Performing a System Upgrade, Downgrade or Recovery

- Upgrading the Software, on page 1
- Downgrading the Software, on page 21
- Performing a System Recovery, on page 24
- Triggering an Upgrade of the Cloud Service Routers, on page 24

Upgrading the Software

Before upgrading your Cisco Cloud APIC software, review the information provided in Guidelines and Limitations, on page 2.

The method that you use to upgrade your Cisco Cloud APIC software varies, depending on the situation:

- If you are upgrading from a pre-5.0(1) release to release 5.2(1), you will use a migration-based process to upgrade your software. Go to Migration-Based Upgrade, on page 3 for those instructions.

  Note The same migration-based procedures used for an upgrade can also be used for a system recovery, as described in Performing a System Recovery, on page 24.

- If you are upgrading from release 5.0(1) or later to release 5.2(1), you will use a policy-based process to upgrade your software. Go to Policy-Based Upgrade, on page 16 for those instructions.

  Note If the policy-based upgrade from release 5.0(1) or later to release 5.2(1) does not work for some reason, you can upgrade from release 5.0(1) or later to release 5.2(1) using the migration-based process as described in Migration-Based Upgrade, on page 3.

Upgrading the CSRs

Regardless of the method that you use to upgrade your Cisco Cloud APIC software, the Cloud Services Routers (CSRs) must also be upgraded whenever the Cloud APIC software is upgraded.

- Prior to release 5.2(1), the CSRs are upgraded automatically whenever you trigger an upgrade for the Cisco Cloud APIC.
- Beginning with release 5.2(1), you can trigger upgrades to the CSRs and monitor those CSR upgrades, independent from the Cisco Cloud APIC upgrades. This is useful to reduce traffic loss by allowing you to split up the upgrades for the management plane (Cisco Cloud APIC) and the data plane (CSRs).

See Triggering an Upgrade of the Cloud Service Routers, on page 24 for more information.

Guidelines and Limitations

Following are the guidelines and limitations that you must be aware of before upgrading the Cisco Cloud APIC software:

- Beginning with release 5.0(2), the configuration drift feature became available as described in the "Configuration Drifts" chapter in the Cisco Cloud APIC for Azure User Guide, Release 5.0(x) or later. After you upgrade your Cisco Cloud APIC, if you had configuration drifts enabled prior to the upgrade, you will see that the configuration drift feature is restarted after the upgrade is completed. When the feature is restarted, the previous configuration drift analysis is cleared (no configuration drifts are shown after the upgrade) and a fresh analysis is started for the configuration drift when the feature is restarted after the upgrade. This is expected behavior.
- If your Cisco Cloud APIC is part of a Cisco Multi-Site ACI fabric, where it is orchestrated with Cisco Multi-Site, you must first upgrade the Cisco ACI Multi-Site Orchestrator software to an equivalent or later release before you can upgrade the Cisco Cloud APIC software. In other words, the release of the Cisco ACI Multi-Site Orchestrator software should always be equal to or later than the release of the Cisco Cloud APIC software.
  - To determine the release date for the Cisco ACI Multi-Site Orchestrator software, go to ACI Multi-Site Software in the Software Download site, then select the appropriate release in the left nav bar to see the release date for that release
  - To determine the release date for the Cisco Cloud APIC software, go to Cloud Application Policy Infrastructure Controller in the Software Download site, then select the appropriate release in the left nav bar to see the release date for that release

  For example, if you are upgrading to Cisco Cloud APIC Release 5.1(2e):

  1. Determine the release date for Cisco Cloud APIC Release 5.1(2e) using the information in Cloud Application Policy Infrastructure Controller in the Software Download site (in this case, 28-Nov-2020), then go to ACI Multi-Site Software in the Software Download site to find the equivalent or later release of the Cisco ACI Multi-Site Orchestrator software (in this case, Multi-Site Release 3.1(1g), which was released on 28-Nov-2020).
  2. First upgrade the Cisco ACI Multi-Site Orchestrator software to the Multi-Site Release 3.1(1g). See Cisco ACI Multi-Site Orchestrator Installation and Upgrade Guide, Release 3.1(x) for those instructions.
  3. After you have upgraded the Cisco ACI Multi-Site Orchestrator software, then upgrade the Cisco Cloud APIC to the Cloud APIC Release 5.1(2e) using the instructions in this document.

- Starting with Multi-Site Release 3.0(2), the AV pair format in Cisco ACI Multi-Site Orchestrator was updated to match the format used by the Cisco APIC in order to support the single sign-on (SSO) feature. If you upgrade the Cisco ACI Multi-Site Orchestrator software to the Multi-Site Release 3.1(1) or later, you might not be able to log in using remote authentication until you update the AV pair string to the new format.

  To avoid possible issues, we recommend that you combine the AV pairs for the ACI Multi-Site Orchestrator and APIC roles in a single line, using the new format for the AV pair string as follows:

  ```
  Cisco-AVPair = "shell:domains =all/custom-privilege/,msoall/powerUser/"
  ```

  See the "Configuring Remote Authentication Server for Orchestrator Users" section in the "Authentication" chapter in Cisco ACI Multi-Site Configuration Guide, Release 3.1(x) for more information.

- There is an issue with the upgrade process where an upgrade from release 5.2(1g) to any later release will fail.

  To work around this issue, enable the **Ignore Compatibility Check** option:

  1. Follow the normal upgrade instructions provided in Upgrading the Software Using the Policy-Based Upgrade Process, on page 18 until you get to the **Ignore Compatibility Check** step in the **Schedule Upgrade** window.
  2. Enter a check mark in the box next to the **Ignore Compatibility Check** field to enable the **Ignore Compatibility Check** option.

     Enabling the **Ignore Compatibility Check** option allows this specific upgrade to proceed normally.
  3. Complete the upgrade to the post-5.2(1g) release.
  4. Once you have completed the upgrade to the post-5.2(1g) release, return to the **Schedule Upgrade** window and remove the check mark in the box next to the **Ignore Compatibility Check** field.

     This disables the **Ignore Compatibility Check** option, which is the default setting for this field.

- Due to the issue described in the previous bullet, if you are upgrading from a release prior to release 5.2(1) to a 5.2(1) release, we recommend that you upgrade directly to release 5.2(1**h**) and not release 5.2(1**g**).

Migration-Based Upgrade

Follow these procedures if you are upgrading from a pre-5.0(1) release to release 5.2(1), where you will use a migration-based process to upgrade your software.

Review the information provided in Guidelines and Limitations, on page 2 before performing the procedures in this section.

Note These migration-based procedures used for an upgrade can also be used for a system recovery, as described in Performing a System Recovery, on page 24.

Gathering Existing Cloud APIC Configuration Information

Before upgrading your Cisco Cloud APIC software, follow the instructions in this topic to locate the existing configuration information for certain fields and make a note of the entries for each of these fields. You will use the same entries for these fields below, in a step later in the following procedures, when you use the recovery template to upgrade your Cisco Cloud APIC.

For each of the following fields, make a note of the entries that you entered as part of the original deployment that you performed in Deploying the Cloud APIC in Azure:

- Subscription, on page 4
- Resource Group, on page 4
- Location, on page 4
- Fabric Name, on page 5
- External Subnets, on page 6
- Virtual Machine Name, on page 6
- Infra VNET Pool, on page 6
- Storage Account Name, on page 6

Subscription

1. Navigate to **Application Management** > **Tenants**.
2. Locate the row for the tenant that has **infra** underneath the name in the **Name** column.
3. Note the value in the **Azure Subscription** column.

   This is the **Subscription** entry for your Cisco Cloud APIC.

Resource Group

1. Navigate to **Cloud Resources** > **Virtual Machines**.

   The **Virtual Machines** window appears.
2. Locate and note the Cisco Cloud APIC VM in the VM list.

