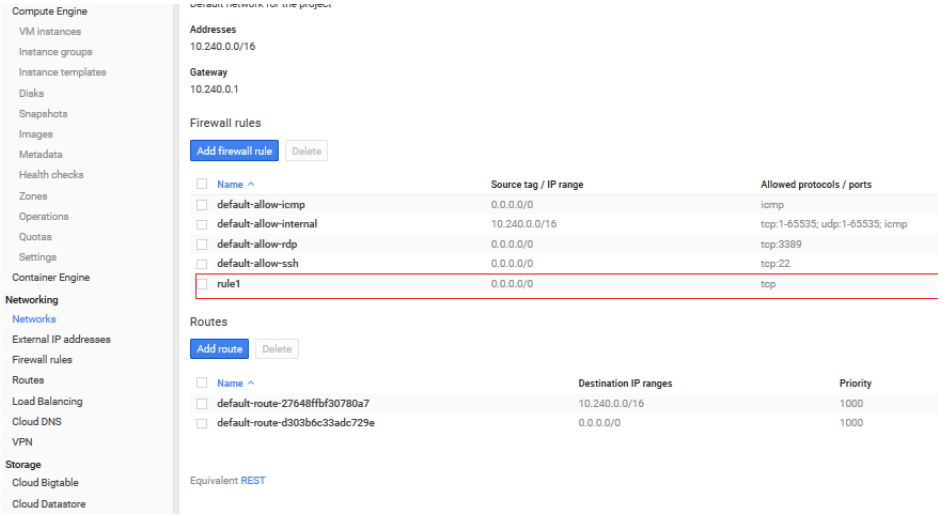
15 In *Source IP ranges*, type the range.

16 In *Allowed protocols and ports*, type the protocols and ports that will be allowed.

17 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.

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

Figure 99. Adding Firewall Rules



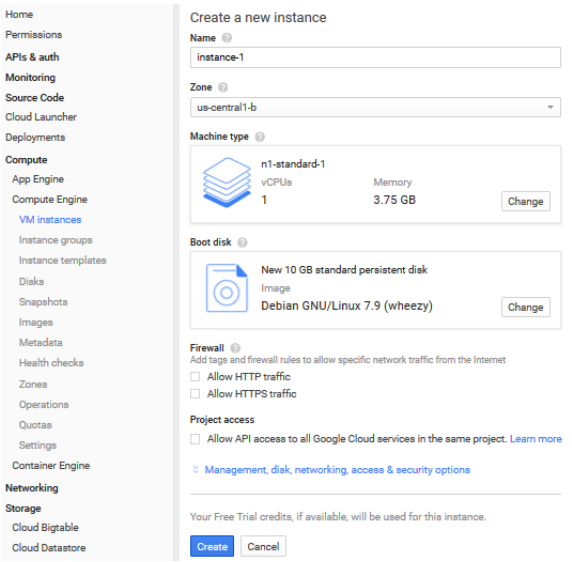
Creating Virtual Machine (VM) Instances

Follow these steps to create new VM instances:

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

2 Click **Create instance**. The *Create a new instance* screen appears.

Figure 100. Creating a new VM Instance

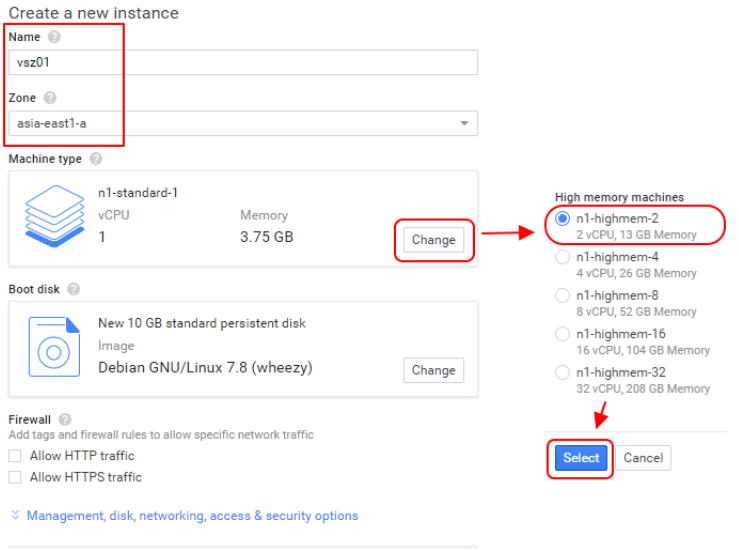


3 In *Name*, type the name of the VM instance.

4 In *Zone*, select a zone from the drop-down list.

5 In *Machine type*, *CPU* and *Memory* are selected by default. To modify, click **Change**. The *Select a machine type* screen appears.

Figure 101. Select a Machine Type



6 Click **Select**.

7 In *Boot disk*, a standard image is selected by default. To modify, click **Change**. The *Boot disk* screen appears.

8 From *Your image*, select the image you want to include.

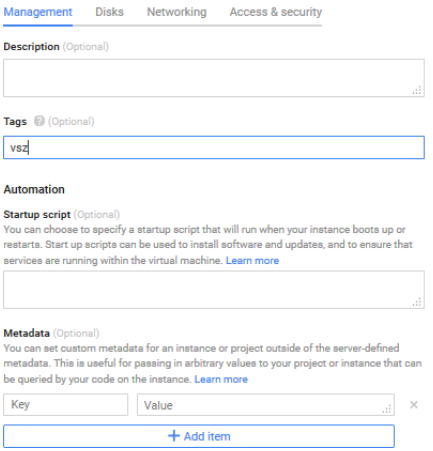
9 Click **Select**.

10 In *Firewall*, select the options as appropriate.

11 In *Project access*, allow API access as appropriate.

12 In *Management*, type the values as appropriate.

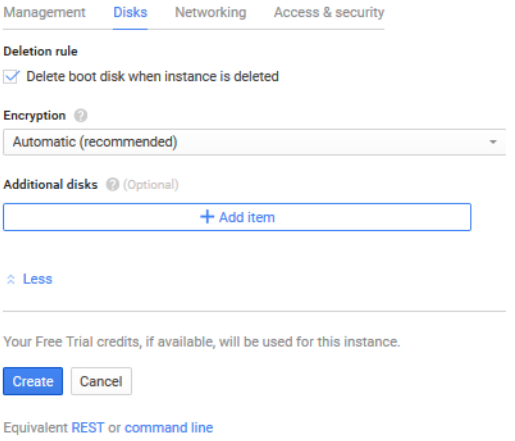
Figure 102. VM Management



NOTE: Ensure that the tag provided is the same as the one provided while creating a firewall rule. This ensures port mapping happens correctly.

13 In *Disk*, select the options as appropriate.

Figure 103. VM Disk Configuration



14 In *Networking*, select the options as appropriate.

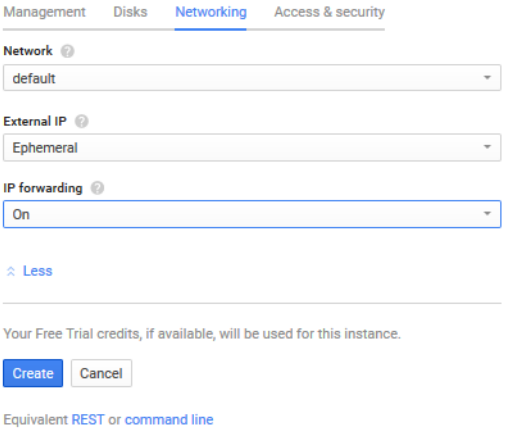
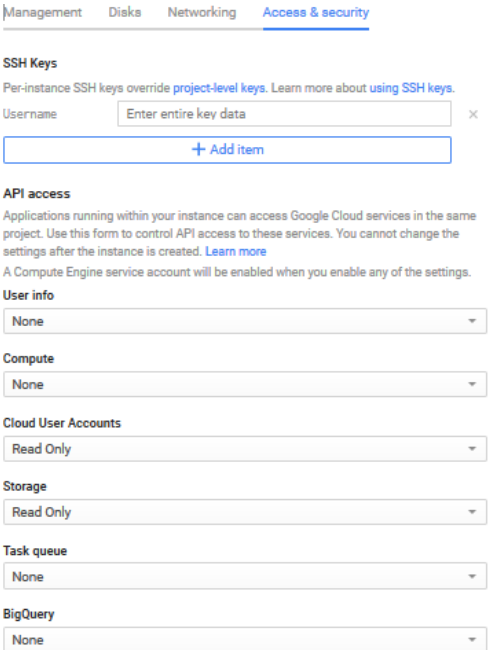


Table 8. External IP Address Options for VM Network Configuration

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

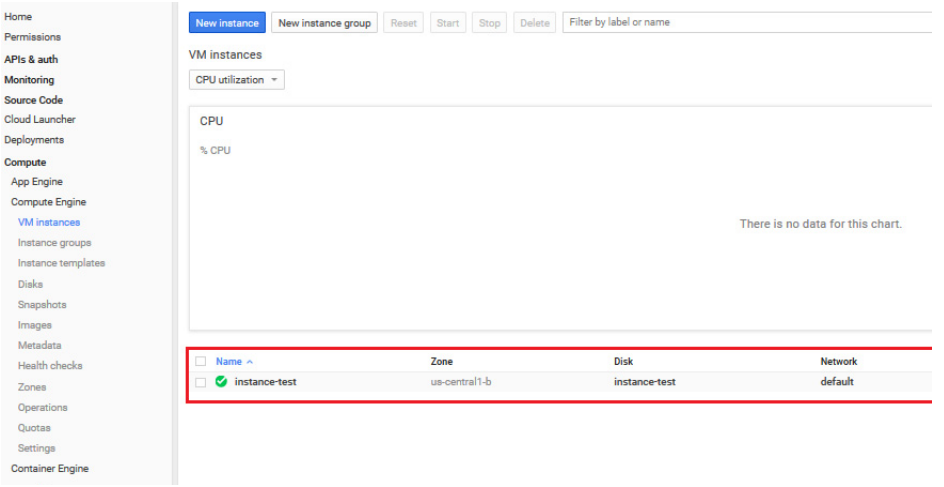
15 In *Access and security*, select the options as appropriate.

Figure 104. VM Access and Security Configuration



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

Figure 105. New VM is Created



Configuring the Virtual Machine Interfaces

5

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

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

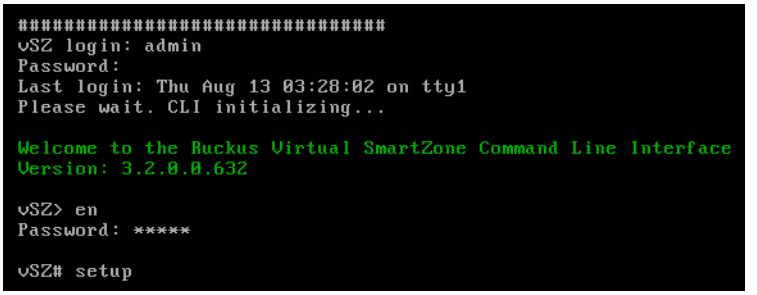
Setting Up th vSZ with One Interface

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

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 following prompt:

   ```
   Do you want to setup network? [YES/no]
   ```

Figure 106. At the vSZ> prompt, enter setup



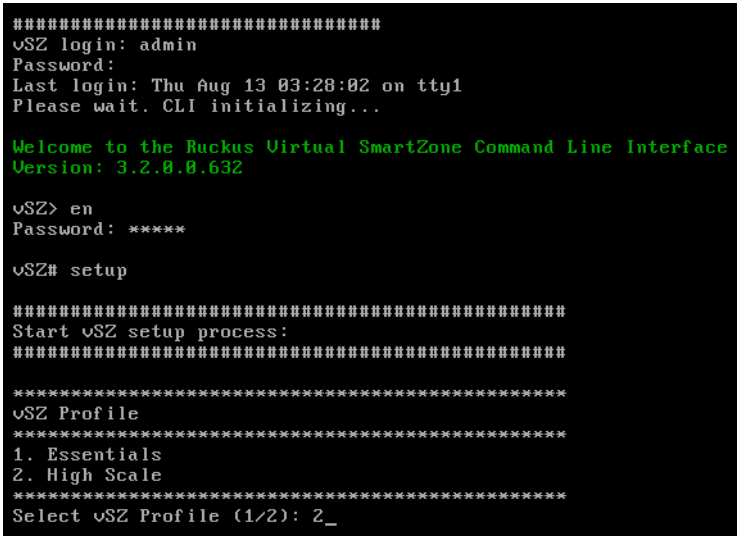
5 Enter **YES**. The next screen prompts you to select the profile configuration that you want to use for this instance of vSZ. The options include:

- (1) High-Scale
- (2) Essentials

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

NOTE: 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 107. Enter the number that corresponds to the profile that you want to deploy



7 At the `Select IP Version Support` prompt, enter one of the following options:

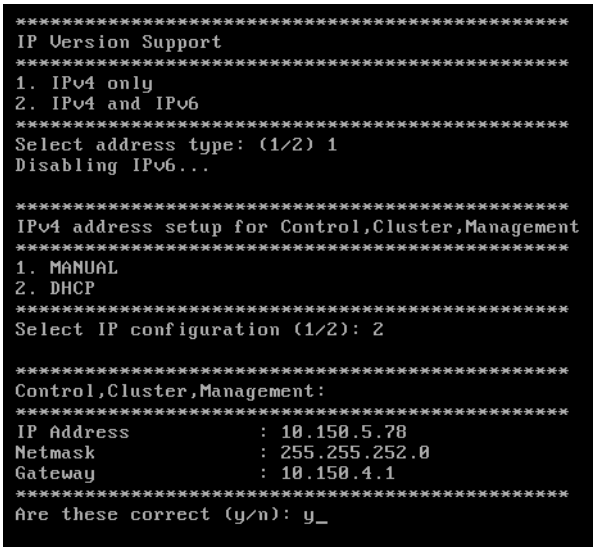
- 1: IPv4 Only
- 2: IPv4 and IPv6

8 At the `Select IP configuration` prompt, enter **`1`** to set up the single vSZ interface (for Control [AP], Cluster, and Management [Web]) manually.

