

Deployment

27 MAR 2018

VMware Validated Design 4.2

VMware Validated Design for Management and Workload
Consolidation 4.2



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About VMware Validated Design Deployment for Consolidated SDDC



VMware Validated Design Deployment for Management and Workload Consolidation (also referred to as the VMware Validated Design for Consolidated SDDC) provides step-by-step instructions for installing, configuring, and operating a software-defined data center (SDDC) based on the VMware Validated Design for Software-Defined Data Center.

VMware Validated Design Deployment for Management and Workload Consolidation does not contain step-by-step instructions for performing all of the required post-configuration tasks because they often depend on customer requirements.

Intended Audience

The *VMware Validated Design Deployment for Management and Workload Consolidation* document is intended for cloud architects, infrastructure administrators and cloud administrators who are familiar with and want to use VMware software to deploy in a short time and manage an SDDC that meets the requirements for capacity, scalability, backup and restore, and extensibility for disaster recovery support.

Required VMware Software

VMware Validated Design Deployment for Management and Workload Consolidation is compliant and validated with certain product versions. See *VMware Validated Design Release Notes* for more information about supported product versions.

Virtual Infrastructure Implementation for Consolidated SDDC

2

The Virtual Infrastructure for Consolidated SDDC is implemented through the following high-level procedures.

Procedure

1 [Install and Configure ESXi Hosts for Consolidated SDDC](#)

Start the deployment of your virtual infrastructure by installing and configuring all the ESXi hosts for Consolidated SDDC.

2 [Deploy and Configure the Platform Services Controller and vCenter Server Components for Consolidated SDDC](#)

3 [Deploy and Configure the NSX Instance of the Consolidated SDDC](#)

Install and Configure ESXi Hosts for Consolidated SDDC

Start the deployment of your virtual infrastructure by installing and configuring all the ESXi hosts for Consolidated SDDC.

Procedure

1 [Prerequisites for Installation of ESXi Hosts for Consolidated SDDC](#)

2 [Install ESXi Interactively on All Hosts for Consolidated SDDC](#)

Install all ESXi hosts for all clusters interactively.

3 [Configure the Network on All Hosts for Consolidated SDDC](#)

After the initial boot, use the ESXi Direct Console User Interface (DCUI) for initial host network configuration and administrative access.

4 [Configure vSphere Standard Switch On a Host for Consolidated SDDC](#)

You must perform network configuration from the VMware Host Client for a single host. You perform network configuration for the other hosts after the deployment of the vCenter Server.

5 [Configure SSH and NTP on the First Host for Consolidated SDDC](#)

Time synchronization issues can result in serious problems with your environment. Configure NTP and SSH on the first host. NTP and SSH configuration for the other hosts will take place after the installation of vCenter Server.

Prerequisites for Installation of ESXi Hosts for Consolidated SDDC

Install and configure the ESXi hosts for your workload and management consolidation deployment.

Before you start:

- Make sure that you have a Windows host that has access to your data center. You use this host to connect to the data center and perform configuration steps.

You must also prepare the installation files.

- Download the ESXi ISO installer.
- Create a bootable USB drive that contains the ESXi Installation. See "Format a USB Flash Drive to Boot the ESXi Installation or Upgrade" in *vSphere Installation and Setup*.

IP Addresses, Hostnames, and Network Configuration

The following values are required to configure your hosts.

Table 2-1. Hosts for the Consolidated SDDC

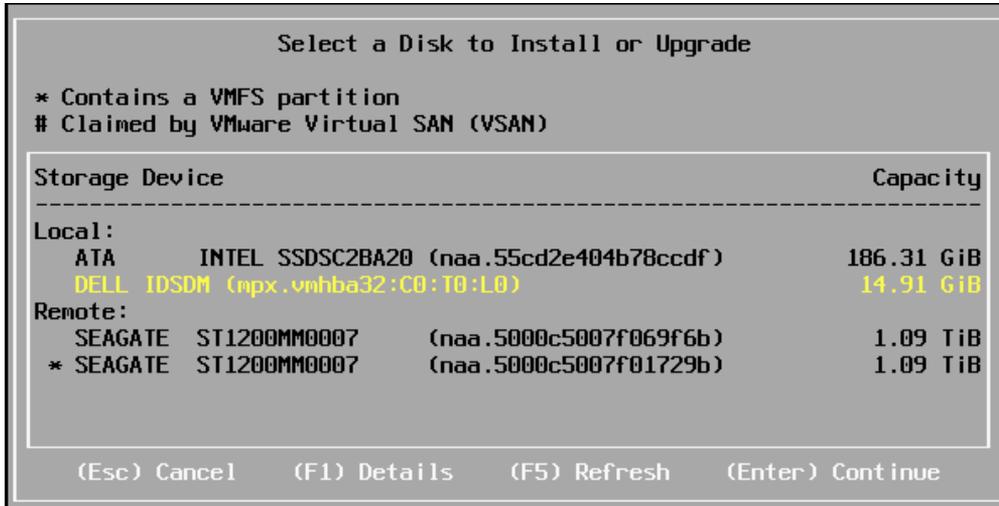
| FQDN | IP | VLAN ID | Default Gateway | NTP Server |
|------------------------------------|---------------|---------|-----------------|----------------------------|
| sfo01w01esx01.sfo01.rainpole.local | 172.16.31.101 | 1631 | 172.16.31.253 | ■ ntp.sfo01.rainpole.local |
| sfo01w01esx02.sfo01.rainpole.local | 172.16.31.102 | 1631 | 172.16.31.253 | ■ ntp.sfo01.rainpole.local |
| sfo01w01esx03.sfo01.rainpole.local | 172.16.31.103 | 1631 | 172.16.31.253 | ■ ntp.sfo01.rainpole.local |
| sfo01w01esx04.sfo01.rainpole.local | 172.16.31.104 | 1631 | 172.16.31.253 | ■ ntp.sfo01.rainpole.local |

Install ESXi Interactively on All Hosts for Consolidated SDDC

Install all ESXi hosts for all clusters interactively.

Procedure

- 1 Power on the **sfo01w01esx01** host.
- 2 Mount the USB drive containing the ESXi ISO file and boot from that USB drive.
- 3 On the **Welcome to the VMware 6.5.0 Installation** screen, press Enter to start the installation.
- 4 On the **End User License Agreement (EULA)** screen, press F11 to accept the EULA.
- 5 On the **Select a Disk to Install or Upgrade** screen, select the USB drive or SD card under local storage to install ESXi, and press Enter to continue.



- 6 Select the keyboard layout, and press Enter.
- 7 Enter the *esxi_root_user_password*, enter the password a second time to confirm the spelling, and press Enter.
- 8 On the **Confirm Install** screen, press F11 to start the installation.
- 9 After the installation completes successfully, unmount the USB drive, and press Enter to reboot the host.
- 10 Repeat this procedure for all hosts, using the respective values for each host you configure.

Configure the Network on All Hosts for Consolidated SDDC

After the initial boot, use the ESXi Direct Console User Interface (DCUI) for initial host network configuration and administrative access.

To configure the host network settings, perform the following tasks:

- Configure the network adapter (vmk0) and VLAN ID for the Management Network.
- Configure the IP address, subnet mask, gateway, DNS server, and FQDN for the ESXi host.

Repeat this procedure for all hosts in the consolidated cluster. Enter the respective values from the prerequisites section for each host that you configure. See [Prerequisites for Installation of ESXi Hosts for Consolidated SDDC](#).

Procedure

- 1 Open the DCUI on the physical ESXi host `sfo01w01esx01.sfo01.rainpole.local`.
 - a Open a console window to the host.
 - b Press F2 to enter the DCUI.
 - c Log in using the following credentials.

| Setting | Value |
|-----------|--------------------------------|
| User name | root |
| Password | <i>esxi_root_user_password</i> |

- 2 Configure the network.
 - a Select **Configure Management Network** and press Enter.
 - b Select **VLAN (Optional)** and press Enter.
 - c Enter **1631** as the VLAN ID for the Management Network and press Enter.
 - d Select **IPv4 Configuration** and press Enter.
 - e Configure the IPv4 network using the following settings, and press Enter.

| Setting | Value |
|--|---------------|
| Set static IPv4 address and network configuration | Selected |
| IPv4 Address | 172.16.31.101 |
| Subnet Mask | 255.255.255.0 |
| Default Gateway | 172.16.31.253 |

- f Select **DNS Configuration** and press Enter.
 - g Configure the DNS by using the following settings, and press Enter.

| Setting | Value |
|--|------------------------------------|
| Use the following DNS Server address and hostname | Selected |
| Primary DNS Server | 172.16.11.5 |
| Alternate DNS Server | 172.16.11.4 |
| Hostname | sfo01w01esx01.sfo01.rainpole.local |

- h Select **Custom DNS Suffixes** and press Enter.
 - i Ensure that there are no suffixes listed, and press Enter.
- 3 After you configure all host network settings, press Escape to exit, and press Y to confirm the changes.
- 4 Repeat this procedure for all hosts.

Configure vSphere Standard Switch On a Host for Consolidated SDDC

You must perform network configuration from the VMware Host Client for a single host. You perform network configuration for the other hosts after the deployment of the vCenter Server.

You configure a vSphere Standard Switch with two port groups:

- The existing virtual machine port group.
- VMkernel port group.

This configuration provides connectivity and common network configuration for virtual machines that reside on each host.

Procedure

- 1 Log in to the vSphere host using the VMware Host Client.
 - a Open a Web browser and go to **https://sfo01w01esx01.sfo01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-------------------------|
| User name | root |
| Password | esxi_root_user_password |

- 2 Click **OK** to Join the Customer Experience Improvement Program.
- 3 Configure a VLAN for the VM Network port group.
 - a In the Navigator, click **Networking**, click the **Port Groups** tab, select the VM Network port group, and click **Edit Settings**.
 - b On the **Edit port group - VM Network** window, enter **1611** for **VLAN ID**, and click **OK**.

Configure SSH and NTP on the First Host for Consolidated SDDC

Time synchronization issues can result in serious problems with your environment. Configure NTP and SSH on the first host. NTP and SSH configuration for the other hosts will take place after the installation of vCenter Server.

Procedure

- 1 Log in to the vSphere host using the VMware Host Client.
 - a Open a Web browser and go to **https://sfo01w01esx01.sfo01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-------------------------|
| User name | root |
| Password | esxi_root_user_password |

- 2 Configure SSH.
 - a In the Navigator, click **Manage**, click the **Services** tab, select the **TSM-SSH** service, and click the **Actions** menu. Select **Policy** and click **Start and stop with host**.
 - b Click **Start** to start the service.
- 3 Configure the NTP Daemon (ntpd).
 - a In the Navigator, click **Manage**, click the **System** tab, click **Time & date**, and click **Edit Settings**.
 - b In the **Edit Time configuration** dialog box, select the **Use Network Time Protocol (enable NTP client)** radio button, change the NTP service startup policy to **Start and stop with host**, and enter **ntp.sfo01.rainpole.local**.
 - c Click **Save** to save these changes.
 - d Start the service by clicking **Actions**, point to **NTP service**, and select **Start**.

Deploy and Configure the Platform Services Controller and vCenter Server Components for Consolidated SDDC

Deploy and configure the vCenter Server and cluster components.

Procedure

- 1 [Deploy the External Platform Services Controllers for Consolidated SDDC](#)
- 2 [Join the Platform Services Controller Instances to Active Directory for Consolidated SDDC](#)

After you have successfully installed the Platform Services Controller instance, you must add the appliance to your Active Directory domain. After that, add the Active Directory domain as an identity source to vCenter Single Sign-On. Users in the Active Directory domain are then visible to vCenter Single Sign-On and can be assigned permissions to view or manage SDDC components.

- 3 [Replace the Platform Services Controller Certificates for Consolidated SDDC](#)

To establish trusted connection with the other SDDC management components, you replace the default or expiring machine SSL certificate on each Platform Services Controller instance in the region with a custom certificate. The certificate, generated by the CertGenVVD utility, is signed by the certificate authority (CA) available on the parent Active Directory (AD) server .

4 [Deploy the vCenter Server Instance for Consolidated SDDC](#)

You can now install the vCenter Server appliance and configure licensing and security.

5 [Replace the Certificate of vCenter Server for Consolidated SDDC](#)

To establish trusted connection with the other SDDC components, you replace the machine SSL certificate on each vCenter Server instance in region with a custom certificate. The certificate, generated by the CertGenVVD utility, is signed by the certificate authority (CA) available on the parent Active Directory (AD) server.

6 [Set SDDC Deployment Details on the vCenter Server for Consolidated SDDC](#)

7 [Configure the vSphere Cluster for the Consolidated SDDC](#)

Create and configure the vSphere cluster.

8 [Create a vSphere Distributed Switch for Consolidated SDDC](#)

After adding all ESXi hosts to the cluster, create a vSphere Distributed Switch to handle the SDDC traffic. You also create port groups to prepare your environment to migrate the Platform Services Controller and vCenter Server instance to the distributed switch.

9 [Create vSAN Disk Groups for Consolidated SDDC](#)

vSAN disk groups must be created on each host that is contributing storage to the vSAN datastore.

10 [Enable vSphere HA for Consolidated SDDC](#)

After the vSphere distributed switch has been created and connected with all hosts, enable vSphere High Availability on the cluster.

11 [Change Advanced Options on the ESXi Hosts for Consolidated SDDC](#)

Change the default ESX Admins group to achieve greater levels of security and enable vSAN to provision the Virtual Machine Swap files as thin to conserve space in the vSAN datastore.

12 [Mount NFS Storage for Consolidated SDDC](#)

Mount an NFS datastore as a storage location for future backups.

13 [Create and Apply the Host Profile for Consolidated SDDC](#)

Host Profiles ensure that all hosts in the cluster have the same configuration.

14 [Configure Lockdown Mode on All ESXi Hosts for Consolidated SDDC](#)

To increase security of your ESXi hosts, you put them in Lockdown mode so that administrative operations can be performed only from vCenter Server.

15 [Set Virtual SAN Policy on Management Virtual Machines for Consolidated SDDC](#)

After you apply the host profile to all hosts, set the storage policy of the virtual machines to the vSAN Default Storage Policy. Set the Platform Services Controller and vCenter Server appliances to the default vSAN storage policy.

16 [Create the VM and Template Folders for Consolidated SDDC](#)

Create folders to group objects of the same type for easier management.

17 Create VM Groups to Define Startup Order for Consolidated SDDC

You can define the startup order of virtual machines with VM Groups. Startup orders are used during vSphere HA events such that vSphere HA powers on virtual machines in the correct order.

18 Create Host Groups to Keep vCenter and the Platform Services Controller on Specific Hosts for Consolidated SDDC

Create a rule to keep vCenter Server and the Platform Services Controller on the first four hosts so they are easy to locate in the event of an outage.

Deploy the External Platform Services Controllers for Consolidated SDDC

The Platform Services Controller contains common infrastructure services such as vCenter Single Sign-On (SSO), VMware Certificate Authority (VMCA), licensing, and server reservation and registration services.

Procedure

- 1 Log in to the Windows host that has access to your data center as an administrator.
- 2 Start the **vCenter Server Appliance Installer** wizard.
 - a Browse to the vCenter Server Appliance ISO file.
 - b Open the <dvd-drive>:\vcsa-ui-installer\win32\Installer.exe application file.
- 3 Complete Stage 1 of the **vCenter Server Appliance Deployment** wizard.
 - a Click **Install** to start the installation.
 - b Click **Next** on the **Introduction** page.
 - c On the **End User License Agreement** page, select the **I accept the terms of the license agreement** check box, and click **Next**.
 - d On the **Select deployment type** page, click **Platform Services Controller** and click **Next**.
 - e On the **Appliance deployment target** page, enter the following settings and click **Next**.

| Setting | Value |
|--------------------|------------------------------------|
| FQDN or IP Address | sfo01w01esx01.sfo01.rainpole.local |
| HTTPS port | 443 |
| User name | root |
| Password | <i>esxi_root_user_password</i> |

- f In the **Certificate Warning** dialog box, click **Yes** to accept the host certificate.

- g On the **Set up appliance VM** page, enter the following settings, and click **Next**.

| Setting | Value |
|-----------------------|--------------------------|
| VM name | sfo01w01psc01 |
| Root password | <i>psc_root_password</i> |
| Confirm root password | <i>psc_root_password</i> |

- h On the **Select datastore** page, perform the following steps, and click **Next**.

| Setting | Value |
|------------------|--|
| Select datastore | Select Install on a new Virtual SAN datastore on the target host and click Next . Confirm at least one Cache tier and two Capacity tier disks have been claimed. Select Enable Thin Disk Mode . |

- i On the **Configure network settings** page, enter the following settings and click **Next**.

| Setting | Value |
|------------------------------|------------------------------------|
| Network | VM Network |
| IP version | IPv4 |
| IP assignment | static |
| System name | sfo01w01psc01.sfo01.rainpole.local |
| IP address | 172.16.11.63 |
| Subnet mask or prefix length | 255.255.255.0 |
| Default gateway | 172.16.11.253 |
| DNS servers | 172.16.11.5,172.16.11.4 |

- j On the **Ready to complete stage 1** page, review the configuration and click **Finish** to start the deployment.
- k When the deployment completes, click **Continue** to proceed to second stage of the installation, setting up the Platform Services Controller Appliance.

4 Complete Stage 2 of the **Set Up Platform Services Controller Appliance** wizard.

- a Click **Next** on the **Introduction** page.
- b On the **Appliance configuration** page, enter the following settings and click **Next**.

| Setting | Value |
|------------------------------------|-----------------------------------|
| Time synchronization mode | Synchronize time with NTP servers |
| NTP servers (comma-separated list) | ntp.sfo01.rainpole.local |
| SSH access | Enabled |

- c On the **SSO configuration** page, enter the following settings, and click **Next**.

| Setting | Value |
|-------------------|-------------------------|
| SSO configuration | Create a new SSO domain |
| SSO domain name | vsphere.local |
| SSO password | <i>sso_password</i> |
| Confirm password | <i>sso_password</i> |
| Site name | SFO01 |

- d On the **Configure CEIP** page, verify that the **Join the VMware's Customer Experience Improvement Program (CEIP)** check box is checked and click **Next**.
- e On the **Ready to complete** page, review the configuration and click **Finish** to complete the setup.
- f Click **OK** on the Warning.
- g When the installation completes, click **Close**.

Join the Platform Services Controller Instances to Active Directory for Consolidated SDDC

After you have successfully installed the Platform Services Controller instance, you must add the appliance to your Active Directory domain. After that, add the Active Directory domain as an identity source to vCenter Single Sign-On. Users in the Active Directory domain are then visible to vCenter Single Sign-On and can be assigned permissions to view or manage SDDC components.

Procedure

- 1 Log in to the administration interface of the Platform Services Controller.
 - a Open a Web browser and go to **https://sfo01w01psc01.sfo01.rainpole.local**.
 - b Click the link for **Platform Services Controller web interface**.
 - c Log in using the following credentials.

| Setting | Value |
|-----------|-------------------------------|
| User name | administrator@vsphere.local |
| Password | <i>vsphere_admin_password</i> |

- 2 Add the Platform Services Controller instance to the Active Directory domain.
 - a In the **Navigator**, click **Appliance Settings**, click the **Manage** tab, and click **Join**.
 - b In the **Join Active Directory Domain** dialog box, enter the following settings, and click **OK**.

| Setting | Value |
|-----------|--------------------------------|
| Domain | sfo01.rainpole.local |
| User name | svc-domain-join@rainpole.local |
| Password | svc-domain-join_password |

- 3 To apply the changes, reboot the Platform Services Controller instance.
 - a Click the **Appliance settings** tab, and click the **VMware Platform Services Appliance** link.
 - b Log in to the VMware vSphere Appliance Management interface with the following credentials.

| Setting | Value |
|-----------|-------------------|
| User name | root |
| Password | psc_root_password |

- c On the **Summary** page, click **Reboot**.
 - d In the **System Reboot** dialog box, click **Yes**.
 - e Wait for the reboot process to finish.
- 4 Log in to **https://sfo01w01psc01.sfo01.rainpole.local** again using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 5 Verify that the Platform Services Controller has successfully joined the domain, click **Appliance Settings** and click the **Manage** tab.
- 6 Add Active Directory as a vCenter Single Sign-On identity source.
 - a In the **Navigator**, click **Configuration** and click the **Identity Sources** tab.
 - b To add a new identity source, click the **Add** icon.
 - c In the **Add Identity Source** dialog box, select the following settings and click **OK**.

| Setting | Value |
|----------------------|--|
| Identity source type | Active Directory (Integrated Windows Authentication) |
| Domain name | SFO01.RAINPOLE.LOCAL |
| Use machine account | Selected |

- d Under **Identity Sources**, select the **rainpole.local** identity source and click **Set as Default Domain** to make `rainpole.local` the default domain.
- e In the confirmation dialog box, click **Yes**.

Replace the Platform Services Controller Certificates for Consolidated SDDC

To establish trusted connection with the other SDDC management components, you replace the default or expiring machine SSL certificate on each Platform Services Controller instance in the region with a custom certificate. The certificate, generated by the CertGenVVD utility, is signed by the certificate authority (CA) available on the parent Active Directory (AD) server .

Table 2-2. Certificate-Related Files on Platform Services Controller Instance

| Platform Services Controller | Certificate File Name |
|------------------------------------|--|
| sfo01w01psc01.sfo01.rainpole.local | <ul style="list-style-type: none"> ■ sfo01w01psc01.1.cer ■ sfo01w01psc01.key ■ Root64.cer |

Prerequisites

- CA-signed certificate files generated by using VMware Validated Design Certificate Generation Utility (CertGenVVD). See the *VMware Validated Design Planning and Preparation* documentation.
- A Windows host with an SSH terminal access software such as PuTTY and an scp software such as WinSCP installed.

Procedure

- 1 Open a Secure SHell connection to the Platform Services Controller virtual machine.
 - a Open an SSH connection to `sfo01w01psc01.sfo01.rainpole.local`.
 - b Log in using the following credentials.

| Setting | Value |
|----------|--------------------------------|
| Username | root |
| Password | <code>psc_root_password</code> |

- 2 To allow secure copy (scp) connections for the root user, change the Platform Services Controller command shell to the Bash shell.

```
shell
chsh -s "/bin/bash" root
```

3 Copy the generated certificates to the Platform Services Controller.

- a Run the following command to create a new temporary folder.

```
mkdir -p /root/certs
```

- b Copy the certificate files `sfo01w01psc01.1.cer`, `sfo01w01psc01.key`, and `Root64.cer` to the `/root/certs` folder.

You can use an `scp` software like WinSCP.

4 Replace the certificate on the Platform Services Controller.

- a Start the vSphere Certificate Manager utility on the Platform Services Controller.

```
/usr/lib/vmware-vmca/bin/certificate-manager
```

- b Select **Option 1 (Replace Machine SSL certificate with Custom Certificate)**.
- c Enter the default vCenter Single Sign-On user name `administrator@vsphere.local` and the `vsphere_admin` password.
- d Select **Option 2 (Import custom certificate(s) and key(s) to replace existing Machine SSL certificate)**.
- e When prompted for the custom certificate, enter `/root/certs/sfo01w01psc01.1.cer`.
- f When prompted for the custom key, enter `/root/certs/sfo01w01psc01.key`.
- g When prompted for the signing certificate, enter `/root/certs/Root64.cer`.
- h When prompted to Continue operation, enter `Y`.

The Platform Services Controller services automatically restart.

5 After Certificate Manager replaces the certificates, restart the `vami-lighttpd` service to update the certificate in the virtual application management interface (VAMI) and to remove certificate files from Platform Services Controller.

```
service vami-lighttpd restart
cd /root/certs

rm sfo01w01psc01.1.cer sfo01w01psc01.key Root64.cer
```

6 Switch the shell back to the appliance shell.

```
chsh -s /bin/appliancesh root
```

Deploy the vCenter Server Instance for Consolidated SDDC

You can now install the vCenter Server appliance and configure licensing and security.

Procedure

- 1 Start the **vCenter Server Appliance Deployment** wizard.
 - a Browse to the vCenter Server Appliance ISO file.
 - b Open the <dvd-drive>:\vcsa-ui-installer\win32\Installer application file.
- 2 Complete the **vCenter Server Appliance Deployment** wizard.
 - a Click **Install** to start the installation.
 - b Click **Next** on the **Introduction** page.
 - c On the **End User License Agreement** page, select the **I accept the terms of the license agreement** check box and click **Next**.
 - d On the **Select deployment type** page, under **External Platform Services Controller**, select the **vCenter Server (Requires External Platform Services Controller)** radio button and click **Next**.
 - e On the **Appliance deployment target** page, enter the following settings and click **Next**.

| Setting | Value |
|----------------------------------|------------------------------------|
| ESXi host or vCenter Server name | sfo01w01esx01.sfo01.rainpole.local |
| HTTPS port | 443 |
| User name | root |
| Password | <i>esxi_root_user_password</i> |

- f In the **Certificate Warning** dialog box, click **Yes** to accept the host certificate.
- g On the **Set up appliance VM** page, enter the following settings and click **Next**.

| Setting | Value |
|-----------------------|-------------------------|
| VM name | sfo01w01vc01 |
| Root password | <i>vc_root_password</i> |
| Confirm root password | <i>vc_root_password</i> |

- h On the **Select deployment size** page, select **Small vCenter Server** and click **Next**.
- i On the **Select datastore** page, select the **vsanDatastore** datastore, select the **Enable Thin Disk Mode** check box, enter sfo01-w01dc for the **Datacenter Name**, enter sfo01-w01-consolidated01 for the **Cluster Name**, and click **Next**.

- j On the **Configure network settings** page, enter the following settings and click **Next**.

| Setting | Value |
|------------------------------|-----------------------------------|
| Network | VM Network |
| IP version | IPv4 |
| IP assignment | Static |
| System name | sfo01w01vc01.sfo01.rainpole.local |
| IP address | 172.16.11.64 |
| Subnet mask or prefix length | 255.255.255.0 |
| Default gateway | 172.16.11.253 |
| DNS servers | 172.16.11.5,172.16.11.4 |

- k On the **Ready to complete stage 1** page, review the configuration and click **Finish** to start the deployment.
- l Once the deployment completes, click **Continue** to proceed to stage 2 of the installation.

3 Complete the **Install - Stage 2: Set Up vCenter Server Appliance** wizard.

- a Click **Next** on the **Introduction** page.
- b On the **Appliance configuration** page, enter the following settings and click **Next**.

| Setting | Value |
|------------------------------------|-----------------------------------|
| Time synchronization mode | Synchronize time with NTP servers |
| NTP servers (comma-separated list) | ntp.sfo01.rainpole.local |
| SSH access | Enabled |

- c On the **SSO configuration** page, enter the following settings and click **Next**.

| Setting | Value |
|------------------------------|------------------------------------|
| Platform Services Controller | sfo01w01psc01.sfo01.rainpole.local |
| HTTPS port | 443 |
| SSO domain name | vsphere.local |
| Single Sign-On user name | administrator |
| Single Sign-On password | <i>vsphere_admin_password</i> |

- d On the **Ready to Complete** page, review your entries and click **Finish**.
- e Click **OK** on the **Warning** dialog box.
- f Once the set up completes, click **Close** to shut down the wizard.

4 Add new licenses for this vCenter Server instance and the ESXi hosts.

- a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
- b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- c Click the **Home** icon above the Navigator and select the **Administration** menu item.
 - d On the **Administration** page, click **Licenses** and click the **Licenses** tab.
 - e Click the **Create New Licenses** icon to add license keys.
 - f On the Enter license keys page, enter license keys for vCenter Server, ESXi and vSAN, one per line, and click **Next**.
 - g On the Edit license name page, enter a descriptive name for each license key and click **Next**.
 - h On the Ready to complete page, review your entries and click **Finish**.
- 5 Assign the newly added licenses to the vCenter Server asset.
- a Click the **Assets** tab.
 - b Select the vCenter Server instance, and click the **Assign License** icon.
 - c Select the vCenter Server license that you entered in the previous step, and click **OK**.
- 6 Assign the vCenterAdmins domain group to the vCenter Server Administrator role.
- a In the **Navigator**, click **Administration**.
 - b In the **Administration** window, click **Global Permissions** and select the **Manage** tab.
 - c In the **Global Permissions** box, click the **Add permission** icon.
 - d In the **Global Permissions Root - Add Permissions** window, click the **Add** button.
 - e Select **sfo01.rainpole.local** from the **Domain** drop-down menu.
 - f Enter **vCenterAdmins** in the **Search** text box and press **Enter**.
 - g Select the **vCenterAdmins** group, click the **Add** button, and then click **OK**.
 - h Ensure **Administrator** is selected and the **Propagate to children** check box is selected under **Assigned Role** and click **OK**.

Replace the Certificate of vCenter Server for Consolidated SDDC

To establish trusted connection with the other SDDC components, you replace the machine SSL certificate on each vCenter Server instance in region with a custom certificate. The certificate, generated by the CertGenVVD utility, is signed by the certificate authority (CA) available on the parent Active Directory (AD) server.

Table 2-3. Certificate-Related Files on the vCenter Server Instance

| vCenter Server FQDN | Files for Certificate Replacement |
|-----------------------------------|--|
| sfo01w01vc01.sfo01.rainpole.local | <ul style="list-style-type: none"> ■ sfo01w01vc01.key ■ sfo01w01vc01.1.cer ■ Root64.cer |

Prerequisites

- CA-signed certificate files generated by using VMware Validated Design Certificate Generation Utility (CertGenVVD). See the *VMware Validated Design Planning and Preparation* documentation.
- A Windows host with an SSH terminal access software such as PuTTY and an scp software such as WinSCP installed.

Procedure

- 1 Log in to vCenter Server by using Secure Shell (SSH) client.
 - a Open an SSH connection to the sfo01w01vc01.sfo01.rainpole.local virtual machine.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|------------------------------|
| User name | root |
| Password | vcenter_server_root_password |

- 2 To allow secure copy (scp) connections for the root user, change the vCenter Server appliance command shell to the Bash shell .

```
shell
chsh -s "/bin/bash" root
```

- 3 Copy the generated certificates to the vCenter Server Appliance.
 - a Run the following command to create a new temporary folder.

```
mkdir -p /root/certs
```

- b Copy the certificate files sfo01w01vc01.1.cer, sfo01w01vc01.key, and Root64.cer to the /root/certs folder.

You can use an scp software such as WinSCP.

- 4 Replace the CA-signed certificate on the vCenter Server instance.
 - a Start the vSphere Certificate Manager utility on the vCenter Server instance.

```
/usr/lib/vmware-vmca/bin/certificate-manager
```

- b Select **Option 1 (Replace Machine SSL certificate with Custom Certificate)**, enter the default vCenter Single Sign-On user name **administrator@vsphere.local** and the **vsphere_admin_password** password.
- c When prompted for the Infrastructure Server IP, enter the IP address of the Platform Services Controller that manages this vCenter Server instance.

| vCenter Server instance | IP Address of managing Platform Services Controller |
|-----------------------------------|---|
| sfo01w01vc01.sfo01.rainpole.local | 172.16.11.63 |

- d Select **Option 2 (Import custom certificate(s) and key(s) to replace existing Machine SSL certificate)**.
- e When prompted, provide the full path to the custom certificate, the root certificate file, and the key file that you copied over earlier, and confirm the import with **Yes (Y)**.

| vCenter Server | Input to the vSphere Certificate Manager Utility |
|-----------------------------------|---|
| sfo01w01vc01.sfo01.rainpole.local | Please provide valid custom certificate for Machine SSL. File : /root/certs/sfo01w01vc01.1.cer Please provide valid custom key for Machine SSL. File : /root/certs/sfo01w01vc01.key Please provide the signing certificate of the Machine SSL certificate. File : /root/certs/Root64.cer |

- 5 When status shows 100% Completed, wait several minutes until all vCenter Server services are restarted.
- 6 Restart the vami-lighttp service to update the certificate on the virtual appliance management interface (VAMI) and to remove certificate files.

```
service vami-lighttp restart
cd /root/certs/
rm sfo01w01vc01.1.cer sfo01w01vc01.key Root64.cer
```

Set SDDC Deployment Details on the vCenter Server for Consolidated SDDC

Set an identity of your SDDC deployment on vCenter Server. You can also use this identity as a label in tools for automated SDDC deployment.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 From the **Home** menu of the vSphere Web Client, select **Global Inventory Lists**.
- 3 In the **Navigator**, click **vCenter Servers** under **Resources**.
- 4 Click the **sfo01w01vc01.sfo01.rainpole.local** vCenter Server object and click the **Configure** tab in the central pane.
- 5 Under the **Settings** pane, click **Advanced Settings** and click the **Edit** button.
- 6 In the **Edit Advanced vCenter Server Settings** dialog box, set the following value pairs one by one, clicking **Add** after each entry.

| Name | Value |
|-------------------------------------|--------------------|
| config.SDDC.Deployed.Type | VVD |
| config.SDDC.Deployed.Flavor | Consolidated |
| config.SDDC.Deployed.Version | 4.2.0 |
| config.SDDC.Deployed.WorkloadDomain | Consolidated |
| config.SDDC.Deployed.Method | DIY |
| config.SDDC.Deployed.InstanceId | unique_identifier* |

Note * To generate a unique identifier, use the Online UUID Generator website <https://www.uuidgenerator.net/> and copy/paste the UUID into the config.SDDC.Deployed.InstanceId value. The Online UUID Generator is a universally unique identifier that generates random numbers using a secure random number generator.

- 7 Click **OK** to close the window.

Configure the vSphere Cluster for the Consolidated SDDC

Create and configure the vSphere cluster.

This process consists of the following actions:

- Enable vSphere DRS.
- Enable Enhanced vMotion Compatibility.

- Add the hosts to the cluster.
- Add a host to the active directory domain.
- Rename the vSAN datastore.
- Create, configure, and populate resource pools.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Enable vSphere DRS.
 - a Expand the **sfo01-w01dc** Datacenter object.
 - b Click the **sfo01-w01-consolidated01** cluster object then click the **Configure** tab.
 - c Select the **vSphere DRS** page, and click **Edit**.
 - d Select the **Turn On vSphere DRS** checkbox then click **OK**.
- 3 Enable VMware EVC.
 - a Select the **VMware EVC** page, and click **Edit**.
 - b *Set EVC mode to the highest available setting supported for the hosts in the cluster*, and click **OK**.
- 4 Add a host to the cluster.
 - a Right-click the **sfo01-w01-consolidated01** cluster, and click **Add Host**.
 - b On the **Name and location** page, enter **sfo01w01esx02.sfo01.rainpole.local** in the **Host name or IP address** text box and click **Next**.
 - c On the **Connection settings** page, enter the following credentials and click **Next**.

| Setting | Value |
|-----------|-------------------------|
| User name | root |
| Password | esxi_root_user_password |

- d In the **Security Alert** dialog, click **Yes**.
- e On the **Host summary** page, review the host information and click **Next**.

- f On the **Assign license** page, select the ESXi license key that you entered during the vCenter Server deployment and click **Next**.
 - g On the **Lockdown mode** page, click **Next**.
 - h On the **Resource pool** page, click **Next**.
 - i On the **Ready to complete** page, review your entries and click **Finish**.
- 5 Repeat the previous step for the remaining hosts to add them to the cluster.

| Setting | Value |
|---------|------------------------------------|
| Host 3 | sfo01w01esx03.sfo01.rainpole.local |
| Host 4 | sfo01w01esx04.sfo01.rainpole.local |

- 6 Add an ESXi host to the Active Directory domain
- a In the **Navigator**, click **Hosts and Clusters** and expand the entire **sfo01w01vc01.sfo01.rainpole.local** tree.
 - b Select the **sfo01w01esx01.sfo01.rainpole.local** host.
 - c Click the **Configure** tab.
 - d Under **System**, select **Authentication Services**.
 - e In the **Authentication Services** panel, click the **Join Domain** button.
 - f In the **Join Domain** dialog, enter the following settings and click **OK**.

| Setting | Value |
|-------------------|--------------------------------|
| Domain | sfo01.rainpole.local |
| Using credentials | Selected |
| User name | svc-domain-join@rainpole.local |
| Password | svc-domain-join_password |

- 7 Set the Active Directory Service to Start and stop with host.
- a In the **Navigator**, click **Hosts and Clusters** and expand the entire **sfo01w01vc01.sfo01.rainpole.local** tree.
 - b Select the **sfo01w01esx01.sfo01.rainpole.local** host.
 - c Click the **Configure** tab.
 - d Under **System**, select **Security Profile**.
 - e Click the **Edit** button next to **Services**.
 - f Select the **Active Directory Service** and change the **Startup Policy** to Start and stop with host and click **OK**.

- 8 Rename the vSAN datastore.
 - a In the **Navigator**, click **Storage** and expand the entire **sfo01w01vc01.sfo01.rainpole.local** tree.
 - b Select **vsanDatastore**, and select **Actions > Rename**.
 - c In the **Datastore - Rename** dialog, enter **sfo01-w01-vsan01** as the datastore name, and click **OK**.
- 9 Configure resource pools for the consolidated cluster.
 - a Right-click the **sfo01-w01-consolidated01** cluster and select **New Resource Pool**.
 - b In the **New Resource Pool** dialog box, enter the following values and click **OK**.
 - c Repeat for each of the resource pools needed.

| Setting | Resource Pool 1 | Resource Pool 2 | Resource Pool 3 | Resource Pool 4 |
|-------------------------|-----------------------|-----------------------|-----------------------|---------------------|
| Name | sfo01-w01rp-sddc-mgmt | sfo01-w01rp-sddc-edge | sfo01-w01rp-user-edge | sfo01-w01rp-user-vm |
| CPU-Shares | High | High | Normal | Normal |
| CPU-Reservation | 0 | 0 | 0 | 0 |
| CPU-Reservation Type | Expandable selected | Expandable selected | Expandable selected | Expandable selected |
| CPU-Limit | Unlimited | Unlimited | Unlimited | Unlimited |
| Memory-Shares | Normal | Normal | Normal | Normal |
| Memory-Reservation | 146 GB | 17 GB | 0 | 0 |
| Memory-Reservation Type | Expandable selected | Expandable selected | Expandable selected | Expandable selected |
| Memory-Limit | Unlimited | Unlimited | Unlimited | Unlimited |

- 10 Move vCenter Server and Platform Services Controller to the **sfo01-w01rp-sddc-mgmt** resource pool.
 - a In the Navigator, click **Hosts and Clusters** and expand the entire **sfo01w01vc01.sfo01.rainpole.local** tree.
 - b Select sfo01w01vc01 and drag it to the **sfo01-w01rp-sddc-mgmt** resource pool.
 - c Select **sfo01w01psc01** and drag it to the **sfo01-w01rp-sddc-mgmt** resource pool.

Create a vSphere Distributed Switch for Consolidated SDDC

After adding all ESXi hosts to the cluster, create a vSphere Distributed Switch to handle the SDDC traffic. You also create port groups to prepare your environment to migrate the Platform Services Controller and vCenter Server instance to the distributed switch.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Create the vSphere Distributed Switch.
 - a In the **Navigator**, click **Networking** and expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
 - b Right-click the sfo01-w01dc datacenter, and select **Distributed Switch > New Distributed Switch** to start the **New Distributed Switch** wizard.
 - c On the **Name and location** page, enter sfo01-w01-vds01 as the name and click **Next**.
 - d On the **Select version** page, ensure the **Distributed switch: 6.5.0** radio button is selected and click **Next**.
 - e On the **Edit settings** page, enter the following values and click **Next**.

| Setting | Value |
|-----------------------------|------------|
| Number of uplinks | 2 |
| Network I/O Control | Enabled |
| Create a default port group | Deselected |

- f On the **Ready to complete** page, review your entries and click **Finish**.
- 3 Edit the settings of the sfo01-w01-vds01 distributed switch.
 - a Right-click the sfo01-w01-vds01 distributed switch, and select **Settings > Edit Settings**.
 - b Click the **Advanced** tab.
 - c Enter **9000** as MTU (Bytes) value, and click **OK**.

- 4 Create port groups in the sfo01-w01-vds01 distributed switch for the management traffic types.
 - a Right-click the sfo01-w01-vds01 distributed switch, and select **Distributed Port Group > New Distributed Port Group**.
 - b Create port groups with the following settings and click **Next**.

| Port Group Name | Port Binding | VLAN Type | VLAN ID |
|-------------------------------|------------------------|-----------|---------|
| sfo01-w01-vds01-management | Ephemeral - no binding | VLAN | 1631 |
| sfo01-w01-vds01-management-vm | Ephemeral - no binding | VLAN | 1611 |
| sfo01-w01-vds01-vmotion | Static binding | VLAN | 1632 |
| sfo01-w01-vds01-vsant | Static binding | VLAN | 1633 |
| sfo01-w01-vds01-nfs | Static binding | VLAN | 1625 |
| sfo01-w01-vds01-uplink01 | Static binding | VLAN | 1635 |
| sfo01-w01-vds01-uplink02 | Static binding | VLAN | 2713 |

Note The port group for VXLAN traffic is automatically created later during the configuration of the NSX Manager.

- c On the **Ready to complete** page, review your entries, and click **Finish**.
 - d Repeat this step for each port group.
- 5 Change the port groups to use the Route Based on Physical NIC Load teaming algorithm.
 - a Right-click the sfo01-w01-vds01 distributed switch and select **Distributed Port Group > Manage Distributed Port Groups**.
 - b On the **Select port group policies** page, select **Teaming and failover** and click **Next**.
 - c Click the **Select distributed port groups** button, add all port groups except sfo01-w01-vds01-uplink01 and sfo01-w01-vds01-uplink02, click **OK** and click **Next**.
 - d On the **Teaming and failover** page, select **Route based on physical NIC load** from the **Load balancing** drop-down menu and click **Next**.
 - e Click **Finish**.
- 6 Configure the uplinks for the sfo01-w01-vds01-uplink01 and sfo01-w01-vds01-uplink02 port groups.
 - a Right click the **sfo01-w01-vds01-uplink01** port group and click **Edit Settings**.
 - b Select **Teaming and Failover**.
 - c Move **dvUplink2** to **Unused uplinks** and click **OK**.
 - d Right click the **sfo01-w01-vds01-uplink02** port group and click **Edit Settings**.
 - e Select **Teaming and Failover**.
 - f Move **dvUplink1** to **Unused uplinks** and click **OK**.

- 7 Connect the ESXi host, sfo01w01esx01.sfo01.rainpole.local, to the sfo01-w01-vds01 distributed switch by migrating its VMkernel network adapters.
 - a Right-click the **sfo01-w01-vds01** distributed switch and click **Add and Manage Hosts**.
 - b On the **Select task** page, select **Add hosts** and click **Next**.
 - c On the **Select hosts** page, click **New hosts**.
 - d In the **Select new hosts** dialog box, select **sfo01w01esx01.sfo01.rainpole.local** and click **OK**.
 - e On the **Select hosts** page, click **Next**.
 - f On the **Select network adapter tasks** page, ensure that **Manage physical adapters** and **Manage VMkernel adapters** check boxes are selected, and click **Next**.
 - g On the **Manage physical network adapters** page, click **vmnic1** and click **Assign uplink**.
 - h In the **Select an Uplink for vmnic1** dialog, click **dvUplink2** and click **OK**.
 - i On the **Manage physical network adapters** page, click **Next**.
- 8 Configure the VMkernel network adapters, edit the existing, and add new adapters as needed.
 - a On the **Manage VMkernel network adapters** page, select **vmk0** and click **Assign port group**.
 - b Select **sfo01-w01-vds01-management** and click **OK**.
 - c On the **Manage VMkernel network adapters** page, click **On this switch** and click **New adapter**.
 - d On the **Add Networking** page, select **Select an existing network**, browse to select the sfo01-w01-vds01-vsan port group, click **OK**, and click **Next**.
 - e On the **Port properties** page, select the **vSAN** check box and click **Next**.
 - f On the **IPv4 settings** page, select **Use static IPv4 settings**, enter IP address **172.16.33.101**, enter subnet **255.255.255.0**, and click **Next**.
 - g Click **Finish**.
 - h On the **Analyze impact** page, click **Next**.
 - i On the **Ready to complete** page, review your entries and click **Finish**.
- 9 Create the vMotion VMkernel adapter.
 - a In the **Navigator**, click **Host and Clusters** and expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
 - b Click on **sfo01w01esx01.sfo01.rainpole.local**.
 - c Click the **Configure** tab then select **VMkernel adapters**.
 - d Click the **Add host networking** icon, select **VMkernel Network Adapter**, and click **Next**.
 - e On the **Add Networking** page, click **Select an existing network**, browse to select the **sfo01-01-vds01-vmotion** port group, click **OK**, and click **Next**.

- f On the **Port properties** page, select **vMotion** from the **TCP/IP Stack** drop-down and click **Next**.
 - g On the **IPv4 settings** page, select **Use static IPv4 settings**, enter IP address **172.16.32.101**, enter subnet **255.255.255.0**, and click **Next**.
 - h On the **Ready to complete** page, review the configuration and click **Finish**.
- 10** Configure the MTU on the vMotion VMkernel adapter.
- a Select the vMotion VMkernel adapter created in the previous step and click **Edit Settings**.
 - b Click the NIC Settings page.
 - c Enter **9000** for the MTU value and click **OK**.
- 11** Configure the vMotion TCP/IP stack.
- a Click **TCP/IP configuration**.
 - b Select **vMotion** and click the **Edit TCP/IP stack configuration** icon.
 - c Click on **Routing**, enter **172.16.32.253** for the **VMkernel gateway**, and click **OK**.
- 12** Migrate the Platform Services Controllers and vCenter Server instances from the standard switch to the distributed switch.
- a In the **Navigator**, click **Networking** and expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
 - b Right-click the **sfo01-w01-vds01** distributed switch and click **Migrate VM to Another Network**.
 - c On the **Select source and destination networks** page, browse the following networks and click **Next**.

| Setting | Value |
|---------------------|-------------------------------|
| Source network | VM Network |
| Destination network | sfo01-w01-vds01-management-vm |

- d On the **Select VMs to migrate** page, select **sfo01w01psc01.sfo01.rainpole.local** and **sfo01w01vc01.sfo01.rainpole.local**, and click **Next**.
- e On the **Ready to complete** page, review your entries and click **Finish**.

13 Define Network I/O Control shares for the different traffic types on the sfo01-w01-vds01 distributed switch.

- a Click the **sfo01-w01-vds01** distributed switch, click the **Configure** tab, and click **Resource Allocation > System traffic**.
- b Under **System Traffic**, configure each of the following traffic types with the following values.

| Traffic Type | Physical adapter Shares |
|--|-------------------------|
| Virtual SAN Traffic | High |
| NFS Traffic | Low |
| vMotion Traffic | Low |
| vSphere Replication (VR) Traffic | Low |
| Management Traffic | Normal |
| vSphere Data Protection Backup Traffic | Low |
| Virtual Machine Traffic | High |
| Fault Tolerance Traffic | Low |
| iSCSI Traffic | Low |

14 Migrate the last physical adapter from the standard switch to the sfo01-w01-vds01 distributed switch.

- a In the **Navigator**, click **Networking** and expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
- b Right-click the **sfo01-w01-vds01** distributed switch and select **Add and Manage Hosts**.
- c On the **Select task** page, select **Manage host networking** and click **Next**.
- d On the **Select hosts** page, click **Attached hosts**.
- e In the **Select member hosts** dialog, select **sfo01w01esx01.sfo01.rainpole.local**, click **OK**, and click **Next**.
- f On the **Select network adapter tasks** page, select **Manage physical adapters** only and click **Next**.
- g On the **Manage physical network adapters** page, select **vmnic0** and click **Assign uplink**.
- h In the **Select an Uplink for vmnic1** dialog box, select **dvUplink1**, click **OK**, and click **Next**.
- i On the **Analyze Impact** page, click **Next**.
- j On the **Ready to complete** page, click **Finish**.

15 Enable vSphere Distributed Switch Health Check.

- a In the **Navigator**, click **Networking** and expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
- b Select the **sfo01-w01-vds01** distributed switch and click the **Configure** tab.
- c In the **Navigator**, select **Health check** and click the **Edit** button.
- d Select **Enabled** for **VLAN and MTU** and **Teaming and failover** and click **OK**.

16 Delete the vSphere Standard Switch.

- a In the **Navigator**, click on **Hosts and Clusters** and expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
- b Click on **sfo01w01esx01.sfo01.rainpole.local** and then click the **Configure** tab.
- c On the **Configure** page, select **Virtual switches**, select **vSwitch0**, and click on the **Remove selected standard switch** icon.
- d In the **Remove Standard Switch** dialog, click **Yes** to confirm the removal.

Create vSAN Disk Groups for Consolidated SDDC

vSAN disk groups must be created on each host that is contributing storage to the vSAN datastore.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 In the **Navigator**, select **Hosts and Clusters** and expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
- 3 Click on the **sfo01-w01-consolidated01** cluster and click the **Configure** tab.
- 4 Under **vSAN**, click **Disk Management**.
- 5 Click on **sfo01w01esx02.sfo01.rainpole.local** and click on the **Create a New Disk Group** button.
- 6 In the **Create Disk Group** window, select a flash disk for the **cache tier**, two hard disk drives for the **capacity tier** and click **OK**.
- 7 Repeat steps 5 and 6 for **sfo01w01esx03.sfo01.rainpole.local** and **sfo01w01esx04.sfo01.rainpole.local**.
- 8 Assign a license to vSAN.
 - a Right Click the **sfo01-w01-consolidated01** cluster and select **Assign License**.
 - b In the **sfo01-w01-consolidated01- Assign License** window, select the previously added Virtual SAN License and click **OK**.

Enable vSphere HA for Consolidated SDDC

After the vSphere distributed switch has been created and connected with all hosts, enable vSphere High Availability on the cluster.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to <https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client>.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 In the Navigator, click **Host and Clusters** and expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
- 3 Select the **sfo01-w01-consolidated01** cluster.
- 4 Click the **Configure** tab and click **vSphere Availability**.
- 5 Click **Edit**.
- 6 In the **sfo01-w01-consolidated01 - Edit Cluster Settings** dialog, select the **Turn on vSphere HA** check box.
- 7 Click **Failures and Responses**, and select the following values:

| Setting | Value |
|-----------------------------|---------------------------|
| Enable Host Monitoring | Selected |
| Host Failure Response | Restart VMs |
| Response for Host Isolation | Power off and restart VMs |
| Datastore with PDL | Disabled |
| Datastore with APD | Disabled |
| VM Monitoring | VM Monitoring Only |

- 8 Click **Admission Control** and enter the following settings.

| Setting | Value |
|---------------------------------------|-----------------------------|
| Host failures cluster tolerates | 1 |
| Define host failover capacity by | Cluster resource percentage |
| Override calculated failover capacity | Deselected |
| Performance degradation VMs tolerate | 100% |

9 Click **OK**.

Note When you enable vSphere HA, the operation fails on hosts 2,3, and 4. This is expected behavior, networking is configured during host profile steps setup.

Change Advanced Options on the ESXi Hosts for Consolidated SDDC

Change the default ESX Admins group to achieve greater levels of security and enable vSAN to provision the Virtual Machine Swap files as thin to conserve space in the vSAN datastore.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Change the default ESX Admins group.
 - a In the **Navigator**, click **Hosts and Clusters** and expand the entire **sfo01w01vc01.sfo01.rainpole.local** tree.
 - b Select the **sfo01w01esx01.sfo01.rainpole.local** host.
 - c Click the **Configure** tab, click **System > Advanced System Settings**.
 - d Click the **Edit** button.
 - e In the **filter** box, enter **esxAdmins** and wait for the search results.
 - f Change the value of **Config.HostAgent.plugins.hostsvc.esxAdminsGroup** to **SDDC-Admins** and click **OK**.
- 3 Provision Virtual Machine swap files on vSAN as thin.
 - a In the **Navigator**, click **Hosts and Clusters** and expand the entire **sfo01w01vc01.sfo01.rainpole.local** tree
 - b Select the **sfo01w01esx01.sfo01.rainpole.local** host.
 - c Click the **Configure** tab, click **System > Advanced System Settings**.
 - d Click the **Edit** button.
 - e In the **filter** box, enter **vsan.swap** and wait for the search results.
 - f Change the value of **VSAN.SwapThickProvisionDisabled** to **1** and click **OK**.

- 4 Disable the SSH warning banner.
 - a In the **Navigator**, click **Hosts and Clusters** and expand the entire **sfo01w01vc01.sfo01.rainpole.local** tree
 - b Select the **sfo01w01esx01.sfo01.rainpole.local** host.
 - c Click the **Configure** tab, click **System > Advanced System Settings**.
 - d Click the **Edit** button.
 - e In the **filter** box, enter **ssh** and wait for the search results.
 - f Change the value of **UserVars.SuppressShellWarning** to **1** and click **OK**.

