



Deploying Cisco Nexus Data Broker Embedded for OpenFlow

This chapter contains details of procedures for deploying Cisco Nexus Data Broker on Cisco Nexus series switches.

Generating TLS certificate between NDB server and NDB switch for Embedded mode of deployment is not supported. For details about TLS, see the Managing TLS Certificate, KeyStore and TrustStore Files chapter in the *Cisco Nexus Data Broker Configuration Guide*.

The sections in this chapter are:

- [Obtaining the Cisco Nexus Data Broker Embedded Software for OpenFlow, on page 1](#)
- [Enable Auxiliary mode for Openflow, on page 3](#)
- [Installing and Activating the Cisco Nexus Data Broker Embedded Software for OpenFlow, on page 3](#)
- [Installing and Activating the Cisco Nexus Data Broker Embedded Software for OpenFlow Mode for NXOS Versions in 7.0\(3\)I7\(2\) or Later, on page 7](#)
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- [Upgrading to Release 3.8, on page 13](#)
- [Upgrading to Release 3.8 for Cisco NXOS Releases 7.0\(3\)I7\(2\) or Later, on page 15](#)
- [Configuring the Cisco Plug-in for OpenFlow, on page 16](#)
- [Logging in to the Cisco Nexus Data Broker GUI, on page 18](#)

Obtaining the Cisco Nexus Data Broker Embedded Software for OpenFlow

To obtain the Cisco Nexus Data Broker Embedded Software for OpenFlow, complete the following steps:



Attention

Starting with Cisco NXOS Release 7.0(3)I5(1), Openflow is supported in Embedded deployment.



Note This procedure is applicable for the following Cisco Nexus 3000, Nexus 9000 platforms:

- Cisco Nexus 9000 Series switches (excluding EX, FX, and 9500 models) running NXOS version I4 or lower.
 - Cisco Nexus 3000 and 3100 Series switches running NXOS version I4 or lower.
 - Cisco Nexus 3548 switches running version 6.0(2)A6 or 6.0(2)A8.
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Step 1 In a web browser, navigate to Cisco.com.

Step 2 Under **Support**, click **All Downloads**.

Step 3 In the center pane, click **Cloud and Systems Management**.

Step 4 If prompted, enter your Cisco.com username and password to log in.

Step 5 In the right pane, click **Network Controllers and Applications**, and then click **Cisco Nexus Data Broker**.

Step 6 Download and unzip the **Cisco Nexus Data Broker Release 3.8** application bundle zip file. For more information regarding the NDB zip file name, see [Cisco Nexus Data Broker Software Release Filename Matrix](#).

Step 7 Download the activator script. The Python activator script needed to activate the NDB is available at: <https://github.com/datacenter/nexus-data-broker>. For more information regarding the Python activator script file name, see [Cisco Nexus Data Broker Software Release Filename Matrix](#).

Step 8 Unzip the application bundle to extract the two files:

- ndb1000-sw-app-emb-k9-3.8.0.ova – NDB application OVA
- ofa_mmemb-2.1.4-r2-nxos-SPA-k9.ova (N9K switches) OR ofa_mmemb-1.1.5-r3-n3000-SPA-k9.ova (N3K and N3548 switches) – Openflow Plugin OVA

Step 9 Copy the OpenFlow Plugin OVA to bootflash of the switch.

Example:

copy ftp://user@10.10.10.1/download_dir/ndb1000-sw-app-emb-k9-3.8.0.ova bootflash: vrf management

Step 10 Copy the NDB application OVA to bootflash of the switch.

Example:

copy ftp://user@10.10.10.1/download_dir/ofa_mmemb-2.1.4-r2-nxos-SPA-k9.ova bootflash: vrf management

Example:

copy ftp://user@10.10.10.1/download_dir/ofa_mmemb-1.1.5-r3-n3000-SPA-k9.ova bootflash: vrf management

Step 11 Copy the Python activator script to switch.

Example:

copy ftp://user@10.10.10.1/download_dir/NDBActivator2.0_A6_A8_Plus.py bootflash:NDBActivator.py vrf management

Example:

copy ftp://user@10.10.10.1/download_dir/NDBActivator2.0_I3_I4.py bootflash:NDBActivator.py vrf management

What to do next

Install the software on a Cisco Nexus 3000, 3100, 3200, 3500, or 9000 Series switch.