9 Configure the IP address, netmask, and gateway of the *control interface*, and the press **<Enter>**. The IP address configuration that you entered appears.

10 When the prompt `Are these correct? (y/n)` appears, enter **`y`** to confirm the IP address configuration.

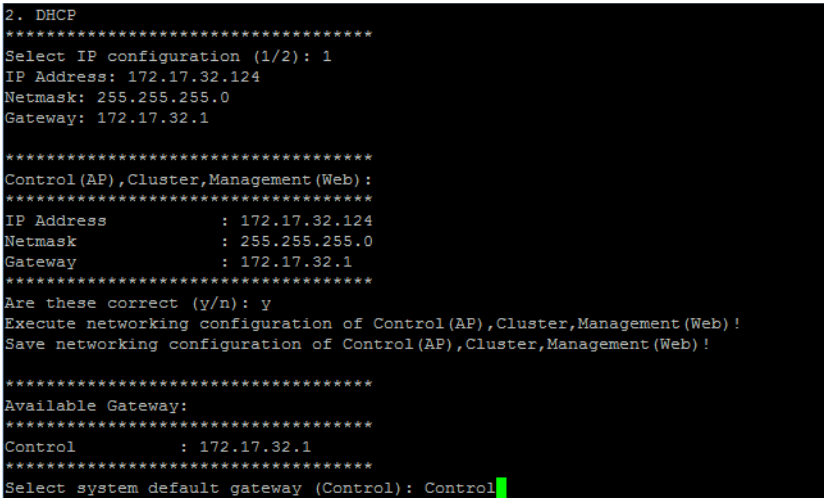
Figure 108. Configure the IP address settings of the single interface



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

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

Figure 109. When prompted for the system default gateway, enter Control



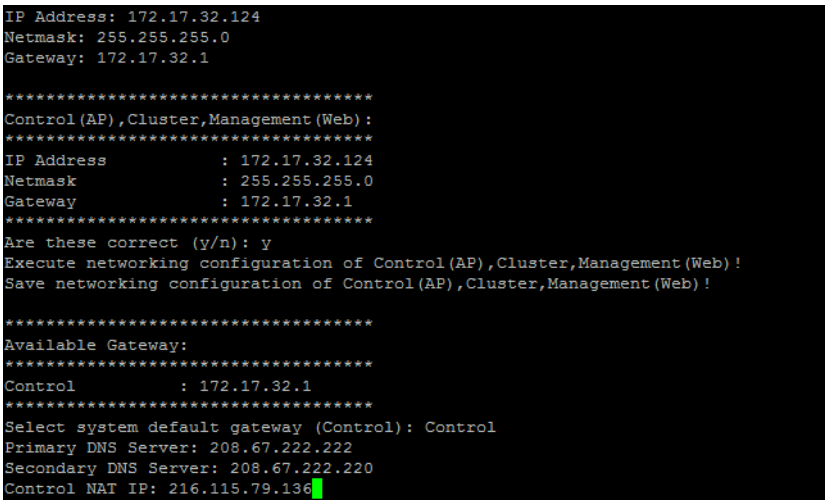
12 At the `Primary DNS Server` prompt, enter the primary DNS server on the network.

13 At the `Secondary DNS Server` prompt, enter the secondary DNS server (if any) on the network.

14 At the `Control NAT IP` prompt, enter the public IP address of the NAT server on the network. If you are not deploying the vSZ behind a NAT server, press `<Enter>` without typing an IP address.

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

Figure 110. Enter the public IP address of the NAT server (if any)



15 Enter **`restart network`**.

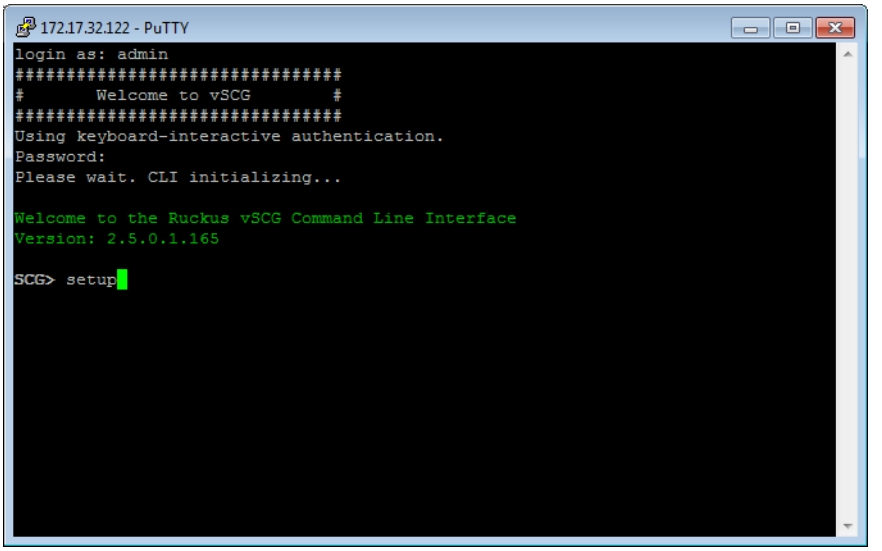
You have completed configuring the vSZ interfaces. You are now ready to run the vSZ Setup Wizard. See Using the Setup Wizard to Install vSZ.

Setting Up the vSZ with Three Interfaces

1 Log on to the console using the following credentials:
   - User name: admin
   - Password: admin
2 At the *vSZ*> prompt, enter **`en`** to enable privileged mode.
3 At the `Password` prompt, enter **`admin`**. The vSZ# prompt appears.
4 Enter **`setup`**. The console displays the current network settings (if any), and then displays the following prompt:

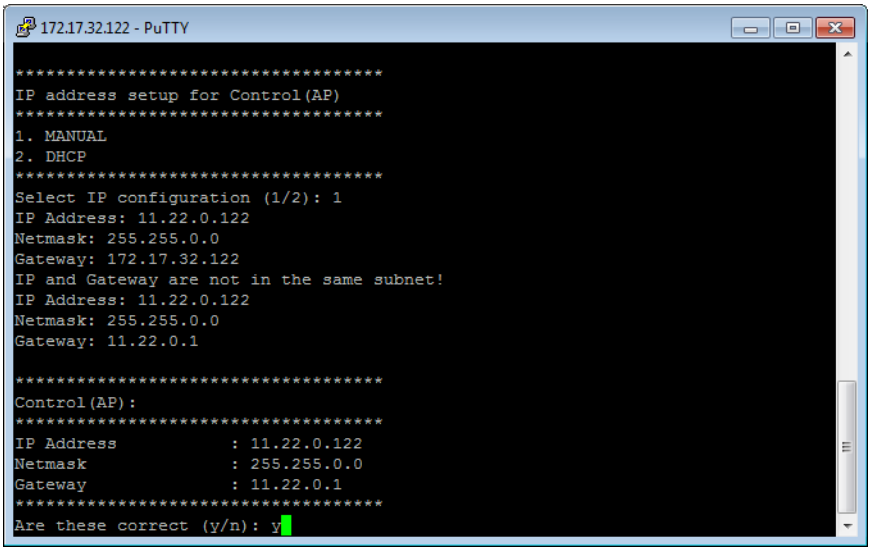
   `Do you want to setup network? [YES/no]`

Figure 111. At the vSZ> prompt, enter setup



5 At the `Select IP configuration` appears 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.
   - **b** When the message *Are these correct?* appears, enter **`y`** to confirm the IP address configuration.

Figure 112. 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.

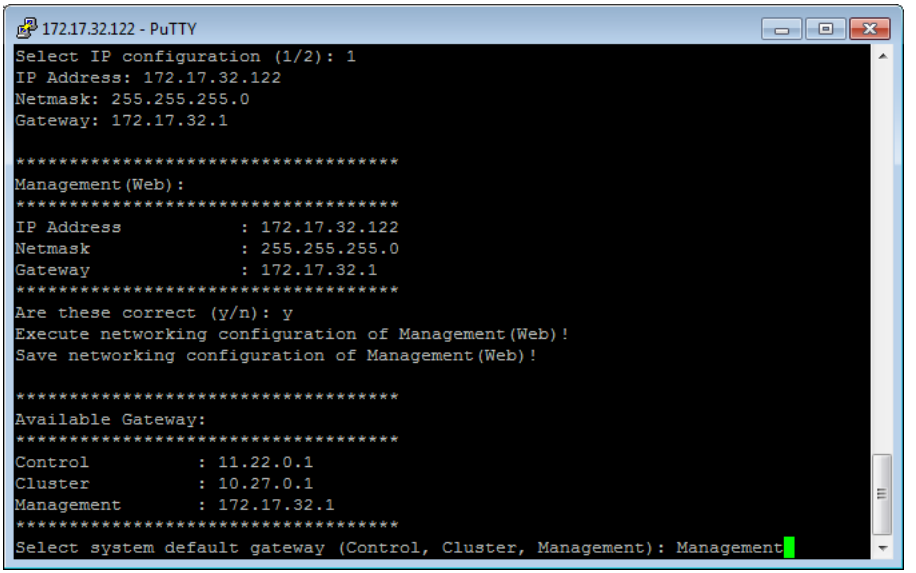
NOTE: Take note of the IP address that you assign to the management interface – you will use this IP address to log on to the vSZ web interface.

   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).

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

Figure 113. When prompted for the system default gateway, enter either Management or Control (depending on your network design)



9 When prompted, enter the primary and secondary DNS server IP addresses.

10 Enter **`restart network`**.

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

Important Notes About Selecting the System Default Gateway

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

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

Using the Setup Wizard to Install vSZ

6

In this chapter:

Before You Begin

The Setup Wizard helps you perform the initial configuration of the vSZ by presenting the vSZ configuration options in a set of easy-to-complete screens.

The Setup Wizard will prompt you to select one of the two available profile configurations (High-Scale profile and Essentials profile). You must select the profile configuration that corresponds to the vSZ license that you purchased.

Before you start the Setup Wizard, make sure you know the profile configuration that you need to select. If you are unsure which profile configuration you need to select, contact Ruckus Wireless Support.

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

Step 1: Start the Setup Wizard and Set the Language

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

Step 3: Configure the Management IP Address Settings

Step 4: Configure the Cluster Settings

Step 5: Set the Administrator Password

Step 6: 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

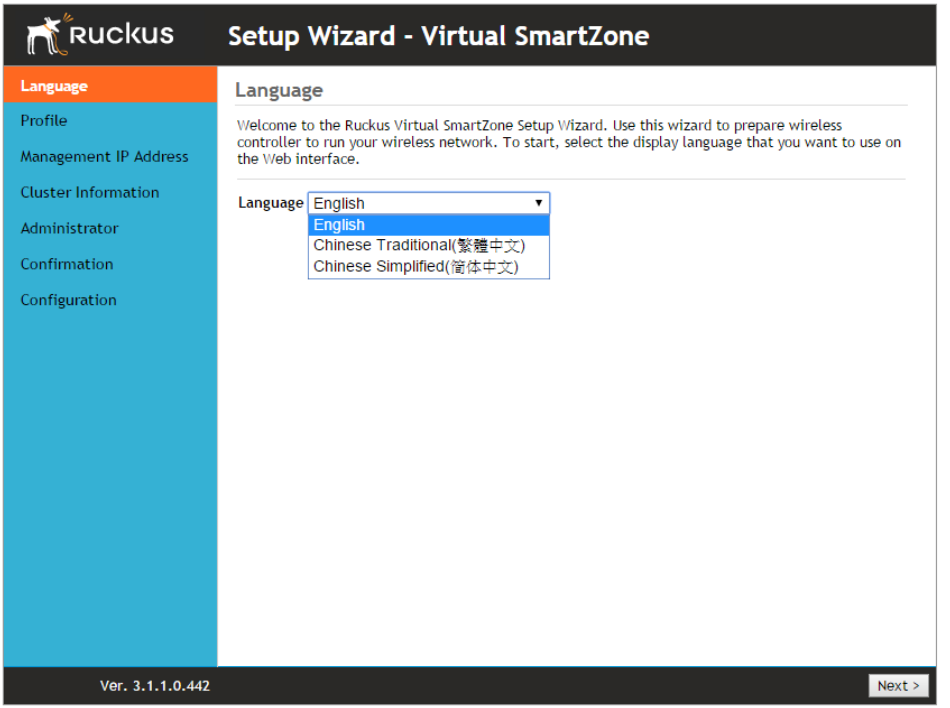
1 Start your web browser, and then enter the following in the address bar:

`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 114. 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.