Mount NFS Storage for Consolidated SDDC

Mount an NFS datastore as a storage location for future backups.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 In the **Navigator**, click **Host and Clusters** and expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
- 3 Click on **sfo01w01esx01.sfo01.rainpole.local**.
- 4 Click on **Datastores**.
- 5 Click the **Create a New Datastore** icon.
- 6 On the **Type** page, select **NFS** and click **Next**.
- 7 On the **Select NFS version** page, select **NFS 3** and click **Next**.
- 8 On the **Name and configuration** page, enter the following datastore information and click **Next**.

| Setting | Value |
|----------------|--------------------------------------|
| Datastore Name | sfo01-w01-bkp01 |
| Folder | /V2D_backup01_nfs01_Consolidated_6TB |
| Server | 172.16.25.251 |

- 9 On the **Ready to complete page**, review the configuration and click **Finish**.

Create and Apply the Host Profile for Consolidated SDDC

Host Profiles ensure that all hosts in the cluster have the same configuration.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Create a Host Profile from sfo01w01esx01.sfo01.rainpole.local.
 - a In the **Navigator**, select **Hosts and Clusters** and expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
 - b Right-click **sfo01w01esx01.sfo01.rainpole.local** and select **Host Profiles > Extract Host Profile**.
 - c In the **Extract Host Profile** window, enter **sfo01-w01hp-consolidated01** as the name of the host profile and click **Next**.
 - d On the **Ready to complete** page, click **Finish**.
- 3 Attach the Host Profile to the cluster.
 - a In the **Navigator**, select **Hosts and Clusters** and expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
 - b Right-click the **sfo01-w01-consolidated01** cluster, and select **Host Profiles > Attach Host Profile**.
 - c In the **Attach Host Profile** window, click **sfo01-w01hp-consolidated01**, select the **Skip Host Customization** box, and click **Finish**.
- 4 Create a host customization profile for the hosts in the cluster.
 - a From the **Home** menu, select **Policies and Profiles** from the drop-down menu.
 - b In the **Navigator**, click **Host Profiles**.
 - c Right-click **sfo01-w01hp-consolidated01** and select **Export Host Customizations**. Click **Save**.
 - d Save the **sfo01-w01-consolidated01_host_customizations.csv** file that is generated.
 - e Open the file with Excel.

f Edit the Excel file to include the following values.

| ESXi Host | Active Directory Configuration Password | Active Directory Configuration Username | NetStack Instance defaultTcpipStack->DNS configuration Name for this host | NetStack Instance vmotion->DNS configuration |
|------------------------------------|--|--|---|--|
| sfo01w01esx01.sfo01.rainpole.local | <i>svc-domain-join_password</i> | svc-domain-join@rainpole.local | sfo01w01esx01 | sfo01w01esx01 |
| sfo01w01esx02.sfo01.rainpole.local | <i>svc-domain-join_password</i> | svc-domain-join@rainpole.local | sfo01w01esx02 | sfo01w01esx02 |
| sfo01w01esx03.sfo01.rainpole.local | <i>svc-domain-join_password</i> | svc-domain-join@rainpole.local | sfo01w01esx03 | sfo01w01esx03 |
| sfo01w01esx04.sfo01.rainpole.local | <i>svc-domain-join_password</i> | svc-domain-join@rainpole.local | sfo01w01esx04 | sfo01w01esx04 |

| ESXi Host | Host virtual NIC sfo01-w01-vds01:sfo01-w01-vds01-management:management->IP address settings Host IPv4 address | Host virtual NIC sfo01-w01-vds01:sfo01-w01-vds01-management:management->IP address settings SubnetMask |
|------------------------------------|---|--|
| sfo01w01esx01.sfo01.rainpole.local | 172.16.31.101 | 255.255.255.0 |
| sfo01w01esx02.sfo01.rainpole.local | 172.16.31.102 | 255.255.255.0 |
| sfo01w01esx03.sfo01.rainpole.local | 172.16.31.103 | 255.255.255.0 |
| sfo01w01esx04.sfo01.rainpole.local | 172.16.31.104 | 255.255.255.0 |

| ESXi Host | Host virtual NIC sfo01-w01-vds01:sfo01-w01-vds01-nfs:<UNRESOLVED>->IP address settings Host IPv4 address | Host virtual NIC sfo01-w01-vds01:sfo01-w01-vds01-nfs:<UNRESOLVED>->IP address settings SubnetMask |
|------------------------------------|--|---|
| sfo01w01esx01.sfo01.rainpole.local | 172.16.15.101 | 255.255.255.0 |
| sfo01w01esx02.sfo01.rainpole.local | 172.16.15.102 | 255.255.255.0 |
| sfo01w01esx03.sfo01.rainpole.local | 172.16.15.103 | 255.255.255.0 |
| sfo01w01esx04.sfo01.rainpole.local | 172.16.15.104 | 255.255.255.0 |

| ESXi Host | Host virtual NIC sfo01-w01-vds01:sfo01-w01-vds01-vsan:vsan->IP address settings Host IPv4 address | Host virtual NIC sfo01-w01-vds01:sfo01-w01-vds01-vsan:vsan->IP address settings SubnetMask |
|------------------------------------|---|--|
| sfo01w01esx01.sfo01.rainpole.local | 172.16.33.101 | 255.255.255.0 |
| sfo01w01esx02.sfo01.rainpole.local | 172.16.33.102 | 255.255.255.0 |
| sfo01w01esx03.sfo01.rainpole.local | 172.16.33.103 | 255.255.255.0 |
| sfo01w01esx04.sfo01.rainpole.local | 172.16.33.104 | 255.255.255.0 |

| ESXi Host | Host virtual NIC sfo01-w01-vds01:sfo01-w01-vds01-vmotion:vmotion->IP address settings Host IPv4 address | Host virtual NIC sfo01-w01-vds01:sfo01-w01-vds01-vmotion:vmotion->IP address settings SubnetMask |
|------------------------------------|---|--|
| sfo01w01esx01.sfo01.rainpole.local | 172.16.32.101 | 255.255.255.0 |
| sfo01w01esx02.sfo01.rainpole.local | 172.16.32.102 | 255.255.255.0 |
| sfo01w01esx03.sfo01.rainpole.local | 172.16.32.103 | 255.255.255.0 |
| sfo01w01esx04.sfo01.rainpole.local | 172.16.32.104 | 255.255.255.0 |

- g When you have updated the Excel file, save it in the CSV file format and close Excel.
 - h Click the **Configure** tab.
 - i Click the **Edit Host Customizations** button.
 - j On the **Select hosts** page, click **Next**.
 - k On the **Customize hosts** page, click the **Browse** button, select the customization CSV file you created previously, and click **Finish**.
- 5 Remediate the hosts in the cluster.
- a On the **Policies and Profiles** page, click **sfo01-w01hp-consolidated01**, click the **Monitor** tab, and then click the **Compliance** tab.
 - b Click **sfo01-w01-consolidated01** in the **Host/Cluster** column and click **Check Host Profile Compliance**. This compliance test shows that the first host is **Compliant**, but the other hosts are **Not Compliant**.
 - c Click each of the non-compliant hosts, click **Remediate Hosts Based on its Host Profile**, and then click **Finish** on the wizard that appears.
- All hosts should show a **Compliant** status in the **Host Compliance** column.
- 6 Schedule nightly compliance checks.
- a On the **Policies and Profiles** page, click **sfo01-w01hp-consolidated01**, click the **Monitor** tab, and then click the **Scheduled Tasks** subtab.
 - b Click **Schedule a New Task** then click **Check Host Profile Compliance**.
 - c In the **sfo01-w01hp-consolidated01: Check Host Profile Compliance (scheduled)** window click **Scheduling Options**.
 - d Enter **sfo01-w01hp-consolidated01 Compliance Check** in the **Task Name** field.
 - e Click the **Change** button on the **Configured Scheduler** line.
 - f In the **Configure Scheduler** window select **Setup a recurring schedule for this action**, change the **Start time** to **10:00 PM**, and click **OK**.
 - g Click **OK** in the **sfo01-w01hp-consolidated01: Check Host Profile Compliance (scheduled)** window.

Configure Lockdown Mode on All ESXi Hosts for Consolidated SDDC

To increase security of your ESXi hosts, you put them in Lockdown mode so that administrative operations can be performed only from vCenter Server.

vSphere supports an Exception User list, which is for service accounts that have to log in to the host directly. Accounts with administrator privileges that are on the Exception Users list can log in to the ESXi Shell. In addition, these users can log in to a host's DCUI in normal lockdown mode and can exit lockdown mode.

You repeat this procedure to enable normal lockdown mode for all hosts in the data center. The following table lists all the hosts.

| Host | FQDN |
|--------|------------------------------------|
| Host 1 | sfo01w01esx01.sfo01.rainpole.local |
| Host 2 | sfo01w01esx02.sfo01.rainpole.local |
| Host 3 | sfo01w01esx03.sfo01.rainpole.local |
| Host 4 | sfo01w01esx04.sfo01.rainpole.local |

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Option | Description |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 In the **Navigator**, click **Hosts and Clusters** and expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
- 3 Select the **sfo01w01esx01.sfo01.rainpole.local** host.
- 4 Click **Configure**.
- 5 Under **System**, select **Security Profile**.
- 6 In the **Lockdown Mode** panel, click **Edit**.
- 7 In the **Lockdown Mode** dialog, select the **Normal** radio button, and click **OK**.

- 8 Repeat this procedure and enable normal lockdown mode for all remaining hosts in the data center.

Note Lockdown Mode settings are not part of Host Profiles and must be manually enabled on all hosts.

Set Virtual SAN Policy on Management Virtual Machines for Consolidated SDDC

After you apply the host profile to all hosts, set the storage policy of the virtual machines to the vSAN Default Storage Policy. Set the Platform Services Controller and vCenter Server appliances to the default vSAN storage policy.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to <https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client>.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 In the **Navigator**, click **Hosts and Clusters**.
- 3 Expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
- 4 Select the sfo01w01psc01 virtual machine.
- 5 Click the **Configure** tab, click **Policies**, and click **Edit VM Storage Policies**.
- 6 In the **Manage VM Storage Policies** dialog, from the **VM storage policy** drop-down menu, select **vSAN Default Storage Policy**, and click **Apply to all**.
- 7 Click **OK** to apply the changes.
- 8 Verify that the **Compliance Status** column shows a **Compliant** status for all items in the table.
- 9 Repeat this step to apply the **vSAN Default Storage Policy** on sfo01w01vc01 virtual machine.

Create the VM and Template Folders for Consolidated SDDC

Create folders to group objects of the same type for easier management.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Create folders for each of the management applications.
 - a In the Navigator, click **VMs and Templates** and expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
 - b Right-click the **sfo01-w01dc** data center, and select **New Folder > New VM and Template Folder**.
 - c In the **New Folder** dialog box, enter **sfo01-w01fd-mgmt** as the name to label the folder and click **OK**.
 - d Repeat this step to create the remaining folders.

| Management Applications | Folder |
|--|---------------------|
| vCenter Server, Platform Services Controllers, and Update Manager Download Service | sfo01-w01fd-mgmt |
| vRealize Automation, vRealize Orchestrator, and vRealize Business | sfo01-w01fd-vra |
| vRealize Automation (Proxy Agent) and vRealize Business (Data Collector) | sfo01-w01fd-vraias |
| vRealize Operations Manager | sfo01-w01fd-vrops |
| vRealize Operations Manager (Remote Collectors) | sfo01-w01fd-vropsrc |
| vRealize Log Insight | sfo01-w01fd-vrli |
| NSX Manager, Controllers, and Edges | sfo01-w01fd-nsx |

- 3 Move the vCenter Server and Platform Services Controller virtual machines to the sfo01-w01fd-mgmt folder.
 - a In the Navigator, click **VMs and Templates** and expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
 - b Expand the **Discovered Virtual Machines** folder.
 - c Drag sfo01w01vc01 and sfo01w01psc01 to the sfo01-w01fd-mgmt folder.

- 4 Delete the Discovered Virtual Machines folder.
 - a In the Navigator, click **VMs and Templates** and expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
 - b Right-click the **Discovered Virtual Machines** folder and click **Remove from Inventory**.
 - c On the **Confirm Remove** dialog, click **Yes**.

Create VM Groups to Define Startup Order for Consolidated SDDC

You can define the startup order of virtual machines with VM Groups. Startup orders are used during vSphere HA events such that vSphere HA powers on virtual machines in the correct order.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 In the Navigator, select **Host and Clusters** and expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
- 3 Create a VM Group for the Platform Services Controllers.
 - a Select the **sfo01-w01-consolidated01** cluster and click the **Configure** tab.
 - b On the **Configure** page, click **VM/Host Groups**.
 - c On the **VM/Host Groups** page, click the **Add** button.
 - d In the **Create VM/Host Group** dialog, enter **PLatform Services Controllers** in the **Name** text box, select **VM Group** from the **Type** drop-down menu, and click the **Add** button.
 - e In the **Add VM/Host Group Member** dialog, select **sfo01w01psc01** and click **OK**.
 - f On the **Create VM/Host Group** dialog, click **OK**.
- 4 Create a VM Group for the vCenter Server virtual machine.
 - a Select the **sfo01-w01-consolidated01** cluster and click the **Configure** tab.
 - b On the **Configure** page, click **VM/Host Groups**.
 - c On the **VM/Host Groups** page, click the **Add** button.
 - d In the **Create VM/Host Group** dialog, enter **vCenter Servers** in the **Name** text box, select **VM Group** from the **Type** drop-down menu, and click the **Add** button.

- e In the **Add VM/Host Group Member** dialog, select `sfo01w01vc01` and click **OK**.
 - f On the **Create VM/Host Group** dialog, click **OK**.
- 5 Create a Rule to power on the Platform Services Controllers followed by the vCenter Servers.
- a Select the **sfo01-w01-consolidated01** cluster and click the **Configure** tab.
 - b On the **Configure** page, click **VM/Host Rules**.
 - c On the **VM/Host Rules** page, click the **Add** button.
 - d In the **Create VM/Host Rule** dialog, enter **SDDC Management Virtual Machines** in the **Name** text box, ensure the **Enable rule** check box is selected, select **Virtual Machines to Virtual Machines** from the **Type** drop-down menu.
 - e Select **Platform Services Controllers** from the **First restart VMs in VM group** drop-down menu.
 - f Select **vCenter Servers** from the **Then restart VMs in VM group** drop-down menu and click **OK**.

Create Host Groups to Keep vCenter and the Platform Services Controller on Specific Hosts for Consolidated SDDC

Create a rule to keep vCenter Server and the Platform Services Controller on the first four hosts so they are easy to locate in the event of an outage.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to <https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client>.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 In the Navigator, select **Host and Clusters** and expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
- 3 Create a Host Group containing the first four hosts in the cluster.
 - a Select the **sfo01-w01-consolidated01** cluster and click the **Configure** tab.
 - b On the **Configure** page, click **VM/Host Groups**.
 - c On the **VM/Host Groups** page, click the **Add** button.

- d In the **Create VM/Host Group** dialog, enter **vCenter and PSC Host Group** in the **Name** text box, select **Host Group** from the **Type** drop-down menu, and click the **Add** button.
 - e In the **Add VM/Host Group Member** dialog, select **sfo01w01esx01.sfo01.rainpole.local**, **sfo01w01esx02.sfo01.rainpole.local**, **sfo01w01esx03.sfo01.rainpole.local**, and **sfo01w01esx04.sfo01.rainpole.local** and click **OK**.
- 4 Create a rule to run the Platform Services Controller on the hosts in the vCenter and PSC Host Group.
- a Select the **sfo01-w01-consolidated01** cluster and click the **Configure** tab.
 - b On the **Configure** page, click **VM/Host Rules**.
 - c On the **VM/Host Rules** page, click the **Add** button.
 - d In the **Create VM/Host Rule** dialog, enter **host-group-rule-psc** in the **Name** text box, ensure the **Enable rule** check box is selected, select **Virtual Machines to Hosts** from the **Type** drop-down menu.
 - e from the **VM group** drop-down menu, select **Platform Services Controllers**.
 - f Select **Should run on hosts in group**.
 - g From the **Host Group** drop-down menu, select **vCenter and PSC Host Group** and click **OK**.
- 5 Create a rule to run the vCenter Server on the hosts in the vCenter and PSC Host Group.
- a Select the **sfo01-w01-consolidated01** cluster and click the **Configure** tab.
 - b On the **Configure** page, click **VM/Host Rules**.
 - c On the **VM/Host Rules** page, click the **Add** button.
 - d In the **Create VM/Host Rule** dialog, enter **host-group-rule-vc** in the **Name** text box, ensure the **Enable rule** check box is selected, select **Virtual Machines to Hosts** from the **Type** drop-down menu.
 - e From the **VM group** drop-down menu, select **vCenter Servers** .
 - f Select **Should run on hosts in group**.
 - g From the **Host Group** drop-down menu, select **vCenter and PSC Host Group** and click **OK**.

Deploy and Configure the NSX Instance of the Consolidated SDDC

Deploy and configure the NSX instance for the consolidated cluster in your SDDC deployment.

Procedure

1 [Deploy the NSX Manager for Consolidated SDDC](#)

For this implementation, NSX Manager and vCenter Server have a one-to-one relationship. For every instance of NSX Manager, there is one connected vCenter Server. To deploy the NSX Manager virtual appliance, you first assign a domain service account which NSX uses as the vCenter Server Administrator role. Deploy the NSX Manager virtual appliance, then connect it to the vCenter Server instance.

2 [Deploy the NSX Controllers for the NSX Instance for Consolidated SDDC](#)

After the NSX Manager is successfully connected to the vCenter Server, you must promote it to the primary role and deploy the three NSX Controller nodes that form the NSX Controller cluster.

3 [Assign Licensing for NSX Instance for Consolidated SDDC](#)

Assign licensing for the NSX instance.

4 [Prepare the ESXi Hosts in the Cluster for NSX for Consolidated SDDC](#)

NSX kernel modules packaged in VIB files run within the hypervisor kernel and provide services such as distributed routing, distributed firewall, and VXLAN bridging capabilities. To use NSX, you must install the NSX kernel modules on the ESXi hosts.

5 [Configure the NSX Logical Network for the Consolidated Cluster for Consolidated SDDC](#)

After all the deployment tasks are ready, you must configure the NSX logical network.

6 [Update the Host Profile for the Consolidated Cluster for Consolidated SDDC](#)

After you configure NSX logical networking on the hosts, update the host profile and remediate the hosts to align their configuration.

7 [Configure NSX Dynamic Routing in the Consolidated Cluster for Consolidated SDDC](#)

NSX for vSphere creates a network virtualization layer on top of which all virtual networks are created. This layer is an abstraction between the physical and virtual networks. You configure NSX dynamic routing within the management cluster, deploying two NSX Edge devices and a Universal Distributed Logical Router (UDLR).

8 [Distributed Firewall Configuration for Management Applications](#)

Configuring a distributed firewall for use with your SDDC increases the security level of your environment by allowing only the network traffic that is required for the SDDC to run. The firewall rules you define allow access to management applications.

9 [Test the Consolidated Cluster NSX Configuration for Consolidated SDDC](#)

Test the configuration of the NSX logical network using a ping test. A ping test checks if two hosts in a network can reach each other.

10 [Deploy Application Virtual Networks for Consolidated SDDC](#)

Deploy the application virtual networks.

11 [Deploy the NSX Load Balancer for Consolidated SDDC](#)

Deploy a load balancer for use by management applications connected to the application virtual network, Mgmt-xRegion01-VXLAN.

Deploy the NSX Manager for Consolidated SDDC

For this implementation, NSX Manager and vCenter Server have a one-to-one relationship. For every instance of NSX Manager, there is one connected vCenter Server. To deploy the NSX Manager virtual appliance, you first assign a domain service account which NSX uses as the vCenter Server Administrator role. Deploy the NSX Manager virtual appliance, then connect it to the vCenter Server instance.

Procedure

1 [Assign an NSX Domain Service Account and Deploy the NSX Manager Appliance for Consolidated SDDC](#)

Assign a domain service account for use by NSX to access the vCenter Server Administrator role. Deploy the NSX Manager appliance from the OVF file.

2 [Replace the Certificate of NSX Manager for Consolidated SDDC](#)

3 [Connect NSX Manager to vCenter Server for Consolidated SDDC](#)

4 [Assign Administrative Access to NSX for Consolidated SDDC](#)

Assign the administrator@vsphere.local account to the NSX Enterprise Administrator Role.

Assign an NSX Domain Service Account and Deploy the NSX Manager Appliance for Consolidated SDDC

Assign a domain service account for use by NSX to access the vCenter Server Administrator role. Deploy the NSX Manager appliance from the OVF file.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to `https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client`.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 In the **Navigator**, click **Administration** and click **Global Permissions**.
- 3 Click the **Add permission** icon.
- 4 In the **Global Permission Root - Add Permission** dialog box, click **Add**.
- 5 In the **Select Users/Groups** dialog box, select **rainpole.local** from the **Domain** drop-down menu.
- 6 In the search box, enter **svc-nsxmanager** and press **Enter**.

- 7 Select **svc-nsxmanager** and click **Add**. Click **OK** to return to the **Global Permission Root - Add Permission** window.
- 8 Click **OK** to give the svc-nsxmanager account vCenter administrative privileges.
- 9 Click the **Home** icon and select **Hosts and Clusters**.
- 10 Expand the entire **sfo01w01vc01.sfo01.rainpole.local** control tree.
- 11 Right-click the **sfo01-w01rp-sddc-mgmt** resource pool and click **Deploy OVF Template**.
- 12 On the **Select template** page, click the **Browse** button, select the VMware NSX Manager .ova file, and click **Next**.
- 13 On the **Select name and location** page, enter the following settings, and click **Next**.

| Setting | Value |
|-------------------------------|-----------------|
| Name | sfo01w01nsx01 |
| Select a datacenter or folder | sfo01-w01fd-nsx |

- 14 On the **Select a resource** page, select the following values, and click **Next**.

| Setting | Value |
|---------------|--------------------------|
| Cluster | sfo01-w01-consolidated01 |
| Resource Pool | sfo01-w01rp-sddc-mgmt |

- 15 On the **Review details** page, review the **extra configuration option** message, and click **Next**.
- 16 On the **Accept license agreements** page, click **Accept**, and click **Next**.
- 17 On the **Select storage** page, enter the following settings and click **Next**.

| Setting | Value |
|----------------------------|-----------------------------|
| Select virtual disk format | Thin provision |
| VM storage policy | vSAN Default Storage Policy |
| Datastore | sfo01-w01-vsan01 |

- 18 On the **Select networks** page, under **Destination Network**, select sfo01-w01-vds01-management and click **Next**.
- 19 On the **Customize template** page, expand the different options, enter the following settings, and click **Next**.

| Setting | Value |
|------------------------|------------------------------------|
| DNS Server List | 172.16.11.5,172.16.11.4 |
| Domain Search List | sfo01.rainpole.local |
| Default IPv4 Gateway | 172.16.11.253 |
| Hostname | sfo01w01nsx01.sfo01.rainpole.local |
| Network 1 IPv4 Address | 172.16.11.66 |

| Setting | Value |
|--|------------------------------------|
| Network 1 Netmask | 255.255.255.0 |
| Enable SSH | Selected |
| NTP Server List | ntp.sfo01.rainpole.local |
| CLI "admin" User Password / enter | <i>sfo01nsx_admin_password</i> |
| CLI "admin" User Password / confirm | <i>sfo01nsx_admin_password</i> |
| CLI Privilege Mode Password / enter | <i>sfo01nsx_privilege_password</i> |
| CLI Privilege Mode Password / confirm | <i>sfo01nsx_privilege_password</i> |
| VMware Customer Experience Improvement Program | Selected |

20 On the **Ready to complete** page, review your configuration and click **Finish**.

21 In the Navigator, expand the entire **sfo01w01vc01.sfo01.rainpole.local** tree, select the sfo01w01nsx01 virtual machine, and click the **Power on** button.

Replace the Certificate of NSX Manager for Consolidated SDDC

After you deploy the appliance of NSX Manager, replace the default certificate with a custom certificate to establish trusted connection with the other management components in the SDDC. The certificate, that is generated by the CertGenVVD utility, is signed by the certificate authority on the parent Active Directory (AD) server.

Use the following certificate file to replace the certificate on the NSX Manager instance:

Table 2-4. Certificate-Related Files on the NSX Manager Instance for Consolidated SDDC

| NSX Manager FQDN | Certificate File Name |
|------------------------------------|-----------------------------|
| sfo01w01nsx01.sfo01.rainpole.local | ■ sfo01w01nsx01.sfo01.4.p12 |

Prerequisites

- CA-signed certificate files generated by using VMware Validated Design Certificate Generation Utility (CertGenVVD). See the *VMware Validated Design Planning and Preparation* documentation.

Procedure

- 1 Log in to the NSX Manager appliance user interface.
 - a Open a Web browser and go to **https://sfo01w01nsx01.sfo01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------------|
| User name | admin |
| Password | <i>nsx_manager_admin_password</i> |

- 2 On the **Home** page, select **Manage Appliance Settings**.
- 3 On the **Manage** tab, click **SSL Certificates**, click **Upload PKCS#12 Keystore**.

- 4 Browse to the certificate chain file `sfo01w01nsx01.4.p12`, provide the keystore password or passphrase, and click **Import**.
- 5 Restart the NSX Manager to propagate the CA-signed certificate.
 - a In the right corner of the **NSX Manager** page, click the **Settings** icon.
 - b From the drop-down menu, select **Reboot Appliance**.

Connect NSX Manager to vCenter Server for Consolidated SDDC

After you deploy the NSX Manager virtual appliance for the cluster, you connect NSX Manager to vCenter Server.

Procedure

- 1 Log in to the NSX Manager appliance user interface.
 - a Open a Web browser and go to `https://sfo01w01nsx01.sfo01.rainpole.local`.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------------|
| User name | admin |
| Password | <i>nsx_manager_admin_password</i> |

- 2 Click **Manage vCenter Registration**.
- 3 Under **Lookup Service URL**, click **Edit**.
- 4 In the **Lookup Service URL** dialog box, enter the following settings and click **OK**.

| Setting | Value |
|-----------------------------|------------------------------------|
| Lookup Service Host | sfo01w01psc01.sfo01.rainpole.local |
| Lookup Service Port | 443 |
| SSO Administrator User Name | administrator@vsphere.local |
| Password | <i>vsphere_admin_password</i> |

- 5 In the **Trust Certificate?** dialog box, click **Yes**.
- 6 Under **vCenter Server**, click **Edit**.
- 7 In the **vCenter Server** dialog box, enter the following settings, and click **OK**.

| Setting | Value |
|-------------------|-----------------------------------|
| vCenter Server | sfo01w01vc01.sfo01.rainpole.local |
| vCenter User Name | svc-nsxmanager@rainpole.local |
| Password | <i>svc-nsxmanager_password</i> |

- 8 In the **Trust Certificate?** dialog box, click **Yes**.

- 9 Wait for the **Status** indicators for the Lookup Service URL and vCenter Server to change to the Connected status.

Assign Administrative Access to NSX for Consolidated SDDC

Assign the administrator@vsphere.local account to the NSX Enterprise Administrator Role.

Procedure

- 1 Log in to the vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-------------------------------|
| User name | svc-nsxmanager@rainpole.local |
| Password | svc-nsxmanager_password |

- 2 In the Navigator, click **Networking & Security** and click **Users and Domains**.
- 3 Under **Users and Domains**, click the **172.16.11.66** instance.
- 4 Click the **Add** icon.
- 5 On the **Identify User** page, select the **Specify a vCenter user** radio button, enter **administrator@vsphere.local** in the text box, and click **Next**.
- 6 On the **Select Roles** page, select the **Enterprise Administrator** radio button and click **Finish**.

Deploy the NSX Controllers for the NSX Instance for Consolidated SDDC

After the NSX Manager is successfully connected to the vCenter Server, you must promote it to the primary role and deploy the three NSX Controller nodes that form the NSX Controller cluster.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Promote the NSX Manager to the primary role.
 - a Under **Inventories**, click **Networking & Security**.
 - b In the **Navigator**, click **Installation and Upgrade**.
 - c On the **Management** tab, select the **172.16.11.66** instance.
 - d Click the **Actions** menu and click **Assign Primary Role**.
 - e In the **Assign Primary Role** dialog box, click **Yes**.
- 3 Configure an IP pool for the NSX Controller cluster.
 - a In the **Navigator**, click **Groups and Tags**.
 - b Under **NSX Managers**, click the **172.16.11.66** instance.
 - c Click the **IP Pools** tab and click the **Add New IP Pool** icon.
 - d In the **Add Static IP Pool** dialog box, enter the following settings, and click **OK**.

| Setting | Value |
|----------------|-----------------------------|
| Name | sfo01-comp01-nsrc01 |
| Gateway | 172.16.31.253 |
| Prefix Length | 24 |
| Primary DNS | 172.16.11.5 |
| Secondary DNS | 172.16.11.4 |
| DNS Suffix | sfo01.rainpole.local |
| Static IP Pool | 172.16.31.118-172.16.31.120 |

- 4 Deploy the NSX Controller cluster. It is important to deploy every node only after the previous one is successfully deployed.
 - a In the **Navigator**, click **Installation and Upgrade**.
 - b Under **NSX Controller nodes**, click the **Add** icon to deploy three NSX Controller nodes with the same configuration.

- c In the **Add Controller** page, enter the following settings, and click **OK**.

You configure a password only during the deployment of the first controller. The other controllers use the same password.

| Setting | Value |
|-----------------------|--|
| Name | sfo01w01nsxc01 |
| NSX Manager | 172.16.11.66 |
| Datacenter | sfo01-w01dc |
| Cluster/Resource Pool | sfo01-w01rp-sddc-edge |
| Datastore | sfo01-w01-vsan01 |
| Folder | sfo01-w01fd-nsx |
| Connected To | sfo01-w01-vds01-management |
| IP Pool | sfo01-comp01-nsxc01 |
| Password | <i>sfon_{nsx}_controllers_password</i> |
| Confirm Password | <i>sfon_{nsx}_controllers_password</i> |

- d After the **Status** of the controller node changes to **Connected**, repeat the step and deploy the two remaining NSX Controller nodes in the controller cluster with the same configuration, incrementing the name by 1 each time.

5 Enable CDO Mode.

- Under **Inventories**, click **Networking & Security**.
- In the **Navigator**, click **Installation and Upgrade**.
- On the **Management** tab, select the **172.16.11.66** instance.
- Click the **Actions** menu and click **Enable CDO Mode**.
- In the **Enable CDO Mode** dialog box, click **Yes**.

6 Configure DRS affinity rules for the NSX Controller nodes.

- Return to the **Home** page.
- In the **Navigator**, click **Hosts and Clusters**, and expand the sfo01w01vc01.sfo01.rainpole.local tree.
- Select the **sfo01-w01-consolidated01** cluster, and click the **Configure** tab.
- Under **Configuration**, click **VM/Host Rules**.
- Click **Add**.

- f In the **sfo01-w01-consolidated01 - Create VM/Host Rule** dialog box, enter the following settings and click **OK**.

| Setting | Value |
|-------------|--------------------------|
| Name | anti-affinity-rule-nsxc |
| Enable rule | Selected |
| Type | Separate Virtual Machine |

- g In the **Add Rule Member** dialog box, select the check box next to each of the three NSX Controller virtual machines and click **OK**.
- h In the **sfo01-w01-consolidated01 - Create VM/Host Rule** dialog box, click **OK**.

Assign Licensing for NSX Instance for Consolidated SDDC

Assign licensing for the NSX instance.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Add new licenses for this NSX instance.
 - a Click the **Home** icon above the **Navigator** and select the **Administration** menu item.
 - b On the **Administration** page, click **Licenses** and click the **Licenses** tab.
 - c Click the **Create New Licenses** icon to add license keys.
 - d On the **Enter license keys** page, enter license keys for **NSX**, and click **Next**.
 - e On the **Edit license name** page, enter License name and click **Next**.
 - f On the **Ready to complete** page, review your entries and click **Finish**.
- 3 Assign the newly added licenses to NSX.
 - a Click the **Home** icon above the **Navigator** and select the **Administration** menu item.
 - b On the **Administration** page, under **Licensing** and select **Licenses**.
 - c Under **Licenses**, click on the **Assets** tab, then click the **Solutions** tab.

- d Select **NSX for vSphere**, and click the **Assign License** icon.
- e On the **NSX for vSphere - Assign License** page select the license you created in step 2 and click **OK**.

Prepare the ESXi Hosts in the Cluster for NSX for Consolidated SDDC

NSX kernel modules packaged in VIB files run within the hypervisor kernel and provide services such as distributed routing, distributed firewall, and VXLAN bridging capabilities. To use NSX, you must install the NSX kernel modules on the ESXi hosts.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 In the **Navigator**, click **Networking & Security**.
- 3 Click **Installation and Upgrade**, and click the **Host Preparation** tab.
- 4 Select **172.16.11.66** from the **NSX Manager** drop-down menu.
- 5 Under **NSX Component Installation on Hosts**, click **Actions** then **Install** for the **sfo01-w01-consolidated01** cluster and click **Yes** in the confirmation dialog box.
- 6 Verify that the **Installation Status** column displays the NSX version for all hosts in the cluster, confirming that the NSX kernel modules are successfully installed.

Configure the NSX Logical Network for the Consolidated Cluster for Consolidated SDDC

After all the deployment tasks are ready, you must configure the NSX logical network.

To configure the NSX logical network, you perform the following tasks:

- Configure the Segment ID allocation.
- Configure the VXLAN networking.
- Configure the transport zone.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Configure the Segment ID allocation.
 - a In the **Navigator**, click **Networking & Security**.
 - b Click **Installation and Upgrade**, click **Logical Network Preparation**, and click **Segment ID**.
 - c Select **172.16.11.66** from the **NSX Manager** drop-down menu.
 - d Click **Edit**, enter the following settings, and click **OK**.

| Setting | Value |
|---------------------------------------|-------------------------|
| Segment ID pool | 5300-9000 |
| Enable Multicast addressing | Selected |
| Multicast addresses | 239.3.0.0-239.3.255.255 |
| Universal Segment ID Pool | 20000-29000 |
| Enable Universal Multicast addressing | Selected |
| Universal Multicast addresses | 239.4.0.0-239.4.255.255 |

- 3 Configure the VXLAN networking.
 - a Click the **Host Preparation** tab.
 - b Under **VXLAN**, click **Not Configured** on the **sfo01-w01-consolidated01** row, enter the following settings, and click **OK**.

| Setting | Value |
|-----------------------|----------------------|
| Switch | sfo01-w01-vds01 |
| VLAN | 1634 |
| MTU | 9000 |
| VMKNic IP Addressing | Use DHCP |
| VMKNic Teaming Policy | Load Balance - SRCID |
| VTEP | 2 |

- 4 Configure the transport zone.
 - a On the **Installation and Upgrade** page, click the **Logical Network Preparation** tab and click **Transport Zones**.
 - b Select **172.16.11.66** from the **NSX Manager** drop-down menu.
 - c Click the **New Transport zone** icon.
 - d In the **New Transport Zone** dialog, enter the following settings and click **OK**.

| Setting | Value |
|--|-----------------------------------|
| Mark this object for Universal Synchronization | Selected |
| Name | SFO01W01 Universal Transport Zone |
| Replication mode | Hybrid |
| Select clusters to be part of the Transport Zone | sfo01-w01-consolidated01 |

Update the Host Profile for the Consolidated Cluster for Consolidated SDDC

After you configure NSX logical networking on the hosts, update the host profile and remediate the hosts to align their configuration.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Update the host profile.
 - a In the **Navigator**, select **Policies and Profiles**.
 - b Click **Host Profiles**, right-click **sfo01-w01hp-consolidated01**, and select **Copy Settings from Host**.
 - c Select **sfo01w01esx01.sfo01.rainpole.local** and click **OK**.
- 3 Verify compliance and remediate the hosts.
 - a On the **Policies and Profiles** page, click the **sfo01-m01hp-mgmt01** host profile.
 - b On the **Monitor** tab, click the **Compliance** tab.

- c Select **sfo01-w01-consolidated01** in the **Host/Cluster** column and click **Check Host Profile Compliance**.

This compliance test shows that the first host is `Compliant`, but the other hosts are `Not Compliant`.

- d Click each of the non-compliant hosts and click **Remediate Hosts Based on its Host Profile**.
- e In the **Remediate Hosts Based on its Host Profile** wizard, enter **Host Name** if prompted for **NetStack Instance vxlan->DNS configuration**, and click **Next**.
- f On the **Ready to complete** page, click **Finish**.

All hosts have `Compliant` status in the **Host Compliance** column.

Configure NSX Dynamic Routing in the Consolidated Cluster for Consolidated SDDC

NSX for vSphere creates a network virtualization layer on top of which all virtual networks are created. This layer is an abstraction between the physical and virtual networks. You configure NSX dynamic routing within the management cluster, deploying two NSX Edge devices and a Universal Distributed Logical Router (UDLR).

Procedure

- 1 [Create a Universal Logical Switch for Use as the Transit Network for Consolidated SDDC](#)

Create a universal logical switch for use as the transit network.

- 2 [Deploy NSX Edge Devices for North-South Routing for Consolidated SDDC](#)

Deploy two NSX Edge devices for North-South Routing.

- 3 [Disable the Firewall Service for Consolidated SDDC](#)

Disable the firewall of the NSX Edge devices. This is required for equal-cost multi-path (ECMP) to operate correctly. Perform this procedure for each NSX Edge device.

- 4 [Enable and Configure Routing for Consolidated SDDC](#)

Enable the Border Gateway Protocol (BGP) to exchange routing information between the NSX Edge services gateways.

- 5 [Verify Peering of Upstream Switches and Establishment of BGP for Consolidated SDDC](#)

The NSX Edge devices must establish a connection to each of the upstream BGP switches before BGP updates can be exchanged. Verify that the NSX Edges devices are successfully peering, and that BGP routing has been established.

- 6 [Deploy the Universal Distributed Logical Router for Consolidated SDDC](#)

Deploy the universal distributed logical router (UDLR).

- 7 [Configure Universal Distributed Logical Router for Dynamic Routing for Consolidated SDDC](#)

Configure the Universal Distributed Logical Router (UDLR) to use dynamic routing.

8 Verify Establishment of BGP for the Universal Distributed Logical Router for Consolidated SDDC

The Universal Distributed Logical router (UDLR) must establish a connection to the Edge Services Gateways before BGP updates can be exchanged. Verify that peering is successful and BGP routing has been established.

Create a Universal Logical Switch for Use as the Transit Network for Consolidated SDDC

Create a universal logical switch for use as the transit network.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to <https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client>.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Under **Inventories**, click **Networking & Security**.
- 3 In the **Navigators**, click **Logical Switches**.
- 4 Select the instance labeled **172.16.11.66**.
- 5 Click the **New Logical Switch** icon.
- 6 In the **New Logical Switch** dialog, enter the following settings and click **OK**.

| Setting | Value |
|------------------|-----------------------------------|
| Name | Universal Transit Network |
| Transport Zone | SFO01W01 Universal Transport Zone |
| Replication Mode | Hybrid |

Deploy NSX Edge Devices for North-South Routing for Consolidated SDDC

Deploy two NSX Edge devices for North-South Routing.

Perform this procedure two times to deploy two NSX Edge devices.

Table 2-5. NSX Edge Devices

| NSX Edge Device | Device Name |
|-------------------|---------------|
| NSX Edge Device 1 | sfo01w01esg01 |
| NSX Edge Device 2 | sfo01w01esg02 |

Table 2-6. NSX Edge Interfaces Settings

| Interface | Primary IP Address sfo01w01esg01 | Primary IP Address sfo01w01esg02 |
|----------------|----------------------------------|----------------------------------|
| Uplink01 | 172.16.35.2 | 172.16.35.3 |
| Uplink02 | 172.27.13.3 | 172.27.13.2 |
| sfo01w01udlr01 | 192.168.100.1 | 192.168.100.2 |

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Under **Inventories**, click **Networking & Security**.
- 3 In the **Navigator**, click **NSX Edges**.
- 4 Select **172.16.11.66** from the **NSX Manager** drop-down menu.
- 5 Click the **Add** icon to deploy a new NSX Edge.

The **New NSX Edge** wizard appears.

- a On the **Name and description** page, enter the following settings and click **Next**.

| Settings | sfo01w01esg01 | sfo01w01esg02 |
|--------------------------|----------------------|----------------------|
| Install Type | Edge Service Gateway | Edge Service Gateway |
| Name | sfo01w01esg01 | sfo01w01esg02 |
| Deploy NSX Edge | Selected | Selected |
| Enable High Availability | Deselected | Deselected |

- b On the **Settings** page, enter the following settings and click **Next**.

| Settings | Value |
|-----------------------------|---------------------|
| User Name | admin |
| Password | edge_admin_password |
| Enable SSH access | Selected |
| Enable FIPS mode | Deselected |
| Enable auto rule generation | Selected |
| Edge Control Level logging | INFO |

- c On the **Configure deployment** page, click **Large** to specify the **Appliance Size** and click the **Add** icon.
- d In the **Add NSX Edge Appliance** dialog, enter the following settings, click **OK**, and click **Next**.

| Setting | Value |
|-----------------------|-----------------------|
| Cluster/Resource Pool | sfo01-w01rp-sddc-edge |
| Datastore | sfo01-w01-vsan01 |
| Folder | sfo01-w01fd-nsx |
| Resource Reservation | System Managed |

- e On the **Configure interfaces** page, click the **Add** icon to configure the Uplink01 interface, enter the following settings, and click **OK**.

| Setting | sfo01w01esg01 | sfo01w01esg02 |
|----------------------|--------------------------|--------------------------|
| Name | Uplink01 | Uplink01 |
| Type | Uplink | Uplink |
| Connected To | sfo01-w01-vds01-uplink01 | sfo01-w01-vds01-uplink01 |
| Connectivity Status | Connected | Connected |
| Primary IP Address | 172.16.35.2 | 172.16.35.3 |
| Subnet Prefix Length | 24 | 24 |
| MTU | 9000 | 9000 |
| Send ICMP Redirect | Selected | Selected |

- f Click the **Add** icon to configure the Uplink02 interface, enter the following settings, and click **OK**.

| Setting | sfo01w01esg01 | sfo01w01esg02 |
|----------------------|--------------------------|--------------------------|
| Name | Uplink02 | Uplink02 |
| Type | Uplink | Uplink |
| Connected To | sfo01-w01-vds01-uplink02 | sfo01-w01-vds01-uplink02 |
| Connectivity Status | Connected | Connected |
| Primary IP Address | 172.27.13.3 | 172.27.13.2 |
| Subnet Prefix Length | 24 | 24 |
| MTU | 9000 | 9000 |
| Send ICMP Redirect | Selected | Selected |

- g Click the **Add** to configure the UDLR interface, enter the following settings click **OK**, and click **Next**.

| Setting | sfo01w01esg01 | sfo01w01esg02 |
|----------------------|---------------------------|---------------------------|
| Name | sfo01w01udlr01 | sfo01w01udlr01 |
| Type | Internal | Internal |
| Connected To | Universal Transit Network | Universal Transit Network |
| Connectivity Status | Connected | Connected |
| Primary IP Address | 192.168.100.1 | 192.168.100.2 |
| Subnet Prefix Length | 24 | 24 |
| MTU | 9000 | 9000 |
| Send ICMP Redirect | Selected | Selected |

- h On the **Default gateway settings** page, deselect the **Configure Default Gateway** check box and click **Next**.
 - i On the **Firewall and HA** page, click **Next**.
 - j On the **Ready to complete** page, review the configuration settings that you entered and click **Finish**.
- 6 Repeat this procedure to configure another NSX edge using the settings for the second NSX Edge device.

7 Configure DRS anti-affinity rules for the Edge Services Gateways.

- a Go back to the **Home** page.
- b In the **Navigator**, click **Hosts and Clusters**, and expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
- c Select the **sfo01-w01-consolidated01** cluster, and click the **Configure** tab.
- d Under **Configuration**, click **VM/Host Rules**.
- e Click **Add**.
- f In the **sfo01-w01-consolidated01 - Create VM/Host Rule** dialog box, enter the following settings and click **Add**.

| Setting | Value |
|-------------|------------------------------|
| Name | anti-affinity-rule-ecmpedges |
| Enable rule | Selected |
| Type | Separate Virtual Machine |

- g In the **Add Rule Member** dialog box, select the check box next to each of the two, newly deployed NSX ESGs and click **OK**.
- h In the **sfo01-w01-consolidated01 - Create VM/Host Rule** dialog, click **OK**.

Disable the Firewall Service for Consolidated SDDC

Disable the firewall of the NSX Edge devices. This is required for equal-cost multi-path (ECMP) to operate correctly. Perform this procedure for each NSX Edge device.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to `https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client`.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Under **Inventories**, click **Networking & Security**.
- 3 In the **Navigator**, click **NSX Edges**.
- 4 Select **172.16.11.66** from the **NSX Manager** drop-down menu.
- 5 Double-click the sfo01w01esg01 NSX Edge device.
- 6 Click the **Manage** tab, then click **Firewall**.
- 7 In the **Firewall** page, click the **Stop** button.
- 8 Click **Publish Changes**.
- 9 Repeat this procedure for the NSX Edge device sfo01w01esg02.

Enable and Configure Routing for Consolidated SDDC

Enable the Border Gateway Protocol (BGP) to exchange routing information between the NSX Edge services gateways.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to `https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client`.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Under **Inventories**, click **Networking & Security**.

- 3 In the **Navigator**, click **NSX Edges**.
- 4 Select **172.16.11.66** from the **NSX Manager** drop-down menu.
- 5 Double-click the **sfo01w01esg01** NSX Edge device.
- 6 Click the **Manage** tab and click **Routing**.
- 7 On the **Global Configuration** page, enter the following settings.
 - a Click the **Start** button for ECMP.
 - b To configure dynamic routing, click the **Edit** button next to Dynamic Routing Configuration.
 - c Select **Uplink01** as the **Router ID** and click **OK**.
 - d Click **Publish Changes**.
- 8 On the **Routing** tab, select **Static Routes** to configure it.
 - a Click the **Add** icon, enter the following settings, and click **OK**.

| Setting | Value |
|----------------|-----------------|
| Network | 192.168.11.0/24 |
| Next Hop | 192.168.100.3 |
| Interface | sfo01w01udlr01 |
| Admin Distance | 210 |

- b Click the **Add** icon, enter the following settings, and click **OK**.

| Setting | Value |
|----------------|-----------------|
| Network | 192.168.31.0/24 |
| Next Hop | 192.168.100.3 |
| Interface | sfo01w01udlr01 |
| Admin Distance | 210 |

- c Click **Publish Changes**.
- 9 On the **Routing** tab, select **BGP** to configure it.
 - a Click **Edit**, enter the following settings, and click **OK**.

| Setting | Value |
|--------------------------|------------|
| Enable BGP | Selected |
| Enable Graceful Restart | Selected |
| Enable Default Originate | Deselected |
| Local AS | 65000 |

- b On the **BGP** page, click the **Add** icon to add a neighbor.

The **New Neighbor** dialog box appears. You add two neighbors: the first Top of Rack Switch and the second Top of Rack Switch.

- c In the **New Neighbor** dialog box, enter the following values for the first Top of Rack Switch, and click **OK**.

| Setting | Value |
|-----------------|---------------------|
| IP Address | 172.16.35.1 |
| Remote AS | 65001 |
| Weight | 60 |
| Keep Alive Time | 4 |
| Hold Down Time | 12 |
| Password | <i>BGP_password</i> |

- d Click the **Add** icon to add another neighbor.

The **New Neighbor** dialog box appears. Add the second Top of Rack switch.

- e In the **New Neighbor** dialog box, enter the following values for the second Top of Rack Switch, and click **OK**.

| Setting | Value |
|-----------------|---------------------|
| IP Address | 172.27.13.1 |
| Remote AS | 65001 |
| Weight | 60 |
| Keep Alive Time | 4 |
| Hold Down Time | 12 |
| Password | <i>BGP_password</i> |

- f Click the **Add** icon to add another **Neighbor**.

The **New Neighbor** dialog box appears. Configure the universal distributed logical router (UDLR) as a neighbor.

- g In the **New Neighbor** dialog box, enter the following values, and click **OK**.

| Setting | Value |
|-----------------|---------------------|
| IP Address | 192.168.100.4 |
| Remote AS | 65000 |
| Weight | 60 |
| Keep Alive Time | 1 |
| Hold Down Time | 3 |
| Password | <i>BGP_password</i> |

- h Click **Publish Changes**.

The three neighbors you added appear in the **Neighbors** table.

- 10 On the **Routing** tab, select **Route Redistribution** to configure it.
 - a On the **Route Redistribution** page, click the **Edit** button.
 - b In the **Change redistribution settings** dialog, select the **BGP** check box and click **OK**.
 - c Click the **Add** icon for **Route Redistribution table**.
 - d In the **New Redistribution criteria** dialog box, enter the following settings and click **OK**.

| Setting | Value |
|------------------|------------|
| Prefix | Any |
| Learner Protocol | BGP |
| OSPF | Deselected |
| Static routes | Selected |
| Connected | Selected |
| Action | Permit |

- e Click **Publish Changes**.

The route redistribution configuration appears in the **Route Redistribution** table.

- 11 Repeat this procedure for the NSX Edge device sfo01w01esg02.

Verify Peering of Upstream Switches and Establishment of BGP for Consolidated SDDC

The NSX Edge devices must establish a connection to each of the upstream BGP switches before BGP updates can be exchanged. Verify that the NSX Edges devices are successfully peering, and that BGP routing has been established.

Procedure

- 1 Log in to the NSX Edge device using a Secure Shell (SSH) client.
 - a Open an SSH connection to the NSX Edge device **sfo01w01esg01**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|---------------------|
| User name | admin |
| Password | edge_admin_password |

- 2 Run the `show ip bgp neighbors` command to display information about the BGP connections to neighbors.

The BGP State displays **Established**, **UP** if you have peered with the upstream switches.

Note You have not yet created the universal distributed logical router (UDLR), the BGP State does not display the **Established**, **UP** status message.

```

sfo01m01esg01.sfo01.rainpole.local
BGP neighbor is 172.28.12.1, remote AS 65001,
BGP state = Established, up
Hold time is 12, Keep alive interval is 4 seconds
Neighbor capabilities:
  Route refresh: advertised and received
  Address family IPv4 Unicast:advertised and received
  Graceful restart Capability:advertised and received
  Restart remain time: 0
Received 157598 messages, Sent 157592 messages
Default minimum time between advertisement runs is 30 seconds
For Address family IPv4 Unicast:advertised and received
  Index 1 Identifier 0x1a14f2cc
  Route refresh request:received 0 sent 0
  Prefixes received 11 sent 6 advertised 6
Connections established 1, dropped 1
Local host: 172.28.12.2, Local port: 11814
Remote host: 172.28.12.1, Remote port: 179

BGP neighbor is 172.28.13.1, remote AS 65001,
BGP state = Established, up
Hold time is 12, Keep alive interval is 4 seconds
Neighbor capabilities:
  Route refresh: advertised and received
  Address family IPv4 Unicast:advertised and received
  Graceful restart Capability:advertised and received
  Restart remain time: 0
Received 157574 messages, Sent 157573 messages
Default minimum time between advertisement runs is 30 seconds
For Address family IPv4 Unicast:advertised and received
  Index 2 Identifier 0x1a14f2cc
  Route refresh request:received 0 sent 0
  Prefixes received 11 sent 6 advertised 6
Connections established 1, dropped 1
Local host: 172.28.13.3, Local port: 27743
Remote host: 172.28.13.1, Remote port: 179

BGP neighbor is 192.168.10.4, remote AS 65003,
BGP state = Established, up
Hold time is 3, Keep alive interval is 1 seconds
byte 1593

```

- 3 Run the `show ip route` command to verify that you are receiving routes using BGP, and that there are multiple routes to BGP learned networks.