Enable Auxiliary mode for Openflow

This task has details about enabling AUX mode in openflow for embedded and centralized modes.

Step 1 Navigate to **Administration > Devices > Device Connections**.

Step 2 Click **Add Device**.

Provide the device, connection and port details.

Step 3 Check the **Set Auxiliary Node** check box.

Note If the device has already been discovered by Openflow, the **Set Auxiliary Node** checkbox is enabled by default.

Step 4 Click **Add Device** to enable the selected device in auxiliary mode.

Configure these commands in the switch for NX-AUX support:

```
feature nxapi
nxapi http port 80
nxapi use-vrf management
```

The **nxapi use-vrf management** command is supported from NX-OS Release 7.x onwards.

Installing and Activating the Cisco Nexus Data Broker Embedded Software for OpenFlow

To install and activate Cisco Nexus Data Broker (NDB) for OpenFlow, you need two OVA files for deployment, one file for OpenFlow plugin and other for NDB application.

OpenFlow agent in the switch cannot be installed as a virtual service. The OpenFlow support is made natively available on the switch. You can configure OpenFlow on a switch using the **feature openflow** command. For detailed information about OpenFlow switch configuration, see *Configuring the Cisco Plug-in for OpenFlow*.



Note Cisco Nexus 93xx EX/FX platforms do not support OpenFlow as a virtual service or as a native OpenFlow feature.



Note Download Cisco NDB Application bundle and the activator scripts as mentioned in section [Obtaining the Cisco Nexus Data Broker Embedded Software for OpenFlow](#).



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- Note** This procedure is applicable for the following Cisco Nexus 3000 and Nexus 9000 platforms:
- Cisco Nexus 9000 Series switches (excluding EX, FX, and 9500 models) running NXOS version I4 or lower.
 - Cisco Nexus 3000 and 3100 Series switches running NXOS version I4 or lower.
 - Cisco Nexus 3548 switches running version 6.0(2)A6 or 6.0(2)A8.
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- Note** To add a device to NDB in embedded mode, you need to use the device IP address. Currently, NDB embedded mode does not support hostname for adding a device.
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- Note** Starting with Cisco NXOS Release 7.0(3)I5(1), OpenFlow agent in the switch is not installed as a virtual service. OpenFlow agent is built into the switch OS and you can configure OpenFlow on a switch by using the **feature openflow** command.

```
switch#
conf t
feature openflow
```



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- Note** OpenFlow switch configurations are mandatory on the switch. For detailed information about OpenFlow switch configuration, see [Configuring the Cisco Plug-in for OpenFlow](#).
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- Note** Cisco Nexus 93xx series EX and Nexus 93xx series FX platforms do not support OpenFlow as a virtual service or as a native OpenFlow feature.
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Before you begin

Configure the pre-requisite profile, **hardware profile openflow** for Cisco Nexus 3000, 3100, 3200, and Nexus 9000 Series switches.

```
switch# configure terminal
switch (config)# hardware profile openflow
switch (config)# spanning-tree mode mst
switch (config)# vlan 1-3967
switch (config)# no spanning-tree vlan 1-3967
switch (config)# int <int> - <int> Enter the interface ranges for use in openflow
switch (config-if-range) switchport
switch (config-if-range) switchport mode trunk
switch (config-if-range) exit
switch (config)# copy running-config startup-config
switch (config)# reload
```

For Cisco Nexus 3500 Series switches, configure the pre-requisite profile **hardware profile forwarding-mode openflow-hybrid** for the Cisco Nexus 3500 Series switches.

```
device-3548# configure terminal
device-3548(config)# hardware profile forwarding-mode openflow-hybrid
device-3548(config)# spanning-tree mode mst
device-3548(config)# vlan 1-3967
device-3548(config)# no spanning-tree vlan 1-3967
device-3548(config)# int <int> - <int> Enter the interface ranges for use in openflow
device-3548(config-if-range) swithcport
device-3548(config-if-range) swithcport mode trunk
device-3548(config-if-range) exit
device-3548(config)# copy running-config startup-config
device-3548(config)# reload
```

Ensure that the OpenFlow switch configurations are complete, for detailed information about OpenFlow switch configuration, see [Configuring the Cisco Plug-in for OpenFlow](#).