   The value for the VM is typically shown with the format <*vm_name*>(<*resource_group*>), where:

   - <*vm_name*> is the virtual machine name, as described in Virtual Machine Name, on page 6.
   - (<*resource_group*>) is the **Resource Group** entry for your Cisco Cloud APIC.

Location

1. Navigate to **Cloud Resources** > **Virtual Machines**.

   The **Virtual Machines** window appears.
2. Locate the Cisco Cloud APIC VM in the VM list.
3. Click the value for the Cisco Cloud APIC VM in the VM list.

A nav panel with details about the Cisco Cloud APIC VM slides in from the right side of the screen.

4. In the **General** area, locate and note the value in the **Region** field.

   This is the **Location** entry for your Cisco Cloud APIC.

Fabric Name

1. SSH to your Cisco Cloud APIC through the CLI:

   ```
   # ssh admin@<cloud_apic_ip_address>
   ```

   Enter the password if prompted.

2. Enter the following in the CLI:

   ```
   ACI-Cloud-Fabric-1# acidiag avread
   ```

3. Locate the **FABRIC_DOMAIN** area in the output:

```
Local appliance ID=1 ADDRESS=10.100.0.13 TEP ADDRESS=10.100.0.12/30 ROUTABLE IP
ADDRESS=0.0.0.0
CHASSIS_ID=afe36d66-042a-11eb-ab21-7b2dc494b182

Cluster of 1 lm(t):1(zeroTime) appliances (out of targeted 1
lm(t):1(2020-10-01T21:15:48.743+00:00))
with FABRIC_DOMAIN name=ACI-Cloud-Fabric set to version=5.0(2i)
lm(t):1(2020-10-01T21:15:48.746+00:00);
discoveryMode=PERMISSIVE lm(t):0(zeroTime); drrMode=OFF lm(t):0(zeroTime); kafkaMode=OFF
 lm(t):0(zeroTime)

appliance id=1 address=10.100.0.13 lm(t):1(2020-10-01T21:14:23.001+00:00) tep
address=10.100.0.12/30
lm(t):1(2020-10-01T21:14:23.001+00:00) routable address=0.0.0.0 lm(t):1(zeroTime)
oob address=10.100.0.29/28 lm(t):1(2020-10-01T21:14:26.723+00:00) version=5.0(2i)
lm(t):1(2020-10-01T21:14:26.841+00:00) chassisId=afe36d66-042a-11eb-ab21-7b2dc494b182
lm(t):1(2020-10-01T21:14:26.841+00:00) capabilities=0X7EEFFFFFFFFF--0X2020--0X1
lm(t):1(2020-10-01T21:20:27.483+00:00) rK=(stable,present,0X206173722D687373)
lm(t):1(2020-10-01T21:14:26.728+00:00) aK=(stable,present,0X206173722D687373)
lm(t):1(2020-10-01T21:14:26.728+00:00) oobrK=(stable,present,0X206173722D687373)
lm(t):1(2020-10-01T21:14:26.728+00:00) oobaK=(stable,present,0X206173722D687373)
lm(t):1(2020-10-01T21:14:26.728+00:00) cntrlSbst=(APPROVED, E8E6DDB1D800)
lm(t):1(2020-10-01T21:14:26.841+00:00) (targetMbSn= lm(t):0(zeroTime),
failoverStatus=0 lm(t):0(zeroTime)) podId=1 lm(t):1(2020-10-01T21:14:23.001+00:00)
commissioned=YES lm(t):1(zeroTime) registered=YES lm(t):1(2020-10-01T21:14:23.001+00:00)

standby=NO lm(t):1(2020-10-01T21:14:23.001+00:00) DRR=NO lm(t):0(zeroTime) apicX=NO
lm(t):1(2020-10-01T21:14:23.001+00:00) virtual=YES lm(t):1(2020-10-01T21:14:23.001+00:00)

active=YES(2020-10-01T21:14:23.001+00:00) health=(applnc:255
lm(t):1(2020-10-01T21:16:16.514+00:00) svc's)
--------------------------------------------
clusterTime=<diff=-1 common=2020-10-02T07:46:19.717+00:00
local=2020-10-02T07:46:19.718+00:00
pF=<displForm=0 offsSt=0 offsVlu=0 lm(t):1(2020-10-01T21:15:50.026+00:00)>>
--------------------------------------------
```

This is the **Fabric Name** entry for your Cisco Cloud APIC.

External Subnets

1. Navigate to **Application Management** > **EPGs**.
2. Locate the EPG with the name **ext-networks** and click that EPG.

   A nav panel slides in from the right side of the screen.
3. In the nav panel, click the **Details** icon ( ).

   The **Overview** page for this EPG appears.
4. In the **Endpoints** area, locate the row for **ext-Network1** and note the value in the **Subnet** column.

   This is the **External Subnets** entry for your Cisco Cloud APIC. Note that a value of `0.0.0.0/0` meant that anyone is allowed to connect to your Cisco Cloud APIC.

Virtual Machine Name

1. Navigate to **Cloud Resources** > **Virtual Machines**.

   The **Virtual Machines** window appears.
2. Locate and note the value for the Cisco Cloud APIC VM in the list.

   The value for the VM is typically shown with the format <*vm_name*>(<*resource_group*>), where:

   - <*vm_name*> is the **Virtual Machine Name** entry for your Cisco Cloud APIC.
   - (<*resource_group*>) is the resource group, as described in Resource Group, on page 4.

Infra VNET Pool

For the infra VNET pool, you might have multiple infra subnet pools, so be sure to locate the information for the infra subnet that was used when you launched the original Cisco Cloud APIC through the ARM template as part of the procedures in Deploying the Cloud APIC in Azure.

1. In your Cisco Cloud APIC GUI, click the Intent icon ( ) and choose **cAPIC Setup**.
2. In the Region Management area, click **Edit Configuration**.

   The **Regions to Manage** window appears.
3. Click **Next**.

   The **General Connectivity** window appears.
4. In the **Subnet Pools for Cloud Routers** area underneath **General**, locate the row that has a **System Internal** value in the **Created By** column and note the value in the **Subnet** column.

   This is the **Infra VNET Pool** entry for your Cisco Cloud APIC.

Storage Account Name

Navigate to the **Storage accounts** page in Azure under the resource group where the Cisco Cloud APIC was deployed previously:

1. Log into your Azure account for the Cloud APIC infra tenant and go to the Azure management portal, if you are not there already:

   https://portal.azure.com/#home

2. Under **Services**, select **Storage accounts**.

   The **Storage accounts** page appears.

3. Locate and note the storage account name for your Cisco Cloud APIC resource group.

   This is the **Storage Account Name** entry for your Cisco Cloud APIC.

Performing Pre-Upgrade Procedures

Before you begin

Complete the procedures in Gathering Existing Cloud APIC Configuration Information, on page 4 before proceeding with these procedures.

Step 1 Enable the encrypted passphrase control, if it is not enabled already.

a) In your Cisco Cloud APIC GUI, navigate to **Infrastructure** > **System Configuration**.

It should be underneath the **General** tab by default; if not, click the **General** tab.

b) Determine if the encrypted passphrase control is enabled already.

- In the **Global AES Encryption** area, if you see **Yes** underneath the **Encryption** and **Key Configured** fields, then you have the encrypted passphrase control enabled already. Go to Step 2, on page 7.
- If you do not see **Yes** underneath the **Encryption** and **Key Configured** fields:

  1. Click the pencil icon at the upper right part of the **Global AES Encryption** area.

     The **Global AES Encryption Settings** window appears.

  2. Click the box next to the **Encryption: Enabled** area, enter a passphrase in the **Passphrase/Confirm Passphrase** fields, then click **Save** at the bottom of the window.

     Make a note of the passphrase that you entered in this step, as you will need it in a step later in the following procedures.

Step 2 Back up your existing Cisco Cloud APIC configuration.

There are a number of different ways that you can back up your Cisco Cloud APIC configuration. See the *Cloud APIC for Azure Users Guide* for more information. Note that if you want to use a remote backup, you will also need to add a remote location first.

