Oracle® SD-WAN Aware

Installation and Upgrade Guide

Release 9.0
F29164-04
March 2022

Oracle SD-WAN Aware Installation and Upgrade Guide, Release 9.0

F29164-04

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About This Guide

The purpose of this document is to provide the reader with an understanding of how to install Oracle SD-WAN Aware on VMware vSphere or in the Amazon Web Services (AWS) Cloud. It covers requirements for installing the Aware VM server and instructions on how to deploy the Aware application.

Audience

This document was designed for network administrators.

Documentation Set

The following table lists related documentation.

Document Name	Document Description
Oracle SD-WAN Aware Installation and Upgrade Guide	Contains information about installing and configuring Oracle SD-WAN Aware.
Oracle SD-WAN Aware Release Notes	Contains information about added features, resolved issues, requirements for use, and known issues in the latest Oracle SD-WAN Aware release.
Oracle SD-WAN Security Guide	Contains information about security methods within the Oracle SD-WAN solution.
Oracle SD-WAN Aware Features Guide	Collects feature descriptions and procedures for all incremental releases of this product. This guide is organized by release version.

My Oracle Support

My Oracle Support (https://support.oracle.com) is your initial point of contact for all product support and training needs. A representative at Customer Access Support (CAS) can assist you with My Oracle Support registration.

Call the CAS main number at 1-800-223-1711 (toll-free in the US), or call the Oracle Support hotline for your local country from the list at http://www.oracle.com/us/support/contact/index.html. When calling, make the selections in the sequence shown below on the Support telephone menu:

1. Select `2` for New Service Request.
2. Select `3` for Hardware, Networking, and Solaris Operating System Support.
3. Select one of the following options:
   - For technical issues such as creating a new Service Request (SR), select `1`.
   - For non-technical issues such as registration or assistance with My Oracle Support, select `2`.

You are connected to a live agent who can assist you with My Oracle Support registration and opening a support ticket.

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In the event of a critical service situation, emergency response is offered by the Customer Access Support (CAS) main number at 1-800-223-1711 (toll-free in the US), or call the Oracle Support hotline for your local country from the list at http://www.oracle.com/us/support/contact/index.html. The emergency response provides immediate coverage, automatic escalation, and other features to ensure that the critical situation is resolved as rapidly as possible.

A critical situation is defined as a problem with the installed equipment that severely affects service, traffic, or maintenance capabilities, and requires immediate corrective action. Critical situations affect service and/or system operation resulting in one or several of these situations:

- A total system failure that results in loss of all transaction processing capability
- Significant reduction in system capacity or traffic handling capability
- Loss of the system's ability to perform automatic system reconfiguration
- Inability to restart a processor or the system
- Corruption of system databases that requires service affecting corrective actions
- Loss of access for maintenance or recovery operations
- Loss of the system ability to provide any required critical or major trouble notification

Any other problem severely affecting service, capacity/traffic, billing, and maintenance capabilities may be defined as critical by prior discussion and agreement with Oracle.

Locate Product Documentation on the Oracle Help Center Site

Oracle Communications customer documentation is available on the web at the Oracle Help Center (OHC) site, http://docs.oracle.com. You do not have to register to access these documents. Viewing these files requires Adobe Acrobat Reader, which can be downloaded at http://www.adobe.com.

1. Access the Oracle Help Center site at http://docs.oracle.com.
2. Click **Industries**.
3. Click the **Oracle Communications** link.
   Under the **SD-WAN** header, select a product.
4. Select the Release Number.
   A list of the entire documentation set for the selected product and release appears.
5. To download a file to your location, right-click the **PDF** link, select **Save target as** (or similar command based on your browser), and save to a local folder.

Revision History

The following table shows the dates and descriptions of revisions to the Installation and Upgrade Guide.

Date	Description
May 2020	• Initial Release
December 2020	• Adds information about migrating data from an existing Virtual Disk to the "Upgrade Aware Using a New VM" topic.
March 2022	• Updates "Configure Management IP Address" steps in the "Install Oracle SD-WAN Aware On A New VM Using VMware" topic

1

Oracle SD-WAN Aware Installation Requirements

Virtual Machine Requirements

1. Processor
   - 4 Core, 3 GHz (or equivalent) or better for the server managing up to 64 Sites
   - 8 Core, 3 GHz (or equivalent) or better for the server managing up to 128 Sites
   - 16 Core, 3 GHz (or equivalent) or better for the server managing up to 256 Sites
   - 16 Core, 3 GHz (or equivalent) or better for the server managing up to 550 Sites
2. Memory
   - A minimum of 8GB of RAM is recommended for the VM managing up to 64 Sites
   - A minimum of 16GB of RAM is recommended for the VM managing up to 128 Sites
   - A minimum of 32GB of RAM is recommended for the VM managing up to 256 Sites
   - A minimum of 32GB of RAM is recommended for the VM managing up to 550 Sites
3. Operating System
   - VMware Hypervisor ESXi 5.1.0 or higher
   - An environment running Microsoft Windows to perform the Oracle SD-WAN Aware installation
4. Disk Space

> **Note:**
>
> Oracle SD-WAN Aware only supports locally-attached storage due to application performance requirements.

The Oracle SD-WAN Aware VM image itself is about 500 MB. When you install the image, it creates a default 8 GB disk containing the Oracle SD-WAN Aware program, supporting operating system files, Maps, Configurations, Views, and default data storage for polled data. You will need to migrate from the default data disk to a disk that is sized per your Oracle SD-WAN Aware deployment.

> **Note:**
>
> Disk space requirements are highly dependent on the number of Sites, WAN links, and Network Services configured in your WAN. The table below provides guidelines for storage required based on the scale of your WAN.

Table 1-1 WAN Scale Database Sizing Parameters

WAN Scale			Storage Size for up to One Year of Data
Max # of Client Sites	Average # of WAN Links per Site	Average # of Network Services per Site[1]	
32	2	4	1.2 TB
32	4	8	1.8 TB
32	8	16	5.3 TB
64	2	4	1.5 TB
64	4	8	2.6 TB
64	8	16	9.6 TB
96	2	4	1.8 TB
96	4	8	3.3 TB
96	8	16	14.0 TB
128	2	4	2.0 TB
128	4	8	4.1 TB
128	8	16	18.0 TB
192	2	4	2.6 TB
192	4	8	5.6 TB
192	8	16	27.0 TB
256	2	4	3.0 TB
256	4	8	7.2 TB
256	8	16	35.0 TB
550	2	4	6.0 TB
550	4	8	14.4 TB
550	8	16	70 TB

1 Static Conduit Service, Dynamic Conduit Service, Intranet Service, Internet Service

The database size also considers the space required for database migration during software updates. Database configuration options within Oracle SD-WAN Aware allow for older data to be automatically deleted. The numbers below scale by the number of months that data is stored. For example, storing six months of data requires half the space identified in the table above for storing one year of data.

> **Note:**
>
> Due to the write-heavy nature of time-series data and the database, it is recommended that you do not use RAID-5 with Oracle SD-WAN Aware. RAID-1 or RAID-1+0 are recommended if you plan to implement a RAID. In addition, Logical Volume Manager (LVM) adds a small but appreciable amount of overhead, so using LVM is not recommended.

Amazon Web Services Requirements

- A 64-bit Oracle SD-WAN Aware Amazon Machine Image (AMI)
- An Amazon Virtual Machine and EC2 Instance that meets the following requirements based on the scale of the WAN to be managed by Cloud Aware:

Table 1-2 Amazon Web Services Requirements

WAN Scale			Amazon EC2 Instance		
Max # of Client Sites	Average # of WAN Links per Site	Average # of Network Services[1] per Site	Instance Type	Storage Volume Type	Storage Size for up to One Year of Data
64	2	4	m4.xlarge	General Purpose	1.5 TB
64	4	8	m4.xlarge	General Purpose	2.6 TB
64	8	16	m4.xlarge	General Purpose	9.6 TB
128	2	4	m4.2xlarge	General Purpose	2.0 TB
128	4	8	m4.2xlarge	General Purpose	4.1 TB
128	8	16	m4.2xlarge	General Purpose	18.0 TB
256	2	4	m4.4xlarge	General Purpose	3.0 TB
256	4	8	m4.4xlarge	General Purpose	7.2 TB
256	8	16	m4.4xlarge	General Purpose	35.0 TB
550	2	4	m4.4xlarge	General Purpose	6.0 TB
550	4	8	m4.4xlarge	General Purpose	14.4 TB
550	8	16	m4.4xlarge	General Purpose	70 TB

[1] Static Conduit Service, Dynamic Conduit Service, Intranet Service, Internet Service

Network Bandwidth Requirements

The Oracle SD-WAN Aware VM requires network bandwidth for polling appliances. The table below shows the total network overhead for polling variable sized networks with a five-minute polling interval and the configured Bandwidth Limit rate that is required to poll the data within five minutes. The Bandwidth Limit rate is controlled by the Oracle SD-WAN Aware VM and is configured from the **Manage** tab and the **APN Discovery** tile if the default value is not sufficient.

> **Note:**
>
> Network Bandwidth requirements are highly dependent on the number of Sites, WAN links, and Network Services configured in your WAN. A typical deployment can use the default value, which limits the total Oracle SD-WAN Aware network bandwidth to 1000kbps. Configure your Oracle SD-WAN Aware network use based on the scale of your network.

Table 1-3 Network Bandwidth Requirements

WAN Scale			Data Collected per 5-minute Poll	Bandwidth Rate to Configure per 5-minute Poll (Kbps)
Max # of Client Sites	Average # of WAN Links per Site	Average # of Network Services[1] per Site		
32	2	4	1.2 MB	Default 1000
32	4	8	3.6 MB	Default 1000
32	8	16	20.0 MB	Default 1000
64	2	4	2.3 MB	Default 1000
64	4	8	7.2 MB	Default 1000
64	8	16	40.0 MB	2000
96	2	4	3.5 MB	Default 1000
96	4	8	10.8 MB	Default 1000
96	8	16	60.0 MB	3000
128	2	4	4.6 MB	Default 1000
128	4	8	14.4 MB	Default 1000
128	8	16	80.0 MB	4000
192	2	4	6.9 MB	Default 1000
192	4	8	21.6 MB	2000
192	8	16	120.0 MB	6000
256	2	4	9.2 MB	Default 1000
256	4	8	28.8 MB	2000
256	8	16	160 MB	10000
550	2	4	18.4 MB	Default 1000
550	4	8	57.6 MB	2000
550	8	16	320 MB	10000

[1] Static Conduit Service, Dynamic Conduit Service, Intranet Service, Internet Service

2

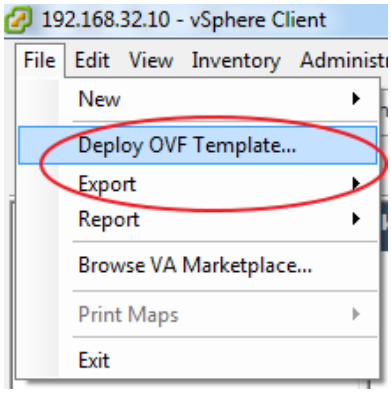
Install Oracle SD-WAN Aware On a New VM Using VMware

Before attempting this procedure, make sure your server meets the minimum requirements. The following procedure must be performed from a Microsoft Windows environment.

Import the ISO into vSphere Client

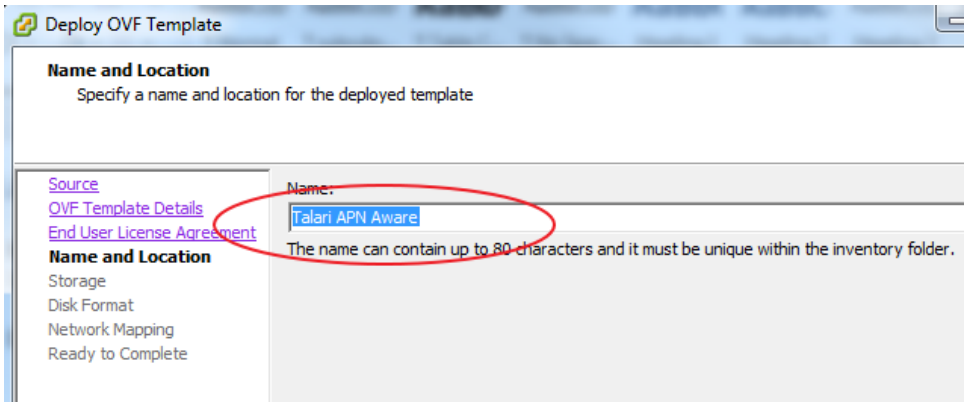
1. Download the release you plan to upgrade to.
2. Download the **Aware VM Image** (full VM Install) to download the software update file (for example, **Aware_OS_R8_2_0_0_0_GA_09192019_Aware_R8_2_0_0_0_GA_09192019_nmsv1_aware_vmware.ova**).
3. Start and log on to the vSphere Client program.
4. When the start screen of the vSphere Client opens, click **File**, then **Deploy OVF Template...**.

Figure 2-1 Deploy OVF Template



5. Browse to the location of the Oracle SD-WAN Aware VM Image (.ova package) that you downloaded from the Talari Support portal.
6. Click **Next** and a screen displays information for the VM being imported.
7. Click **Next** and a screen displays the End User License Agreement. Click **Accept**.
8. Click **Next** and the **Name and Location** screen displays a default name for the VM. Change the name if you want and click **Next**.

Figure 2-2 Name the VM



9. Accept the defaults on the next three screens by clicking **Next**, then click Finish. vSphere creates the VM.

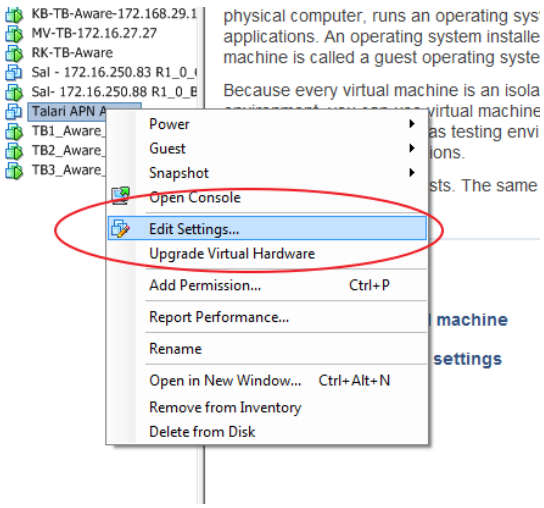
> **Note:**
>
> Decompressing the disk image onto the server can take several minutes.