Step 1 Verify that NDB application and OpenFlow plugin is not installed and activated. If already installed, please use the upgrade procedure.

Example:

```
switch# show virtual-service list
```

Step 2 Install OpenFlow plugin OVA, with service name **ofa**.

Example:

```
switch# virtual-service install name ofa bootflash:ofa_mmemb-2.1.4-r2-nxos-SPA-k9.ova
# (for N9K switches)
```

Example:

```
switch# virtual-service install name ofa package bootflash:ofa_mmemb-1.1.5-r3-n3000-SPA-k9.ova
# (for N3K and N3548 switches)
```

Step 3 Install Cisco NDB Application OVA, with service name **ndb**.

Example:

```
switch# virtual-service install name ndb package bootflash:ndb1000-sw-app-emb-k9-3.8.0.ova
```

Step 4 Monitor the installation status.

Example:

```
switch# show virtual-service list
```

Note Do not continue until both OVA files have been successfully installed.

Step 5 Enter the global configuration mode on the switch.

Example:

```
switch# configure terminal
```

Step 6 Enter virtual service configuration mode for OpenFlow plugin **ofa** on the switch

Example:

```
switch (config)# virtual-service ofa
```

Step 7 Activate the Cisco Plug-in for OpenFlow OVA.

Example:

```
switch(config-virt-serv)# activate
```

Step 8 Return to global configuration mode.

Example:

```
switch(config-virt-serv)# exit
```

Step 9 Enter virtual service configuration mode for NDB Application **ndb** on the switch.

Example:

```
switch(config)# virtual-service ndb
```

Step 10 Activate the Cisco Nexus Data Broker Embedded application OVA.

Example:

```
switch(config-virt-serv)# activate
```

Step 11 Exit virtual service configuration mode on the switch.

Example:

```
switch(config-virt-serv)# exit
```

Step 12 Monitor the service status.

Example:

```
switch# show virtual-service list
```

Example:

```
N9k(config-virt-serv)# show virtual-service list
Virtual Service List:
Name Status Package Name
-----
ndb Activated ndb1000-sw-app-emb-k9-3.8.0.ova
ofa Activated ofa_mmemb-1.1.5-r3-n3000-SPA-k9.ova
```

Step 13 Run the NDB activator script to setup management interface file and to activate the NDB.

Note On a Cisco Nexus 3548 switch, a user with username/password set to admin/admin and with *admin* privileges can only activate a NDB application.

Example for installing NDB on Cisco Nexus 3548 switch.

Example:

```
device-3548# run bash
bash-3.8$ sudo su
Password: #(Enter the password for the "admin" user when prompted).
bash-3.8# cd /bootflash/
bash-3.8# python NDBActivator.py -v ndb
2017-05zx-27 09:08:05,923 - __main__ - INFO - Successfully created /embndb/interface file with
management interface details
bash-3.8#
```

Example for installing NDB on Cisco Nexus 3000, Nexus 3100 and Nexus 9000 switches.

Example:

```
switch# python bootflash:NDBActivator.py -v ndb
```

Step 14 Deactivate the NDB virtual service and activate it for the activator configuration changes to apply.

Example:

```
device# configure terminal
device(config)# virtual-service ndb
device(config)# no activate
device(config)# show virtual-service list (repeat until status shows deactivated)
device(config)# activate
device(config)# show virtual-service list (repeat until status shows activated)
device(config)# end
device(config)# copy running-config startup-config
```

Installing and Activating the Cisco Nexus Data Broker Embedded Software for OpenFlow Mode for NXOS Versions in 7.0(3)I7(2) or Later

Cisco NDB is not installed as OVA, it is installed in the Guestshell. You can now install NDB directly on a device in embedded mode on NXOS 7.0(3)I7(2) or later release on the Guestshell. To install Cisco Nexus Data Broker Embedded software on NXOS 7.0(3)I7(2) or later release, use the NDB activator script, `NDBActivator2.0_I5_Plus.py`. After you install NDB, you need to enable it. To enable NDB, use the **guestshell enable** command. To disable NDB, use **guestshell disable** command.

The activator script performs the following functions:

- Resizes the Guestshell resources.
- Unzips and places the XNC folder into the Guestshell home directory.
- Configures the Guestshell to management VRF.