Step 3 If you have non-home region CSRs in your deployment, remove the CSRs from all regions *except the home region*.

Note You do not have to perform the procedures in this step if you do not have non-home region CSRs in your deployment. Skip to Step 4, on page 8 in that case.

a) In your Cisco Cloud APIC GUI, click the Intent icon ( ) and choose **cAPIC Setup**.

b) In the Region Management area, click **Edit Configuration**.

The **Regions to Manage** window appears.

c) Make a note of the regions that have boxes selected in the **Cloud Routers** column.

You will be unselecting the boxes in the **Cloud Routers** column in the next step. When you restore the backed-up configuration later in these procedures, these same cloud router selections should be selected automatically. However, you can use the list that you note in this step if you want to verify that the same cloud routers were correctly selected.

d) Unselect (remove checks from boxes) in the **Cloud Routers** column for every region in the window except for the home region (the region that has the text **Cloud APIC Deployed**).

e) Click **Next**, then enter the necessary information in the following page and click **Save and Continue**.

After you click **Save and Continue**, wait until the following changes to take place:

- All of the non-home region CSR virtual machines are deleted from the Azure portal
- All of the public IP addresses for the CSR interfaces are deleted from the Azure portal
- All of the **Network interfaces** assigned to these virtual machines are deleted from the Azure portal

The process of removing the CSRs might take roughly a half hour. You can monitor the process of the CSR removal by looking at the virtual machines for the infra resource group in the Azure portal.

Step 4 Delete the Cisco Cloud APIC VM.

a) In the Microsoft Azure portal, navigate to **Services** > **Virtual Machines**.

b) Locate the Cisco Cloud APIC VM in the **Virtual Machines** window and click on the Cloud APIC VM.

The **Overview** page for the Cisco Cloud APIC VM appears.

c) Click **Delete**, then click **Yes** when asked for confirmation of this action.

You can view the deletion process in the Notifications area.

What to do next

Follow the procedures in Downloading and Deploying the Recovery Template, on page 8.

Downloading and Deploying the Recovery Template

Before you begin

Complete the procedures in Performing Pre-Upgrade Procedures, on page 7 before proceeding with these procedures.

Step 1 Download the release 5.2(1) recovery template for Cisco Cloud APIC.

Contact Cisco TAC to get the release 5.2(1) recovery template:

https://www.cisco.com/c/en/us/support/web/tsd-cisco-worldwide-contacts.html

Step 2 Deploy the release 5.2(1) recovery template in the Azure portal.

a) In the Azure portal, go to the **All Services** page:

https://portal.azure.com/#allservices

b) In the **General** area, click **Templates**.
c) In the **Templates** page, click Add.

The **Add Template** page appears.

d) Enter the necessary information in the **Add Template** page.

- **Name**: Enter a unique name that will identify this template as the release 5.2(1) recovery template (for example, `template-521-recovery`).
- **Description**: Enter descriptive text for this template, if necessary.

e) Click **OK**.

The **ARM Template** page appears.

f) In the **ARM Template** page, delete the default text that is automatically added in the template.
g) Navigate to the area where you downloaded the release 5.2(1) recovery template in Step 1, on page 8.
h) Using a text editor, open the release 5.2(1) recovery template and copy the contents in the template.
i) In the Azure portal window, paste the contents into the **ARM Template** page.
j) Click **OK**.

The **Add Template** page appears again.

k) Click **Add**.

The new release 5.2(1) recovery template is added to the **Templates** page. If you do not see the new release 5.2(1) recovery template in the **Templates** page, click **Refresh** to refresh the page.

Step 3 Use the recovery template to deploy the Cisco Cloud APIC VM in the same resource group.

a) In the Templates page, click the new release 5.2(1) recovery template that you just added.
b) Click **Deploy**.

The **Custom Deployment** page appears.

c) Enter the necessary information in the recovery template.

- **Basics**:
  - **Subscription**: Choose the same subscription that you used when you first deployed your Cisco Cloud APIC, as described in Subscription, on page 4.
  - **Resource Group**: You must choose the same resource group that you used when you first deployed your Cisco Cloud APIC, as described in Resource Group, on page 4.
  - **Location**: Select the same region that you used when you first deployed your Cisco Cloud APIC, as described in Location, on page 4.

    Note The **Location** option might not be available when you are using the same resource group.

- **Settings**:
  - **Vm Name**: Enter the same VM name that was used previously, as described in Virtual Machine Name, on page 6.
  - **Vm Size**: Select the size for the VM.
  - **Image Sku**: Select the `5_0_2_byol` image SKU.

- **Admin Username**: Leave the default entry for this field as-is. The admin username login will work once the Cisco Cloud APIC is up.
- **Admin Password or Key**: Enter an admin password.
- **Admin Public Key**: Enter the admin public key (the ssh key).
- **Fabric Name**: Enter the same fabric name that was used previously, as described in Fabric Name, on page 5.
- **Infra VNET Pool**: Enter the same infra subnet pool that was used previously, as described in Infra VNET Pool, on page 6.
- **External Subnets**: Enter the IP addresses and subnets of the external networks that were used previously to allow access to the Cisco Cloud APIC, as described in External Subnets, on page 6. This would be the same external subnet pool for Cisco Cloud APIC access that you entered as part of the original deployment that you performed in Deploying the Cloud APIC in Azure.
- **Storage Account Name**: Enter the same storage account name that was used previously, as described in Storage Account Name, on page 6.
- **Virtual Network Name**: The name for the virtual network.
  - If you are performing an upgrade from pre-release 5.2(1) to release 5.2(1), do not modify the values of these parameter. Leave the default value for the virtual network name as-is for this field.
  - If you are performing a recovery from 5.2(1), verify that the virtual network name in this field matches the virtual network name that was originally used to deploy the Cisco Cloud APIC.
- **Mgmt Nsg Name**: The name for the management network security group.
  - If you are performing a recovery or an upgrade from pre-release 5.2(1) to release 5.2(1), do not modify the values of these parameter. Leave the default value for the management network security group name as-is for this field.
  - If you are performing a recovery from 5.2(1), verify that the management network security group name in this field matches the management network security group name that was originally used to deploy the Cisco Cloud APIC.
- **Mgmt Asg Name**: The name for the management application security group.
  - If you are performing a recovery or an upgrade from pre-release 5.2(1) to release 5.2(1), do not modify the values of these parameter. Leave the default value for the management application security group name as-is for this field.
  - If you are performing a recovery from 5.2(1), verify that the management application security group name in this field matches the management application security group name that was originally used to deploy the Cisco Cloud APIC.
- **Subnet Prefix**: The entry for this field will be the subnet prefix that needs to be used for the automatically-configured infra subnet.
  - If you are performing an upgrade from pre-release 5.2(1) to release 5.2(1), do not modify the values of these parameter. Leave the default values as-is for this field.
  - If you are performing a recovery from 5.2(1), verify that the subnet prefix in this field matches the subnet prefix that was originally used to deploy the Cisco Cloud APIC. You can check that prefix by

looking at the format of the subnet names on the Cisco Cloud APIC Virtual Network. For example, if subnet names shown there are **subnet-10.10.0.0_28**, then the subnet prefix for this field should be **subnet-**.

d) Click the box next to the agreement statement, then click **Purchase**.

The **Azure services** window appears, with a small popup window saying **Deployment in progress**. Click the Notifications icon to continue to monitor the progress of the deployment. The deployment usually takes roughly five or so minutes to complete.

After a period of time, you will see the **Deployment succeeded** window.

What to do next

Follow the procedures in Performing Post-Upgrade Procedures, on page 11.

Performing Post-Upgrade Procedures

Before you begin

Complete the procedures in Downloading and Deploying the Recovery Template, on page 8 before proceeding with these procedures.

