Managing Components

About the Component RPM Packages

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Note Beginning with Cisco NX-OS Release 7.0(3)I6(2), the NX-OS Programmable Interface Base Component RPM packages (agents, the Cisco native model, most of the other required models, and infrastructure) are included in the Cisco NX-OS image. As a result, nearly all the required software is installed automatically when the image is loaded. This situation means that there is no need to download and install the bulk of the software from the Cisco Artifactory. The exception is the OpenConfig model, which is required. You must explicitly download the OpenConfig models from the Cisco Artifactory.

But, for Cisco NX-OS Release 7.0(3)I6(1) and earlier releases, if you need to upgrade, the following sections describing downloading and installing the packages are required.

NX-OS Programmable Interface Component RPM packages may be downloaded from the Cisco Artifactory. There are two types of component RPM packages that are needed:

- Base Components (required)

- Common Model Components (OpenConfig models must be explicitly downloaded and installed)

Base Components

The Base Components comprise the following required RPM packages:

- **mtx-infra** — Infrastructure

- **mtx-device** — Cisco native model

At least one of the following agent packages must be installed in order to have access to the modeled NX-OS interface:

- **mtx-netconf-agent** — NETCONF agent

- **mtx-restconf-agent** — RESTCONF agent

- **mtx-grpc-agent** — gRPC agent

Common Model Components

Common Model component RPMs support OpenConfig models. To use the OpenConfig models, you must download and install the OpenConfig RPMs. For convenience, there is a single combined package of all supported OpenConfig models, `mtx-openconfig-all`.

While the single combined package is recommended, an alternative is to download and install RPMs of selected models and their dependencies among the supported models listed in the following table. The `mtx-openconfig-all` RPM is not compatible with the individual model RPMs. You must uninstall the former before installing the latter, and you must unistall the latter before installing the former.

Model Name	Model Rev	Model Ver	Package Name	Dependencies
openconfig-acl	2017-05-26	1.0.0	mtx-openconfig-acl	mtx-openconfig-interfaces
openconfig-bgp-policy	2017-07-30	4.0.1	mtx-openconfig-bgp-policy	mtx-openconfig-interfaces mtx-openconfig-routing-policy
openconfig-if-aggregate	2017-07-14	2.0.0	mtx-openconfig-if-aggregate	mtx-openconfig-if-ethernet mtx-openconfig-interfaces
openconfig-if-ethernet	2017-07-14	2.0.0	mtx-openconfig-if-ethernet	mtx-openconfig-interfaces
openconfig-if-ip	2016-05-26	1.0.2	mtx-openconfig-if-ip	mtx-openconfig-if-aggregate mtx-openconfig-if-ethernet mtx-openconfig-interfaces mtx-openconfig-vlan
openconfig-if-ip-ext	2018-01-05	2.3.0	mtx-openconfig-if-ip-ext	mtx-openconfig-if-aggregate mtx-openconfig-if-ethernet mtx-openconfig-if-ip mtx-openconfig-interfaces mtx-openconfig-vlan
openconfig-interfaces	2017-07-14	2.0.0	mtx-openconfig-interfaces	-

Model Name	Model Rev	Model Ver	Package Name	Dependencies
openconfig-network-instance	2017-08-24	0.8.1	mtx-openconfig-network-instance	mtx-openconfig-bgp-policy mtx-openconfig-if-aggregate mtx-openconfig-if-ethernet mtx-openconfig-interfaces mtx-openconfig-routing-policy mtx-openconfig-vlan
openconfig-network-instance-policy	2017-02-15	0.1.0	mtx-openconfig-network-instance-policy	mtx-openconfig-routing-policy
openconfig-ospf-policy	2017-08-24	0.1.1	mtx-openconfig-ospf-policy	mtx-openconfig-interfaces mtx-openconfig-routing-policy
openconfig-platform	2018-01-16	0.8.0	mtx-openconfig-platform	-
openconfig-platform-linecard	2017-08-03	0.1.0	mtx-openconfig-platform-linecard	mtx-openconfig-platform
openconfig-platform-port	2018-01-20	0.3.0	mtx-openconfig-platform-port	mtx-openconfig-if-ethernet mtx-openconfig-interfaces mtx-openconfig-platform
openconfig-platform-transceiver	2018-01-22	0.4.1	mtx-openconfig-platform-transceiver	mtx-openconfig-if-ethernet mtx-openconfig-interfaces mtx-openconfig-platform
openconfig-relay-agent	2016-05-16	0.1.0	mtx-openconfig-relay-agent	mtx-openconfig-interfaces
openconfig-routing-policy	2016-05-12	2.0.1	mtx-openconfig-routing-policy	-
openconfig-spanning-tree	2017-07-14	0.2.0	mtx-openconfig-spanning-tree	mtx-openconfig-interfaces
openconfig-system	2017-09-18	0.3.0	mtx-openconfig-system	-
openconfig-vlan	2017-07-14	2.0.0	mtx-openconfig-vlan	mtx-openconfig-if-aggregate mtx-openconfig-if-ethernet mtx-openconfig-interfaces

Preparing For Installation

This section contains installation preparation and other useful information for managing NX-OS Programmable Interface components.