You verify multiple routes to BGP learned networks by locating the same route using a different IP address. The IP addresses are listed after the word *via* in the right-side column of the routing table output. In the following image there are two different routes to the following BGP networks: 0.0.0.0/0 and 172.27.22.0/24. You can identify BGP networks by the letter B in the left-side column. Lines beginning with C (connected) have only a single route.

```

sfo01m01esg01.sfo01.rainpole.local
sfo01m01esg01.sfo01.rainpole.local-0> show ip route

Codes: O - OSPF derived, i - IS-IS derived, B - BGP derived,
C - connected, S - static, L1 - IS-IS level-1, L2 - IS-IS level-2,
IA - OSPF inter area, E1 - OSPF external type 1, E2 - OSPF external type 2,
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

Total number of routes: 16

B    0.0.0.0/0          [20/0]    via 172.28.12.1
B    0.0.0.0/0          [20/0]    via 172.28.13.1
B    10.159.4.0/23      [20/0]    via 172.28.12.1
B    10.159.4.0/23      [20/0]    via 172.28.13.1
B    172.18.11.0/24     [20/0]    via 172.28.12.1
B    172.18.11.0/24     [20/0]    via 172.28.13.1
B    172.18.21.0/24     [20/0]    via 172.28.12.1
B    172.18.21.0/24     [20/0]    via 172.28.13.1
B    172.19.11.0/24     [20/0]    via 172.28.12.1
B    172.19.11.0/24     [20/0]    via 172.28.13.1
B    172.19.21.0/24     [20/0]    via 172.28.12.1
B    172.19.21.0/24     [20/0]    via 172.28.13.1
B    172.19.35.0/24     [20/0]    via 172.28.12.1
B    172.19.35.0/24     [20/0]    via 172.28.13.1
C    172.28.12.0/24     [0/0]     via 172.28.12.2
C    172.28.13.0/24     [0/0]     via 172.28.13.3
B    172.28.15.0/24     [20/0]    via 172.28.12.1
B    172.28.15.0/24     [20/0]    via 172.28.13.1
B    172.28.21.0/24     [20/0]    via 172.28.12.1
B    172.28.21.0/24     [20/0]    via 172.28.13.1
B    172.28.23.0/24     [20/0]    via 172.28.12.1
B    172.28.23.0/24     [20/0]    via 172.28.13.1
C    192.168.10.0/24    [0/0]     via 192.168.10.1
B    192.168.11.0/24    [200/0]   via 192.168.10.3
B    192.168.31.0/24    [200/0]   via 192.168.10.3
S    192.168.32.0/24    [210/210] via 192.168.10.3

sfo01m01esg01.sfo01.rainpole.local-0> █

```

- 4 Repeat this procedure for the NSX Edge device sfo01w01esg02.

Deploy the Universal Distributed Logical Router for Consolidated SDDC

Deploy the universal distributed logical router (UDLR).

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to <https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client>.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Under **Inventories**, click **Networking & Security**.
- 3 In the **Navigator**, click **NSX Edges**.
- 4 Select **172.16.11.66** from the **NSX Manager** drop-down menu.
- 5 Click the **Add** icon to create a new UDLR.

6 Complete the **New NSX Edge** wizard to deploy and configure the UDLR.

- a On the **Name and description** page, enter the following settings and click **Next**.

| Setting | Value |
|--|----------------|
| Universal Logical (Distributed) Router | Selected |
| Name | sfo01w01udlr01 |
| Deploy Edge Appliance | Selected |
| Enable High Availability | Selected |

- b On the **Settings** page, enter the following settings and click **Next**.

| Setting | Value |
|----------------------------|----------------------------|
| User Name | admin |
| Password | <i>udlr_admin_password</i> |
| Confirm password | <i>udlr_admin_password</i> |
| Enable SSH access | Selected |
| Enable FIPS mode | Deselected |
| Edge Control Level logging | INFO |

- c On the **Configure deployment** page, click the **Add** icon.

- d In the **Add NSX Edge Appliance** dialog box, enter the following settings and click **OK**.

| Setting | Value |
|-----------------------|-----------------------|
| Cluster/Resource Pool | sfo01-w01rp-sddc-edge |
| Datastore | sfo01-w01-vsan01 |
| Folder | sfo01-w01fd-nsx |
| Resource Reservation | System Managed |

- e On the **Configure deployment** page, click the **Add** icon a second time to add a second NSX Edge device.

- f In the **Add NSX Edge Appliance** dialog box, enter the following settings and click **OK**.

| Setting | Value |
|-----------------------|-----------------------|
| Cluster/Resource Pool | sfo01-w01rp-sddc-edge |
| Datastore | sfo01-w01-vsan01 |
| Folder | sfo01-w01fd-nsx |
| Resource Reservation | System Managed |

- g On the **Configure interfaces** page, under **HA Interface Configuration**, click **Change** and connect to **sfo01-w01-vds01-management**.

- h On the **Configure interfaces** page, under **Configure interfaces of this NSX Edge**, click the **Add** icon to configure interface.

- i In the **Add Interface** dialog box, enter the following settings, click **OK**, and click **Next**.

| Setting | Value |
|----------------------|---------------------------|
| Name | Uplink |
| Type | Uplink |
| Connected To | Universal Transit Network |
| Connectivity Status | Connected |
| Primary IP Address | 192.168.100.3 |
| Subnet Prefix Length | 24 |
| MTU | 9000 |

- j On the **Default gateway settings** page, deselect **Configure Default Gateway** and click **Next**.
- k On the **Ready to complete** page, click **Finish**.

7 Enable SSH access in the Universal Distributed Logical Router firewall.

- a Double click the device labeled sfo01w01udlr01.
- b Click the **Manage** tab and click the **Firewall** tab.
- c Click **Add** icon to create a new firewall rule with the following settings.

| Setting | Value |
|-------------|-----------|
| Name | enableSSH |
| Source | any |
| Destination | any |
| Service | SSH |
| Action | Accept |

- d Click **Publish Changes**.

Configure Universal Distributed Logical Router for Dynamic Routing for Consolidated SDDC

Configure the Universal Distributed Logical Router (UDLR) to use dynamic routing.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
- a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
- b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Under **Inventories**, click **Networking & Security**.
- 3 In the **Navigator**, click **NSX Edges**.
- 4 Select **172.16.11.66** from the **NSX Manager** drop-down menu.
- 5 Enable HA logging.
 - a Double-click the device labeled **sfo01w01udlr01**.
 - b Click the **Manage** tab and click the **Settings** tab
 - c Click **Change** in the **HA Configuration** window.
 - d Select the **Enable Logging** checkbox and click **OK**.
- 6 Configure the routing for the Universal Distributed Logical Router.
 - a Double-click **sfo01w01udlr01**.
 - b Click the **Manage** tab and click **Routing**.
 - c On the **Global Configuration** page, perform the following configuration steps.
 - d Click **Edit** under **Routing Configuration**, select the **Enable ECMP** check box, and click **OK**
 - e Click **Edit** under **Dynamic Routing Configuration**, select **Uplink** as the **Router ID**, and click **OK**.
 - f Click **Publish Changes**.
- 7 On the left, select **BGP** to configure it.
 - a On the **BGP** page, click the **Edit** button.
 - b In the **Edit BGP Configuration** dialog box, enter the following settings and click **OK**.

| Setting | Value |
|-------------------------|----------|
| Enable BGP | Selected |
| Enable Graceful Restart | Selected |
| Local AS | 65000 |

- c Click the **Add** icon to add a Neighbor.

- d In the **New Neighbor** dialog box, enter the following values for both NSX Edge devices and click **OK**.

You repeat this step two times to configure the UDLR for both NSX Edge devices: sfo01w01esg01 and sfo01w01esg02.

| Setting | sfo01w01esg01 Value | sfo01w01esg02 Value |
|--------------------|---------------------|---------------------|
| IP Address | 192.168.100.1 | 192.168.100.2 |
| Forwarding Address | 192.168.100.3 | 192.168.100.3 |
| Protocol Address | 192.168.100.4 | 192.168.100.4 |
| Remote AS | 65000 | 65000 |
| Weight | 60 | 60 |
| Keep Alive Time | 1 | 1 |
| Hold Down Time | 3 | 3 |
| Password | <i>BGP_password</i> | <i>BGP_password</i> |

- e Click **Publish Changes**.
- 8 On the left, select **Route Redistribution** to configure it.
- a Click **Edit**.
- b In the Change redistribution settings dialog box, enter the following settings and click **OK**.

| Setting | Value |
|---------|------------|
| OSPF | Deselected |
| BGP | Selected |

- c On the **Route Redistribution** page, select the default **OSPF** entry on the **Route Redistribution table** and click **Edit** button.
- d Select **BGP** from the **Learner Protocol** drop-down menu, and click **OK**.
- e Click **Publish Changes**.

Verify Establishment of BGP for the Universal Distributed Logical Router for Consolidated SDDC

The Universal Distributed Logical router (UDLR) must establish a connection to the Edge Services Gateways before BGP updates can be exchanged. Verify that peering is successful and BGP routing has been established.

Procedure

- 1 Log in to the UDLR by using a Secure Shell (SSH) client.
 - a Open an SSH connection to **sfo01w01udlr01**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------------|
| User name | admin |
| Password | <i>udlr_admin_password</i> |

- 2 Run the `show ip bgp neighbors` command to display information about the BGP and TCP connections to neighbors.

The BGP State displays `Established, UP` if you have successfully peered with the Edge Service Gateway.

```
BGP neighbor is 192.168.10.1, remote AS 65003,
BGP state = Established, up
Hold time is 3, Keep alive interval is 1 seconds
Neighbor capabilities:
  Route refresh: advertised and received
  Address family IPv4 Unicast:advertised and received
  Graceful restart Capability:advertised and received
  Restart remain time: 0
Received 228 messages, Sent 225 messages
Default minimum time between advertisement runs is 30 seconds
For Address family IPv4 Unicast:advertised and received
  Index 1 Identifier 0x03ddf8ac
  Route refresh request:received 0 sent 0
  Prefixes received 5 sent 1 advertised 1
Connections established 1, dropped 1
Local host: 192.168.10.4, Local port: 18332
Remote host: 192.168.10.1, Remote port: 179

BGP neighbor is 192.168.10.2, remote AS 65003,
BGP state = Established, up
Hold time is 3, Keep alive interval is 1 seconds
```

- 3 Run the `show ip route` command to verify that you are receiving routes using BGP, and that there are multiple routes to BGP learned networks.

You verify multiple routes to BGP learned networks by locating the same route using a different IP address. The IP addresses are listed after the word `via` in the right-side column of the routing table output. In the following image there are two different routes to the BGP networks: `0.0.0.0/0`, `172.27.11.0/24`, `172.27.12.0/24`, and `172.27.22.0/24`. You can identify BGP networks by the letter `B` in the left-side column. Lines beginning with `C` (connected) have only a single route.

```
NSX-edge-b6fb7e6a-ef26-41e1-bc86-c8519732ac7a-0> show ip route

Codes: 0 - OSPF derived, i - IS-IS derived, B - BGP derived,
C - connected, S - static, L1 - IS-IS level-1, L2 - IS-IS level-2,
IA - OSPF inter area, E1 - OSPF external type 1, E2 - OSPF external type 2,
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

Total number of routes: 6

B    0.0.0.0/0          [20/0]    via 192.168.10.1
B    0.0.0.0/0          [20/0]    via 192.168.10.2
C   169.254.1.0/30     [0/0]
B   172.27.11.0/24     [200/0]   via 192.168.10.1
B   172.27.11.0/24     [200/0]   via 192.168.10.2
B   172.27.12.0/24     [200/0]   via 192.168.10.1
B   172.27.12.0/24     [200/0]   via 192.168.10.2
B   172.27.22.0/24     [20/0]    via 192.168.10.1
B   172.27.22.0/24     [20/0]    via 192.168.10.2
C   192.168.10.0/24    [0/0]     via 192.168.10.4
```

Distributed Firewall Configuration for Management Applications

Configuring a distributed firewall for use with your SDDC increases the security level of your environment by allowing only the network traffic that is required for the SDDC to run. The firewall rules you define allow access to management applications.

You define explicit rules for the distributed firewall that allow access to management applications.

Procedure

1 Add vCenter Server Instances to the NSX Distributed Firewall Exclusion List

Exclude vCenter Server from all of your distributed firewall rules. This ensures that network access between vCenter Server and NSX is not blocked.

2 Create IP Sets for Components of the Consolidated Cluster

Create IP sets for all management applications. You use the IP sets later to create security groups for use with the distributed firewall rules.

3 Create Security Groups

Create security groups for use in configuring firewall rules for the groups of applications in the SDDC.

4 Create Distributed Firewall Rules

A firewall rule consists of a section to segregate the firewall rules and the rule itself, which defines what network traffic is, or is not, blocked.

Add vCenter Server Instances to the NSX Distributed Firewall Exclusion List

Exclude vCenter Server from all of your distributed firewall rules. This ensures that network access between vCenter Server and NSX is not blocked.

You configure NSX Distributed Firewall using vCenter Server. If a rule prevents access between NSX Manager and vCenter Server, you are not able to manage the distributed firewall. You must exclude vCenter Server from all of your distributed firewall rules, ensuring that access between the two products is not blocked.

Procedure

1 Log in to vCenter Server by using the vSphere Web Client.

- a Open a Web browser and go to **`https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client`**.
- b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Exclude vCenter Server instances from firewall protection.
 - a In the **Navigator**, click **Networking & Security**.
 - b Click **Firewall** and select the **Exclusion List** tab.
 - c Select **172.16.11.66** from the NSX Manager drop-down menu.
 - d Click the **Add** button.
 - e Add sfo01w01vc01 to the **Selected Objects** list, and click **OK**.

Create IP Sets for Components of the Consolidated Cluster

Create IP sets for all management applications. You use the IP sets later to create security groups for use with the distributed firewall rules.

You perform this procedure multiple times to configure all of the necessary IP sets. For applications that are load balanced, include their VIP in the IP Set.

Table 2-7. IP Sets for the Management Applications

| Name | IP Addresses |
|---|---|
| Platform Services Controller Instances | <i>Platform-Service-Controller_IP's</i> |
| vCenter Server Instances | <i>vCenter-Server_IP's</i> |
| vRealize Automation Appliances | <i>vRealize-Automation-Appliances_IP's</i> |
| vRealize Automation Windows | <i>vRealize-Automation-Windows_IP's</i> |
| vRealize Automation Proxy Agents | <i>vRealize-Automation-Proxy-Agents-IP's</i> |
| vRealize Business Server | <i>vRealize-Business_IP's</i> |
| vRealize Business Data Collector | <i>vRealize-Business-Data-Collector_IP's</i> |
| vSphere Data Protection | <i>vSphere-Data-Protection_IP's</i> |
| vRealize Operations Manager | <i>vRealize-Operations-Manager_IP's</i> |
| vRealize Operations Manager Remote Collectors | <i>vRealize-Operations-Manager-Remote-Collectors_IP's</i> |
| vRealize Log Insight | <i>vRealize-Log-Insight_IP's</i> |
| Update Manager Download Service | <i>UMDS_IP's</i> |
| SDDC | <i>Management-VLAN_Subnets, Management-VXLAN_Subnets</i> |
| Administrators | <i>Administrators_Subnet</i> |

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Create an IP set.
 - a In the **Navigator**, click **Networking & Security**.
 - b Click **Groups and Tags** and select the **172.16.11.66** instance.
 - c Click **IP Sets**.
 - d Click the **Add** icon.
 - e In the **New IP Set** dialog box, configure the values for the IP set that you are adding, and click **OK**.

For all IP sets that you configure, select the **Mark this object for Universal Synchronization** check box.

| Setting | Value |
|--|--------------------------|
| Name | vCenter Server Instances |
| IP Addresses | 172.16.11.64 |
| Mark this object for Universal Synchronization | Selected |

- 3 Repeat this procedure to create IP sets for all of the remaining components.

Create Security Groups

Create security groups for use in configuring firewall rules for the groups of applications in the SDDC.

A security group is a collection of assets (or objects) from your vSphere inventory that you group together.

You perform this procedure multiple times to configure all of the necessary security groups. In addition, you create the VMware Appliances and Windows Servers groups from the security groups you add in the previous repetitions of this procedure.

Table 2-8. Security Groups for the Management Clusters Components in the SDDC

| Name | Object Type | Selected Object |
|--|-------------|--|
| Platform Services Controller Instances | IP Sets | Platform Services Controller Instances |
| vCenter Server Instances | IP Sets | vCenter Server Instances |
| vRealize Automation Appliances | IP Sets | vRealize Automation Appliances |

Table 2-8. Security Groups for the Management Clusters Components in the SDDC (Continued)

| Name | Object Type | Selected Object |
|---|-----------------|---|
| vRealize Automation Windows | IP Sets | vRealize Automation Windows |
| vRealize Business Server | IP Sets | vRealize Business Server |
| vRealize Automation Proxy Agents | IP Sets | vRealize Automation Proxy Agents |
| vRealize Business Data Collector | IP Sets | vRealize Business Data Collector |
| vSphere Data Protection | IP Sets | vSphere Data Protection |
| vRealize Operations Manager | IP Sets | vRealize Operations Manager |
| vRealize Operations Manager Remote Collectors | IP Sets | vRealize Operations Manager Remote Collectors |
| vRealize Log Insight | IP Sets | vRealize Log Insight |
| Update Manager Download Service | IP Sets | Update Manager Download Service |
| SDDC | IP Sets | SDDC |
| Administrators | IP Sets | Administrators |
| Windows Servers | Security Groups | <ul style="list-style-type: none"> ■ vRealize Automation Windows ■ vRealize Automation Proxy Agents |
| VMware Appliances | Security Groups | <ul style="list-style-type: none"> ■ Platform Services Controller Instances ■ vCenter Server Instances ■ vRealize Automation Appliances ■ vRealize Business Server ■ vRealize Business Data Collector ■ vSphere Data Protection ■ vRealize Operations Manager ■ vRealize Operations Manager Remote Collectors ■ vRealize Log Insight |

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 In the **Navigator**, click **Networking & Security** and click **Groups and Tags**.
- 3 Select the **172.16.11.66** NSX Manger instance, and click the **Security Group** tab.
- 4 Click the **Add new Security Group** icon.
The **Add Security Group** wizard appears.

- 5 On the **Name and description** page, enter **Platform Services Controller Instances** in the **Name** text box, select the **Mark this object for Universal Synchronization** check box, and click **Next**.

For all security groups that you configure, select the **Mark this object for Universal Synchronization** check box.

- 6 On the **Select objects to include** page, select **IP Sets** from the **Object Type** drop-down menu, select **Platform Services Controller Instances** from the list of available objects, click the **Add** button, and click **Next**.
- 7 On the **Ready to Complete** page, verify the configuration values that you entered and click **Finish**.
- 8 Repeat this procedure to create all of the necessary security groups.

Create Distributed Firewall Rules

A firewall rule consists of a section to segregate the firewall rules and the rule itself, which defines what network traffic is, or is not, blocked.

You create firewall rules that allow administrators to connect to the different VMware solutions, rules to allow user access to the vRealize Automation portal, and to provide external connectivity to the SDDC.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Add a section of rules for the management applications.
 - a In the **Navigator**, click **Networking & Security** and click **Firewall**.
 - b From the **NSX Manager** drop-down menu, select **172.16.11.66**.
 - c Click the **Add Section** icon.
 - d In the **Add New Section** dialog box, enter **VMware Management Services** in the **Section Name** text box, select the **Mark this section for Universal Synchronization** check box, and click **Save**.

- 3 Create a distributed firewall rule to allow SSH access to administrators for the different VMware appliances.
 - a Click **Add rule** in the VMware Management Services section.
 - b In the **Name** cell of the new rule, click the **Edit** icon to change the rule name to **Allow SSH to admins**.
 - c Click the **Edit** icon in the **Source** column, change the **Object Type** to **Security Groups**, add **Administrators** to the **Selected Objects** list, and click **OK**.
 - d Click the **Edit** icon in the **Destination** column, change the **Object Type** to **Security Groups**, add **VMware Appliances** and **Update Manager Download Service** to the **Selected Objects** list, and click **OK**.
 - e Click the **Edit** icon in the **Service** column, enter **SSH** in the filter, add **SSH** to the **Selected Objects** list, and click **OK**.
 - f Click **Publish Changes**.
- 4 Repeat the previous step to create the following distributed firewall rules.

| Name | Source | Destination | Service / Port |
|--------------------------------------|----------------|---|----------------|
| Allow vRA Portal to end users | * any | <ul style="list-style-type: none"> ■ vRealize Automation Appliances ■ vRealize Automation Windows ■ vRealize Business Server | HTTP, HTTPS |
| Allow vRA Console Proxy to end users | * any | vRealize Automation Appliances | TCP:8444 |
| Allow SDDC to any | SDDC | * any | * any |
| Allow PSC to admins | Administrators | Platform Services Controller Instances | HTTPS |
| Allow SSH to admins | Administrators | <ul style="list-style-type: none"> ■ VMware Appliances ■ Update Manager Download Service | SSH |
| Allow RDP to admins | Administrators | Windows Servers | RDP |
| Allow Orchestrator to admins | Administrators | vRealize Automation Appliances | TCP:8281,8283 |
| Allow vRB Data Collector to admins | Administrators | vRealize Business Data Collector | HTTP, HTTPS |
| Allow vROPs to admins | Administrators | <ul style="list-style-type: none"> ■ vRealize Operations Manager ■ vRealize Operations Manager Remote Collectors | HTTP, HTTPS |
| Allow vRLI to admins | Administrators | vRealize Log Insight | HTTP, HTTPS |
| Allow VAMI to admins | Administrators | VMware Appliances | TCP:5480 |
| Allow VDP to admins | Administrators | VMware Appliances | TCP:8543 |

- 5 Change the default rule action from **Allow** to **Block**.
 - a From the **NSX Manager** drop-down menu, select **172.16.11.66**.
 - b Under **Default Section Layer3**, in the **Action** column for the Default Rule, change the action to **Block** and click **Save**.
 - c Click **Publish Changes**.

Network security is improved by allowing only required network traffic by the SDDC to pass.

Test the Consolidated Cluster NSX Configuration for Consolidated SDDC

Test the configuration of the NSX logical network using a ping test. A ping test checks if two hosts in a network can reach each other.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Use the Ping Monitor to test connectivity.
 - a Select **Home**, then select **Networking & Security**.
 - b Under **Logical Switches**, double-click **Universal Transit Network**.
 - c Click the **Monitor** tab and select **Ping**.
 - d From the **Source host** drop-down menu, select **sfo01w01esx01.sfo01.rainpole.local**.
 - e Leave the **Size of test packet** with the default of VXLAN standard.
 - f From the **Destination host** drop-down menu, select **sfo01w01esx03.sfo01.rainpole.local**.
 - g Click **Start Test**.

The host-to-host ping test results are displayed in the **Results** text box. Verify that there are no error messages.

Deploy Application Virtual Networks for Consolidated SDDC

Deploy the application virtual networks.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Create a Universal Logical Switch for workloads that move between sites.
 - a Under **Inventories**, click **Networking & Security**.
 - b In the **Navigator**, click **Logical Switches**.
 - c Select **172.16.11.66** from the **NSX Manager** drop-down menu.
 - d Click the **New Logical Switch** icon to create a new Logical Switch.
 - e In the **New Logical Switch** dialog box, enter the following settings and click **OK**.

| Setting | Value |
|------------------|-------------------------------|
| Name | Mgmt-xRegion01-VXLAN |
| Transport Zone | Mgmt Universal Transport Zone |
| Replication Mode | Hybrid |

- 3 Create a Universal Logical Switch for workloads specific to Workload and Management Consolidation.
 - a On the **Logical Switches** page, click the **Add** icon to create a new Logical Switch.
 - b In the **New Logical Switch** dialog box, enter the following settings, and click **OK**.

| Setting | Value |
|------------------|-----------------------------------|
| Name | Mgmt-RegionA01-VXLAN |
| Transport Zone | SFO01W01 Universal Transport Zone |
| Replication Mode | Hybrid |

- 4 Connect Mgmt-xRegion01-VXLAN to the Universal Distributed Logical Router.
 - a On the **Logical Switches** page, select the **Mgmt-xRegion01-VXLAN** Logical Switch.
 - b Click the **Connect Edge** icon.
 - c On the **Connect an Edge** page, select sfo01w01udlr01 and click **Next**.

- d On the **Edit NSX Edge Interface** page, enter the following settings and click **Next**.

| Setting | Value |
|----------------------|----------------------|
| Name | Mgmt-xRegion01-VXLAN |
| Type | Internal |
| Connected To | Mgmt-xRegion01-VXLAN |
| Connectivity Status | Connected |
| Primary IP Address | 192.168.11.1 |
| Subnet Prefix Length | 24 |

- e On the **Ready to complete** page, click **Finish**.

5 Connect Mgmt-RegionA01-VXLAN to the Universal Distributed Logical Router.

- a On the **Logical Switches** page, select the **Mgmt-RegionA01-VXLAN** Logical Switch.
- b Click the **Connect Edge** icon.
- c On the **Connect an Edge** page, select sfo01w01udlr01 and click **Next**.
- d On the **Edit NSX Edge Interface** page, enter the following settings and click **Next**.

| Setting | Value |
|----------------------|----------------------|
| Name | Mgmt-RegionA01-VXLAN |
| Type | Internal |
| Connected To | Mgmt-RegionA01-VXLAN |
| Connectivity Status | Connected |
| Primary IP Address | 192.168.31.1 |
| Subnet Prefix Length | 24 |

- e On the **Ready to complete** page, click **Finish**.

6 Configure the MTU for the Logical Switches.

- a In the Navigator, select **NSX Edges**.
- b Double-click sfo01w01udlr01.
- c Click the **Manage** tab and click **Settings**.
- d On the **Settings** page, click on **Interfaces**.
- e Under **Interfaces**, select **Mgmt-RegionA01-VXLAN**, and click **Edit**.
- f On the **Edit Logical Router Interface**, configure **MTU**, and click **OK**.

| Setting | Value |
|-----------------------------|-------|
| Mgmt-RegionA01-VXLAN | 9000 |
| Mgmt-xRegion01-VXLAN | 9000 |

Deploy the NSX Load Balancer for Consolidated SDDC

Deploy a load balancer for use by management applications connected to the application virtual network, Mgmt-xRegion01-VXLAN.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Under **Inventories**, click **Networking & Security**.
- 3 In the **Navigator**, click **NSX Edges**.
- 4 Select **172.16.11.66** from the **NSX Manager** drop-down menu.
- 5 Click the **Add** icon to create an NSX Edge.
- 6 On the **Name and description** page, enter the following settings and click **Next**.

| Setting | Value |
|--------------------------|-----------------------------------|
| Install Type | Edge Services Gateway |
| Name | sfo01w01lb01 |
| Hostname | sfo01w01lb01.sfo01.rainpole.local |
| Deploy NSX Edge | Selected |
| Enable High Availability | Selected |

- 7 On the **Settings** page, enter the following settings and click **Next**.

| Setting | Value |
|-----------------------------|---------------------|
| User Name | admin |
| Password | edge_admin_password |
| Enable SSH access | Selected |
| Enable FIPS mode | Deselected |
| Enable auto rule generation | Selected |
| Edge Control Level logging | INFO |

- 8 On the **Configure deployment** page, perform the following configuration steps, and click **Next**.
 - a Select **sfo01-w01dc**, from the **Datacenter** drop-down menu.
 - b Click **Large** to specify the **Appliance Size**.
 - c Click the **Add** icon, enter the following settings, and click **OK**.

| Setting | Value |
|----------------------|--------------------------|
| Resource pool | sfo01-w01-consolidated01 |
| Datastore | sfo01-w01-vsan01 |
| Folder | sfo01-w01fd-nsx |
| Resource Reservation | System Managed |

- d To create a second appliance, click the **Add** icon again, make the same selections in the **New NSX Appliance** dialog box, and click **OK**.
- 9 On the **Configure interfaces** page, click the **Add** icon to configure the OneArmLB interface, enter the following settings, click **OK**, and click **Next**.

| Setting | Value |
|----------------------|----------------------|
| Name | OneArmLB |
| Type | Internal |
| Connected To | Mgmt-xRegion01-VXLAN |
| Connectivity Status | Connected |
| Primary IP Address | 192.168.11.2 |
| Subnet Prefix Length | 24 |
| MTU | 9000 |
| Send ICMP Redirect | Selected |

- 10 On the **Default gateway** settings page, click **Next**.
- 11 On the **Firewall and HA** page, select the following settings and click **Next**.

| Setting | Value |
|-----------------------------------|----------|
| Configure Firewall default policy | Selected |
| Default Traffic Policy | Accept |
| Logging | Disable |
| vNIC | any |
| Declare Dead Time | 15 |

- 12 On the **Ready to complete** page, review the configuration settings you entered and click **Finish**.
- 13 Enable HA logging.
 - a In the Navigator, click **NSX Edges**.
 - b Select **172.16.11.66** from the **NSX Manager** drop-down menu.

- c Double-click the device labeled **sfo01w01lb01**.
- d Click the **Manage** tab and click the **Settings** tab.
- e Click **Change** in the **HA Configuration** window.
- f Select the **Enable Logging** checkbox and click **OK**.

14 Configure the Default Gateway.

- a In the Navigator, click **NSX Edges**.
- b Select **172.16.11.66** from the **NSX Manager** drop-down menu.
- c Double-click the device labeled **sfo01w01lb01**.
- d Click the **Manage** tab and click the **Routing** tab.
- e Click the **Edit** button to configure the **Default Gateway** and enter **192.168.11.1**.
- f Click **Publish Changes**.

15 Enable the Load Balancer service.

- a In the **Navigator**, click **NSX Edges**.
- b Select **172.16.11.66** from the **NSX Manager** drop-down menu.
- c Double-click the device labeled **sfo01w01lb01**.
- d Click the **Manage** tab, click the **Load Balancer** tab, click **Global Configuration**, and click **Edit**.
- e In the **Edit Load balancer global configuration** dialog, select **Enable Load Balancer** and click **OK**.

Operations Management Implementation for Consolidated SDDC

3

Deploy vRealize Operations Manager, vRealize Log Insight, and vSphere Update Manager Download Service to add operations management capabilities to your SDDC.

Procedure

- 1 [vRealize Operations Manager Implementation for Consolidated SDDC](#)
Deploy vRealize Operations Manager components to monitor the resources in your SDDC.
- 2 [vRealize Log Insight Implementation for Consolidated SDDC](#)
- 3 [vSphere Update Manager Download Service Implementation for Consolidated SDDC](#)
Install the vSphere Update Manager Download Service (UMDS) on a Linux virtual machine to download and store binaries and metadata to a shared repository in the region. In the region, connect the UMDS instance to the vSphere Update Manager for vCenter Server.

vRealize Operations Manager Implementation for Consolidated SDDC

Deploy vRealize Operations Manager components to monitor the resources in your SDDC.

Deploy the vRealize Operations Manager analytics cluster with a single node to monitor the resources in your consolidated SDDC. Deploy also the remote collector group with a single node to collect data from the management components in the consolidated SDDC.

Procedure

- 1 [Deploy vRealize Operations Manager for Consolidated SDDC](#)
Start the deployment of vRealize Operations Manager by deploying the nodes of the analytics cluster and the remote collector nodes.
- 2 [Configure the Load Balancer for vRealize Operations Manager for Consolidated SDDC](#)
Configure load balancing for the analytics cluster on the dedicated NSX Edge services gateway. The remote collector group for Consolidated SDDC does not require load balancing.
- 3 [Add an Authentication Source for the Active Directory for Consolidated SDDC](#)
Connect vRealize Operations Manager to the Active Directory of the SDDC for central user management and access control.

- 4 [Configure User Access in vSphere for Integration with vRealize Operations Manager for Consolidated SDDC](#)
- 5 [Add vCenter Adapter Instances to vRealize Operations Manager for Consolidated SDDC](#)
- 6 [Connect vRealize Operations Manager to the NSX Manager Instances for Consolidated SDDC](#)
Install and configure the vRealize Operations Management Pack for NSX for vSphere to monitor the NSX networking services deployed in the clusters in the region and view the vSphere hosts in the NSX transport zones.
- 7 [Enable Storage Device Monitoring in vRealize Operations Manager for Consolidated SDDC](#)
Install and configure the vRealize Operations Management Pack for Storage Devices to view the storage topology in the SDDC and to monitor the capacity and problems on storage components.
- 8 [Enable vSAN Monitoring in vRealize Operations Manager for Consolidated SDDC](#)
Configure the vRealize Operations Management Pack for vSAN to view the vSAN topology, and to monitor the capacity and problems.
- 9 [Configure Email Alerts for vRealize Operations Manager for Consolidated SDDC](#)
You configure email notifications in vRealize Operations Manager so that users and applications receive the administrative alerts from vRealize Operations Manager about certain situations in the data center.

Deploy vRealize Operations Manager for Consolidated SDDC

Start the deployment of vRealize Operations Manager by deploying the nodes of the analytics cluster and the remote collector nodes.

Procedure

- 1 [Prerequisites for Deploying vRealize Operations Manager for Consolidated SDDC](#)
Before you deploy vRealize Operations Manager, verify that your environment satisfies the requirements for this deployment.
- 2 [Deploy the Virtual Appliances for the Analytics Cluster for Consolidated SDDC](#)
- 3 [Configure the Master Node in the Analytics Cluster for Consolidated SDDC](#)
After you deploy the virtual appliance for the master node of the vRealize Operations Manager analytics cluster, enable its administration role in the cluster.
- 4 [Deploy the Remote Collector Virtual Appliances for Consolidated SDDC](#)
- 5 [Connect the Remote Collector Nodes to the Analytics Cluster for Consolidated SDDC](#)
- 6 [Start vRealize Operations Manager for Consolidated SDDC](#)
- 7 [Assign a License to vRealize Operations Manager for Consolidated SDDC](#)
After you deploy and start vRealize Operations Manager, you assign a valid license.
- 8 [Group Remote Collector Nodes for Consolidated SDDC](#)

Prerequisites for Deploying vRealize Operations Manager for Consolidated SDDC

Before you deploy vRealize Operations Manager, verify that your environment satisfies the requirements for this deployment.

IP Addresses and Host Names

Verify that static IP addresses and FQDNs for the application virtual networks are available for the SDDC deployment.

For the analytics cluster application virtual network, allocate one static IP address and FQDN for the master node and one for the load balancer, and map the host name to the IP address. For the remote collector group, allocate one static IP address and FQDN and map host names to the IP addresses.

Table 3-1. Application Virtual Network Names for vRealize Operations Manager

| vRealize Operations Manager Component | Application Virtual Network |
|---------------------------------------|-----------------------------|
| Analytics Cluster | Mgmt-xRegion01-VXLAN |
| Remote Collector Group | Mgmt-RegionA01-VXLAN |

Table 3-2. IP Addresses and Host Names for the Analytics Cluster

| Role | IP Address | FQDN |
|------------------------------------|--|------------------------------|
| External load balancer VIP address | 192.168.11.35 | vrops01svr01.rainpole.local |
| Master node | 192.168.11.31 | vrops01svr01a.rainpole.local |
| Default gateway | 192.168.11.1 | - |
| DNS server | 172.16.11.4 | - |
| Subnet mask | 255.255.255.0 | - |
| NTP servers | <ul style="list-style-type: none"> ■ 172.16.11.251 ■ 172.16.11.252 | ntp.sfo01.rainpole.local |

Table 3-3. IP Addresses and Host Names for the Remote Collector Group

| Role | IP Address | FQDN |
|-----------------------|---------------|-------------------------------------|
| Remote collector node | 192.168.31.31 | sfo01vropsc01a.sfo01.rainpole.local |
| Default gateway | 192.168.31.1 | - |
| DNS server | 172.16.11.5 | - |
| Subnet mask | 255.255.255.0 | - |

Deployment Prerequisites

Verify that your environment satisfies the following prerequisites for the deployment of vRealize Operations Manager.

| Prerequisite | Value |
|-----------------------|--|
| Storage | <ul style="list-style-type: none"> ■ Virtual disk provisioning. <ul style="list-style-type: none"> ■ Thin ■ Required storage per analytics cluster node. <ul style="list-style-type: none"> ■ Initial storage for the analytics cluster node: 274 GB ■ Additional storage for monitoring data per node: none ■ Required storage per remote collector group node. <ul style="list-style-type: none"> ■ Initial storage per node: 274 GB |
| Software Features | <ul style="list-style-type: none"> ■ Verify that vCenter Server is operational. ■ Verify that the vSphere cluster has vSphere DRS and HA enabled. ■ Verify that the NSX Manager is operational. ■ Verify that the application virtual networks are available. ■ Verify that the Load Balancer service is enabled on the NSX Edge services gateway. ■ Verify that Postman App is installed. |
| Installation Package | <ul style="list-style-type: none"> ■ Download the .ova file of the vRealize Operations Manager virtual appliance on the machine where you use the vSphere Web Client. ■ Download the .pak file for the vRealize Operations Manager Management Pack for NSX for vSphere from VMware Solutions Exchange. ■ Download the .pak file for the vRealize Operations Manager Management Pack for Storage Devices from VMware Solutions Exchange. |
| License | <ul style="list-style-type: none"> ■ Verify that you have obtained a license that covers the use of vRealize Operations Manager. |
| Active Directory | <ul style="list-style-type: none"> ■ Verify that you have a parent active directory with the SDDC user roles configured for the rainpole.local domain. |
| Certificate Authority | <ul style="list-style-type: none"> ■ Configure the root Active Directory domain controller as a certificate authority for the environment. ■ Download the CertGenVVD tool and generate the signed certificate for the analytics cluster. See the <i>VMware Validated Design Planning and Preparation</i> documentation. |
| External Services | <ul style="list-style-type: none"> ■ Verify that you have access to an SMTP server. ■ Verify that SNMP is enabled in your network environment, to monitor network devices. ■ Verify that Link Layer Discovery Protocol (LLDP) or Cisco Discovery Protocol (CDP) is enabled on each network device for complete monitoring of your environment. |

Deploy the Virtual Appliances for the Analytics Cluster for Consolidated SDDC

Use the vSphere Web Client to deploy the vRealize Operations Manager analytics node as a virtual appliance on the consolidated cluster.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Navigate to the **sfo01w01vc01.sfo01.rainpole.local** vCenter Server object.
- 3 Right-click the **sfo01w01vc01.sfo01.rainpole.local** object and select **Deploy OVF Template**.
- 4 On the **Select template** page, select **Local file**, browse to the location of the vRealize Operations Manager OVA file on your file system, and click **Next**.
- 5 On the **Select name and location** page, enter a node name, select the inventory folder for the virtual appliance, and click **Next**.
 - a Enter a name for the node according to its role.

| Name | Role |
|---------------|-------------|
| vrops01svr01a | Master node |

- b Select the inventory folder for the virtual appliance.

| Setting | Value |
|----------------|-----------------------------------|
| vCenter Server | sfo01w01vc01.sfo01.rainpole.local |
| Datacenter | sfo01-w01dc |
| Folder | sfo01-w01fd-vrops |

- 6 On the **Select a resource** page, select the following values, and click **Next**.

| Setting | Value |
|---------------|--------------------------|
| Datacenter | sfo01-w01dc |
| Cluster | sfo01-w01-consolidated01 |
| Resource Pool | sfo01-w01rp-sddc-mgmt |

- 7 On the **Review details** page, examine the virtual appliance details, such as product, version, download and disk size, and click **Next**.
- 8 On the **Accept license agreements** page, accept the end user license agreements, and click **Next**.
- 9 On the **Select configuration** page, from the **Configuration** drop-down menu, select the **Medium** deployment configuration of the virtual appliance, and click **Next**.

- 10 On the **Select storage** page, select the following datastore and configure its settings, and click **Next**.

| Setting | Value |
|----------------------------|-----------------------------|
| Select virtual disk format | Thin provision |
| VM Storage Policy | vSAN Default Storage Policy |
| Datastore | sfo01-w01-vsan01 |

- 11 On the **Select networks** page, select the distributed port group on the **sfo01-w01-vds01** distributed switch that ends with **Mgmt-xRegion01-VXLAN**, and click **Next**.
- 12 On the **Customize template** page, set IPv4 settings and select the time zone for the virtual appliance, and click **Next**.
- a In the **Networking Properties** section, configure the following IPv4 settings.

| Setting | Value |
|---------------------|---------------|
| DNS server | 172.16.11.4 |
| Default gateway | 192.168.11.1 |
| Static IPv4 address | 192.168.11.31 |
| Subnet mask | 255.255.255.0 |
| Timezone setting | Etc/UTC |

- 13 On the **Ready to complete** page, verify that the settings for deployment are correct, and click **Finish**.
- 14 After the virtual appliance configuration is updated, right-click the virtual appliance object and select **Power > Power On**.
- 15 Change the default empty password for the root user.
- a In the vSphere Web Client, right-click the analytics virtual appliance and select **Open Console** to open the remote console to the appliance.

| Name | Role |
|---------------|-------------|
| vrops01svr01a | Master node |

- b Press ALT+F1 to switch to the command prompt.
- c At the command prompt, log in as the **root** user using empty password.
- d At the command prompt, change the default empty password for the root user account with a new **vrops_root_password** password.
- e Close the virtual appliance console.

Configure the Master Node in the Analytics Cluster for Consolidated SDDC

After you deploy the virtual appliance for the master node of the vRealize Operations Manager analytics cluster, enable its administration role in the cluster.

Procedure

- 1 Open a Web browser and go to **https://vrops01svr01a.rainpole.local**.
- 2 On the **Get Started** page, click **New Installation**.
- 3 On the **Getting Started** page, review the steps for creating a cluster, and click **Next**.
- 4 On the **Set Administrator Password** page, type and confirm the password for the admin user account.
- 5 On the **Choose Certificate** page, click the **Install a certificate** button, click **Browse**, select the certificate chain .pem file that contains the own private key and the issuer and own certificate files, and click **Next**.

You generate a PEM file `vrops-for-1-pod.2.chain.pem` by using the CertGenVVD tool.

After the setup imports and validates the certificate, notice that the certificate has a common name, `vrops01svr01.rainpole.local`, and a subject alternative name that contains `vrops01svr01a.rainpole.local` for the master node.

- 6 On the **Deployment Settings** page, configure the following settings, and click **Next**.

| Setting | Value |
|--------------------------|--------------------------|
| Cluster Master Node Name | vrops01svr01a |
| NTP Server Address | ntp.sfo01.rainpole.local |

- 7 On the **Ready To Complete** page, click **Finish**

When the configuration process completes, the vRealize Operations Manager Administration console opens.

- 8 Click **System Status** in the **Administration** panel to verify that you have a vRealize Operations Manager instance created.

The virtual appliance instance acting as the master node appears in the **Nodes in the vRealize Operations Manager Cluster** list.

Deploy the Remote Collector Virtual Appliances for Consolidated SDDC

After you deploy the master node in the analytics cluster, use the vSphere Web Client to deploy the virtual appliance for the remote collector for Consolidated SDDC.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Navigate to the sfo01w01vc01.sfo01.rainpole.local vCenter Server object.
- 3 Right-click the **sfo01w01vc01.sfo01.rainpole.local** object and select **Deploy OVF Template**.
- 4 On the **Select template** page, select **Local file**, browse to the location of the vRealize Operations Manager OVA file on your file system, and click **Next**.
- 5 On the **Select name and location** page, enter a node name, select the inventory folder for the virtual appliance, and click **Next**.

| Setting | Value |
|----------------------------|-----------------------------------|
| Name of remote collector 1 | sfo01vropsc01a |
| vCenter Server | sfo01w01vc01.sfo01.rainpole.local |
| Data center | sfo01-w01dc |
| Folder | sfo01-w01fd-vrosrc |

- 6 On the **Select a resource** page, select the following values, and click **Next**.

| Setting | Value |
|-------------|--------------------------|
| Data center | sfo01-w01dc |
| Cluster | sfo01-w01-consolidated01 |

- 7 On the **Review details** page, examine the virtual appliance details, such as product, version, download and disk size, and click **Next**.
- 8 On the **Accept license agreements** page, accept the end user license agreements, and click **Next**.
- 9 On the **Select configuration** page, from the **Configuration** drop-down menu, select the **Remote Collector (Standard)** deployment configuration of the virtual appliance, and click **Next**.
- 10 On the **Select storage** page, select the following datastore and click **Next**.

| Setting | Value |
|----------------------------|-----------------------------|
| Select virtual disk format | Thin provision |
| VM Storage Policy | vSAN Default Storage Policy |
| Datastore table | sfo01-w01-vsan01 |

- 11 On the **Select networks** page, select the distributed port group on the **sfo01-w01-vds01** distributed switch that ends with **Mgmt-RegionA01-VXLAN** and click **Next**.
- 12 On the **Customize template** page, set the IPv4 settings and select the time zone for the virtual appliance and click **Next**.
 - a In the **Networking Properties** section, configure the following IPv4 settings.

| Option | Description |
|---------------------|---------------|
| DNS server | 172.16.11.5 |
| Default gateway | 192.168.31.1 |
| Static IPv4 address | 192.168.31.31 |
| Subnet mask | 255.255.255.0 |
| Timezone setting | Etc/UTC |

- 13 On the **Ready to complete** page, verify that the settings for deployment are correct, and click **Finish**.
- 14 After the virtual appliance is deployed, right-click the virtual appliance object and select **Power > Power On**.
- 15 Change the default empty password for the root user.
 - a In the vSphere Web Client, right-click the remote collector virtual appliance and select **Open Console** to open the remote console to the appliance.

| Name | Role |
|----------------|--------------------|
| sfo01vropsc01a | Remote collector 1 |

- b Press ALT+F1 to switch to the command prompt.
- c At the command prompt, log in as the **root** user using empty password.
- d At the command prompt, change the default empty password for the root user account with a new **vrops_root_password** password.
- e Close the virtual appliance console.

Connect the Remote Collector Nodes to the Analytics Cluster for Consolidated SDDC

After you deploy the virtual appliance for the remote collector node, configure the settings of the remote collector and connect it to the analytics cluster.

Procedure

- 1 Open a Web browser, and go to the initial setup user interface of the remote collector virtual appliance.

| Remote Collector Node | URL for Setup Interface |
|-----------------------|---|
| Remote collector 1 | https://sfo01vropsc01a.sfo01.rainpole.local |

- 2 On the **Get Started** page, click **Expand an Existing Installation**.
- 3 On the **Getting Started** page, review the steps for creating a cluster, and click **Next**.
- 4 On the **Node Settings And Cluster Info** page, configure the settings of the remote collector node.
 - a Enter a node name, select a node type, and enter the master node address.

| Setting | Value |
|--------------------------------|---------------------------------------|
| Node name | sfo01vropsc01a for remote collector 1 |
| Node type | Remote Collector |
| Master node IP address or FQDN | vrops01svr01a.rainpole.local |

- b Click **Validate** next to the **Master node IP address or FQDN** text box.
The certificate of the master node appears in the text box.
 - c Validate that the master certificate is correct, click **Accept this certificate**, and click **Next**.
- 5 On the **Username And Password** page, select **Use cluster administrator user name and password**, enter the *vrops_admin_password* password for the admin user, and click **Next**.
- 6 On the **Ready to Complete** page, click **Finish**.
After the configuration process completes, the vRealize Operations Manager Administration console opens.
- 7 Click **System Status** in the **Administration** panel to verify that the node is added to the vRealize Operations Manager cluster.
The virtual appliance instance acting as the remote collector node appears in the **Nodes in the vRealize Operations Manager Cluster** list.

Start vRealize Operations Manager for Consolidated SDDC

After you deploy the virtual appliances for the analytics cluster node and for the remote collector node, start the analytics cluster.

Procedure

- 1 Log in to vRealize Operations Manager by using the administration interface.
 - a Open a Web browser and go to **https://vrops01svr01a.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | admin |
| Password | <i>vrops_admin_password</i> |

On the **System Status** page, the cluster status is Not Started, and the high availability of the cluster is Disabled.

- 2 Click **Start vRealize Operations Manager**.

- 3 On the **Confirm First Application Startup** dialog box, click **Yes** to confirm the startup of vRealize Operations Manager.

After several minutes, the nodes of the vRealize Operations Manager cluster start. The analytics cluster and remote collector nodes are online. You are logged out from the administrator interface of the master node.

Assign a License to vRealize Operations Manager for Consolidated SDDC

After you deploy and start vRealize Operations Manager, you assign a valid license.

Procedure

- 1 Log in to vRealize Operations Manager by using the administration interface.
 - a Open a Web browser and go to **https://vrops01svr01a.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------|
| User name | admin |
| Password | vrops_admin_password |

- 2 On the **Welcome** page of the **vRealize Operations Manager Configuration** wizard, examine the process overview, and click **Next**.
- 3 On the **Accept EULA** page, accept the end-user license agreement, and click **Next**.
- 4 On the **Enter Product License Key** page, enter the vRealize Operations Manager product license key.
 - a Select **Product Key** and enter the license key.
 - b Click **Validate License Key**, and click **Next**.
- 5 (Optional) On the **Customer Experience Improvement Program** page, to send technical information for product improvement, select **Join the VMware Customer Experience Improvement Program** and click **Next**.
- 6 On the **Ready to Complete** page, click **Finish**.

The vRealize Operations Manager user interface opens.

Group Remote Collector Nodes for Consolidated SDDC

After you start vRealize Operations Manager and assign it a license, join the remote collector node into a collector group.

Procedure

- 1 Log in to vRealize Operations Manager by using the administration interface.
 - a Open a Web browser and go to **https://vrops01svr01a.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------|
| User name | admin |
| Password | vrops_admin_password |

- 2 On the main navigation bar, click **Administration**.
- 3 In the left pane of vRealize Operations Manager, click **Management** and click **Collector Groups**.
- 4 Click **Add**.
- 5 In the **Add New Collector Group** dialog box, configure the following settings, and click **Save**.

| Setting | Value |
|----------------|----------------------------------|
| Name | sfo01-remote-collectors |
| Description | Remote collector group for sfo01 |
| sfo01vropsc01a | Selected |

The sfo01-remote-collectors group appears on the **Collector Groups** page under the **Administration** view of the user interface.

Configure the Load Balancer for vRealize Operations Manager for Consolidated SDDC

Configure load balancing for the analytics cluster on the dedicated NSX Edge services gateway. The remote collector group for Consolidated SDDC does not require load balancing.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 From the **Home** menu of the vSphere Web Client, select **Networking & Security**.
- 3 In the **Navigator**, click **NSX Edges**.

- 4 From the **NSX Manager** drop-down menu, select **172.16.11.66** and double-click the **sfo01w01lb01** NSX Edge to open its network settings.
- 5 Configure the VIP address for load balancing for the analytics cluster.
 - a On the **Manage** tab, click the **Settings** tab and click **Interfaces**.
 - b Select the **OneArmLB** interface and click **Edit**.
 - c In the **Edit NSX Edge Interface** dialog box, click the **Edit** and in the **Secondary IP Addresses** text box enter the **192.168.11.35** VIP address.
 - d Click **OK** to save the configuration.
- 6 Create an application profile.
 - a On the **Manage** tab for the sfo01w01lb01 device, click the **Load Balancer** tab.
 - b Click **Application Profiles**, and click **Add**.
 - c In the **New Profile** dialog box, configure the profile using the following configuration settings, and click **OK**.

| Setting | Value |
|------------------------|-------------|
| Name | vrops-https |
| Type | HTTPS |
| Enable SSL Passthrough | Selected |
| Persistence | Source IP |
| Expires in (Seconds) | 1800 |
| Client Authentication | Ignore |

- 7 Create a service monitoring entry.
 - a On the **Load Balancer** tab for the of the sfo01w01lb01 device, click **Service Monitoring** and click **Add**.
 - b In the **New Service Monitor** dialog box, configure the health check parameters using the following configuration settings, and click **OK**.

| Setting | Value |
|-------------|---------------------------------------|
| Name | vrops-443-monitor |
| Interval | 3 |
| Timeout | 5 |
| Max Retries | 2 |
| Type | HTTPS |
| Method | GET |
| URL | /suite-api/api/deployment/node/status |
| Receive | ONLINE (must be upper case) |

8 Add a server pool.

- a On the **Load Balancer** tab of the sfo01w01lb01 device, select **Pools**, and click **Add**
- b In the **New Pool** dialog box, configure the load balancing profile using the following configuration settings.

| Setting | Value |
|-----------|-------------------|
| Name | vrops-svr-443 |
| Algorithm | LEASTCONN |
| Monitors | vrops-443-monitor |

- c Under **Members**, click **Add** to add the pool members.
- d In the **New Member** dialog box, add one member for each node of the analytics cluster and click **OK**.

| Setting | Value |
|-----------------|-----------------|
| Name | ■ vrops01svr01a |
| IP Address | ■ 192.168.11.31 |
| State | Enable |
| Port | 443 |
| Monitor Port | 443 |
| Weight | 1 |
| Max Connections | 8 |
| Min Connections | 8 |

- e In the **New Pool** dialog box, click **OK**.

9 Add a virtual server.

- a On the **Load Balancer** tab of the sfo01w011b01 device, select **Virtual Servers** and click **Add**.
- b In the **New Virtual Server** dialog box, configure the settings of the virtual server for the analytics cluster and click **OK**.

| Setting | Value |
|-----------------------|---|
| Enable Virtual Server | Selected |
| Application Profile | vrops-https |
| Name | vrops-svr-443 |
| Description | vRealize Operations Manager Cluster |
| IP Address | 192.168.11.35 Click Select IP Address , select OneArmLB from the drop-down menu, and select 192.168.11.35 IP for the virtual NIC. |
| Protocol | HTTPS |
| Port | 443 |
| Default Pool | vrops-svr-443 |
| Connection Limit | 0 |
| Connection Rate Limit | 0 |

You can now connect to the analytics cluster using the public Virtual Server IP address over HTTPS at the **https://vrops01svr01.rainpole.local** address.