Step 1 Give the contributor role to the Cisco Cloud APIC VM on the infra subscription.

a) In the Microsoft Azure portal, under **Services**, select **Subscription**.
b) Select the subscription where Cisco Cloud APIC was deployed.
c) Select **Access Control (IAM)**.
d) On the top menu, click **Add** > **Add role assignment**.
e) In the **Role** field, select **Contributor**.
f) In the **Assign access to** field, select **Virtual Machine**.
g) In the **Subscription** field, select the subscription where the Cisco Cloud APIC was deployed.
h) In **Select**, click on the Cisco Cloud APIC Virtual Machine.
i) Click **Save**.

Note Also give the contributor role to the Cisco Cloud APIC VM if you have managed user tenants. You must do this on user subscriptions that are used to deploy the user tenants. See Understanding Tenants, Identities, and Subscriptions and Adding a Role Assignment for a Virtual Machine for more information.

Step 2 Enable the same encryption passphrase.

a) In the Microsoft Azure portal, under **Services**, select **Virtual machines**.
b) In the **Virtual machines** window, click the Cisco Cloud APIC.

The **Overview** page for the Cisco Cloud APIC appears.

c) Locate the **Public IP address** field and copy the IP address.
d) In another browser window, enter the IP address and hit Return:

```
https://<IP_address>
```

The **Welcome to Cloud APIC** screen appears after logging in for the first time.

e) Click **Begin First Time Setup**.

The **Let's Configure the Basics** window appears. Click the **X** in the upper right corner to exit out of this window to proceed with procedures to enable the same encryption passphrase.

f) In your Cisco Cloud APIC GUI, navigate to **Infrastructure** > **System Configuration**.

It should be underneath the **General** tab by default; if not, click the **General** tab.

After first login, welcome screen appears. Click begin first time setup.first time setup page opens, close the first time setup pagethen user can proceed to setting the pass phrase.

g) In the **Global AES Encryption** area, click the pencil icon at the upper right part of the **Global AES Encryption** area.

The **Global AES Encryption Settings** window appears.

h) Click the box next to the **Encryption: Enabled** area, enter the same passphrase in the **Passphrase/Confirm Passphrase** fields that you used in Step 1, on page 7 in Performing Pre-Upgrade Procedures, on page 7, then click **Save** at the bottom of the window.

Step 3 If you are performing a migration-based upgrade to release 5.2(1), run the Python script to clean up the necessary configuration before importing the configuration that you backed up earlier.

Contact Cisco TAC to get the Python script to address the issue raised in CSCvy42684 to clean up the necessary configuration:

https://www.cisco.com/c/en/us/support/web/tsd-cisco-worldwide-contacts.html

Step 4 Import the configuration that you backed up in Step 2, on page 7 in Performing Pre-Upgrade Procedures, on page 7.

If you configured a remote location when you backed up your configuration, you might have to create the remote location again to access the backup.

a) In your Cisco Cloud APIC GUI, navigate to **Operations** > **Backup & Restore**.
b) In the **Backup & Restore** window, click the **Backups** tab.
c) Click the **Actions** scrolldown menu, then choose **Restore Configuration**.

The **Restore Configuration** window appears.

d) Enter the necessary information to restore the configuration that you backed up in Step 2, on page 7 in Performing Pre-Upgrade Procedures, on page 7.

If you are upgrading from a 4.2(x) release to release 5.2(x) or later, for this particular backup restore, use the following settings:

- In the **Restore Type** field, choose **Merge**.
- In the **Restore Mode** field, choose **Best Effort**.

Click **Restore Configuration** when you have entered the necessary information in this window.

e) Wait until the restore process is complete before proceeding to the next step.

Click the **Job Status** tab in the **Backup & Restore** window to get the status of the restore process and verify that the restore process was successful.

Step 5 Review the naming policy.

a) In your Cisco Cloud APIC GUI, click the Intent icon ( ) and choose **cAPIC Setup**.
b) In the Region Management area, click **Edit Configuration**.

The **Regions to Manage** window appears.

c) Verify that the selections that you had prior to the migration were transferred over successfully with the backup import, then click **Next**.

Note Do not modify the managed region or CSR configuration at this point.

d) Navigate to the last page in the setup and review the information in the **Cloud Resource Naming Rules** area.

- If you are performing a recovery or an upgrade from pre-release 5.2(1) to release 5.2(1), do not modify the default cloud resource naming rules. Leave the default cloud resource naming rules as-is in this case.
- If you are performing a recovery from 5.2(1), verify that the cloud resource naming rules match the cloud resource naming rules that were originally used to deploy the Cisco Cloud APIC.

Click the box next to **Deploy cloud resources based on these naming rules**, then click **Save and Continue** after reviewing the information in this screen. Resources will not be deployed to the cloud until the naming rules have been reviewed and accepted.

At this point in the process, the non-home region CSRs will be deployed automatically with the new CSR image.

Note Allow for some time to pass for the Cisco Cloud APIC to clear all of the faults before proceeding to the next step. See "Viewing Health Details Using the Cisco Cloud APIC GUI" in the *Cisco Cloud APIC for Azure User Guide* for more information.

Step 6 Wait for the non-home region CSRs to come up on the cloud, and ensure that all of the VGW tunnels are up with the newly-created CSRs and the configuration reconciliation is complete.

In addition, you may see that the home region CSR is deleted and recreated at this point in the process if a CSR upgrade is required. Ignore these actions and any faults that might appear as a result, as they will clear up when you complete the following steps in this procedure.

Wait until the home region CSRs are upgraded to the latest CSR version in this case. For example, for Release 5.2(1), the latest CSR version would be 17_3_2.

Step 7 (Optional) If you have intersite connectivity and you want to avoid a complete intersite traffic drop, reconfigure the non-home region intersite tunnels and bring up the tunnels through the ACI Multi-Site Orchestrator before bringing down the home region CSRs in the next step.

This step is not necessary if you do not have intersite connectivity or if you have intersite connectivity but you're not concerned with traffic loss.

a) In the ACI Multi-Site Orchestrator, in the **Sites** screen, click **CONFIGURE INFRA**.

The **Fabric Connectivity Infra** page appears.

b) In the left pane, under **SITES**, click on the cloud site.
c) Click **Reload Site Data**.
d) Verify that the new CSRs are added in the UI.
e) Click the **Deploy** button at the top right of the screen, then choose the **Deploy & Download IPN Device config files** option.

This action pushes the configuration to both the on-premises APIC site and the Cloud APIC site and enables the end-to-end interconnect connectivity between the on-premises and the cloud site. In addition, this option downloads a zip file that contains configuration information that you will use to enable connectivity between the Cisco Cloud Services Router 1000V (CSR) deployed in Azure and the on-premises IPsec termination device. A followup screen appears that allows you to select all or some of the configuration files to download.

Note If you delete and recreate intersite tunnels on the cloud CSRs from the Cisco Cloud APIC in this step, and you need to program the new keys on the on-premises IPsec termination device, where you are going to change the key for the same public IP address of the cloud CSRs, you must first manually delete the existing keys on the on-premises IPsec termination device and add a new key. There should be only one matching IPsec pre-shared key for a given cloud CSR destination IP address on the on-premises IPsec termination device.

Step 8 Undeploy the home region CSRs.

Note If you are upgrading from 4.2(3) to 5.2(1), undeploying and redeploying the home region CSRs also migrates the CSR public IP SKU from the basic SKU to the standard SKU.

a) In your Cisco Cloud APIC GUI, click the Intent icon ( ) and choose **cAPIC Setup**.
b) In the Region Management area, click **Edit Configuration**.

The **Regions to Manage** window appears.

c) Locate the home region (the region that has the text **Cloud APIC Deployed**) and unselect the boxes in the **Cloud Routers** column for the home region.
d) Click **Save**.

This removes the old CSRs for the home region.

e) Wait for home region CSR VMs, CSR NICs, and CSR public IP addresses to get deleted on the cloud.