Before you begin

Note By default, you cannot install a new version of the Cisco Nexus Data Broker Embedded if you already have an existing Cisco Nexus Data Broker Embedded application installed and active. You can forcefully run the activator script even if it is already activated using **python bootflash** command with **--force** attribute. For example:

```
Syntax: python <file path>NDBActivator3.0_I5_Plus.py -v guestshell+ <zip file path> --force
```

```
Example: python bootflash:NDBActivator3.0_I5_Plus.py -v guestshell+
/bootflash/ndb1000-sw-app-emb-i6-plus-k9-3.8.zip -force
```



Note If you are using Cisco NXOS version I4.7 in embedded mode, you need to uninstall the NDB OVA and OpenFlow agent OVA and then upgrade the device to NXOS version I7.2.



Note Before you begin installing a new version of the Cisco Nexus Data Broker in Embedded mode, you must download and copy `NDBActivator3.0_I5_Plus.py` and `ndb1000-sw-app-emb-i6-plus-k9-3.8.zip` files to device.



Note If an instance of NDB exists in the guestshell and you need to install a new NDB instance, you need to destroy the existing Guestshell and re-install the Guestshell and the NDB. To uninstall NDB application, destroy the Guestshell using the command, **guestshell destroy**.

```
N9K-switch# guestshell destroy
```



Important Ensure that you have sufficient space available in the bootflash. The **ndb1000-sw-app-emb-i6-plus-k9-3.8.zip** file require a total of ~600 MB of space in the bootflash (/volatile folder) for the decompression processes. The script runs only on NXOS platform, version 7.0(3)I5(1) or later, with memory greater than 8GB.

Step 1 switch# **copy ftp://10.10.10.1 NDBActivator3.0_I5_Plus.py bootflash: vrf management**

Copies the `NDBActivator3.0_I5_Plus.py` from the directory where you downloaded it to the switch. You can download the file from different sources such as HTTP, FTP, or SSH.

Step 2 switch# **copy ftp://10.10.10.1 ndb1000-sw-app-emb-i6-plus-k9-3.8.zip bootflash: vrf management**

Copies the Cisco Nexus Data Broker Embedded package from the directory where you downloaded it to the switch. You can download the file from different sources such as HTTP, FTP, or SSH.

Step 3 switch# **show virtual-service list**

Monitors the status of the copy processes.

Step 4 switch# **guestshell enable**

Enables the guestshell.

Step 5 switch# **python bootflash:NDBActivator3.0_I5_Plus.py -v guestshell+ /bootflash/ndb1000-sw-app-emb-i6-plus-k9-3.8.zip**

Installs the Cisco Nexus Data Broker Embedded package on the switch.

Step 6 switch# **show virtual-service list**

Monitors the status of the installations.

Note Do not continue until both the OVA files are installed successfully.

Step 7 switch# **show processes cpu sort | grep java**

Example:

```
switch# show processes cpu sort | grep java
```

```
19587 3 6 551 0.00% java
```


switch#

Verify whether NDB installed and initiated successfully. Stop the NDB using **guestshell disable** command and then enable it using the **guestshell enable** command.

Step 8 switch# **guestshell disable**

Disables the NDB.

Step 9 switch# **guestshell enable**

Enables the NDB.

Step 10 Log in to the NDB application using the credentials.

Step 11 Configure the OpenFlow switch, see [Configuring the Cisco Plug-in for OpenFlow](#).

Installing, Activating and upgrading the Cisco Nexus Data Broker for OpenFlow Mode for NXOS Version 7.0(3)I7(2) or Later on Low Memory Devices

Complete the following steps to upgrade Nexus 3K Switches (Nexus 3548P and 3548X) with low memory (less than 4 Gb). This procedure is applicable when you are upgrading devices with NXOS version 6.0(2)A6(x) and 6.0(2)A8(x) to NXOS version 7.0(3)I7(X) or 9.2(x).

Before you begin



Note By default, you cannot install a new version of the Cisco Nexus Data Broker Embedded if you already have an existing Cisco Nexus Data Broker Embedded application installed and active. You can forcefully run the activator script even if it is already activated using **python bootflash** command with **--force** attribute. For example:

```
Syntax: python <file path>NDBActivator3.0_I5_Plus.py -v guestshell+ <zip file path> --force
```

```
Example: python bootflash:NDBActivator3.0_I5_Plus.py -v guestshell+
/bootflash/ndb1000-sw-app-emb-i6-plus-k9-3.8.0.zip -force
```



Note If you are using Cisco NXOS version I4.7 in embedded mode, you need to uninstall the NDB OVA and OpenFlow agent OVA and then upgrade the device to NXOS version I7.2.