10 Configure auto-redirect from HTTP to HTTPS requests.

The NSX Edge can redirect users from HTTP to HTTPS without entering another URL in the browser.

- a On the **Load Balancer** tab of the sfo01w011b01 device, select **Application Profiles** and click **Add**.
- b In the **New Profile** dialog box, configure the application profile settings and click **OK**.

| Setting | Value |
|----------------------|--|
| Name | vrops-http-redirect |
| Type | HTTP |
| HTTP Redirect URL | https://vrops01svr01.rainpole.local/vcops-web-ent/login.action |
| Persistence | Source IP |
| Expires in (Seconds) | 1800 |

- c On the **Load Balancer** tab of the sfo01w01lb01 device, select **Virtual Servers** and click **Add**.
- d Configure the settings of the virtual server for HTTP redirects and click **OK**.

| Setting | Value |
|-----------------------|---|
| Enable Virtual Server | Selected |
| Application Profile | vrops-http-redirect |
| Name | vrops-svr-80-redirect |
| Description | HTTP Redirect for vRealize Operations Manager |
| IP Address | 192.168.11.35 |
| Protocol | HTTP |
| Port | 80 |
| Default Pool | NONE |
| Connection Limit | 0 |
| Connection Rate Limit | 0 |

You can connect to the analytics cluster at the public Virtual Server IP address over HTTP at the `http://vrops01svr01.rainpole.local` address.

- 11 Verify the pool configuration by examining the pool statistics that reflect the status of the components behind the load balancer.
 - a Log out and log in again to the vSphere Web Client.
 - b From the **Home** menu, select **Networking & Security**.
 - c On the **NSX Home** page, click **NSX Edges** and select **172.16.11.66** from the **NSX Manager** drop-down menu at the top of the **NSX Edges** page.
 - d On the **NSX Edges** page, double-click the **sfo01w01lb01** NSX Edge.
 - e On the **Manage** tab, click the **Load Balancer** tab.
 - f Select **Pools** and click **Show Pool Statistics**.
 - g In the **Pool and Member Status** dialog box, select the **vrops-svr-443** pool.
 - h Verify that the load balancer pool is up.

Add an Authentication Source for the Active Directory for Consolidated SDDC

Connect vRealize Operations Manager to the Active Directory of the SDDC for central user management and access control.

Procedure

- 1 Log in to vRealize Operations Manager by using the operations interface.
 - a Open a Web browser and go to **https://vrops01svr01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | admin |
| Password | <i>vrops_admin_password</i> |

- 2 On the main navigation bar, click **Administration**.
- 3 In the left pane of vRealize Operations Manager, click **Access** and click **Authentication Sources**.
- 4 On the **Authentication Sources** page, click **Add**.
- 5 In the **Add Source for User and Group Import** dialog box, enter the settings for the rainpole.local and sfo01.rainpole.local Active Directories, and click **OK**.

| Active Directory Settings | rainpole.local Value | sfo01.rainpole.local Value |
|---|---------------------------|-------------------------------|
| Source Display Name | RAINPOLE.LOCAL | SFO01.RAINPOLE.LOCAL |
| Source Type | Active Directory | Active Directory |
| Integration Mode | Basic | Basic |
| Domain/Subdomain | RAINPOLE.LOCAL | SFO01.RAINPOLE.LOCAL |
| Use SSL/TLS | Deselected | Deselected |
| User Name | svc-vrops@rainpole.local | svc-vrops@rainpole.local |
| Password | <i>svc-vrops_password</i> | <i>svc-vrops_password</i> |
| Settings under the Details section | | |
| Automatically synchronize user membership for configured groups | Selected | Selected |
| Host | dc01rpl.rainpole.local | dc01sfo.sfo01.rainpole.local |
| Port | 3268 | 389 |
| Base DN | dc=RAINPOLE,dc=LOCAL | dc=SFO01,dc=RAINPOLE,dc=LOCAL |
| Common Name | userPrincipalName | userPrincipalName |

- 6 Click the **Test** button to test the connection to the domain controller and in the **Info** dialog click **OK**.
- 7 In the **Add Source for User and Group Import** dialog box, click **OK**.

The users and user groups in the two Active Directories are added to vReliaze Operations Manager.

Configure User Access in vSphere for Integration with vRealize Operations Manager for Consolidated SDDC

Configure operations service accounts with permissions that are required to enable vRealize Operations Manager access to monitoring data on the consolidated cluster.

You associate the `svc-vrops-solution` service accounts in the Active Directory with user roles that have certain privileges and you assign the users to the vCenter Server instances in the inventory by using global permissions.

Procedure

- 1 [Define a User Role in vSphere for vCenter Adapters in vRealize Operations Manager for Consolidated SDDC](#)

In vSphere, create a user role with privileges that are required to query information from vCenter Server and receive metric data in vRealize Operations Manager. In vRealize Operations Manager, you can also run actions or tasks on the objects it manages in vCenter Server. Add the privileges to the role that are required for typical virtual machine lifecycle operations, such as snapshot management and virtual machine resource configuration.

- 2 [Define a User Role in vSphere for Storage Devices Adapters in vRealize Operations Manager for Consolidated SDDC](#)

In vSphere, create a user role with privileges that are required for collecting data about storage devices in vRealize Operations Manager.

- 3 [Configure User Privileges in vSphere for Integration with vRealize Operations Manager for Consolidated SDDC](#)

Assign global permissions to the operations service accounts to access monitoring data from vCenter Server instances in vRealize Operations Manager.

Define a User Role in vSphere for vCenter Adapters in vRealize Operations Manager for Consolidated SDDC

In vSphere, create a user role with privileges that are required to query information from vCenter Server and receive metric data in vRealize Operations Manager. In vRealize Operations Manager, you can also run actions or tasks on the objects it manages in vCenter Server. Add the privileges to the role that are required for typical virtual machine lifecycle operations, such as snapshot management and virtual machine resource configuration.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 On the **Home** page of the vSphere Web Client, click **Roles** under **Administration**.
- 3 Create a role for collecting data from and performing actions on vCenter Server.
 - a On the **Roles** page, click the **Create role action** icon.
 - b In the **Create Role** dialog box, configure the role using the following configuration settings, and click **OK**.

| Setting | Value |
|-----------|---|
| Role name | vSphere Actions User |
| Privilege | <ul style="list-style-type: none"> ▪ Virtual Machine.Configuration.Change CPU Count ▪ Virtual Machine.Configuration. Change Resource ▪ Virtual Machine.Configuration. Memory ▪ Virtual Machine.Interaction. Power Off ▪ Virtual Machine.Interaction. Power On ▪ Virtual Machine.Snapshot Management. Create Snapshot ▪ Virtual Machine.Snapshot Management. Remove Snapshot |

This role inherits the **System.Anonymous**, **System.View**, and **System.Read** privileges.

Define a User Role in vSphere for Storage Devices Adapters in vRealize Operations Manager for Consolidated SDDC

In vSphere, create a user role with privileges that are required for collecting data about storage devices in vRealize Operations Manager.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to `https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client`.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 On the **Home** page of the vSphere Web Client, click **Roles** under **Administration**.
- 3 Create a new role for collecting storage device data.
 - a On the **Roles** page, click the **Create role action** icon.
 - b In the **Create Role** dialog box, configure the role using the following configuration settings, and click **OK**.

| Setting | Value |
|-----------|--|
| Role name | MPSD Metrics User |
| Privilege | <ul style="list-style-type: none"> ▪ Host.CIM.CIM interaction ▪ Host.Configuration.Storage partition configuration ▪ Profile-driven storage.Profile-driven storage view ▪ Storage views.View |

This role inherits the **System.Anonymous**, **System.View**, and **System.Read** privileges.

Configure User Privileges in vSphere for Integration with vRealize Operations Manager for Consolidated SDDC

Assign global permissions to the operations service accounts to access monitoring data from vCenter Server instances in vRealize Operations Manager.

- The svc-vrops-vsphere user has the rights that are specifically required to collect data from and perform actions on vCenter Server from vRealize Operations Manager.
- The svc-vrops-nsx user has read-only access on all objects in vCenter Server.
- The svc-vrops-mpsd and svc-vrops-vsan users have rights that are specifically required for access to storage device and vSAN information, respectively, in vRealize Operations Manager on all objects in vCenter Server.

You assign global permissions that are based on the following roles to these service accounts:

| Service Account | Role |
|----------------------------------|----------------------|
| svc-vrops-vsphere@rainpole.local | vSphere Actions User |
| svc-vrops-nsx@rainpole.local | Read-only |

| Service Account | Role |
|-------------------------------|-------------------|
| svc-vrops-mpsd@rainpole.local | MPSD Metrics User |
| svc-vrops-vsan@rainpole.local | MPSD Metrics User |

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 From the **Home** menu, select **Administration**.
- 3 Click **Global Permissions** under **Access Control**.
- 4 On the **Manage** tab, click **Add permission**.
- 5 In the **Global Permissions Root - Add Permission** dialog box, click **Add** to associate the service account with the role that contains the privileges for accessing data from the inventory.
- 6 Add the service account.
 - a In the **Select Users/Groups** dialog box, from the **Domain** drop-down menu, select **rainpole.local**, in the filter box type **svc-vrops**, and press Enter.
 - b From the list of users and groups, select **svc-vrops-*vsphere***, click **Add**, and click **OK**.
- 7 Associate the service account with the role.
 - a In the **Global Permissions Root - Add Permission** dialog box, from the **Assigned Role** drop-down menu, select **vSphere Actions User**.
 - b Verify that **Propagate to children** is selected and click **OK**.
- 8 Repeat the steps to assign global permissions to the other service accounts.

Add vCenter Adapter Instances to vRealize Operations Manager for Consolidated SDDC

After you deploy the analytics and the remote collector nodes of vRealize Operations Manager and start vRealize Operations Manager, pair a vCenter Adapter instance with each vCenter Server instance in the region.

Procedure

- 1 Log in to vRealize Operations Manager by using the operations interface.
 - a Open a Web browser and go to **https://vrops01svr01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | admin |
| Password | <i>vrops_admin_password</i> |

- 2 On the main navigation bar, click **Administration**.
- 3 In the left pane of vRealize Operations Manager, click **Solutions**.
- 4 From the solution table on the **Solutions** page, select the **VMware vSphere** solution, and click the **Configure** icon at the top.

The **Manage Solution - VMware vSphere** dialog box appears.

- 5 Under **Instance Settings**, enter the settings for connection to vCenter Server.
 - a Enter the display name, description, and FQDN of the vCenter Server instance.

| Setting | Value for Consolidated vCenter Server |
|----------------|---------------------------------------|
| Display Name | vCenter Adapter - sfo01w01vc01 |
| Description | Consolidated vCenter Server |
| vCenter Server | sfo01w01vc01.sfo01.rainpole.local |

- b Click the **Add** icon on the right side, configure the collection credentials for connection to the vCenter Server instance, and click **OK**.

| vCenter Server Credentials Attribute | Value |
|--------------------------------------|--|
| Credential name | ■ vCenter Adapter Credentials - sfo01w01vc01 |
| User Name | svc-vrops-vsphere@rainpole.local |
| Password | <i>svc-vrops-vsphere-password</i> |

- c Leave **Enable Actions** set to **Enable** so that vCenter Adapter can run actions on objects in vCenter Server from vRealize Operations Manager.
 - d Click **Test Connection** to validate the connection to the vCenter Server instance.
The vCenter Server certificate appears.
 - e In the **Review and Accept Certificate** dialog box, verify the certificate information, and click **Accept**.
 - f Click **OK** in the **Info** dialog box.
 - g Expand the **Advanced Settings** section of settings.

- h From the **Collectors/Groups** drop-down menu, select the **sfo01-remote-collectors** group.
- i Specify a user account with administrator privileges to register vRealize Operations Manager with the vCenter Server instance.

| Setting | Value |
|-----------------------|-----------------------------|
| Registration user | administrator@vsphere.local |
| Registration password | vsphere_admin_password |

- 6 Click **Define Monitoring Goals**.
- 7 In the **Define Monitoring Goals** page, under **Enable vSphere Hardening Guide Alerts?**, select **Yes**, leave the default configuration for the other options, and click **Save**.
- 8 Click **OK** in the **Success** dialog box.
- 9 Click **Save Settings**.
- 10 In the **Info** dialog box, click **OK**.
- 11 In the **Manage Solution - VMware vSphere** dialog box, click **Close**.
- 12 On the **Solutions** page, select **VMware vSphere** from the solution table to view the collection state and collection status.

The collection state indicates whether the adapter should be collecting data. The collection status value indicates whether vRealize Operations Manager is receiving data about a certain object type. An adapter instance has a status value only if its collection state is **Collecting**.

The **Collection State** column for the vCenter Adapter displays **Collecting**, and the **Collection Status** column displays **Data receiving**.

Connect vRealize Operations Manager to the NSX Manager Instances for Consolidated SDDC

Install and configure the vRealize Operations Management Pack for NSX for vSphere to monitor the NSX networking services deployed in the clusters in the region and view the vSphere hosts in the NSX transport zones.

You can also access end-to-end logical network topologies between two virtual machines or NSX objects. You can isolate problems in the logical or physical network by using the physical host - network device relationship.

Procedure

- 1 [Install the vRealize Operations Manager Management Pack for NSX for vSphere for Consolidated SDDC](#)

Install the .pak file for the management pack for NSX for vSphere to add the management pack as a solution to vRealize Operations Manager.

2 [Configure User Privileges in NSX Manager for Integration with vRealize Operations Manager for Consolidated SDDC](#)

Assign the permissions to the service account `svc-vrops-nsx` that are required to access monitoring data from the NSX Manager in vRealize Operations Manager.

3 [Add NSX-vSphere Adapter Instances to vRealize Operations Manager for Consolidated SDDC](#)

4 [Add Network Devices Adapter to vRealize Operations Manager for Consolidated SDDC](#)

Configure a Network Devices Adapter to monitor the switches and routers in your environment, and view related alerts, metrics and object capacity.

Install the vRealize Operations Manager Management Pack for NSX for vSphere for Consolidated SDDC

Install the `.pak` file for the management pack for NSX for vSphere to add the management pack as a solution to vRealize Operations Manager.

Procedure

- 1 Log in to vRealize Operations Manager by using the operations interface.
 - a Open a Web browser and go to `https://vrops01svr01.rainpole.local`.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------------|
| User name | admin |
| Password | <code>vrops_admin_password</code> |

- 2 On the main navigation bar, click **Administration**.
- 3 In the left pane of vRealize Operations Manager, click **Solutions**.
- 4 On the **Solutions** page, click the **Add** icon.
- 5 On the **Select Solution** page from the **Add Solution** wizard, browse to the `.pak` file of the vRealize Operations Manager Management Pack for NSX for vSphere and click **Upload**.

After the NSX management pack file has been uploaded, you see details about the management pack.

- 6 After the upload is complete, click **Next**.
- 7 On the **End User License Agreement** page, accept the license agreement and click **Next**.
The installation of the management pack starts. You see its progress on the **Install** page.
- 8 After the installation is complete, click **Finish** on the **Install** page.

The Management Pack for NSX-vSphere solution appears on the **Solutions** page of the vRealize Operations Manager user interface.

Configure User Privileges in NSX Manager for Integration with vRealize Operations Manager for Consolidated SDDC

Assign the permissions to the service account `svc-vrops-nsx` that are required to access monitoring data from the NSX Manager in vRealize Operations Manager.

Procedure

- 1 Log in to the NSX Manager by using a Secure Shell (SSH) client.

- a Open an SSH connection to the NSX Manager virtual machine.

| NSX Manager | Host name |
|--|------------------------------------|
| NSX Manager for the consolidated cluster | sfo01w01nsx01.sfo01.rainpole.local |

- b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------------|
| User name | admin |
| Password | <i>nsx_manager_admin_password</i> |

- 2 Create the local service account `svc-vrops-nsx` on the NSX Manager instance.

- a Run the following command to switch to Privileged mode of NSX Manager.

```
enable
```

- b Enter the admin password when prompted and press Enter.

- c Switch to Configuration mode.

```
configure terminal
```

- d Create the service account `svc-vrops-nsx`.

```
user svc-vrops-nsx password plaintext svc-vrops-nsx_password
```

- e Assign the `svc-vrops-nsx` user access to NSX Manager from the vSphere Web Client.

```
user svc-vrops-nsx privilege web-interface
```

- f Commit these updates to the NSX Manager.

```
write memory
```

- g Exit Configuration mode.

```
exit
```

- 3 Assign the **security_admin** role to the svc-vrops-nsx service account.
 - a Log in to the Windows host that has access to your data center.
 - b Launch the Postman application and log in.
 - c Select **POST** from the drop-down menu that contains the HTTP request methods.
 - d In the URL text box next to the selected method, enter the following URL.

| NSX Manager | POST URL |
|--------------------------------------|--|
| NSX Manager for consolidated cluster | https://sfo01w01nsx01.sfo01.rainpole.local/api/2.0/services/usermgmt/role/svc-vrops-nsx?isCli=true |

- e On the **Authorization** tab, configure the following authorization settings and click **Update Request**.

| Setting | Value |
|-----------|---------------------------|
| Type | Basic Auth |
| User name | admin |
| Password | <i>nsx_admin_password</i> |

- f On the **Headers** tab, enter the following header details.

| Setting | Value |
|---------|--------------|
| Key | Content-Type |
| Value | text/xml |

- g In the **Body** tab, select **raw** and paste the following request body in the **Body** text box and click **Send**.

```
<accessControlEntry>
  <role>security_admin</role>
  <resource>
    <resourceId>globalroot-0</resourceId>
  </resource>
</accessControlEntry>
```

The Status changes to 204 No Content.

Add NSX-vSphere Adapter Instances to vRealize Operations Manager for Consolidated SDDC

After you install the management pack, configure NSX-vSphere Adapter for the NSX Manager in the consolidated cluster.

Procedure

- 1 Log in to vRealize Operations Manager by using the operations interface.
 - a Open a Web browser and go to **https://vrops01svr01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | admin |
| Password | <i>vrops_admin_password</i> |

- 2 On the main navigation bar, click **Administration**.
- 3 In the left pane of vRealize Operations Manager, click **Solutions**.
- 4 On the **Solutions** page, select **Management Pack for NSX-vSphere** from the solution table, and click **Configure**.
- 5 In the **Manage Solution - Management Pack for NSX-vSphere** dialog box, from the **Adapter Type** table at the top, select **NSX-vSphere Adapter**.
- 6 Under **Instance Settings**, enter the settings for connection to the NSX Manager instance.
 - a Enter the display name, the FQDN of the NSX Manager, and the FQDN of the vCenter Server instance that is connected to the NSX Manager.

| Setting | Value for the NSX Manager in the Consolidated Cluster |
|--|---|
| Display Name | NSX Adapter - sfo01w01nsx01 |
| Description | Consolidated NSX Manager |
| NSX Manager Host | sfo01w01nsx01.sfo01.rainpole.local |
| VC Host | sfo01w01vc01.sfo01.rainpole.local |
| Enable Log Insight integration if configured | false |

- b Click the **Add** icon next to the **Credential** text box, configure the credentials for the connection to NSX Manager and vCenter Server, and click **OK**.

| vCenter Server Credentials Attribute | Value |
|--------------------------------------|---|
| Credential name | ■ NSX Adapter Credentials - sfo01w01nsx01 |
| NSX Manager User Name | svc-vrops-nsx |
| NSX Manager Password | <i>svc-vrops-nsx_password</i> |
| vCenter User Name | svc-vrops-nsx@rainpole.local |
| vCenter Password | <i>svc-vrops-nsx_password</i> |

- c Click **Test Connection** to validate the connection to the NSX Manager instance.
The NSX Manager certificate appears.
 - d In the **Review and Accept Certificate** dialog box, verify the certificate information and click **Accept**.

- e Click **OK** in the **Info** dialog.
- f Expand the **Advanced Settings** section of settings.
- g From the **Collectors/Groups** drop-down menu, select the **sfo01-remote-collectors** remote collector group.
- h Click **Save Settings**.
- i Click **OK** in the **Info** dialog box that appears.

7 In the **Manage Solution - Management Pack for NSX-vSphere** dialog box, click **Close**.

The NSX-vSphere adapter appears on the **Solutions** page of the vRealize Operations Manager user interface. The **Collection State** of the adapter is **Collecting** and the **Collection Status** is **Data receiving**.

Add Network Devices Adapter to vRealize Operations Manager for Consolidated SDDC

Configure a Network Devices Adapter to monitor the switches and routers in your environment, and view related alerts, metrics and object capacity.

The Network Devices Adapter collects data across all network devices that you want to monitor using vRealize Operations Manager.

Procedure

- 1 Log in to vRealize Operations Manager by using the operations interface.
 - a Open a Web browser and go to **https://vrops01svr01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | admin |
| Password | <i>vrops_admin_password</i> |

- 2 On the main navigation bar, click **Administration**.
- 3 In the left pane of vRealize Operations Manager, click **Solutions**.
- 4 On the **Solutions** page, select the **Management Pack for NSX-vSphere** from the solution table, and click **Configure**.
- 5 In **Manage Solution - Management Pack for NSX-vSphere** dialog box, from the **Adapter Type** table at the top, select **Network Devices Adapter**.

- 6 Under **Instance Settings**, enter the settings for SNMP connection to the network devices for the management cluster.
- a Enter the display name, SNMP version and credentials.

| Setting | Value |
|--------------------------------|--------------------------------|
| Display Name | Network Devices Adapter |
| Description | Global Network Devices Adapter |
| SNMP Ports | 161 |
| SNMP Version | SNMPv2 |
| SNMPv3 Privacy Protocol | AES |
| SNMPv3 Authentication Protocol | MD5 |

- b Click the **Add** icon, and configure the credentials for connecting the Network Devices Adapter to the network devices, and click **OK**.

| Credential | Value |
|-----------------------------|-----------------------------|
| Credential Kind | SNMPv1, SNMPv2 Credential |
| Credential Name | Network Devices Credentials |
| SNMP Read Community Strings | public |

For SNMPv1 and SNMPv2 devices, enter a comma-separated list of community names (default is public).

- c Click **Test Connection** to verify the settings, and if the test is successful click the **OK** button.
- d Expand the **Advanced Settings** section of settings, and verify that the **Collectors/Groups** option is set to **Default collector group**.
- e Click **Save Settings**.
- f Click **OK** in the **Info** dialog box that appears.
- 7 In the **Manage Solution - Management Pack for NSX-vSphere** dialog box, click **Close**.

The Network Devices Adapter appears on the **Solutions** page of the vRealize Operations Manager user interface. The adapter is collecting data about the network devices in all regions of the SDDC. The **Collection State** of the adapter is **Collecting** and the **Collection Status** is **Data receiving**.

Enable Storage Device Monitoring in vRealize Operations Manager for Consolidated SDDC

Install and configure the vRealize Operations Management Pack for Storage Devices to view the storage topology in the SDDC and to monitor the capacity and problems on storage components.

Procedure

1 [Install the vRealize Operations Manager Management Pack for Storage Devices for Consolidated SDDC](#)

Install the .pak file of the management pack for storage devices to add the management pack as a solution to vRealize Operations Manager.

2 [Disable the vSAN Dashboards of the Management Pack for Storage Devices for Consolidated SDDC](#)

Use the vRealize Operations Management Pack for Storage Devices to monitor fabric-based storage such as the NFS datastores in this validated design. To monitor the vSAN datastores for the management applications, disable the vSAN dashboards of management pack for Storage Devices and use the dashboards of the vRealize Operations Management Pack for vSAN. The management pack for vSAN comes pre-installed with vRealize Operations Manager.

3 [Add Storage Devices Adapters in vRealize Operations Manager for Consolidated SDDC](#)

Install the vRealize Operations Manager Management Pack for Storage Devices for Consolidated SDDC

Install the .pak file of the management pack for storage devices to add the management pack as a solution to vRealize Operations Manager.

Procedure

- 1 Log in to vRealize Operations Manager by using the operations interface.
 - a Open a Web browser and go to **https://vrops01svr01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | admin |
| Password | <i>vrops_admin_password</i> |

- 2 On the main navigation bar, click **Administration**.
- 3 In the left pane of vRealize Operations Manager, click **Solutions**.
- 4 On the **Solutions** page, click the **Add** icon.
- 5 On the **Select Solution** page from the **Add Solution** wizard, browse to the .pak file of the vRealize Operations Manager Management Pack for Storage Devices and click **Upload**.
- 6 After the upload is complete, click **Next**.
- 7 On the **End User License Agreement** page, accept the license agreement and click **Next**.
The installation of the management pack starts. You see its progress on the **Install** page.
- 8 After the installation is complete, click **Finish** on the **Install** page.

The **Management Pack for Storage Devices** solution appears on the **Solutions** page of the vRealize Operations Manager user interface.

Disable the vSAN Dashboards of the Management Pack for Storage Devices for Consolidated SDDC

Use the vRealize Operations Management Pack for Storage Devices to monitor fabric-based storage such as the NFS datastores in this validated design. To monitor the vSAN datastores for the management applications, disable the vSAN dashboards of management pack for Storage Devices and use the dashboards of the vRealize Operations Management Pack for vSAN. The management pack for vSAN comes pre-installed with vRealize Operations Manager.

Procedure

- 1 Log in to vRealize Operations Manager by using Secure Shell (SSH) client.
 - a Open an SSH connection to `vrops01svr01a.rainpole.local`.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------------|
| User name | root |
| Password | <i>vrops_root_password</i> |

- 2 Disable the vSAN dashboards provided by the vRealize Operations Manager Management Pack for Storage Devices by running the following commands.

```
cd /usr/lib/vmware-vcops/tools/opscli
$VMWARE_PYTHON_BIN ./ops-cli.py dashboard hide all 'VirtualSAN Heatmap'
$VMWARE_PYTHON_BIN ./ops-cli.py dashboard hide all 'VirtualSAN Entity Usage'
$VMWARE_PYTHON_BIN ./ops-cli.py dashboard hide all 'VirtualSAN Cluster Insights'
$VMWARE_PYTHON_BIN ./ops-cli.py dashboard hide all 'VirtualSAN Device Insights'
$VMWARE_PYTHON_BIN ./ops-cli.py dashboard hide all 'VirtualSAN Troubleshooting'
```

- 3 Log in to vRealize Operations Manager by using the operations interface.
 - a Open a Web browser and go to <https://vrops01svr01.rainpole.local>.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | admin |
| Password | <i>vrops_admin_password</i> |

- 4 On the main navigation bar, click **Dashboards** and verify that the following dashboards are no longer visible.
 - VirtualSAN Heatmap
 - VirtualSAN Entity Usage

- VirtualSAN Cluster Insights
- VirtualSAN Device Insights
- VirtualSAN Troubleshooting

Add Storage Devices Adapters in vRealize Operations Manager for Consolidated SDDC

After you install the management pack, configure a Storage Devices adapter to collect monitoring data about the storage devices in the SDDC. Each adapter communicates with a vCenter Server instance to retrieve data about the storage devices from the vCenter Server inventory.

Procedure

- 1 Log in to vRealize Operations Manager by using the operations interface.
 - a Open a Web browser and go to **https://vrops01svr01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------|
| User name | admin |
| Password | vrops_admin_password |

- 2 On the main navigation bar, click **Administration**.
- 3 In the left pane of vRealize Operations Manager, click **Solutions**.
- 4 On the **Solutions** page, select **Management Pack for Storage Devices** from the solution table and click **Configure**.

The **Manage Solution - Management Pack for Storage Devices** dialog box appears.

- 5 Under **Instance Settings**, enter the settings for connection to the vCenter Server instance.
 - a Enter the display name, description, and name of the vCenter Server instance.

| Setting | Value for the Consolidated vCenter |
|------------------------|--|
| Display Name | Storage Devices Adapter - sfo01w01vc01 |
| Description | Storage Devices in Consolidated vCenter Server for sfo01 |
| vCenter Server | sfo01w01vc01.sfo01.rainpole.local |
| SNMP Community Strings | - |

- b Click the **Add** icon on the right side, configure the collection credentials for connection to the vCenter Server instance, and click **OK**.

| vCenter Server Credentials Attribute | Value |
|--------------------------------------|--|
| Credential name | ■ Storage Devices Adapter Credentials - sfo01w01vc01 |
| User Name | svc-vrops-mpsd@rainpole.local |
| Password | svc-vrops-mpsd-password |

- c Click **Test Connection** to validate the connection to the vCenter Server.
The vCenter Server certificate appears.
- d In the **Review and Accept Certificate** dialog box, verify the vCenter Server certificate information and click **Accept**.
- e Click **OK** in the **Info** dialog box.
- f Expand the **Advanced Settings** section of settings.
- g From the **Collectors/Groups** drop-down menu, select the **sfo01-remote-collectors** remote collector group.
- h Click **Save Settings**.
- i Click **OK** in the **Info** dialog box that appears.

- 6 In the **Manage Solution - Management Pack for Storage Devices** dialog box, click **Close**.

The Storage Devices adapter appears on the **Solutions** page of the vRealize Operations Manager user interface. The **Collection State** of the adapter is **Collecting** and the **Collection Status** is **Data receiving**.

Enable vSAN Monitoring in vRealize Operations Manager for Consolidated SDDC

Configure the vRealize Operations Management Pack for vSAN to view the vSAN topology, and to monitor the capacity and problems.

The vRealize Operations Management Pack for vSAN is installed by default in the vRealize Operations Manager version that is used in this version of VMware Validated Design.

Procedure

1 [Turn On vSAN Performance Service for Consolidated SDDC](#)

When you create a vSAN cluster, the performance service is disabled. Turn on the vSAN performance service to monitor the performance of vSAN clusters, hosts, disks, and VMs.

2 [Add a vSAN Adapter in vRealize Operations Manager for Consolidated SDDC](#)

Configure the vSAN adapter to collect monitoring data about vSAN usage in the SDDC.

Turn On vSAN Performance Service for Consolidated SDDC

When you create a vSAN cluster, the performance service is disabled. Turn on the vSAN performance service to monitor the performance of vSAN clusters, hosts, disks, and VMs.

When you turn on the performance service, vSAN places a Stats database object in the datastore to collect statistical data. The Stats database is a namespace object in the vSAN datastore of the cluster.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 In the **Navigator**, expand the **sfo01-w01dc** data center object.
- 3 Click the **sfo01-w01-consolidated01** cluster object and click the **Configure** tab.
- 4 Under **vSAN**, select **Health and Performance**.
- 5 Next to the **Performance Service** settings, click **Edit**, configure the following settings, and click **OK**.

| Setting | Value |
|----------------------------------|-----------------------------|
| Turn ON vSAN performance service | Selected |
| Storage policy | vSAN Default Storage Policy |

Add a vSAN Adapter in vRealize Operations Manager for Consolidated SDDC

Configure the vSAN adapter to collect monitoring data about vSAN usage in the SDDC.

Procedure

- 1 Log in to vRealize Operations Manager by using the operations interface.
 - a Open a Web browser and go to **https://vroops01svr01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------|
| User name | admin |
| Password | vroops_admin_password |

- 2 On the main navigation bar, click **Administration**.
- 3 In the left pane of vRealize Operations Manager, click **Solutions**.
- 4 On the **Solutions** page, select **VMware vSAN** from the solution table, and click **Configure**.
The **Manage Solution - VMware vSAN** dialog box appears.

5 Under **Instance Settings**, enter the settings for the connection to the vCenter Server instance.

- a Enter the settings for connection to the vCenter Server.

| Setting | Value for the Consolidated vCenter Server |
|----------------|--|
| Display Name | vSAN Adapter - sfo01w01vc01 |
| Description | Consolidated vCenter Server vSAN Adapter for sfo01 |
| vCenter Server | sfo01w01vc01.sfo01.rainpole.local |

- b Click the **Add** icon next to the **Credential** text box, and configure the credentials for connection to vCenter Server, and click **OK**.

| Setting | Value for the Consolidated vCenter |
|-------------------|---|
| Credential name | vSAN Adapter Credentials - sfo01w01vc01 |
| vCenter User Name | svc-vrops-vsan@rainpole.local |
| vCenter Password | svc-vrops-vsan-password |

- c Click **Test Connection** to validate the connection to vCenter Server.

The vCenter Server certificate appears.

- d In the **Review and Accept Certificate** dialog box, verify the vCenter Server certificate information, and click **Accept**.

- e Click **OK** in the **Info** dialog box.

- f Expand the **Advanced Settings** section of settings.

- g From the **Collectors/Groups** drop-down menu, select the **sfo01-remote-collectors** collector group.

- h Make sure **Auto Discovery** is set to **true**.

- i Click **Save Settings**.

- j Click **OK** in the **Info** dialog box that appears.

6 In the **Manage Solution - VMware vSAN** dialog box, click **Close**.

The vSAN Adapter appears on the **Solutions** page of the vRealize Operations Manager user interface. The **Collection State** of the adapter is **Collecting** and the **Collection Status** is **Data receiving**.

Configure Email Alerts for vRealize Operations Manager for Consolidated SDDC

You configure email notifications in vRealize Operations Manager so that users and applications receive the administrative alerts from vRealize Operations Manager about certain situations in the data center.

Procedure

- 1 Log in to vRealize Operations Manager by using the operations interface.
 - a Open a Web browser and go to **https://vrops01svr01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------|
| User name | admin |
| Password | vrops_admin_password |

- 2 On the main navigation bar, click **Administration**.
- 3 In the left pane of vRealize Operations Manager, click **Management** and click **Outbound Settings**.
- 4 On the **Outbound Settings** page, click the **Add** icon to create an outbound alert instance.
- 5 In the **Add/Edit Outbound Instance** dialog box, configure the settings for the Standard Email Plug-in, and click **OK**.

| Alert Instance Setting | Value |
|------------------------|--|
| Plugin Type | Standard Email Plugin |
| Instance Name | SMTP Alert Mail Relay |
| Use Secure Connection | Selected |
| SMTP Host | <i>FQDN of the SMTP server</i> |
| SMTP Port | <i>Server port for SMTP requests</i> |
| Secure Connection Type | TLS |
| Sender Email Address | <i>Address that appears as the sender of the email</i> |
| Sender Name | <i>Name that appears as the sender of the email</i> |

- 6 Click **Test** to verify the connection with the SMTP server and click **OK**.
- 7 Click **Save**.

vRealize Log Insight Implementation for Consolidated SDDC

Deploy vRealize Log Insight in a single-node configuration consisting of a single master node with an integrated load balancer.

Procedure

1 [Deploy vRealize Log Insight for Consolidated SDDC](#)

Start the deployment of vRealize Log Insight for Consolidated SDDC by deploying the master node and enabling the integrated load balancer.

2 [Replace the Certificate of vRealize Log Insight for Consolidated SDDC](#)

Update the certificate chain of vRealize Log Insight to use a trusted non-default certificate after deployment or to replace a certificate that is soon to expire. In this way, connection to the vRealize Log Insight user interface remains trusted.

3 [Connect vRealize Log Insight to the vSphere Environment for Consolidated SDDC](#)

Start collecting log information about the ESXi and vCenter Server instances in the SDDC.

4 [Connect vRealize Log Insight to vRealize Operations Manager for Consolidated SDDC](#)

Connect vRealize Log Insight to vRealize Operations Manager so that you can use the Launch in Context functionality between the two applications to troubleshoot management nodes and vRealize Operations Manager by using dashboards and alerts in the vRealize Log Insight user interface.

5 [Connect vRealize Log Insight to the NSX Instances for Consolidated SDDC](#)

Install and configure the vRealize Log Insight Content Pack for NSX for vSphere for log visualization and alerting of the NSX for vSphere real-time operation. You can use the NSX-vSphere dashboards to monitor logs about installation and configuration, and about virtual networking services.

6 [Collect Operating System Logs from the Management Virtual Appliances in vRealize Log Insight for Consolidated SDDC](#)

Install and configure the vRealize Log Insight Content Pack for Linux to visualize and analyze operating system logs from the management virtual appliances.

7 [Configure Log Retention and Archiving for Consolidated SDDC](#)

Set log retention to one week and archive logs for 90 days according to the *VMware Validated Design Architecture and Design* documentation.

Deploy vRealize Log Insight for Consolidated SDDC

Start the deployment of vRealize Log Insight for Consolidated SDDC by deploying the master node and enabling the integrated load balancer.

Procedure

1 [Prerequisites for Deploying vRealize Log Insight for Consolidated SDDC](#)

2 [Deploy the Virtual Appliances for vRealize Log Insight for Consolidated SDDC](#)

Use the vSphere Web Client to deploy all necessary vRealize Log Insight virtual appliances.

3 [Start the vRealize Log Insight Master Node for Consolidated SDDC](#)

4 [Enable the Integrated Load Balancer of vRealize Log Insight for Consolidated SDDC](#)

5 [Enable Active Directory Support for vRealize Log Insight for Consolidated SDDC](#)

To use service accounts in vRealize Log Insight that are maintained centrally and are inline with the other solutions in the SDDC, enable Active Directory support.

Prerequisites for Deploying vRealize Log Insight for Consolidated SDDC

Before you deploy vRealize Log Insight, verify that your environment satisfies the requirements for this deployment.

IP Addresses and Host Names

Verify that static IP addresses and FQDNs for vRealize Log Insight are available in the region-specific application virtual network.

For the application virtual network, allocate one static IP address for the vRealize Log Insight node and one IP address for the integrated load balancer. Map host names to the IP addresses in DNS.

Table 3-4. IP Addresses and Host Names for vRealize Log Insight in Consolidated SDDC

| Role | IP Address | FQDN |
|--------------------------------------|--|-----------------------------------|
| Integrated load balancer VIP address | 192.168.31.10 | sfo01vrli01.sfo01.rainpole.local |
| Master node | 192.168.31.11 | sfo01vrli01a.sfo01.rainpole.local |
| Default gateway | 192.168.31.1 | - |
| DNS server | <ul style="list-style-type: none"> ■ 172.16.11.5 ■ 172.16.11.4 | - |
| Subnet mask | 255.255.255.0 | - |
| NTP servers | <ul style="list-style-type: none"> ■ 172.16.11.251 ■ 172.16.11.252 | ntp.sfo01.rainpole.local |

Deployment Prerequisites

Verify that your environment satisfies the following prerequisites for deploying vRealize Log Insight.

| Prerequisite | Value |
|-------------------|--|
| Storage | <ul style="list-style-type: none"> ■ Virtual disk provisioning. <ul style="list-style-type: none"> ■ Thin ■ Required storage per node <ul style="list-style-type: none"> ■ Initial storage for node deployment: 510 GB |
| Software Features | <ul style="list-style-type: none"> ■ Verify that the vCenter Server instances are operational. ■ Verify that the vSphere cluster has DRS and HA enabled. ■ Verify that the NSX Manager instances are operational. ■ Verify that vRealize Operations Manager is operational. ■ Verify that the application virtual network is available. ■ Verify that the Postman application is installed. ■ Verify the following NFS datastore requirements: <ul style="list-style-type: none"> ■ Create an NFS share of 250 GB and export it as /V2D_vRLI_Consolidated_250GB. ■ Verify that the NFS server supports NFS v3. ■ Verify that the NFS partition allows read and write operations for guest accounts. ■ Verify that the mount does not require authentication. ■ Verify that the NFS share is directly accessible to vRealize Log Insight ■ If using a Windows NFS server, allow unmapped user Unix access (by UID/GID). |

| Prerequisite | Value |
|-----------------------|---|
| Installation Package | Download the .ova file of the vRealize Log Insight virtual appliance on the machine where you use the vSphere Web Client. |
| License | Obtain a license that covers the use of vRealize Log Insight. |
| Active Directory | Verify that you have a parent and child Active Directory domain controllers configured with the role-specific SDDC users and groups for the <code>rainpole.local</code> domain. |
| Certificate Authority | Configure the Active Directory domain controller as a certificate authority for the environment. |
| E-mail account | Provide an email account to send vRealize Log Insight notifications. |

Deploy the Virtual Appliances for vRealize Log Insight for Consolidated SDDC

Use the vSphere Web Client to deploy all necessary vRealize Log Insight virtual appliances.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to `https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client`.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|--|
| User name | <code>administrator@vsphere.local</code> |
| Password | <code>vsphere_admin_password</code> |

- 2 Navigate to the `sfo01w01vc01.sfo01.rainpole.local` vCenter Server object.
- 3 Right-click `sfo01w01vc01.sfo01.rainpole.local` and select **Deploy OVF Template**.
- 4 On the **Select source** page, select **Local file**, click **Browse**, browse to the location of the vRealize Log Insight .ova file on your local file system, and click **Next**.
- 5 On the **Select name and folder** page, make the following selections, and click **Next**.
 - a Enter a name for the node according to its role.

| Name | Value |
|---------------------------|-------------|
| <code>sfo01vrli01a</code> | Master node |

- b Select the inventory folder for the virtual appliance.

| Setting | Value |
|----------------|--|
| vCenter Server | <code>sfo01w01vc01.sfo01.rainpole.local</code> |
| Data center | <code>sfo01-w01dc</code> |
| Folder | <code>sfo01-w01fd-vrli</code> |

- 6 On the **Select a resource** page, select the **sfo01-w01-consolidated01** cluster as the resource to run the virtual appliance on, and click **Next**.

| Setting | Value |
|-------------|--------------------------|
| Data center | sfo01-w01dc |
| Cluster | sfo01-w01-consolidated01 |

- 7 On the **Review details** page, examine the virtual appliance details, such as product, version, download size, and disk size, and click **Next**.
- 8 On the **Accept License Agreements** page, click **Accept** to accept the end user license agreements, and click **Next**.
- 9 On the **Select configuration** page, from the **Configuration** drop-down menu, select the **Medium** deployment configuration, and click **Next**.
- 10 On the **Select storage** page, select the following datastore, configure its settings, and click **Next**.

| Setting | Value |
|----------------------------|-----------------------------|
| Select virtual disk format | Thin provision |
| VM Storage Policy | vSAN Default Storage Policy |
| Datastore | sfo01-w01-vsan01 |

- 11 On the **Setup networks** page, select the distributed port group on the sfo01-w01-vds01 distributed switch that ends with **Mgmt-RegionA01-VXLAN**, and click **Next**.

12 On the **Customize template** page, set networking settings and the root user credentials for the virtual appliance.

a In the **Networking Properties** section, configure the following networking settings:

| Setting | Value |
|----------------------|-------------------------------------|
| DNS | 172.16.11.5,172.16.11.4 |
| DNS domain | sfo01.rainpole.local |
| DNS searchpath | sfo01.rainpole.local,rainpole.local |
| Default gateway | 192.168.31.1 |
| Host name | ■ sfo01vrli01a.sfo01.rainpole.local |
| Network 1 IP Address | ■ 192.168.31.11 |
| Network 1 Netmask | 255.255.255.0 |

b In the **Other Properties** section, enter and confirm a password for the root user.

The password must contain at least 8 characters, and must include:

- One uppercase character
- One lowercase character
- One digit
- One special character

Use this password when you log in to the console of the vRealize Log Insight virtual appliance.

c Click **Next**.

13 On the **Ready to complete** page, click **Finish**.

The deployment of the virtual appliance starts.

14 Right-click the virtual appliance object and select **Power > Power On**.

Start the vRealize Log Insight Master Node for Consolidated SDDC

Configure and start the vRealize Log Insight master node.

Procedure

1 Open a Web browser and go to **`https://sfo01vrli01a.sfo01.rainpole.local`**.

The initial configuration wizard opens.

2 On the **Setup** page, click **Next**.

3 On the **Choose Deployment Type** page, click **Start New Deployment**.

4 After the deployment is launched, on the **Admin Credentials** page, set the email address and the password of the admin user, and click **Save and Continue**.

The password must be at least 8 characters long, and must contain one uppercase character, one lowercase character, one number, and one special character.

- 5 On the **License** page, enter the license key, click **Add License**, and click **Save and Continue**.
- 6 On the **General Configuration** page, enter the following settings and click **Save and Continue**.

| Setting | Value |
|--|--|
| Email System Notifications to | <i>email_address_to_receive_system_notifications</i> |
| Send HTTP Post System Notifications To | https://sfo01vrli01.sfo01.rainpole.local |

- 7 On the **Time Configuration** page, enter the following settings, click **Test**, and click **Save and Continue**.

| Setting | Value |
|-----------------------|--------------------------|
| Sync Server Time With | NTP Server (recommended) |
| NTP Servers | ntp.sfo01.rainpole.local |

- 8 On the **SMTP Configuration** page, specify the properties of an SMTP server to enable outgoing alerts and system notification emails, and to test the email notification.
 - a Set the connection settings for the SMTP server that sends the email messages from vRealize Log Insight.

| SMTP Option | Description |
|---------------------|---|
| SMTP Server | <i>FQDN of the SMTP server</i> |
| Port | <i>Server port for SMTP requests</i> |
| SSL (SMTPS) | <i>Enable or disable encryption for the SMTP transport</i> |
| STARTTLS Encryption | <i>Enable or disable the STARTTLS encryption</i> |
| Sender | <i>Address that appears as the sender of the email</i> |
| Username | <i>User name on the SMTP server</i> |
| Password | <i>Password for the SMTP server you specified in Username</i> |

Contact your system administrator for details about the email server.

- b To verify that the SMTP configuration is correct, type a valid email address and click **Send Test Email**.
vRealize Log Insight sends a test email to the address that you provided.
- 9 On the **Setup Complete** page, click **Finish**.
vRealize Log Insight starts operating in standalone mode.

Enable the Integrated Load Balancer of vRealize Log Insight for Consolidated SDDC

Enable the Integrated Load Balancer (ILB) of vRealize Log Insight to allow high availability when an expansion is required.

Procedure

- 1 Log in to the vRealize Log Insight user interface.
 - a Open a Web browser and go to **https://sfo01vrli01a.sfo01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------------|
| User name | admin |
| Password | <i>vrli_admin_password</i> |

- 2 Click the configuration drop-down menu icon  and select **Administration**.
- 3 Under **Management**, click **Cluster**.
- 4 Under **Integrated Load Balancer**, click **New Virtual IP Address**.
- 5 In the **New Virtual IP** dialog box, enter the following settings and click **Save**.

| Setting | Value |
|---------|----------------------------------|
| IP | 192.168.31.10 |
| FQDN | sfo01vrli01.sfo01.rainpole.local |

Enable Active Directory Support for vRealize Log Insight for Consolidated SDDC

To use service accounts in vRealize Log Insight that are maintained centrally and are inline with the other solutions in the SDDC, enable Active Directory support.

Procedure

- 1 Log in to the vRealize Log Insight user interface.
 - a Open a Web browser and go to **https://sfo01vrli01.sfo01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------------|
| User name | admin |
| Password | <i>vrli_admin_password</i> |

- 2 From the Administration page, under **Configuration**, click **Authentication**.
- 3 On the **Authentication Configuration** page, select the **Active Directory** tab.

- 4 Slide the toggle button to enable the support for Active Directory and configure the Active Directory settings.
 - a Configure the Active Directory connection settings according to the details from your IT administrator.

| Setting | Value |
|---------------------------------|---|
| Enable Active Directory support | Selected |
| Default Domain | rainpole.local |
| Domain Controller(s) | dc01rpl.rainpole.local |
| User Name | svc-vrli |
| Password | <i>svc_vrli_password</i> |
| Connection Type | Standard |
| Require SSL | Yes or No according to the instructions from the IT administrator |

- b Click **Test Connection** to verify the connection, and click **Save**.

Replace the Certificate of vRealize Log Insight for Consolidated SDDC

Update the certificate chain of vRealize Log Insight to use a trusted non-default certificate after deployment or to replace a certificate that is soon to expire. In this way, connection to the vRealize Log Insight user interface remains trusted.

Procedure

- 1 Log in to the vRealize Log Insight user interface.
 - a Open a Web browser and go to **https://sfo01vrli01.sfo01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------------|
| User name | admin |
| Password | <i>vrli_admin_password</i> |

- 2 In the vRealize Log Insight user interface, click the configuration drop-down menu icon  and select **Administration**.
- 3 Under **Configuration**, click **SSL**.
- 4 On the **SSL Configuration** page, next to **New Certificate File (PEM format)** click **Choose File**, browse to the location of the PEM file on your computer, and click **Save**.

| Certificate Generation Option | Certificate File |
|-------------------------------|----------------------------|
| Using the CertGenVVD tool | vrli-for-1-pod.2.chain.pem |

The certificate is uploaded to vRealize Log Insight.

- 5 Open a Web browser and go to **https://sfo01vrli01.sfo01.rainpole.local**

A warning message that the connection is not trusted appears.

- 6 To review the certificate, click the padlock  in the address bar of the browser, and verify that **Subject Alternative Name** contains the names of the vRealize Log Insight cluster nodes.

- 7 Import the certificate in your Web browser.

For example, in Google Chrome under the HTTPS/TLS settings click **Manage certificates**, and in the **Certificates** dialog box import `vrli-chain.pem`.

You can also use Certificate Manager on Windows or Keychain Access on MAC OS X.

Connect vRealize Log Insight to the vSphere Environment for Consolidated SDDC

Start collecting log information about the ESXi and vCenter Server instances in the SDDC.

Procedure

- 1 [Configure User Privileges in vSphere for Integration with vRealize Log Insight for Consolidated SDDC](#)

Assign global permissions to the service account `svc-vrli-vsphere` to collect log information from the vCenter Server instances and ESXi hosts with vRealize Log Insight. The `svc-vrli-vsphere` user account is dedicated to collecting log information from vCenter Server and ESXi.

- 2 [Connect vRealize Log Insight to vSphere for Consolidated SDDC](#)

After you configure the `svc-vrli-vsphere` Active Directory user with the vSphere privileges that are required for retrieving log information from the vCenter Server instances and ESXi hosts, connect vRealize Log Insight to vSphere in the vRealize Log Insight user interface.

- 3 [Configure vCenter Server to Forward Log Events to vRealize Log Insight for Consolidated SDDC](#)

Configure vCenter Server and Platform Services Controller appliances to forward system logs and events to the vRealize Log Insight. You can then view and analyze all syslog information in the vRealize Log Insight Web interface.

- 4 [Update the Host Profiles with Syslog Settings for Consolidated SDDC](#)

To have a consistent logging configuration across all ESXi hosts, update the host profile in each cluster to accommodate the syslog settings for connection to vRealize Log Insight.

Configure User Privileges in vSphere for Integration with vRealize Log Insight for Consolidated SDDC

Assign global permissions to the service account `svc-vrli-vsphere` to collect log information from the vCenter Server instances and ESXi hosts with vRealize Log Insight. The `svc-vrli-vsphere` user account is dedicated to collecting log information from vCenter Server and ESXi.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 From the **Home** menu, select **Administration**.

- 3 Under **Access Control**, click **Roles**.

- 4 Create a role for vRealize Log Insight.
 - a From **Roles provider** drop-down menu, select sfo01w01vc01.sfo01.rainpole.local
 - b Select **Read-only** and click the **Clone role action** icon.

You clone the Read-only role because it includes the **System.Anonymous**, **System.View**, and **System.Read** privileges. vRealize Log Insight requires those privileges for accessing log information related to the vCenter Server instances.

- c In the **Clone Role Read-only** dialog box, complete the configuration of the role and click **OK**.

| Setting | Description |
|-----------|--|
| Role name | Log Insight User |
| Privilege | <ul style="list-style-type: none"> ▪ Host.Configuration.Advanced settings ▪ Host.Configuration.Change settings ▪ Host.Configuration.Network configuration ▪ Host.Configuration.Security profile and firewall |

These host privileges allow vRealize Log Insight to configure the syslog service on the ESXi hosts.

The Log Insight User role is propagated to other linked vCenter Server instances.

- 5 Assign global permissions to the svc-vrli-vmware@rainpole.local service account.
 - a In the vSphere Web Client, select **Administration** from the **Home** menu and click **Global Permissions** under **Access Control**.
 - b On the **Manage** tab, click **Add Permission**.
 - c In the **Global Permissions Root - Add Permission** dialog box, click **Add** to associate a user or a group with a role.
 - d In the **Select Users/Groups** dialog box, from the **Domain** drop-down menu, select **rainpole.local**, in the filter box type **svc**, and press Enter.

- e From the list of users and groups, select the **svc-vrli-vsphere** user, click **Add**, and click **OK**.
- f In the **Add Permission** dialog box, from the **Assigned Role** drop-down menu, select **Log Insight User**, select **Propagate to children**, and click **OK**.

The global permissions of the svc-vrli-vsphere@rainpole.local user propagate to all vCenter Server instances.

Connect vRealize Log Insight to vSphere for Consolidated SDDC

After you configure the svc-vrli-vsphere Active Directory user with the vSphere privileges that are required for retrieving log information from the vCenter Server instances and ESXi hosts, connect vRealize Log Insight to vSphere in the vRealize Log Insight user interface.

