



## **Service-Specific Configurations: Milestone Draft (Cisco Internal)**

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## Enabling Multiple Subscriptions for a Tenant

Multiple orderings of a service allow service providers to customize the same service to meet different needs of a subscriber. For example, multiple WAN networks can be instantiated separately for security reasons to provide an air gap in the network by configuring a red network and a green network using WAN network.

As a user with an administrator role, you can enable this feature at the service definition time. Upon installing service packs, you need to do the necessary configuration at the service pack level to enable this feature on Cisco MSX Portal. To configure this feature, enable the multipleInstance metadata using the POST request in the Catalog Service API. For more information on this API, refer the Swagger documentation that can be accessed from **Cisco MSX portal > Account Settings > Swagger > Cisco MSX Platform Catalog Service API**. By default, only a single instance of a service can be ordered. After this feature is enabled, tenants can order more than one instance of a service.

```
{
  "id": "f3e326cc-6545-11e7-6547-be2e65b06b65",
  "name": "vbranch",
  "label": "cisco.consume.service.vbranch.name",
  "activeFlag": true,
  "version": 1,
  "displayOrder": 1,
  "description": "cisco.consume.service.vbranch.description",
  "image": "/services/vbranch/images/icons/image_vbranch_service.svg",
  "multipleInstanceAllowed": true,
  "configuration": {
    "device": "false",
    "parts": "2",
    "showOffers": "true"
  },
}
```



---

**Note** Multiple Service instance is supported for both Create and Update Subscription.

---

## Assigning Offers to Tenants

Using the Cisco MSX platform, you can hide or show service offerings to a tenant or a group of tenants. You can enable this feature from the Cisco MSX portal or by using the **Cisco MSX Platform Catalog Services API**. Only tenants with required permissions can subscribe to the service offerings visible to them. The **Cisco MSX Platform Catalog Service API** provides an extended capability to set labels or tags such as Preview on the service offer that is available on the **Tenant Workspace > Offer Catalog** window.

Use **Cisco MSX Platform Catalog Services API** to create, update, cancel, close, and delete service offerings.

You can manage the configurations of services and offers using **Cisco MSX Platform Catalog Services API**:

- Manage the services configuration, use the **Service Controller** section of the **Cisco MSX Platform Catalog Services API**.
- Manage the offers configuration and provide labels on the service offer, use the **Service Offer Controller** section of the **Cisco MSX Platform Catalog Services API**.

From the **Services, Configurations, and Devices** category, assign the following permissions for the user to run this API.

- Subscribed Services (View)
- Import Service and Offer Definitions (Manage)

For more information on this API, refer to the Swagger documentation that can be accessed from **Cisco MSX portal > Account Settings > Swagger > Cisco MSX Platform Catalog Services API**.

The service providers can assign the service offers to a specific or all tenants from the Cisco MSX portal.

Using this procedure, you can assign service offer to the tenant.

## Procedure

---

**Step 1** Log in to the Cisco MSX portal using your credentials.

**Step 2** From the left pane, click **Offer Management**.

The **Offer Management** window is displayed.

**Step 3** Select an offer.

The service offer details window displays both the **Variant Details** pane and **Tenant Assignments** pane.

The **Variant Details** pane allows you to view the details of the service offers.

The **Tenant Assignments** pane allows you to restrict the service offers to the specific tenants.

**Step 4** Edit the service offer or variants in the **Variant Details** pane.

- To edit the title, description, image of a service offer, and pricing details of the variants, click the **Edit** icon that is located on the top right of the window.
- Click **Save** to update the latest changes of the service offers or variants.

**Step 5** Assign service offer to tenant from the **Tenant Assignments** pane.

**Note** The service offers are available to all tenants. To restrict, assign the offer only to the specific tenants.

- From the **Tenant Assignment** pane, click the **Assign** icon that is located on the top right of the window and do one of the following:

**Note** The tenants, who are already subscribed to a service offer cannot subscribe to this same service offer again. Assigned tenants are displayed in the **Tenant Assignments** pane. Add only new tenants to this offer.

- Click the **Specific Tenants** radio button and select the tenants.
- Click the **All Tenants** radio button to select all the tenants.

- Click >.

The **Confirm Assignment** dialog box is displayed. Confirm the assignation of the offer to the specific tenants or all the tenants.