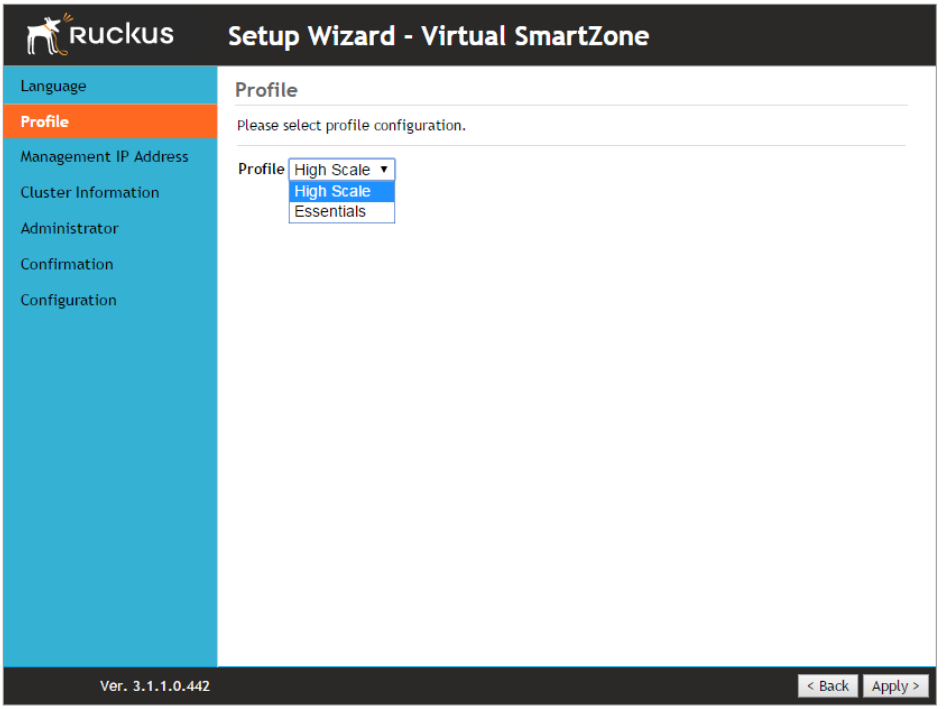
Step 2: Select the Profile Configuration That Corresponds to Your vSZ License

1 Select the profile configuration that corresponds to the vSZ license that you purchased. Available profile configurations include:

- High Scale
- Essentials

2 Click **Apply**. The message `Applying profile` appears, and then the *Management IP* page appears.

Figure 115. The Profile page



Step 3: Configure the Management IP Address Settings

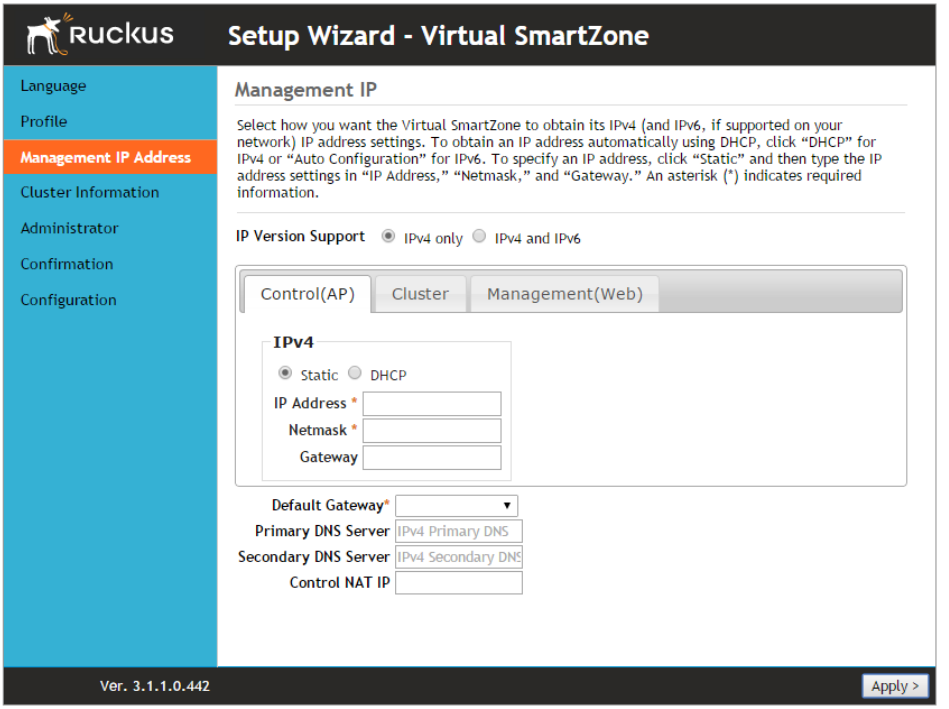
NOTE: The vSZ comes in either a single network interface or three network interfaces (one interface each for Control (AP), Cluster, and Management (Web) traffic). The following procedure assumes that the vSZ you are installing uses a single network interface.

WARNING! 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.

Figure 116. 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.

NOTE: Although it is possible to use DHCP to assign IP address settings to the Control interface automatically, Ruckus Wireless strongly recommends assigning a static IP address to this interface.

The following network settings are required (others are optional):

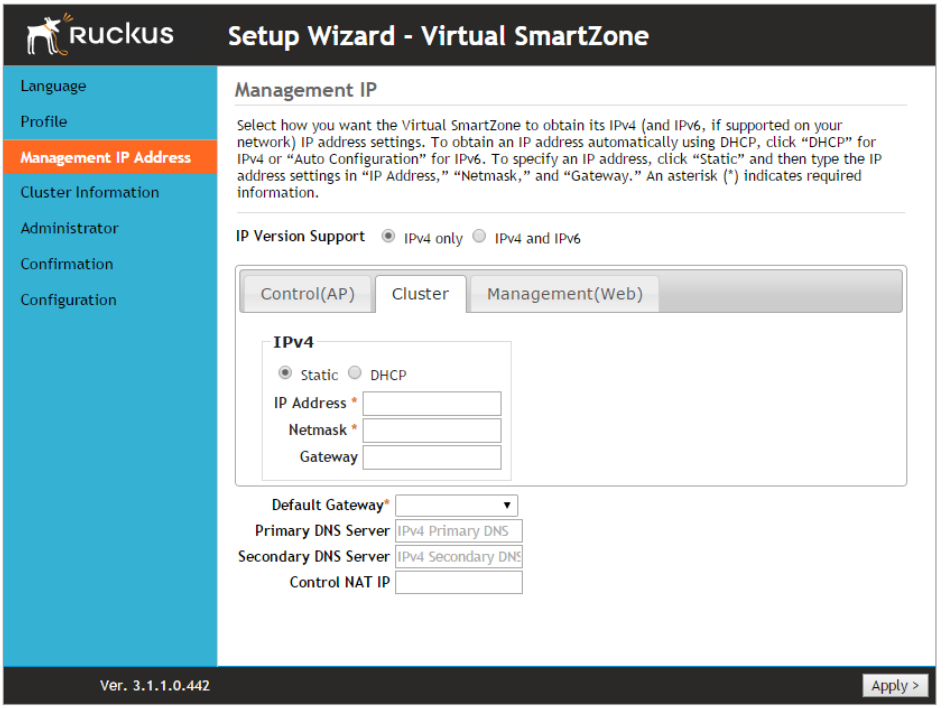
- IP address
- Netmask
- Default gateway

b If you clicked **IPv4 and IPv6** at the beginning of this procedure, under the *IPv6* section, click **Auto Configuration** if you want the 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`

c Click the *Cluster* tab when done.

Figure 117. The Cluster tab



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

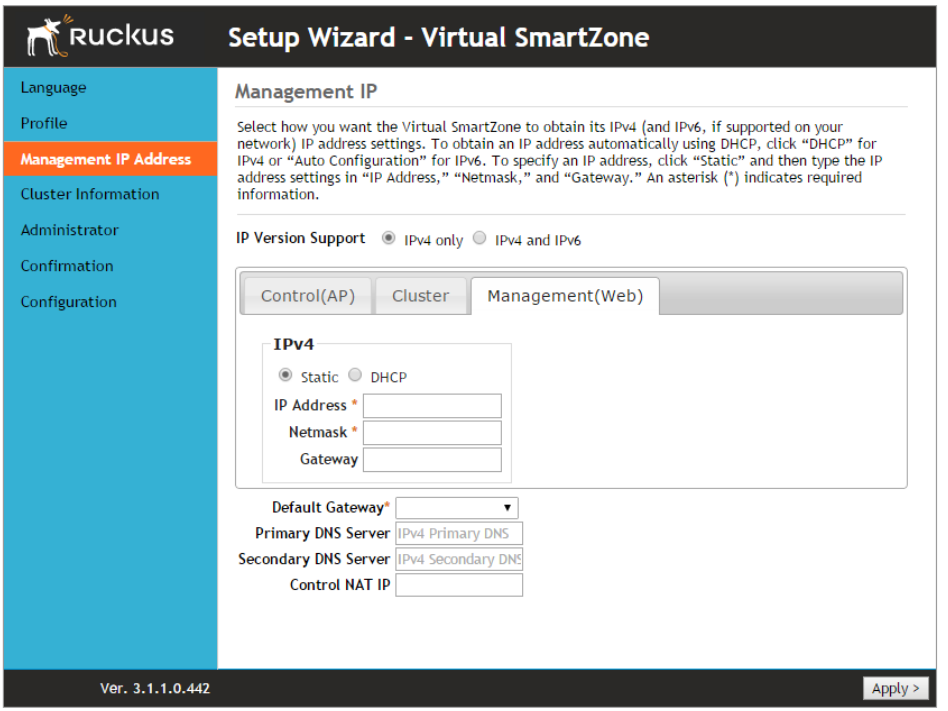
NOTE: Although it is possible to use DHCP to assign IP address settings to the Cluster interface automatically, Ruckus Wireless strongly recommends assigning a static IP address to this interface.

The following network settings are required (others are optional):

- IP address
- Netmask
- Default gateway

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

Figure 118. The Management (Web) tab



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

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

NOTE: Although it is possible to use DHCP to assign IP address settings to the Control interface automatically, Ruckus Wireless strongly recommends assigning a static IP address to this interface.

The following network settings are required (others are optional):

- IP address
- Netmask
- Default gateway

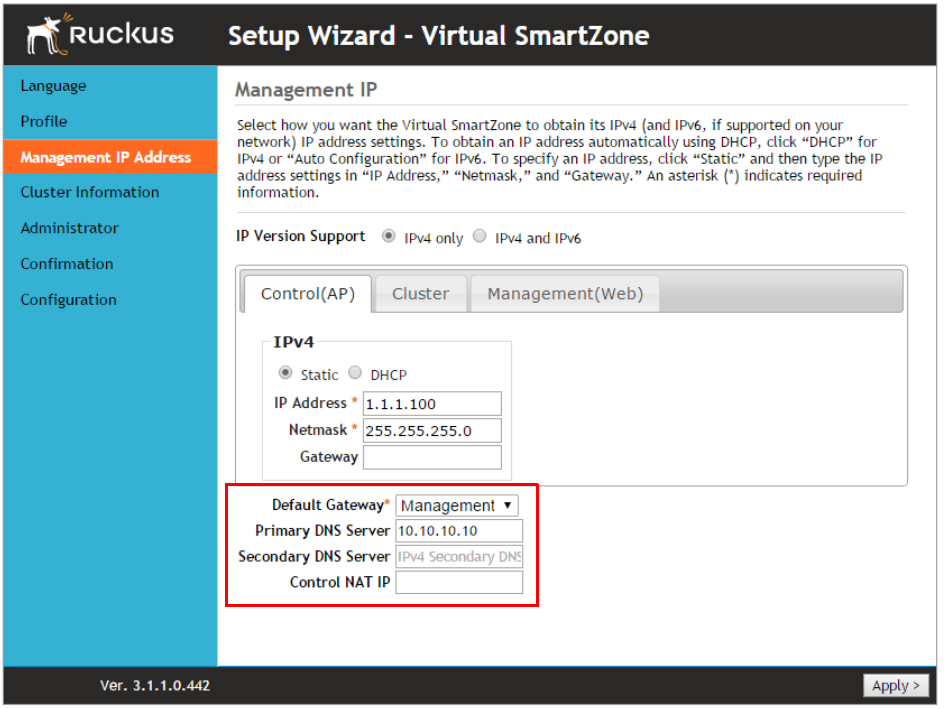
b If you clicked **IPv4 and IPv6** at the beginning of this procedure, under the *IPv6* section, click **Auto Configuration** if you want the management (web) interface to obtain its IP address from Router Advertisements (RAs) or from a DHCPv6 server on the network. If you want to manually assign the IPv6 network address, click **Static**, and then set the values for the following:

- *IP address* (IPv6): Enter an IPv6 address (global only) with a prefix length (for example, `1234::5678:0:C12/123`). Link-local addresses are unsupported.
- *Gateway*: Enter an IPv6 address (global or link-local) without a prefix length. Here are examples:
  - Global address without a prefix length: `1234::5678:0:C12`
  - Link-local address without a prefix length: `fe80::5678:0:C12`

5 At the bottom of the screen (see Figure 119), select the interface that you want to set as the default system gateways for IPv4 and IPv6 (if enabled), and then type the primary and secondary DNS server addresses.