Procedure

- 1 Log in to the vRealize Log Insight user interface.
 - a Open a Web browser and go to **https://sfo01vrli01.sfo01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|---------------------|
| User name | admin |
| Password | vrli_admin_password |

- 2 Click the configuration drop-down menu icon  and select **Administration**.
- 3 Under **Integration**, click **vSphere**.
- 4 In the **vCenter Servers** pane, enter the connection settings for the vCenter Server instances in the region.
 - a Enter the host name, user credentials, and collection options for the vCenter Server instances, and click **Test Connection**.

| vCenter Server Option | Value |
|--|-----------------------------------|
| Hostname | sfo01w01vc01.sfo01.rainpole.local |
| Username | svc-vrli-vsphere@rainpole.local |
| Password | svc-vrli-vsphere_user_password |
| Collect vCenter Server events, tasks and alarms | Selected |
| Configure ESXi hosts to send logs to Log Insight | Selected |

- b Click **Advanced Options** and examine the list of ESXi hosts that are connected to the vCenter Server instance to verify that you connect to the correct vCenter Server.
 - c In the **Advanced Options** configuration window, select **Configure all ESXi hosts**, select **UDP** under **Syslog protocol**, and click **OK**.
- 5 Click **Save**.

A progress dialog box appears.

- 6 Click **OK** in the confirmation dialog box that appears after vRealize Log Insight contacts the vCenter Server instances.

You see the vSphere dashboards under the **VMware - vSphere** content pack dashboard category.

Configure vCenter Server to Forward Log Events to vRealize Log Insight for Consolidated SDDC

Configure vCenter Server and Platform Services Controller appliances to forward system logs and events to the vRealize Log Insight. You can then view and analyze all syslog information in the vRealize Log Insight Web interface.

You configure the following vCenter Server and Platform Services Controller instances:

| Appliance Type | Appliance Management Interface URL |
|--|---|
| vCenter Server instances | https://sfo01w01vc01.sfo01.rainpole.local:5480 |
| Platform Services Controller instances | https://sfo01w01psc01.sfo01.rainpole.local:5480 |

Procedure

- 1 Redirect the log events from the vCenter Server Appliance to vRealize Log Insight.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local:5480**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|------------------|
| User name | root |
| Password | vc_root_password |

- c In the **Navigator**, click **Syslog Configuration**.
- d On the **Syslog Configuration** page, click **Edit**, configure the following settings, and click **OK**.

| Setting | Value |
|------------------------|----------------------------------|
| Common Log Level | * |
| Remote Syslog Host | sfo01vrli01.sfo01.rainpole.local |
| Remote Syslog Port | 514 |
| Remote Syslog Protocol | UDP |

- e Repeat the steps for the other appliances.

- 2 Verify that the appliances are forwarding their syslog traffic to vRealize Log Insight.
 - a Open a Web browser and go to **https://sfo01vrli01.sfo01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------------|
| User name | admin |
| Password | <i>vrli_admin_password</i> |

- c In the vRealize Log Insight user interface, click **Dashboards** and select **VMware - vSphere** under **Content Pack Dashboards**.
 - d Verify that the vCenter Server nodes are presented on the **All vSphere events by hostname** widget of the **General Overview** dashboard.

Update the Host Profiles with Syslog Settings for Consolidated SDDC

To have a consistent logging configuration across all ESXi hosts, update the host profile in each cluster to accommodate the syslog settings for connection to vRealize Log Insight.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-------------------------------|
| User name | administrator@vsphere.local |
| Password | <i>vsphere_admin_password</i> |

- 2 Update the host profile for the consolidated cluster.
 - a From the vSphere Web Client **Home** menu, select **Home**.
 - b In the **Navigator**, click **Policies and Profiles** and click **Host Profiles**.
 - c Right-click **sfo01-w01hp-consolidated01** and select **Copy Settings from Host**.
 - d Select **sfo01w01esx01.sfo01.rainpole.local** and click **OK**.
- 3 Verify that the syslog host settings have been updated.
 - a On the **Host Profiles** page in the **Navigator**, click **sfo01-w01hp-consolidated01**.
 - b On the **Configure** tab, click **Settings**.
 - c In **Filter** search box, enter **Syslog.global.logHost**.
 - d Select the **Syslog.global.logHost** entry from the results list and verify that value of the option is **udp://sfo01vrli01.sfo01.rainpole.local:514**

- 4 Verify the compliance of the hosts in the consolidated cluster.
 - a From the vSphere Web Client **Home** menu, select **Hosts and Clusters**.
 - b Click the **sfo01-w01hp-consolidated01** cluster, click the **Monitor** tab, and click **Profile Compliance**.
 - c Click the **Check Compliance Now** button.
 - d Verify that all hosts are compliant with the attached profile.

Connect vRealize Log Insight to vRealize Operations Manager for Consolidated SDDC

Connect vRealize Log Insight to vRealize Operations Manager so that you can use the Launch in Context functionality between the two applications to troubleshoot management nodes and vRealize Operations Manager by using dashboards and alerts in the vRealize Log Insight user interface.

Procedure

- 1 [Configure User Privileges on vRealize Operations Manager for Integration with vRealize Log Insight for Consolidated SDDC](#)

Configure administrator privileges for the svc-vrli-vrops@rainpole.local service account for vRealize Log Insight on vRealize Operations Manager. You must assign administrator privileges to the service account for the Launch in Context integration between the two management components.

- 2 [Enable the vRealize Log Insight Integration with vRealize Operations Manager for Consolidated SDDC](#)

Connect vRealize Log Insight in the region with vRealize Operations Manager to launch vRealize Log Insight from within vRealize Operations Manager and to send alerts to vRealize Operations Manager.

- 3 [Connect vRealize Operations Manager to vRealize Log Insight for Consolidated SDDC](#)

- 4 [Configure the Log Insight Agent on vRealize Operations Manager to Forward Log Events to vRealize Log Insight for Consolidated SDDC](#)

After you connect vRealize Operations Manager to vRealize Log Insight for Launch in Context, configure the Log Insight agent on vRealize Operations Manager to send audit logs and system events to vRealize Log Insight.

Configure User Privileges on vRealize Operations Manager for Integration with vRealize Log Insight for Consolidated SDDC

Configure administrator privileges for the svc-vrli-vrops@rainpole.local service account for vRealize Log Insight on vRealize Operations Manager. You must assign administrator privileges to the service account for the Launch in Context integration between the two management components.

Procedure

- 1 Log in to vRealize Operations Manager by using the operations interface.
 - a Open a Web browser and go to **https://vrops01svr01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------|
| User name | admin |
| Password | vrops_admin_password |

- 2 On the main navigator bar, click **Administration**.
- 3 On the left of vRealize Operations Manager, expand **Access** and click **Access Control**.
- 4 On the **Access Control** page, click the **User Accounts** tab and click the **Import Users** icon.
- 5 On the **Import Users** page, import the svc-vrli-vrops@rainpole.local service account.
 - a From the **Import From** drop-down menu, select **RAINPOLE.LOCAL**.
 - b Select the **Basic** option for the search query.
 - c In the **Search String** text box, enter **svc-vrli-vrops** and click **Search**.
The search results contain the svc-vrli-vrops user account.
 - d Select **svc-vrli-vrops@rainpole.local** and click **Next**.
- 6 On the **Assign Groups and Permissions** page, to assign the Administrator role to the svc-vrli-vrops@rainpole.local service account, click the **Objects** tab, configure the following settings, and click **Finish**.

| Setting | Value |
|---|---------------|
| Select Role | Administrator |
| Assign this role to the user | Selected |
| Allow access to all objects in the system | Selected |

- 7 When prompted with the warning about allowing access to all objects on the system, click **Yes**.

Enable the vRealize Log Insight Integration with vRealize Operations Manager for Consolidated SDDC

Connect vRealize Log Insight in the region with vRealize Operations Manager to launch vRealize Log Insight from within vRealize Operations Manager and to send alerts to vRealize Operations Manager.

Procedure

- 1 Log in to the vRealize Log Insight user interface.
 - a Open a Web browser and go to **https://sfo01vrli01.sfo01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------------|
| User name | admin |
| Password | <i>vrli_admin_password</i> |

- 2 In the vRealize Log Insight user interface, click the configuration drop-down menu icon  and select **Administration**.
- 3 Under **Integration**, click **vRealize Operations**.
- 4 On the **vRealize Operations Manager** page, configure the integration settings for vRealize Operations Manager.

| Setting | Value |
|---------------------------|--------------------------------|
| Hostname | vrops01svr01.rainpole.local |
| Username | svc-vrli-vrops@rainpole.local |
| Password | <i>svc-vrli-vrops_password</i> |
| Enable alerts integration | Selected |
| Enable launch in context | Selected |

- 5 Click **Test Connection** to validate the connection and click **Save**.
A progress dialog box appears.
- 6 Click **OK** to close the dialog box.

Connect vRealize Operations Manager to vRealize Log Insight for Consolidated SDDC

Configure a vRealize Log Insight Adapter to integrate vRealize Log Insight with vRealize Operations Manager in your environment. You can access unstructured log data about any object in your environment by using Launch in Context in vRealize Operations Manager.

Procedure

- 1 Log in to vRealize Operations Manager by using the operations interface.
 - a Open a Web browser and go to **https://vrops01svr01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | admin |
| Password | <i>vrops_admin_password</i> |

- 2 On the main navigation bar, click **Administration**.
- 3 In the left pane of vRealize Operations Manager, click **Solutions**.
- 4 On the **Solutions** page, select **VMware vRealize Log Insight** from the solution table, and click **Configure**.

The **Manage Solution - VMware vRealize Log Insight** dialog box appears.

- 5 Under **Instance Settings**, enter the settings for connection to vRealize Log Insight.
 - a Enter the display name, description and the FQDN of the vRealize Log Insight instance.

| Setting | Value |
|--------------------|-----------------------------------|
| Display Name | Log Insight Adapter - sfo01vrli01 |
| Description | vRealize Log Insight for sfo01 |
| Log Insight server | sfo01vrli01.sfo01.rainpole.local |

- b Click **Save Settings**.
 - c Click **OK** in the **Info** box.
- 6 Validate the connection to vRealize Log Insight.
 - a Click **Test Connection** to validate the connection to vRealize Log Insight.
 - b Click **OK** in the **Info** dialog box.
- 7 Expand the **Advanced Settings** pane and select the collector group from the **Collectors/Groups** drop-down menu.

| Setting | Value |
|-------------------|-------------------------|
| Collectors/Groups | sfo01-remote-collectors |

- 8 Click **Save Settings** and click **OK** in the **Info** dialog box that appears.
- 9 In the **Manage Solution - VMware vRealize Log Insight** dialog box, click **Close**.

The vRealize Log Insight Adapter is available on the **Solutions** page of the vRealize Operations Manager user interface. The **Collection State** of the adapter is **Collecting** and the **Collection Status** is **Data receiving**.

Configure the Log Insight Agent on vRealize Operations Manager to Forward Log Events to vRealize Log Insight for Consolidated SDDC

After you connect vRealize Operations Manager to vRealize Log Insight for Launch in Context, configure the Log Insight agent on vRealize Operations Manager to send audit logs and system events to vRealize Log Insight.

Procedure

1 Enable Secure Shell (SSH) on each node of vRealize Operations Manager.

- a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
- b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- c Under the sfo01w01vc01.sfo01.rainpole.local vCenter Server, navigate to the virtual appliance for the node.

| Virtual Appliance Name | Role |
|------------------------|--------------------|
| vrops01svr01a | Master node |
| sfo01vropsc01a | Remote collector 1 |

- d Right-click the appliance node and select **Open Console** to open the remote console to the appliance.
- e Press ALT+F1 to switch to the command prompt.
- f Log in using the following credentials.

| Setting | Value |
|-----------|---------------------|
| User name | root |
| Password | vrops_root_password |

- g Start the SSH service by running the following command.

```
service sshd start
```

- h Close the virtual appliance console.
- i Repeat the step for other node.

2 Configure the Log Insight agent in vRealize Operation Manager.

- a Open an SSH connection to the vRealize Operations Manager appliances using the following settings.

| Setting | Value |
|-----------|---|
| Host name | <ul style="list-style-type: none"> ■ vrops01svr01a.rainpole.local ■ sfo01vropsc01a.sfo01.rainpole.local |
| User name | root |
| Password | <i>vrops_root_password</i> |

- b Edit the `liagent.ini` file on each vRealize Operations Manager node using a text editor such as `vi`.

```
vi /var/lib/loginsight-agent/liagent.ini
```

- c Locate the `[server]` section, uncomment the following parameters and input the following values.

```
[server]
; Log Insight server hostname or ip address
; If omitted the default value is LOGINSIGHT
hostname=sfo01vr1i01.sfo01.rainpole.local
; Set protocol to use:
; cfapi - Log Insight REST API
; syslog - Syslog protocol
; If omitted the default value is cfapi
;
proto=cfapi
; Log Insight server port to connect to. If omitted the default value is:
; for syslog: 512
; for cfapi without ssl: 9000
; for cfapi with ssl: 9543
port=9000
;ssl - enable/disable SSL. Applies to cfapi protocol only.
; Possible values are yes or no. If omitted the default value is no.
ssl=no
; Time in minutes to force reconnection to the server
; If omitted the default value is 30
;reconnect=30
```

- d After the `[server]` section, add the following block on each vRealize Operations Manager node.

```
[common|filelog]
tags={"vmw_vr_ops_appliance":"vROps", "vmw_vr_ops_clustername":"vrops01svr01",
"vmw_vr_ops_clusterrole":"<vROPS Node Role Here>",
"vmw_vr_ops_nodename":"<Your vROPS Node Name Here>",
"vmw_vr_ops_hostname":"<Your vROPS Hostname Here>"}
```

- e Modify the following parameters specifically for each node.

| Parameter | Description | Location in liagent.ini |
|------------------------|--|---|
| vmw_vr_ops_clusterrole | Role of the vRealize Operations Manager node | Set to Master or Remote Collector according to the role of the node. |
| vmw_vr_ops_nodename | IP address or FQDN of the vRealize Operations Manager node | Replace each <Your VR0PS Node Name Here> with the following names: <ul style="list-style-type: none"> ■ vrops01svr01a ■ sfo01vropsc01a |
| vmw_vr_ops_hostname | Name of the vRealize Operations Manager node that is set during node initial configuration | Replace each <Your VR0PS Hostname Here> with the following names: <ul style="list-style-type: none"> ■ vrops01svr01a.rainpole.local ■ sfo01vropsc01a.sfo01.rainpole.local |

For example, on the master node you change the [common|filelog] section to add a context to the logs that are sent to the vRealize Log Insight cluster:

```
[common|filelog]
tags={"vmw_vr_ops_appname":"VR0ps", "vmw_vr_ops_clustername":"vrops01svr01",
"vmw_vr_ops_clusterrole":"Master", "vmw_vr_ops_nodename":"vrops01svr01a",
"vmw_vr_ops_hostname":"vrops01svr01a.rainpole.local"}
```

- f Press Esc and enter **:wq!** to save the file.
- g Restart the Log Insight agent on node by running the following console command.

```
/etc/init.d/liagentd restart
```

- h Verify that the Log Insight agent is running.

```
/etc/init.d/liagentd status
```

- i Stop the SSH service on the virtual appliance by running the following command.

```
service sshd stop
```

- Repeat the steps for each of the remaining vRealize Operations Manager node.
- Configure the Agent Group for the vRealize Operations Manager components in the vRealize Log Insight Web user interface.
 - Open a Web browser and go to **https://sfo01vrli01.sfo01.rainpole.local**.
 - Log in using the following credentials.

| Setting | Value |
|-----------|----------------------|
| User name | admin |
| Password | vrl_i_admin_password |

- c Click the configuration drop-down menu icon  and select **Administration**.
- d Under **Management**, click **Agents**.
- e From the drop-down menu at the top, select **vRops 6.4 or higher - Sample** from the **Available Templates** section and click the **Copy Template** button at the bottom.
- f In the **Copy Agent Group** dialog box, enter **vROPs – Appliance Agent Group** in the **Name** text box and click **Copy**.
- g In the **agent filter** fields, enter the following values pressing Enter after each host name.

| Filter | Operator | Values |
|----------|----------|---|
| Hostname | Matches | <ul style="list-style-type: none"> ■ vrops01svr01a.rainpole.local ■ sfo01vropsc01a.sfo01.rainpole.local |

- h Click **Refresh** and verify that all the agents in the filter appear in the **Agents** list.
- i Click **Save New Group** at the bottom of the page.
- j Click the **Dashboard** tab and select the **VMware - vRops 6.x** dashboard under the **Content Pack Dashboards** on the left.

All **VMware - vRops 6** dashboards become available on the home page of vRealize Log Insight. You see the **Total number of vRops Clusters** showing 1 and **Total number of vRops nodes over time** showing the host names of the vRealize Operations Manager nodes.

Connect vRealize Log Insight to the NSX Instances for Consolidated SDDC

Install and configure the vRealize Log Insight Content Pack for NSX for vSphere for log visualization and alerting of the NSX for vSphere real-time operation. You can use the NSX-vSphere dashboards to monitor logs about installation and configuration, and about virtual networking services.

Procedure

- 1 [Install the vRealize Log Insight Content Pack for NSX for vSphere for Consolidated SDDC](#)
Install the content pack for NSX for vSphere to add the dashboards for viewing log information in vRealize Log Insight.
- 2 [Configure NSX Manager to Forward Log Events to vRealize Log Insight for Consolidated SDDC](#)
Configure the NSX Manager instances in the region to send audit logs and system events to vRealize Log Insight.
- 3 [Configure the NSX Controllers to Forward Events to vRealize Log Insight for Consolidated SDDC](#)
Configure the NSX Controller instances to forward log information to vRealize Log Insight by using the NSX REST API. To enable log forwarding, you can use a REST client, such as the Postman application.

4 Configure the NSX Edge Instances to Forward Log Events to vRealize Log Insight for Consolidated SDDC

Redirect log information from the edge services gateways, universal distributed logical router, and load balancer to vRealize Log Insight.

Install the vRealize Log Insight Content Pack for NSX for vSphere for Consolidated SDDC

Install the content pack for NSX for vSphere to add the dashboards for viewing log information in vRealize Log Insight.

Procedure

- 1 Log in to the vRealize Log Insight user interface.
 - a Open a Web browser and go to **https://sfo01vrli01.sfo01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------------|
| User name | admin |
| Password | <i>vrli_admin_password</i> |

- 2 In the vRealize Log Insight user interface, click the configuration drop-down menu icon  and select **Content Packs**.
- 3 Under **Content Pack Marketplace**, select **Marketplace**.
- 4 In the list of content packs, locate the **VMware - NSX-vSphere** content pack and click its icon.
- 5 In the **Install Content Pack** dialog box, accept the **License Agreement**, and click **Install**.
- 6 In the **VMware - NSX-vSphere Setup Instructions** dialog box, click **OK**.

After the installation is complete, the VMware - NSX-vSphere content pack appears in the **Installed Content Packs** list on the left.

Configure NSX Manager to Forward Log Events to vRealize Log Insight for Consolidated SDDC

Configure the NSX Manager instances in the region to send audit logs and system events to vRealize Log Insight.

Procedure

- 1 Log in to the Management NSX Manager appliance user interface.

- a Open a Web browser and go to following URL.

| NSX Manager | URL |
|--------------------------------------|---|
| NSX Manager for consolidated cluster | https://sfo01w01nsx01.sfo01.rainpole.local |

- b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------------|
| User name | admin |
| Password | <i>nsx_manager_admin_password</i> |

- 2 On the main page of the appliance user interface, click **Manage Appliance Settings**.
- 3 Under **Settings**, click **General**, and in the **Syslog Server** pane, click **Edit**.
- 4 In the **Syslog Server** dialog box, configure vRealize Log Insight as a syslog server by specifying the following settings and click **OK**.

| Syslog Server Setting | Value |
|-----------------------|----------------------------------|
| Syslog Server | sfo01vrli01.sfo01.rainpole.local |
| Port | 514 |
| Protocol | UDP |

Configure the NSX Controllers to Forward Events to vRealize Log Insight for Consolidated SDDC

Configure the NSX Controller instances to forward log information to vRealize Log Insight by using the NSX REST API. To enable log forwarding, you can use a REST client, such as the Postman application.

Procedure

- 1 Log in to the Windows host that has access to your data center.
- 2 Start the Postman application and log in.

3 Specify the headers for requests to the NSX Manager.

- a On the **Authorization** tab, configure the following authorization settings and click **Update Request**.

| Setting | Value |
|-----------|---------------------------|
| Type | Basic Auth |
| User name | admin |
| Password | <i>nsx_admin_password</i> |

The `Authorization:Basic XXX` header appears in the **Headers** pane.

- b On the **Headers** tab, enter the following header details.

| Request Header Attribute | Value |
|--------------------------|-----------------|
| Content-Type | application/xml |

The `Content-Type:application/xml` header appears in the **Headers** pane.

4 Contact NSX Manager to retrieve the IDs of the associated NSX Controllers.

- a Select **GET** from the drop-down menu that contains the HTTP request methods.
- b In the **URL** text box next to the selected method, enter the following URL, and click **Send**.

| NSX Manager | URL |
|--|--|
| NSX Manager for the consolidated cluster | <code>https://sfo01w01nsx01.sfo01.rainpole.local/api/2.0/vdn/controller</code> |

The Postman application sends a query to the NSX Manager about the installed NSX controllers.

- c After the NSX Manager sends a response back, click the **Body** tab in the response pane.

The response body contains a root <controllers> XML element that groups the details about the three controllers that form the controller cluster.

- d Within the <controllers> element, locate the <controller> element for each controller and write down the content of the <id> element.

Controller IDs have the `controller-id` format where *id* represents the sequence number of the controller in the cluster, for example, `controller-1` in the following image.

The screenshot shows a REST client interface with the following details:

- URL: `https://sfo01w01nsx01.sfo01.rainpole.local/api/2.0/vdn/controller`
- Method: GET
- Authorization: Basic Auth (Username: admin, Password: [redacted])
- Status: 200 OK, Time: 130 ms
- Response Body (XML):


```

1 <?xml version="1.0" encoding="UTF-8"?>
2 <controllers>
3   <controller>
4     <objectTypeName>Controller</objectTypeName>
5     <revision>0</revision>
6     <name>nsx-controller-w01-01</name>
7     <clientHandle></clientHandle>
8     <isUniversal>false</isUniversal>
9     <universalRevision>0</universalRevision>
10    <id>controller-1</id>
11    <ipAddress>172.20.31.118</ipAddress>
12    <status>RUNNING</status>
13    <upgradeStatus>NOT_STARTED</upgradeStatus>
14    <version>6.3.49862</version>
15    <upgradeAvailable>true</upgradeAvailable>
16    <virtualMachineInfo>
17      <objectId>vm-61</objectId>
18      <objectTypeName>VirtualMachine</objectTypeName>
19      <vsmUuid>42238848-7155-14FC-6A2F-E381D54081EA</vsmUuid>
20      <nodeId>9eb6f396-a3bc-4d95-a64e-e38d019f3c70</nodeId>
21      <revision>12</revision>
22      <type>
23        <typeName>VirtualMachine</typeName>
24      </type>
25      <name>NSX_Controller_d5c429e8-192d-4e32-8dfc-e347a2dc3ee1</name>
26      <scope>
27        <id>resgroup-25</id>
28        <objectTypeName>ResourcePool</objectTypeName>
29        <name>sfo01-w01rp-sddc-edge</name>
30      </scope>
31      <clientHandle></clientHandle>
32      <extendedAttributes></extendedAttributes>
33      <isUniversal>false</isUniversal>
34      <universalRevision>0</universalRevision>
35    </virtualMachineInfo>
36    <hostInfo>
37      <objectId>host-22</objectId>
38      <objectTypeName>HostSystem</objectTypeName>

```

- 5 For each NSX Controller, send a request to configure vRealize Log Insight as a remote syslog server.
- a In the request pane at the top, select **POST** from the drop-down menu that contains the HTTP request methods, and in the **URL** text box, enter the following URL.

Replace *controller-ID* with the controller IDs you have written down.

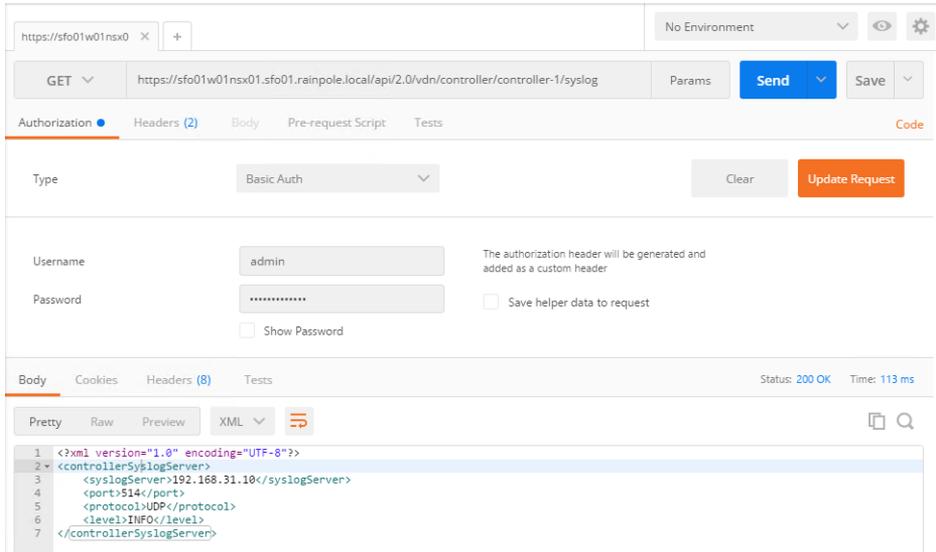
| NSX Manager | NSX Controller in the Controller Cluster | POST URL |
|--|--|--|
| NSX Manager for the consolidated cluster | NSX Controller 1 | https://sfo01w01nsx01.sfo01.rainpole.local/api/2.0/vdn/controller/ controller-1 /syslog |
| | NSX Controller 2 | https://sfo01w01nsx01.sfo01.rainpole.local/api/2.0/vdn/controller/ controller-2 /syslog |
| | NSX Controller 3 | https://sfo01w01nsx01.sfo01.rainpole.local/api/2.0/vdn/controller/ controller-3 /syslog |

- b In the **Request** pane, click the **Body** tab, select **Raw**, and using the drop-down menu, select **XML (Application/XML)**.
- c Paste the following request body in the **Body** text box and click **Send**.

```
<controllerSyslogServer>
  <syslogServer>192.168.31.10</syslogServer>
  <port>514</port>
  <protocol>UDP</protocol>
  <level>INFO</level>
</controllerSyslogServer>
```

- d Repeat the steps for the other NSX Controllers in the cluster.
- 6 Verify the syslog configuration on each NSX Controller.
- a In the **Request** pane, from the **Method** drop-down menu, select **GET**, in the **URL** text box, enter the controller-specific syslog URL from [Step 5](#), and click the **SEND** button.
- b After the NSX Manager sends a response back, click the **Body** tab under **Response**.
- The response body contains a root `<controllerSyslogServer>` element, which represents the settings for the remote syslog server on the NSX Controller.

- c Verify that the value of the <syslogServer> element is 192.168.31.10.
- d Repeat the steps for the other NSX Controllers to verify the syslog configuration.



Configure the NSX Edge Instances to Forward Log Events to vRealize Log Insight for Consolidated SDDC

Redirect log information from the edge services gateways, universal distributed logical router, and load balancer to vRealize Log Insight.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to `https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client`.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 From the **Home** menu of the vSphere Web Client, select **Networking & Security**.
- 3 In the **Navigator**, click **NSX Edges**.
- 4 On the **NSX Edges** page, select the NSX Manager instance from the **NSX Manager** drop-down menu.

| NSX Manager Instance | IP Address |
|--|--------------|
| NSX Manager for the consolidated cluster | 172.16.11.65 |

The edge devices in the scope of the NSX Manager appear.

5 Configure the log forwarding on each edge service gateway instance.

- a Double-click the edge device to open its user interface.

| Traffic | Consolidated NSX Edge Services Gateway |
|---------------------|--|
| North-South Routing | sfo01w01esg01 |
| North-South Routing | sfo01w01esg02 |
| East-West Routing | sfo01w01udlr01 |
| Load Balancer | sfo01w01lb01 |

- b On the NSX Edge device page, click the **Manage** tab, click **Settings**, and click **Configuration**.
- c In the **Details** pane, click **Change** next to **Syslog servers**.
- d In the **Edit Syslog Servers Configuration** dialog box, configure the following settings and click **OK**.

| Setting | Value |
|-----------------|---------------|
| Syslog Server 1 | 192.168.31.10 |
| Protocol | udp |

- e Click **OK**.
- f Repeat the steps for the remaining NSX Edge devices for the cluster.

The vRealize Log Insight user interface starts showing log data in the **NSX-vSphere-Overview** dashboard available under the VMware - NSX-vSphere group of content pack dashboards.

Collect Operating System Logs from the Management Virtual Appliances in vRealize Log Insight for Consolidated SDDC

Install and configure the vRealize Log Insight Content Pack for Linux to visualize and analyze operating system logs from the management virtual appliances.

Procedure

- 1 [Install the vRealize Log Insight Content Pack for Linux for Consolidated SDDC](#)
Install the content pack for Linux to add dashboards for viewing log information in vRealize Log Insight from the operating system of the management virtual appliances in the region.
- 2 [Configure a Log Insight Agent Group for the Management Virtual Appliances for Consolidated SDDC](#)
After you install the content pack for Linux, configure an agent group to apply common settings to the agents on the appliances in the region.

Install the vRealize Log Insight Content Pack for Linux for Consolidated SDDC

Install the content pack for Linux to add dashboards for viewing log information in vRealize Log Insight from the operating system of the management virtual appliances in the region.

Procedure

- 1 Log in to the vRealize Log Insight user interface.
 - a Open a Web browser and go to **https://sfo01vrli01.sfo01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|---------------------------|
| User name | admin |
| Password | <i>vri_admin_password</i> |

- 2 In the vRealize Log Insight user interface, click the configuration drop-down menu icon  and select **Content Packs**.
- 3 Under **Content Pack Marketplace**, select **Marketplace**.
- 4 In the list of content packs, locate the **Linux** content pack and click its icon.
- 5 In the **Install Content Pack** dialog box, accept the License Agreement, and click **Install**.

After the installation is complete, the **Linux** content pack appears in the **Installed Content Packs** list on the left.

Configure a Log Insight Agent Group for the Management Virtual Appliances for Consolidated SDDC

After you install the content pack for Linux, configure an agent group to apply common settings to the agents on the appliances in the region.

Procedure

- 1 Log in to the vRealize Log Insight user interface.
 - a Open a Web browser and go to **https://sfo01vrli01.sfo01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|---------------------------|
| User name | admin |
| Password | <i>vri_admin_password</i> |

- 2 Click the configuration drop-down menu icon  and select **Administration**.
- 3 Under **Management**, click **Agents**.
- 4 From the drop-down at the top, select **Linux** from the **Available Templates** section.
- 5 Click **Copy Template**.
- 6 In the **Copy Agent Group** dialog box, enter **VA – Linux Agent Group** in the **Name** text box and click **Copy**.

- 7 In the agent filter fields, use the following selections.

Press Enter to separate the host name values.

| Filter | Operator | Values |
|----------|----------|---|
| Hostname | matches | <ul style="list-style-type: none"> ■ vrops01svr01a.rainpole.local ■ sfo01vropsc01a.sfo01.rainpole.local |

- 8 Click **Refresh** and verify that all the agents listed in the filter appear in the **Agents** list.
- 9 Click **Save New Group** at the bottom of the page.
- 10 Verify that log data is showing up on the Linux dashboards.
 - a On the main navigation bar, click **Dashboards**.
 - b Expand **Linux** and click **Security - Overview**.

You see events that have occurred over the past 48 hours.

Configure Log Retention and Archiving for Consolidated SDDC

Set log retention to one week and archive logs for 90 days according to the *VMware Validated Design Architecture and Design* documentation.

Procedure

- 1 Log in to the vRealize Log Insight user interface.
 - a Open a Web browser and go to **https://sfo01vrli01.sfo01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|---------------------|
| User name | admin |
| Password | vrlj_admin_password |

- 2 In the vRealize Log Insight user interface, click the configuration drop-down menu icon  and select **Administration**.

3 Configure notification about reaching a retention threshold of one week.

Log Insight continually estimates how long data can be retained with the currently available pool of storage.

If the estimation drops below the retention threshold of one week, Log Insight immediately notifies the administrator that the amount of searchable log data is likely to drop.

- a Under **Configuration**, click **General**.
- b On the **General Configuration** page, under the **Alerts** section, select the **Send a notification when capacity drops below** check box next to **Retention Notification Threshold**, and enter a 1-week period in the text box.
- c Click **Save**.

4 Configure data archiving.

- a Under **Configuration**, click **Archiving**.
- b Toggle **Enable Data Archiving** on.
- c In the **Archive Location** text box, enter the path in the form of `nfs://nfs-server-address/V2D_vRLI_Consolidated_250GB` to an NFS partition where logs will be archived.
- d Click **Test** next to the **Archive Location** text box to verify that the share is accessible.
- e Click **Save**.

vSphere Update Manager Download Service Implementation for Consolidated SDDC

Install the vSphere Update Manager Download Service (UMDS) on a Linux virtual machine to download and store binaries and metadata to a shared repository in the region. In the region, connect the UMDS instance to the vSphere Update Manager for vCenter Server.

Configure PostgreSQL Database on Your Linux-Based Host Operating System for UMDS for Consolidated SDDC

On a virtual machine with Ubuntu 14.04 Long Term Support (LTS) where you plan to install Update Manager Download Service (UMDS), configure a PostgreSQL database instance.

Prerequisites

- Create a virtual machine for UMDS. See *Virtual Machine Specifications* from the *Planning and Preparation* documentation.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **`https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client`**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 In the vSphere Web Client, right-click the sfo01umds01 virtual machine and select **Open Console** to open the remote console to the virtual machine.
- 3 At the command prompt, log in as the **svc-umds** user using **`svc-umds_password`**.
- 4 Install Secure Shell (SSH) server, and end the session.

```
sudo apt-get update
sudo apt-get -y install SSH
exit
```

- 5 Log back in to the UMDS virtual machine using Secure Shell (SSH) client and the svc-umds service account credentials.
- 6 Install and start PostgreSQL and its dependencies.

```
sudo apt-get -y install vim perl tar sed psmisc unixodbc postgresql postgresql-contrib odbc-
postgresql
sudo service postgresql start
```

The installation operation creates a user account called `postgres` that is associated with the default Postgres role. The **postgres** account is used to establish a service account for the Update Manager Download Service.

- 7 Log in as a PostgreSQL user, and create a database instance and a database user, by running the following commands.

When prompted, enter and confirm the `umds_db_admin_password` password.

```
sudo su - postgres
createdb umds_db
createuser -d -e -r umds_db_admin -P
```

8 Enable password authentication for the database user.

- a Navigate to the folder that contains the PostgreSQL configuration file `pg_hba.conf`.

| Linux system | Default Location |
|--------------|--|
| Ubuntu 14.04 | <code>/etc/postgresql/postgres_version/main</code> |

```
cd /etc/postgresql/postgres_version/main
```

- b In the PostgreSQL configuration file, enable password authentication for the database user by inserting the following line right above `local all all peer`.

You can use the `vi` editor to make and save the changes.

| #TYPE | DATABASE | USER | ADDRESS | METHOD |
|-------|----------|---------------|---------|--------|
| local | umds_db | umds_db_admin | | md5 |

- c Log out as a PostgreSQL user by running the following command.

```
logout
```

9 Configure the PostgreSQL driver and the data source name (DSN) for a connection to the UMDS database.

- a Edit the ODBC configuration file.

```
sudo vi /etc/odbcinst.ini
```

- b Replace the file content with the following content and save the change using `:wq`.

```
[PostgreSQL]
Description=PostgreSQL ODBC driver (Unicode version)
Driver=/usr/lib/x86_64-linux-gnu/odbc/psqlodbcw.so
Debug=0
CommLog=1
UsageCount=1
```

- c Edit the system file `/etc/odbc.ini`.

```
sudo vi /etc/odbc.ini
```

- d Replace the file content with the following content and save the change using `:wq`.

```
[UMDS_DSN]
;DB_TYPE = PostgreSQL
;SERVER_NAME = localhost
;SERVER_PORT = 5432
;TNS_SERVICE = <database_name>
;USER_ID = <database_username>
Driver = PostgreSQL
DSN = UMDS_DSN
ServerName = localhost
PortNumber = 5432
Server = localhost
Port = 5432
UserID = umds_db_admin
User = umds_db_admin
Database = umds_db
```

- 10 Create a symbolic link between the UMDS and the PostgreSQL by running the following command.

```
ln -s /var/run/postgresql/.s.PGSQL.5432 /tmp/.s.PGSQL.5432
```

- 11 Restart PostgreSQL.

```
sudo service postgresql restart
```

Install UMDS on Ubuntu OS for Consolidated SDDC

After you install the PostgreSQL database on the UMDS virtual machine, install the UMDS software.

Prerequisites

- Verify that you have administrative privileges on the UMDS Ubuntu virtual machine.
- Mount the ISO file of the vCenter Server Appliance to the Linux machine.

Procedure

- 1 Log in to the UMDS virtual machine by using a Secure Shell (SSH) client.
 - a Open an SSH connection to `sfo01umds01.sfo01.rainpole.local`.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|--------------------------------|
| User name | <code>svc-umds</code> |
| Password | <code>svc-umds_password</code> |

- 2 Mount the vCenter Server Appliance ISO to the UMDS virtual machine.

```
sudo mkdir -p /mnt/cdrom
sudo mount /dev/cdrom /mnt/cdrom
```

- 3 Extract the VMware-UMDS-6.5.0.-*build_number*.tar.gz file to the /tmp folder.

```
tar -xzvf /mnt/cdrom/ums/VMware-UMDS-6.5.0-build_number.tar.gz -C /tmp
```

- 4 Run the UMDS installation script.

```
sudo /tmp/vmware-ums-distrib/vmware-install.pl
```

- 5 Read and accept the EULA.
- 6 Press Enter to install UMDS in the default directory /usr/local/vmware-ums and enter **yes** to confirm directory creation.
- 7 Enter the UMDS proxy settings if needed according to the settings of your environment.
- 8 Press Enter to set the default patch location to /var/lib/vmware-ums and enter **yes** to confirm directory creation.
- 9 Provide the database details.

| Setting | Value |
|--------------------------------|------------------------------|
| Provide the database DSN | UMDS_DSN |
| Provide the database user name | ums_db_admin |
| Provide the database password | <i>ums_db_admin_password</i> |

- 10 Type **yes** and press Enter to install UMDS.

Set Up the Data to Download Using UMDS for Consolidated SDDC

By default UMDS downloads patch binaries, patch metadata, and notifications for hosts. Specify which patch binaries and patch metadata to download with UMDS.

Procedure

- 1 Log in to the UMDS virtual machine by using a Secure Shell (SSH) client.
 - a Open an SSH connection to sfo01ums01.sfo01.rainpole.local.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-------------------------|
| User name | svc-ums |
| Password | <i>svc-ums_password</i> |

- 2 Navigate to the directory where UMDS is installed.

```
cd /usr/local/vmware-umds/bin
```

- 3 Disable the updates for older hosts and virtual appliances.

```
sudo ./vmware-umds -S -n
sudo ./vmware-umds -S -d embeddedEsx-5.5.0
sudo ./vmware-umds -S -d embeddedEsx-6.0.0
```

- 4 Configure automatic daily downloads by creating a cron job file.

```
cd /etc/cron.daily/
sudo touch umds-download
sudo chmod 755 umds-download
```

- 5 Edit the download command of the cron job.

```
sudo vi umds-download
```

- 6 Add the following lines to the file.

```
#!/bin/sh
/usr/local/vmware-umds/bin/vmware-umds -D
sudo chmod -R 755 /var/lib/vmware-umds
```

- 7 Test the UMDS Download cron job.

```
sudo ./umds-download
```

UMDS downloads required patch binaries, patch metadata, and notifications for hosts. Wait until the download is complete. This process may take several minutes.

Install and Configure the UMDS Web Server for Consolidated SDDC

The UMDS server downloads upgrades, patch binaries, patch metadata, and notifications to a directory that you must share to vSphere Update Manager by using a Web server.

The default folder to which UMDS downloads patch binaries and patch metadata on a Linux machine is `/var/lib/vmware-umds`. You share this folder out to the VUM instances within the consolidated SDDC using a Nginx Web server.

Procedure

- 1 Log in to the UMDS virtual machine by using a Secure Shell (SSH) client.
 - a Open an SSH connection to sfo01umds01.sfo01.rainpole.local.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-------------------|
| User name | svc-umds |
| Password | svc-umds_password |

- 2 Install the Nginx Web server with the following command.

```
sudo apt-get -y install nginx
```

- 3 Change the patch repository directory permissions by running the command.

```
sudo chmod -R 755 /var/lib/vmware-umds
```

- 4 Copy the default site configuration for use with the UMDS configuration.

```
sudo cp /etc/nginx/sites-available/default /etc/nginx/sites-available/umds
```

- 5 Edit the new /etc/nginx/sites-available/umds site configuration file by running the sudo vi /etc/nginx/sites-available/umds command and replace the server {} block with the following text.

```
server {
    listen 80 default_server;
    listen [::]:80 default_server ipv6only=on;

    root /var/lib/vmware-umds;
    index index.html index.htm;

    # Make site accessible from http://localhost/
    server_name localhost sfo01umds01 sfo01umds01.sfo01.rainpole.local;

    location / {
        # First attempt to serve request as file, then
        # as directory, then fall back to displaying a 404.
        try_files $uri $uri/ =404;
        # Uncomment to enable naxsi on this location
        # include /etc/nginx/naxsi.rules
        autoindex on;
    }
}
```

- 6 Disable the existing default site.

```
sudo rm /etc/nginx/sites-enabled/default
```

- 7 Enable the new UMDS site.

```
sudo ln -s /etc/nginx/sites-available/umds /etc/nginx/sites-enabled/
```

- 8 To apply the new configuration, restart the Nginx Web service.

```
sudo service nginx restart
```

- 9 Ensure that you can browse the files on the UMDS Web server by opening a Web browser to **http://sfo01umds01.sfo01.rainpole.local**.

Use the UMDS Shared Repository as the Download Source in Update Manager for Consolidated SDDC

Configure Update Manager to use the UMDS shared repository as a source for downloading ESXi patches, extensions, and notifications.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 From the **Home** menu, select **Update Manager**.
- 3 In the **Navigator** pane, click the sfo01w01vc01.sfo01.rainpole.local vCenter Server .
- 4 Click the **Manage** tab, and under **Settings**, click **Download Settings**.
- 5 On the **Download sources** page, click the **Edit** button.
An **Edit Download Sources** dialog box opens.
- 6 Enter the following settings, and click **OK**.

| Setting | Value |
|-------------------------|---|
| Use a shared repository | Selected |
| URL | http://sfo01umds01.sfo01.rainpole.local |

- 7 On the **Download sources** page, click the **Download Now** button to run the download patch definitions.

Verify that a new task Download patch definitions appears in the **Recent Tasks** pane and shows **Status** Completed.

Cloud Management Implementation for Consolidated SDDC

4

The Cloud Management Platform (CMP) consists of integrated products that support the management of public, private and hybrid cloud environments. The CMP consists of vRealize Automation, an embedded vRealize Orchestrator, and vRealize Business for Cloud.

vRealize Automation incorporates virtual machine provisioning and a self-service portal. vRealize Business enables billing and chargeback functions. vRealize Orchestrator provides workflow optimization.

Procedure

1 [Prerequisites for Cloud Management Platform Implementation for Consolidated SDDC](#)

Verify that the following configurations are established before beginning the Cloud Management Platform procedures.

2 [Configure Service Account Privileges for Consolidated SDDC](#)

To provision virtual machines and logical networks, configure privileges for vRealize Automation for the service account `svc-vra@rainpole.local` on both the vCenter Server and the NSX instance in the Consolidated cluster. If you add more vCenter Server instances in the future, perform this procedure on those instances as well.

3 [vRealize Automation Installation for Consolidated SDDC](#)

A vRealize Automation installation includes installing and configuring single sign-on (SSO) capabilities, the user interface portal, and Infrastructure as a Service (IaaS) components.

4 [vRealize Automation Default Tenant Configuration for Consolidated SDDC](#)

In shared cloud environments, where multiple companies, divisions or independent groups are using a common infrastructure fabric, it is necessary to set up virtual private clouds where authentication, resources, policy are customized to the needs of each group. Tenants are useful for isolating the users, resources, and services of one tenant from those of other tenants.

5 [vRealize Automation Tenant Creation for Consolidated SDDC](#)

You create additional vRealize Automation tenants so that users can access the applications and resources that they need to complete their work assignments.

6 [Embedded vRealize Orchestrator Configuration for Consolidated SDDC](#)

VMware Embedded vRealize Orchestrator is a platform that provides a library of extensible workflows to allow you to create and run automated, configurable processes to manage the VMware vSphere infrastructure and other VMware and third-party technologies.

7 [vRealize Business Installation for Consolidated SDDC](#)

vRealize Business is an IT financial management tool that provides clarity and control over the costs and quality of IT services, enabling alignment with the business and acceleration of IT transformation.

8 [Cloud Management Platform Post-Installation Tasks for Consolidated SDDC](#)

After you deploy vRealize Automation and vRealize Orchestrator, you enable health monitors to check the health status of individual servers, and remove the snapshots created during the vRealize Automation installation.

9 [Tenant Content Creation for Consolidated SDDC](#)

To provision virtual machines in the Compute vCenter Server, you must configure the tenant to use compute resources within vCenter Server.

10 [Operations Management Configuration for Cloud Management for Consolidated SDDC](#)

After you install the Cloud Management Platform, enable its integration with the operations management layer. You can monitor and receive alerts and logs about the platform to a central location by using vRealize Operations Manager and vRealize Log Insight.

Prerequisites for Cloud Management Platform Implementation for Consolidated SDDC

Verify that the following configurations are established before beginning the Cloud Management Platform procedures.

DNS Entries and IP Address Mappings for Consolidated SDDC

Verify that your DNS and IP environment fulfills the requirements for this SDDC deployment.

IP Addresses and Host Names

Table 4-1. IP Addresses and FQDNs for the vRealize Automation Instance for Consolidated SDDC

| Role | IP Address | FQDN |
|--|---------------|-----------------------------|
| vRealize Automation Server Appliance | 192.168.11.51 | vra01svr01a.rainpole.local |
| vRealize Automation Server VIP | 192.168.11.53 | vra01svr01.rainpole.local |
| vRealize Automation for IWS | 192.168.11.54 | vra01iws01a.rainpole.local |
| vRealize Automation IWS VIP | 192.168.11.56 | vra01iws01.rainpole.local |
| vRealize Automation Model Manager IMS | 192.168.11.57 | vra01ims01a.rainpole.local |
| vRealize Automation IMS VIP | 192.168.11.59 | vra01ims01.rainpole.local |
| MS SQL Server for vRealize Automation | 192.168.11.62 | vra01mssql01.rainpole.local |
| vRealize Business for Cloud Server Appliance | 192.168.11.66 | vr01svr01.rainpole.local |

Table 4-2. IP Addresses and Host Name for the Supporting Infrastructure

| Role | IP Address | FQDN |
|--|--------------------------------|----------------------------------|
| vRealize Business for Cloud Data Collector | 192.168.31.54 | sfo01vrbc01.sfo01.rainpole.local |
| Default gateway | 192.168.31.1 | |
| DNS server | 172.16.11.5 | |
| Subnet mask | 255.255.255.0 | |
| NTP | 172.16.11.251 172.16.11.252 | ntp.sfo01.rainpole.local |

vRealize Automation Deployment Prerequisites

Before you install and use vRealize Automation, your environment must meet the following prerequisites.

| Prerequisite | Value |
|-------------------------|---|
| Storage | <ul style="list-style-type: none"> ■ Virtual disk provisioning. ■ Required storage per node. |
| Operating System | Windows 2012 R2 Standard |
| Database | Microsoft SQL Server 2012 Standard Edition |
| Installation Package | Download the vRealize Automation virtual appliance .ova file. Download the vRealize Business for Cloud virtual appliance .ova file. |
| License | Verify that you have obtained a license that covers the use of vRealize Automation. Verify that you have obtained a license that covers the use of vRealize Business for vRealize Automation. |
| Active Directory | Verify that you have a parent Active Directory instance with the SDDC user roles configured for the rainpole.local domain. Verify the existence of the ug-vra-admins-rainpole group in the rainpole.local domain. Verify the existence of the ug-vra-archs-rainpole group in the rainpole.local domain. Verify the existence of the svc-domain-join user in the rainpole.local domain. Verify the existence of the vra-admin-rainpole user in the rainpole.local domain. Verify the existence of the svc-vra-vrops user in the rainpole.local domain. Verify the existence of the svc-vrops-vra user in the rainpole.local domain. Verify the existence of the svc-vra user in the rainpole.local domain. Verify the existence of the ug-vROadmins group in the rainpole.local domain. Verify the existence of the svc-vro user in the rainpole.local domain. The Microsoft SQL Server virtual machine should join the rainpole.local domain. |
| Certification Authority | Configure the root Active Directory domain controller as a certificate authority for the environment. |
| Java | Install Java SE Development Kit (JDK), which is required to run the vRealize Orchestrator Client. |

SQL Server Configuration for the Cloud Management Platform for Consolidated SDDC

The Cloud Management Platform uses a Microsoft SQL Server database to store data for vRealize Automation.

Microsoft SQL Server Recommendations for Consolidated SDDC

vRealize Automation and other VMware components use Microsoft SQL Server as a database to store information. The specific configuration of SQL Server for use in your environment is not addressed in this implementation guide. High-level guidance is provided to ensure more reliable operation of your VMware components.

- Microsoft SQL Server must be configured with separate Operating System Level volumes (drive letters) for each of the following items. The separation of these items into separate logical volumes (drive letters) helps prevent database corruption if a single volume reaches capacity.
 - Operating System
 - Database Application
 - SQL User Database Data Files
 - SQL User Database Log Files
 - SQL TempDB
 - SQL Backup Files
- To provide optimal performance for VMware vRealize databases, configure the SQL Server virtual machine (vra01mssql01.rainpole.local) with 8 vCPU and 16 GB vRAM.
- Configure the primary DNS of the SQL Server virtual machine (vra01mssql01.rainpole.local) to point to 172.16.11.4 (primary DNS) and the secondary DNS to point to 172.16.11.5 (secondary DNS)

For further guidance on the deployment and operation of a production installation of Microsoft SQL Server, see the Microsoft SQL Server documentation, or consult with a qualified Microsoft SQL Server database administrator.

Assign the SQL Server System Role to vRealize Automation for Consolidated SDDC

Assign the SQL Server system role **sysadmin** to the vRealize Automation service account.

vRealize Automation uses the SQL Server system role privilege to create and run scripts on the SQL Server database. By default, only users who are members of the **sysadmin** system role, or the **db_owner** and **db_ddladmin** database roles, can create objects in the database.

Procedure

- 1 Log in to the SQL Server virtual machine by using a Remote Desktop Protocol (RDP) client.
 - a Open an RDP connection to the `vra01mssql01.rainpole.local` virtual machine.
 - b Log in using the following credentials.

| Settings | Value |
|-----------|---|
| User name | Windows administrator user |
| Password | <code>windows_administrator_password</code> |

- 2 From the **Start** menu, click **All Programs**, click **Microsoft SQL Server**, and click **SQL Server Management Studio**.

Note If SQL Server Management Studio does not appear in your **All Programs** menu, you may not have successfully installed SQL Server Management Studio. Verify that you have successfully installed SQL Server Management Studio, and then continue with this procedure.

- 3 In the **Connect to Server** dialog box, leave the default value of the **Server Name** text box, select **Windows Authentication** from the **Authentication** drop-down menu, and click **Connect**.

Note During the SQL Server installation, the **Database Engine** configuration wizard prompts you to provide the user name and password for the SQL Server administrator. If this user was not added during the SQL Server installation, select **SQL Authentication** from the **Authentication** drop-down menu, and enter the user name `sa` in the **User name** text box, and the password `sa_password` in the **Password** text box.

- 4 In the **Object Explorer** pane, expand the **VRA01MSSQL01** server instance .
- 5 Right-click the **Security** folder, click **New**, and click **Login**.
- 6 In the **Login Properties** dialog box, click the **General** page and enter `rainpole\svc-vra` in the **Login name** text box.
- 7 Click the **Server Roles** page, select the **sysadmin** check box, and click **OK**.