Once the home region CSR VMs, CSR NICs, and CSR public IP addresses are deleted on the cloud, you can redeploy the CSRs back in the home region.

Step 9 Redeploy the home region CSRs.

The previously-configured home region CSRs are deleted and the new home region CSRs are re-created in this step.

a) Click **Previous** to return to the **Regions to Manage** screen, then click the boxes in the **Cloud Routers** column for the home region to re-enable the CSRs for the home region.
b) Click **Save**.

If you are upgrading from 4.2(3) to 5.2(1), this action migrates the CSR Public IP SKU to the standard SKU for the home region.

Step 10 (Optional) Complete the procedures in this step if intersite connectivity is required.

- If intersite connectivity is not required, then you do not have to complete the procedures in this step. Skip to Migrating to VNet Peering (Optional), on page 15 in that case.
- If intersite connectivity is required, then complete the following procedures:

a) Once the new home region CSRs come up, in the ACI Multi-Site Orchestrator, in the **Sites** screen, click **CONFIGURE INFRA**.

The **Fabric Connectivity Infra** page appears.

b) In the left pane, under **SITES**, click on the cloud site.
c) Click **Reload Site Data**.
d) Verify that the new CSRs are added in the UI.
e) Click the **Deploy** button at the top right of the screen, then choose the **Deploy & Download IPN Device config files** option.
f) Reconfigure the IPN IPsec tunnels on the on-premises CSR with the downloaded IPN configuration.

See Enabling Connectivity Between the Cisco Cloud APIC and the ISN Devices.

Note If you delete and recreate intersite tunnels on the cloud CSRs from the Cisco Cloud APIC for any reason, and you need to program the new keys on the on-premises IPsec termination device, where you are going to change the key for the same public IP address of the cloud CSRs, you must first manually delete the existing keys on the on-premises IPsec termination device and add a new key. There should be only one matching IPsec pre-shared key for a given cloud CSR destination IP address on the on-premises IPsec termination device.

What to do next

If you want to migrate to Azure VNet peering for inter-VNet connectivity, follow the procedures in Migrating to VNet Peering (Optional), on page 15.

Migrating to VNet Peering (Optional)

Follow the procedures in this task if you want to migrate to Azure VNet peering for inter-VNet connectivity rather than using the traditionial tunnel-based VPN connectivity through the CSRs. For more information on the VNet peering feature, see the *Configuring VNet Peering for Cloud APIC for Azure* document.

Note Migrating to VNet peering mode is a disruptive operation. Be aware that there will be traffic loss during the process.

Before you begin

Complete the procedures in Performing Post-Upgrade Procedures, on page 11 before proceeding with these procedures.

Step 1 In your Cisco Cloud APIC GUI, click the Intent icon ( ) and choose **cAPIC Setup**.

Step 2 In the **Region Management** area, click **Edit Configuration**.

The **Regions to Manage** window appears.

Step 3 Locate the **Connectivity for Internal Network** area and verify that the **Virtual Network Peering** is available.

Step 4 Click **Virtual Network Peering** to enable the Azure VNet peering feature.

This enables VNet peering at the Cisco Cloud APIC level, deploying NLBs in all the regions with CSRs in the infra VNet.

After you have enabled VNet peering at the Cisco Cloud APIC level, on each user cloud context profile, you will have to enable the **VNet Peering** option and disable the **VNet Gateway Router** option.

Note The following steps describe now to enable VNet peering on each cloud context profile through the Cisco Cloud APIC GUI. You can also perform the following steps through the ACI Multi-Site Orchestrator, if you want.

Step 5 In the left navigation bar, navigate to **Application Management** > **Cloud Context Profiles**.

The existing cloud context profiles are displayed.

Step 6 Click Actions and choose **Create Cloud Context Profile**.

The **Create Cloud Context Profile** dialog box appears.

Step 7 Locate the **VNet Gateway Router** field and click to uncheck (disable) the **VNet Gateway Router** check box.

Step 8 Locate the **VNet Peering** field and click to check (enable) the **VNet Peering** check box.

Step 9 Click **Save** when finished.

Step 10 Configure the Network Contributor role for both the infra and user tenant subscriptions.

For example, assume the following:

- The infra tenant is using subscription **S1** with access credentials/service principal **C1**
- The user tenant is using subscription **S2** with access credentials/service principal **C2**

In this situation, you will have to configure the following for peering to work between the user tenant and the infra VNets:

- You will have to give C1 Network Contributor role permissions to S2 for the hub to spoke peering link
- You will have to give C2 Network Contributor role permissions to S1 for the spoke to hub peering link

a) In the yellow window that appears, copy the **az** command provided.

- If you have configure the Network Contributor role for the user tenant, copy the text in the area **Command to run for User Subscription**.
- If you have configure the Network Contributor role for the infra tenant, copy the text in the area **Command to run for Infra Subscription**.

b) Return to the Azure management portal and click **Registrations** in the left navigation bar.

c) Open the Cloud Shell.

d) Select **Bash**.

e) Paste the **az** command that you copied in 10.a, on page 16.

Policy-Based Upgrade

Use the procedures in the following sections to perform a policy-based upgrade of your Cisco Cloud APIC software, if you are upgrading from release 5.0(1) or later to release 5.2(1).

Review the information provided in Guidelines and Limitations, on page 2 before performing the procedures in this section.

Downloading an Image

Step 1 Log in to your Cisco Cloud APIC, if you aren't logged in already.

Step 2 From the **Navigation** menu, choose **Operations** > **Firmware Management**.

The **Firmware Management** window appears.

Step 3 Click the **Images** tab in the **Firmware Management** window.

Step 4 Click **Actions**, then choose **Add Firmware Image** from the scroll-down menu.

The **Add Firmware Image** pop-up appears.

Step 5 Determine if you want to add the firmware image from a local or a remote location.

- If you want to add the firmware image from a *local* location, click the **Local** radio button in the **Image Location** field. Click the **Choose File** button, then navigate to the folder on your local system with the firmware image that you want to import and select the file. Go to Step 6, on page 18.
- If you want to import the firmware image from a *remote* location, click the **Remote** radio button in the **Image Location** field, then perform the following actions:

a) In the **Protocol** field, click either the **HTTP** or the **SCP** radio button.

b) In the **URL** field, enter the URL from where the image will be downloaded.

- If you selected the **HTTP** radio button in the previous step, enter the http source that you want to use to download the software image. An example URL is **`10.67.82.87:/home/<username>/ACI/aci-apic-dk9.1.0.2j.iso`**. Go to Step 6, on page 18.
- If you selected the **SCP** radio button in the previous step, enter the Secure Copy Protocol (SCP) source that you want to use to download the software image, using the format **`<SCP server>:/<path>`**. An example URL is **`10.67.82.87:/home/<username>/ACI/aci-apic-dk9.1.0.2j.iso`**.

c) In the **Username** field, enter your username for secure copy.

d) In the **Authentication Type** field, select the type of authentication for the download. The type can be:

- **Password**
- **SSH Key**

The default is **Password**.

e) If you selected **Password**, in the **Password** field, enter your password for secure copy. Go to Step 6, on page 18.

f) If you selected **SSH Key**, enter the following information:

- **SSH Key Content** — The SSH Key Content is used to create the SSH Key File which is required when creating a Remote location for the download.

  Note The public key is generated at the time of the transfer. After the transfer the key files that were generated in the background are deleted. The temporary key files are stored in dataexport directory of the Cisco Cloud APIC.

- **SSH Key Passphrase** — The SSH Key Passphrase is used to create the SSH Key File which is required when creating a Remote location for the download.

  Note The Passphrase field can remain empty.

Step 6 Click **Select**.
Wait for the Cisco Cloud APIC firmware images to download.

Upgrading the Software Using the Policy-Based Upgrade Process

Use the procedures in the following sections to perform a policy-based upgrade of your Cisco Cloud APIC software, if you are upgrading from release 5.0(1) or later to release 5.2.(1).