Step 1 Log into the current NDB instance.

Step 2 Navigate to **ADMINISTRATION > Devices > NODES LEARNED** tab.

Step 3 Note the Node ID (also known as Data Path ID (DPID)) value for the switch listed on the **NODES LEARNED** tab.

Step 4 Click **Save** to save the NDB configuration for NDB release 3.1 and earlier.

Note Ensure that you save the NDB configuration because configuration in NDB releases 3.1 and earlier are not saved automatically.

Step 5 Navigate to **ADMINISTRATION > System**.

Step 6 Click **Download Configuration** to download the current configuration on the NDB.

Step 7 Remove the OVA files (ndb and ofa virtual services) from the switch. For example:

Example:

```
N3K-130(config)# conf t
N3K-130(config)# virtual-service ndb
N3K-130(config-virt-serv)# no activate
N3K-130(config-virt-serv)# sh virtual-service list
Virtual Service List:
```

Name	Status	Package Name
ndb	Deactivating	ndb1000-sw-app-emb-k9-3.8.0.ova
ofa	Activated	ofa_mmemb-1.1.5-r3-n3000-SPA-k9.ova

```
N3K-130(config-virt-serv)# sh virtual-service list
```

Virtual Service List:

Name	Status	Package Name
ndb	Deactivated	ndb1000-sw-app-emb-k9-3.8.0.ova
ofa	Activated	ofa_mmemb-1.1.5-r3-n3000-SPA-k9.ova

```
N3K-130(config-virt-serv)# no virtual-service ndb
N3K-130(config)# ex
N3K-130# virtual-service uninstall name ndb
N3K-130# sh virtual-service list
```

Virtual Service List:

Name	Status	Package Name
ofa	Activated	ofa_mmemb-1.1.5-r3-n3000-SPA-k9.ova

```
N3K-130# conf t
Enter configuration commands, one per line. End with CNTL/Z.
N3K-130(config)# virtual-service ofa
N3K-130(config-virt-serv)# no activate
N3K-130(config-virt-serv)# sh virtual-service list
```

Virtual Service List:

Name	Status	Package Name
ofa	Deactivating	ofa_mmemb-1.1.5-r3-n3000-SPA-k9.ova

```
N3K-130(config-virt-serv)# sh virtual-service list
```

Virtual Service List:

Name	Status	Package Name
ofa	Deactivating	ofa_mmemb-1.1.5-r3-n3000-SPA-k9.ova

```
N3K-130(config-virt-serv)# sh virtual-service list
```

Virtual Service List:

```

Name                Status                Package Name
-----
ofa                  Deactivated          ofa_mmemb-1.1.5-r3-n3000-SPA-k9.ova

```

```

N3K-130(config-virt-serv)# no virtual-service ofa
N3K-130(config)# ex
N3K-130# virtual-service uninstall name ofa
N3K-130#
N3K-130# sh virtual-service list

```

Virtual Service List:

Step 8 Copy the latest NXOS image to your local server and use the compact option to generate a compact NXOS image while copying the image to the switch bootflash. For example:

Important Starting with Cisco NXOS Release 7.0(3)I5(2), you can compact the image while copying the image to the switch bootflash or USB drive using compact option in the **copy** command. Download and keep the non-compact image in any server. The compact option in the **copy** command overrides the bootflash space limitation as the image is compacted at the time of transferring the image to the switch bootflash or USB drive.

Syntax: switch# copy scp :source image name bootflash :image name compact vrf vrf name

```

copy scp://vm-ubuntu-1604@10.16.206.136//home/vm-ubuntu-1604/praba/nxos_img/nxos.7.0.3.I7.5A.bin
bootflash: compact vrf management

```

Note The compact option with **copy** command is allowed only with SCP protocol.

Step 9 Upgrade the switch to the downloaded compact image. Refer to [Cisco NX-OS Upgrade guide](#).

Step 10 Download the guestshell.ova from [NX-OS software](#) download page. If the guestshell.ova is not available on the download page, you need to extract it from the downloaded NXOS image. Refer to [Extracting Guestshell](#) section for more information.