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

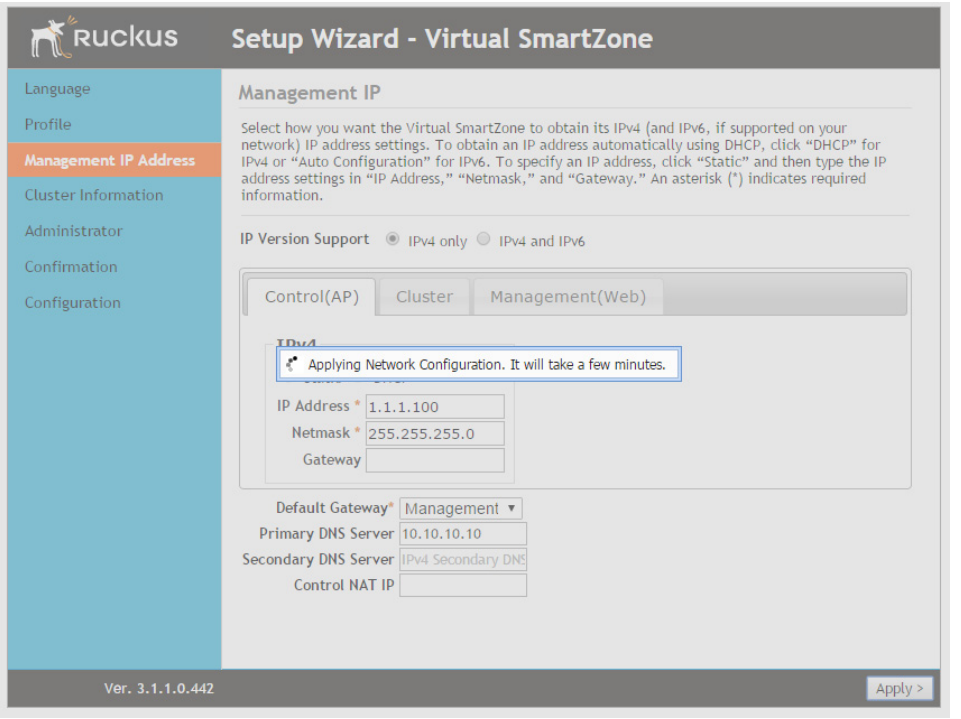
Figure 119. Select the IPv4 and IPv6 (if enabled) default system gateways



6 Check the network settings that you have configured on the *Control*, *Cluster*, and *Management* tabs and the default gateway that you have selected. Verify that they are all correct.

7 Click the **Apply** to continue. The controller validates and applies the network settings that you have configured.

Figure 120. The controller validates and applies the network settings you have configured



CAUTION! It may take the controller up to 15 minutes to activate its interfaces. If an error message appears after you apply the network interface settings, wait at least 15 minutes, and then try again.

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

8 Update the IP address settings of the administrative computer with the same subnet settings that you assigned to the *Management (Web)* interface (see Step 4).

Continue to Step 4: Configure the Cluster Settings.

Important Notes About Selecting the Gateway

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

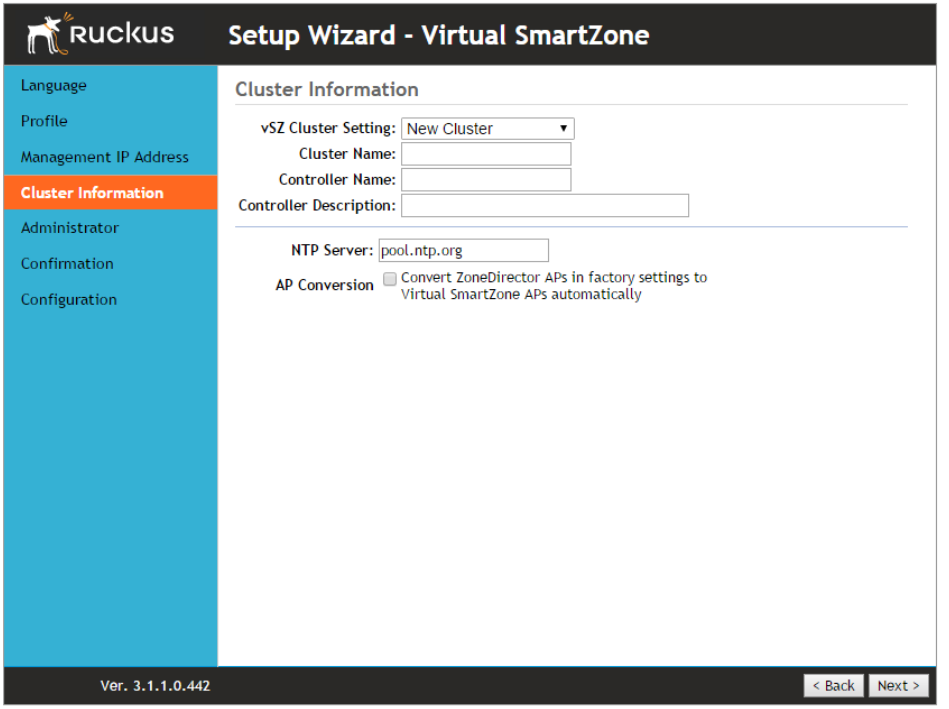
- If all of the managed APs are located in different locations on the Internet, the controller may not know all of the IP subnets of these APs. In this case, the control interface should be set as the default system gateway of the controller and you will need to add a static route to reach the management 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 system gateway of the controller and set static routes for the controller to reach all of its managed APs.

Step 4: Configure the Cluster Settings

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

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

Figure 121. The Cluster Information page, showing the New Cluster option



If This vSZ Is Forming a New Cluster

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

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

- In *vSZ Cluster Setting*, select **New Cluster**.
- In *Cluster Name*, type a name that you want to assign to this new cluster.

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, $, *, #, !).

- In *Controller Name*, type a name for the vSZ controller in this new cluster.
- In *Controller Description*, type a description for the vSZ controller.
- In *NTP Server*, type the address of the NTP server from which members of the cluster will obtain and synchronize time. The default NTP server is `pool.ntp.org`.

CAUTION! Before continuing, verify that the cluster settings are correct. Once the cluster is created, you will be unable to edit its settings without rebuilding the cluster from scratch.

2 Click **Next** to continue to the *Administrator* page (see Step 5: Set the Administrator Password).

If This vSZ Is Joining an Existing Cluster

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

CAUTION! 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.

CAUTION! 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.

Follow these steps to configure this vSZ 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.

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 (optional)*, type a name that you want to assign to this new controller.

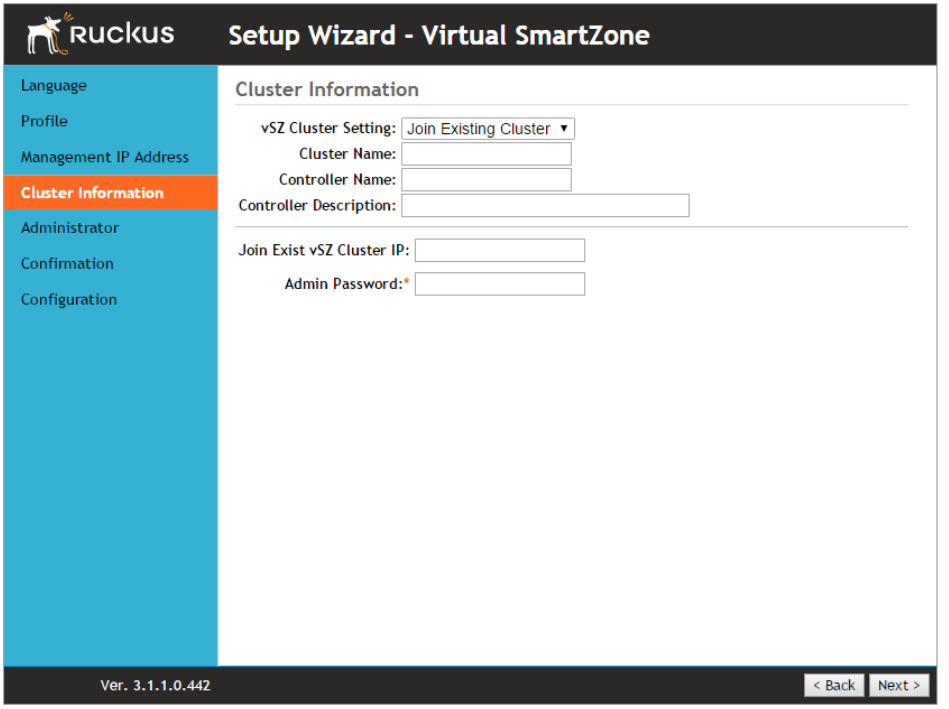
4 In *Controller Description*, type a description for this new controller.

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 5: Set the Administrator Password.

Figure 122. The Cluster Information page, showing the Join Existing Cluster option



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

Step 5: Set the Administrator Password

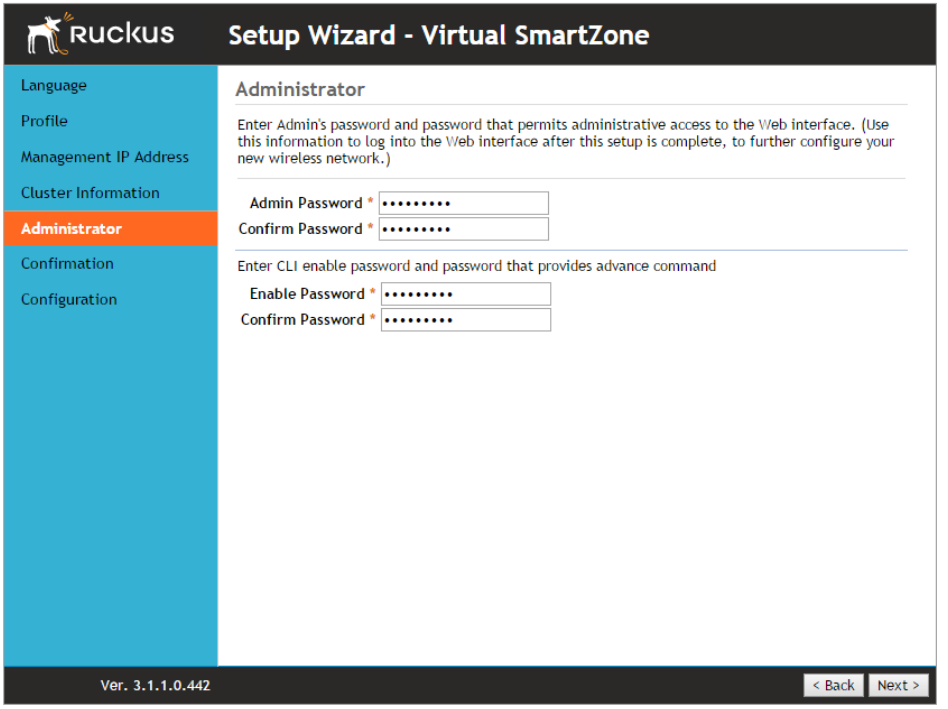
1 On the *Administrator* page, configure the web interface and CLI passwords. All fields are required.

- *Admin Password*: Type a password that you want to use to access the web interface.
- *Confirm Password*: Retype the password above to confirm.
- *Enable Password*: Type a password that you want to use to enable CLI access to the vSZ.
- *Confirmation Password*: Retype the password above to confirm.

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

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

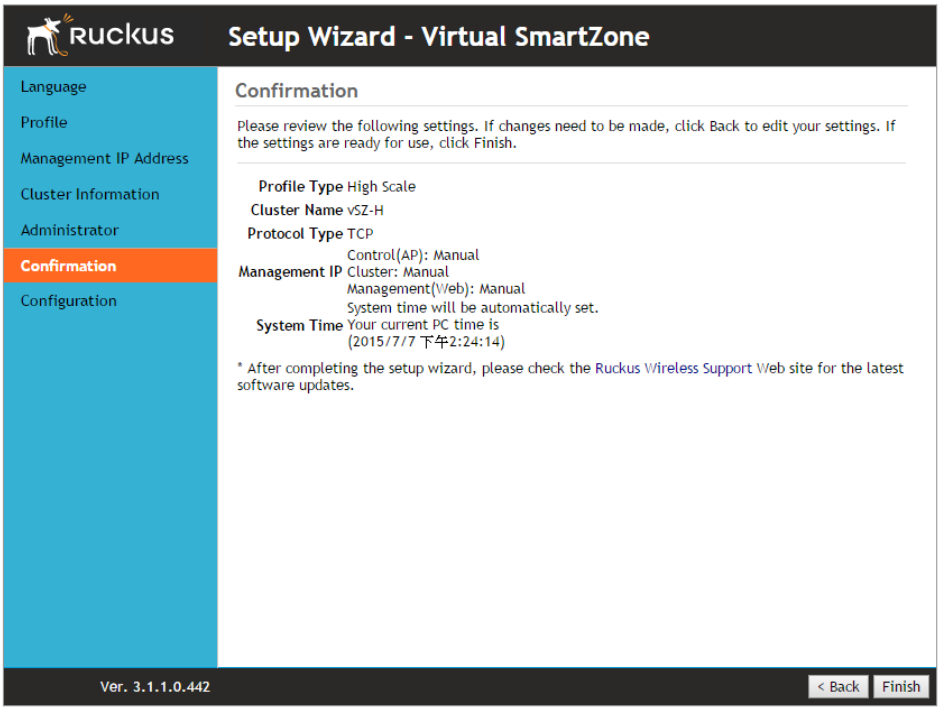
Figure 123. Set the web interface and CLI passwords