Configure Network Access for Distributed Transaction Coordinator for Consolidated SDDC

You configure network access and security between vRealize Automation and your Microsoft SQL Server database using Microsoft Distributed Transaction Coordinator (MSDTC). MSDTC coordinates transactions that update two or more transaction-protected resources, such as databases, message queues, file systems. These transaction-protected resources may be on a single computer, or distributed across many networked computers.

Procedure

- 1 Log in to the SQL Server virtual machine by using a Remote Desktop Protocol (RDP) client.
 - a Open an RDP connection to the `vra01mssql01.rainpole.local` virtual machine.
 - b Log in using the following credentials.

| Settings | Value |
|-----------|---|
| User name | Windows administrator user |
| Password | <code>windows_administrator_password</code> |

- 2 From the **Start** menu, click **Run**, type `comexp.msc` in the **Open** text box, and click **OK**.
The **Component Services** manager displays. Component Services lets you manage Component Object Model (COM+) applications.
- 3 Using the navigation tree in the left-side pane, expand **Component Services > Computers > My Computer > Distributed Transaction List > Local DTC**.
- 4 Right-click **Local DTC** and click **Properties**.
The **Local DTC Properties** dialog box displays.
- 5 Click the **Security** tab in the **Local DTC Properties** dialog box.
- 6 On the **Security** tab, configure the following values, and click **OK**.

| Setting | Value |
|--------------------------------|---|
| Network DTC Access | Selected |
| Allow Remote Clients | Selected |
| Allow Remote Administration | Deselected |
| Allow Inbound | Selected |
| Allow Outbound | Selected |
| Mutual Authentication Required | Selected |
| Enable XA Transactions | Deselected |
| Enable SNA LU 6.2 Transactions | Selected |
| Account | Leave the default setting (NT AUTHORITY\NetworkService) |
| Password | Leave blank |

- 7 Click **Yes** to restart the MSDTC Service, click **OK** to confirm that the service has successfully restarted, and close the **Component Services** manager.

Allow MS SQL Server and MSDTC Access Through Windows Firewall for vRealize Automation for Consolidated SDDC

You can configure Windows Firewall to allow or block specific traffic. For vRealize Automation to function correctly, ensure that network access to Microsoft Distributed Transaction Coordinator (MSDTC) and SQL Server is configured to allow access.

Procedure

- 1 Log in to the SQL Server virtual machine by using a Remote Desktop Protocol (RDP) client.
 - a Open an RDP connection to the `vra01mssql01.rainpole.local` virtual machine.
 - b Log in using the following credentials.

| Settings | Value |
|-----------|---|
| User name | Windows administrator user |
| Password | <code>windows_administrator_password</code> |

- 2 From the **Start** menu, click **Run**, type `WF.msc` in the **Open** text box, and click **OK**.

The Windows Firewall with Advanced Security dialog box appears. You use Windows Firewall with Advanced Security to configure firewall properties for each network profile.

- 3 Allow Access for Microsoft SQL Server on TCP Port 1433.
 - a In the navigation pane, under **Windows Firewall with Advanced Security**, select and right-click **Inbound Rules**, and click **New Rule** in the action pane.
The **New Inbound Rule Wizard** appears.
 - b On the Rule Type page of the **New Inbound Rule Wizard**, select the **Port** radio button, and click **Next**.
 - c On the Protocol and Ports page, select **TCP** and enter the port number **1433** in the **Specific local ports** text box, and click **Next**.
 - d On the Action page, select **Allow the connection**, and click **Next**.
 - e On the Profile page, select the **Domain, Private**, and **Public** profiles, and click **Next**.
 - f On the Name page, enter a *Name* and *Description* for this rule, and click **Finish**.
- 4 Allow access for Microsoft Distributed Transaction Coordinator.
 - a In the navigation pane, under **Windows Firewall with Advanced Security**, select and right-click **Inbound Rules**, and click **New Rule** in the action pane.
 - b On the Rule Type page click **Predefined**, click **Distributed Transaction Coordinator**, and click **Next**.
 - c On the Predefined Rules page, select all rules for **Distributed Transaction Coordinator (RPC-EPMAP)**, **Distributed Transaction Coordinator (RPC)**, **Distributed Transaction Coordinator (TCP-In)**, and click **Next**.
 - d On the Action page, select **Allow the connection**, and click **Finish**.
- 5 Exit the **Windows Firewall with Advanced Security** wizard.

Configure Service Account Privileges for Consolidated SDDC

To provision virtual machines and logical networks, configure privileges for vRealize Automation for the service account `svc-vra@rainpole.local` on both the vCenter Server and the NSX instance in the Consolidated cluster. If you add more vCenter Server instances in the future, perform this procedure on those instances as well.

Configure Service Account Privileges on the vCenter Server for Consolidated SDDC

Configure Administrator privileges for the `svc-vra` and `svc-vro` users on the vCenter Server.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to `https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client`.
 - b Log in using the following credentials.

| Option | Description |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 In the **Navigator** pane, select **Global Inventory Lists > vCenter Servers**.
- 3 Right-click the `sfo01w01vc01.sfo01.rainpole.local` instance and select **Add Permission**.
- 4 In the **Add Permission** dialog box, click the **Add** button.
The **Select Users/Groups** dialog box appears.
- 5 Select **RAINPOLE** from the **Domain** drop-down menu, and enter `svc` in the **Show Users First** text box to filter user and group names.
- 6 Select `svc-vra` and `svc-vro` from the **User/Group** list, click the **Add** button, and click **OK**.
- 7 In the **Add Permission** dialog box, select **Administrator** from the **Assigned Role** drop-down menu, and click **OK**.

The `svc-vra` and `svc-vro` users now have **Administrator** privilege on the vCenter Server.

Configure the Service Account Privilege on the NSX Instance for Consolidated SDDC

Configure Enterprise Administrator privileges for the `svc-vra@rainpole.local` service account.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to
https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client.
 - b Log in using the following credentials.

| Option | Description |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 From the **Home** menu, select **Networking & Security**.
- 3 In the **Navigator** pane, select **Users and Domains**.
- 4 Select the NSX Manager **172.16.11.66** from the drop-down menu.
- 5 Under the **Users** tab, click the **Add** icon.
The **Assign Role** wizard appears.
- 6 On the **Identify User** page, select the **Specify a vCenter User** radio button, enter **svc-vra@rainpole.local** in the **User** text box, and click **Next**.
- 7 On the **Select Roles** page, select the **Enterprise Administrator** radio button, and click **Finish**.

vRealize Automation Installation for Consolidated SDDC

A vRealize Automation installation includes installing and configuring single sign-on (SSO) capabilities, the user interface portal, and Infrastructure as a Service (IaaS) components.

After installation you can customize the installation environment and configure one or more tenants, which sets up access to self-service provisioning and life cycle management of cloud services. By using the secure portal Web interface, administrators, developers, or business users can request IT services and manage specific cloud and IT resources based on their roles and privileges. Users can request infrastructure, applications, desktops, and IT services through a common service catalog.

Load Balancing the Cloud Management Platform for Consolidated SDDC

You configure load balancing for all services and components related to vRealize Automation and vRealize Orchestrator by using an NSX Edge load balancer.

You must configure the load balancer before you deploy the vRealize Automation appliance. This is because you need the virtual IP (VIP) addresses to deploy the vRealize Automation appliance.

Add Virtual IP Addresses to the NSX Load Balancer for Consolidated SDDC

As the first step of configuring load balancing, you add virtual IP Addresses to the edge interfaces.

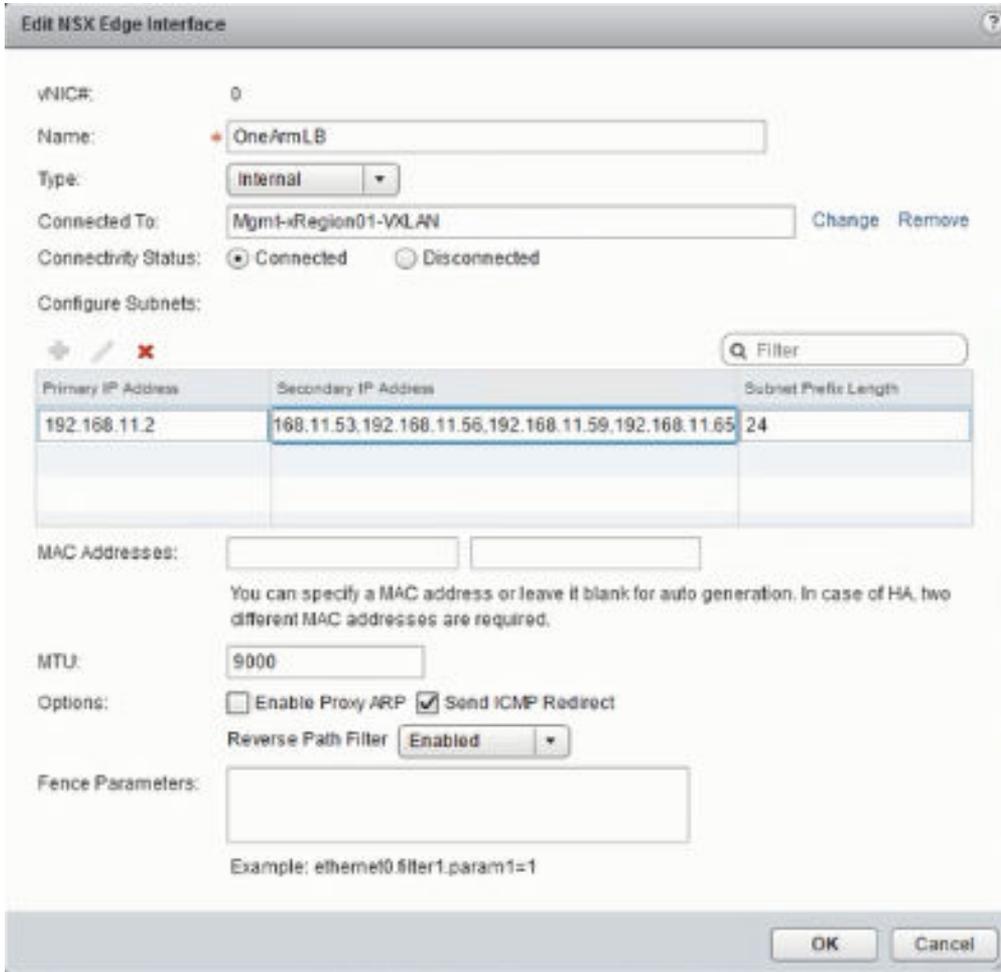
Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Click **Networking & Security**.
- 3 In the **Navigator**, click **NSX Edges**.
- 4 From the **NSX Manager** drop-down menu, select **172.16.11.66** as the NSX Manager and double-click the **sfo01w01lb01** NSX Edge to edit its network settings.
- 5 Click the **Manage** tab, click **Settings**, and select **Interfaces**.
- 6 Select the **OneArmLB** interface and click the **Edit** icon.
- 7 In the **Edit NSX Edge Interface** dialog box, add the VIP addresses of the vRealize Automation nodes in the **Secondary IP Addresses** text box.

| Setting | Value |
|----------------------|---|
| Secondary IP Address | 192.168.11.53,192.168.11.56,192.168.11.59 |



8 Click **OK** to save the configuration.

Create Application Profiles for Consolidated SDDC

To define the behavior of a particular type of network traffic, you create an application profile. After configuring a profile, you associate the profile with a virtual server. The virtual server then processes traffic according to the values specified in the profile. Using profiles enhances your control over managing network traffic, and makes traffic-management tasks easier and more efficient.

You repeat this procedure twice to create two application profiles.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to `https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client`.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 From the **Home** menu of the vSphere Web Client, select **Networking & Security**.
- 3 In the **Navigator**, click **NSX Edges**.
- 4 From the **NSX Manager** drop-down menu, select **172.16.11.66** as the NSX Manager and double-click the **sfo01w01lb01** NSX Edge to manage its network settings.
- 5 Click the **Manage** tab, click **Load Balancer**, and select **Application Profiles**.
- 6 Click the **Add** icon and in the **New Profile** dialog box, enter the following values.

| Setting | Value |
|------------------------|-------------------|
| Name | vra-https-persist |
| Type | HTTPS |
| Enable SSL Passthrough | Selected |
| Persistence | Source IP |
| Expires in (Seconds) | 1800 |

- 7 Click **OK** to save the configuration.
- 8 Repeat the same steps to create the following application profile.

| Setting | Value |
|------------------------|-----------|
| Name | vra-https |
| Type | HTTPS |
| Enable SSL Passthrough | Selected |
| Persistence | None |

Create Service Monitoring for Consolidated SDDC

The service monitor defines health check parameters for the load balancer. You create a service monitor for each component.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 From the **Home** menu of the vSphere Web Client, select **Networking & Security**.
- 3 In the **Navigator**, click **NSX Edges**.
- 4 From the **NSX Manager** drop-down menu, select **172.16.11.66** as the NSX Manager and double-click the **sfo01w01lb01** NSX Edge to manage its network settings.
- 5 Click the **Manage** tab, click **Load Balancer**, and select **Service Monitoring**.
- 6 Click the **Add** icon and in the **New Service Monitor** dialog box, configure the values for the service monitor you are adding, and click **OK**.

| Setting | vra-svr-443-monitor | vra-iws-443-monitor | vra-ims-443-monitor | vra-vro-8283-monitor |
|-------------|---------------------------|----------------------|---------------------|-------------------------|
| Name | vra-svr-443-monitor | vra-iws-443-monitor | vra-ims-443-monitor | vra-vro-8283-monitor |
| Interval | 3 | 3 | 3 | 3 |
| Timeout | 10 | 10 | 10 | 10 |
| Max Retries | 3 | 3 | 3 | 3 |
| Type | HTTPS | HTTPS | HTTPS | HTTPS |
| Expected | 204 | | | |
| Method | GET | GET | GET | GET |
| URL | /vcac/services/api/health | /wapi/api/status/web | /VMPSProvision | /vco-controlcenter/docs |
| Receive | | REGISTERED | ProvisionService | |

The screenshot shows a 'New Service Monitor' dialog box with the following configuration:

- Name: vra-svr-443-monitor
- Interval: 3 (seconds)
- Timeout: 10 (seconds)
- Max Retries: 3
- Type: HTTPS
- Expected: 204
- Method: GET
- URL: /cac/services/api/health
- Send: (empty)
- Receive: (empty)
- Extension: (empty)

- 7 Repeat [Step 6](#) to create a service monitor for each component.

Upon completion, verify that you have successfully entered the monitor names and their respective configuration values.

Create Server Pools for Consolidated SDDC

A server pool consists of back-end server members. After you create a server pool, you associate a service monitor with the pool to manage and share the back-end servers flexibly and efficiently.

The following considerations explain the design of the server pools configuration.

- The configuration uses NONE as a health monitor for all server pools. Until vRealize Automation is fully installed and started, the health monitor marks pool members as offline. Health monitors indicate the status of pool members correctly, only after vRealize Automaton is fully installed and initialized.

- The configuration disables the second pool member of three vRealize Automation VIPs (vra-svr-443, vra-iaas-web-443, vra-iaas-mgr-443). During the installation or power cycle of vRealize Automation, the service inside the second node might not be installed or initialized yet. In this period, if the load balancer passes a request to the second node, the request fails. If the second pool member is not disabled, you can experience random failures during a vRealize Automation installation, and service initialization or registration failure during a vRealize Automation power cycle.

Perform the procedure multiple times to configure five different server pools.

Table 4-3. Server Pools for the Cloud Management Platform

| Pool Name | Algorithm | Monitors | Enable Member | Member Name | IP Address | Port | Monitor Port |
|--------------|-------------|----------|---------------|-------------|---------------|------|--------------|
| vra-svr-443 | ROUND-ROBIN | NONE | Yes | vra01svr01a | 192.168.11.51 | 443 | |
| vra-iws-443 | ROUND-ROBIN | NONE | Yes | vra01iws01a | 192.168.11.54 | 443 | |
| vra-ims-443 | ROUND-ROBIN | NONE | Yes | vra01ims01a | 192.168.11.57 | 443 | |
| vra-svr-8444 | ROUND-ROBIN | NONE | Yes | vra01svr01a | 192.168.11.51 | 8444 | 443 |
| vra-vro-8283 | ROUND-ROBIN | NONE | Yes | vra01svr01a | 192.168.11.51 | 8283 | |

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to <https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client>.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 From the **Home** menu of the vSphere Web Client, select **Networking & Security**.
- 3 In the **Navigator**, click **NSX Edges**.
- 4 From the **NSX Manager** drop-down menu, select **172.16.11.66** as the NSX Manager and double-click the **sfo01w01lb01** NSX Edge to manage its network settings.
- 5 Click the **Manage** tab, click **Load Balancer**, and select **Pools**.

- 6 Click the **Add** icon, and in the **New Pool** dialog box, enter the following values.

| Setting | Value |
|-----------|-------------|
| Name | vra-svr-443 |
| Algorithm | ROUND-ROBIN |
| Monitors | NONE |

- 7 In the **New Members** dialog box, click the **Add** icon to add the first pool member.
- 8 In the **New Member** dialog box, enter the following values, and click **OK**.

| Setting | Value |
|-------------------------|---------------|
| Name | vra01svr01a |
| IP Address/VC Container | 192.168.11.51 |
| State | Enable |
| Port | 443 |
| Monitor Port | |
| Weight | 1 |

- 9 Repeat the procedure to create the remaining server pools.

Create Virtual Servers for Consolidated SDDC

After load balancing is set up, the NSX load balancer distributes network traffic across multiple servers. When a virtual server receives a request, it chooses the appropriate pool to send traffic to. Each pool consists of one or more members. You create virtual servers for all the configured server pools.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to <https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client>.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 From the **Home** menu of the vSphere Web Client, select **Networking & Security**.
- 3 In the **Navigator**, click **NSX Edges**.
- 4 From the **NSX Manager** drop-down menu, select **172.16.11.66** as the NSX Manager and double-click the **sfo01w01lb01** NSX Edge to manage its network settings.
- 5 Click the **Manage** tab, click **Load Balancer**, and select **Virtual Servers**.

- 6 Click the **Add** icon, and in the **New Virtual Server** dialog box configure the values for the virtual server you are adding, and click **OK**.

| Setting | vra-svr-443 | vra-iws-443 | vra-ims-443 | vra-svr-8444 | vra-vro-8283 |
|-----------------------|----------------------------------|---------------------------------|----------------------------------|--|--------------------------------------|
| Enable Virtual server | Selected | Selected | Selected | Selected | Selected |
| Application Profile | vra-https-persist | vra-https-persist | vra-https | vra-https-persist | vra-https-persist |
| Name | vra-svr-443 | vra-iws-443 | vra-ims-443 | vra-svr-8444 | vra-vro-8283 |
| Description | vRealize Automation Appliance UI | vRealize Automation IaaS Web UI | vRealize Automation IaaS Manager | vRealize Automation Remote Console Proxy | vRealize Orchestrator Control Center |
| IP Address | 192.168.11.53 | 192.168.11.56 | 192.168.11.59 | 192.168.11.53 | 192.168.11.53 |
| Protocol | HTTPS | HTTPS | HTTPS | HTTPS | HTTPS |
| Port | 443 | 443 | 443 | 8444 | 8283 |
| Default Pool | vra-svr-443 | vra-iws-443 | vra-ims-443 | vra-svr-8444 | vra-vro-8283 |

- 7 Repeat [Step 6](#) to create a virtual server for each component. Upon completion, verify that you have successfully entered the virtual server names and their respective configuration values.

Deploy the vRealize Automation Appliance for Consolidated SDDC

The vRealize Automation appliance is a pre-configured virtual appliance that contains the vRealize Automation server.

The server includes the vRealize Automation appliance product console, which provides a single portal for self-service provisioning and management of cloud services, authoring, administration, and governance.

Perform this procedure to deploy the vRealize Automation appliance using the configurations settings listed in the following table.

| Setting | Values |
|-------------------------------------|-------------------------------------|
| Name | vra01svr01a |
| Select a folder or datacenter | sfo01-w01fd-vra |
| Network | Mgmt-xRegion01-VXLAN (192.168.11.x) |
| Cluster | sfo01-w01-consolidated01 |
| Virtual Disk Format | Thin provision |
| VM Storage Policy | vSAN Default Storage Policy |
| Datastore | sfo01-w01-vsan01 |
| Enable SSH service in the appliance | Selected |

| Setting | Values |
|-----------------------|-------------------------------------|
| Hostname | vra01svr01a.rainpole.local |
| Initial Root Password | vra_appA_root_password |
| Default gateway | 192.168.11.1 |
| Domain Name | rainpole.local |
| Domain Name Servers | 172.16.11.4,172.16.11.5 |
| Domain Search Path | rainpole.local,sfo01.rainpole.local |
| Network 1 IP Address | 192.168.11.51 |
| Network 1 Netmask | 255.255.255.0 |

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 In the Navigator pane, select **Global Inventory Lists > vCenter Servers**.
- 3 Right-click the **sfo01w01vc01.sfo01.rainpole.local** object and select **Deploy OVF Template**.
- 4 On the **Select template** page, select **Local file**, browse to the location of the vRealize Automation Virtual Machine Template file on your file system, and click **Next**.
- 5 On the **Select name and folder** page, enter the following information, and click **Next**.

| Setting | Value |
|-------------------------------|-----------------|
| Name | vra01svr01a |
| Select a folder or datacenter | sfo01-w01fd-vra |

- 6 On the **Select a Resource** page, expand the **sfo01-w01-consolidated01** cluster, select the **sfo01-w01rp-sddc-mgmt** resource pool, and click **Next**.
- 7 On the **Review details** page, examine the virtual appliance details, such as product, version, download and disk size, and click **Next**.
- 8 On the **Accept license agreements** page, accept the end user license agreements, and click **Next**.

- 9 On the **Select storage** page, select the datastore.
 - a Select **Thin Provision** from the **Select virtual disk format** drop-down menu.
 - b Select **vSAN Default Storage Policy** from the **VM storage policy** drop-down menu.
 - c From the datastore table, select the **sfo01-m01-vsan01** vSAN datastore and click **Next**.
- 10 On the **Setup Networks** page, select the distributed port group that ends with **Mgmt-xRegion01-VXLAN** from the **Destination Network** drop-down menu and click **Next**.
- 11 On the **Customize template** page, configure the following values, and click **Next**.

| Option | Description |
|-------------------------------------|-------------------------------------|
| Enable SSH service in the appliance | Selected |
| Hostname | vra01svr01a.rainpole.local |
| Initial Root Password | vra_appA_root_password |
| Default gateway | 192.168.11.1 |
| Domain Name | rainpole.local |
| Domain Name Servers | 172.16.11.4,172.16.11.5 |
| Domain Search Path | rainpole.local,sfo01.rainpole.local |
| Network 1 IP Address | 192.168.11.51 |
| Network 1 Netmask | 255.255.255.0 |

- 12 On the **Ready to complete** page, review the configuration settings you specified and click **Finish**.
- 13 Click vCenter Server **sfo01w01vc01.sfo01.rainpole.local**. Select the **VMs** tab. Type **vra01svr01** in the search text box.
- 14 Select virtual machine **vra01svr01a** and click the **Power On** icon.
 Wait until the vRealize Automation appliance virtual machine completes its power on procedure. This process may take several minutes.
- 15 From the **Virtual Machine Console**, verify that vra01svr01a uses the configuration settings you specified.

Deploy Windows Virtual Machines for vRealize Automation for Consolidated SDDC

vRealize Automation requires several Windows virtual machines to act as IaaS components in a distributed configuration.

Create vSphere Image Customization Specifications for Consolidated SDDC

Create vSphere image customization specifications to use with your deployments. The customization specification you create customizes the guest operating systems of the virtual machines that host the vRealize Automation IaaS Web Server and IaaS Manager Services.

Customization specifications are XML files that contain guest operating system settings for virtual machines. You create customization specifications with the **Guest Customization** wizard, and manage specifications using the Customization Specification Manager. vCenter Server saves the customized configuration parameters in the vCenter Server database. When you clone a virtual machine or deploy a virtual machine from a template, you can customize the guest operating system of the virtual machine to change properties such as the computer name, network settings, and license settings. When you apply an image customization specification to the guest operating system during virtual machine cloning or deployment, you prevent conflicts that might result if you deploy virtual machines with identical settings, such as duplicate computer names.

Create a Customization Specification File for IaaS Servers for Consolidated SDDC

Create a vSphere Image Customization template to use with your vRealize Automation IaaS Servers deployment.

You can supply a custom sysprep answer file as an alternative to specifying many of the settings in the **Guest Customization** wizard. The vSphere Image Customization template sysprep answer file stores a number of customization settings such as computer name, licensing information, and workgroup or domain settings.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 From **Home** page, under **Policies and Profiles**, click **Customization Specification Manager**.
- 3 Select **sfo01w01vc01.sfo01.rainpole.local** from the **vCenter Server** drop-down menu.
- 4 Click the **Create a new specification** icon.
The **Guest Customization** wizard opens.
- 5 On the **Specify Properties** page, configure the following values, and click **Next**.

| Setting | Value |
|--------------------------------|---------------|
| Target VM Operating System | Windows |
| Use custom SysPrep answer file | Deselected |
| Customization Spec Name | vra7-template |

- 6 On the **Set Registration Information** page, configure the following values, and click **Next**.

| Setting | Value |
|--------------|-------------|
| Name | Rainpole |
| Organization | Rainpole IT |

- 7 On the **Set Computer Name** page, select the **Enter a name in the Clone/Deploy wizard** radio button, and click **Next**.

- 8 On the **Enter Windows License** page, configure the following values, and click **Next**.

If you are using Microsoft License Server, or have multiple single license keys, leave the **Product Key** text box blank.

| Setting | Value |
|------------------------------------|---------------------------|
| Product Key | <i>volume_license_key</i> |
| Include Server License Information | Selected |
| Server License Mode | Per seat |

- 9 On the **Set Administrator Password** page, configure the following values, and click **Next**.

| Setting | Value |
|--|--------------------------------|
| Password | <i>local_administrator_pwd</i> |
| Automatically logon as Administrator | Selected |
| Number of times to logon automatically | 1 |

- 10 On the **Time Zone** page, select **(GMT) Coordinated Universal Time** from the **Time Zone** drop-down menu, and click **Next**.

- 11 On the **Run Once** page, type `net localgroup administrators rainpole\svc-vra /add` in the text box and click **Add**. This command will add service account rainpole\svc-vra into virtual machine's local administrators group. Click **Next**.

- 12 On the **Configure Network** page, select the **Manually select custom settings** radio button, select **NIC1** from the list of network interfaces in the virtual machine, and click **Edit**.

The **Edit Network** dialog box opens.

- 13 In the **Edit Network** dialog box, on the **IPv4** page, configure the following values and click **DNS**.

| Setting | Value |
|---|---------------|
| Prompt the user for an address when the specification is used | Selected |
| Subnet Mask | 255.255.255.0 |
| Default Gateway | 192.168.11.1 |

14 On the **DNS** page, provide DNS servers and search suffixes.

- a Specify the following DNS server settings.

| Setting | Value |
|--------------------------------------|-------------|
| Use the following DNS server address | Selected |
| Preferred DNS Server | 172.16.11.4 |
| Alternate DNS Server | 172.16.11.5 |

- b Enter **rainpole.local** in the **For all connections with TCP/IP enabled** text box and click the **Add** button.
- c Enter **sfo01.rainpole.local** in the **For all connections with TCP/IP enabled** text box and click the **Add** button.
- d Click **OK** to save settings and close the Edit Network dialog box, and click **Next**.

15 On the **Set Workgroup or Domain** page, enter credentials that have privileges to join the domain, and click **Next**.

| Setting | Value |
|-----------------------|---------------------------------|
| Windows Server Domain | rainpole.local |
| Username | svc-domain-join@rainpole.local |
| Password | <i>svc-domain-join_password</i> |

16 On the **Set Operating System Options** page, select the **Generate New Security ID (SID)** check box, and click **Next**.

17 On the **Ready to complete** page, review the configuration settings that you entered, and click **Finish**.

The customization specification you created is listed in the Customization Specification Manager and can be used to customize virtual machine guest operating systems.

Create Windows Virtual Machines for vRealize Automation for Consolidated SDDC

vRealize Automation requires multiple Windows virtual machines to act as IaaS components in a distributed configuration. Additional virtual machines can be introduced to supplement the installation with high availability or to more evenly distribute IaaS components.

To facilitate cloning, this design uses the customization specification templates and the windows-2012r2-64 VM template. Repeat this procedure by using the information in the following table to create all needed VMs.

| Name for Virtual Machine | NetBIOS name | vCenter Folder | IP | vCPU number | Memory Size | Image Customization Specification Template | Network |
|--------------------------|--------------|-----------------|---------------|-------------|-------------|--|------------------------------------|
| vra01iws01a | vra01iws01a | sfo01-w01fd-vra | 192.168.11.54 | 2 | 4 GB | vra7-template | vxxw-dvs-xxxx-Mgmt-xRegion01-VXLAN |
| vra01ims01a | vra01ims01a | sfo01-w01fd-vra | 192.168.11.57 | 2 | 4 GB | vra7-template | vxxw-dvs-xxxx-Mgmt-xRegion01-VXLAN |

Prerequisites

- Verify that you have created the Windows 2012 R2 VM template named **windows-2012r2-64**.
- Verify that windows-2012r2-64 was created with the latest version of VM Tools installed and is updated with the latest Windows updates.
- SHA512 is disabled in Windows for TLS 1.2 by default. If SHA512 certificates are used for vRealize Automation, verify that you have installed the Windows update in Microsoft KB2973337.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 In the **Navigator** pane, select **Global Inventory Lists > vCenter Servers** and click the **sfo01w01vc01.sfo01.rainpole.local** instance.
- 3 Click **VM Templates in Folders**, right-click the IaaS Windows template **windows-2012r2-64**, and select **New VM from this Template**.
- 4 On the **Select a name and folder** page of the **Deploy From Template** wizard, specify a name and location for the virtual machine.
 - a Enter vra01iws01a in the **Enter a name for the virtual machine** text box.
 - b In the **Select a location for the virtual machine** pane, select the **sfo01-w01fd-vra** folder in the **sfo01-w01dc** data center under **sfo01w01vc01.sfo01.rainpole.local**, and click **Next**.
- 5 On the **Select a compute resource** page, select the **sfo01-w01rp-sddc-mgmt** resource pool, and click **Next**.

- 6 On the **Select storage** page, select the datastore on which to create the virtual machine's disks.
 - a From the **VM Storage Policy** drop-down menu, select **vSAN Default Storage Policy**.
 - b Select the **sfo01-w01-vsan01** vSAN datastore from the datastore table and click **Next**.
- 7 On the **Select Clone options** page, select the **Customize the operating system** check box, and click **Next**.
- 8 On the **Customize guest OS** page, select the **vra7-template** from the table, and click **Next**.
- 9 On the **User Settings** page, enter the following values, and click **Next**.

| Setting | Value |
|------------------|---------------|
| NetBIOS name | vra01iws01a |
| IPv4 address | 192.168.11.54 |
| IPv4 subnet mask | 255.255.255.0 |

- 10 On the **Ready to Complete** page, review your settings and click **Finish**.
When the deployment of the virtual machine completes, you can customize the virtual machine.
- 11 In the Navigator, select **VMs and Templates**.
- 12 Right-click the **vra01iws01a** virtual machine and select **Edit Settings**.
- 13 Click **Virtual Hardware** and configure the settings for **CPU**, **Memory**, and the **Network adapter 1**.
 - a Select **2** from the **CPU** drop-down menu.
 - b Set the **Memory** settings to **4096 MB**.
 - c Expand **Network adapter 1** and select **vxw-dvs-xxxx-Mgmt-xRegion01-VXLAN** from the drop-down menu and click **OK**.
- 14 Right-click the virtual machine **vra01iws01a**, and select **Power > Power on**.
- 15 From the Virtual Machine Console, verify that vra01iws01a reboots, and uses the configuration settings that you specified.
- 16 Log in to the Windows operating system and perform final verification and customization.
 - a Verify that the IP address, computer name, and domain are correct.
 - b Verify vRealize Automation service account svc-vra@rainpole.local has been added to the Local Administrators Group.
- 17 Repeat this procedure to deploy and configure the remaining virtual machines.

Install vRealize Automation Management Agent on Windows IaaS VMs for Consolidated SDDC

For each Windows virtual machine deployed as part of the vRealize Automation installation, a management agent must be deployed to facilitate the installation of the Windows dependencies and vRealize Automation components.

Perform this procedure to install the Management Agent on each Windows IaaS virtual machine listed below.

- vra01iws01a.rainpole.local
- vra01ims01a.rainpole.local

Procedure

- 1 Log in to the IaaS virtual machine by using a Remote Desktop Protocol (RDP) client.
 - a Open an RDP connection to the **vra01iws01a.rainpole.local** virtual machine.
 - b Log in using the following credentials.

| Settings | Value |
|-----------|------------------|
| User name | rainpole\svc-vra |
| Password | svc-vra_password |

- 2 Download the vRealize Management Agent.
 - a Open a Web browser and go to **https://vra01svr01a.rainpole.local:5480/installer**.
 - b Download the Management Agent Installer .msi package.
- 3 Install the vRealize Management Agent.
 - a Start the vCAC-IaaSManagementAgent-Setup.msi installer.
 - b On the **Welcome** page, click **Next** to start the install process.
 - c On the **EULA** page, select the **I accept the terms of this agreement** check box and click **Next**.
 - d On the **Destination** Folder page, click **Next** to install in the default path.
 - e On the **Management Site Service** page, enter the following settings and click **Load**.

| Setting | Value |
|-----------------------|--|
| vRA Appliance Address | https://vra01svr01a.rainpole.local:5480 |
| Root username | root |
| Password | vra_appA_root_password |

- f Select the **I confirm the fingerprint matches the Management Site Service SSL certificate** check box, and click **Next**.
- 4 On the **Management Agent Account Configuration** page, enter the following credentials and click **Next**.

| Setting | Value |
|----------|------------------|
| Username | rainpole\svc-vra |
| Password | svc-vra_password |

- 5 On the **Ready to Install** page, click **Install**.

- 6 Repeat the procedure to install the Management Agent on the remaining Windows IaaS virtual machines.

Install the vRealize Automation Environment for Consolidated SDDC

You use the **Installation** wizard to complete the initial installation of the vRA server and fully deploy the IaaS components.

Once you start the wizard, you must complete it. If you cancel the wizard, you must redeploy the appliance to run the wizard again.

Procedure

- 1 Log in to the vRealize Automation appliance.
 - a Open a Web browser and go to **https://vra01svr01a.rainpole.local:5480**
 - b Log in using the following credentials.

| Settings | Value |
|-----------|-------------------------------|
| User name | root |
| Password | <i>vra_appA_root_password</i> |

- 2 On the **Welcome to the vRealize Automation Installation Wizard** page, click **Next**.
- 3 On the **End User License Agreement** page, accept the terms of the agreement and click **Next**.
- 4 On the **Deployment Type** page, specify the following settings and click **Next**.

| Setting | Value |
|-------------------------------------|----------|
| Enterprise deployment | Selected |
| Install Infrastructure as a Service | Selected |

- 5 On the **Installation Prerequisites** page, specify the following time server settings, click **Change Time Settings**, and click **Next**.

| Setting | Value |
|-----------------------------------|--------------------------|
| Virtual Appliance Time Sync. Mode | Use Time Server |
| Time Server | ntp.sfo01.rainpole.local |

- 6 On the **Discovered Hosts** page, verify that all Windows IaaS virtual machines are listed and that the time offset is within the -1 / 0 / 1 values and click **Next**.

Note The Time Offset column shows the time delta between the vRealize Automation appliance and the Windows IaaS VMs. Time synchronization is critical. If there are values outside of the acceptable values, you must remediate those values before you proceed.

- 7 On the **vRealize Appliances** page, click **Next**.

- 8 On the **Server Roles** page, select the respective check boxes for each server based on their role and click **Next**.

| Hosts | Role |
|----------------------------|--------------------------------------|
| vra01iws01a.rainpole.local | Initial Web Server and Model Manager |
| vra01ims01a.rainpole.local | Manager Service, DEM, Agent |

- 9 On the **Prerequisite Checker** page, verify that the Windows servers for IaaS components are correctly configured.
- Click **Run** and wait for the prerequisite checker to complete.
 - If warnings appear, click **Fix**.
 - Verify that the status of all IaaS components changes to **OK** and click **Next**.
- 10 On the **vRealize Automation Host** page, enter `vra01svr01.rainpole.local` in the **vRealize Address** text box and click **Next**.
- 11 On the **Single Sign-On** page, enter and confirm `vra_administrator_password` for the default tenant account `administrator@vsphere.local`, and click **Next**.
- 12 On the **IaaS Host** page, configure the following values and click **Next**.

| Setting | Value |
|-------------------------|---------------------------|
| IaaS Web Address | vra01iws01.rainpole.local |
| Manager Service Address | vra01ims01.rainpole.local |
| Security Passphrase | <code>sql_db_pass</code> |
| Confirm Passphrase | <code>sql_db_pass</code> |

- 13 On the **Microsoft SQL Server** page, configure the following values, click **Validate**, wait for successful validation, and click **Next**.

| Setting | Value |
|---------------------------------|-----------------------------|
| Server Name | vra01mssql01.rainpole.local |
| Database Name | vra-onepod-db |
| Create new database | Selected |
| Default Settings | Selected |
| Use SSL for database connection | Deselected |
| Windows Authentication | Selected |

- 14 On the **Web Role** page, configure the following values for the IaaS servers, click **Validate**, wait for successful validation, and click **Next**.

| Setting | Value |
|--------------|------------------|
| Website Name | Default Web Site |
| Port | 443 |

| Setting | Value |
|--------------------------------------|------------------------|
| vra01iws01a.rainpole.local user name | rainpole.local\svc-vra |
| vra01iws01a.rainpole.local password | svc-vra_password |

- 15 On the **Manager Service Role** page, configure the following values for the IaaS Web servers, click **Validate**, wait for successful validation, and click **Next**.

| Active | IaaS Host Name | Username | Password |
|----------|----------------------------|------------------------|------------------|
| Selected | vra01ims01a.rainpole.local | rainpole.local\svc-vra | svc-vra_password |

- 16 On the **Distributed Execution Managers** page, click the **Add** icon as needed, specify the following settings, click **Validate**, wait for successful validation, and click **Next**.

| IaaS Host Name | Instance Name | Username | Password |
|----------------------------|---------------|------------------------|------------------|
| vra01ims01a.rainpole.local | DEM-WORKER-01 | rainpole.local\svc-vra | svc-vra_password |
| vra01ims01a.rainpole.local | DEM-WORKER-02 | rainpole.local\svc-vra | svc-vra_password |
| vra01ims01a.rainpole.local | DEM-WORKER-03 | rainpole.local\svc-vra | svc-vra_password |

- 17 On the **Agents** page, configure the following values, click **Validate**, wait for successful validation, and click **Next**.

| IaaS Host Name | Agent Name | Endpoint | Agent Type | Username | Password |
|----------------------------|------------------|-----------------------------------|------------|------------------------|------------------|
| vra01ims01a.rainpole.local | VSPHERE-AGENT-01 | sfo01w01vc01.sfo01.rainpole.local | vSphere | rainpole.local\svc-vra | svc-vra_password |

- 18 On the next three certificates configuration pages, configure the certificates for all vRealize Automation.

You complete three different certificate configuration pages for the different nodes using the same process and values from the `vra-for-1-pod.key` file for the Private Key and the `vra-for-1-pod.3.pem` file for all certificates stored in the `vra` folder. For more information on certificate configuration, see "Use the Certificate Generation Utility to Generate CA-Signed Certificates for the SDDC Management Components" in the *VMware Validated Design Planning and Preparation* document.

- a On the vRealize Appliance Certificate page, specify the following settings, click **Save Imported Certificate**, and click **Next**.

| Setting | Value |
|--------------------|---|
| Certificate Action | Import |
| RSA Private Key | -----BEGIN RSA PRIVATE KEY----- <i>private_key_value</i> -----END RSA PRIVATE KEY----- |
| Certificate Chain | -----BEGIN CERTIFICATE----- <i>Server_certificate_value</i> -----END CERTIFICATE-----BEGIN CERTIFICATE----- <i>Intermediate_CA_certificate_value</i> -----END CERTIFICATE-----BEGIN CERTIFICATE----- <i>Root_CA_certificate_value</i> -----END CERTIFICATE----- |
| Passphrase | <i>vra_cert_passphrase</i> |

- b Repeat this step on the **Web Certificate** and the **Manager Service Certificate** pages of the vRealize Automation Installation Wizard.

- 19 On the **Load Balancers** page, click **Next**.

Note You configured load balancing in [Load Balancing the Cloud Management Platform for Consolidated SDDC](#)

- 20 On the **Validation** page, click **Validate**, wait for successful validation, and click **Next**.
- 21 On the **Create Snapshots** page, do not close the wizard. Navigate to the vSphere Web Client, and create snapshots of all vRealize Automation virtual machines.
- a Open a Web browser and go to `https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client`.

- b Log in using the following credentials.

| Setting | Value |
|-----------|-------------------------------|
| User name | administrator@vsphere.local |
| Password | <i>vsphere_admin_password</i> |

- c From the **Home** menu, select **VMs and Templates**.
- d In the **Navigator** pane, expand the `sfo01w01vc01.sfo01.rainpole.local > sfo01-w01dc > sfo01-w01fd-vra` folder.
- e Right-click the `vra01svr01a` VM and select **Snapshots > Take Snapshot**.

- f In the **Take VM Snapshot** dialog box, specify the following settings, and click **OK**.

| Setting | Value |
|---------------------------------------|--|
| Name | Prior to vRA IaaS component installation |
| Snapshot the virtual machine's memory | Deselected |
| Quiesce guest file system | Deselected |

- g Repeat the step to create snapshots of the remaining vRealize Automation VMs.

| Virtual Machine | vCenter Folder |
|-----------------|-----------------|
| vra01mssql01 | sfo01-w01fd-vra |
| vra01iws01a | sfo01-w01fd-vra |
| vra01ims01a | sfo01-w01fd-vra |

After you create snapshots of all virtual machines, return to the **vRealize Automation Installation** wizard.

- 22 On the **Create Snapshots** page, click **Next**.
- 23 On the **Installation Details** page, click **Install**.
- 24 On the **Installation Details** page, verify that all items complete successfully and click **Next**.
- 25 On the **Licensing** page, enter your *vRealize_Automation_License_Key*, click **Submit Key**, and click **Next**.
- 26 On the **Telemetry** page, select **Join the VMware Customer Experience Improvement Program** and click **Next**.
- 27 On the **Post-Installation Options** page, select **Continue** to proceed without creating an initial content and click **Next**.
- 28 Click **Finish** to exit the wizard.

vRealize Automation Default Tenant Configuration for Consolidated SDDC

In shared cloud environments, where multiple companies, divisions or independent groups are using a common infrastructure fabric, it is necessary to set up virtual private clouds where authentication, resources, policy are customized to the needs of each group. Tenants are useful for isolating the users, resources, and services of one tenant from those of other tenants.

Create a Local Tenant Administrator for Consolidated SDDC

To support Integrated Windows Authentication, join the VMware Identity Manager connectors to the Active Directory domain. Perform this operation in the default tenant **vsphere.local**.

Create a local user for the default tenant in vRealize Automation and assign the Tenant Administrator role to the default tenant.

Procedure

- 1 Log in to the vRealize Automation portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------------|
| User name | administrator |
| Password | <i>vra_administrator_password</i> |
| Domain | vsphere.local |

- 2 On the **Tenants** page, click the default tenant **vsphere.local** to edit its settings.
- 3 Click the **Local users** tab and click **New** to add a local user to the default tenant.
- 4 In the **User Details** dialog box, specify the following settings, click **OK**, and click **Next**.

| Setting | Value |
|------------------|---------------------------------------|
| First name | vRA |
| Last name | LocalDefaultAdmin |
| Email | vra-localdefaultadmin@vsphere.local |
| User name | vra-localdefaultadmin |
| Password | <i>vra-localdefaultadmin_password</i> |
| Confirm password | <i>vra-localdefaultadmin_password</i> |

- 5 On the **Administrators** tab, specify tenant and infrastructure administrators.
 - a In the **Tenant administrators** search text box, enter **vra-localdefaultadmin** and press Enter.
 - b In the **laaS administrators** search text box, enter **vra-localdefaultadmin** and press Enter.
 - c Click **Finish**.
- 6 Log out of the vRealize Automation portal.

Join Connectors to an Active Directory Domain for Consolidated SDDC

To use an Active Directory domain for tenant authentication, you must join a VMware Identity Manager connector to vRealize Automation.

Each vRealize Automation appliance includes a connector that supports user authentication. By default, one connector is typically configured to perform a directory synchronization. Perform the procedure by using the `vra-localdefaultadmin` that you configured in the previous procedure.

Procedure

- 1 Log in to the vRealize Automation portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/vsphere.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|--------------------------------|
| User name | vra-localdefaultadmin |
| Password | vra-localdefaultadmin_password |

- 2 Navigate to **Administration > Directories Management > Connectors**.
- 3 For the **first.connector**, click **Join Domain**, specify the following settings, and click **Join Domain**.

| Setting | Value |
|-----------------|---------------------------------|
| Domain | Custom Domain rainpole.local |
| Domain User | svc-domain-join |
| Domain Password | svc-domain-join_password |

- 4 Log out from the vRealize Automation portal.

vRealize Automation Tenant Creation for Consolidated SDDC

You create additional vRealize Automation tenants so that users can access the applications and resources that they need to complete their work assignments.

A tenant is a group of users with specific privileges who work within a software instance. Administrators can create additional tenants so that users can log in and complete their work assignments. Administrators can create as many tenants as needed for system operation. Administrators must specify basic configuration such as name, login URL, local users, and administrators. The tenant administrator must also log in and set up an appropriate Active Directory connection and apply a custom branding to tenants.

Create the Rainpole Tenant for Consolidated SDDC

The vRealize Automation Identity Manager provides Single-Sign On (SSO) capability for vRealize Automation users.

vRealize Automation Identity Manager is an authentication broker and security token exchange that interacts with the Active Directory to authenticate users. As the system administrator, you configure Identity Manager to provide access to vRealize Automation by the Rainpole tenant. The Rainpole tenant is the tenant through which you manage system-wide configuration, that includes global system defaults for branding, notifications, and monitor system logs.

Procedure

- 1 Log in to the vRealize Automation portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------------|
| User name | administrator |
| Password | <i>vra_administrator_password</i> |
| Domain | vsphere.local |

- 2 On the **Tenants** page, click **New** to configure a new tenant.
- 3 On the **General** tab, enter the following settings for the Rainpole tenant, and click **Submit and Next**.

| Setting | Value |
|---------------|------------------------------|
| Name | Rainpole |
| URL Name | rainpole |
| Contact email | administrator@rainpole.local |

- 4 On the **Local Users** tab, click **New** to add a local user for the tenant.
- 5 In the **User Details** dialog box, configure the following settings, click **OK**, and click **Next**.

| Setting | Value |
|------------------|--|
| First name | vRA |
| Last name | LocalRainpoleAdmin |
| Email | vra-localrainpoleadmin@rainpole.local |
| User name | vra-localrainpoleadmin |
| Password | <i>vra-localrainpoleadmin_password</i> |
| Confirm password | <i>vra-localrainpoleadmin_password</i> |

- 6 On the **Administrators** tab, specify tenant and infrastructure administrators.
 - a Enter **vra-localrainpoleadmin** in the **Tenant administrators** search text box and press **Enter**.
 - b Enter **vra-localrainpoleadmin** in the **IaaS administrators** search text box and press **Enter**.
 - c Click **Finish**.
- 7 Log out of vRealize Automation portal.

Configure Identity Management for the vRealize Automation Tenant for Consolidated SDDC

vRealize Automation uses VMware Identity Manager to authenticate users.

Each tenant must be associated with at least one directory as part of the tenant creation. You can add more directories if necessary. Perform the procedure by using the `vra-localrainpoleadmin` that you configured.

Procedure

- 1 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **`https://vra01svr01.rainpole.local/vcac/org/rainpole`**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|--|
| User name | <code>vra-localrainpoleadmin</code> |
| Password | <code>vra-localrainpoleadmin_password</code> |

- 2 Navigate to **Administration > Directories Management > Directories**.
- 3 Click **Add Directory** and select **Add Active Directory over LDAP/IWA**, specify the following settings, and click **Save & Next**.

| Setting | Value |
|----------------------------|--|
| Directory Name | <code>rainpole.local</code> |
| Directory Type | Active Directory (Integrated Windows Authentication) |
| Sync Connector | <code>vra01svr01a.rainpole.local</code> |
| Authentication | Yes |
| Directory Search Attribute | <code>sAMAccountName</code> |
| Certificates | Deselected |
| Domain Name | <code>rainpole.local</code> |
| Domain Admin Username | <code>domain administrator</code> |
| Domain Admin Password | <code>domain_admin_password</code> |
| Bind User UPN | <code>svc-vra@rainpole.local</code> |
| Bind DN Password | <code>svc-vra_password</code> |

- 4 On the **Select the Domains** page, select **rainpole.local (RAINPOLE)**, and click **Next**.
- 5 On the **Map User Attributes** page, click **Next**.
- 6 On the **Select the groups (users) you want to sync** page, enter the group DNs to sync.
 - a Click the **Add** icon to add the distinguished name to the search criteria.
 - b In the **Specify the group DNs** text box, enter `dc=rainpole,dc=local` and click **Find Groups**.
 - c After the **Groups to sync** value updates, click the **Select** button.

- d Select the following groups and click **Save**.
 - ug-vra-admins-rainpole
 - ug-vra-archs-rainpole
 - ug-SDDC-Admins
 - ug-SDDC-Ops
 - ug-vROAdmins
 - e Click **Next**.
- 7 On the **Select the Users you would like to sync** page, enter the user DNs to sync.
 - a Click the **Add** icon to add the distinguished name to the search criteria.
 - b In the **Specify the user DNs** text box, enter **cn=users,dc=rainpole,dc=local**, click the **Add** icon on the same row, and click **Next**.
 - 8 On the **Review** page, click **Sync Directory**.

Assign Tenant Administrative Roles to Active Directory Users for Consolidated SDDC

After vRealize Automation Directories Management is associated with your Active Directory domain, domain users can administer the tenant. Assign domain user groups for tenant and infrastructure administrators.

Procedure

- 1 Log in to the vRealize Automation portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------------|
| User name | administrator |
| Password | vra_administrator_password |
| Domain | vsphere.local |

- 2 On the **Tenants** page, click the Rainpole tenant to edit its settings.
- 3 Click the **Administrators** tab to assign domain user groups for tenant and infrastructure administrators.
 - a Enter **ug-vra-admins-rainpole** in the **Tenant administrators** search text box and press **Enter**.
 - b Enter **ug-vra-admins-rainpole** in the **laaS administrators** search text box and press **Enter**.
 - c Click **Finish**.

Brand the Tenant Login Pages for Consolidated SDDC

You can apply custom branding on a per-customer basis to the vRealize Automation tenant login pages.

System administrators control the default branding for all tenants. As a tenant administrator, you change the branding of the portal. That includes the logo, the background color, and the information in the header and footer. If the branding for a tenant is changed, a tenant administrator can revert to the system defaults.

Procedure

- 1 Log in to the vRealize Automation portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------------|
| User name | administrator |
| Password | vra_administrator_password |
| Domain | vsphere.local |

- 2 Navigate to **Administration > Branding** and deselect the **Use default** check box.
- 3 On the **Header** tab, specify the following settings for the header branding.

| Setting | Value |
|----------------------|-------------------------------|
| Company Name | Rainpole |
| Product Name | Infrastructure Service Portal |
| Background hex color | 3989C7 |
| Text hex color | FFFFFF |

- 4 Click the **Footer** tab, specify the following settings for the footer branding, and click **Finish**.

| Setting | Value |
|---------------------|--|
| Copyright notice | Copyright Rainpole. All Rights Reserved. |
| Privacy policy link | https://www.rainpole.local |
| Contact link | https://www.rainpole.local/contact |

Configure the Default Email Servers for Consolidated SDDC

System administrators configure inbound and outbound email servers to handle email notifications about events involving tenants machines. System administrators can create only one inbound email server and one outbound email server. These servers are the defaults for all tenants.

If tenant administrators do not override the default email server settings before they enable notifications, vRealize Automation uses the globally configured email server.