> **Note:**
>
> If this is the first time you use the vSphere Client, you may need to click the Inventory icon, identify the server, and expand its inventory list.

Configure the VM

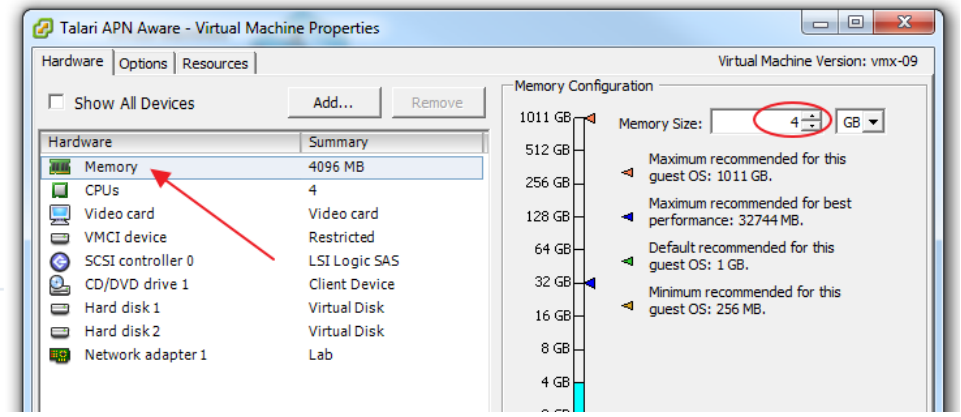
1. From the inventory list, right click the new VM and select **Edit Settings** from the menu.

Figure 2-3 Edit VM Settings



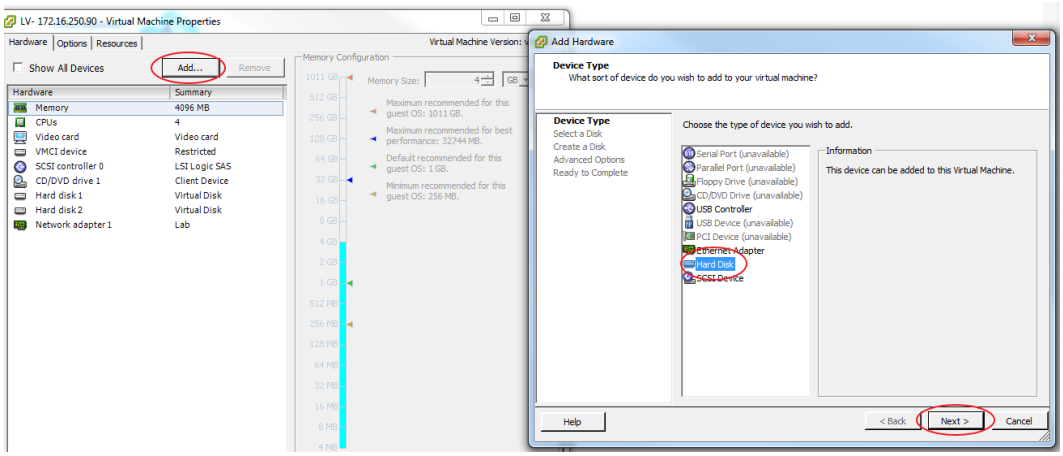
2. On the right side of the **Virtual Machine Properties** screen, change the **Memory Size**.

Figure 2-4 Adjust Memory Size



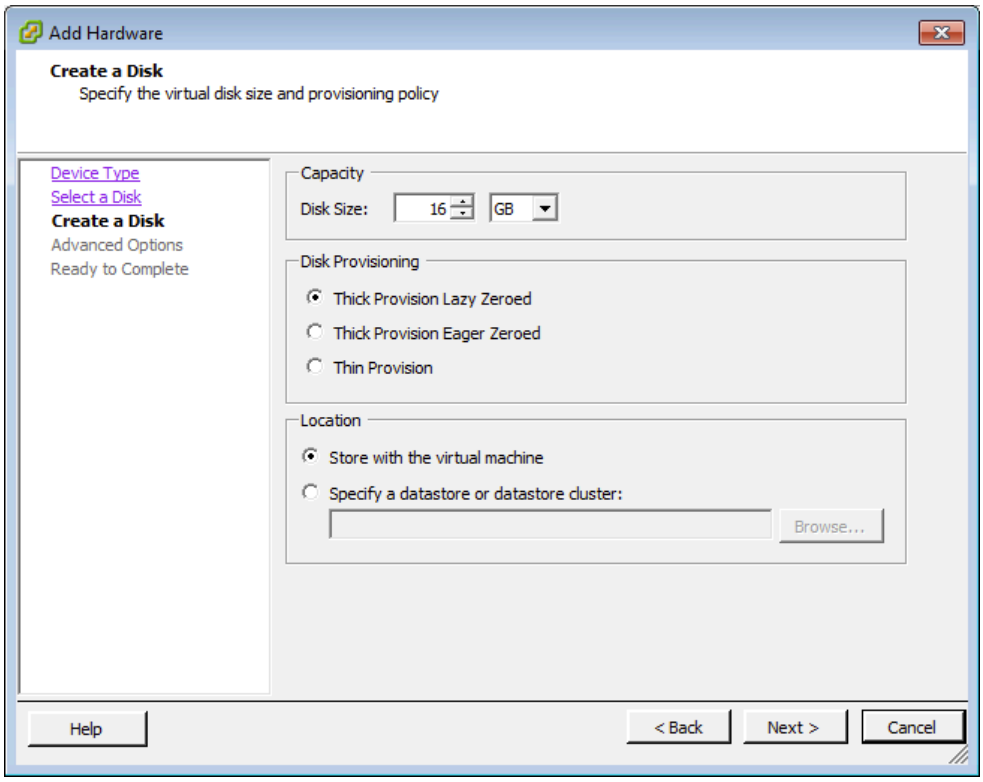
3. Click **Add...** When the **Add Hardware** screen opens, select **Hard Disk** and click **Next**.

Figure 2-5 Add Hard Disk



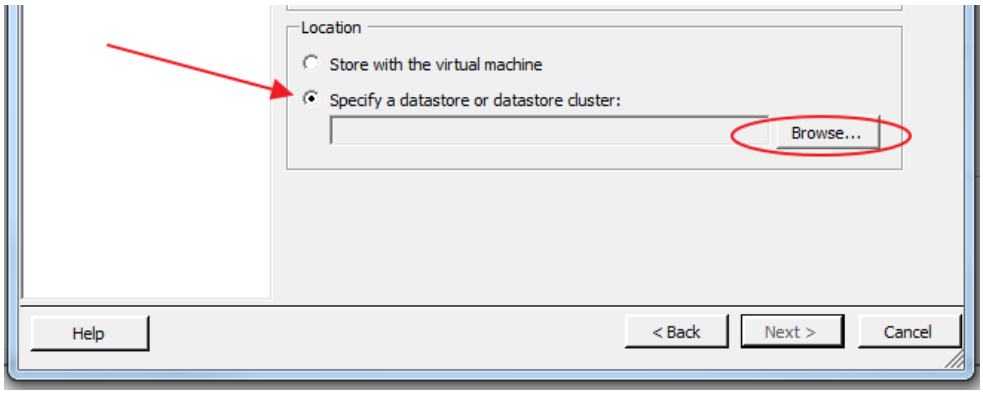
4. Click the radio button for **Create a new virtual disk**, and click **Next**.
5. On the **Create Disk** screen, change the **Disk Size**.

Figure 2-6 Adjust Disk Size



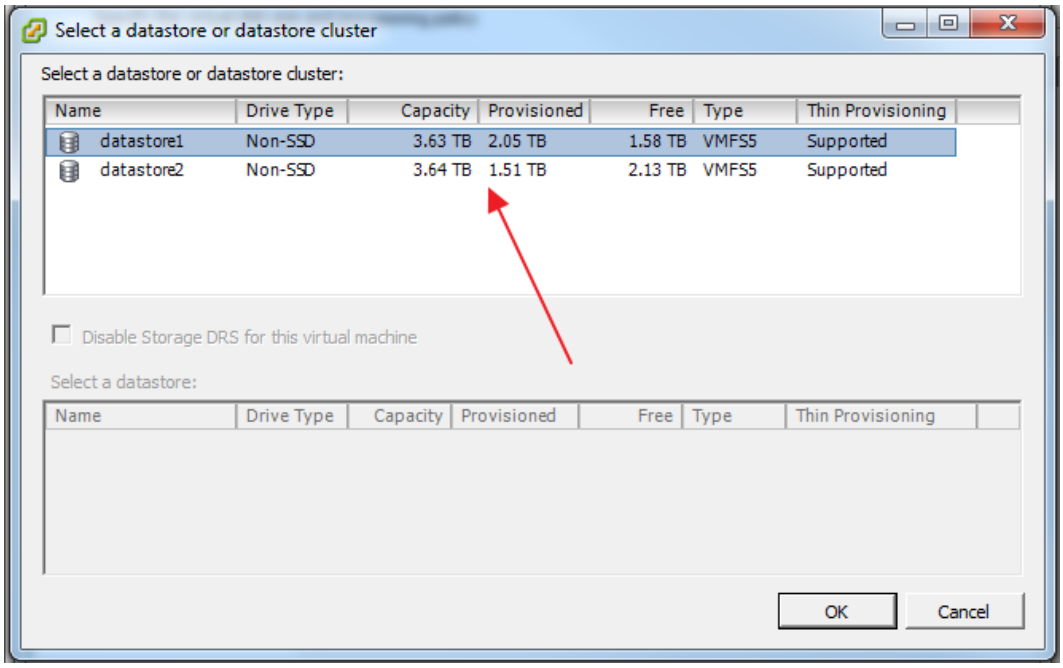
6. In the **Location** section of the **Create a Disk** screen, click the **Specify a datastore or datastore cluster** button, and click **Browse**.

Figure 2-7 Specify Datastore



7. On the **Select a datastore or datastore cluster** screen, choose any available datastore with enough space remaining, and click **OK** to return to the **Add Hardware** screen.

Figure 2-8 Choose Datastore



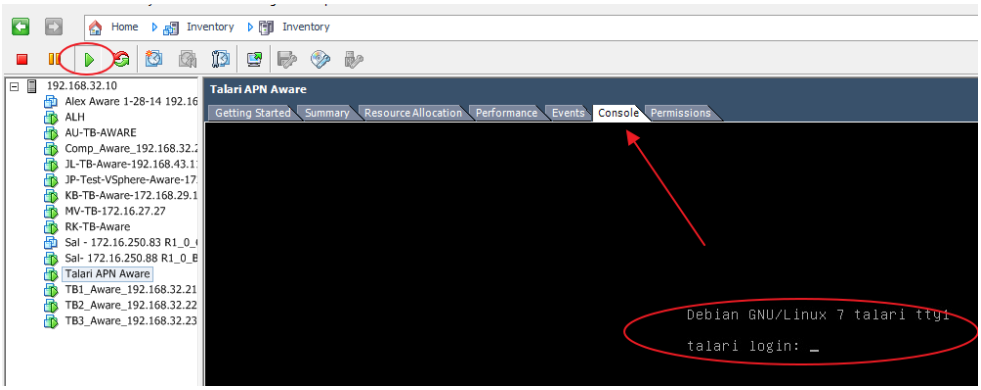
8. Accept the default settings by clicking **Next** and then **Finish** to return to the **Virtual Machine Properties** screen.
9. Click **OK** to exit the **Virtual Machine Properties** screen. A progress bar displays at the bottom of the screen illustrating the creation of the virtual disk.

Start the VM

1. From the inventory list, make sure the new VM is still selected and power it on by clicking the **Play icon**.
2. Click the **Console** tab in the right-hand pane of the vSphere Client screen.
   Note: To exit the console, release the mouse by pressing and holding the **CtrlCtrl** and **Alt** buttons simultaneously.

   Note It may take up to fifteen minutes for the Oracle SD-WAN Aware instance to finish initializing the first time the VM is launched. The log in prompt does not display until initialization is complete.

Figure 2-9 Open vSphere Client Console



3. Enter your login credentials.

Configure Management IP Address

If you are using a DHCP server to get your IP address, skip this section.

1. If you are not using a DHCP server, set the **Host IP** manually as follows:
   a. Log on to the VM Console using talariuser talari
   b. Do one of the following:
      - For Centos, type: `sudo vi /etc/sysconfig/network-interfaces/ifcfg-eth0`
      - For Debian, type: `sudo vi /etc/sysconfig/network-scripts/ifcfg-eth0`

      and edit the file as follows:

```
  GNU nano 2.2.6         File: /etc/network/interfaces

# interfaces(5) file used by ifup(8) and ifdown(8)
auto lo
iface lo inet loopback
# The Management network interface
auto eth0
iface eth0 inet static
address 172.16.250.19
netmask 255.255.0.0
gateway 172.16.0.5

                        [ Read 9 lines ]
^G Get Help  ^O WriteOut  ^R Read File ^Y Prev Page ^K Cut Text  ^C Cur Pos
^X Exit      ^J Justify   ^W Where Is  ^V Next Page ^U UnCut Text^T To Spell
```

   c. Substitute the IPADDR, NETMASK and GATEWAY as applicable to your network, and save the file.
   d. Save the file with the appropriate settings, type `sudo service network restart`, and run the following command: `sudo ifdown eth0 && sudo ifup eth0`.

> **Note:**
>
> If the interface is not up, run the same command again.