- Click >.

The **Tenants Assignment** dialog box is displayed with the information that tenants are added.

**Note** If the tenant assignment fails, the failure message and number of tenants failed to be assigned are displayed.

- d) Click **Close** to exit.
  - e) (Optional) Click **View Tenants** to see the list of tenants to whom the offer is assigned on the **Tenant Assignments** pane.
- 

### What to do next

Tenants can view the assigned offers by clicking **Tenant Workspace > Offer Catalog**. The list of all the assigned service offers are displayed on the **Offer Catalog** window for the tenants to subscribe to the available offers. For more information, see [Subscribing to a Service Offer from Tenant Workspace](#).

## Unassigning offers From Tenant

Using this procedure, you can unassign service offer from tenant.

### Procedure

---

- Step 1** Log in to the Cisco MSX portal using your credentials.
  - Step 2** From the left pane, click **Offer Management**.  
The **Offer Management** window is displayed with all the available service pack offers.
  - Step 3** Select a service pack offer.  
The **Offer Details** window is displayed. The **Variant Details** pane lists the available variants and the **Tenants Assignments** pane that lists the tenant to whom the service pack offer was assigned.
  - Step 4** Select the tenant to unassign the service pack offer.
  - Step 5** Click the **X** icon in the **Unassign** column of the **Tenants Assignment** pane.  
**Note** If a tenant had already subscribed this service pack offer, the **Unassign** icon appears to be disabled.  
The **Unassign Tenant** dialog box is displayed.
  - Step 6** Click **Unassign**.  
The **Tenant Unassigned** dialog box is displayed.
  - Step 7** Click **Close** to exit.
  - Step 8** (Optional) Click **View Tenants** to view the tenants list in the **Tenants Assignment** pane.
- 

## Subscribing to a Service Offer from Tenant Workspace

Using this procedure, tenants can subscribe to a service offer.

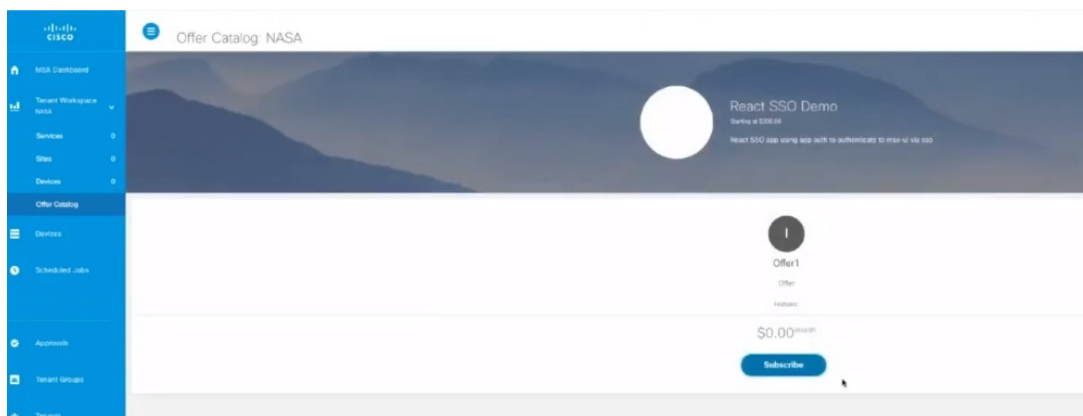
### Procedure

---

- Step 1** Log in to the Cisco MSX portal using your credentials.

- Step 2** Select the tenant.  
The tenant dashboard is displayed.
- Step 3** Click **View Offer Catalog**.  
The **Offer Catalog** window is displayed with all the available service offers assigned by the service provider for the tenants.
- Step 4** Select a service offer.
- Step 5** Click **Subscribe**.  
The **Confirm Subscription** dialog box is displayed to confirm the subscription.
- Step 6** Click **Subscribe**.  
The confirmation dialog box is displayed.
- Step 7** Click **Continue**.  
The service offer is subscribed to the tenant. This service offer is displayed on the tenant dashboard.

**Figure 1: Offer Catalog**



## Unsubscribing to a Service Offer from Tenant Workspace

Using this procedure, tenants can unsubscribe a service offer from Tenant Workspace.