Before you begin

- You have downloaded an image using the procedures provided in Downloading an Image, on page 17.

Step 1 Subscribe to the **17.3.2** image for the Cisco Cloud Services Router (CSR) 1000V - Bring Your Own License (BYOL) for release 5.2.(1).

a) In the Azure Marketplace search text field, type *Cisco Cloud Services Router (CSR) 1000V* and select the option that appears.

The **Cisco Cloud Services Router (CSR) 1000V** option appears as a search suggestion.

b) Click the **Cisco Cloud Services Router (CSR) 1000V** option.

You should be redirected to the **Cisco Cloud Services Router (CSR) 1000V** page in the Microsoft Azure Marketplace.

c) Locate the **Select a software plan** drop-down menu.

If you do not see the **Select a software plan** drop-down menu in the main page, you might have to click the **Plans + Pricing** tab, if that option is available, to access the **Select a software plan** drop-down menu.

d) In the **Select a software plan** drop-down menu, select the **Cisco CSR 1000V Bring Your Own License - XE 17.3.2** option.

e) Locate the **Want to deploy programmability?** field and click **Get Started**.

f) In the **Configure Programmability Deployment** page, scroll down to your subscription and, in the Status column, change the status from **Disable** to **Enable** for your subscription.

g) Click **Save**.

Step 2 If you are upgrading from **release 5.0(1)** to release 5.2.(1), remove the CSRs from all regions *except the home region*.

Note If you are upgrading from **release 5.0(2)** or later to release 5.2(1), do not remove any CSRs. Go to Step 3, on page 19 in this case.

Do not remove the CSR from the home region at this point. Removing the CSR for the home region at this point will cause an outage.

a) In your Cloud APIC GUI, click the Intent icon ( ) and choose **cAPIC Setup**.

b) In the Region Management area, click **Edit Configuration**.

The **Regions to Manage** window appears.

c) Make a note of the regions that have boxes selected in the **Cloud Routers** column.

You will be unselecting the boxes in the **Cloud Routers** column in the next step, so make sure you know which regions will need to selected again at the end of this procedure.

d) Unselect (remove checks from boxes) in the **Cloud Routers** column for every region in the window except for the home region (the region that has the text **Cloud APIC Deployed**).
e) Click **Next**, then enter the necessary information in the following page and click **Save and Continue**.

The process of removing the CSRs might take roughly a half hour. You can monitor the process of the CSR removal by looking at the virtual machines for the resource group in the Azure portal.

Do not proceed to the next step until the necessary CSRs have been completely removed.

Step 3 From the **Navigation** menu, choose the **Operations** > **Firmware Management**.

The **Firmware Management** window appears.

Step 4 Click **Schedule Upgrade**.

The **Schedule Upgrade** pop-up appears.

If you see a message that says that faults are present in your fabric, we recommend that you resolve these faults before performing a upgrade. See "Viewing Health Details Using the Cisco Cloud APIC GUI" in the *Cisco Cloud APIC for Azure User Guide* for more information.

Step 5 In the **Target Firmware** field, choose a firmware image from the scroll-down menu.

Step 6 In the **Upgrade Start Time** field, determine if you want to begin the upgrade now or later.

- Click **Now** if you want to schedule the upgrade for now. Go to Step 7, on page 19.
- Click **Later** if you want to schedule the upgrade for a later date or time, then select the date and time from the pop-up calendar for the scheduled upgrade.

Step 7 In the **Ignore Compatibility Check** field, leave the setting in the default off (unchecked) setting, unless you are specifically told to disable the compatibility check feature.

In Cloud APIC, there is a compatibility check feature that verifies if an upgrade path from the currently-running version of the system to a specific newer version is supported or not. The **Ignore Compatibility Check** setting is set to off by default, so the system automatically checks the compatibility for possible upgrades by default.

Note If you choose to disable the compatibility check feature by entering a check mark in the box next to the **Ignore Compatibility Check** field, you run the risk of making an unsupported upgrade to your system, which could result in your system going to an unavailable state.

Step 8 Click **Schedule Upgrade**.

You can monitor the progress of the upgrade in the main **Firmware Management** window, under the **Upgrade Status** area.

Step 9 If you are upgrading from **release 5.0(1)** to release 5.2(1), when the upgrade is completed, add the necessary CSRs back again.

Note This step is necessary only if you are upgrading from **release 5.0(1)** to release 5.2(1). If you are upgrading from **release 5.0(2)** or later to release 5.2(1), you do not have to perform any more steps in this section.

Verify that the home region CSR is stabilized before adding the CSRs in the other regions back again.

a) In your Cloud APIC GUI, click the Intent icon ( ) and choose **cAPIC Setup**.
b) In the Region Management area, click **Edit Configuration**.

The **Regions to Manage** window appears.

c) Locate all of the regions that had CSRs and check the boxes in the **Cloud Routers** column for each of those regions to add the CSRs back again.
d) Click Next, then enter the necessary information in the following page and click **Save and Continue**.

Step 10 Verify that all of the CSRs (home region CSR and non-home region CSRs) have come up with release 17.3.2.

Do not power off your Cisco Cloud APIC VM until all of the CSRs have come up with release 17.3.2.

Step 11 If you are upgrading from release 5.0(1) to release 5.2(1), determine if you want to migrate to Azure VNet peering for inter-VNet connectivity rather than using the traditionial tunnel-based VPN connectivity through the CSRs.

For more information on the VNet peering feature, see the *Configuring VNet Peering for Cloud APIC for Azure* document.

Note Migrating to VNet peering mode is a disruptive operation. Be aware that there will be traffic loss during the process.

Follow these instructions to enable the VNet peering feature:

a) In your Cloud APIC GUI, click the Intent icon ( ) and choose **cAPIC Setup**.
b) In the **Region Management** area, click **Edit Configuration**.

The **Regions to Manage** window appears.

c) Locate the **Connectivity for Internal Network** area and verify that the **Virtual Network Peering** is available.

- If the **Virtual Network Peering** is available, then the home region CSR has already been successfully migrated from the basic SKU to the standard SKU. Go to 11.i, on page 20 in this case.
- If the **Virtual Network Peering** is not available, that means that the home region CSR is still set to the basic SKU rather than the updated standard SKU. Continue to 11.d, on page 20 to migrate the home region CSR to the standard SKU.

d) Locate the home region (the region that has the text **Cloud APIC Deployed**) and unselect the box in the **Cloud Routers** column for the home region.
e) Click **Save**.

This action removes the CSR with the basic SKU for the home region.

f) Click **Previous** to return to the **Regions to Manage** screen, then click the box in the **Cloud Routers** column for the home region to re-enable the CSR for the home region.
g) Click **Save**.

This action adds the CSR with the standard SKU for the home region.

h) Click **Previous** to return to the **Regions to Manage** screen, then locate the **Connectivity for Internal Network** area and verify that the **Virtual Network Peering** is available.
i) Click **Virtual Network Peering** to enable the Azure VNet peering feature.

This enables VNet peering at the Cloud APIC level, deploying NLBs in all the regions with CSRs in the infra VNet.

Note The **VPN Connectivity via CSR** option is used to enable the traditional VPN connectivity through the overlay IPsec tunnels between CSRs and Azure VPN Gateway routers, instead of using VNet peering.

After you have enabled VNet peering at the Cloud APIC level, on each user cloud context profile, you will have to enable the **VNet Peering** option and disable the **VNet Gateway Router** option.

j) In the left navigation bar, navigate to **Application Management** > **Cloud Context Profiles**.

The existing cloud context profiles are displayed.

k) Click Actions and choose **Create Cloud Context Profile**.

The **Create Cloud Context Profile** dialog box appears.

l) Locate the **VNet Gateway Router** field and click to uncheck (disable) the **VNet Gateway Router** check box.
m) Locate the **VNet Peering** field and click to check (enable) the **VNet Peering** check box.
n) Click **Save** when finished.