1. When Aware OS is older than 7.0, do the following:
   a. Type 'sudo nano /etc/network/interfaces' and edit the file as follows:

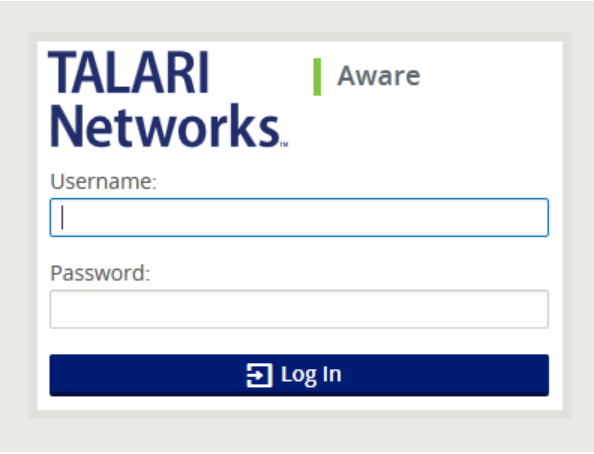
```
DEVICE=eth0
BOOTPROTO=static
ONBOOT=yes
IPADDR=192.168.20.10
NETMASK=255.255.255.0
GATEWAY=192.168.20.254
~
```

   b. Substitute the address, netmask and gateway as applicable to your network, and save the file.
   c. When the file is saved with the appropriate settings, type 'sudo pkill dhclient' and 'sudo /etc/init.d/network restart'

Configure the Storage System

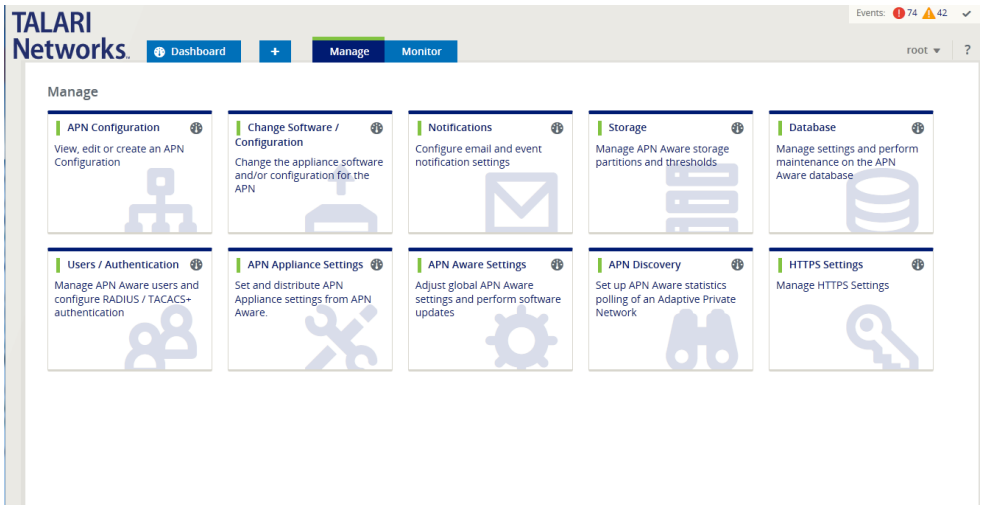
1. Open any web browser and navigate to the Host IP.
2. Log on with your credentials.

Figure 2-10 Login to Oracle SD-WAN Aware



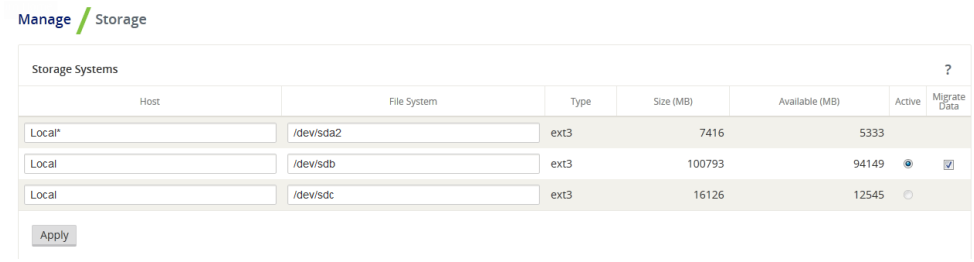
3. Click **Manage**, and then **Storage**.

Figure 2-11 Click the Storage tile



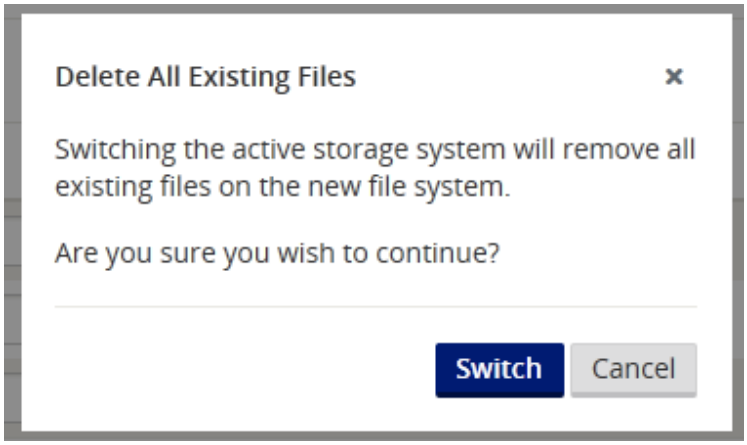
4. Click **Active** next to the storage partition you created and click **Apply**.

Figure 2-12 Switch the Storage Partition



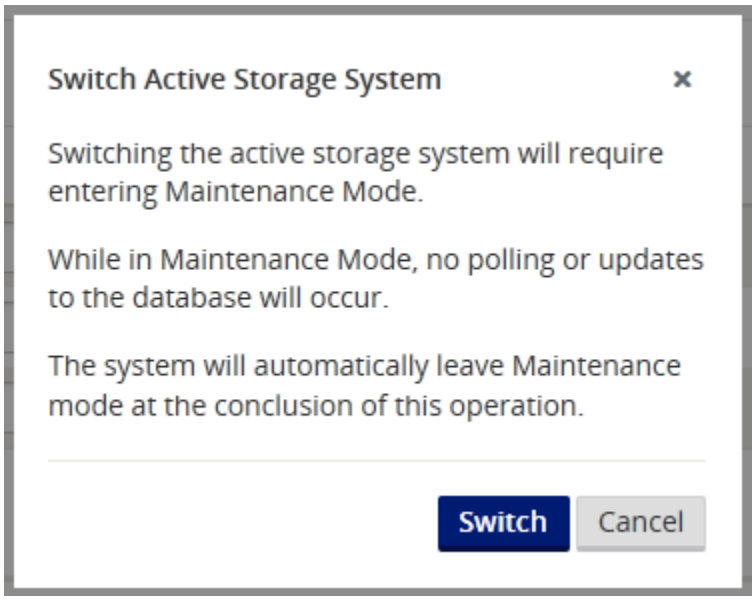
5. The **Delete All Existing Files** warning dialog displays. Click **Switch**.

Figure 2-13 Delete All Existing Files Warning Dialog



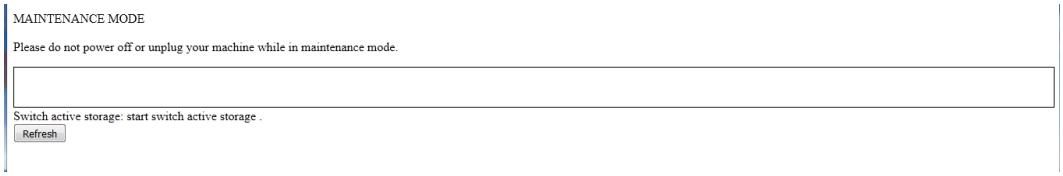
6. The **Switch Active Storage System** dialog displays. Click **Switch**.

Figure 2-14 Switch Active Storage System Warning Dialog



7. This places Oracle SD-WAN Aware into **Maintenance Mode** and a progress bar displays.

Figure 2-15 Put Aware in Maintenance Mode



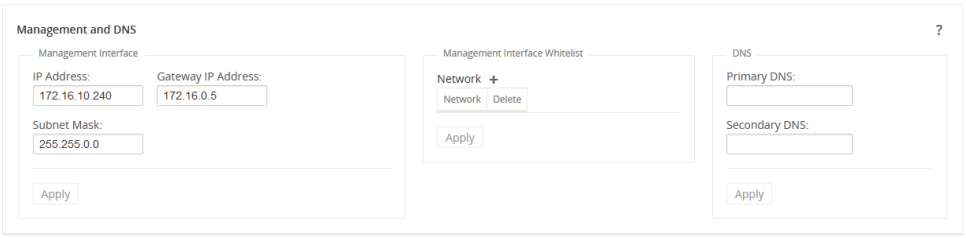
8. When the progress bar completes, click **Complete**.

Configure Oracle SD-WAN Aware Settings

1. Click **Manage**, then **APN Aware Settings**.
2. Change the Management IP, DNS, and Time Settings as needed.

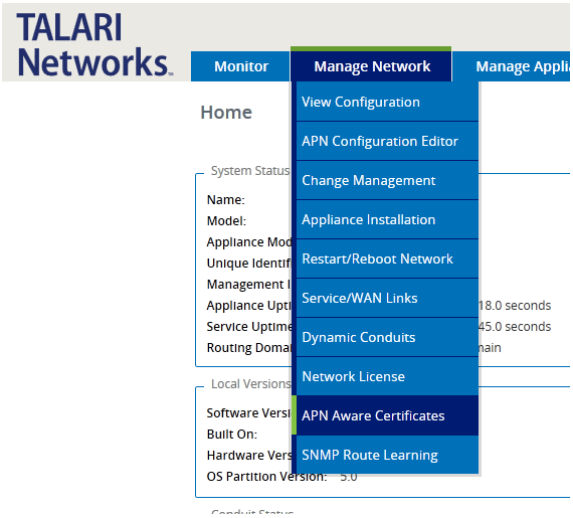
> **Note:**
>
> Enter the Host IP address, Netmask, and Gateway information here to enforce the settings as static.

Figure 2-16 Change Management IP and DNS Settings



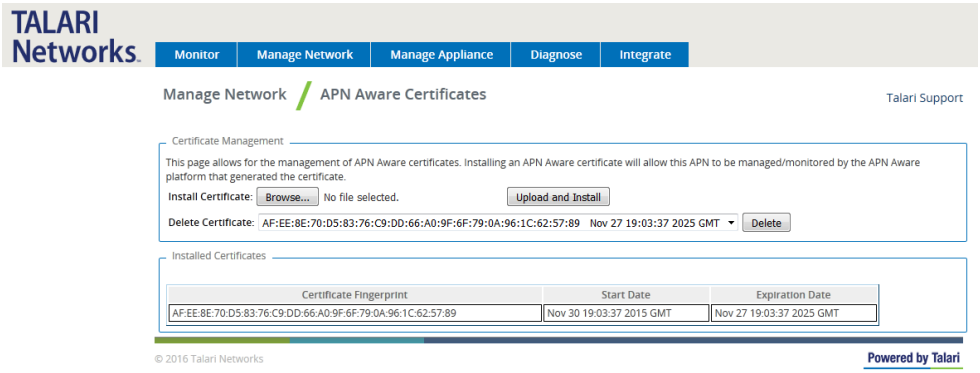
3. Click **ManageManage**, then **APN Discovery**.
4. Click on **Download Certificate**, then **Save**Save to save the certificate file to the local workstation.
5. Login to the NCN, click **Manage Network**, then **APN Aware Certificates**.

Figure 2-17 Choose APN Aware Certificates



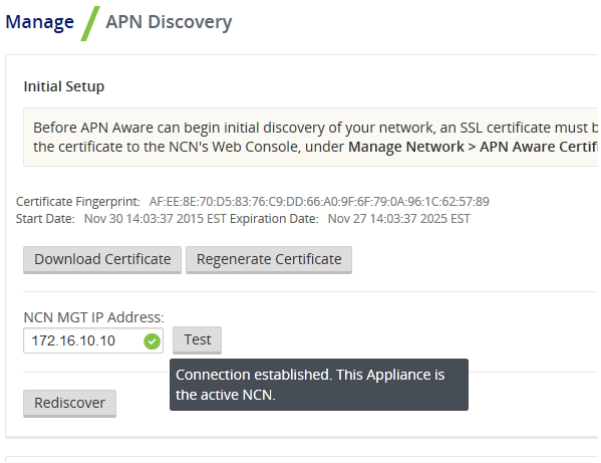
6. Click **Choose File**and choose the file you downloaded (for example, **APNAAwareSSLCert**) to open the file.

Figure 2-18 Open Aware SSL Certificate from the NCN



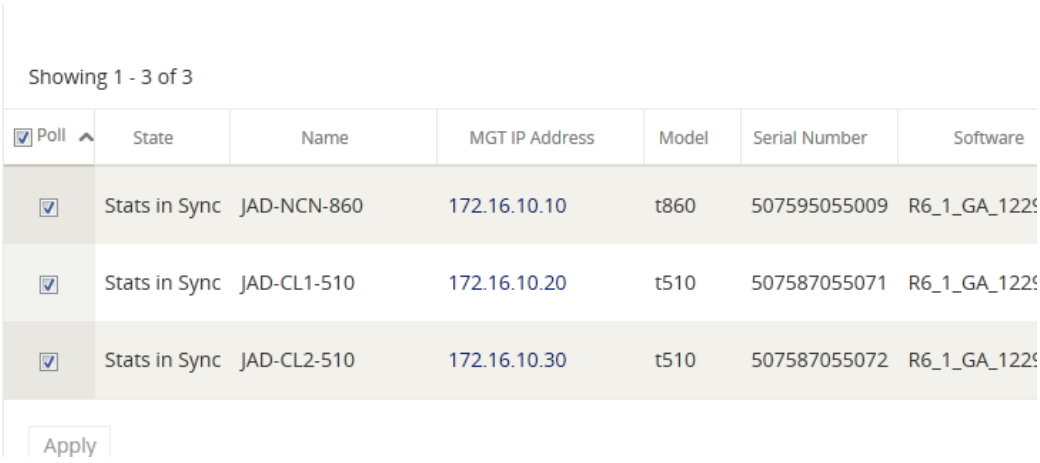
7. Click **Upload and Install**. When installation is complete, go back to the Aware installation.
8. In Aware, click on the **Manage**, then **APN Discovery**.
9. Enter the NCN Management IP Address and click **Test**. If everything is correct a green check mark appears with a message stating, "**Connection established. This appliance is the active NCN**"

Figure 2-19 Enter the NCN Management IP Address



10. Click **Discover** and all the configured appliances will autopopulate in a list at the bottom of the screen.
11. Click the check box next to **Poll** to automatically select all the polling check boxes for discovered devices and click **Apply**.