Step 6: Verify the Settings

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

Figure 124. The Confirmation page

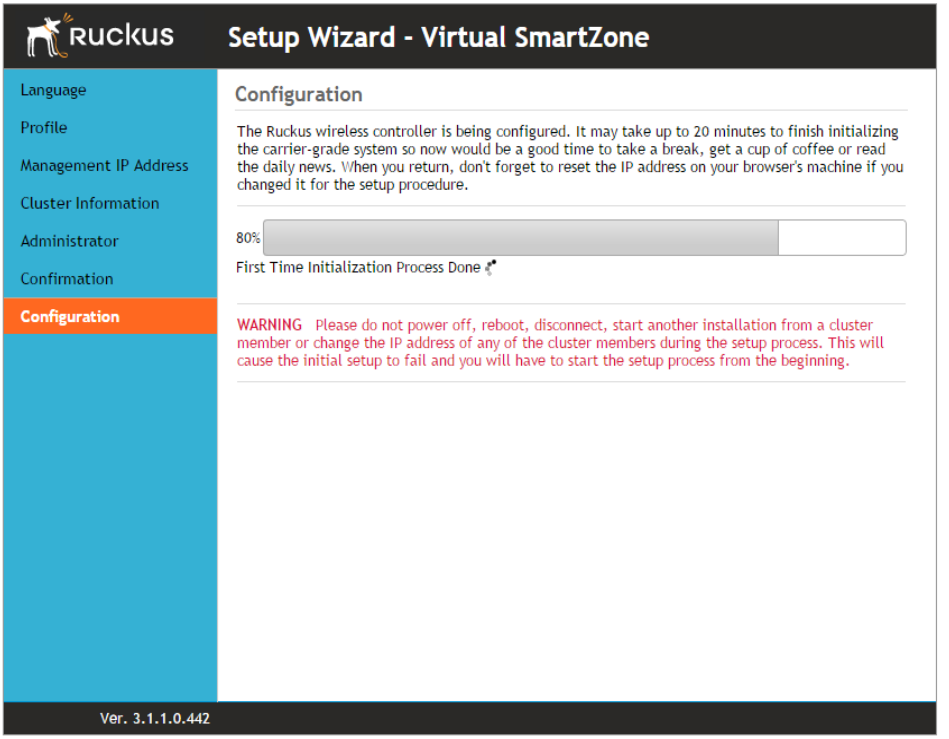


NOTE: If you find an incorrect setting, click the **Back** button until you reach the related page, and then edit the settings. When you finish editing the settings, click the **Next** button until you reach the *Confirmation* page again.

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 appliance.

Figure 125. 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 vSZ 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.

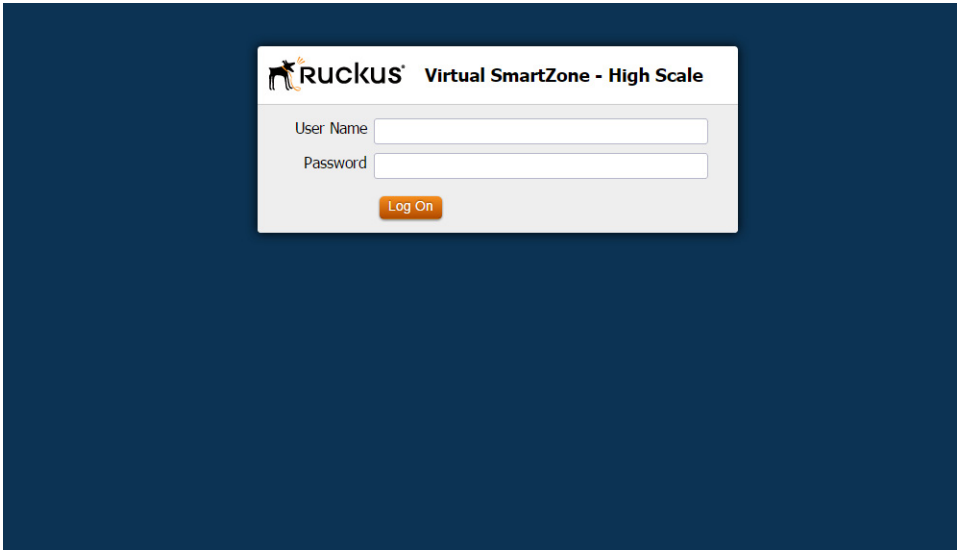
2 In the address bar, enter the IP address that you assigned to the Management (Web) interface and append a colon and `8443` (vSZ management port number) at the end of the address.

For example, 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 web interface logon page appears.

Figure 126. vSZ web interface logon page



3 Log on to the vSZ web interface using the following logon details:

- User Name: **`admin`**
- Password: **`{the password that you set when you ran the vSZ Setup Wizard}`**

4 Click **Log On**.

The web interface refreshes, and then displays the vSZ dashboard page, which indicates that you have logged on successfully.

You are now ready to configure the vSZ.

Configuring the vSZ High-Scale for the First Time

7

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

In this chapter:

Creating an AP Zone

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

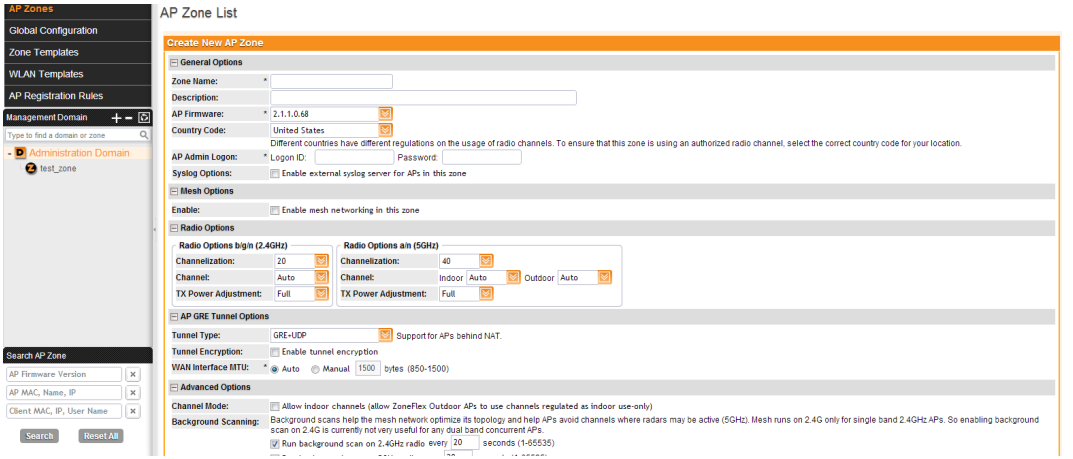
A zone called `Staging Zone` exists by default. Any AP that registers with the vSZ that is not assigned a specific zone is automatically assigned to the `Staging Zone`.

Follow these steps to create a new AP zone.

1 Click **Configuration** > **AP Zones**.

2 Click **Create New**.

Figure 127. Creating a new AP zone



3 Configure the options listed in Table 9.

Table 9. Configuration options in the Create New Zone form

Option	Description
General Options	
Zone Name	Type a name that you want to assign to this new zone.
Description	Type a description for this new zone.
AP Firmware	Displays the latest AP firmware available on the vSZ. If you want this zone to use a different firmware, click **Change**, and then select a firmware from the list.

Table 9. Configuration options in the Create New Zone form (Continued)

Option	Description
Country Code	Different countries and regions maintain different rules that govern which channels can be used for wireless communications. Set the country code to the proper regulatory region ensures that your vSZ network does not violate local and national regulatory restrictions.
AP Admin Logon	Specify the user name and password that administrators can use to log on directly to the managed access point's native web interface. The following boxes are provided: • *Logon ID*: Type the admin user name. • *Password*: Type the admin password.
Syslog Options	If you have a syslog server on the network and you want the vSZ to send syslog data to it, select the **Enable external syslog server for APs in this zone** check box. The following boxes are provided: • *IP Address:* Type the IP address of the syslog server. • *Port*: Type the port number that has been opened on the server for syslog data. The default port number is 514.
Mesh Options	
Enable	Select the **Enable mesh networking in this zone** check box if you want managed devices that belong to this zone to be able to form a mesh network automatically.
Radio Options	
Radio Options b/g/n (2.4GHz)	Configure the following 2.4GHz radio options: • *Channelization*: Select either 20MHz or 40MHz channel width. • *Channel*: Select Auto or manually assign a channel for the 2.4GHz radio. • *TX Power Adjustment*: Manually set the transmit power on all 2.4GHz radios (default is Full).

Table 9. Configuration options in the Create New Zone form (Continued)

Option	Description
Radio Options a/n (5GHz)	Configure the following 5GHZ radio options: • *Channelization*: Select either 20MHz or 40MHz channel width. • *Channel (Indoor and Outdoor)*: Select Auto or manually assign channels to the indoor and outdoor 5GHz radios. • *TX Power Adjustment*: Manually set the transmit power on all 5GHz radios (default is **Full**).
AP GRE Tunnel Options	
Tunnel Type	Select a protocol to use for tunneling WLAN traffic back to the vSZ. Options include **Ruckus GRE** and **SoftGRE**.
Tunnel Profile	Select the tunnel profile that you want to use. If you want to use Ruckus GRE tunneling for this AP zone, you can use the default tunnel profile or you can select a profile that you created. If you want to use Soft GRE tunneling, you must first create a Soft GRE tunnel profile. NOTE: Instructions for creating Ruckus GRE and Soft GRE tunnel profiles are provided in the *Administrator Guide* for this release.
Advanced Options	
Channel Mode	If you want to allow outdoor APs that belong to this zone to use wireless channels that are regulated as indoor use only, select the **Allow indoor channels** check box.
Background Scanning	If you want APs to automatically evaluate radio channel usage, enable and configure the background scanning settings on both the 2.4GHz and 5GHz radios. By default, background scanning is enabled on both radios and set to run every 20 seconds.

Table 9. Configuration options in the Create New Zone form (Continued)

Option	Description
Client Load Balancing	Improve WLAN performance by enabling load balancing. Load balancing spreads the wireless client load between nearby access points, so that one AP does not get overloaded while another site idles. Load balancing must be enabled on a per-radio basis. To enable load balancing, select the **Enable load balancing on [2.4GHz or 5GHz]** check box, and then set or accept the default *Adjacent Radio Threshold* (50dB for the 2.4GHz radio and 43dB for the 5GHz radio).
Smart Monitor	To disable the WLANs of an AP (that belongs to this zone) whenever the AP uplink or Internet connection becomes unavailable, select the **Enable** check box. And then, configure the following options: • *Health Check Interval*: Set the interval (between 5 and 60 seconds) at which the vSZ will check the AP's uplink connection. The default value is 10 seconds. • *Health Check Retry Threshold*: Set the number of times (between 1 and 10 times) that the vSZ will check the AP's uplink connection. If the vSZ is unable to detect the uplink after the configured number of retries, the vSZ will disable the AP's WLANs. The default value is 3 retries. NOTE: When the vSZ disables the AP's WLANs, the AP creates a log for the event. When the AP's uplink is restored, the AP sends the event log (which contains the timestamp when the WLANs were disabled, and then enabled) to the vSZ.

4 Click **Create New** to finish creating your first AP Zone. When the vSZ completes creating the AP zone, the following confirmation message appears:

```
AP zone created successfully. Do you want to view the zone
information?
```

5 Click **Yes** to view the zone details, or click **No** to close the confirmation message and return to the zone list.

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

Configuring AAA Servers and Hotspot Settings

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

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

AAA servers and hotspot settings must be configured on a per-AP zone basis.

Adding an AAA Server

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

1 Go to **Configuration** > **AP Zones**.

2 Click the AP zone for which you want to add an AAA server. Alternatively, click the AP zone from the *Management Domains* tree.

3 Under the *AP Zones* menu on the sidebar, click **AAA**.

4 Click **Create New**. The *Create New RADIUS Server* form appears.

5 In the *General Options* section, configure the following settings:

- *Name*: Type a name for the AAA server that you are adding.
- *Description*: Type a description for the AAA server that you are adding.
- *Type*: Click either **RADIUS** or **RADIUS Accounting**, depending on the type of RADIUS server that you are using.
- *Backup RADIUS*: If a backup RADIUS server exists on the network, you may enable RADIUS backup support by selecting the **Enable backup RADIUS support** check box.

6 Configure the options in the Health Check Policy section. These options define the health monitoring settings of the primary RADIUS server by the secondary RADIUS server. The secondary RADIUS is responsible for monitoring the health of the primary RADIUS and for periodically synchronizing its settings to match those of the primary RADIUS.

- *Response Window*: Set the time (in seconds) during which the secondary RADIUS must wait for a response from the primary RADIUS. If the secondary RADIUS does not receive a response during the defined Response Window, the Zombie Period (see below) is started for the primary RADIUS. The default Response Window is 20 seconds.
- *Zombie Period*: Set the time (in seconds) during which the secondary RADIUS must wait for a response from the primary RADIUS before marking it as "down". If the secondary RADIUS does not receive a response during the defined Zombie Period, the Revive Interval (see below) is started for the primary server. The default Zombie Period is 40 seconds. If the primary RADIUS still does not respond when the Zombie Period expires, it will be marked as down and the secondary RADIUS will start receiving new requests from the Network Access Server (NAS).
- *Revive Interval*: Set the time (in seconds) during which the secondary RADIUS must wait for the primary RADIUS to start responding to requests again. If the primary RADIUS starts responding before the Revive Interval expires, new requests will be forwarded to the primary RADIUS again. The default Revive Interval is 120 seconds.
- *No Response Fail*: Click **Yes** to respond with a reject message to the NAS if no response is received from the RADIUS server. Click **No** to skip sending a response.