Downgrading the Software

The following sections provide the necessary information that you will need to successfully downgrade your Cisco Cloud APIC software.

Prerequisites for Downgrading the Software

Following are prerequisites that you must follow before downgrading the Cisco Cloud APIC software:

- If your Cisco Cloud APIC is part of a Cisco Multi-Site ACI fabric, where it is orchestrated with Cisco Multi-Site, you must first downgrade the Cisco Cloud APIC software to an equivalent or earlier release before you can downgrade the Cisco ACI Multi-Site Orchestrator software. In other words, the release of the Cisco ACI Multi-Site Orchestrator software should always be equal to or later than the release of the Cisco Cloud APIC software.
  - To determine the release date for the Cisco ACI Multi-Site Orchestrator software, go to ACI Multi-Site Software in the Software Download site, then select the appropriate release in the left nav bar to see the release date for that release
  - To determine the release date for the Cisco Cloud APIC software, go to Cloud Application Policy Infrastructure Controller in the Software Download site, then select the appropriate release in the left nav bar to see the release date for that release

  For example, if you are downgrading to Cisco Cloud APIC Release 5.0(2i):

  1. Determine the release date for Cisco Cloud APIC Release 5.0(2i) using the information in Cloud Application Policy Infrastructure Controller in the Software Download site (in this case, 25-Sep-2020), then go to ACI Multi-Site Software in the Software Download site to find the equivalent or later release of the Cisco ACI Multi-Site Orchestrator software (in this case, Multi-Site Release 3.0(2k), which was released on 02-Oct-2020).
  2. First downgrade the Cisco Cloud APIC software to the Cloud APIC Release 5.0(2i) using the instructions in this document.
  3. After you have downgraded the Cisco Cloud APIC software, then downgrade the Cisco ACI Multi-Site Orchestrator software to the Multi-Site Release 3.0(2k). See Cisco ACI Multi-Site Orchestrator Installation and Upgrade Guide, Release 3.1(x) for those instructions.

Downgrading the Software

Before you begin

The following prerequisites apply if you are downgrading from 5.2(1) to a release prior to 5.2(1):

- If your Cisco Cloud APIC has always been running on release 5.2(1) [if you never upgraded from a release prior to 5.2(1) to release 5.2(1)], then you cannot downgrade to a release prior to release 5.2(1) on your Cisco Cloud APIC. Downgrading to a release prior to 5.2(1) when your Cisco Cloud APIC never ran on that prior release is not supported.
- If you upgraded your Cisco Cloud APIC to release 5.2(1) and you completed certain release 5.2(1)-specific configurations afterward, and you want to downgrade to a release prior to release 5.2(1), you will have to remove the CSRs from all the regions except the home region. Go to Step 1, on page 22 for those instructions.
- If you upgraded your Cisco Cloud APIC to release 5.2(1) but you never completed any release 5.2(1)-specific configurations afterward, and you want to downgrade to a release prior to release 5.2(1), you do not have to remove CSRs from any regions. Go to Step 3, on page 23 in that case.

Step 1 Remove any 5.2(1)-specific configurations before downgrading.

Step 2 Remove the CSRs from the necessary regions, depending on the release.

- If you are downgrading from release 5.2(1) to **release 5.0(1)**, remove the CSRs from all regions, including the home region.
- If you are downgrading from release 5.2(1) to a **5.0(2) release prior to release 5.0(2j)**, remove the CSRs only from the home region.
- If you are downgrading from release 5.2(1) to **release 5.0(2j) or later**, you do not have to remove any CSRs. Skip to Step 3, on page 23 in that case.

a) In your Cloud APIC GUI, click the Intent icon (the icon with an arrow pointing into several circles) and choose **Cloud APIC Setup**.

b) In the Region Management area, click **Edit Configuration**.

The **Regions to Manage** window appears.

c) Make a note of the regions that have boxes selected in the **Cloud Routers** column.

You will be unselecting the boxes in the **Cloud Routers** column in the next step, so make sure you know which regions will need to selected again at the end of this procedure.

d) Remove the CSRs from the necessary regions, depending on the release.

- If you are downgrading from release 5.2(1) to **release 5.0(1)**, unselect (remove checks from boxes) in the **Cloud Routers** column for every region in the window, including the home region (the region that has the text **Cloud APIC Deployed**).
- If you are downgrading from release 5.2(1) to a **5.0(2) release prior to release 5.0(2j)**, unselect (remove checks from boxes) in the **Cloud Routers** column only for the home region (the region that has the text **Cloud APIC Deployed**).

e) Click Next, then enter the necessary information in the following page and click **Save and Continue**.

The process of removing the CSRs might take roughly a half hour. You can monitor the process of the CSR removal by looking at the virtual machines for the resource group in the Azure portal.

Note Do not proceed to the next step until the necessary CSRs have been completely removed.

Step 3 Download an image for the downgrade using the procedures provided in Downloading an Image, on page 17.

Step 4 When the image is fully downloaded, from the **Navigation** menu, choose the **Operations** > **Firmware Management**.

The **Firmware Management** window appears.

Step 5 Click **Schedule Upgrade**.

The **Schedule Upgrade** pop-up appears.

If you see a message that says that faults are present in your fabric, we recommend that you resolve these faults before performing a downgrade. See "Viewing Health Details Using the Cisco Cloud APIC GUI" in the *Cisco Cloud APIC for Azure User Guide* for more information.

Step 6 In the **Target Firmware** field, choose a firmware image from the scroll-down menu.

Step 7 In the **Upgrade Start Time** field, determine if you want to begin the downgrade now or later.

- Click **Now** if you want to schedule the downgrade for now. Go to Step 8, on page 23.
- Click **Later** if you want to schedule the downgrade for a later date or time, then select the date and time from the pop-up calendar for the scheduled downgrade.

Step 8 In the **Ignore Compatibility Check** field, leave the setting in the default off (unchecked) setting, unless you are specifically told to disable the compatibility check feature.

In Cloud APIC, there is a compatibility check feature that verifies if an downgrade path from the currently-running version of the system to a specific newer version is supported or not. The **Ignore Compatibility Check** setting is set to off by default, so the system automatically checks the compatibility for possible downgrades by default.

Note If you choose to disable the compatibility check feature by entering a check mark in the box next to the **Ignore Compatibility Check** field, you run the risk of making an unsupported downgrade to your system, which could result in your system going to an unavailable state.

Step 9 Click **Schedule Upgrade**.

You can monitor the progress of the downgrade in the main **Firmware Management** window, under the **Upgrade Status** area.

Step 10 When the downgrade is completed, add the necessary CSRs back again.

a) In your Cloud APIC GUI, click the Intent icon ( ) and choose **Cloud APIC Setup**.
b) In the Region Management area, click **Edit Configuration**.

The **Regions to Manage** window appears.

c) Locate the appropriate regions that had CSRs and check the boxes in the **Cloud Routers** column for those regions to add the CSRs back again, depending on the release.

- If you are downgrading from release 5.2(1) to **release 5.0(1)**, check the boxes in the **Cloud Routers** column for every region in the window, including the home region (the region that has the text **Cloud APIC Deployed**).
- If you are downgrading from release 5.2(1) to a **5.0(2) release prior to release 5.0(2j)**, check the boxes in the **Cloud Routers** column only for the home region (the region that has the text **Cloud APIC Deployed**).

Note that you do not have to add CSRs back again if you are downgrading from release 5.2(1) to **release 5.0(2j) or later** because you didn't remove CSRs in Step 2, on page 22 in that case.

d) Click **Next**, then enter the necessary information in the following page and click **Save and Continue**.

Performing a System Recovery

The procedures for performing a system recovery is identical to the procedures for performing a migration-based upgrade. Refer to the section Migration-Based Upgrade, on page 3 for those procedures.