### Procedure

- Step 1** Log in to the Cisco MSX portal using your credentials.
- Step 2** From the left pane, choose **Tenant Workspace**.
- Step 3** Select the tenant.  
The tenant dashboard is displayed.
- Step 4** To unsubscribe from a service offer, select the service offer and click the **ellipses (...)**.
- Step 5** Click **Unsubscribe**.

The **Unsubscribe** dialog box is displayed.

**Step 6** Click **Unsubscribe**.

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## Defining Terms and Conditions for a Service

Using this procedure, you can define and maintain the terms for a service.

### Procedure

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- Step 1** Log in to the Cisco MSX portal using your credentials.
- Step 2** From the left pane, choose **Settings > Service Configuration**.
- The **Service Configuration** window is displayed.
- Select the service pack.
- Step 3** Click **Terms & Conditions**.
- Step 4** Select one of the service packs offers from the **Offers** drop-down list.
- Step 5** Select the desired format for the font.
- Step 6** Enter details required for acceptance by a consumer while purchasing a service. This information is displayed while the consumer places an order for the service. The terms and conditions are defined specific to an offer in a service.
- Step 7** Click **Save**.
- 

## Building New Services Using Cisco MSX Platform SDK

Cisco MSX Platform SDK allows you to build new services for Cisco MSX. These new services can be:

- Platform extensions that add functionality to the platform.
- Service packs that implement new products apart from the service packs provided by Cisco MSX. Cisco MSX provides SD-Branch, SD-WAN, Cloud UTD, Managed Devices, and Enterprise Access service packs. For more information on the service packs available with Cisco MSX, see [Cisco Managed Services Accelerator \(MSX\) 4.3 Solution Overview Documentation](#).

The Cisco MSX supports the following APIs integrated as part of the platform SDK:

- User Management Service
- Catalog Service
- Manage Service
- Monitor Service
- Workflow Service

The Cisco MSX SDK documentation is available here: <https://developer.cisco.com/site/msx>.

## Onboarding and Deploying Component into Cisco MSX

The Cisco MSX allow service providers to develop the third-party services or components using the Software Development Kit (SDK). These new services can be onboarded, deployed, and published into Cisco MSX. You can enable this functionality from the Cisco MSX portal or by using the **Service Lifecycle Management (SLM)** API. The new service can be any service, including platform extension, which can run within the Cisco MSX infrastructure after the platform is deployed.

Each component can provide one or more APIs and applications. The component is a configuration file that contains all the information required to onboard and deploy a service. Applications must be published to the Cisco MSX Offer Catalog before users can subscribe to the applications.

The capabilities of the SLM API include:

- Uploading a third-party component (in parts, if required)
- Getting component details
- Getting the deployment status of component Kubernetes
- Getting a list of components
- Deleting a component

To deploy a new service using API, use the **Service Lifecycle Management Controller** section of the SLM API.

From the **Services, Configurations, and Devices** category, assign the Service Lifecycle Management (View and Manage) permission to a user to run this API.

For more information on this API, see the Swagger documentation that can be accessed from **Cisco MSX portal > Account Settings > Swagger > Service Lifecycle Management API**.

Process involved in onboarding a new service into the Cisco MSX:

1. [Deploying the Component](#)
2. [Publishing the Application](#)
3. [Creating an Offer](#)

### Deploying the Component

Using this procedure, the service providers can deploy the service or components in Cisco MSX from the Cisco MSX portal.

#### Procedure

---

**Step 1** Log in to the Cisco MSX portal using your credentials.

**Step 2** From the left pane, click **Settings > Component Management**.

**Step 3** Click the **Upload Component** icon that is located on the far right on the **Component Management** window.

The **Upoad Component** dialog box is displayed.

**Note** Click **Sample Manifest** to know more about the configuration details that needs to be included in the new service tar files.

**Step 4** Choose the component tar file from your local storage.

**Step 5** Click **Upload** to upload and install the component into Cisco MSX.

The confirmation dialog box is displayed to confirm the new component upload.