Figure 2-20 Choose the Devices to Poll



12. The Oracle SD-WAN Aware installation is complete.

Upgrading an Oracle SD-WAN Aware VM

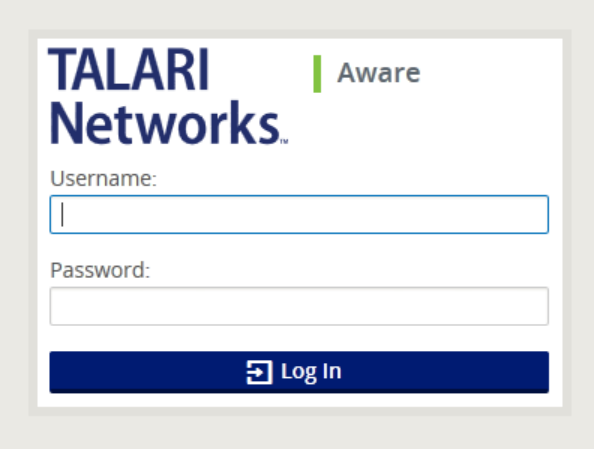
An upgrade may be done either on an existing VM or by provisioning a new VM.

Upgrade Aware On Existing VM

> **Note:**
>
> Before attempting this upgrade procedure, make sure your server meets the minimum requirements.

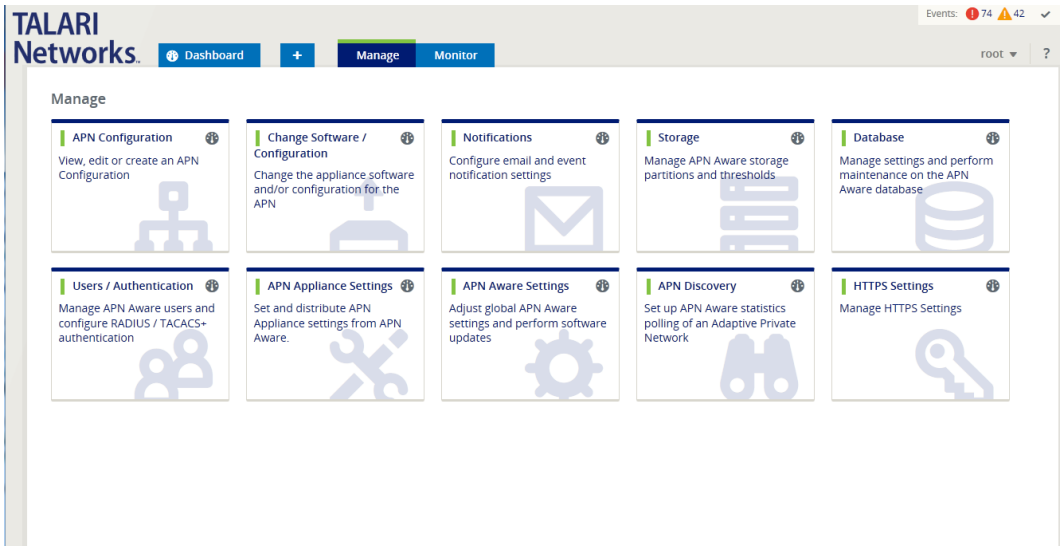
1. Download the software update file (e.g., **talari-nms_Aware_R3_0_GA_P1_11082016_amd64.tar.gz**).
2. Open any web browser and navigate to the Host IP. Login with your existing credentials.

Figure 2-21 APN Aware Login Screen



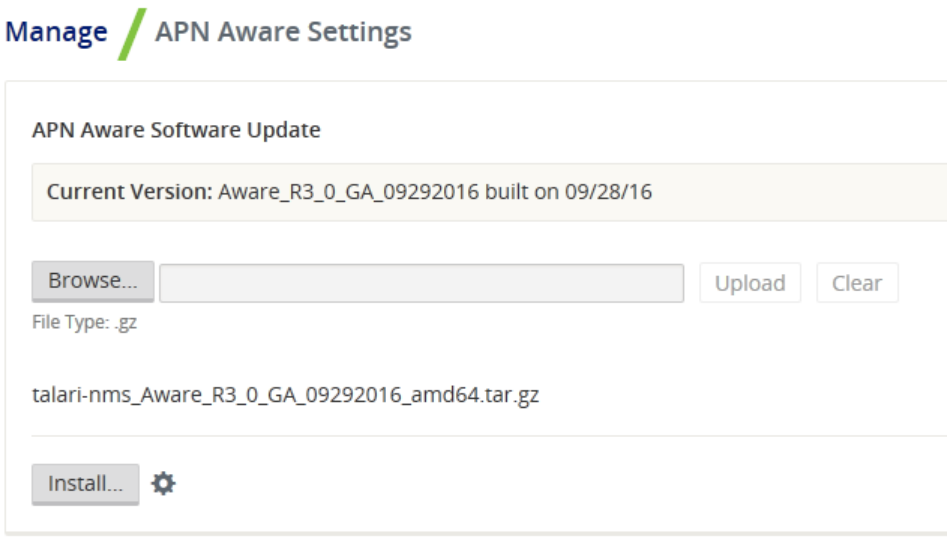
3. On the Web interface click on **Manage**, then **APN Aware Settings**.

Figure 2-22 Manage APN Aware Settings



4. In the **APN Aware Software Update** section, click on **Browse** and navigate to the file downloaded.

Figure 2-23 Select Software Update File



5. Click **Upload**, and once the upload finishes, click **Install**, and follow the onscreen prompts to complete the software upgrade.

Upgrade Oracle SD-WAN Aware Using a New VM

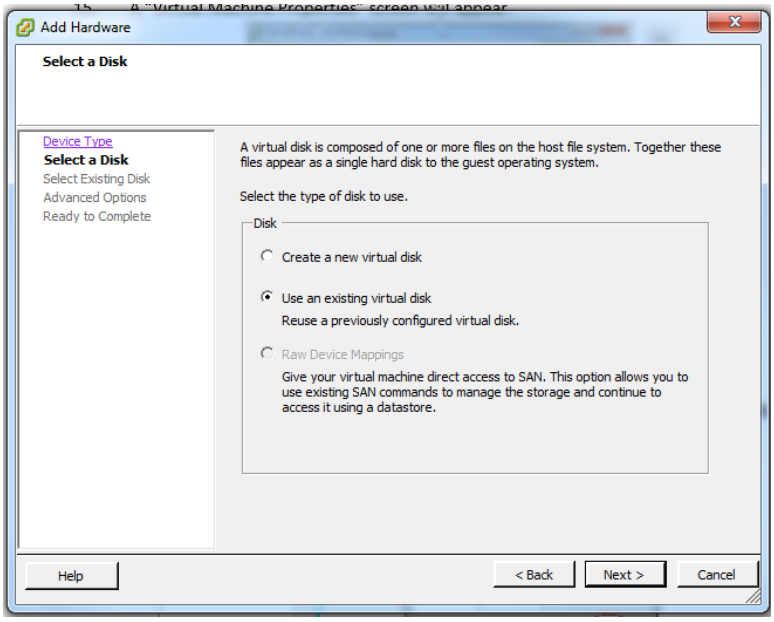
Check Aware OS version with Monitor→System Information.

If the current Aware OS version is 5.01 and the new VM install is for Aware R8.1 or earlier follow the steps below to upgrade using a new VM.

If the current Aware OS version is 5.01 and the new VM install is for Aware R8.2 or later with Aware OS 7.0 or later, please follow the steps in section Upgrade Aware Using a New VM moving from OS 5.01 to OS 7.0.

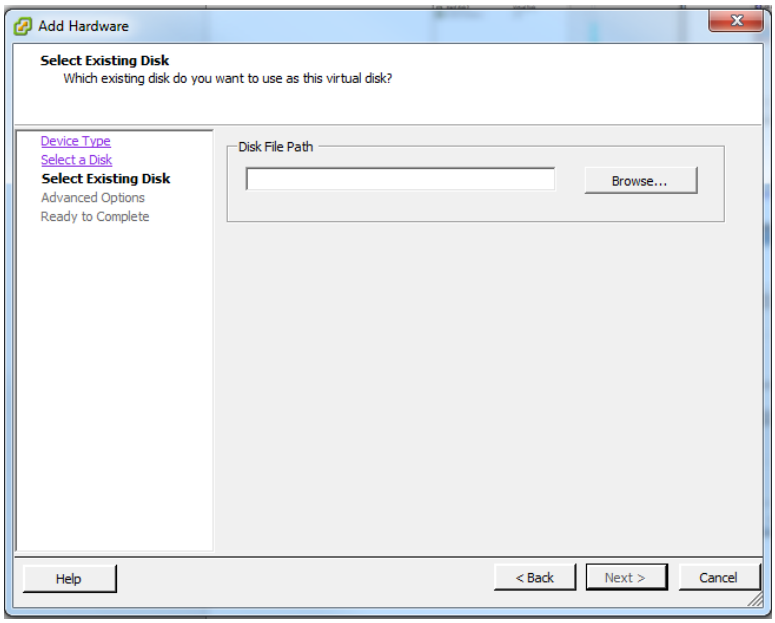
1. From the **Select a Disk** screen, click the radio button next to **Use an existing virtual disk** then click **Next**.

Figure 2-24 Use Existing Virtual Disk



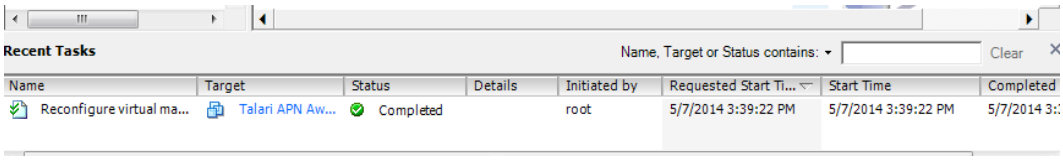
2. Click the **Browse** button, and select the **Disk File Path** of the existing Oracle SD-WAN Aware VM you want to upgrade.

Figure 2-25 Choose Existing Oracle SD-WAN Aware VM



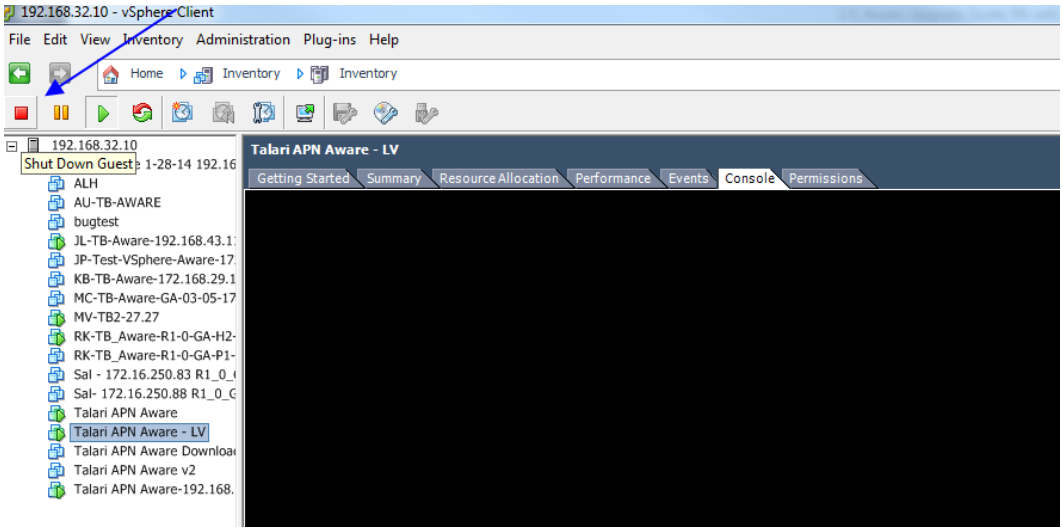
3. Click the **Next** button after selecting the VM, and a progress bar will appear at the bottom of the screen illustrating the reconfiguration of the virtual machine. Wait for the update to reach **Completed** status.

Figure 2-26 Wait for Reconfiguration to Complete



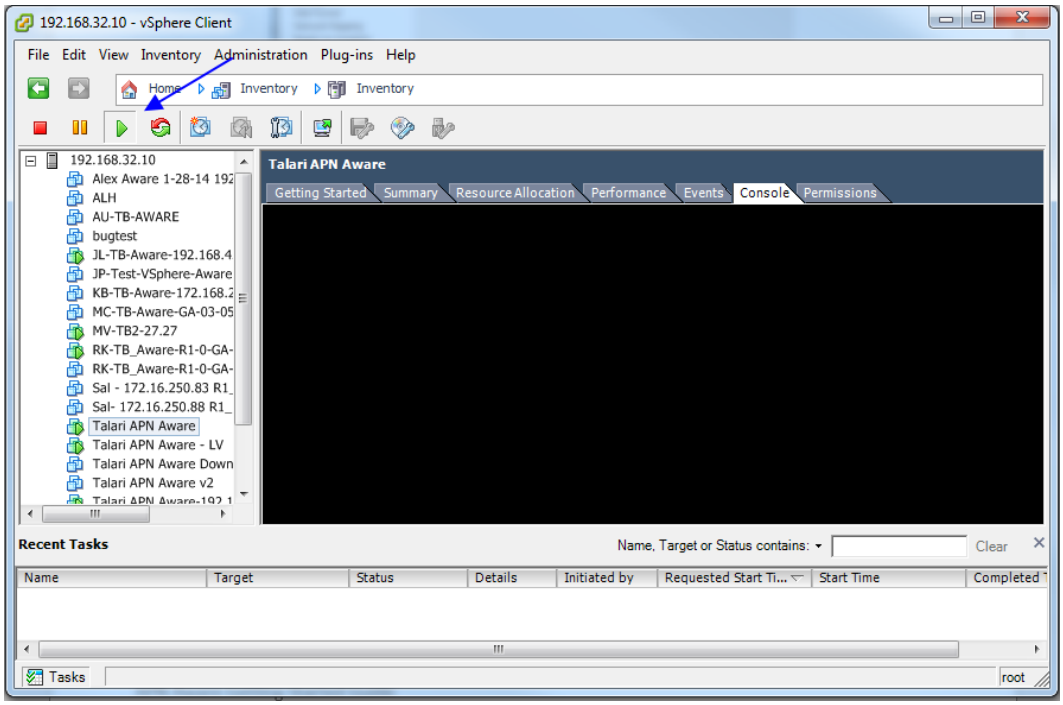
4. From the inventory list, select your previous Oracle SD-WAN Aware VM and power it down by clicking the red **Stop icon**.