Procedure

- 1 Log in to the vRealize Automation portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------------|
| User name | administrator |
| Password | <i>vra_administrator_password</i> |
| Domain | vsphere.local |

- 2 Navigate to **Administration > Email Servers**, and click **New**.
- 3 In the **New Email Server** dialog box, select **Email - Inbound**, and click **OK**.
- 4 On the **New Inbound Email** page, specify the following values, click **Test Connection** to verify that the settings are correct, and click **OK**.

| Setting | Value |
|-----------------|-----------------------------------|
| Name | Rainpole-Inbound |
| Security | Deselected |
| Protocol | IMAP |
| Server Name | email.rainpole.local |
| Server Port | 143 |
| Folder Name | INBOX |
| Processed Email | Deselected |
| User Name | administrator@rainpole.local |
| Password | <i>vra_administrator_password</i> |
| Email Address | svc-vra@rainpole.local |

- 5 On the **Email Servers** page, click **New** to configure the outbound server settings.
- 6 In the **New Email Server** dialog box, select **Email - Outbound**, and click **OK**.
- 7 On the **New Outbound Email** page, specify the following values, click **Test Connection** to verify that the settings are correct, and click **OK**.

| Setting | Value |
|-------------------|------------------------------|
| Name | Rainpole-Outbound |
| Server Name | email.rainpole.local |
| Encryption Method | None |
| Server Port | 25 |
| Authentication | Selected |
| User Name | administrator@rainpole.local |

| Setting | Value |
|----------------|-----------------------------------|
| Password | <i>vra_administrator_password</i> |
| Sender Address | svc-vra@rainpole.local |

- 8 Log out of vRealize Automation portal.

Embedded vRealize Orchestrator Configuration for Consolidated SDDC

VMware Embedded vRealize Orchestrator is a platform that provides a library of extensible workflows to allow you to create and run automated, configurable processes to manage the VMware vSphere infrastructure and other VMware and third-party technologies.

vRealize Orchestrator is composed of three distinct layers: an orchestration platform that provides the common features required for an orchestration tool, a plug-in architecture to integrate control of subsystems, and a library of workflows. vRealize Orchestrator is an open platform that can be extended with new plug-ins and libraries, and can be integrated into larger architectures through a REST API.

Configure the Embedded vRealize Orchestrator for Consolidated SDDC

Configure the vRealize Orchestrator services to provide the SDDC foundation orchestration engine.

Configure the Embedded vRealize Orchestrator Service in the vRealize Automation Appliance for Consolidated SDDC

To enable the embedded vRealize Orchestrator functionality, configure the vRealize Orchestrator service in the vRealize Automation appliance.

Procedure

- ◆ Log in to the vRealize Automation Appliance by using Secure Shell (SSH) client to configure the embedded vRealize Orchestrator.
 - a Open an SSH connection to `vra01svr01a.rainpole.local` using the following credentials.

| Setting | Value |
|-----------|----------------------------|
| User name | root |
| Password | <i>hostA_root_password</i> |

- b Start `vco-configurator` service using the command `service vco-configurator start`.



```
vra01svr01a.rainpole.local - PuTTY
vra01svr01a:~ # service vco-configurator start
Starting tcServer
Using CATALINA_BASE:   /var/lib/vco/configuration
Using CATALINA_HOME:   /opt/pivotal/pivotal-tc-server-standard/tomcat-8.5.4.B.RELEASE
Using CATALINA_TMPDIR: /var/lib/vco/configuration/temp
Using JRE_HOME:        /usr/java/jre-vmware
Using CLASSPATH:       /opt/pivotal/pivotal-tc-server-standard/tomcat-8.5.4.B.RELEASE/bin/bootstrap.jar:/opt/pivotal/pivotal-tc-server-standard/tomcat-8.5.4.B.RELEASE/bin/tomcat-juli.jar
Using CATALINA_PID:    /var/lib/vco/configuration/logs/tcserver.pid
Tomcat started.
Status:                RUNNING as PID=3742
vra01svr01a:~ #
```

- c Verify the status of vco-configurator using the command `service vco-configurator status`.

```
vra01svr01a:~ # service vco-configurator status
Status-Ing tcServer
Instance name:      configuration
Runtime version:   0.5.4.B.RELEASE
tc Runtime Base:   /var/lib/vco/configuration
Status:            RUNNING as PID=3742
vra01svr01a:~ #
```

- d Run the command `chkconfig vco-configurator on` to enable automatic restart of the vco-configurator service upon subsequent reboots of the vRealize Automation appliance.

Configure Authentication Provider for vRealize Orchestrator for Consolidated SDDC

Configure vRealize Orchestrator to use the Rainpole local tenant in vRealize Automation for authentication. By associating vRealize Orchestrator authentication to a non-default tenant, vRealize Orchestrator runs workflows with end-user permissions. If vRealize Orchestrator authenticates using the default tenant, Orchestrator users always have administrative rights.

Procedure

- 1 Log in to the vRealize Orchestrator Control Center.
 - a Open a Web browser and go to **`https://vra01svr01.rainpole.local:8283/vco-controlcenter`**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------------|
| User name | administrator |
| Password | <i>vra_administrator_password</i> |
| Domain | vsphere.local |

- 2 Configure vRealize Automation as a vRealize Orchestrator authentication provider.
 - a On the **Home** page, under **Manage**, click **Configure Authentication Provider**.
 - b In the **Default Tenant** text box, click the **Change** button, enter **rainpole**, and click **Apply**.
 - c In the **Admin group** text box, enter **ug-vR0** and click **Search**.
 - d From the drop-down menu, select **rainpole.local\ug-vROAdmins** and click **Save Changes**.

The control center logs you out.

- 3 Verify that the role-based access control (RBAC) is enabled in the control center by logging in as svc-vra.

- a Open a Web browser and go to **https://vra01svr01.rainpole.local:8283/vco-controlcenter**.
- b Log in using the following credentials.

| Setting | Value |
|-----------|-------------------------|
| Domain | rainpole.local |
| User name | svc-vra |
| Password | <i>svc-vra_password</i> |

- c Log out of the control center.

- 4 Restart the vRealize Orchestrator services.

- a Open an SSH connection to **vra01svr01a.rainpole.local**.
- b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------------|
| User name | root |
| Password | <i>hostA_root_password</i> |

- c Run the following commands.

```
service vco-server restart
service vco-configurator restart
```

- 5 Log back in to the control center as the svc-vra user.

Note The log in process might be delayed due to the vRealize Orchestrator services restarting.

- a Open a Web browser and go to **https://vra01svr01.rainpole.local:8283/vco-controlcenter**.
- b Log in using the following credentials.

| Setting | Value |
|-----------|-------------------------|
| Domain | rainpole.local |
| User name | svc-vra |
| Password | <i>svc-vra_password</i> |

Validate the Configuration of vRealize Orchestrator for Consolidated SDDC

You can verify that Embedded vRealize Orchestrator is configured properly by opening the **Validate Configuration** page in the Control Center.

Procedure

- 1 Log in to the Embedded vRealize Orchestrator Control Center.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local:8283/vco-controlcenter**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|------------------|
| Domain | rainpole.local |
| User name | svc-vra |
| Password | svc-vra_password |

- 2 On the **Home** page, under **Manage**, click **Validate Configuration**, and verify that all check marks are green.

Add Compute vCenter Server Instance to Embedded vRealize Orchestrator for Consolidated SDDC

Add each vCenter Server instance that contributes resources to vRealize Automation and uses vRealize Orchestrator workflows to allow for communication.

Procedure

- 1 Download and Install the vRealize Orchestrator Client.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local**.
 - b Click **vRealize Orchestrator Client**.
 - c On the **VMware vRealize Orchestrator Login** page, log in to the Embedded vRealize Orchestrator by using the following hostname and credentials.

| Setting | Value |
|-----------|-------------------------------|
| Host name | vra01svr01.rainpole.local:443 |
| User name | svc-vra |
| Password | svc-vra_password |

- 2 In the left pane, click **Workflows**, and navigate to **Library > vCenter > Configuration**.

- 3 Right-click the **Add a vCenter Server instance** workflow, and click **Start Workflow**.
 - a On the **Set the vCenter Server Instance** page, configure the following settings, and click **Next**.

| Setting | Value |
|--|-----------------------------------|
| IP or hostname of the vCenter Server instance to add | sfo01w01vc01.sfo01.rainpole.local |
| HTTPS port of the vCenter Server instance | 443 |
| Location of SDK that you use to connect | /sdk |
| Will you orchestrate this instance | Yes |
| Do you want to ignore certificate warnings | Yes |

- b On the **Set the connection properties** page, configure the following settings, and click **Submit**.

| Setting | Value |
|------------------------------|-------------------------|
| Use a session per user | No |
| vCenter Server user name | rainpole.local\svc-vro |
| vCenter Server user password | <i>svc-vro_password</i> |

- 4 To verify that the workflow completed successfully, click the **Inventory** tab, and expand the **vSphere vCenter Plugin** tree control.

The vCenter Server instance you added is now visible in the inventory.

Integrate vRealize Orchestrator with vRealize Automation for Consolidated SDDC

Configure vRealize Automation to work with the embedded vRealize Orchestrator instance.

Configure Embedded vRealize Orchestrator Server for Consolidated SDDC

To use vRealize Automation workflows to call vRealize Orchestrator workflows, you must configure vRealize Orchestrator to act as an endpoint.

Procedure

- 1 Log in to the vRealize Automation portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------------|
| User name | administrator |
| Password | <i>vra_administrator_password</i> |
| Domain | vsphere.local |

- 2 Click **Administration > vRO Configuration > Server Configuration**.
- 3 Select the **Use the default Orchestrator server** radio button and click **Test Connection**.

- 4 Once the Successfully connected to the Orchestrator server message appears, click **OK** to complete the configuration.

Create a vRealize Orchestrator Endpoint for Consolidated SDDC

IaaS administrators are responsible for creating the endpoints that allow vRealize Automation to communicate with your infrastructure. You create a vRealize Orchestrator endpoint for use by Realize Automation to communicate workflows.

Procedure

- 1 Log in to the Rainpole Infrastructure Service Portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b From the **Select your domain** drop-down menu, select **Rainpole.local** and click **Next**.
 - c Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | vra-admin-rainpole |
| Password | vra-admin-rainpole_password |
| Domain | rainpole.local |

- 2 Create an endpoint for vRealize Orchestrator.
 - a Select **Infrastructure > Endpoints > Endpoints**.
 - b Click **New > Orchestration > vRealize Orchestrator**, enter the following values, and click **OK** to complete the process.

| Setting | Value |
|-----------|--|
| Name | vra01svr01.rainpole.local |
| Address | https://vra01svr01.rainpole.local/vco |
| User name | svc-vra@rainpole.local |
| Password | svc-vra_password |
| Priority | 1 |

- 3 Start the data collection for the newly created endpoint.
 - a Select the vRealize Orchestrator endpoint in the Endpoints list and click **Actions > Data Collection**.
 - b Click **Start** to begin the vRealize Orchestrator data collection process. Wait several minutes for the data collection process to complete.
 - c Click **Refresh** to verify that the data collection successfully complete.

When a data collection succeeded status message appears, the configuration process is complete.

Add vRealize Automation Host in vRealize Orchestrator for Consolidated SDDC

To call vRealize Automation Plugin workflows, you configure the vRealize Automation host in vRealize Orchestrator.

Procedure

- 1 Log in to the vRealize Orchestrator Client.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vco**.
 - b Click **Start Orchestrator Client**.
 - c On the VMware vRealize Orchestrator login page, log in to vRealize Orchestrator using the following hostname and credentials.

| Setting | Value |
|-----------|-------------------------------|
| Host name | vra01svr01.rainpole.local:443 |
| User name | svc-vra |
| Password | svc-vra_password |

- 2 In the left pane, click **Workflows**, and navigate to **Library > vRealize Automation > Configuration**.
- 3 Right-click the **Add a vRA host using component registry** workflow and click **Start Workflow**.
 - a On the **Common parameters** page, configure the following settings, and click **Submit**.

| Setting | Value |
|--|---------------------------|
| Name of the vCAC host | vra01svr01.rainpole.local |
| Connection timeout | 30.0 |
| Operation timeout | 60.0 |
| Maximum page size for objects retrieved from this host | 100.0 |

- 4 To verify that the workflow completed successfully, click the **Inventory** tab and expand the **vRealize Automation** tree control.

The vRealize Automation Server instance that you just added is visible in the inventory.

- 5 In the left pane, click **Workflows**, and navigate to **Library > vRealize Automation > Configuration**.

- 6 Right-click the **Add the IaaS host of a vRA host** workflow and click **Start Workflow**.
 - a On the **Common parameters** page, click the search icon labelled **Not set**. Select **vra01svr01.rainpole.local [https://vra01svr01.rainpole.local] [rainpole]** for **vCAC host** and click **Next**.
 - b On the **Add an IaaS host** page, keep the default settings for **Host Properties**, and click **Next**.

Start Workflow : Add the IaaS host of a vRA host

- ✓ 1 Common parameters
- 2 Add an IaaS host
 - 2a Host Properties
 - 2b Proxy settings
- 3 Host Authentication
 - 3a User Credentials
 - 3b Domain and Workstation

* Host Name
IaaS host for vra01svr01.rainpole.local

* Host URL
https://vra01iws01.rainpole.local

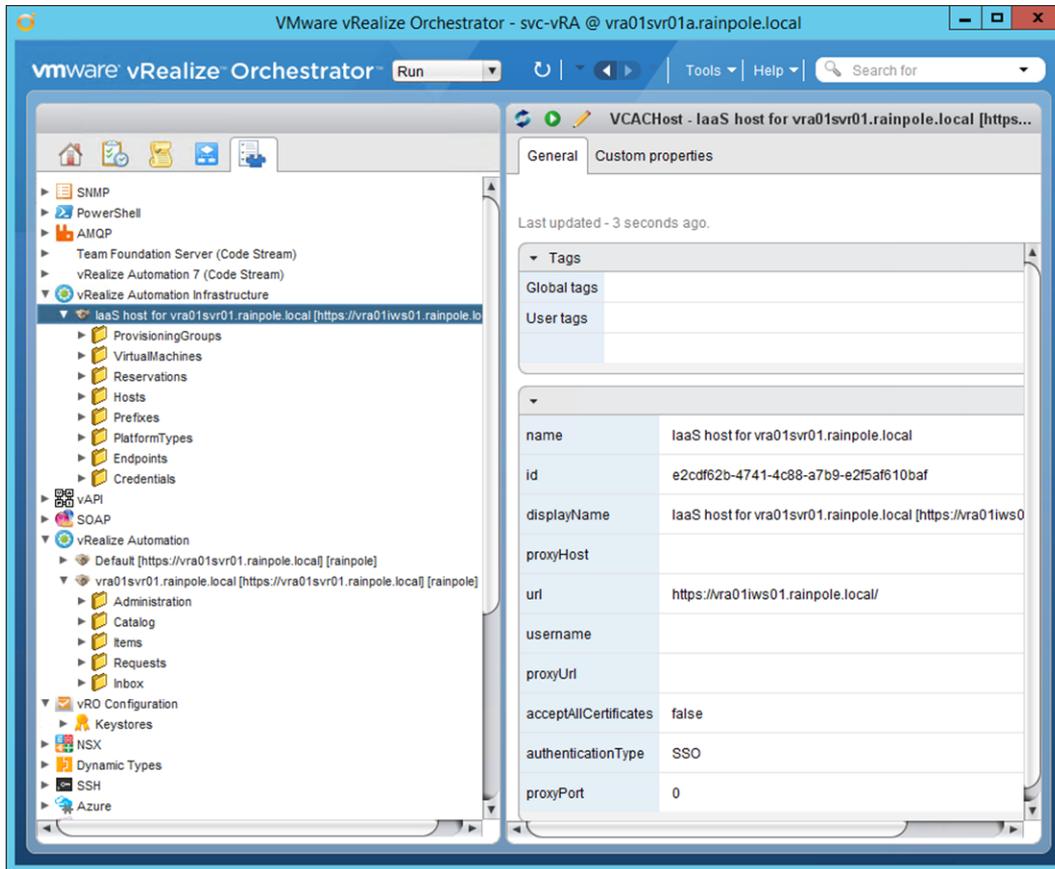
* Connection timeout
30

* Operation timeout
60

Cancel Back Next Submit

- c On the **Add an IaaS host** page, keep the default settings for the **Proxy Settings**, and click **Next**.
 - d On the **Host Authentication** page, select **SSO** for **Host's authentication type**, and click **Submit**.
- 7 To verify that the workflow completed successfully, click the **Inventory** tab, and expand the **vRealize Automation Infrastructure** tree control.

The vRealize Automation IaaS Server instance you added is visible in the inventory.



vRealize Business Installation for Consolidated SDDC

vRealize Business is an IT financial management tool that provides clarity and control over the costs and quality of IT services, enabling alignment with the business and acceleration of IT transformation.

Install vRealize Business and integrate it with vRealize Automation to continuously monitor the cost of each individual Virtual Machine and the cost of their data center.

Deploy the vRealize Business for Cloud Virtual Appliances for Consolidated SDDC

VMware vRealize Business provides capabilities that allow users to gain greater visibility into financial aspects of their cloud infrastructure and let them optimize and improve these operations.

You deploy two instances of vRealize Business, a Server and a Data Collector. Repeat this procedure twice to deploy the two appliances.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Click **Hosts and Clusters** and navigate to the **sfo01w01vc01.sfo01.rainpole.local** vCenter Server object.
- 3 Right-click the **sfo01w01vc01.sfo01.rainpole.local** object and select **Deploy OVF Template**.
- 4 On the **Select template** page, select **Local file**, browse to the location of the vRealize Business virtual appliance .ova file on your file system, and click **Next**.
- 5 On the **Select name and location** page, enter the following information for the respective appliance that you deploy and click **Next**.

| Setting | Value for Server | Value for Data Collector |
|-------------------------------|------------------|--------------------------|
| Name | vrb01svr01 | sfo01vrbc01 |
| Select a datacenter or folder | sfo01-w01fd-vra | sfo01-w01fd-vraias |

- 6 On the **Select a resource** page, select the **sfo01-w01-consolidated01** cluster, select the sfo01-w01rp-sddc-mgmt resource pool, and click **Next**.
- 7 On the **Review details** page, examine the virtual appliance details, such as product, version, download and disk size, and click **Next**.
- 8 On the **Accept license agreements** page, accept the end-user license agreements and click **Next**.
- 9 On the **Select storage** page, select the datastore.
 - a Select **Thin provision** from the **Select virtual disk format** drop-down menu.
 - b Select **vSAN Default Storage Policy** from the **VM storage policy** drop-down menu.
 - c From the datastore table, select the **sfo01-w01-vsan01** datastore and click **Next**.
- 10 On the **Select networks** page, select the appropriate network from the **Destination** drop-down menu, and click **Next**.

| Setting | Value for Server | Value for Data Collector |
|-----------|--------------------------------|--------------------------------|
| Network 1 | Ends with Mgmt-xRegion01-VXLAN | Ends with Mgmt-RegionA01-VXLAN |

11 On the **Customize template** page, configure the following values and click **Next**.

| Setting | Values for Server | Values for Data Collector |
|---|-------------------------------------|-------------------------------------|
| Currency | USD | USD |
| Enable SSH service | Selected | Selected |
| Enable Server | Selected | Deselected |
| Join the VMware Customer Experience Improvement Program | Selected | Selected |
| Root user password | <i>vr_b_server_root_password</i> | <i>vr_b_collector_root_password</i> |
| Default Gateway | 192.168.11.1 | 192.168.31.1 |
| Domain Name | vr_b01svr01.rainpole.local | sfo01vrbc01.sfo01.rainpole.local |
| Domain Name Servers | 172.16.11.4, 172.16.11.5 | 172.16.11.5, 172.16.11.4 |
| Domain Search Path | rainpole.local,sfo01.rainpole.local | sfo01.rainpole.local |
| Network 1 IP Address | 192.168.11.66 | 192.168.31.54 |
| Network 1 Netmask | 255.255.255.0 | 255.255.255.0 |

12 On the **Ready to complete** page, review the configuration settings you specified and click **Finish**.

13 Adjust the vRealize Business virtual appliance memory size.

- a Right-click the virtual machine and select **Edit Settings**. Click **Virtual Hardware**, enter the following value for **Memory**, and click **OK**.

| Setting | Value for Server | Value for Data Collector |
|-------------------------------------|------------------|--------------------------|
| vRealize Business virtual appliance | vr_b01svr01 | sfo01vrbc01 |
| Memory | 8 GB (Default) | 2 GB |

14 Navigate to the new appliance and power on the VM.

15 Repeat this procedure to deploy the vRealize Business Data Collector sfo01vrbc01

Replace the SSL Certificate on vRealize Business Server for Consolidated SDDC

Replace the default or existing SSL certificate of vRealize Business with a new one using the vRealize Business appliance management console. This certificate is used when you access the Web interface of the vRealize Business server.

Prerequisites

- CA-signed certificate files generated by using VMware Validated Design Certificate Generation Utility (CertGenVVD). See the *VMware Validated Design Planning and Preparation* documentation.

Procedure

- 1 Log in to the vRealize Business Server appliance management console.
 - a Open a Web browser and go to **https://vrb01svr01.rainpole.local:5480**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|---------------------------------|
| User name | root |
| Password | <i>vrb_server_root_password</i> |

- 2 Click the **Administration** tab and click **SSL**.
- 3 On the **Replace SSL Certificate** page, upload the certificate files that you previously generated for vRealize Business and click **Replace Certificate**.

Use the *vrb.key* file as the **RSA Private Key (.key)** and the *vrb.3.pem* file for the **Certificate(s) (.pem)** entry. These files are in the *vrb* folder that you created during certificate generation.

| Setting | Value |
|------------------------|---|
| Choose mode | Import PEM encoded Certificate |
| RSA Private Key (.key) | <pre>-----BEGIN RSA PRIVATE KEY----- private_key_value -----END RSA PRIVATE KEY-----</pre> |
| Certificate(s) (.pem) | <pre>-----BEGIN CERTIFICATE----- Server_certificate_value -----END CERTIFICATE----- -----BEGIN CERTIFICATE----- Intermediate_CA -----END CERTIFICATE----- -----BEGIN CERTIFICATE----- Root_CA_certificate_value -----END CERTIFICATE-----</pre> |
| Private Key Passphrase | <i>vrb_cert_passphrase</i> |

A message that the SSL certificate was successfully configured appears.

- 4 Click the **System** tab and click **Reboot** for the changes to take effect.

Configure NTP for vRealize Business for Consolidated SDDC

Configure the network time protocol (NTP) on the vRealize Business appliances from the virtual appliance management interface (VAMI).

Perform the procedure on both vRealize Business Server and vRealize Business Data Collector virtual appliances.

| Host | VAMI URL |
|----------------|---|
| Server | https://vrb01svr01.rainpole.local:5480 |
| Data Collector | https://sfo01vrbc01.sfo01.rainpole.local:5480 |

Procedure

- 1 Log in to the vRealize Business Server appliance management console.
 - a Open a Web browser and go to <https://vrb01svr01.rainpole.local:5480>.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|---------------------------------|
| User name | root |
| Password | <i>vrb_server_root_password</i> |

- 2 Configure the appliance to use a time server.
 - a Click the **Administration** tab and click **Time Settings**.
 - b On the **Time Settings** page, enter the following settings and click **Save Settings**.

| Setting | Value |
|-----------------|--------------------------|
| Time Sync. Mode | Use Time Server |
| Time Server #1 | ntp.sfo01.rainpole.local |

- 3 Repeat the procedure on the vRealize Business Data Collector virtual appliance sfo01vrbc01.sfo01.rainpole.local.

Integrate vRealize Business with vRealize Automation for Consolidated SDDC

To prepare vRealize Business for use, you must register the vRealize Business Server to vRealize Automation by using the management interface.

Procedure

- 1 Log in to the vRealize Business Server appliance management console.
 - a Open a Web browser and go to <https://vrb01svr01.rainpole.local:5480>.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|---------------------------------|
| User name | root |
| Password | <i>vrb_server_root_password</i> |

- 2 On the **Registration > vRA** subtab, enter the following credentials to register with the vRealize Automation server.

| Setting | Value |
|--|-----------------------------------|
| Hostname | vra01svr01.rainpole.local |
| SSO Default Tenant | vsphere.local |
| SSO Admin User | administrator |
| SSO Admin Password | <i>vra_administrator_password</i> |
| Accept "vRealize Automation" certificate | Selected |

- 3 Click **Register** to connect to vRealize Automation and get its certificate.

A failure message may appear at the top of the page. Wait until the SSO Status changes to The certificate of "vRealize Automation" is not trusted. Please view and accept to register.

- 4 Click the **View "vRealize Automation" certificate** link to download the vRealize Automation certificate.
- 5 Select the **Accept "vRealize Automation" certificate** check box and click **Register**.

SSO Status changes to Connected to vRealize Automation.

Register the vRealize Business Data Collector with the Server for Consolidated SDDC

As part of the vRealize Business installation, you connect the Data Collectors with the vRealize Business Server.

Because the tenant is configured in vRealize Automation, you register the vRealize Business Data Collector appliance with the vRealize Business Server using the following procedure.

- Grant an added role to the tenant admin, enter the product license key, and generate a one-time key from vRealize Automation.
- Register the Data Collector to the vRealize Business Server.

Procedure

- 1 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|------------------------------------|
| User name | vra-admin-rainpole |
| Password | <i>vra-admin-rainpole_password</i> |
| Domain | rainpole.local |

- 2 Navigate to **Administration > Users & Groups > Directory Users and Groups**.
- 3 In the search text box, enter **ug-vra-admins-rainpole**.
- 4 Click the **ug-vra-admins-rainpole** group to edit its settings.
- 5 On the **Edit Group** page, in the **Add Roles to this Group** list, select the **Business Management Administrator** and **Business Management Controller** role to add the role and click **Finish**.
- 6 Close your browser, and log in again by using the same credentials.
- 7 Assign a license to the vRealize Business solution.
 - a Navigate to **Administration > Business Management**.
 - b Under **License**, enter your serial number for vRealize Business and click **Save**.
- 8 Generate a one-time use key for connecting the two vRealize Business appliances.
 - a Expand the **Manage Data Collector > Remote Data Collection** section.
 - b Click **Generate a new one time use key**.
 - c Save the one time use key as you need it at a later stage in the implementation sequence.
- 9 Log in to the vRealize Business Data Collector console.
 - a Open a Web browser and go to **https://sfo01vrbc01.sfo01.rainpole.local:9443/dc-ui**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-------------------------------------|
| User name | root |
| Password | <i>vrbc_collector_root_password</i> |

- 10 Register the Data Collector with the vRealize Business Server.
 - a Expand the **Registration with the vRealize Business Server** section.
 - b Enter the following values and click **Register**.

| Setting | Value |
|--------------------------|---|
| Enter the vRB Server Url | <i>https://vrbc01svr01.rainpole.local</i> |
| Enter the One Time Key | <i>one_time_use_key</i> |

After you click **Register**, a warning message informs you that the certificate is not trusted.

- c Click **Install** and click **OK**.

The vRealize Business appliances are now connected.

Connect vRealize Business with the Compute vCenter Server for Consolidated SDDC

vRealize Business requires a connection with the vCenter Server to collect data from the entire cluster. You add the vCenter Server to vRealize Business by using the vRealize Business Data Collector console.

Procedure

- 1 Log in to the vRealize Business Data Collector console.
 - a Open a Web browser and go to **https://sfo01vrbc01.sfo01.rainpole.local:9443/dc-ui**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|------------------------------------|
| User name | root |
| Password | <i>vrb_collector_root_password</i> |

- 2 Click **Manage Private Cloud Connections**, select **vCenter Server**, and click the **Add** icon.
- 3 In the **Add vCenter Server Connection** dialog box, enter the following settings, and click **Save**.

| Setting | Value |
|----------------|-----------------------------------|
| Name | sfo01w01vc01.sfo01.rainpole.local |
| vCenter Server | sfo01w01vc01.sfo01.rainpole.local |
| Username | svc-vra@rainpole.local |
| Password | <i>svc_vra_password</i> |

- 4 In the **SSL Certificate warning** dialog box, click **Install**.
- 5 In the **Success** dialog box, click **OK**.

Cloud Management Platform Post-Installation Tasks for Consolidated SDDC

After you deploy vRealize Automation and vRealize Orchestrator, you enable health monitors to check the health status of individual servers, and remove the snapshots created during the vRealize Automation installation.

Create VM Groups to Define the Startup Order of the Cloud Management Platform for Consolidated SDDC

VM Groups allow you to define the startup order of virtual machines. The startup order you define ensures that vSphere HA powers on virtual machines in the correct order.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 In the **Navigator**, select **Host and Clusters** and expand the **sfo01w01vc01.sfo01.rainpole.local** tree.
- 3 Create a VM Group for the vRealize Automation IaaS Database.
 - a Select the **sfo01-w01-consolidated01** cluster and click the **Configure** tab.
 - b On the **Configure** page, click **VM/Host Groups**.
 - c On the **VM/Host Groups** page, click the **Add** button.
 - d In the **Create VM/Host Group** dialog box, enter **vRealize Automation IaaS Database** in the **Name** field, select **VM Group** from the **Type** drop-down menu, and click the **Add** button.
 - e In the **Add VM/Host Group Member** dialog box, select **vra01mssql01** and click **OK**.
 - f Click **OK** to save the VM/Host Group.
- 4 Repeat *Step 3* to create the following VM/Host Groups.

| VM/Host Group Name | VM/Host Group Member |
|--|----------------------|
| vRealize Automation Virtual Appliances | vra01svr01a |
| vRealize Automation IaaS Web Servers | vra01iws01a |
| vRealize Automation IaaS Managers | vra01ims01a |
| vRealize Business Servers | vrb01svr01 |
| vRealize Business Remote Collectors | sfo01vrbc01 |

- 5 Create a rule to power on the vRealize Automation Database before the vRealize Automation Virtual Appliances.
 - a Select the **sfo01-w01-consolidated01** cluster and click the **Configure** tab.
 - b On the **Configure** page, click **VM/Host Rules**.
 - c On the **VM/Host Rules** page, click the **Add** button.
 - d In the **Create VM/Host Rule** dialog box, enter **SDDC Cloud Management Platform 01** in the **Name** text box, ensure the **Enable Rule** check box is selected, and select **Virtual Machines to Virtual Machines** from the **Type** drop-down menu.

- e Select **vRealize Automation IaaS Database** from the **First restart VMs in VM group** drop-down menu.
 - f Select **vRealize Automation Virtual Appliances** from the **Then restart VMs in VM group** drop-down menu, and click **OK**.
- 6 Repeat *Step 5* to create the following VM/Host Rules to ensure the correct restart order for your Cloud Management Platform.

| VM/Host Rule Name | First restart VMs in VM group | Then restart VMs in VM group |
|-----------------------------------|--|--------------------------------------|
| SDDC Cloud Management Platform 02 | vRealize Automation Virtual Appliances | vRealize Automation IaaS Web Servers |
| SDDC Cloud Management Platform 03 | vRealize Automation IaaS Web Servers | vRealize Automation IaaS Managers |
| SDDC Cloud Management Platform 04 | vRealize Automation IaaS Managers | vRealize Business Servers |
| SDDC Cloud Management Platform 05 | vRealize Business Servers | vRealize Business Remote Collectors |

Clean up the vRealize Automation VM Snapshots for Consolidated SDDC

You made snapshots of each vRealize virtual machine during the vRealize Automation installation process. After you successfully complete the installation, you can delete these snapshots.

Repeat this procedure to remove all the vRealize Automation virtual machine snapshots you created during the implementation. The virtual machine names and their respective folders are listed in the following table.

| Virtual Machines | vCenter Folder |
|------------------|-----------------|
| vra01svr01a | sfo01-w01fd-vra |
| vra01mssql01 | sfo01-w01fd-vra |
| vra01iws01a | sfo01-w01fd-vra |
| vra01ims01a | sfo01-w01fd-vra |

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 From the **Home** page, click **VMs and Templates**.
- 3 In the **Navigator**, expand the **sfo01w01vc01.sfo01.rainpole.local > sfo01-w01dc > sfo01-w01fd-vra** folder.

- 4 Right-click the **vra01ims01a** VM and select **Snapshots > Manage Snapshots**.
- 5 Select the **Prior to vRA IaaS Component Installation** snapshot and click the **Delete** icon.
- 6 Repeat this procedure to remove all the remaining vRealize Automation virtual machine snapshots.

Tenant Content Creation for Consolidated SDDC

To provision virtual machines in the Compute vCenter Server, you must configure the tenant to use compute resources within vCenter Server.

Prerequisites

- Verify that a vCenter Server cluster has been deployed and configured. See
- Verify that an NSX instance has been configured for use by the vCenter Server cluster.
- Proxy agents have been deployed.

Create Logical Switches for Business Groups for Consolidated SDDC

For each vCenter Server compute instance, you create three logical switches for each business group which simulate networks for the web, database, and application tiers.

You repeat this procedure six times to create six logical switches.

Table 4-4. Logical Switch Names and Descriptions

| Logical Switch Name | Description |
|-----------------------|---|
| Production-Web-VXLAN | Logical switch for the Web tier of Product Business Group |
| Production-DB-VXLAN | Logical switch for the Database tier of Product Business Group |
| Production-App-VXLAN | Logical switch for the Application tier of Product Business Group |
| Development-Web-VXLAN | Logical switch for the Web tier of Development Business Group |
| Development-DB-VXLAN | Logical switch for the Database tier of Development Business Group |
| Development-App-VXLAN | Logical switch for the Application tier of Development Business Group |

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Option | Description |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Create a logical switch.
 - a Click **Networking & Security**.
 - b In the Navigator, select **Logical Switches**.
 - c From the **NSX Manager** drop-down menu, select **172.16.11.66** as the NSX Manager.
 - d Click the **New Logical Switch** icon.
The **New Logical Switch** dialog box appears.
 - e In the **New Logical Switch** dialog box, enter the following settings, and click **OK**.

| Setting | Value |
|---------------------|--|
| Name | Production-Web-VXLAN |
| Description | Logical switch for Web tier of Production Business Group |
| Transport Zone | Comp Universal Transport Zone |
| Replication Mode | Hybrid |
| Enable IP Discovery | Selected |
| Enable MAC Learning | Deselected |

- 3 Repeat this procedure to create the remaining logical switches.

Configure User Roles in vRealize Automation for Consolidated SDDC

You assign user roles in the context of a specific tenant. However, some roles for the default tenant can manage system-wide configuration settings that apply to multiple tenants.

Roles are sets of privileges that you associate with users to determine what tasks they can perform. Based on their responsibilities, individuals might have one or more roles associated with their user account.

You assign tenant architect and administrator roles to the **ug-vra-admins-rainpole** and **ug-vra-archs-rainpole** user groups.

Procedure

- 1 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|------------------------------------|
| User name | vra-admin-rainpole |
| Password | <i>vra-admin-rainpole_password</i> |
| Domain | rainpole.local |

- 2 On the **Administration** tab, navigate to **Users & Groups > Directory Users and Groups**.
- 3 Enter **ug-vra-admins-rainpole** in the search box and press Enter.
The ug-vra-admins-rainpole (ug-vra-admins-rainpole@rainpole.local) group name appears in the **Name** text box.
- 4 Click the **ug-vra-admins-rainpole (ug-vra-admins-rainpole@rainpole.local)** user group.
- 5 In the **Add Roles to this Group** list, select the following roles, and click **Finish**.
 - Application Architect
 - Approval Administrator
 - Business Management Administrator
 - Catalog Administrator
 - Container Administrator
 - Container Architect
 - Infrastructure Architect
 - Software Architect
 - Tenant Administrator
 - XaaS Architect
- 6 Search for **ug-vra-archs-rainpole** in the **Tenant Administrators** search box .
The ug-vra-archs-rainpole (ug-vra-archs-rainpole@rainpole.local) group appears in the **Name** text box.
- 7 Click the **ug-vra-archs-rainpole (ug-vra-archs-rainpole@rainpole.local)** user group.
- 8 In the **Add Roles to this Group** list, select the following user groups, and click **Finish**.
 - Application Architect
 - Container Architect
 - Infrastructure Architect

- Software Architect
- XaaS Architect

Create Fabric Groups for Consolidated SDDC

IaaS administrators can organize virtualization compute resources and cloud endpoints into fabric groups by type and intent. One or more fabric administrators manage the resources in each fabric group.

Fabric administrators are responsible for creating reservations on the compute resources in their groups to allocate fabric resources to specific business groups. Fabric groups are created in a specific tenant, but their resources can be made available to users who belong to business groups in all tenants.

Procedure

- 1 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | vra-admin-rainpole |
| Password | vra-admin-rainpole_password |
| Domain | rainpole.local |

- 2 Select **Infrastructure > Endpoints > Fabric Groups**.
- 3 Click **New Fabric Group**, enter the following settings, and click **OK**.

| Setting | Value |
|-----------------------|---------------------------------------|
| Name | SFO Fabric Group |
| Fabric administrators | ug-vra-admins-rainpole@rainpole.local |

Note You have not yet configured a vCenter Endpoint, so no compute resource is available for you to select. You configure the vCenter Endpoint later.

- 4 Log out of the vRealize Automation portal and close your browser.

Create Machine Prefixes for Consolidated SDDC

As a fabric administrator, you create machine prefixes that are used to create names for machines provisioned through vRealize Automation. Tenant administrators and business group managers select these machine prefixes and assign them to provisioned machines through blueprints and business group defaults.

Machine prefixes are shared across all tenants. Every business group has a default machine prefix. Every blueprint must have a machine prefix or use the group default prefix. Fabric administrators are responsible for managing machine prefixes. A prefix consists of a base name to be followed by a counter of a specified number of digits. When the digits are all used, vRealize Automation rolls back to the first number.

Procedure

- 1 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | vra-admin-rainpole |
| Password | vra-admin-rainpole_password |
| Domain | rainpole.local |

- 2 Select **Infrastructure > Administration > Machine Prefixes**.
- 3 Click the **New** icon to create a default machine prefix for the Production group using the following settings, and click the **Save** icon.

| Setting | Value |
|------------------|-------|
| Name | Prod- |
| Number of Digits | 5 |
| Next Number | 1 |

- 4 Click the **New** icon to create a default machine prefix for the Development group using the following settings, and click the **Save** icon.

| Setting | Value |
|------------------|-------|
| Name | Dev- |
| Number of Digits | 5 |
| Next Number | 1 |

Create Business Groups for Consolidated SDDC

Tenant administrators create business groups to associate a set of services and resources to a set of users that often correspond to a line of business, department, or other organizational unit. Users must belong to a business group to request machines.

For this implementation create two business groups, the Production business group and the Development business group.

Procedure

- 1 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | vra-admin-rainpole |
| Password | vra-admin-rainpole_password |
| Domain | rainpole.local |

- 2 Navigate to **Administration > Users and Groups > Business Groups**.
- 3 Click the **New** icon.
- 4 On the **General** tab, enter the following values and click **Next**.

| Setting | Value |
|------------------------|-----------------------------------|
| Name | Production |
| Send Manager emails to | vra-admin-rainpole@rainpole.local |

- 5 On the **Members** tab, enter **ug-vra-admins-rainpole.local** in the **Group manager role** text box, and click **Next**.
- 6 On the **Infrastructure** tab, select **Prod-** from the **Default machine prefix** drop-down menu and click **Finish**.
- 7 Click the **New** icon.
- 8 On the **General** tab, configure the following values, and click **Next**.

| Setting | Value |
|------------------------|-----------------------------------|
| Name | Development |
| Send Manager emails to | vra-admin-rainpole@rainpole.local |

- 9 On the **Members** tab, enter **ug-vra-admins-rainpole.local** in the **Group manager role** text box and click **Next**.
- 10 On the **Infrastructure** tab, select **Dev-** from the **Default machine prefix** drop-down menu, and click **Finish**.

Create Reservation Policies for Consolidated SDDC

You use reservation policies to group similar reservations together. Create the reservation policy tag first, then add the policy to reservations to allow a tenant administrator or business group manager to use the reservation policy in a blueprint.

When you request a machine, it can be provisioned on any reservation of the appropriate type that has sufficient capacity for the machine. You can apply a reservation policy to a blueprint to restrict the machines provisioned from that blueprint to a subset of available reservations. A reservation policy is often used to collect resources into groups for different service levels, or to make a specific type of resource easily available for a particular purpose. You can add multiple reservations to a reservation policy, but a reservation can belong to only one policy. You can assign a single reservation policy to more than one blueprint. A blueprint can have only one reservation policy. A reservation policy can include reservations of different types, but only reservations that match the blueprint type are considered when selecting a reservation for a particular request.

Procedure

- 1 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | vra-admin-rainpole |
| Password | vra-admin-rainpole_password |
| Domain | rainpole.local |

- 2 Navigate to **Infrastructure > Reservation > Reservation Policies**.
- 3 Click the **New** icon, configure the following settings, and click **OK**.

| Setting | Value |
|-------------|---|
| Name | SFO-Production-Policy |
| Type | Reservation Policy |
| Description | Reservation policy for Production Business Group in SFO |

- 4 Click the **New** icon, configure the following settings, and click **OK**.

| Setting | Value |
|-------------|--|
| Name | SFO-Development-Policy |
| Type | Reservation Policy |
| Description | Reservation policy for Development Business Group in SFO |

- 5 Click the **New** icon, configure the following settings, and click **OK**.

| Setting | Value |
|-------------|---|
| Name | SFO-Edge-Policy |
| Type | Reservation Policy |
| Description | Reservation policy for Tenant Edge resources in SFO |

Create a vSphere Endpoint in vRealize Automation for Consolidated SDDC

As an IaaS administrator, to allow vRealize Automation to manage the infrastructure, create endpoints and configure user credentials for those endpoints. When you create a vSphere Endpoint, vRealize Automation can communicate with the vSphere environment and discover vCenter Server-managed compute resources, collect data, and provision machines.

Procedure

- 1 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | vra-admin-rainpole |
| Password | vra-admin-rainpole_password |
| Domain | rainpole.local |

- 2 Navigate to **Infrastructure > Endpoints > Endpoints**, and click **New > Virtual > vSphere (vCenter)**.
- 3 On the **New Endpoint - vSphere (vCenter)** page, create a vSphere Endpoint with the following settings, and click **Test Connection**.

| Setting | Value |
|-----------|---|
| Name | sfo01w01vc01.sfo01.rainpole.local |
| Address | https://sfo01w01vc01.sfo01.rainpole.local/sdk |
| User Name | rainpole\svc-vra |
| Password | svc-vra_password |

Note The vSphere Endpoint name must be identical to the Endpoint name from Step 19 in [Install the vRealize Automation Environment for Consolidated SDDC](#).

- 4 If a **Security Alert** window appears, click **OK**.
- 5 Click **OK** to create the Endpoint.

Create an NSX Endpoint in vRealize Automation for Consolidated SDDC

When you create an endpoint for NSX for the shared edge and compute cluster, vRealize Automation can communicate with NSX Manager to discover networking resources.

Procedure

- 1 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | vra-admin-rainpole |
| Password | vra-admin-rainpole_password |
| Domain | rainpole.local |

- 2 Navigate to **Infrastructure > Endpoints > Endpoints** and click **New > Network and Security > NSX**.
- 3 On the **General** page, configure the vRealize Automation Endpoint with the following settings.

| Setting | Value |
|-----------|--|
| Name | SFO-NSXEndpoint |
| Address | https://sfo01w01nsx01.sfo01.rainpole.local |
| User Name | rainpole\svc-vra |
| Password | svc_vra_password |

- 4 Click **Test Connection**.
- 5 Click the **Associations** tab, click **New**, select **sfo01w01vc01.sfo01.rainpole.local** from the **Name** drop-down menu, and click **OK**.
- 6 If a **Security Alert** window appears, click **OK**.
- 7 Click **OK**.

Add Compute Resources to a Fabric Group for Consolidated SDDC

You allocate compute resources to fabric groups so that vRealize Automation can use the resources in that compute resource for that fabric group when provisioning virtual machines.

Procedure

- 1 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | vra-admin-rainpole |
| Password | vra-admin-rainpole_password |
| Domain | rainpole.local |

- 2 Navigate to **Infrastructure > Endpoints > Fabric Groups**.
- 3 In the **Name** column, point to the fabric group name **SFO Fabric Group**, and click **Edit**.
- 4 On the **Edit Fabric Group** page, select **sfo01-w01-consolidated01** from the **Compute resources** table, and click **OK**.

Note It might take several minutes for vRealize Automation to connect to the vCenter Server system and associated clusters. If you are unable to see the consolidated cluster after sufficient time has passed, restart the proxy agent service in the virtual machine vra01ims01a.rainpole.local.

- 5 Navigate to **Infrastructure > Compute Resources > Compute Resources**.
- 6 In the **Compute Resource** column, point to the compute cluster **sfo01-w01-consolidated01**, and click **Data Collection**.
- 7 Click the **Request now** buttons in each field on the page.
Wait a few seconds for the data collection process to complete.
- 8 Click **Refresh**, and verify that **Status** for both **Inventory** and **Network and Security Inventory** shows **Succeeded**.

Create External Network Profiles for Consolidated SDDC

Before members of a business group can request virtual machines, fabric administrators must create network profiles to define the subnet and routing configuration for those virtual machines. Each network profile is configured for a specific network port group or virtual network to specify the IP address and the routing configuration for virtual machines provisioned to that network.

Repeat this procedure six times to create the following external network profiles.

- Ext-Net-Profile-Production-App
- Ext-Net-Profile-Production-DB
- Ext-Net-Profile-Production-Web
- Ext-Net-Profile-Development-App
- Ext-Net-Profile-Development-DB

- Ext-Net-Profile-Development-Web

Procedure

- 1 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | vra-admin-rainpole |
| Password | vra-admin-rainpole_password |
| Domain | rainpole.local |

- 2 Navigate to **Infrastructure > Reservations > Network Profiles**, and click **New > External**.
- 3 On the **New Network Profile - External** page, specify the network profiles on the **General** tab.
 - a Add the values for the Production Group External Network Profile.

| Setting | Production Web Value | Production DB Value | Production App Value |
|-------------|--|---|--|
| Name | Ext-Net-Profile-Production-Web | Ext-Net-Profile-Production-DB | Ext-Net-Profile-Production-App |
| Description | External Network profile for Web Tier of Production Business Group | External Network profile for DB Tier of Production Business Group | External Network profile for App Tier of Production Business Group |
| Subnet mask | 255.255.255.0 | 255.255.255.0 | 255.255.255.0 |
| Gateway | 172.11.10.1 | 172.11.11.1 | 172.11.12.1 |

- b Add the values for the Development Group External Network Profile.

| Setting | Development Web Value | Development DB Value | Development App Value |
|-------------|---|--|---|
| Name | Ext-Net-Profile-Development-Web | Ext-Net-Profile-Development-DB | Ext-Net-Profile-Development-App |
| Description | External Network profile for Web Tier of Development Business Group | External Network profile for DB Tier of Development Business Group | External Network profile for App Tier of Development Business Group |
| Subnet mask | 255.255.255.0 | 255.255.255.0 | 255.255.255.0 |
| Gateway | 172.12.10.1 | 172.12.11.1 | 172.12.12.1 |

- 4 On the **DNS** tab, enter the following values for the profile you are creating.

| Setting | Value |
|-------------------|----------------------|
| Primary DNS | 172.16.11.4 |
| Secondary DNS | 172.16.11.5 |
| DNS suffix | sfo01.rainpole.local |
| DNS search suffix | sfo01.rainpole.local |

- 5 Click the **Network Ranges** tab.
- 6 On the **Network Ranges** tab, click the **New** button and enter the following values for the profile you are creating.
 - a Enter the following values for Production Business Network Range.

| Setting | Production Web Value | Production DB Value | Production App Value |
|-------------|--|---|--|
| Name | Production-Web | Production-DB | Production-App |
| Description | Static IP range for Web Tier of Production Group | Static IP range for DB Tier of Production Group | Static IP range for App Tier of Production Group |
| Start IP | 172.11.10.20 | 172.11.11.20 | 172.11.12.20 |
| End IP | 172.11.10.250 | 172.11.11.250 | 172.11.12.250 |

- b Enter the following values for Development Business Network Range.

| Setting | Development Web Value | Development DB Value | Development App Value |
|-------------|---|--|---|
| Name | Development-Web | Development-DB | Development-App |
| Description | Static IP range for Web Tier of Development Group | Static IP range for DB Tier of Development Group | Static IP range for App Tier of Development Group |
| Start IP | 172.12.10.20 | 172.12.11.20 | 172.12.12.20 |
| End IP | 172.12.10.250 | 172.12.11.250 | 172.12.12.250 |

- c Click **OK** to save the network range.
- 7 Click **OK** to save the network profile.
- 8 Repeat this procedure to create additional external network profiles.

When all the network profiles have been added, the **Network Profiles** page displays six profiles.

Create Reservations for the Compute Cluster for Consolidated SDDC

Before members of a business group can request machines, as a fabric administrator, you must allocate resources to them by creating a reservation. Each reservation is configured for a specific business group to grant them access to request machines on a specified compute resource.

For the scenarios, you perform this procedure twice to create reservations for both the Production and Development business groups.

| Group | Name |
|-------------|-------------------------|
| Production | SFO01-Comp01-Prod-Res01 |
| Development | SFO01-Comp01-Dev-Res01 |

Procedure

- 1 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | vra-admin-rainpole |
| Password | vra-admin-rainpole_password |
| Domain | rainpole.local |

- 2 Navigate to **Infrastructure > Reservations > Reservations**, and click **New > vSphere (vCenter)**.
- 3 On the **New Reservation - vSphere (vCenter)** page, click the **General** tab and configure the following values.

| Setting | Production Group Value | Development Group Value |
|-------------------------|-------------------------|-------------------------|
| Name | SFO01-Comp01-Prod-Res01 | SFO01-Comp01-Dev-Res01 |
| Tenant | rainpole | rainpole |
| Business Group | Production | Development |
| Reservation Policy | SFO-Production-Policy | SFO-Development-Policy |
| Priority | 100 | 100 |
| Enable This Reservation | Selected | Selected |

- 4 On the **New Reservation - vSphere (vCenter)** page, click the **Resources** tab.
 - a Select **sfo01-w01-consolidated01(sfo01w01vc01.sfo01.rainpole.local)** from the **Compute resource** drop-down menu.
 - b In the **This Reservation** column of the **Memory (GB)** table, enter **200**.
 - c In the **Storage (GB)** table, select the check box for your primary datastore, for example, **sfo01-w01-vsan01**, enter **2000** in the **This Reservation Reserved** text box, enter **1** in the **Priority** text box, and click **OK**.
 - d Select **sfo01-w01rp-user-vm** from the **Resource pool** drop-down menu.
- 5 On the **New Reservation - vSphere (vCenter)** page, click the **Network** tab.

- 6 On the **Network** tab, select the network path check boxes listed in the following table from the **Network Paths** list, and select the corresponding network profile from the **Network Profile** drop-down menu for the business group whose reservation you are configuring.

- a Configure the Production Business Group with the following values.

| Production Network Path | Production Group Network Profile |
|------------------------------------|----------------------------------|
| vxw-dvs-xxxxx-Production-Web-VXLAN | Ext-Net-Profile-Production-Web |
| vxw-dvs-xxxxx-Production-DB-VXLAN | Ext-Net-Profile-Production-DB |
| vxw-dvs-xxxxx-Production-App-VXLAN | Ext-Net-Profile-Production-App |

- b Configure the Development Business Group with the following values.

| Development Network Path | Development Group Network Profile |
|-------------------------------------|-----------------------------------|
| vxw-dvs-xxxxx-Development-Web-VXLAN | Ext-Net-Profile-Development-Web |
| vxw-dvs-xxxxx-Development-DB-VXLAN | Ext-Net-Profile-Development-DB |
| vxw-dvs-xxxxx-Development-App-VXLAN | Ext-Net-Profile-Development-App |

- 7 Click **OK** to save the reservation.
- 8 Repeat this procedure to create a reservation for the Development Business Group.

Create Reservations for the User Edge Resources for Consolidated SDDC

Before members of a business group can request virtual machines, as a fabric administrator, you must allocate resources to that business group by creating a reservation. Each reservation is configured for a specific business group to grant them access to request virtual machines on a specified compute resource.

Perform this procedure twice to create Edge reservations for both the Production and Development business groups.

| Group | Name |
|-------------|-------------------------|
| Production | SFO01-Edge01-Prod-Res01 |
| Development | SFO01-Edge01-Dev-Res01 |

Procedure

- 1 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | vra-admin-rainpole |
| Password | vra-admin-rainpole_password |
| Domain | rainpole.local |

- 2 Navigate to **Infrastructure > Reservations > Reservations**, and click **New > vSphere (vCenter)**.
- 3 On the **New Reservation - vSphere (vCenter)** page, click the **General** tab, and configure the following values for your business group.

| Setting | Production Group Value | Development Group Value |
|-------------------------|-------------------------|-------------------------|
| Name | SFO01-Edge01-Prod-Res01 | SFO01-Edge01-Dev-Res01 |
| Tenant | rainpole | rainpole |
| Business Group | Production | Development |
| Reservation Policy | SFO-Edge-Policy | SFO-Edge-Policy |
| Priority | 100 | 100 |
| Enable This Reservation | Selected | Selected |

- 4 On the **New Reservation - vSphere (vCenter)** page, click the **Resources** tab.
 - a Select **sfo01-w01-consolidated01(sfo01w01vc01.sfo01.rainpole.local)** from the **Compute resource** drop-down menu.
 - b Enter **200** in the **This Reservation** column of the **Memory (GB)** table.
 - c In the **Storage (GB)** table, select the check box for your primary datastore, for example, **sfo01-w01-vsan01**, enter **2000** in the **This Reservation Reserved** text box, enter **1** in the **Priority** text box, and click **OK**.
 - d Select **sfo01-w01rp-user-edge** from the **Resource pool** drop-down menu.
- 5 On the **New Reservation - vSphere (vCenter)** page, click the **Network** tab.
- 6 On the **Network** tab, select the network path check boxes listed in the following tables from the Network Paths list, and select the corresponding network profile from the **Network Profile** drop-down menu for the business group whose reservation you are configuring.