7 In the *Primary Server* section, configure the following settings:
- *IP Address*: Type the IP address of the AAA server.
- *Port*: Type the AAA port number. The default AAA port number is 1812.
- *Shared Secret*: Type the AAA shared secret.
- *Confirm Secret*: Retype the AAA shared secret that you typed above.

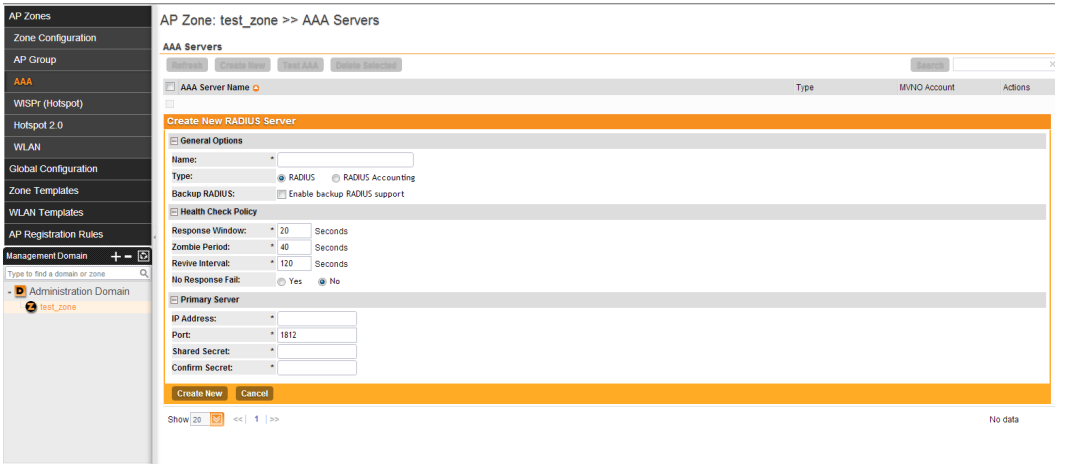
8 If you selected the **Enable backup RADIUS support** check box, the *Secondary Server* section is visible. Configure the following *Secondary Server* settings:
- *IP Address*: Type the IP address of the secondary AAA server.
- *Port*: Type the AAA port number. The default AAA port number is 1812.
- *Shared Secret*: Type the AAA shared secret.
- *Confirm Secret*: Retype the AAA shared secret that you typed above.

9 Click **Create New**. The following message appears to confirm that you have successfully added the AAA server to the vSZ:

```
Authentication server created successfully.
```

The page refreshes, and then the AAA server that you created appears under the *AAA Servers Configuration* section.

Figure 128. The Create New RADIUS Server form



Creating a Hotspot Service

NOTE: If you do not want to provide a hotspot service to users, skip this step.

NOTE: Before creating a hotspot, you need to create a user defined interface. For information on how to create a user defined interface, see the *Administrator Guide* for release 2.5.

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

Follow these steps to create a hotspot service for an AP zone.

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

5 Configure the hotspot service settings listed in Table 10.

Table 10. Hotspot service settings

Setting	Description
General Options	
Name	Type a name for this new hotspot service that you are creating.
Description	Type a description for this new hotspot service (for example, `Main Office Lobby`).
Type	Click **Registered Users** if you want only users with existing profiles on the vSZ to be able to connect to this hotspot. Click **Guest-Access** if you want guest users to be able to connect to this hotspot.
Redirection	
Smart Client Support	• **None**: Click to disable Smart Client support. • **Enable**: Click to enable Smart Client support. • **Only Smart Client allowed**: Click to allow only Smart Clients to access this hotspot service.
Logon URL	Type the URL of the subscriber portal (the page where hotspot users can log in to access the service). For more information, see the section "Configuring the Logon URL" in the *Administrator Guide* for release 2.5.
Start Page	Set where users will be redirected after logging in successfully. You could redirect them to the page that they want to visit, or you could set a different page where users will be redirected (for example, your company website).
User Session	
Session Timeout	Set a time limit after which users will be disconnected from the hotspot service and required to log on again. Allowed session timeout range is between 2 and 14400 minutes. The default value is 1440 minutes.
Grace Period	Allow disconnected users a grace period after disconnection, during which clients will not need to re-authenticate. Allowed grace period range is between 1 and 14399 minutes. The default value is 60 minutes.

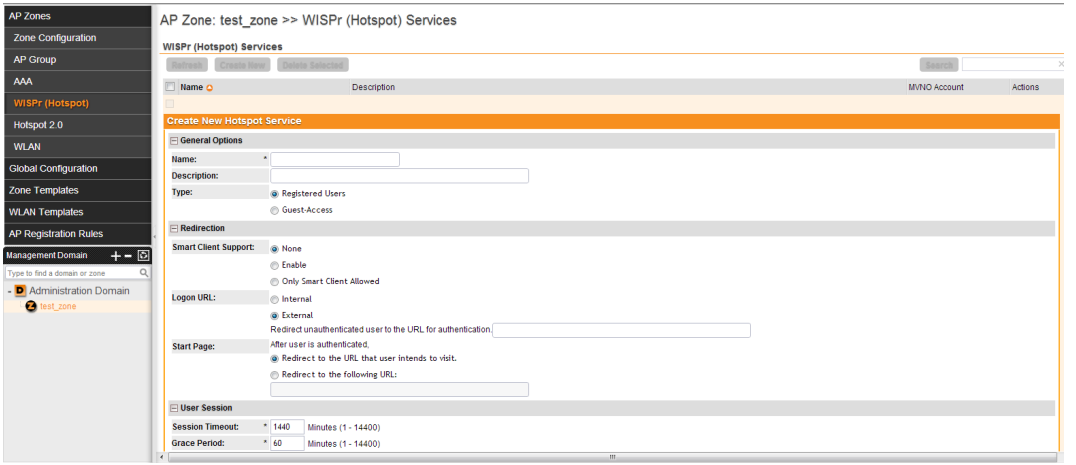
Table 10. Hotspot service settings (Continued)

Setting	Description
Location Information	
Location ID	Type a location ID for the hotspot, for example: `isocc=us,cc=1,ac=408,network=ACMEWISP_NewarkAirport`
Location Name	Type a location name for the hotspot, for example: `ACMEWISP,Gate_14_Terminal_C_of_Newark_Airport`
Walled Garden	Click **Create New** to add a walled garden, which is a limited environment to which an unauthenticated user is given access for the purpose of setting up an account. In the box provided, type a URL or IP address to which you want to grant unauthenticated user access. You can add up to 128 network destinations to the walled garden. Network destinations can be any of the following: • IP address (for example, `10.11.12.13`) • Exact website address (for example, `www.ruckuswireless.com`) • Website address with regular expression (for example, `*.ruckuswireless.com`, `*.com`, `*`) After the account is established, the user is allowed out of the walled garden. URLs will be resolved to IP addresses. Users will not be able to click through to other URLs that may be presented on a page if that page is hosted on a server with a different IP address. Avoid using common URLs that are translated into many IP addresses (such as `www.yahoo.com`), as users may be redirected to re-authenticate when they navigate through the page.

6 Click **Create New**.

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

Figure 129. The Create New Hotspot Service form



Creating a Registration Rule

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

Follow these steps to create a registration rule.

1 Go to **Configuration** > **AP Zones**.

2 On the sidebar on the left, click **AP Registration Rules**. The *AP Registration Rules* page appears.

3 Click **Create New**. A form appears.

4 In *Rule Description*, type a name that you want to assign to this rule.

5 In *Rule Type*, click the basis upon which you want to create the rule. Options include:

- *IP Address*: If you select this option, type the *From* (starting) and *To* (ending) IP address that you want to use.
- *Subnet Mask*: If you select this option, type the IP address and subnet mask pair to use for matching.
- *GPS Coordinates*: If you select this option, type the GPS coordinates to use for matching. Access points that have been assigned the same GPS coordinates will be automatically assigned to the AP zone that you will choose in the next step.

- *Provision Tag*: If the access points that are joining the vSZ have been configured with provision tags, click the **Provision Tag** option, and then type a tag name in the *Provision Tag* box. Access points with matching tags will be automatically assigned to the AP zone that you will choose in the next step.

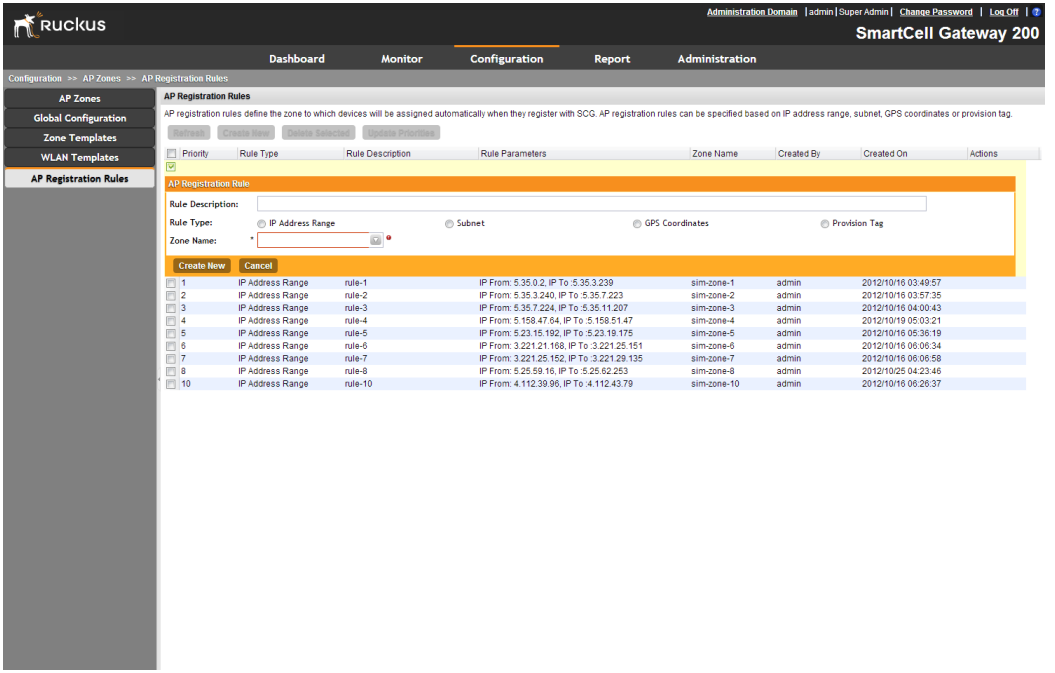
NOTE: Provision tags can be configured on a per-AP basis from the access point's command line interface.

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

7 Click **OK.**

You have completed creating an AP registration rule.

Figure 130. Creating an AP registration rule



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

Configuring the Rule Priority

The vSZ applies registration rules in the same order as they appear in the AP Registration Rules table (highest to lowest priority). If you want a particular registration rule to have higher priority, you must move it up the table. Once an AP matches a registration rule, the vSZ assigns the AP to the zone specified in the rule and stops processing the remaining rules.

Follow these steps to configure the rule priority.

1 Go to **Configuration** > **AP Zones**.

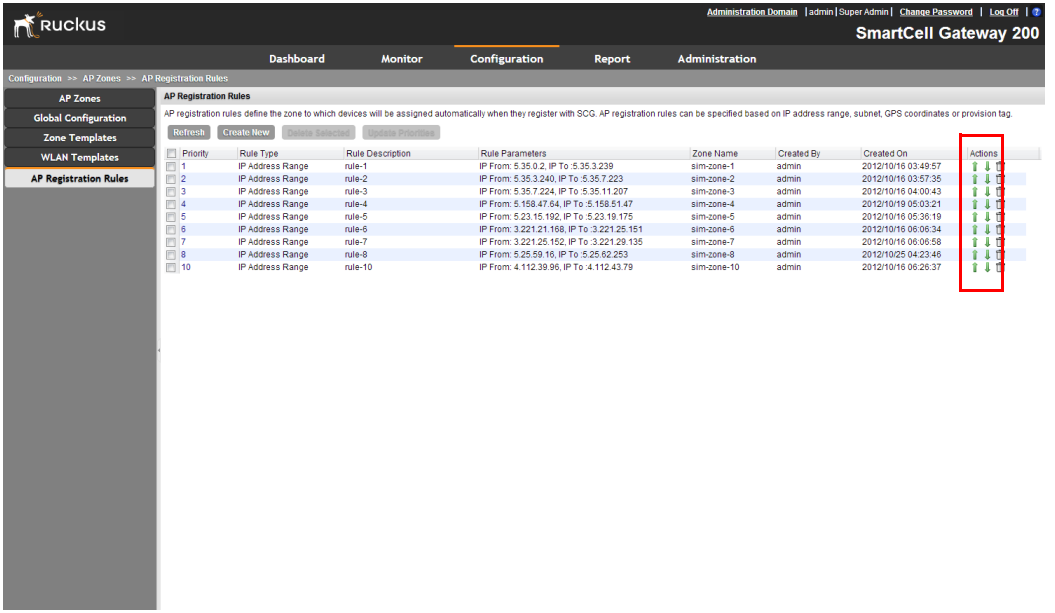
2 On the sidebar on the left, click **AP Registration Rules**. The AP Registration Rules page appears and displays the rules that you have created.