Figure 2-27 Power Down the Existing VM



5. Power on the VM you chose to upgrade by clicking the green **Play** icon.

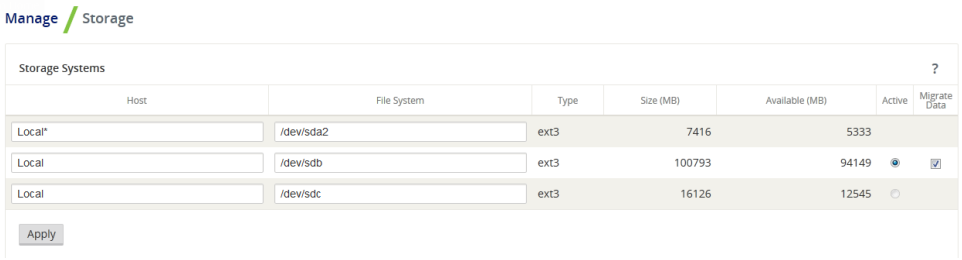
Figure 2-28 Power On Upgraded VM



Increase Storage On Existing Oracle SD-WAN Aware VMs

1. Open your vSphere Client and power down the VM you want to create more storage on.
2. Right click on the VM and choose **Edit Settings** from the menu.
3. Click the **Add** button and choose **Hard Disk** then click **Next**.
4. Click the radio button next to **Create a new virtual disk** and click **Next**.
5. In the **Capacity** section of the **Create a Disk** window, adjust the disk size appropriately and then click **Next**.
6. Click **Next** on the **Advanced Options** screen, and click **Finish** on the **Ready to Complete**
7. Power on the VM.
8. Open a web browser and navigate to the Oracle SD-WAN Aware Management IP.
9. Click on **Manage**, then **Storage** where you will see your new disk.
10. Click the radio button under Active then click apply (the migrate option is checked by default).

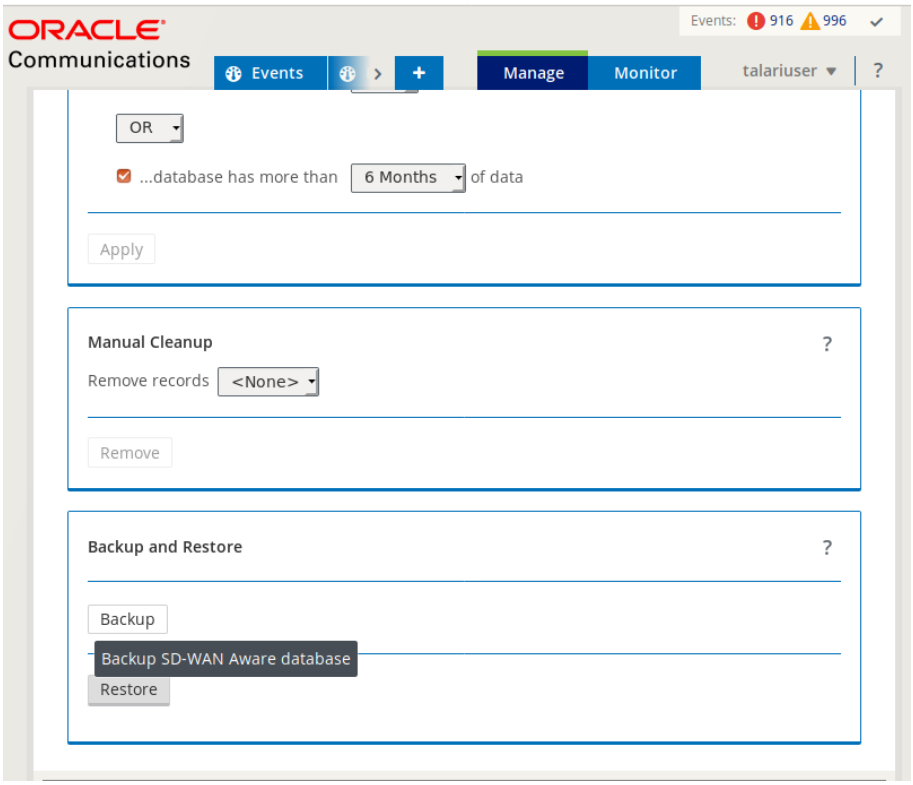
Figure 2-29 Oracle SD-WAN Aware Storage Systems



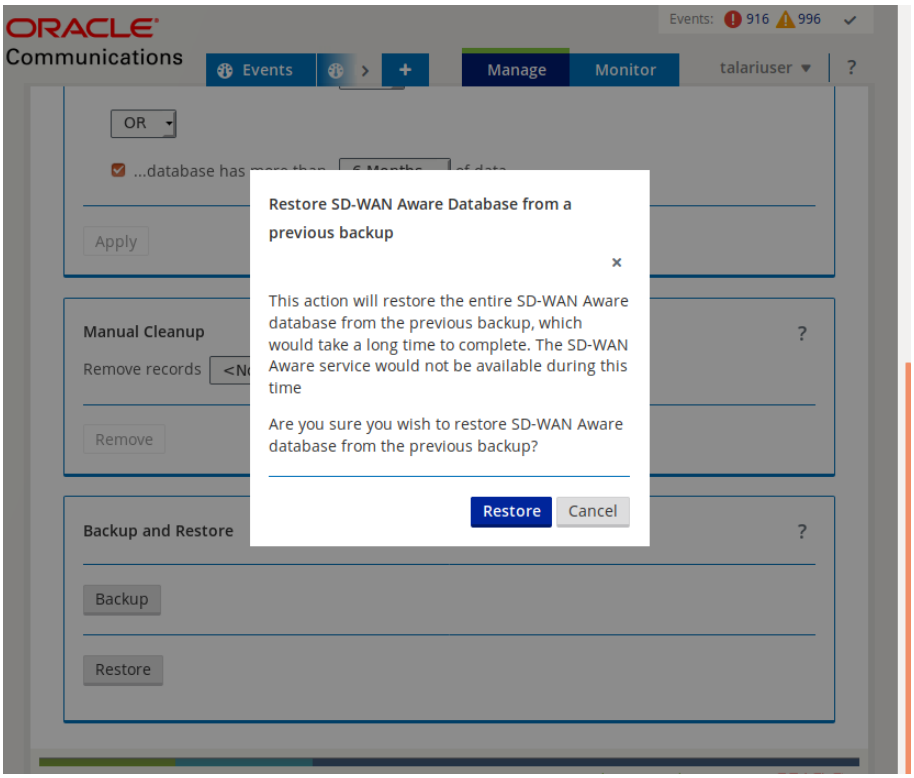
11. When the **Delete All Existing Files** dialog appears, click **Switch**.
12. When the **Switch Active Storage System** dialog appears, click **Switch**.
13. Maintenance mode may run for quite some time. When the **Switch active storage** process completes, click **Continue**.
14. You can now see the new disk is active and your data still intact.
15. Navigate back to the vSphere Client and power down the VM.
16. Right click on the VM and choose **Edit Settings** from the menu.
17. Select the old Hard Disk from the list and click the **Remove** button. Click **OK**.
18. Power on the VM.
19. Open a web browser and navigate to the Oracle SD-WAN Aware Management IP.
20. Click on **Manage Storage**, and you will see the old disk is no longer displayed in the list.

Aware Database Backup and Restore

Aware database backup option is available in Aware R8.2 or later to take a backup of the Aware database. This backup can be used to restore Aware database at a later point in time. The database backup requires extra space of two times the size of the current database.



Clicking on the Backup option in Manage→Database→Backup and Restore section brings up a confirmation dialog. Clicking Backup button on the confirmation dialog initiates the backup operation in the background. The Aware system is put in maintenance mode during the backup operation. Depending on the size of the database, the CPU and memory available, the database backup operation could take many hours to complete. For example the backup operation took about 23 hours to complete for a database size of 200GB. It also needed additional 400GB of storage for the backup files before they are compressed.



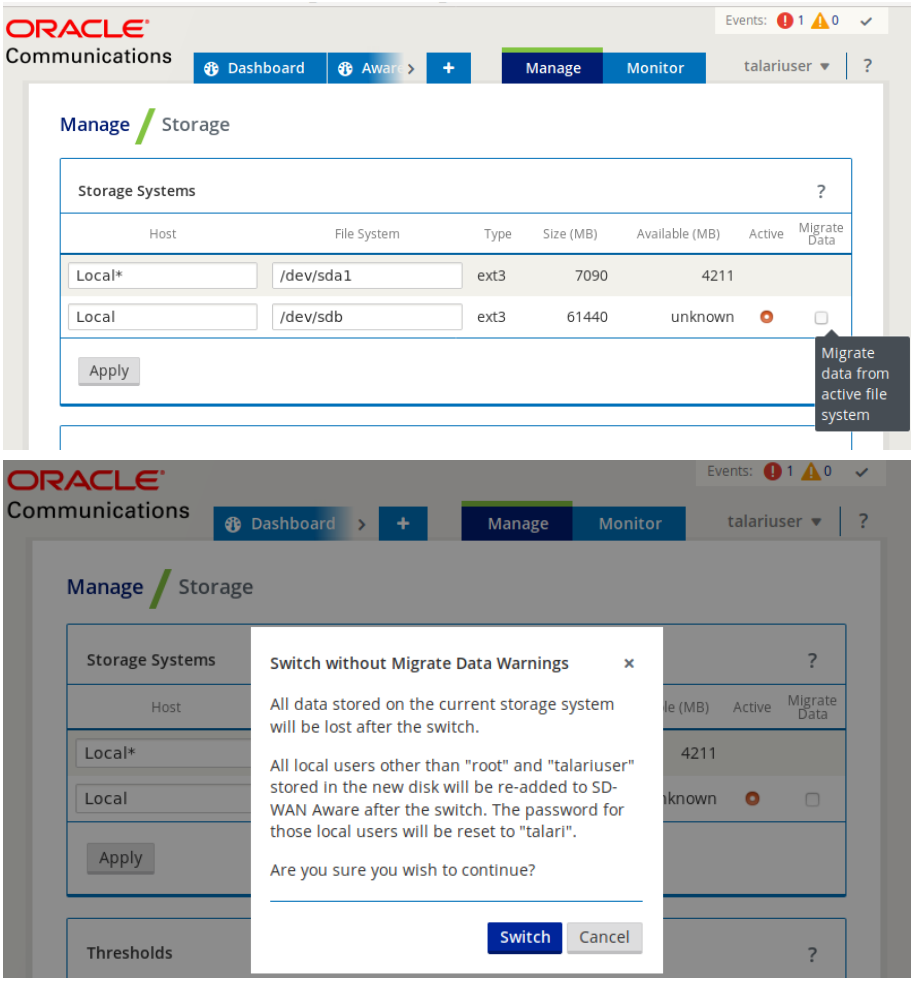
Database restore option can be used to restore Aware database to the previous restore point from the previous backup if available. The user needs to create the backup of the database for future restore.

Upgrade Aware Using a New VM moving from OS 5.01 to OS 7.0

If moving from an Aware VM with current Aware OS version is 5.01 to new VM install with Aware OS 7.0 or later please use the following procedure:

1. Upgrade to Aware R8.2 or later in the current VM using Manage→SD-WAN Aware Settings→Install.
2. After upgrading to Aware R8.2 in the current Aware VM, click on Backup button in Manage→Database→Backup and Restore section.
3. Install a new Aware VM with Aware R8_2 or later by following the steps 1 to 7 in section Upgrade Aware Using a New VM.
4. In the newly installed Aware VM, go to Manage→Storage section. The disk added from the previous VM will be shown as not active.
5. Click on the Active button of the added disk. Migrate Data option will be shown as checked. Uncheck the Migrate Data option and click on Apply. A confirmation dialog will show Switch without Migrate Data Warnings.
6. Click the Switch button to make the added disk as Active disk storage. See the diagram Aware storage Active option.
7. After the added disk is made active, go to Manage→Database→Backup And Restore section and click on Restore button. Complete the Restore action by clicking on the confirmation dialog.

After the restore action is completed the database would have been migrated completely and will be available in the current VM.



Selecting an existing Virtual Disk, while creating a new Aware instance from scratch, allows you to preserve old data by migrating it from the old Aware instance to the new one

Upgrade Aware Using a New VM moving from OS 4.x to OS 7.x

Moving from Aware OS 4.x to Aware OS 7.x is a two step process.

1. Use the procedure to move to new VM with Aware full install having OS 5.01 and moving the disk from the previous VM and make it active. Note that Migrate Data option should not be checked while making the new disk active.
2. This completes migration from Aware OS 4.x to Aware OS 5.x. Follow the steps described in section Upgrade Aware Using a New VM moving from OS 5.01 to OS 7.0.

3

Oracle SD-WAN Aware on Amazon Web Services

The following sections contain procedures for creating and preparing an Amazon Virtual Machine and EC2 instance for a Cloud Aware installation.

Before You Begin

Before you continue, take some time to consider how a Cloud Aware Instance will fit into your current network architecture.

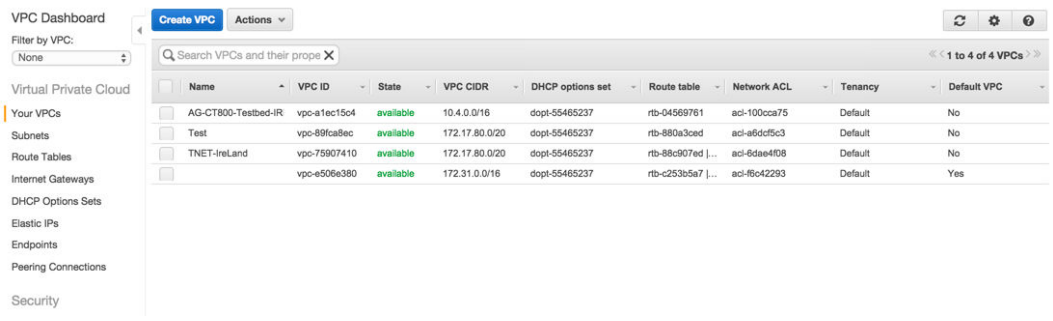
- What CIDR block do you plan to use for your VPC and its subnets?
- Do you plan to use existing subnets or create new ones for your VPC and Cloud Aware interfaces?
- Have you determined how much storage you will need for your Cloud Aware instance based on your Talari WAN?
- How do you plan to configure Security Groups for your Cloud Aware instance?
- Have you already created an AWS Key Pair?