**Step 6** Click **Upload**.

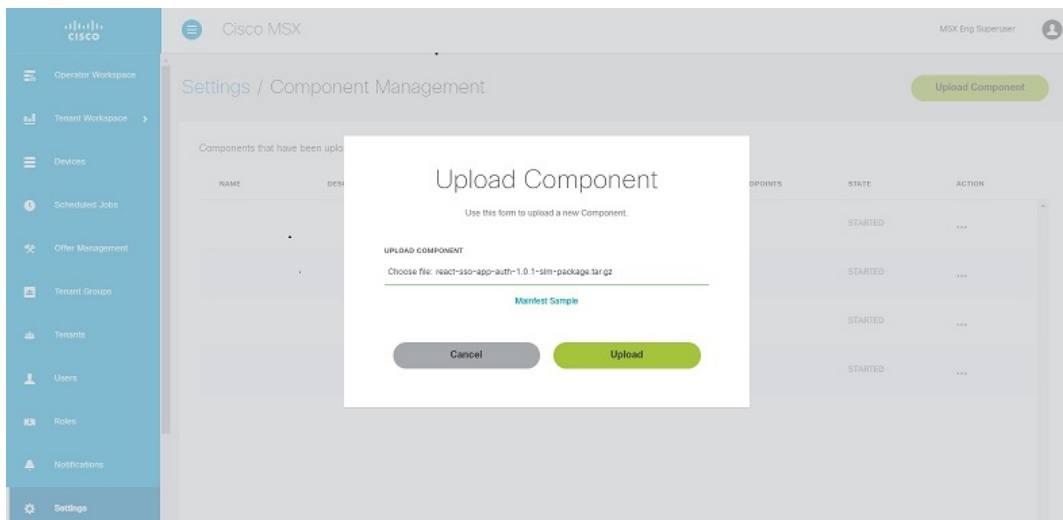
**Note** Uploading a component might take few minutes depending upon the size of the application.

**Step 7** After the successful completion of the new component upload, the confirmation dialog box appears, click **Close**.

The **Component Management** window displays the newly uploaded component. The component details such as Name, Description, Product, Version, Endpoint, State, and Action are displayed on this window. Specify the endpoint value to display both the **Delete** and **Publish Application** options on clicking the **ellipses (...)** icon that is located on the same row of every component. If the endpoint values are not included only Delete option is displayed.

The newly uploaded service component is now readily available as a part of the Cisco MSX Microservices API list. You can use this new API to manage the new component.

**Figure 2: Uploading Component**



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## Publishing an Application

After deploying a component, it should be published to make it available on the Cisco MSX. On publishing this new application, a tile is created on the **Offer Management** window. A tenant cannot subscribe to the application until it has been published, and an offer is created.

Using this procedure, you can publish an application into the Cisco MSX.

### Procedure

---

**Step 1** Log in to the Cisco MSX portal using your credentials.

**Step 2** From the left pane, click **Settings > Component Management**.

**Step 3** Click the **ellipses (...)** icon that is located on the same row of the component and click **Publish Application**.

The **Add Application** dialog box is displayed.



In the **Add Application** dialog box, specify the following details:

- Enter the Label of the application. The Name and Descriptions are automatically populated.
- Click **Advanced Options**, if you need to enter some additional details to further define the application.

**Note** Click **Basic Options** to enter only basic information, without any additional data.

**Step 4** Click **Save**.

The newly-added application is displayed on the **Application** window.

**Figure 3: Adding Application**

The screenshot shows the 'Add Application' dialog box. At the top, it says 'Add Application' and 'Use this form below to add a new application.' There is a circular icon placeholder on the left with the text 'Drop or click to upload'. The main form includes an 'Active' toggle switch (checked), a 'Name' field with the value 'reactsswappauth', a 'Label' field, and a 'Description' field with the value 'React SSO app using app auth to authenticate to mxs-ui via sso'. Below these are 'ADVANCED OPTIONS' including 'Parent ID', 'Version: 1', 'Display Order: 1', 'Order Limit: 1', 'Price', 'Properties', and 'Options'. On the right, there are configuration fields for 'Configuration' and 'SLM UI Config', and three toggle switches: 'Is Resource' (checked), 'Has Children' (checked), and 'Multiple Instance Allowed' (unchecked). At the bottom, there are three buttons: 'Basic Options' (highlighted in blue), 'Cancel', and 'Save'.

## Creating an Offer

Using this procedure, you can create an offer that has pricing and terms and conditions details.

### Procedure

**Step 1** Log in to the Cisco MSX portal using your credentials.

**Step 2** From the left pane, click **Settings > Component Management**.

**Step 3** Click the **ellipsis (...)** on the far right in the same row of the application and then click **Offer**.

The **Add Offer** dialog box is displayed.