Step 11 Install the guestshell on the low memory switch using the guestshell enable package command.

```

N3K-130# guestshell enable package bootflash:guestshell.ova
N3K-130#
N3K-130# show virtual-service list
Virtual Service List:
Name                Status                Package Name
-----
guestshell+         Activated             guestshell.ova

```

Step 12 Install and activate the NDB for OpenFlow mode. For detailed information, see [Installing and Activating the Cisco Nexus Data Broker Embedded Software for OpenFlow Mode for NXOS Versions in 7.0\(3\)I7\(2\) or Later for more information](#).

Step 13 Configure the Cisco Plugin. For more information, see the [Configuring the Cisco Plug-in for OpenFlow](#) section.

Step 14 Use the show openflow switch command to check the current DPID in the switch after upgrading to Cisco NX-OS Release I7(5A)

```

N3K-130# show openflow switch 1 | grep DPID
DPID: 0x0001a44c116a7620

```

Note If DPID is different from the DPID in Step 1, you need to configure DPID described in the next step.

Step 15 Enable the Openflow feature and add controller configuration along with DPID value to the switch.

```

N3K-130(config)# feature openflow
N3K-130(config)# openflow

```

```

N3K-130(config-ofa)# switch 1 pipeline 203
N3K-130(config-ofa-switch)# controller ipv4 10.16.206.130 port 6653 vrf management security none
N3K-130(config-ofa-switch)# datapath-id ?
<0-18446744073709551615> 64-bit hex value [0x1-0xffffffffffffffff]
N3K-130(config-ofa-switch)# datapath-id 0x001a44c116a7620
N3K-130(config-ofa-switch)# of-port interface ethernet 1/1-48

```

Note DataPath ID should be the same as mentioned in the device currently (after the NXOS upgrade). Any change in the DataPath ID will result in the upgrade failure.

Extracting Guestshell

Complete these steps to extract the guestshell from the downloaded NX-OS image.

Before you begin

Ensure that guestshell extraction is performed on a switch with more than 4 Gb disk space and 1 Gb of memory. Load the regular non-compact I7(5) image the switch.

Step 1 Log into a switch with non-compact image installed.

Step 2 Use the **feature bash-shell** command to enable the bash-shell feature.

```
N3548X(config)# feature bash-shell
```

Step 3 Use the **run bash** command to enter the bash-shell mode.

```
N3548X# run bash
bash-4.2$
```

Step 4 Use the **sudo su** command to switch to super user.

```
bash-4.2$ sudo su
```

Step 5 Set the following environment variables where the guest shell ova is to be stored.

```
root@N3548X#TARGET="/isanboot/bin/guestshell.ova"
```

Step 6 Set the system image environment variable from where the guest shell needs to be extracted.

```
root@N3548X#SYSIMG="/bootflash/nxos.7.0.3.I7.5_full.bin"
```

Step 7 Use the **isanboot** command to extract the guest shell ova from the specified NXOS image.

Example:

```
root@N3548X#/isanboot/bin/x_nbi_seg $SYSIMG stdout 3 | /bin/zcat | /bin/cpio -ivd $TARGET
```

Step 8 Exit the super user mode using the **exit** command.

```
root@N3548X#exit
logout
```

Step 9 Exit the bash-shell mode using the **exit** command.

```
bash-4.2$ exit
```

Step 10 Verify the extracted files using the **dir boot flash** command.

It downloads the configuration in a zip file format. The name of the zip file is **configuration_startup.zip**.

OR

Navigate to the **System** tab under **Administration > Backup/Restore** tab. Click **Backup and Backup Locally** to download the configuration in zip file format.

Step 3 Download the configuration in Cisco NDB version 3.8.

Step 4 Deactivate and uninstall Cisco NDB. For example:

Example:

```
configure terminal
virtual-service ndb
no activate
no virtual-service ndb
end
virtual-service uninstall name ndb
copy running-config startup-config
```

Step 5 Install and activate Cisco NDB 3.8 using the following steps:

- a) **virtual-service install name <virtual-services-name> package bootflash: ndb1000-sw-app-emb-k9-3.8.0.ova**
- b) **show virtual-service list**

Use the show command to check the status of the virtual service installation. After the status of the virtual service becomes listed as **Installed**, run the following commands to activate the service.