Create an Amazon Virtual Private Cloud

> **Note:**
>
> If a pre-existing VPC is available with connectivity to your private network, we recommend installing Cloud Aware within that VPC to simplify the deployment procedure. If you need to create a new VPC, continue with this procedure.

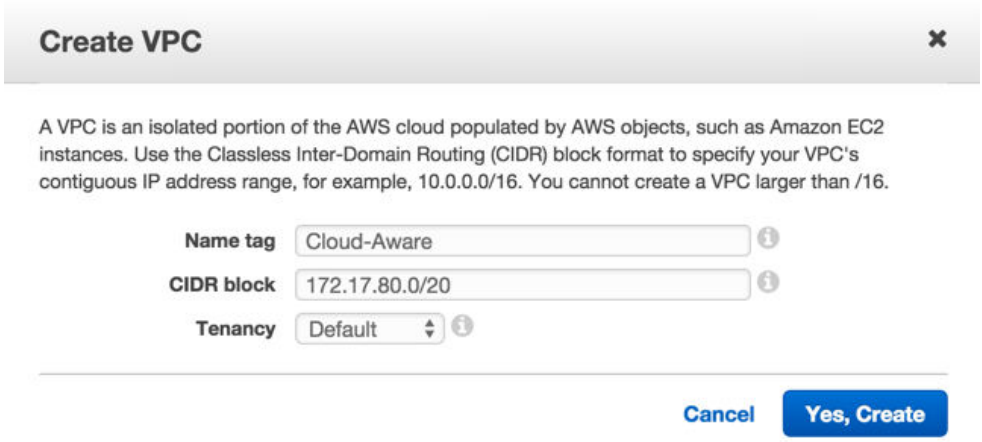
1. Log into Amazon Web Services (AWS).
2. From the main AWS Management Console click on the **VPC** link.
3. From the **VPC Dashboard**, click on the **Your VPCs** link and then click the **Create VPC** button to create a Virtual Private Cloud (VPC).

Figure 3-1 Create a VPC



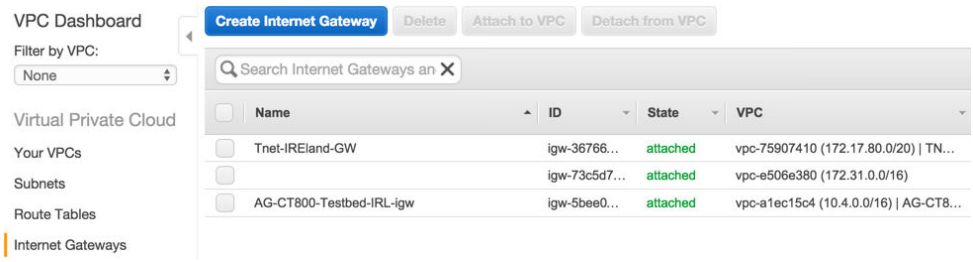
4. Enter a **Name tag** to identify your VPC.

Figure 3-2 Enter a Name and CIDR block



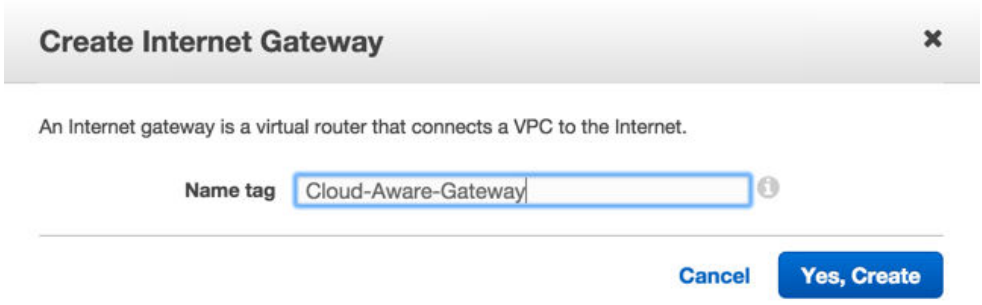
5. Enter your pre-defined VPC **CIDR block**. Click **Yes, Create** to continue.
6. If you do not already have an existing Internet Gateway to use in AWS, from the VPC Dashboard, click the **Internet Gateway Link** and then click the **Create Internet Gateway** button.

Figure 3-3 Create Internet Gateway



7. Enter a **Name tag** for your Internet Gateway and click the **Yes, Create** button.

Figure 3-4 Name Internet Gateway



8. Select the Internet Gateway you just created and click the **Attach to VPC** button.

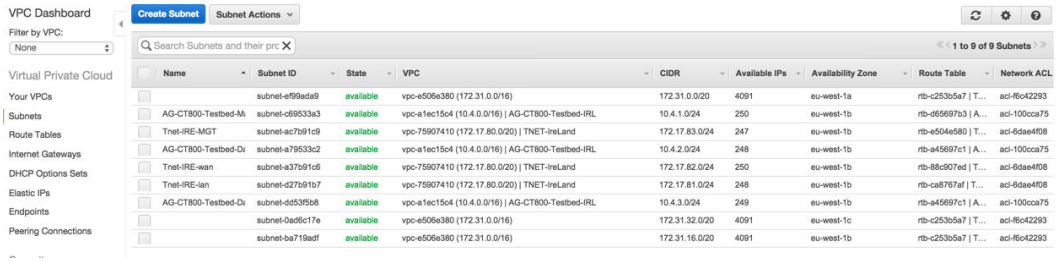
Figure 3-5 Attach Internet Gateway to VPC

9. Choose the Internet Gateway you created from the drop-down menu and click the **Yes, Attach** button to attach it to your VPC.

Figure 3-6 Choose VPC to Attach to Internet Gateway

10. If you have not defined subnets to use with your VPC, click the **Subnets** link on the **VPC Dashboard**, and then click **Create Subnet** to create subnets (e.g., WAN, LAN, MGT) as your network requires. Cloud Aware only requires access to a management subnet.

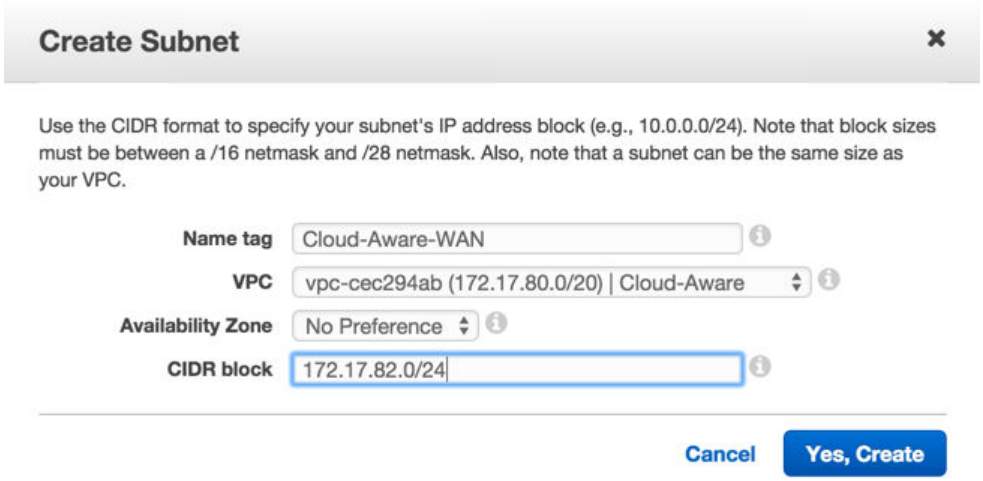
Figure 3-7 Create Subnet



11. Enter a **Name tag** to easily identify the subnet you are creating. Choose your new **VPC** from the drop-down menu. Enter the **CIDR block** you want to define for the subnet. (e.g., WAN, LAN, and MGT). Click the **Yes, Create** button to continue.

12. Create as many subnets as your network requires.

Figure 3-8 Insert Name, Choose VPC, and Enter CIDR block

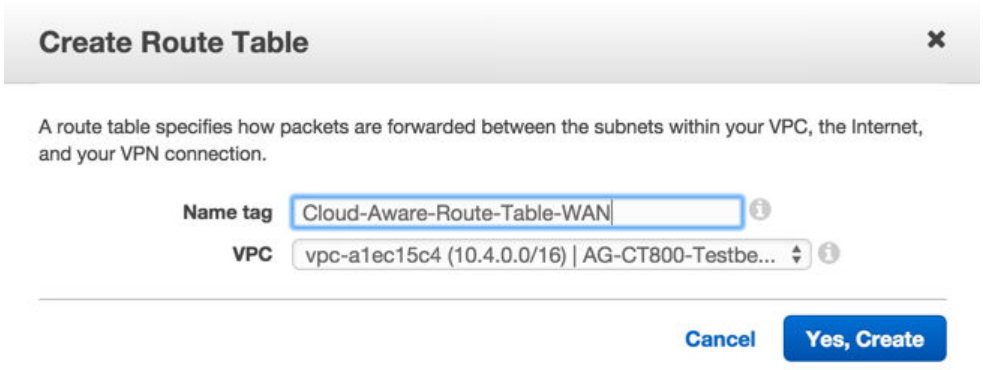


13. If you have not defined route tables to use with your VPC, click the **Route Tables** link on the **VPC Dashboard**, and then click **Create Route Table** to create route tables for your subnets (e.g., WAN, LAN, and MGT) for your Cloud Aware instance.

Figure 3-9 Create Route Table

14. Enter a **Name tag** to easily identify the route table you are creating. Choose your new **VPC** from the drop-down menu. Click the **Yes, Create** button to continue.

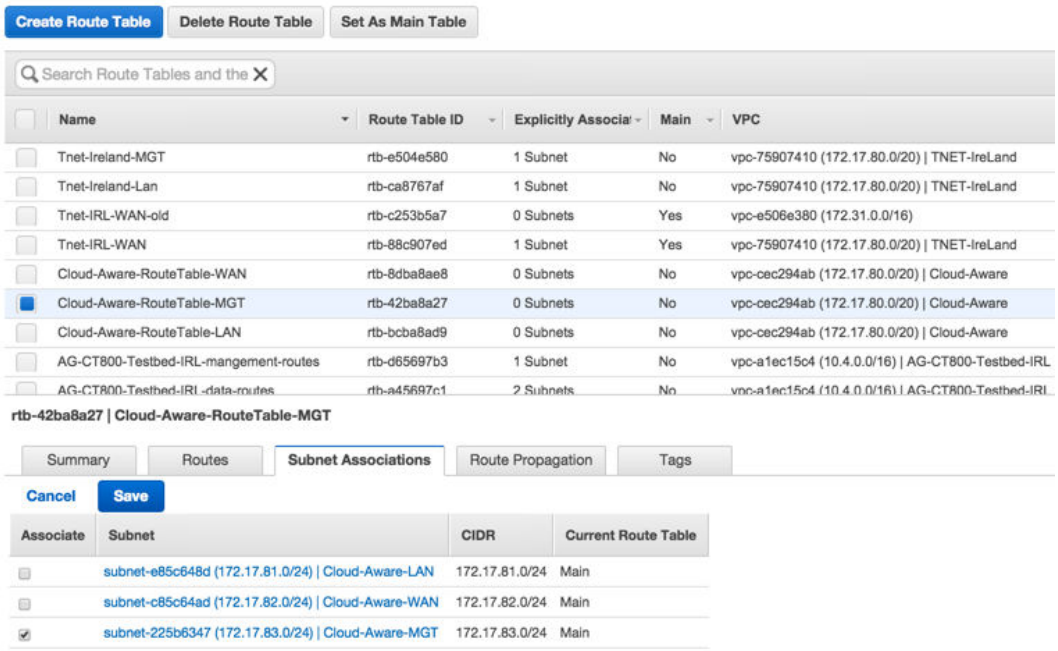
Figure 3-10 Enter Name and Choose VPC for Route Table



15. Create a route table for each subnet.

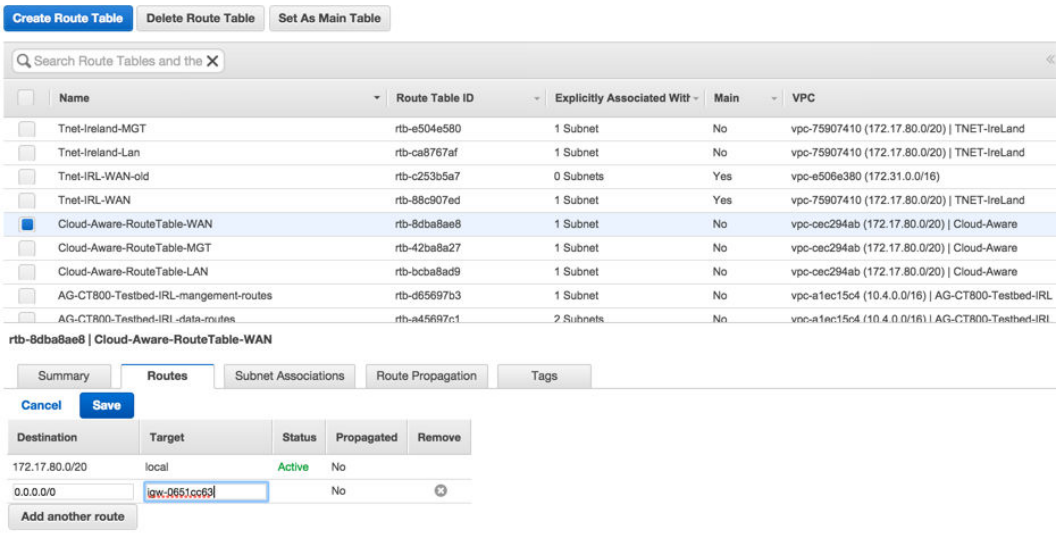
16. Select the route table you plan to use for Cloud Aware. Click on the **Subnet Associations** tab and click the checkbox next to the management subnet to associate with this route table. Click **Save**.