**Step 4** Enter the Name, Label, Description, Terms and Conditions, and Price Plan of the offer.

**Step 5** Click **Save**.

The newly-added offer is displayed on the **Offer** window. You can create as many offers as you want.

The offers can be edited, duplicated, or deleted. For more information on managing offers, see [Managing an Offer](#).

**Figure 4: Offers Window**



## What to do next

- From the left pane, choose **Offer Management**.

The **Offer Management** window displays the deployed service component tile. Click the new component tile to see the offers.

- The Cisco MSX service providers can assign service offer to the tenant from the **Offer Management** window. For more information, see [Assigning Offers to Tenants](#).
- The tenants can subscribe to the assigned offers. For more information, see [Subscribing to a Service Offer from Tenant Workspace](#).

## Managing an Offer

Using this procedure, the service providers can manage the service offers from the Cisco MSX portal.

### Procedure

**Step 1** Log in to the Cisco MSX portal using your credentials.

**Step 2** From the left pane, choose **Settings > Component Management**.

**Step 3** Click the **ellipsis (...)** on the far right in the same row of the application that needs to be edited or duplicated.

**Step 4** Choose **Offer**.

The **Offer** window is displayed.

**Step 5** **Edit an offer.**

a) Click the **ellipsis (...)** on the far right in the same row of the existing list of offers and choose **Edit**.

The **Edit Offer** dialog box is displayed.

b) Enter the Name, Label, Description, Terms and Condition, and Price Plan of the offer.

- c) Click **Save**.

**Step 6 Duplicate an offer.**

- a) Click the **ellipsis (...)** on the far right in the same row of the existing list of offers and then choose **Duplicate**.  
The **Add Offer** dialog box is displayed.
- b) Enter the Name, Label, Description, Terms and Condition, and Price Plan of the offer.
- c) Click **Save**.

---

## Deleting the Component from Cisco MSX

Using this procedure, service providers can delete the service or component from Cisco MSX.

### Procedure

---

**Step 1** Log in to the Cisco MSX portal using your credentials.

**Step 2** From the left pane, choose **Settings > Component Management**.

The **Component Management** window is displayed.

**Note** If the tenants are subscribed to the application that is to be deleted, the service providers should ensure that the tenants unsubscribe from that particular application. For the tenants to unsubscribe from the application, choose **Tenant Workspace > Services**. Click the **Unsubscribe** icon that is located on the far right of the application pane that is to be deleted.

**Step 3** Click the **ellipsis (...)** on the far right in the same row of the component that you need to delete and then choose **Delete**.  
The **Delete Component confirmation** dialog box is displayed. Confirm the deletion of the component from Cisco MSX.

**Step 4** Click **Delete**.

The component is deleted.

---

## Uploading a New Network Element Driver Package

The NED is uploaded to Cisco Network Services Orchestrator (NSO) to enable network connectivity of different device types and services. Cisco MSX allows you to add, replace, and delete NED for device management.

You can add a new NED at any time after the Cisco MSX is installed and deployed into production.

To support this feature for all the service packs, you must have the ability to upload a NED package to NSO, and NSO must appropriately get restarted to take on that new NED.

Using this procedure, you can upload a new NED package using the Cisco MSX portal.

### Before you begin

- Download the Network Element Driver (NED) from the [URL](#). Use your Cisco credentials to log in.

- The downloaded NED package contains the following files:

```

README.signature
cisco_x509_verify_release.py
ncs-4.7.6-juniper-junos-4.5.13.signed.bin
ncs-4.7.6-juniper-junos-4.5.13.tar.gz
ncs-4.7.6-juniper-junos-4.5.13.tar.gz.signature
tailf.cer

```

**Table 1: NED Package Files**

Downloaded NED Package Files	Name of Each NED files
ncs-4.7.6-juniper-junos-4.5.13.tar.gz	Main NED file
ncs-4.7.6-juniper-junos-4.5.13.tar.gz.signature	Signature File
tailf.cer	Certificate File

## Procedure

**Step 1** Log in to the Cisco MSX portal using your credentials.

**Step 2** From the left pane, choose **Settings > NED Management**.

The **NED Management** window is displayed with a table.

All the NEDs installed in different service packs are displayed in this table.