3 Change the priority of each registration rule as required.

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

4 When you finish configuring the rule priority, click **Update Priorities** to save your changes.

Figure 131. Change the rule priority by clicking the up-arrow or down-arrow



Defining the WLAN Settings of an AP Zone

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

1. Go to **Configuration** > **AP Zones**.
2. Click the AP zone for which you want to add the WLAN settings. Alternatively, click the AP zone from the *Management Domains* tree.
3. Under the *AP Zones* menu on the sidebar, click **WLAN**.
4. Click **Create New**. The *Create New WLAN Configuration* form appears.
5. Configure the WLAN settings listed in Table 11. You can find a detailed description of each setting in the succeeding sections.

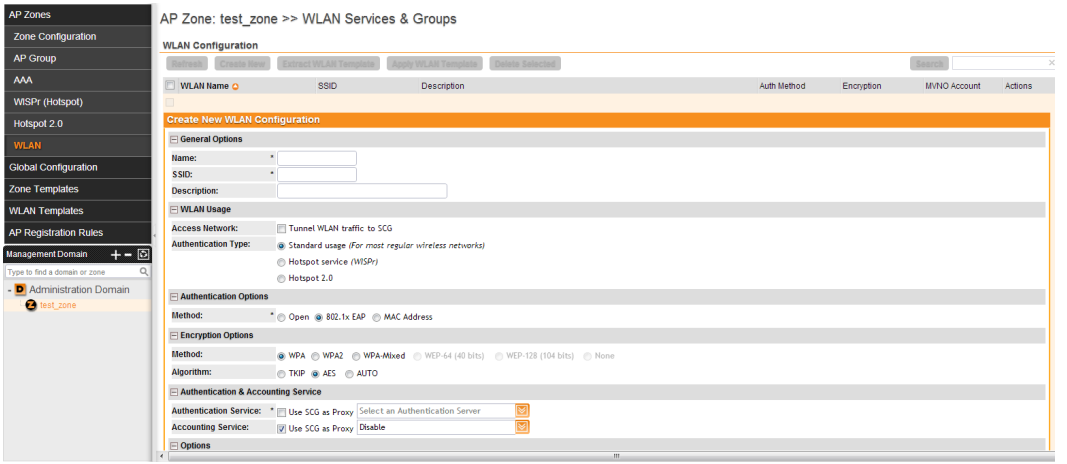
Table 11. Overview of WLAN settings

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

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

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

Figure 132. Configuring the WLAN settings of an AP zone



General Options

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

WLAN Usage

- In *Access Network*, select the Tunnel WLAN traffic to vSZ check box if you want to tunnel the traffic from this WLAN back to the vSZ. Tunnel mode enables wireless clients to roam across different APs on different subnets. If the WLAN has clients that require uninterrupted wireless connection (for example, VoIP

devices), Ruckus Wireless recommends enabling tunnel mode. When you enable this option, you need to select core network for tunneling WLAN traffic back to the vSZ.

- In *Authentication Type*, click one of the following options:
  - **Standard usage (For most regular wireless networks)**: This is a regular WLAN suitable for most wireless networks.
  - **Hotspot service (WISPr)**: Click this option if want to use a hotspot (WISPr) service that you previously created.
  - **Hotspot 2.0**: Click this option if you want to use a Hotspot 2.0 profile that you previously created.
  - **Guest Access**: Click this option if you want to use this WLAN for guest access.

Authentication Options

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

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

Encryption Options

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

Method

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

CAUTION! If you set the encryption method to WEP-64 (40 bit) or WEP-128 (104 bit) and you are using an 802.11n AP for the WLAN, the AP will operate in 802.11g mode.

Algorithm (For WPA or WPA2 Encryption Only)

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

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

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

WEP Key/Passphrase

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

Authentication & Accounting Service

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

Options

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

RADIUS Options

NOTE: The *RADIUS Options* section only appears when *Authentication Type* (under *WLAN Usage*) is set to **Standard usage (For most regular wireless networks)**.

- *RADIUS NAS ID*: Select how the RADIUS server will identify the AP:
  - WLAN BSSID
  - AP MAC
  - User-defined
- *RADIUS NAS Request Timeout*: Type the timeout period (in seconds) after, which an expected RADIUS response message is considered to have failed.
- *RADIUS NAS Max Number of Retries:* Type the number of failed connection attempts after which the vSZ will fail over to the backup RADIUS server.
- *RADIUS NAS Reconnect Primary*: If the vSZ fails over to the backup RADIUS server, this is the interval (in minutes) at which the vSZ will recheck the primary RADIUS server if it is available. The default interval is 5 minutes.
- *Call STA ID*: Use either WLAN BSSID or AP MAC as the station calling ID. Select one.

Advanced Options

- *Rate Limiting*: Rate limiting controls fair access to the network. When enabled, the network traffic throughput of each network device (client) is limited to the rate specified in the traffic policy, and that policy can be applied on either the uplink or downlink.

  Toggle the Uplink and/or Downlink drop-down lists to limit the rate at which WLAN clients upload/download data. The “Disabled” state means rate limiting is disabled; thus, traffic flows without prescribed limits.
- *Access VLAN*: By default, all wireless clients associated with APs that the vSZ is managing are segmented into a single VLAN (with VLAN ID 1). If you want to tag this WLAN traffic with a different VLAN ID, enter a valid VLAN ID (2-4094) in the box. Select the **Enable Dynamic VLAN** check box to allow the vSZ to assign VLAN IDs on a per-user basis. Before enabling dynamic VLAN, you need to define on the RADIUS server the VLAN IDs that you want to assign to users.
- *Hide SSID*: Click this option if you do not want the ID of this WLAN advertised at any time. This will not affect performance or force the WLAN user to perform any unnecessary tasks.

- *Proxy ARP*: When enabled on a WLAN, the AP provides proxy service for stations when receiving neighbor discovery packets (for example, ARP requests and ICMPv6 Neighbor Solicit messages), and acts on behalf of the station in delivering ARP replies. When the AP receives a broadcast ARP/Neighbor Solicit request for a known host, the AP replies on behalf of the host. If the AP receives a request for an unknown host, it forwards the request at the rate limit specified
- *Max Clients*: Limit the number of clients that can associate with this WLAN per AP (default is 100). You can also limit the total number of clients that a specific AP (or radio, on dual radio APs) will manage.
- *802.11d*: The 802.11d standard provides specifications for compliance with additional regulatory domains (countries or regions) that were not defined in the original 802.11 standard. Enable this option if you are operating in one of these additional regulatory domains.
- *DHCP Option 82*: When this option is enabled and an AP receives a DHCP request from a wireless client, the AP will encapsulate additional information (such as VLAN ID, AP name, SSID and MAC address) into the DHCP request packets before forwarding them to the DHCP server. The DHCP server can then use this information to allocate an IP address to the client from a particular DHCP pool based on these parameters.
- *Client TX/RX Statistics*: Select the **Ignore statistics from unauthorized clients** check box if you do not want the vSZ to monitor traffic statistics for unauthorized clients.
- *Inactivity Timeout*: Select the check box and enter a value in minutes (6 to 600 minutes) after which idle clients will be disconnected.
- *Client Fingerprinting*: If you select this check box, the vSZ will attempt to identify client devices by their operating system, device type, and host name, if available. This makes identifying client devices easier on the Dashboard, Monitor and Client Details pages.
- *Disable WLAN*: Select this option to disable this WLAN service.

Configuring DHCP Option 43

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

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

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

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

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

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

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

OR

```
option space VendorInfo;
option VendorInfo.SCG code 6 = text;
```

CAUTION! Make sure that space characters exist in "6 = text". Omitting these space characters could result in AP connectivity issues.

5. Under the subnet section, insert the following lines:

```
Vendor-option-space VendorInfo;
```

```
option VendorInfo.WSG "{control-ip-address-or-fqdn}"
```

OR

```
Vendor-option-space VendorInfo;
option VendorInfo.SCG "{control-ip-address-or-fqdn}"
```

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

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

The vSZ supports two formats for vendor information:

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

Inserting Multiple IP Addresses or URLs

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

- URL format
  - `option VendorInfo.WSG "https://10.2.0.87/wsg/ap,https://10.2.0.88/wsg/ap"`, or
  - `option VendorInfo.SCG "https://10.2.0.87/wsg/ap,https://10.2.0.88/wsg/ap"`
- IP address format
  - `option VendorInfo.WSG "10.2.0.87,10.2.0.88"`, or
  - `option VendorInfo.SCG "10.2.0.87,10.2.0.88"`

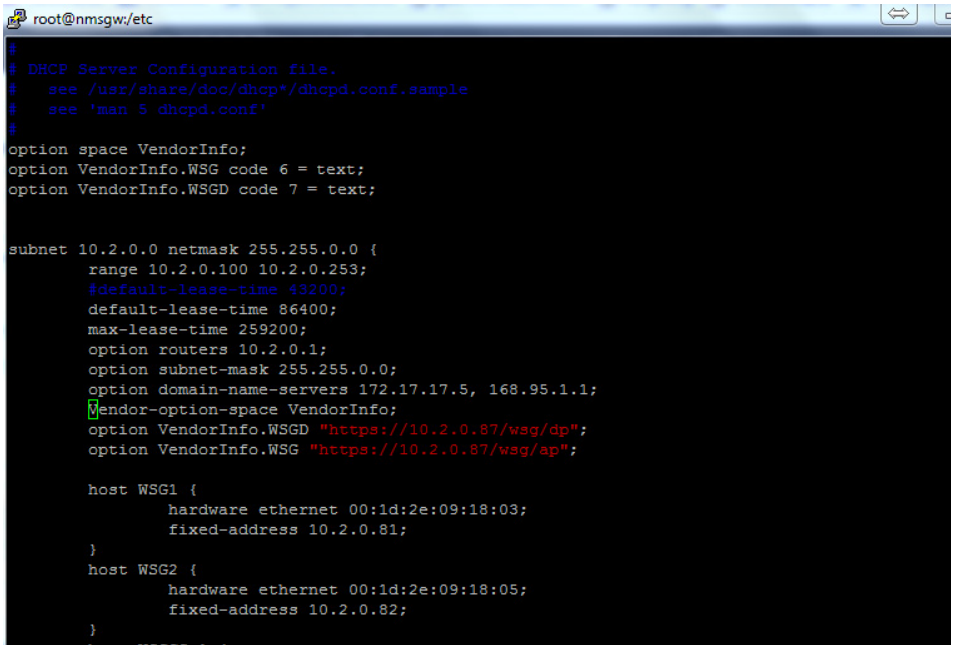
CAUTION! Take care not to insert any space characters before or after the comma (,) character that separates the multiple IP addresses or URLs.

6 Save the changes.

7 Restart the DHCP server to apply the new settings.

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

Figure 133. Editing dhcpd.conf



Verifying That Wireless Clients Can Associate with a Managed AP

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

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

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

   Your wireless client connects to the wireless network. After the wireless client connects to the wireless network successfully, the wireless client icon in the system tray changes to .
5. Start your web browser, and then enter `www.ruckuswireless.com` in the address bar.

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

What to Do Next

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

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

Ensuring That APs Can Discover the Controller on the Network

8

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

In this chapter:

Is LWAPP2SCG Enabled on the Controller?

All of the controller discovery methods described in this chapter require LWAPP2SCG (the application that enables APs to discover and be managed by a controller) to be installed and enabled on the controller. See Table 12 to check if your controller release includes the LWAPP2SCG application and whether it is enabled or disabled by default.

Table 12. LWAPP2SCG availability on each controller release

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

Obtaining the LWAPP2SCG Application

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

Enabling LWAPP2SCG

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

1 Log on to the controller's console.

2 Enter **`en`** to enable privileged mode.

3 Enter **`config`**.

4 Enter **`lwapp2scg`**.

5 Enter **`policy accept-all`**.

You have completed enabling the LWAPP2SCG application on the controller.

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

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

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

After you ensure that the controller's licenses have been activated on the SmartLicense server, you only need to connect the AP to the network, ensure that it has Internet connectivity, and then reboot the AP. Upon reboot, the AP will automatically attempt to discover its parent controller by sending the following HTTPS query to ap-registrar.ruckuswireless.com (the SmartLicense server URL):

```
https://ap-registrar.ruckuswireless.com/
controller?ap_mac=APMAC&ap_serial=APSERIAL
```

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

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

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

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

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

If you are deploying the AP and the controller on different subnets, let the AP perform auto discovery on the same subnet as the controller before moving the AP to another subnet. To do this, connect the AP to the same network as the controller. When the AP starts up, it will discover and attempt to register with the controller. Approve the registration request if auto approval is disabled. After the AP registers with the controller successfully, transfer it to its intended subnet. It will be able to find and communicate with the controller once you reconnect it to the other subnet.