- c) **configure terminal**
- d) **device-3548(config)# virtual-service <virtual-services-name>**
- e) **device-3548(config)# activate**
- f) **device-3548(config)# end**
- g) **device-3548(config)# copy running-config startup-config**

Note Verify that the OpenFlow plugin is present in the **show virtual-service list**. If it is present, continue with the next step. If it is not listed, follow Step 2 in [Installing and Activating the Cisco Nexus Data Broker Embedded Software for OpenFlow](#).

Step 6 Run the **<python activator script>** in the bash shell **python bootflash:<python activator script> -v <ndbvirtual service name>** command. The script deactivates and activates the NDB OVA automatically. If the NDB OVA is not activated automatically, you need to activate is manually.

Note For NXOS devices with A6/A8 version, run the activator script in root user. Copy the activator script in the bootflash of the device and complete the following steps:

Note Starting with Cisco NXOS, Release 7.0(3)I5(1), only NXAPI embedded is supported, OpenFlow embedded is not supported.

Note Cisco Nexus 3548 switches, running NXOS A6/A8 version, need **root** user privileges to run the activator script. Ensure that activator script is downloaded and copied to bootflash with the name NDBActivator.py as mentioned in the previous section.

```
device-3548# run bash
bash-3.8$ sudo su
Password:      #(Enter the password for the "admin" user).
bash-3.8# cd /bootflash/
bash-3.8# python NDBActivator.py -v ndb
2017-05zx-27 09:08:05,923 - __main__ - INFO - Successfully created /embndb/interface file with
```

```
management interface details
bash-3.8#
```

Example:

```
device# configure terminal
device-3548(config)# virtual-service <virtual-services-name>
device-3548(config)# no activate
device-3548(config)# show virtual-service list (Wait until deactivated complete)
device-3548(config)# activate
device-3548(config)# show virtual-service list (Wait until activated complete)
device-3548(config)# end
device-3548(config)# copy running-config startup-config
```

- Step 7** Upload Cisco NDB configuration that you downloaded earlier in the Cisco NDB User Interface (UI). Navigate to **Administration > System > BACKUP/RESTORE** tab, click **Restore locally** and follow the prompts to upload the configuration zip file.

Upgrading to Release 3.8 for Cisco NXOS Releases 7.0(3)I7(2) or Later

This process involves downloading, upgrading, and finally uploading the configuration using the GUI.



Note For detailed information about upgrading Cisco Nexus OS from I4(6) to I6(1), see *Cisco Nexus 9000 Series NX-OS Software Upgrade and Downgrade Guide, Release 7.x*.



Note While upgrading NDB embedded, after configuration upload from NDB, wait for at least 60 seconds before restarting the guestshell.

- Step 1** For embedded NDB release 3.3 or earlier, navigate to the **System** tab under **Administration** and click **System Administration** to open the **System Administration** window. Click **Download Configuration**. For embedded NDB release 3.6 or later, navigate to the **System** tab under **Administration** -> **Backup/Restore** tab. Click **Backup and Backup locally**.

It downloads the configuration in a zip file format. The name of the zip file is **configuration_startup.zip**

Note For Cisco NXOS I4 or earlier versions, uninstall both the NDB OVA and Embedded OVA and then upgrade the NXOS version to I7.2.

Note For Cisco NXOS I5 and later versions, disable and destroy the guestshell and then upgrade the NXOS version to I7.2.

- Step 2** Copy the NDBActivator3.0_I5_Plus.py from the directory where you downloaded it to the switch. You can download the file from different sources such as HTTP, FTP, or SSH.

Example:

```
switch# copy scp://10.10.10.1 NDBActivator3.0_I5_Plus.py bootflash:vrf management
```

Step 3 Copy the Cisco Nexus Data Broker Embedded package from the directory where you downloaded it to the switch. You can download the file from different sources such as HTTP, FTP, or SSH.

Example:

```
switch# copy scp://10.10.10.1 ndb1000-sw-app-emb-i6-plus-k9-3.8.0.zip bootflash:vrf management
```

Step 4 Monitor the status of the copy processes.

Example:

```
switch# show virtual-service list
```

Step 5 Enable the guestshell.

Example:

```
switch# guestshell enable
```

Step 6 Install the Cisco Nexus Data Broker Embedded package on the switch.