Figure 3-11 Associate Route Table with Subnet



17. Associate each route table with the appropriate subnet.
18. Select the route table you plan to use for Cloud Aware. Click on the **Routes** tab. Click the **Edit** button, and then click the **Add another** route button.

Figure 3-12 Add Routes



19. Enter **0.0.0.0/0** in the **Destination** field and enter the Internet Gateway in the **Target** field. Click **Save** to continue.

> **Note:**
>
> When you click in the **Target** field, a list of available Internet Gateways that you can choose from should appear. If said list does not appear, you can find the name of your Internet Gateway by clicking on the **Internet Gateways** link on the VPC Dashboard and selecting the Internet Gateway. The name appears on the **Summary** tab.

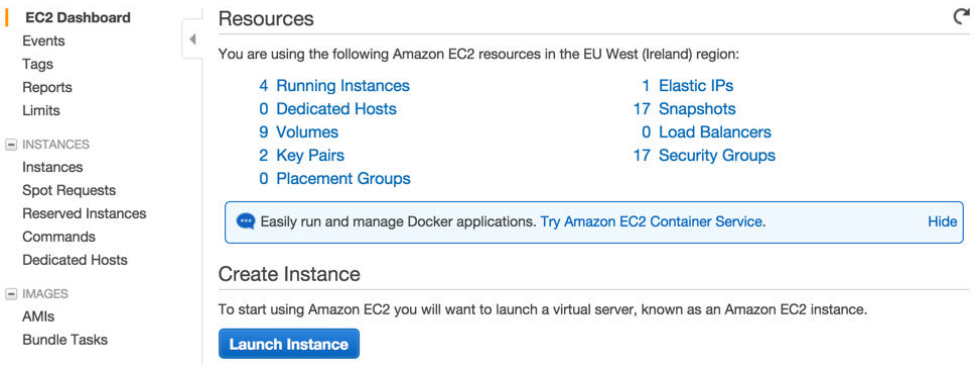
20. Repeat for each route table that you created.

> **Note:**
>
> Adding the 0.0.0.0/0 destination may only be necessary for the MGT and WAN route tables.

Create an Amazon EC2 Instance for Cloud Aware

1. Click **EC2** to open the EC2 Dashboard.
2. Click the **Launch Instance** button.

Figure 3-13 Launch Instance



3. Click on **My AMIs** and **Select** the Cloud Aware version you would like to install.
4. Choose an EC2 Instance Type. Consult the following table to determine what Instance Type is sized appropriately for your Talari WAN.

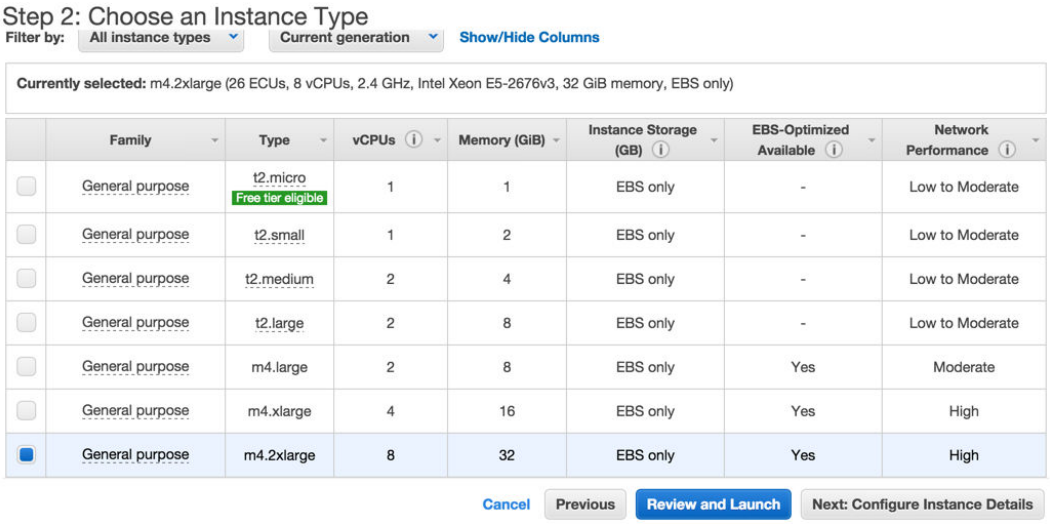
Talari WAN Scale			Amazon EC2 Instance		
Max # of Client Sites	Average # of WAN Links per Site	Average # of Network Services[1] per Site	Instance Type	Storage Volume Type	Storage Size for up to One Year of Data
64	2	4	m4.xlarge	General Purpose	1.5 TB
64	4	8	m4.xlarge	General Purpose	2.6 TB
64	8	16	m4.xlarge	General Purpose	9.6 TB

128	2	4	m4.2xlarge	General Purpose	2.0 TB
128	4	8	m4.2xlarge	General Purpose	4.1 TB
128	8	16	m4.2xlarge	General Purpose	18.0 TB
256	2	4	m4.4xlarge	General Purpose	3.0 TB
256	4	8	m4.4xlarge	General Purpose	7.2 TB
256	8	16	m4.4xlarge	General Purpose	35.0 TB

[1] Static Conduit Service, Dynamic Conduit Service, Intranet Service, Internet Service

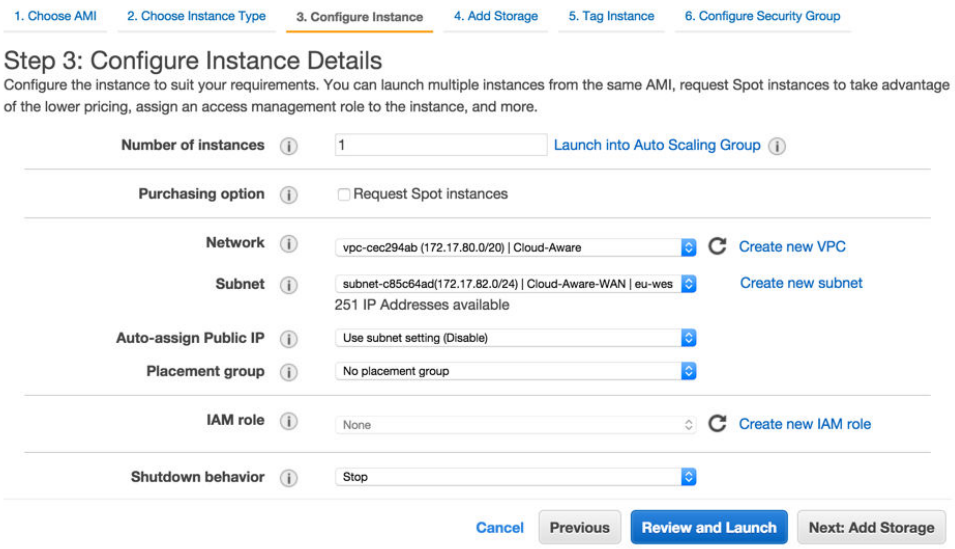
5. Click **Next: Configure Instance Details**.

Figure 3-14 Configure Instance Details



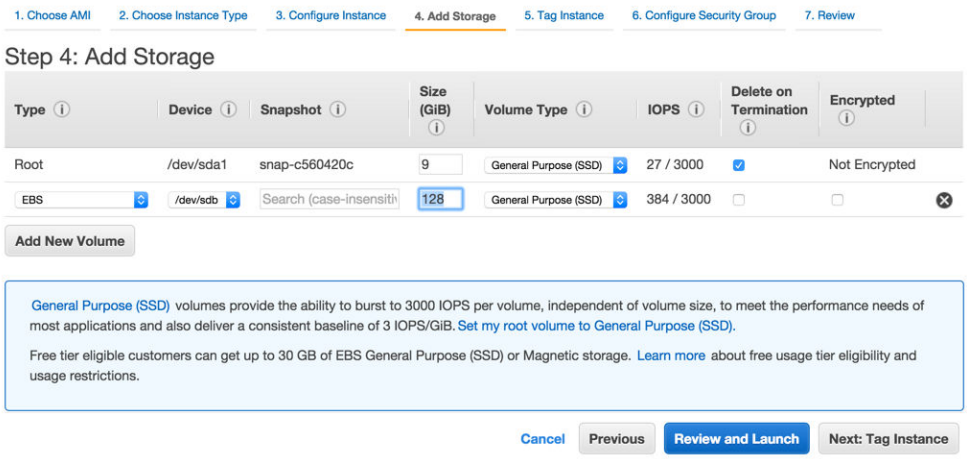
6. Choose the previously created VPC from the **Network** drop-down menu.

Figure 3-15 Create Instance on VPC



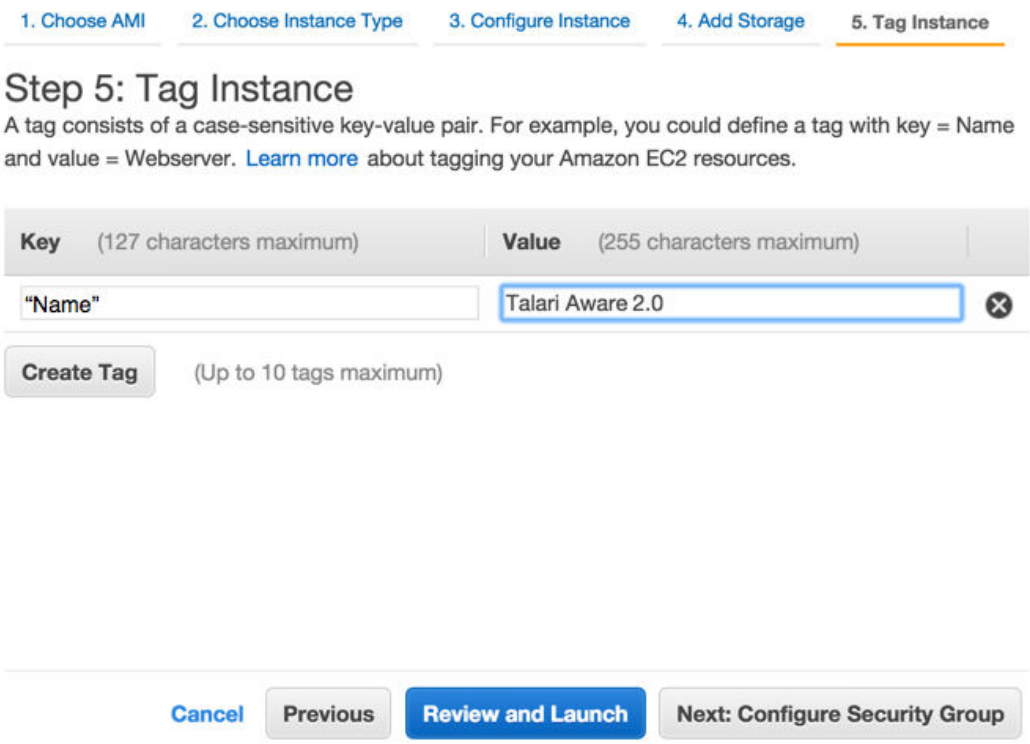
7. Choose the management **Subnet** you previously created from the drop-down menu that will allow you to access your Cloud Aware. Click **Next: Add Storage** to continue.
8. Under the **Network Interfaces** section, you may choose to specify a **Primary IP** for the default interface (eth0); otherwise, the IP address is automatically assigned from the subnet.
9. On the **Add Storage** screen click **Add New Volume** and enter the **Size** of the volume to store your Oracle SD-WAN Aware database. Consult the Amazon Web Services Requirements section on page 4 for details on how to size this device. Click **Next: Tag Instance** to continue.

Figure 3-16 Add Storage to Instance



10. On the **Tag Instance** screen, enter a **Key** (i.e., a Name) and a **Value** (i.e., a specific identifier for the Instance such as "Oracle SD-WAN Aware 2.0") to make it easy to identify your Cloud Aware EC2 instance. Click **Next: Configure Security Group** to continue.

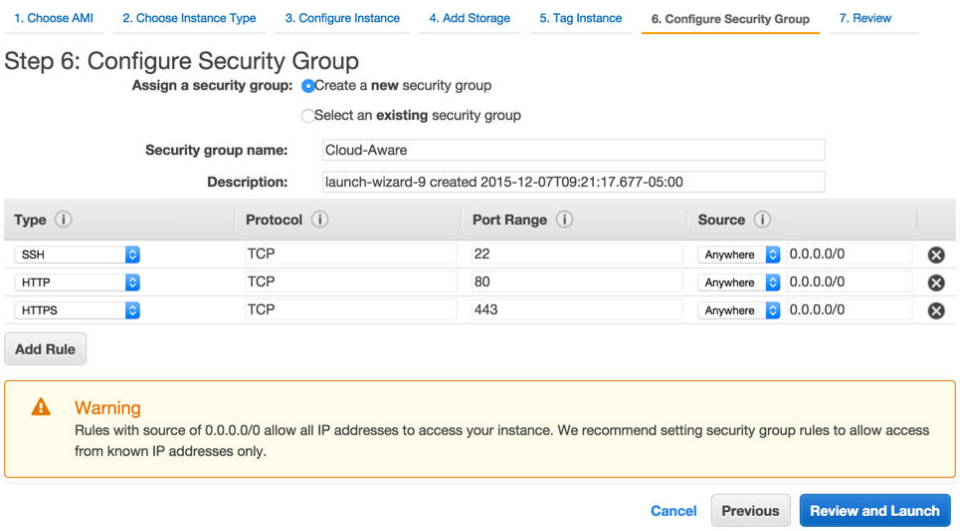
Figure 3-17 Tag the Instance



11. On the **Configure Security Group** page, click the radio button next to **Create a new security group** to follow the process for creating a new security group, or click the radio button next to **Select an existing security group** to choose from the groups already configured. Click **Review and Launch** to continue.