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

Method 3: Register the Controller with the DNS Server

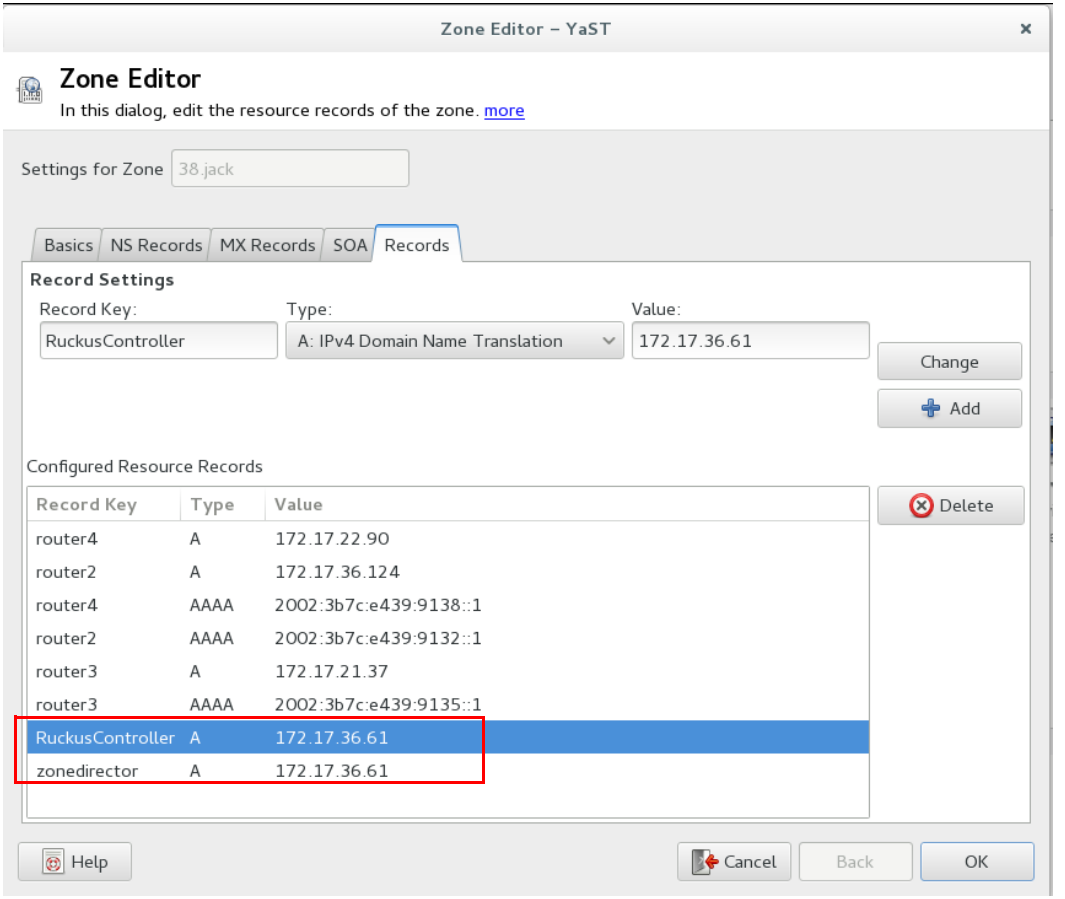
If you register the controller with your DNS server, supported APs that request IP addresses from your DHCP server will also obtain DNS related information that will enable them to discover controllers on the network. Using the DNS information they obtained during the DHCP request, APs will attempt to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

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

1 Open the DNS zone file, and then add two records with the following information:

- Record Key#1: RuckusController
  Type: A (IPv4 Domain Name Translation)
  Value: (IP address of the controller)
- Record Key#2: zonedirector
  Type: A (IPv4 Domain Name Translation)
  Value: (IP address of the controller)

Figure 134. Add records for “RuckusController” and “zonedirector” to the DNS zone file

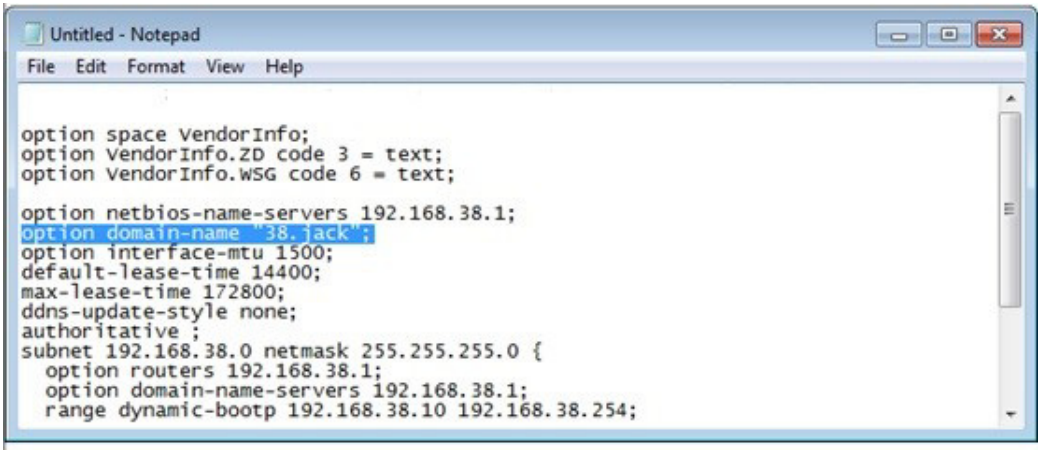


2 Save the zone file.

3 Open the DHCP configuration file, and then insert the DNS domain name in the DHCP configuration file. For example, if the DNS domain name is “38.jack”, insert the following line into the DHCP configuration file:

```
option domain-name "38.jack"
```

Figure 135. Insert option domain-name “38.jack”



4 Save the DHCP configuration file.

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

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

You have completed registering the controller with the DNS server.

Method 4: Configure DHCP Option 43 on the DHCP Server

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

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

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

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

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

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

1. Log on to your DHCP server via a console terminal (for example, PuTTY).
2. Go to **`/etc`** directory.
3. Run **`vi dhcpd.conf`**. This command opens the DHCP configuration file for editing.

4 At the beginning of the DHCP configuration file, insert the following lines:

```
option VendorInfo.WSG_sub6 code 6=text;
option VendorInfo.WSG_sub3 code 3=text;

option VendorInfo.WSG_sub6 "<Controller IP>";
option VendorInfo.WSG_sub3 "<Controller IP>";
```

For example, if you only have one controller on the network and its IP address is 120.0.0.3, then these lines in the DHCP configuration file should look like in Figure 136Sample DHCP Option 43 configuration.

Figure 136. Sample DHCP Option 43 configuration

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

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

If you have a two-node controller cluster on the network, use a comma to separate the control interface IP addresses in option VendorInfo.WSG, for example:

```
option VendorInfo.WSG "120.0.0.3,120.0.0.4"
```

where 120.0.0.3 is the control interface IP address of the first controller and 120.0.0.4 is the control interface IP address of the second controller.

5 Save the DHCP configuration file.

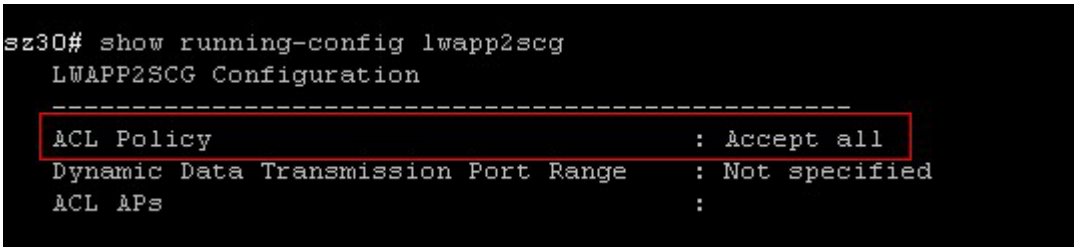
6 Restart the DHCP server to apply the new settings.

7 Verify that the LWAPP2SCG application is enabled on the controller. To verify, log on to the controller's CLI, and then enter the following command:

`show running-config lwapp2scg`

If LWAPP2SCG is enabled, the value for `ACL Policy` should show as `Accept all`.

Figure 137. “Accept all” indicates that LWAPP2SCG is enabled



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

a Enter **`config`**.

b Enter **`lwapp2scg`**.

c Enter **`policy`**.

d Enter one of the following commands:

- **`accept {MAC`**
- **`address}`**: Enter this command if you only want specific APs to be managed by the controller. See Figure 139.
- **`accept-all`**: Enter this command if you want all APs that discover the controller to be managed by it.

Figure 138. Options that appear after you enter the “policy” command

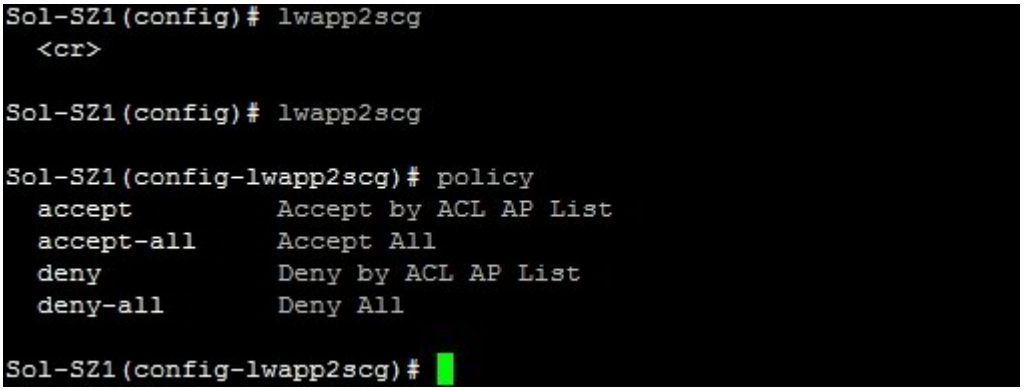
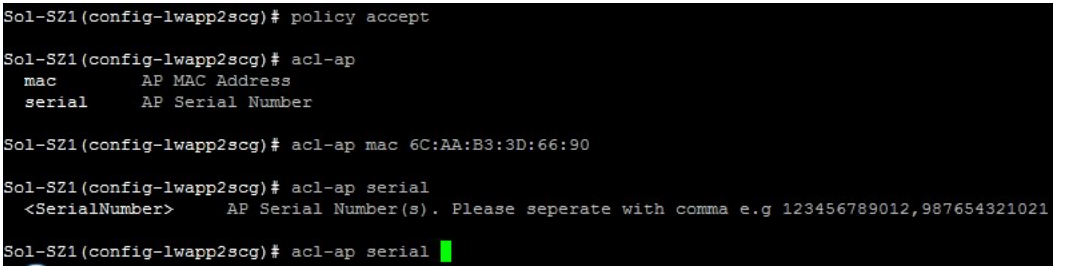


Figure 139. Enter accept {MAC address} if you only want specific APs to be managed by the controller



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

9 Reboot the AP.

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

You have completed

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

1 Log on to the AP's web interface.

2 Go to the Administration > Management page.

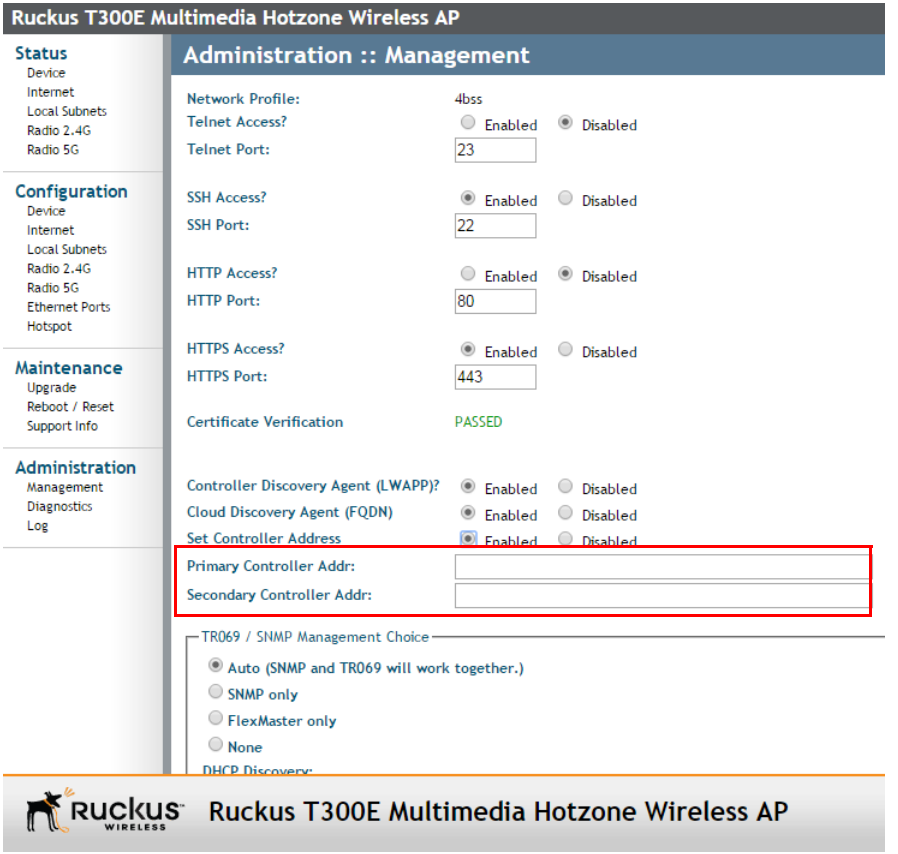
3 In *Primary Controller Address*, type the IP address of the controller that you want to manage the AP.

4 In Secondary Controller Address, type the IP address of a backup controller that you want to manage the AP if the primary controller is unavailable.

5 Click **Apply**.

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

Figure 140. Set the IP addresses of the primary and secondary controllers that you want to manage the AP



What to Do Next

For more information on configuring and managing the controller, refer to the *Virtual SmartZone Administrator Guide* for this release, which is available for download on the Ruckus Wireless Support website at http://support.ruckuswireless.com.

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

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