Opening the Bash Shell on the Device

RPM installation on the switch is performed in the Bash shell. Make sure that **feature bash** is configured on the device.

```
Switch# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)# feature bash-shell
Switch(config)# end
Switch# run bash sudo su
bash-4.2#
```

To return to the device CLI prompt from Bash, type **exit** or **Ctrl-D**.

Verify Device Readiness

You can use the following CLI **show** commands to confirm the readiness of the device before installation of an RPM.

- `show module` — Indicates whether all modules are up.

  ```
  Switch# show module
  ```

- `show system redundancy status` — Indicates whether the standby device is up and running and in HA mode. If a standby sync is in progress, the RPM installation may fail.

  ```
  Switch# show system redundancy status
  ```

If the line cards have failed to come up, enter the `createrepo /rpms` command in the Bash shell.

```
bash-4.2# createrepo /rpms
```

Copying Files to the Device

You can use SCP to copy files to the device, using a command in this form.

copy scp://_username_@_source_ip_/_path_to_agent_rpm_ **bootflash: vrf management**

Example:

```
Switch# copy scp://jdoe@192.0.20.123//myrpms/mtx-infra.1.0.0.r082616.x86_64.rpm bootflash:
 vrf management
```

Displaying Installed NX-OS Programmable Interface RPMs

To show all installed NXOS Programmable Interface RPMs, issue the following command on the device:

```
bash-4.2# yum list installed | grep mtx
```

Downloading Components from the Cisco Artifactory

The NX-OS Programmable Interface Component RPMs can be downloaded from the Cisco Artifactory at the following URL. The RPMs are organized by NX-OS release-specific directories. Ensure that you are downloading the RPMs from the correct NX-OS release directory.

https://devhub.cisco.com/artifactory/open-nxos-agents

The NX-OS Programmable Interface Component RPMs adhere to the following naming convention:

<package>-<version>-<NX-OS release>.<architecture>.**rpm**

Select and download the desired NX-OS Programmable Interface Component RPM packages to the device for installation as described in the following sections.

Installing RPM Packages

Installing the Programmable Interface Base And Common Model Component RPM Packages

Before you begin

- From the Cisco Artifactory, download the following packages:

  - mtx-infra

  - mtx-device

  - mtx-netconf-agent/mtx-restconf-agent/mtx-grpc-agent (at least one)

  - mtx-openconfig-all (alternatively, selected individual models)

- Using the CLI commands in Verify Device Readiness, on page 4, confirm that all line cards in the Active and Standby devices are up and ready.

Procedure

Step 1 Copy the downloaded RPMs to the device.

Example:

```
Switch# copy scp://jdoe@192.0.20.123/myrpms/mtx-infra-2.0.0.0-9.2.1.lib32_n9000.rpm bootflash:
 vrf management
Switch# copy scp://jdoe@192.0.20.123/myrpms/mtx-device-2.0.0.0-9.2.1.lib32_n9000.rpm
bootflash: vrf management
Switch# copy scp://jdoe@192.0.20.123/myrpms/mtx-netconf-agent-2.0.0.0-9.2.1.lib32_n9000.rpm
 bootflash: vrf management
Switch# copy scp://jdoe@192.0.20.123/myrpms/mtx-openconfig-all-1.0.0.0-9.2.1.lib32_n9000.rpm
 bootflash: vrf management
```

Step 2 From the Bash shell, install the RPMs.

Example:

```
bash-4.2# cd /bootflash
bash-4.2# yum install mtx-infra-2.0.0.0-9.2.1.lib32_n9000.rpm
mtx-device-2.0.0.0-9.2.1.lib32_n9000.rpm mtx-netconf-agent-2.0.0.0-9.2.1.lib32_n9000.rpm
```

```
mtx-openconfig-all-1.0.0.0-9.2.1.lib32_n9000.rpm
```

Step 3   From the Bash shell, verify the installation.

Example:

```
bash-4.2# yum list installed | grep mtx
```