Triggering an Upgrade of the Cloud Service Routers

The following topics provide information and procedures for triggering an upgrade of the cloud service routers (CSRs).

Triggering an Upgrade of the Cloud Service Routers

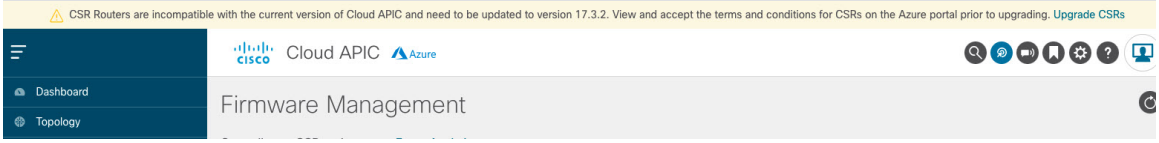
Prior to Release 5.2(1), the Cloud Services Routers (CSRs) are upgraded automatically whenever you trigger an upgrade for the Cisco Cloud APIC. Beginning with Release 5.2(1), you can trigger upgrades to the CSRs and monitor those CSR upgrades, independent from the Cisco Cloud APIC upgrades. This is useful to reduce traffic loss by allowing you to split up the upgrades for the management plane (Cisco Cloud APIC) and the data plane (CSRs).

Beginning with Release 5.2(1), this feature is enabled by default, where the default assumption is that you will be triggering the upgrades to the CSRs after you trigger an upgrade to the Cisco Cloud APIC. You cannot disable this feature once it's enabled.

When this feature is enabled, the proper upgrade sequence for the Cisco Cloud APIC and the CSRs is as follows.

Note Following are upper-level steps to describe the overall process for triggering upgrades to the CSRs. For specific step-by-step instructions, see Triggering an Upgrade of the Cloud Service Routers Using the Cisco Cloud APIC GUI, on page 25.

1. Upgrade Cisco Cloud APIC using the instructions provided in this chapter.
2. Wait for the Cisco Cloud APIC upgrade process to complete. When that upgrade is completed, the system will recognize that the CSRs are now incompatible with the Cisco Cloud APIC. You will then see a message saying that the CSRs and the Cisco Cloud APIC are incompatible and that any new policies configured for the Cisco Cloud APIC will not be applied to the CSRs until you've upgraded the CSRs.



3. View and accept the terms and conditions for the CSRs on the Azure portal.
4. Trigger the CSR upgrade so that it is now at a compatible version as the Cisco Cloud APIC.

   You can begin the process of triggering the CSR upgrade using either of these two methods:

   - In the banner at the top of the screen, click on the **Upgrade CSRs** link, or
   - Through the **CSRs** area in the **Firmware Management** page. Navigate to:

     Operations > **Firmware Management**

     Click the **CSRs** tab, then choose **Upgrade CSRs**.

You can also trigger the CSR upgrade through the REST API. See Triggering an Upgrade of the Cloud Service Routers Using the REST API, on page 26 for those instructions.

Guidelines and Limitations

- After you have upgraded the Cisco Cloud APIC, if you do not see the message saying that the CSRs and the Cisco Cloud APIC are incompatible, you might have to refresh the browser for that message to appear.
- Trigger an upgrade to the CSRs *after* you have upgraded the Cisco Cloud APIC. Do not trigger an upgrade to the CSRs before you have upgraded the Cisco Cloud APIC.
- Once you have triggered an upgrade to the CSRs, it cannot be stopped.
- If you see any errors after you trigger an upgrade to the CSRs, check and resolve those errors. The CSR upgrade will continue automatically once those CSR upgrade errors have been resolved.

Triggering an Upgrade of the Cloud Service Routers Using the Cisco Cloud APIC GUI

This section describes how to trigger an upgrade to the cloud service routers (CSRs) using the Cisco Cloud APIC GUI. For more information, see Triggering an Upgrade of the Cloud Service Routers, on page 24.

Step 1 If the CSR software version is incompatible with the Cisco Cloud APIC software version, first view and accept the terms and conditions for the CSRs on the Azure portal.

a) In the Azure Marketplace search text field, type *Cisco Cloud Services Router (CSR) 1000V* and select the option that appears.

   The **Cisco Cloud Services Router (CSR) 1000V** option appears as a search suggestion.

b) Click the **Cisco Cloud Services Router (CSR) 1000V** option.

   You should be redirected to the **Cisco Cloud Services Router (CSR) 1000V** page in the Microsoft Azure Marketplace.

c) Locate the **Select a software plan** drop-down menu.

   If you do not see the **Select a software plan** drop-down menu in the main page, you might have to click the **Plans + Pricing** tab, if that option is available, to access the **Select a software plan** drop-down menu.

d) In the **Select a software plan** drop-down menu, select the **Cisco CSR 1000V Bring Your Own License - XE 17.3.2** option or later.

e) Locate the **Want to deploy programmability?** field and click **Get Started**.
f) In the **Configure Programmability Deployment** page, scroll down to your subscription and, in the Status column, change the status from **Disable** to **Enable** for your subscription.
g) Click **Save**.

Step 2 Begin the process of triggering the CSR upgrade to a compatible CSR version.

You can begin the process of triggering the CSR upgrade using either of these two methods:

- In the banner at the top of the screen, click on the **Upgrade CSRs** link, or
- Through the **CSRs** area in the **Firmware Management** page. Navigate to:

  Operations > **Firmware Management**

  Click the **CSRs** tab, then choose **Upgrade CSRs**.

A warning appears after clicking **Upgrade CSRs**, stating that upgrading the CSRs will cause the CSRs to reboot, which may cause temporary disruption in traffic.

Step 3 If this is a good time to upgrade the CSRs and have a temporary disruption in traffic, click **Confirm Upgrade** in the warning message.
The CSR software upgrade begins. A banner appears at the top of the screen, saying that the CSR upgrade is in process. Click **View CSR upgrade status** in the message to view the status of the CSR upgrade.

Step 4 Fix any faults that might occur during the upgrade of the CSRs.

If a fault occurs during the upgrade, you can get more information on the fault by navigating to:

Operations > **Event Analytics** > **Faults**

Triggering an Upgrade of the Cloud Service Routers Using the REST API

This section describes how to trigger an upgrade to the cloud service routers (CSRs) using the REST API. For more information, see Triggering an Upgrade of the Cloud Service Routers, on page 24.

Set the value for the `routerUpgrade` field to `"true"` in the cloud template to trigger an upgrade to the CSRs through the REST API (`routerUpgrade="true"`).

```
<polUni>
<fvTenant name="infra">
    <cloudtemplateInfraNetwork name="default" vrfName="overlay-1">
       <cloudtemplateProfile name="defaultxyz" routerUsername="SomeFirstName" routerPassword="SomePass"
 routerUpgrade="true">
        </cloudtemplateProfile>
        <cloudtemplateExtSubnetPool subnetpool="10.20.0.0/16"/>
        <cloudtemplateIntNetwork name="default">
            <cloudRegionName provider="azure" region="westus"/>
            <cloudRegionName provider="azure" region="westus2"/>
        </cloudtemplateIntNetwork>
        <cloudtemplateExtNetwork name="default">
            <cloudRegionName provider="aws" region="us-west-2"/>
            <cloudtemplateVpnNetwork name="default">
                <cloudtemplateIpSecTunnel peeraddr="23.2.1.1/32" />
                <cloudtemplateIpSecTunnel peeraddr="23.0.1.1/32" />
```

```
                <cloudtemplateIpSecTunnel peeraddr="23.1.1.1/32" />
                <cloudtemplateOspf area="0.0.0.1"/>
            </cloudtemplateVpnNetwork>
           <cloudtemplateBgpEvpn peeraddr="34.1.1.1/32" asn="63000" siteId="123" password="abcd1234"
 />
        </cloudtemplateExtNetwork>
    </cloudtemplateInfraNetwork>
</fvTenant>
</polUni>
```