Production Business Group

| Production Port Group | Production Network Profile |
|------------------------------------|--------------------------------|
| vxw-dvs-xxxxx-Production-Web-VXLAN | Ext-Net-Profile-Production-Web |
| vxw-dvs-xxxxx-Production-DB-VXLAN | Ext-Net-Profile-Production-DB |
| vxw-dvs-xxxxx-Production-App-VXLAN | Ext-Net-Profile-Production-App |

Development Business Group

| Development Port Group | Development Network Profile |
|-------------------------------------|---------------------------------|
| vxw-dvs-xxxxx-Development-Web-VXLAN | Ext-Net-Profile-Development-Web |
| vxw-dvs-xxxxx-Development-DB-VXLAN | Ext-Net-Profile-Development-DB |
| vxw-dvs-xxxxx-Development-App-VXLAN | Ext-Net-Profile-Development-App |

- 7 Click **OK** to save the reservation.
- 8 Repeat the procedure to create an Edge reservation for the Development Business Group.

Create Blueprint Customization Specifications in Compute vCenter Server for Consolidated SDDC

Create two customization specifications, one for Linux and one for Windows, for use by the virtual machines you deploy. Customization specifications are XML files that contain system configuration settings for the guest operating systems used by virtual machines. When you apply a specification to a guest operating system during virtual machine cloning or deployment, you prevent conflicts that might result if you deploy virtual machines with identical settings, such as duplicate computer names.

You will later use the customization specifications you create when you create blueprints for use with vRealize Automation.

Create a Customization Specification for Linux Blueprints for Consolidated SDDC

Create a Linux guest operating system specification that you can apply when you create blueprints for use with vRealize Automation. This customization specification can be used to customize virtual machine guest operating systems when provisioning new virtual machines from vRealize Automation.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client**.
 - b Log in using the following credentials.

| Option | Description |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Navigate to **Home > Policies and Profiles > Customization Specification Manager**.
- 3 Select the vCenter Server **sfo01w01vc01.sfo01.rainpole.local** from the drop-down menu.
- 4 Click the **Create a new specification** icon.
The **New VM Guest Customization Spec** wizard appears.
- 5 On the **Specify Properties** page, select **Linux** from the **Target VM Operating System** drop-down menu, enter **os-linux-custom-spec** for the **Customization Spec Name**, and click **Next**.
- 6 On the **Set Computer Name** page, select **Use the virtual machine name**, enter **sfo01.rainpole.local** in the **Domain Name** text box, and click **Next**.
- 7 On the **Time Zone** page, specify the time zone as shown in the following table for the virtual machine, and click **Next**.

| Setting | Value |
|-----------------------|-------------|
| Area | America |
| Location | Los Angeles |
| Hardware Clock Set To | Local Time |

- 8 On the **Configure Network** page, click **Next**.
- 9 On the **Enter DNS and domain settings** page, leave the default settings, and click **Next**.
- 10 Click **Finish** to save your changes.

The customization specification that you created is listed in the **Customization Specification Manager**.

Create a Customization Specification for Windows Blueprints for Consolidated SDDC

Create a Windows guest operating system specification that you can apply when you create blueprints for use with vRealize Automation. This customization specification can be used to customize virtual machine guest operating systems when provisioning new virtual machines from vRealize Automation.

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to `https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client`.
 - b Log in using the following credentials.

| Option | Description |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Navigate to **Home > Policies and Profiles > Customization Specification Manager**.
- 3 Select the vCenter Server `sfo01w01vc01.sfo01.rainpole.local` from the drop-down menu.
- 4 Click the **Create a new specification** icon.
The **New VM Guest Customization** wizard appears.
- 5 On the **Specify Properties** page, select **Windows** from the **Target VM Operating System** drop-down menu, enter `os-windows-joindomain-custom-spec` for the **Customization Spec Name**, and click **Next**.
- 6 On the **Set Registration Information** page, enter `Rainpole` for the virtual machine owner's **Name** and **Organization**, and click **Next**.
- 7 On the **Set Computer Name** page, select **Use the virtual machine name**, and click **Next**.
The operating system uses this name to identify itself on the network.
- 8 On the **Enter Windows License** page, provide licensing information for the Windows operating system, enter the `volume_license_key`, and click **Next**.
- 9 Specify the administrator password for use with the virtual machine, and click **Next**.
- 10 On the **Time Zone** page, select **(GMT-08:00) Pacific Time(US & Canada)**, and click **Next**.
- 11 On the **Run Once** page, click **Next**.
- 12 On the **Configure Network** page, click **Next**.
- 13 On the **Set Workgroup or Domain** page, select **Windows Server Domain**, configure the following settings, and click **Next**.

| Setting | Value |
|-----------------------|--------------------------------|
| Windows Server Domain | sfo01.rainpole.local |
| Username | svc-domain-join@rainpole.local |
| Password | svc-domain-join_password |

- 14 On the **Set Operating System Options** page, select **Generate New Security ID (SID)**, and click **Next**.

- 15 Click **Finish** to save your changes.

The customization specification that you created is listed in the **Customization Specification Manager**.

Convert Virtual Machines to VM Templates for Consolidated SDDC

You need to convert the virtual machines directly to templates instead of making a copy by cloning.

Repeat this procedure for each of the VM Templates in the content library. The table below lists the VM Templates and the guest OS that each template uses to create a virtual machine.

| VM Template Name | Guest OS |
|---------------------------|--------------------------------------|
| redhat6-enterprise-64 | Red Hat Enterprise Server 6 (64-bit) |
| windows-2012r2-64 | Windows Server 2012 R2 (64-bit) |
| windows-2012r2-64-sql2012 | Windows Server 2012 R2 (64-bit) |

Procedure

- 1 Log in to vCenter Server by using the vSphere Web Client.
 - a Open a Web browser and go to **`https://sfo01w01vc01.sfo01.rainpole.local/vsphere-client`**.
 - b Log in using the following credentials.

| Option | Description |
|-----------|-----------------------------|
| User name | administrator@vsphere.local |
| Password | vsphere_admin_password |

- 2 Navigate to **Home > VMs and Templates**.
- 3 In the **Navigator** pane, expand **sfo01w01vc01.sfo01.rainpole.local > sfo01-w01dc > VM Templates**.
- 4 Right-click the **redhat6-enterprise-64** virtual machine located in the VM Templates folder, and click **Template > Convert to Template**.
- 5 Click **Yes** to confirm the template conversion.
- 6 Repeat this procedure for all of the VM Templates in the content library, verifying that each VM Template appears in the VM Templates folder.

Configure Single Machine Blueprints for Consolidated SDDC

Virtual machine blueprints determine a machine's attributes, the manner in which it is provisioned, and its policy and management settings.

Create a Service Catalog for Consolidated SDDC

A service catalog provides a common interface for consumers of IT services to request services, track their requests, and manage their provisioned service items.

Procedure

- 1 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | vra-admin-rainpole |
| Password | vra-admin-rainpole_password |
| Domain | rainpole.local |

- 2 Navigate to the **Administration** tab, click **Catalog Management > Services**, and click **New**.
The **New Service** page appears.
- 3 In the **New Service** page, configure the following settings and click **OK**.

| Setting | Value |
|---------------|-------------------------|
| Name | SFO Service Catalog |
| Description | Default setting (blank) |
| Status | Active |
| Icon | Default setting (blank) |
| Status | Default setting (blank) |
| Hours | Default setting (blank) |
| Owner | Default setting (blank) |
| Support Team | Default setting (blank) |
| Change Window | Default setting (blank) |

Create a Single Machine Blueprint for Consolidated SDDC

Create a blueprint for cloning the windows-2012r2-64 virtual machine template using the specified resources on vCenter Server. Tenants can later use this blueprint for automatic provisioning. A blueprint is the complete specification for a virtual, cloud, or physical machine. Blueprints determine a machine's attributes, the manner in which it is provisioned, and its policy and management settings.

Repeat this procedure to create the following six blueprints.

| Blueprint Name | VM Template | Customization Specification | Reservation Policy |
|--|--|-----------------------------------|------------------------|
| Windows Server 2012 R2 - SFO Prod | windows-2012r2-64 (sfo01w01vc01.sfo01.rainpole.local) | os-windows-joindomain-custom-spec | SFO-Production-Policy |
| Windows Server 2012 R2 - SFO Dev | windows-2012r2-64 (sfo01w01vc01.sfo01.rainpole.local) | os-windows-joindomain-custom-spec | SFO-Development-Policy |
| Windows Server 2012 R2 With SQL2012 - SFO Prod | windows-2012r2-64-sql2012(sfo01w01vc01.sfo01.rainpole.local) | os-windows-joindomain-custom-spec | SFO-Production-Policy |
| Windows Server 2012 R2 With SQL2012 - SFO Dev | windows-2012r2-64-sql2012(sfo01w01vc01.sfo01.rainpole.local) | os-windows-joindomain-custom-spec | SFO-Development-Policy |
| Redhat Enterprise Linux 6 - SFO Prod | redhat6-enterprise-64(sfo01w01vc01.sfo01.rainpole.local) | os-linux-custom-spec | SFO-Production-Policy |
| Redhat Enterprise Linux 6 - SFO Dev | redhat6-enterprise-64(sfo01w01vc01.sfo01.rainpole.local) | os-linux-custom-spec | SFO-Development-Policy |

Procedure

- 1 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | vra-admin-rainpole |
| Password | vra-admin-rainpole_password |
| Domain | rainpole.local |

- 2 Navigate to **Design > Blueprints**.
- 3 Click **New**.
- 4 In the **New Blueprint** dialog box, configure the following settings on the **General** tab. Click **OK**.

| Setting | Value |
|-----------------------|-----------------------------------|
| Name | Windows Server 2012 R2 - SFO Prod |
| Deployment limit | Default setting (blank) |
| Lease (days): Minimum | 30 |
| Lease (days): Maximum | 270 |
| Archive (days) | 15 |

- 5 Select and drag the **vSphere (vCenter) Machine** icon to **Design Canvas**.

- 6 Click the **General** tab, configure the following settings, and click **Save**.

| Setting | Default |
|-----------------------------|---|
| ID | Default setting (vSphere_vCenter_Machine_1) |
| Description | Default setting (blank) |
| Display location on request | Deselected |
| Reservation policy | SFO-Production-Policy |
| Machine prefix | Use group default |
| Instances: Minimum | Default setting |
| Instances: Maximum | Default setting |

- 7 Click the **Build Information** tab, configure the following settings, and click **Save**.

| Setting | Value |
|-----------------------|-----------------------------------|
| Blueprint type | Server |
| Action | Clone |
| Provisioning workflow | CloneWorkflow |
| Clone from | windows-2012r2-64 |
| Customization spec | os-windows-joindomain-custom-spec |

Note If the value of the **Clone from** setting does not list **windows-2012r2-64** template, you must perform a data collection on the **sfo01-w01-consolidated01** Compute Resource.

- 8 Click the **Machine Resources** tab, configure the following settings, and click **Save**.

| Setting | Minimum | Maximum |
|--------------|-----------------|-----------------|
| CPU | 2 | 4 |
| Memory (MB): | 4096 | 16384 |
| Storage | Default setting | Default setting |

- 9 Click the **Network** tab.
- Select **Network & Security** in the **Categories** section to display the list of available network and security components.
 - Select the **Existing Network** component and drag it onto the design canvas.

- c Click in the **Existing network** text box and select the **Ext-Net-Profile-Production-Web** network profile.

| Blueprint Name | Existing network |
|--|---------------------------------|
| Windows Server 2012 R2 - SFO Prod | Ext-Net-Profile-Production-Web |
| Windows Server 2012 R2 - SFO Dev | Ext-Net-Profile-Development-Web |
| Windows Server 2012 R2 With SQL2012 - SFO Prod | Ext-Net-Profile-Production-DB |
| Windows Server 2012 R2 With SQL2012 - SFO Dev | Ext-Net-Profile-Development-DB |
| Redhat Enterprise Linux 6 - SFO Prod | Ext-Net-Profile-Production-App |
| Redhat Enterprise Linux 6 - SFO Dev | Ext-Net-Profile-Development-App |

- d Click **Save**.
- e Select the **vSphere_vCenter_Machine** object from the design canvas.
- f Select the **Network** tab, click **New**, and configure the following settings. Click **OK**.

| Network | Assignment Type | Address |
|-----------------------------|-----------------|-------------------------|
| ExtNetProfileProductionWeb | Static IP | Default setting (blank) |
| ExtNetProfileDevelopmentWeb | Static IP | Default setting (blank) |
| ExtNetProfileProductionDB | Static IP | Default setting (blank) |
| ExtNetProfileDevelopmentDB | Static IP | Default setting (blank) |
| ExtNetProfileProductionApp | Static IP | Default setting (blank) |
| ExtNetProfileDevelopmentApp | Static IP | Default setting (blank) |

- g Click **Finish** to save the blueprint.
- 10 Select the blueprint **Windows Server 2012 R2 - SFO Prod** and click **Publish**.
 - 11 Repeat this procedure to create additional blueprints.

Create Entitlements for Business Groups for Consolidated SDDC

You add a service, catalog item, or action to an entitlement, allowing the users and groups identified in the entitlement to request provisionable items in the service catalog. The entitlement allows members of a particular business group (for example, the Production business group) to use the blueprint. Without the entitlement, users cannot use the blueprint.

Perform this procedure twice to create entitlements for both the Production and Development business groups.

| Entitlement Name | Status | Business Group | User & Groups |
|---------------------------|--------|----------------|------------------------|
| Prod-SingleVM-Entitlement | Active | Production | ug-vra-admins-rainpole |
| Dev-SingleVM-Entitlement | Active | Development | ug-vra-admins-rainpole |

Procedure

- 1 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|------------------------------------|
| User name | vra-admin-rainpole |
| Password | <i>vra-admin-rainpole_password</i> |
| Domain | rainpole.local |

- 2 Click the **Administration** tab, and click **Catalog Management > Entitlements**.
- 3 Click **New**.

The **New Entitlement** page appears.

- 4 On the **New Entitlement** page, select the **Details** tab, configure the following values, and click **Next**.

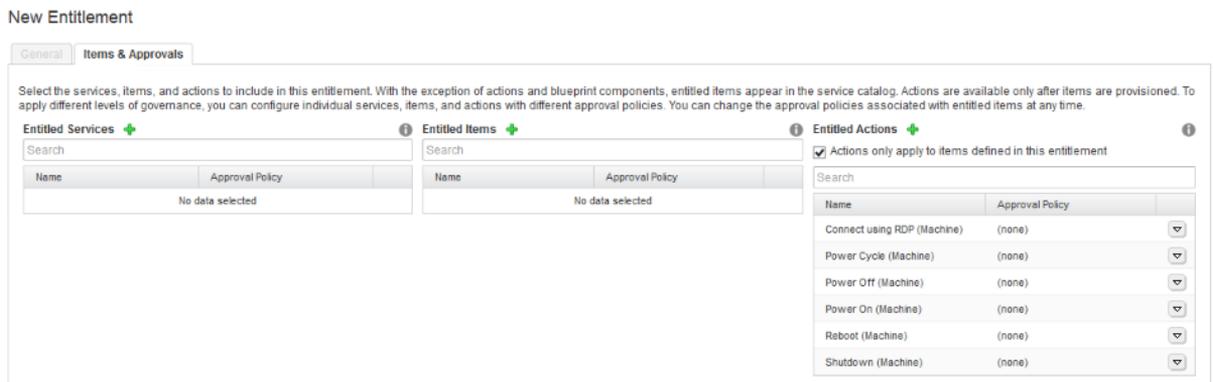
| Setting | Production Value | Development Value |
|----------------------|---------------------------|--------------------------|
| Name | Prod-SingleVM-Entitlement | Dev-SingleVM-Entitlement |
| Description | Default setting (blank) | Default setting (blank) |
| Expiration Date | Default setting (blank) | Default setting (blank) |
| Status | Active | Active |
| Business Group | Production | Development |
| All Users and Groups | Unselected | Unselected |
| Users & Groups | ug-vra-admins-rainpole | ug-vra-admins-rainpole |

5 Click the **Items & Approvals** tab.

a On the **Entitlementment Actions** page, click the **Add Action** icon, add the following actions, and click **OK**.

- Connect using RDP (Machine)
- Power Cycle (Machine)
- Power Off (Machine)
- Power On (Machine)
- Reboot (Machine)
- Shutdown (Machine)

b Click **Finish**.



6 Repeat this procedure to create an entitlementment for the Development business group.

Use the same Entitled Actions as for the Production business group.

Configure Entitlementments for Blueprints for Consolidated SDDC

You entitle users to the actions and items that belong to the service catalog by associating each blueprint with an entitlementment.

Repeat this procedure to associate the blueprints with their entitlementment.

| Blueprint Name | Service Catalog | Add to Entitlementment |
|--|---------------------|-------------------------------|
| Windows Server 2012 R2 - SFO Prod | SFO Service Catalog | Prod-SingleVM-Entitlementment |
| Windows Server 2012 R2 - SFO Dev | SFO Service Catalog | Dev-SingleVM-Entitlementment |
| Windows Server 2012 R2 With SQL2012 - SFO Prod | SFO Service Catalog | Prod-SingleVM-Entitlementment |
| Windows Server 2012 R2 With SQL2012 - SFO Dev | SFO Service Catalog | Dev-SingleVM-Entitlementment |
| Redhat Enterprise Linux 6 - SFO Prod | SFO Service Catalog | Prod-SingleVM-Entitlementment |
| Redhat Enterprise Linux 6 - SFO Dev | SFO Service Catalog | Dev-SingleVM-Entitlementment |

Procedure

- 1 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | vra-admin-rainpole |
| Password | vra-admin-rainpole_password |
| Domain | rainpole.local |

- 2 Select the **Administration** tab and navigate to **Catalog Management > Catalog Items**.
- 3 On the **Catalog Items** pane, select the **Windows Server 2012 R2 - SFO Prod** blueprint in the **Catalog Items** list and click **Configure**.
- 4 On the **General** tab of the **Configure Catalog Item** dialog box, select **SFO Service Catalog** from the **Service** drop-down menu, and click **OK**.
- 5 Associate the blueprint with the **Prod-SingleVM-Entitlement** entitlement.
 - a Click **Entitlements** and select **Prod-SingleVM-Entitlement**.
The **Edit Entitlement** pane appears.
 - b Select the **Items & Approvals** tab, add the **Windows Server 2012 R2 - SFO Prod** blueprint to the **Entitled Items** list, and click **OK**.
 - c Click **Finish**.
- 6 Select the **Catalog** tab and verify that the blueprints are listed in the Service Catalog.
- 7 Repeat this procedure to associate all the blueprints with their entitlements.

Test the Deployment of a Single Machine Blueprint for Consolidated SDDC

Test your environment and confirm the successful provisioning of virtual machines using the blueprints that have been created.

Procedure

- 1 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | vra-admin-rainpole |
| Password | vra-admin-rainpole_password |
| Domain | rainpole.local |

- 2 Select the **Catalog** tab, and click **SFO Service Catalog** from the catalog of available services.
- 3 Click the **Request** button for the **Windows Server 2012 R2 - SFO Prod** blueprint.
- 4 Click **Submit**.
- 5 Verify the request finishes successfully.
 - a Select the **Requests** tab.
 - b Select the request you submitted and wait several minutes for the request to complete.
Click the **Refresh** icon every few minutes until a Successful message appears under **Status**.
 - c Click **View Details**.
 - d Under **Status Details**, verify that the virtual machine successfully provisioned.
- 6 Verify that the virtual machine provisions in the consolidated cluster.
 - a Select **Home > VMs and Templates**.
 - b In the Navigator panel, expand the vCenter Server cluster **sfo01w01vc01.sfo01.rainpole.local > sfo01-w01-consolidated01 > sfo01-w01rp-user-vm**, and verify the existence of the virtual machine.

Operations Management Configuration for Cloud Management for Consolidated SDDC

After you install the Cloud Management Platform, enable its integration with the operations management layer. You can monitor and receive alerts and logs about the platform to a central location by using vRealize Operations Manager and vRealize Log Insight.

Connect vRealize Operations Manager to vRealize Automation for Consolidated SDDC

Configure the vRealize Operations Manager Management Pack for vRealize Automation to monitor the health and capacity risk of your cloud infrastructure in the context of the tenant's business groups.

The vRealize Operations Manager Management Pack for vRealize Automation is installed by default on the version of vRealize Operations Manager in this validated design.

Procedure

- 1 [Start Collecting of Metrics from vRealize Automation in to vRealize Operations Manager for Consolidated SDDC](#)

Connect vRealize Automation to vRealize Operations Manager for collecting statistics about the tenant workloads that are provisioned by using vRealize Automation.

2 [Configure Integration of vRealize Operations Manager with vRealize Automation for Workload Reclamation for Consolidated SDDC](#)

Connect vRealize Automation to vRealize Operations Manager to collect metrics that vRealize Automation can use to identify tenant workloads for reclamation in the consolidated SDDC. Such workloads have low use of CPU, memory use, or disk space.

Start Collecting of Metrics from vRealize Automation in to vRealize Operations Manager for Consolidated SDDC

Connect vRealize Automation to vRealize Operations Manager for collecting statistics about the tenant workloads that are provisioned by using vRealize Automation.

Procedure

1 [Configure User Privileges on vRealize Automation for Integration with vRealize Operations Manager for Consolidated SDDC](#)

Assign the permissions that are required to access monitoring data from the vRealize Automation in vRealize Operations Manager to the svc-vrops-vra operations service account. The svc-vrops-vra user has rights that are specifically required for access to vRealize Automation in vRealize Operations Manager.

2 [Add a vRealize Automation Adapter to vRealize Operations Manager for Consolidated SDDC](#)

Configure a vRealize Automation adapter to collect monitoring data from vRealize Automation.

Configure User Privileges on vRealize Automation for Integration with vRealize Operations Manager for Consolidated SDDC

Assign the permissions that are required to access monitoring data from the vRealize Automation in vRealize Operations Manager to the svc-vrops-vra operations service account. The svc-vrops-vra user has rights that are specifically required for access to vRealize Automation in vRealize Operations Manager.

Procedure

- 1 Log in to the vRealize Automation portal.
 - a Open a Web browser and go to **`https://vra01svr01.rainpole.local/vcac`**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------------|
| User name | administrator |
| Password | <i>vra_administrator_password</i> |
| Domain | vsphere.local |

- 2 On the **Tenants** tab, click the **Rainpole** tenant.

- 3 Click the **Administrators** tab to assign tenant administrator and IaaS administrator roles to the svc-vrops-vra service account.
 - a Enter **svc-vrops-vra** in the **Tenant administrators** search text box, click the **Search** icon, and click **svc-vrops-vra (svc-vrops-vra@rainpole.local)** user that shows in the search result list to assign the role to the account.
 - b Enter **svc-vrops-vra** in the **IaaS administrators** search text box, click the **Search** icon, and click **svc-vrops-vra (svc-vrops-vra@rainpole.local)** user that shows in the search result list to assign the role to the account.
 - c Click **Finish**.
- 4 Log out of the vRealize Automation portal for the default tenant.
- 5 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | vra-admin-rainpole |
| Password | vra-admin-rainpole_password |
| Domain | rainpole.local |

- 6 Navigate to **Administration > Users & Groups > Directory Users and Groups** to assign the software architect role to the svc-vrops-vra service account.
 - a Enter **svc-vrops-vra** in the search box, click the **Search** icon and click the **svc-vrops-vra (svc-vrops-vra@rainpole.local)** user.
 - b The setting of the svc-vrops-vra account appear.
 - c On the **General** tab, select **Infrastructure Architect** and **Software Architect** under **Add roles to this User**, and click **Finish**.
- 7 Navigate to **Infrastructure > Endpoints > Fabric Groups** to assign the fabric administrator role to the svc-vrops-vra service account.
 - a On the **Fabric Groups** page, click **SFO Fabric Group**.
 - b On **Edit Fabric Group** page, enter **svc-vrops-vra** in **Fabric administrators** search text box and click the **Search** icon.
 - c Click **svc-vrops-vra@rainpole.local** in the search result list to assign the fabric administrator role to the account, and click **OK**.

Add a vRealize Automation Adapter to vRealize Operations Manager for Consolidated SDDC

Configure a vRealize Automation adapter to collect monitoring data from vRealize Automation.

Procedure

- 1 Log in to vRealize Operations Manager by using the operations interface.
 - a Open a Web browser and go to **https://vrops01svr01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | admin |
| Password | <i>vrops_admin_password</i> |

- 2 On the main navigation bar, click **Administration**.
- 3 In the left pane of vRealize Operations Manager, click **Solutions**.
- 4 From the solution table on the **Solutions** page, select **VMware vRealize Automation** and click **Configure**.

The Manage Solution - VMware vRealize Automation dialog box appears.

- 5 In the Manage Solution - VMware vRealize Automation dialog box, under **Instance Settings**, enter the settings for the connection to vRealize Automation.
 - a Enter the display name, description and FQDN of the vRealize Automation front-end portal, and turn on data collection for the Rainpole tenant.

| Setting | Value |
|-----------------------------------|---|
| Display Name | vRealize Automation Adapter - vra01svr01 (Rainpole) |
| Description | vRealize Automation - Rainpole Tenant |
| vRealize Automation Appliance URL | https://vra01svr01.rainpole.local |

- b Click the **Add** icon next to the **Credential** text box, configure the credentials for the connection to vRealize Automation, and click **OK**.

| Credential | Value |
|--------------------|--------------------------------------|
| Credential name | vRA Adapter Credentials - vra01svr01 |
| SysAdmin Username | administrator@vsphere.local |
| SysAdmin Password | <i>vra_administrator_password</i> |
| SuperUser Username | svc-vrops-vra@rainpole.local |
| SuperUser Password | <i>svc_vrops_vra_password</i> |

- c Click **Test Connection** to validate the connection to vRealize Automation.
 - d In the **Review and Accept Certificate** dialog box, verify the vRealize Automation certificate information, and click **Accept**.
 - e Click **OK** in the **Info** dialog box.

- f Expand the **Advanced Settings** section, and verify the following configuration.

| Advanced Setting | Value |
|-------------------------|-------------------------|
| Collectors/Groups | Default collector group |
| Tenants | rainpole |
| vRA Endpoint Monitoring | Enabled |
| Auto Discovery | true |

- g Click **Save Settings** and click **OK** in the **Info** box that appears.

- 6 In the **Manage Solution - VMware vRealize Automation** dialog box, click **Close**.

The **vRealize Automation Adapter** appears on the **Solutions** page of the vRealize Operations Manager user interface. The **Collection State** of the adapter is **Collecting** and the **Collection Status** is **Data receiving**.

Configure Integration of vRealize Operations Manager with vRealize Automation for Workload Reclamation for Consolidated SDDC

Connect vRealize Automation to vRealize Operations Manager to collect metrics that vRealize Automation can use to identify tenant workloads for reclamation in the consolidated SDDC. Such workloads have low use of CPU, memory use, or disk space.

Procedure

- 1 [Configure User Privileges on vRealize Operations Manager for Tenant Workload Reclamation for Consolidated SDDC](#)

Configure read-only privileges for the `svc-vra-vrops@rainpole.local` service account on vRealize Operations Manager. You configure these privileges so that vRealize Automation can pull metrics from vRealize Operations Manager for reclamation of tenant workloads for Consolidated SDDC.

- 2 [Add vRealize Operations Manager as a Metrics Provider in vRealize Automation for Consolidated SDDC](#)

Integrate vRealize Automation with vRealize Operations Manager to pull metrics for the reclamation of tenant workloads.

Configure User Privileges on vRealize Operations Manager for Tenant Workload Reclamation for Consolidated SDDC

Configure read-only privileges for the `svc-vra-vrops@rainpole.local` service account on vRealize Operations Manager. You configure these privileges so that vRealize Automation can pull metrics from vRealize Operations Manager for reclamation of tenant workloads for Consolidated SDDC.

Procedure

- 1 Log in to vRealize Operations Manager by using the operations interface.
 - a Open a Web browser and go to **https://vrops01svr01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------|
| User name | admin |
| Password | vrops_admin_password |

- 2 On the main navigation bar, click **Administration**.
- 3 In the left pane of vRealize Operations Manager, expand **Access**, and click **Access Control**.
- 4 On the **Access Control** page, click the **User Accounts** tab and click the **Import Users** icon.
- 5 On the **Import Users** page, import the svc-vra-vrops@rainpole.local service account.
 - a From the **Import From** drop-down menu, select **RAINPOLE.LOCAL**.
 - b Select the **Basic** option for the search query.
 - c In the **Search String** text box, enter **svc-vra-vrops** and click **Search**.
The search results contain the svc-vra-vrops user account.
 - d Select **svc-vra-vrops@rainpole.local** and click **Next**.
- 6 On the **Assign Groups and Permissions** page, to assign the ReadOnlY role to the svc-vra-vrops@rainpole.local service account, click the **Objects** tab, configure the following settings, and click **Finish**.

| Setting | Value |
|------------------------------|--|
| Select Role | ReadOnly |
| Assign this role to the user | Selected |
| Select Object | vCenter Adapter > vCenter Adapter - > sfo01w01vc01 |

Add vRealize Operations Manager as a Metrics Provider in vRealize Automation for Consolidated SDDC

Integrate vRealize Automation with vRealize Operations Manager to pull metrics for the reclamation of tenant workloads.

Procedure

- 1 Log in to the vRealize Automation Rainpole portal.
 - a Open a Web browser and go to **https://vra01svr01.rainpole.local/vcac/org/rainpole**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------------|
| User name | vra-admin-rainpole |
| Password | vra-admin-rainpole_password |
| Domain | rainpole.local |

- 2 Navigate to **Administration > Reclamation > Metrics Provider**.
- 3 On the **Metrics Provider** page, configure the vRealize Operations Manager settings.
 - a Select **vRealize Operations Manager endpoint**.
 - b Configure the following settings for vRealize Operations Manager.

| Setting | Value |
|----------|--|
| URL | https://vrops01svr01.rainpole.local/suite-api/ |
| Username | svc-vra-vrops@rainpole.local |
| Password | svc-vra-vrops_password |

- c Click **Test Connection**, verify that the test connection is successful, and click **Save**.
 - d In the certificate warning message box, click **OK**.

The vSphere metrics provider updated successfully message appears.

Connect vRealize Operations Manager with vRealize Business for Consolidated SDDC

Configure the vRealize Operations Manager Management Pack for vRealize Business to view your infrastructure performance, cost information, and troubleshooting tips. You can connect vRealize Operations Manager to a single instance of vRealize Business for Cloud.

Configure vRealize Business Adapter in vRealize Operations for Consolidated SDDC

Configure a vRealize Business for Cloud adapter to collect monitoring data from vRealize Business for Cloud in vRealize Operations Manager.

Procedure

- 1 Log in to vRealize Operations Manager by using the operations interface.
 - a Open a Web browser and go to **https://vrops01svr01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------|
| User name | admin |
| Password | vrops_admin_password |

- 2 On the main navigation bar, click **Administration**.
- 3 In the left pane of vRealize Operations Manager, click **Solutions**.
- 4 From the solution table on the **Solutions** page, select **VMware vRealize Business for Cloud** solution, and click **Configure**.

The **Manage Solution - VMware vRealize Business for Cloud** dialog box appears.

- 5 In the **Manage Solution - VMware vRealize Business for Cloud** dialog box, under **Instance Settings**, enter the settings for the connection to vRealize Business for Cloud.
 - a Enter the display name, description, and FQDN of the vRealize Business for Cloud server.

| Setting | Value for vRealize Business for Cloud Server |
|------------------------------------|--|
| Display Name | vRealize Business Adapter - vrb01svr01 |
| Description | vRealize Business for Cloud Server |
| vRealize Business for Cloud server | vrb01svr01.rainpole.local |

- b Click **Test Connection** to validate the connection to the vRealize Business server instance.
 - c Click **OK** in the **Info** dialog box.
 - d Expand the **Advanced Settings** section of settings
 - e From the **Collectors/Groups** drop-down menu, make sure that the **Default collector group** is selected.
- 6 Click **Save Settings**.
- 7 Click **OK** in the **Info** dialog box.
- 8 In the **Manage Solution - VMware vRealize Business for Cloud** dialog box, click **Close**.

The **vrBC Adapter** appears on the Solutions page of the vRealize Operations Manager user interface. The **Collection State** of the adapter is **Collecting** and the **Collection Status** is **Data receiving**.

Connect vRealize Log Insight to vRealize Automation for Consolidated SDDC

Connect vRealize Log to vRealize Automation to receive log information from all components of vRealize Automation in the vRealize Log Insight user interface.

Procedure

1 [Install the vRealize Log Insight Content Packs for the Cloud Management Platform for Consolidated SDDC](#)

Install the content packs for vRealize Automation, vRealize Orchestrator, and Microsoft SQL Server to add the dashboards for viewing log information about the Cloud Management Platform in vRealize Log Insight.

2 [Install vRealize Log Insight Windows Agents for Consolidated SDDC](#)

Install the vRealize Log Insight agent on the Windows virtual machines for the Distributed Execution Manager, IaaS Manager Service, IaaS Web Server, IaaS SQL Server, and the vSphere proxy agents. The agents forward log data to vRealize Log Insight that appears in the dashboards for vRealize Automation.

3 [Create Log Insight Agent Groups for vRealize Automation Windows Agents for Consolidated SDDC](#)

Create agent groups for the vRealize Automation IaaS components and for Microsoft SQL Server. By using the agent groups, you can configure Log Insight Windows Agents centrally from the vRealize Log Insight user interface.

4 [Configure vRealize Log Insight Linux Agents in the vRealize Automation Appliances for Consolidated SDDC](#)

vRealize Log Insight Agent comes pre-installed on the vRealize Automation Appliance. On each virtual appliance in the region, by updating the `liagent.ini` configuration file, configure the agent with the location of the vRealize Log Insight deployment.

5 [Configure the vRealize Log Insight Linux Agents on vRealize Business for Consolidated SDDC](#)

vRealize Log Insight Agent comes pre-installed on the vRealize Business virtual appliances. On each virtual appliance, by updating `liagent.ini` configuration file, configure the agent with the location of the vRealize Log Insight deployment in the region.

6 [Configure vRealize Orchestrator to Forward Log Events to vRealize Log Insight for Consolidated SDDC](#)

You enable the vRealize Log Insight agent and configure the agent group for vRealize Orchestrator that is embedded in vRealize Automation Appliance to start collecting log data in the vRealize Orchestrator dashboards.

7 Add the Cloud Management Components to the Agent Group for Management Virtual Appliances for Consolidated SDDC

After you deploy the Cloud Management Platform and configure the Log Agent agents on its components, add the virtual appliance of the platform to the agent group for the management virtual appliances. You use this agent group to centrally configure a collection of logs from the operating system of the appliances.

Install the vRealize Log Insight Content Packs for the Cloud Management Platform for Consolidated SDDC

Install the content packs for vRealize Automation, vRealize Orchestrator, and Microsoft SQL Server to add the dashboards for viewing log information about the Cloud Management Platform in vRealize Log Insight.

You install the following content packs:

- VMware - vRA 7
- VMware - Orchestrator 7.0.1+
- Microsoft - SQL Server

Procedure

- 1 Log in to the vRealize Log Insight user interface.
 - a Open a Web browser and go to **https://sfo01vrli01.sfo01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------------|
| User name | admin |
| Password | <i>vrli_admin_password</i> |

- 2 In the vRealize Log Insight user interface, click the configuration drop-down menu icon  and select **Content Packs**.
- 3 Under **Content Pack Marketplace**, select **Marketplace**.
- 4 In the list of content packs, locate the **VMware - vRA 7** content pack and click its icon.
- 5 In the **Install Content Pack** dialog box, click **Install**.
- 6 Repeat the procedure to install the **VMware - Orchestrator** and **Microsoft - SQL Server** content packs.

After the installation is complete, the VMware - vRA, VMware - Orchestrator 7.0.1+ and Microsoft - SQL Server content packs appear in the **Installed Content Packs** list on the left.

Install vRealize Log Insight Windows Agents for Consolidated SDDC

Install the vRealize Log Insight agent on the Windows virtual machines for the Distributed Execution Manager, IaaS Manager Service, IaaS Web Server, IaaS SQL Server, and the vSphere proxy agents. The agents forward log data to vRealize Log Insight that appears in the dashboards for vRealize Automation.

Procedure

- 1 Log in to the Windows virtual machines of the vRealize Automation component.
 - a Open a Remote Desktop Protocol (RDP) connection to each of the following vRealize Automation virtual machines.

| vRealize Automation Component | Host Name or VM Name |
|---|-----------------------------|
| IaaS Web Server | vra01iws01a.rainpole.local |
| IaaS Manager Service and DEM Orchestrator | vra01ims01a.rainpole.local |
| Microsoft SQL Server | vra01mssql01.rainpole.local |

- b Log in using the following credentials.

| Setting | Value |
|-----------|-----------------------|
| User name | Rainpole\svc-vra |
| Password | svc-vra-user-password |

- 2 Log in to the vRealize Log Insight user interface.
 - a Open a Web browser and go to **https://sfo01vrli01.sfo01.rainpole.local**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|---------------------|
| User name | admin |
| Password | vrli_admin_password |

- 3 Click the configuration drop-down menu icon  and select **Administration**.
- 4 Under **Management**, click **Agents**.
- 5 On the **Agents** page, click the **Download Log Insight Agent Version** link.
- 6 In the **Download Log Insight Agent Version** dialog box, click **Windows MSI (32-bit/64-bit)** and save the .msi file on the vRealize Automation virtual machine.
- 7 Open an administrative command prompt window, and navigate to the directory to where you saved the .msi file.
- 8 Run the following command to install the vRealize Log Insight agent with custom values.

```
VMware-Log-Insight-Agent-4.5.0-5626690_192.168.31.10.msi SERVERPORT=9000 AUTOUPDATE=yes
LIAGENT_SSL=no
```

- 9 In the **VMware vRealize Log Insight Agent Setup** wizard, accept the license agreement and click **Next**.
- 10 With the Log Insight host name `sfo01vrli01.sfo01.rainpole.local` selected in the **Host** text box, click **Install**.
- 11 After the installation is complete, click **Finish**.
- 12 Repeat the steps for the other vRealize Automation virtual machines.

All VMware vRA 7 dashboards become available on the home page of vRealize Log Insight.

Create Log Insight Agent Groups for vRealize Automation Windows Agents for Consolidated SDDC

Create agent groups for the vRealize Automation IaaS components and for Microsoft SQL Server. By using the agent groups, you can configure Log Insight Windows Agents centrally from the vRealize Log Insight user interface.

Procedure

- 1 Log in to the vRealize Log Insight user interface.
 - a Open a Web browser and go to **`https://sfo01vrli01.sfo01.rainpole.local`**.
 - b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------------------|
| User name | admin |
| Password | <code>vrli_admin_password</code> |

- 2 Click the configuration drop-down menu icon  and select **Administration**.
- 3 Under **Management**, click **Agents**.
- 4 Create an agent group for the IaaS components of vRealize Automation.
 - a From the drop-down menu at the top, select **vRealize Automation 7 - Windows** from the **Available Templates** section.
 - b Click **Copy Template**.
 - c In the **Copy Agent Group** dialog box, enter **vRA – Windows Agent Group** in the name text box and click **Copy**.
 - d In the agent filter fields, use the following selections.

Press Enter to separate the host name values.

| Filter | Operator | Values |
|----------|----------|--|
| Hostname | Matches | <ul style="list-style-type: none"> ■ <code>vra01iws01a.rainpole.local</code> ■ <code>vra01ims01a.rainpole.local</code> |

- e Under **Agent Configuration**, click **Edit**.

- f Under **[filelog|vra-agent-vcenter-70x]**, located directory `C:\Program Files (x86)\VMware\vCAC\Agents\vCenter\logs\` and change it to **directory=C:\Program Files (x86)\VMware\vCAC\Agents\VSPHERE-AGENT-01\logs** .
 - g Click **Refresh** and verify that all the agents that are listed in the filter appear in the Agents list.
 - h Click **Save New Group** at the bottom of the page.
- 5 Create an agent group for the Microsoft SQL Server component that is used by vRealize Automation.
- a Click the configuration drop-down menu icon  and select **Administration**.
 - b Under **Management**, click **Agents**.
 - c From the drop-down at the top, select **Microsoft - SQL Server** from the **Available Templates** section.
 - d Click **Copy Template**.
 - e In the **Copy Agent Group** dialog box, enter **vRA – SQL Agent Group** in the name text box and click **Copy**.
 - f In the agent filter fields, use the following selections.
Press Enter to separate the host name values.
- | Filter | Operator | Values |
|----------|----------|-----------------------------|
| Hostname | Matches | vra01mssql01.rainpole.local |
- g Under **Agent Configuration**, click **Edit**
 - h Locate `directory=C:\Program Files\Microsoft SQL Server\MSSQL10.MSSQLSERVER\MSSQL\Log` and change it to **directory=C:\Program Files\Microsoft SQL Server\MSSQL11.MSSQLSERVER\MSSQL\Log**
-
- Note** In this VMware Validated Design, Microsoft SQL Server 2012 R2 has been installed in the default location on the Windows Server virtual machine.
-
- i Click **Refresh** and verify that all the agents listed in the filter appear in the Agents list.
 - j Click **Save New Group** at the bottom of the page.
- 6 In the vRealize Log Insight user interface, configure the Log Insight Windows Agent Group for the Microsoft SQL Server component that is used by vRealize Automation.
- a Click the configuration drop-down menu icon  and select **Administration**.
 - b Under **Management**, click **Agents**.
 - c From the drop-down at the top, select **Microsoft - SQL Server** from the **Available Templates** section.
 - d Click **Copy Template**.

- e In the **Copy Agent Group** dialog box, enter **vRA – SQL Agent Group** in the name text box and click **Copy**.
- f In the agent filter fields, use the following selections.

Press Enter to separate the host name values.

| Filter | Operator | Values |
|----------|----------|-----------------------------|
| Hostname | Matches | vra01mssql01.rainpole.local |

- g Under **Agent Configuration**, click **Edit**
- h Locate `directory=C:\Program Files\Microsoft SQL Server\MSSQL10.MSSQLSERVER\MSSQL\Log` and change it to **`directory=C:\Program Files\Microsoft SQL Server\MSSQL11.MSSQLSERVER\MSSQL\Log`**

Note In this VMware Validated Design, Microsoft SQL Server 2012 R2 has been installed in the default location on the Windows Server virtual machine.

- i Click **Refresh** and verify that all the agents listed in the filter appear in the Agents list.
- j Click **Save New Group** at the bottom of the page.

Configure vRealize Log Insight Linux Agents in the vRealize Automation Appliances for Consolidated SDDC

vRealize Log Insight Agent comes pre-installed on the vRealize Automation Appliance. On each virtual appliance in the region, by updating the `liagent.ini` configuration file, configure the agent with the location of the vRealize Log Insight deployment.

Agent configuration for the vRealize Automation Appliances includes the following tasks:

- In the management interface of the vRealize Automation Appliances, enable log forwarding to vRealize Log Insight.
- Create an agent group for configuring log forwarding from the vRealize Automation modules on the appliances.
- Create an agent group for configuring log forwarding from the operating system of the appliances.

Procedure

- 1 Open a Web browser and log in to the management interface of the vRealize Automation Appliance.

| Setting | Value |
|----------|--|
| URL | <code>https://vra01svr01a.rainpole.local:5480</code> |
| Username | <code>root</code> |
| Password | <code>vra_applianceA_root_password</code> |

2 Configure log forwarding to vReliaze Log Insight.

- a On the **VRA Settings** tab, click the **Logs** tab.
- b Scroll down to the **Log Insight Agent Configuration** section.
- c Enter the following values and click **Save Settings**

| Setting | Value |
|-----------------|----------------------------------|
| Host | sfo01vrli01.sfo01.rainpole.local |
| Port | 9000 |
| Protocol | CFAPI |
| SSL Enabled | Unchecked |
| Reconnect | 30 |
| Max Buffer Size | 2000 |

3 Log in to the vRealize Log Insight user interface.

- a Open a Web browser and go to **https://sfo01vrli01.sfo01.rainpole.local**.
- b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------------|
| User name | admin |
| Password | <i>vrli_admin_password</i> |

4 Click the configuration drop-down menu icon and select **Administration**.

5 Under **Management**, click **Agents**.

6 Create the agent group for vRealize Automation appliances on vRealize Log Insight.

- a From the drop-down menu on the top, select **vRealize Automation 7 - Linux** from the **Available Templates** section.
- b Click **Copy Template** at the bottom of the page.
- c In the **Copy Agent Group** dialog box, enter **vRA7 – Appliance Agent Group** in the name field and click **Copy**.
- d In the agent filter fields, enter the following values pressing Enter after each host name.

| Filter | Operator | Values |
|----------|----------|------------------------------|
| Hostname | Matches | ■ vra01svr01a.rainpole.local |

- e Click **Refresh** and verify that all the agents in the filter appear in the **Agents** list.
- f Click **Save New Group** at the bottom of the page.

- 7 To verify the configuration, click the **Dashboards** tab, under the **VMware - vRA 7** category click **General - Overview**.

The dashboard shows log data from the components of the vRealize Automation Appliances.

Configure the vRealize Log Insight Linux Agents on vRealize Business for Consolidated SDDC

vRealize Log Insight Agent comes pre-installed on the vRealize Business virtual appliances. On each virtual appliance, by updating `liagent.ini` configuration file, configure the agent with the location of the vRealize Log Insight deployment in the region.

Procedure

- 1 Enable Secure Shell (SSH) on the vRealize Business appliances.

- a Open a Web browser and go to the following URL.

| vRealize Business Node | Virtual Appliance Management Interface URL |
|------------------------------------|--|
| vRealize Business Server Appliance | <code>https://vrb01svr01.rainpole.local:5480</code> |
| vRealize Business Data Collector | <code>https://sfo01vrbc01.sfo01.rainpole.local:5480</code> |

- b Log in using the following credentials.

| Setting | Value |
|-----------|---------------------------------------|
| User name | <code>root</code> |
| Password | <code>vrb_server_root_password</code> |

The appliance management interface of the appliance opens.

- c Click the **Administration** tab and click **Administration**.
 - d Under the **Actions** section, click **Toggle SSH setting**.
 - e Verify that the **SSH service status** is Enabled.
 - f Repeat the step for the second vRealize Business appliance.
- 2 Configure the vRealize Log Insight agent in the vRealize Business appliance.
 - a Open an SSH connection to the vRealize Business appliance using the following settings.

| Setting | Value |
|-----------|---|
| Hostname | <ul style="list-style-type: none"> ■ <code>vrb01svr01.rainpole.local</code> ■ <code>sfo01vrbc01.sfo01.rainpole.local</code> |
| User name | <code>root</code> |
| Password | <code>vrb_server_appliance_root_password</code> |

- b Edit the `liagent.ini` file using a text editor such as `vi`.

```
vi /var/lib/loginsight-agent/liagent.ini
```

- c Add the following information under the [server] section.

```
[server]
hostname=sfo01vrli01.sfo01.rainpole.local
proto = cfapi
port = 9000
ssl = no
```

- d Replace all instances of the FQDN_localhost parameter located after agent_name with **vr01svr01.rainpole.local**.

```
[server]
hostname=sfo01vrli01.sfo01.rainpole.local
proto=cfapi
port=9000
ssl=no

; itfm server log
[filelog]ItfmServer
directory=/var/log/vrb/itfm-server
include=*
tags={"appname":"vrb", "service":"itfm_server", "agent_name":"vr01svr01.rainpole.local"}
event_marker="(\d{4}-\d{2}-\d{2})|\d{2}:\d{2}:\d{2}\.\d{3}|\d{2}-[A-Z][a-z]{2}-\d{4}|\d{1,3}
.\d{1,3}\.\d{1,3}\.\d{1,3})

; itfm tomcat log
[filelog]ItfmCatalina
directory=/usr/local/ccserver/vfabric-tc-server-standard/itbm-server/logs
include=*
tags={"appname":"vrb", "service":"itfm_catalina", "agent_name":"vr01svr01.rainpole.local"}
event_marker="(\d{4}-\d{2}-\d{2})|\d{2}:\d{2}:\d{2}\.\d{3}|\d{2}-[A-Z][a-z]{2}-\d{4}|\d{1,3}
.\d{1,3}\.\d{1,3}\.\d{1,3})

; data collector log
[filelog]DataCollector
directory=/var/log/vrb/data-collector
include=*
tags={"appname":"vrb", "service":"data_collector", "agent_name":"vr01svr01.rainpole.local"}
event_marker="(\d{4}-\d{2}-\d{2})|\d{2}:\d{2}:\d{2}\.\d{3}|\d{2}-[A-Z][a-z]{2}-\d{4}|\d{1,3}
.\d{1,3}\.\d{1,3}\.\d{1,3})
```

- e Press Esc and type :wq! to save the file.
- f Start the Log Insight agent.

```
/etc/init.d/liagentd start
```

- g Verify that the Log Insight agent is running.

```
/etc/init.d/liagentd status
```

- h Turn on autorun by default for the Log Insight agent.

```
chkconfig liagentd on
```

- i Repeat the procedure to configure the vRealize Business Data Collector at sfo01vrbc01.sfo01.rainpole.local.

Configure vRealize Orchestrator to Forward Log Events to vRealize Log Insight for Consolidated SDDC

You enable the vRealize Log Insight agent and configure the agent group for vRealize Orchestrator that is embedded in vRealize Automation Appliance to start collecting log data in the vRealize Orchestrator dashboards.

Procedure

- 1 Enable the vRealize Log Insight agents for vRealize Orchestrator.

- a Open a Web browser and go to **https://sfo01vrli01.sfo01.rainpole.local**.
- b Log in using the following credentials.

| Setting | Value |
|-----------|----------------------------|
| User name | admin |
| Password | <i>vrli_admin_password</i> |

- c Click the configuration drop-down menu icon  and select **Administration**.
- d Under **Management**, click **Agents**.
- e From the drop-down menu at the top, select **vRealize Orchestrator 7.0.1** from the **All Agents** section and click **Copy Template**.
- f In the **Copy Agent Group** dialog box, enter **vr07 – Appliance Agent Group** in the name text box and click **Copy**.
- g In the **agent filter** fields, enter the following values pressing Enter after each host name to determine which agents receive the configuration.

| Filter | Operator | Values |
|----------|----------|---|
| Hostname | Matches | <ul style="list-style-type: none"> ■ vra01svr01a.rainpole.local ■ |

- h Click **Refresh** and verify that in the **Agents** list vRealize Log Insight receives data from the two agents in the filter.
 - i Click **Save New Group** at the bottom of the page.
- 2 Verify that the vRealize Log Insight server is receiving log events from the vRealize Orchestrator appliances.
 - a Click **Dashboards**, select **VMware - Orchestrator - 7.0.1+** from the **Navigator** menu on the left side.
 - b Verify that the **Server nodes grouped by hostname** widget on the **Server overview** dashboard shows the two vRealize Orchestrator hosts.

Add the Cloud Management Components to the Agent Group for Management Virtual Appliances for Consolidated SDDC

After you deploy the Cloud Management Platform and configure the Log Agent agents on its components, add the virtual appliance of the platform to the agent group for the management virtual appliances. You use this agent group to centrally configure a collection of logs from the operating system of the appliances.

Procedure

- 1 In the **All Agents** drop-down menu, select **VA - Linux Agent Group** from the **Active Groups** section.
- 2 In the agent filter fields, add the host names of the vRealize Automation and vRealize Business Appliances to the list of management virtual appliances in the region pressing Enter after each host name.

| Filter | Operator | Values |
|----------|----------|--|
| Hostname | Matches | <ul style="list-style-type: none">■ vrops01svr01a.rainpole.local■ sfo01vropsc01a.sfo01.rainpole.local■ vra01svr01a.rainpole.local■ vr01svr01.rainpole.local■ sfo01vrbc01.sfo01.rainpole.local |

- 3 Click **Refresh** and verify that all the agents listed in the filter appear in the **Agents** list.
- 4 Click **Save New Group** at the bottom of the page.