**Step 3** Click **Add NED**.

The **Upload NED File** dialog box is displayed.

**Step 4** Upload the downloaded NED package files in their respective fields:

- Upload NED Package

- Choose file—Select the main NED file from the downloaded NED package and upload it.

**Note** The same NED file cannot be uploaded more than once unless we delete the existing file.

- Verify NED Package—After the NED package is uploaded, a back-end process verifies the correctness of the file.

- Choose file—Select the Signature file from the downloaded NED package and upload it.

- Choose file—Select the Certificate file from the downloaded NED package and upload it.

**Note** You will get a popup message stating whether the validation was successful or had any error.

- Install NED Package—After the NED package is verified, it gets installed to the NSO.

- Service Pack—Select the Service Pack from the Service Pack drop-down list.

**Note** NSO pods are restarted, and the new NED package becomes active.

**Step 5** Click **Upload**.

The **Upload NED** confirmation dialog box is displayed for you to confirm the upload.

**Step 6** Click **Upload** again.

**Note** Now the NSO POD restarts; during this time, the device operations are unavailable. So, do not navigate away from the window.

The **Validating and Installing NED file** popup is displayed. The installation process takes a few minutes to complete. After a while, the popup message **Success** appears if the validation is successful, else the popup message **An Error Occurred** is displayed if the validation is not successful.

**Step 7** Click **Close**.

Now you can see the NED in the **NED Management** window.

---

## Deleting a NED Package

You can delete an uploaded NED package at any time after the Cisco MSX is installed and deployed into production.

Using this procedure, you can delete a NED package using the Cisco MSX portal.

### Before you begin

- Ensure to delete all the sites that are using the NED.
- On deleting NED, the device models that use NED namespace cannot be used in the service pack anymore.

### Procedure

---

**Step 1** Log in to the Cisco MSX portal using your credentials.

**Step 2** From the left pane, choose **Settings > NED Management**.

The **NED Management** window is displayed with a table.

This table displays all the NEDs installed in different service packs.

**Step 3** Select the NED, and click **ellipsis (...) > Delete**.

The **Delete NED** confirmation dialog box is displayed for you to confirm the delete.

**Step 4** Click **Delete**.

**Note** Now the NSO POD restarts; during this time, the device operations are unavailable. So, do not navigate away from the page.

The **Deleting and Uninstalling NED file** dialog box is displayed. The deletion process takes a few minutes to complete. Then the popup message **Success** is displayed.

**Step 5** Click **Close**.

---

## Replacing a NED Package

Cisco MSX allows you to replace NED for device management. The replace option is used to upgrade or change an existing version of the NED package.

Using this procedure, you can replace a NED package using the Cisco MSX portal.

### Procedure

---

- Step 1** Log in to the Cisco MSX portal using your credentials.
- Step 2** From the left pane, choose **Settings > NED Management**.
- The **NED Management** window is displayed with a table.
- This table displays all the NEDs that are currently installed in different service packs.
- Step 3** Select the NED, and click **ellipsis (...) > Replace**.
- The **Replace NED File** dialog box is displayed.
- Step 4** Upload the downloaded NED package files in their respective fields:
- Upload New NED Package
    - Choose file—Select the main NED file from the downloaded NED package and upload it.
  - Verify NED Package—After the NED package is uploaded, a back-end process verifies the correctness of the file.
    - Choose file—Select the Signature file from the downloaded NED package and upload it.
    - Choose file—Select the Certificate file from the downloaded NED package and upload it.
- Note** You will get a pop-up message stating whether the validation was successful or had any error.
- Install NED Package—After the NED package is verified, it replaces the already installed NED.
    - Note**
      - The Service Pack is selected by default.
      - NSO pods are restarted, and the new NED package is replaced.
- Step 5** Click **Replace**.
- The **Replace NED** confirmation dialog box is displayed for you to confirm the replace.
- Step 6** Click **Replace** again.
- Note** Now the NSO POD restarts; during this time, the device operations are unavailable. So, do not navigate away from the page.
- The **Validating and Replacing NED file** pop-up is displayed. The replacement process takes a few minutes to complete. After a while, the pop-up message **Success** is displayed, if the validation is successful, else the pop-up message **An Error Occurred** is displayed, if the validation is not successful.
- Step 7** Click **Close**.

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