Example:

```
switch# python bootflash:NDBActivator3.0_I5_Plus.py -v guestshell+
/bootflash/ndb1000-sw-app-emb-i6-plus-k9-3.8.0.zip
```

Step 7 Monitor the status of the installations.

Example:

```
switch# show virtual-service list
```

Note Do not continue until installation completes successfully. NDB application starts after it is installed successfully. Auto discovery for embedded Nexus devices is not available, you need to manually add a device using the Web GUI.

Step 8 Verify whether NDB installed and initiated successfully.

Example:

```
switch# show processes cpu sort | grep java
19587 3 6 551 0.00% java
```

Step 9 Log in to the NDB application using the credentials.

Step 10 Upload Cisco NDB 3.x configuration that you downloaded in step 1 in the Cisco NDB user interface (UI). After uploading you need to disable and enable the guestshell to apply the uploaded configuration.

Configuring the Cisco Plug-in for OpenFlow

The Cisco Plug-in for OpenFlow needs to be connected to the Cisco Nexus Data Broker locally running on the Cisco Nexus 3000, 3100, 3200, 3500, or 9000 Series switch.



Note This procedure is applicable if you are installing the Cisco NDB with Openflow for the first time.



Note The flow can have only up to 16 output actions.

Before you begin

Configure the pre-requisite profile, **hardware profile openflow** for the Cisco Nexus 3000, 3100, 3200, and hardware access-list team region openflow <team> double-wide (optional) for the Nexus 9000 Series switches. For Cisco Nexus 3500 Series switches, configure the pre-requisite profile **hardware profile forwarding-mode openflow-hybrid** for the Cisco Nexus 3500 Series switches. Use the **copy running-config startup-config** to save the configuration and reload the switch.

Step 1 Enter the configuration mode on the switch.

configure terminal

Step 2 Enter the Cisco Plug-in for OpenFlow configuration mode on the switch.

switch(config)# **openflow**

Step 3 Choose the switch to which you want to connect.

switch(config-ofa)# **switch** *switch_num*

Caution Set the *switch_num* to **1**. This is the default value.

Step 4 Choose the pipeline to which you want to connect.

switch(config-ofa-switch)# **pipeline** *pipeline_num*

Caution Set the *pipeline_num* to **201** for Cisco Nexus 3000, 3100, 3200, and 9300 Series switches. This is the default value. Only expert users should set the *pipeline_num* number to any value other than 201.

Set the *pipeline_num* to **203** for Cisco Nexus 3500 Series Switch This is the default value. Only expert users should set the *pipeline_num* number to any value other than 203.

Starting with NXOS version I6(1), you must configure the switch and pipeline in a single command.

Step 5 Configure the controller address using vrf management.

switch(config-ofa-switch)# **controller ipv4** *management_interface_address* **port** *port_num* **vrf management security none**

Note

- The controller ipv4 address should match the management interface (mgmt0) address.
- By default, the Cisco Plug-in for OpenFlow listens on port 6653.

Step 6 Assign ports to the Cisco Plug-in for OpenFlow.

switch(config-ofa-switch)# **of-port interface** *ethernet_port_num*

Example:

switch(config-ofa-switch)# **of-port interface** ethernet1/10

Step 7 Exit from the current configuration command mode and return to EXEC mode.

```
switch(config-ofa-switch)# end
```

Step 8 Verify that the Cisco Plug-in for OpenFlow is connected to the Cisco Nexus Data Broker.

```
switch# show openflow switch switch_num controllers
```

See the [Cisco Plug-in for OpenFlow Configuration Guide 1.3](#)

Logging in to the Cisco Nexus Data Broker GUI

The default HTTPS web link for the Cisco Nexus Data Broker GUI is
`https://Nexus_Switch_Management_IP:8443/monitor`



Note You must manually specify the https:// protocol in your web browser. The controller must also be configured for HTTPS.

Step 1 In your web browser, enter the Cisco Nexus Data Broker web link, for example,
`https://Nexus_Switch_Management_IP:8443/monitor`.

Step 2 On the launch page, do the following:

- a) Enter your username and password.
The default username and password is admin/admin.
 - b) Click **Log In**.
-

What to do next

See the *Cisco Nexus Data Broker Configuration Guide* for the procedures that you need to configure Cisco Nexus Data Broker.