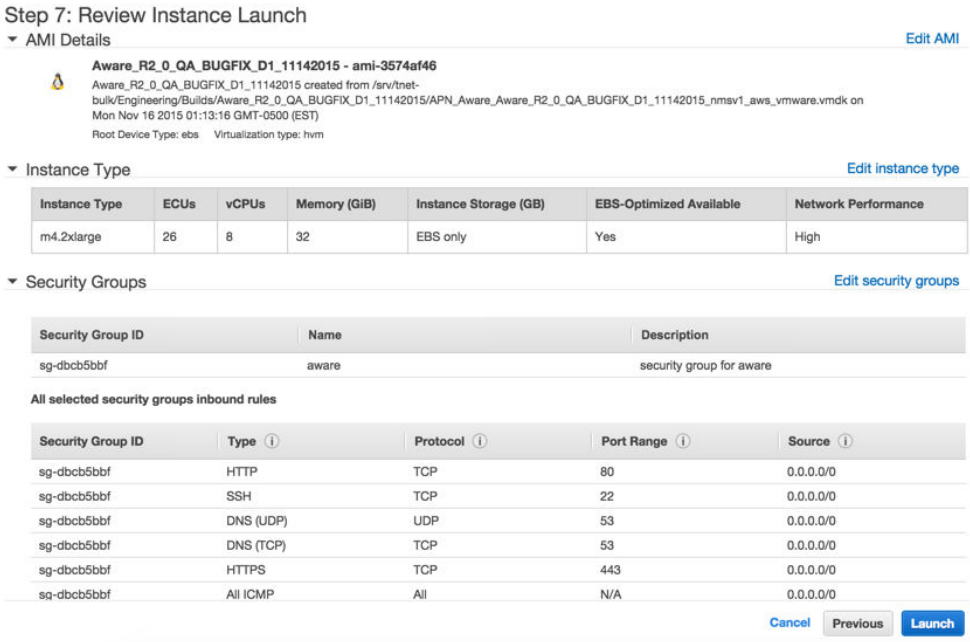
> **Note:**
>
> To use Oracle SD-WAN Aware on AWS, at a minimum, SSH, HTTP, and HTTPS should be configured with a **Source** of **Anywhere** or a custom IP range. Network administrators may choose to adjust the security settings to best fit their existing network architecture and security policies.

Figure 3-18 Configure Security Groups



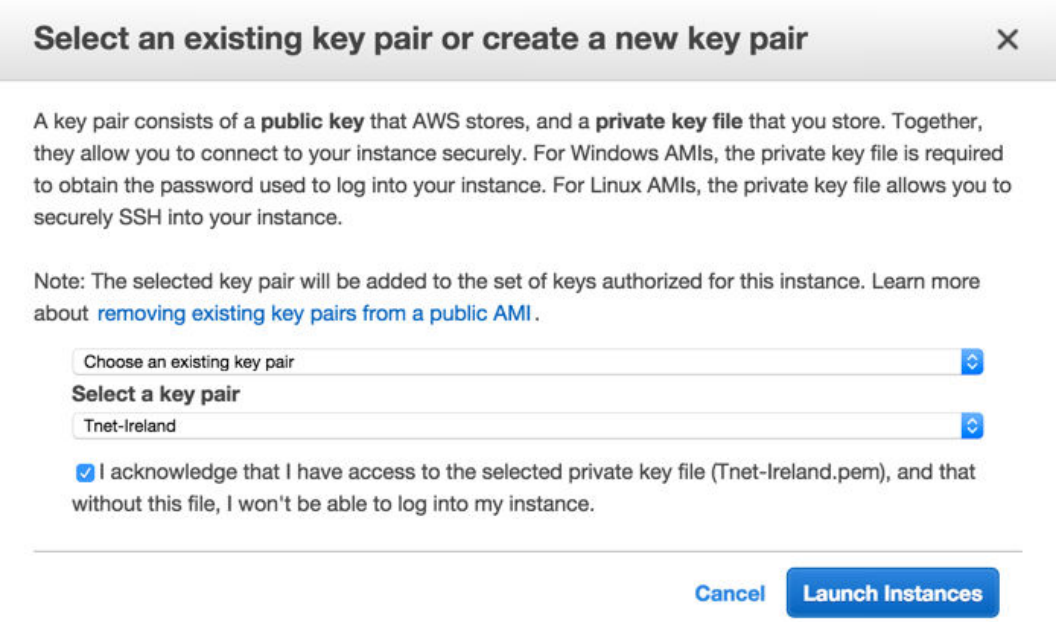
12. The **Review Instance Launch** screen summarizes the settings you configured for your Cloud Aware EC2 instance including any possible security issues and Amazon warnings. Once you have reviewed the information presented on this page, click **Launch** to create and initialize the EC2 instance.

Figure 3-19 Review Instance Before Launch



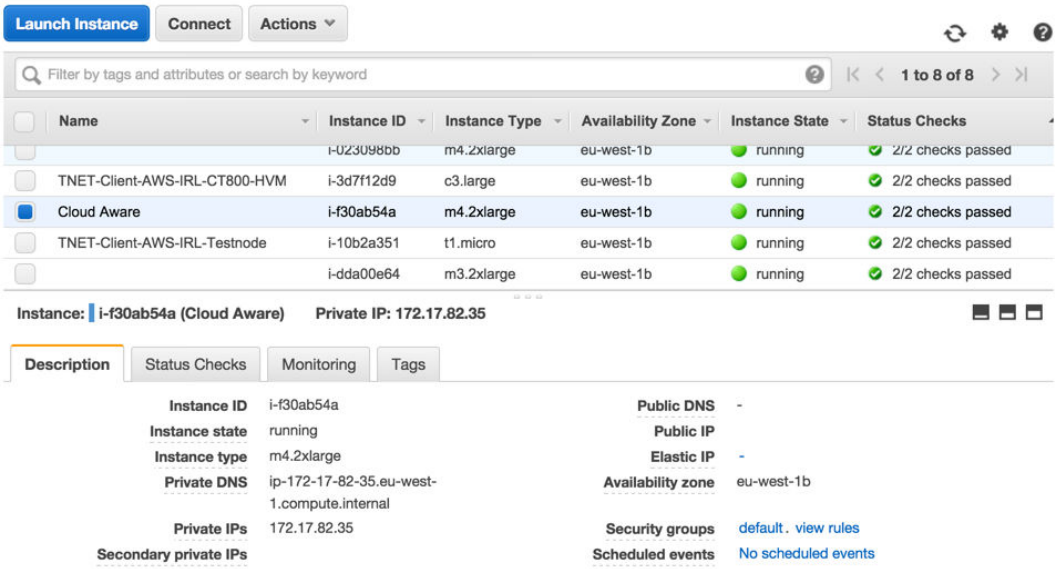
13. On the **Key Pair** window, you may **Choose an existing key pair** or create a new one. Click **Launch Instances** to start your Oracle SD-WAN Aware EC2 Instance.

Figure 3-20 Choose or Create a Key Pair



14. When the **Instance State** is **running** and the **Status Checks** are passed, make note of the **Private IP** of your Oracle SD-WAN Aware Instance, which can be found on the **Description** tab.

Figure 3-21 Launch New Cloud Oracle SD-WAN Aware Instance



15. From the **EC2 Dashboard**, select the **Network Interfaces** link and locate the default interface that was created for the Oracle SD-WAN Aware Instance. This will be used as the management interface. Highlight the interface and edit the **Name** tag to make it easy to identify.
16. From the **EC2 Dashboard**, select the **Elastic IPs** link and then click the **Allocate New Address** button to allocate an Elastic IP that will be reachable from outside the VPC.

17. Highlight the Elastic IP and click **Associate Address** from the **Actions** drop-down. Enter the **Network Interface** and **Private IP** of the Oracle SD-WAN Aware Instance and click **Associate**.
18. You can now use the Elastic IP to connect to Oracle SD-WAN Aware via a web browser. Default login credentials are: **Username:** *talariuser*, **Password:** *talari-<instance-id>* (e.g., talari-i-726a09ff).

Connect Cloud Oracle SD-WAN Aware to Your WAN

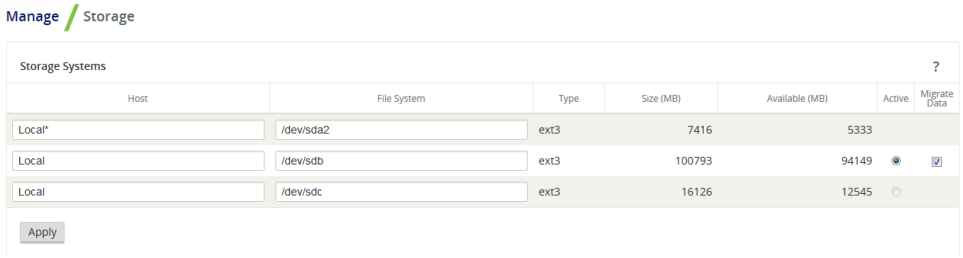
There are a few options for connecting Cloud Aware to your existing Talari WAN.

- **Option 1**: Connect Cloud Aware via VPC
    1. A **Virtual Private Gateway** may be used to establish a **VPN Connection** between the VPC and your private network. Please consult AWS documentation for configuration details.
    2. Once the **Virtual Private Gateway** is operational, add a route to the VPC's route table that directs traffic destined for your private network to the **Virtual Private Gateway.**
- **Option 2**: Connect Cloud Aware via Talari Conduit
    1. If you deployed a Talari Virtual Appliance CT800 within a VPC and connected it to your Talari WAN, Cloud Aware can access the rest of the Talari WAN through its secure Talari Conduit.
    2. Add a route to the VPC's route table that directs traffic destined for your private network to the LAN-side **Network Interface** of the CT800 instance
- Option 3: Create an AWS Direct Connection
  AWS Direct Connect can be used to establish a private connection between the VPC and your private network. Please consult AWS documentation for configuration details (https://aws.amazon.com/directconnect/).

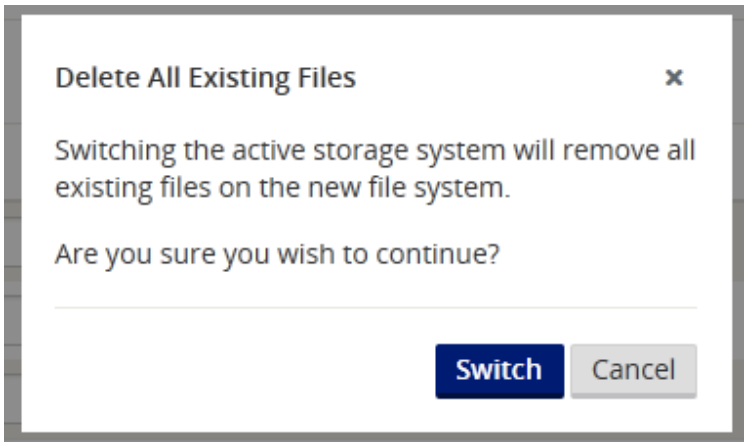
Completing the Connection Between Cloud Aware and Your Talari WAN

Once a connection has been established between the VPC and your private network, do the following:

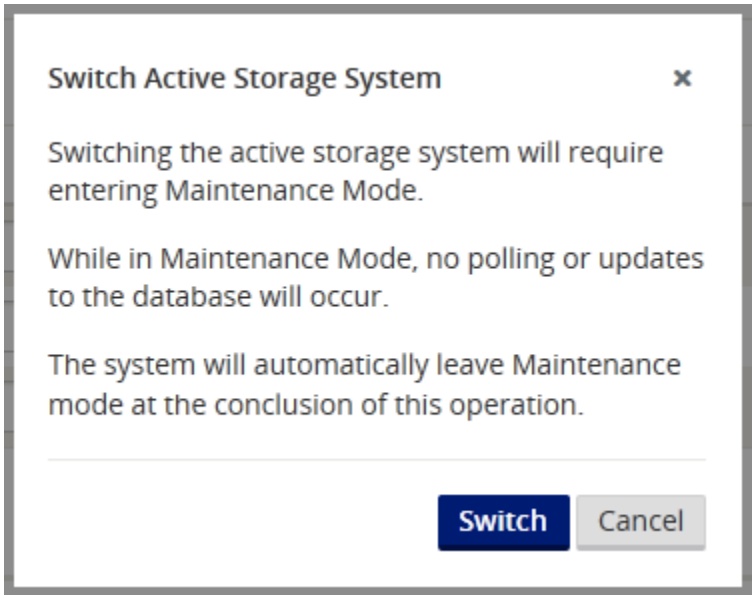
1. Log in to the Oracle SD-WAN Aware web console with the username **talariuser** and password **<AWS-ID>**.
2. From the Oracle SD-WAN Aware web console, go to **Manage**, then **Storage**, then click the **Active** radio button next to the storage partition you created, and click **Apply**.



3. The **Delete All Existing Files** warning dialog will appear. Click **Switch**.



4. The **Switch Active Storage System** dialog will appear. Click **Switch**.



5. Oracle SD-WAN Aware will be placed into **Maintenance Mode**. A progress bar will appear. When the progress bar completes, click **Continue**.
6. From the Oracle SD-WAN Aware web console, go to **Manage**, then **APN Discovery** and click the **Download Certificate** button to download an SSL certificate to your workstation.
7. From the Network Control Node (NCN) web console, got to **Manage Network**, then **APN Aware Certificates** to upload and install the SSL certificate on the NCN.
8. From the Oracle SD-WAN Aware web console, go to **Manage à APN Discovery** and enter the **NCN MGT IP Address**, then click the **Discover** button to discover the Talari Appliances in your Talari WAN.
9. Oracle SD-WAN Aware can now manage and monitor the Talari Appliances on your Talari WAN.

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Aware Network Traffic

Oracle SD-WAN Aware network traffic uses SSL encryption. To identify or classify Oracle SD-WAN Aware network traffic, look for the following:

1. Poll Request from Oracle SD-WAN Aware to Talari Appliance
   - **Protocol:** TCP
   - **Source IP:** Aware Management IP
   - **Source Port:** Random port number
   - **Destination IP:** Appliance Management IP
   - **Destination Port:** 2156
2. Poll Response from Talari Appliance to Oracle SD-WAN Aware
   - **Protocol:** TCP
   - **Source IP:** Appliance Management IP
   - **Source Port:** 2156
   - **Destination IP:** Aware Management IP
   - **Destination Port:** Same random port number as initial request