



Cisco Nexus Data Broker Embedded Deployment Guide, Release 3.0

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Cisco Nexus Data Broker Embedded Overview

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About Cisco Nexus Data Broker Embedded

Visibility into application traffic has traditionally been important for infrastructure operations to maintain security, troubleshooting, and compliance mechanisms, and to perform resource planning. With the technological advances and growth in cloud-based applications, it has become imperative to gain increased visibility into the network traffic. Traditional approaches to gain visibility into network traffic are expensive and rigid, making it difficult to do in large-scale deployments.

Cisco Nexus Data Broker Embedded with Cisco Nexus Switches provides a software-defined, programmable solution to aggregate copies of network traffic using Switched Port Analyzer (SPAN) or network Test Access Points (TAP) for monitoring and visibility. As opposed to traditional network taps and monitoring solutions, this packet-brokering approach offers a simple, scalable and cost-effective solution that is well suited for customers who need to monitor higher-volume and business-critical traffic for efficient use of security, compliance, and application performance monitoring tools.

The Cisco Nexus Data Broker Embedded option provides the flexibility for you to run the Cisco Nexus Data Broker software directly on a Cisco Nexus 3000, 3100, 3200, 3500, or 9000 Series switch in a single-switch deployment. This is suitable for smaller, co-located facilities where customers need only a single Cisco Nexus 3000, 3100, 3200, 3500, or 9000 Series switch for TAP/SPAN aggregation, because it eliminates the requirement to have a separate virtual machine for the Cisco Nexus Data Broker application.

The Cisco Nexus Data Broker Embedded solution supports the following:

- Support for the OpenFlow mode or the NX-API mode of operation.

**Note**

The OpenFlow mode and the NX-API mode are supported on both Cisco Nexus 3000 Series and Cisco Nexus 9000 Series switches. Cisco Nexus 9500 supports only NX-API mode of deployment. Cisco Nexus 3500 supports only Openflow mode of deployment.

You can enable only one mode, either OpenFlow or NX-API mode, at a time.

In order to start or stop the Cisco Nexus Data Broker application in embedded mode, you should activate or de-activate the **ofa** file. Do not use **./runxnc.sh** as it is not the right way to start the application.

**Note**

Starting with Cisco Nexus 3000 Release 7.x, the NX-API configuration is supported on the following Cisco Nexus 3100 Series switches:

- Cisco Nexus 3172 switches
- Cisco Nexus 3132 switches
- Cisco Nexus 3164 switches
- Cisco Nexus 31128 switches
- Cisco Nexus 3232 switches
- Cisco Nexus 3264 switches

- Support for Layer-7 filtering for the HTTP traffic using the HTTP methods.
- Support for VLAN and MPLS tag stripping.
- The ability to aggregate traffic from multiple TAP or SPAN ports connected to a single switch.
- Support for Q-in-Q to tag input source TAP and SPAN ports.
- Symmetric hashing or symmetric load balancing.
- Rules for matching monitoring traffic based on Layer 1 through Layer 4 information.
- The ability to replicate and forward traffic to multiple monitoring tools.
- Timestamp tagging using the Precision Time Protocol.
- Packet truncation beyond a specified number of bytes to discard payload.
- Security features, such as role-based access control (RBAC), and integration with an external Active Directory using RADIUS or TACACS for authentication and authorization.
- End-to-end path visibility and both port and flow level statistics for troubleshooting.
- Robust Representational State Transfer (REST) API and web-based GUI for all functions.

Supported Web Browsers

The following web browsers are supported for Cisco Nexus Data Broker Embedded:

- Firefox 18.x and later versions
- Chrome 24.x and later versions

**Note**

JavaScript 1.5 or a later version must be enabled in your browser.

Prerequisites for Cisco Nexus 3000, 3100, 3200, 3500, and 9000 Series Switches

Cisco Nexus Data Broker is supported on Cisco Nexus 3000, 3100, 3200, 3500, and 9000 series switches. Before you deploy the software, you must do the following:

- Ensure that you have administrative rights to log in to the switch.
- Verify that the management interface of the switch (mgmt0) has an IP address configured by running the switch# **show running-config interface mgmt0** command.
- Add the VLAN range in the database that is to be used in Cisco Nexus Data Broker for tap aggregation and inline monitoring redirection to support VLAN filtering. For example, the syntax is **vlan <range of VLAN IDs>**. For example, the VLAN range is <1-3967>.

For running the OpenFlow and NX-API mode on the Cisco Nexus 3000, 3100, 3500, and 9000 Series switches, see the following pre-requisites.

Device Models	OpenFlow Mode	NX-API Mode
Nexus 3000 Series switches	Enter the # hardware profile openflow command at the prompt.	Enter the following commands at the prompt: <ul style="list-style-type: none"> • # hardware profile tcam region qos 0 • # hardware profile tcam region racl 0 • # hardware profile tcam region vacl 0 • # hardware profile tcam region ifacl 1024 double-wide • # hardware profile tap-aggregation

Device Models	OpenFlow Mode	NX-API Mode
Nexus 3164Q switches	The OpenFlow mode is not supported on the Nexus 3164Q switches.	Enter the following commands at the prompt: <ul style="list-style-type: none"> • # hardware profile tcam region qos 0 • # hardware profile tcam region racl 0 • # hardware profile tcam region vacl 0 • # hardware profile tcam region ifacl 1024 double-wide
Nexus 3200 Series switches	Enter the hardware access-list tcam region openflow 256 command at the prompt.	Enter the following commands at the prompt: <ul style="list-style-type: none"> • # hardware access-list tcam region e-racl 0 • # hardware access-list tcam region span 0 • # hardware access-list tcam region redirect 0 • # hardware access-list tcam region vpc-convergence 0 • # hardware access-list tcam region racl-lite 256 • # hardware access-list tcam region l3qos-intra-lite 0 • # hardware access-list tcam region ifacl 256 double-wide

Device Models	OpenFlow Mode	NX-API Mode
Nexus 9000 Series switches	Enter the hardware access-list team region openflow 512 command at the prompt.	Enter the following commands at the prompt: <ul style="list-style-type: none"> • # hardware access-list team region qos 0 • # hardware access-list team region vacl 0 • # hardware access-list team region racl 0 • # hardware access-list team region redirect 0 • # hardware access-list team region vpc-convergence 0 • # hardware access-list team region ifacl 1024 double-wide • # hardware access-list team region mac-ifacl 512

Cisco Nexus Data Broker Software Release Filename Matrix

See the Cisco Nexus Data Broker software release filename matrix for more information on the software images:

Mode of Deployment	OpenFlow	NX-API	N3K	N3500	N9K	File Name
Embedded	N	Y	Y	N	Y	ndb1000-sw-app-emb-nxapi-3.0.0-k9.zip
Embedded	Y	N	Y	Y	N	ndb1000-sw-app-emb-3.0.0-ofa_mmemb-1.1.5-r3-n3000-SPA-k9.zip
Embedded	Y	N	Y	N	Y	ndb1000-sw-app-emb-3.0.0-ofa_mmemb-2.1.4-r2-nxos-SPA-k9.zip



Deploying Cisco Nexus Data Broker Embedded for OpenFlow

This chapter contains the following sections:

- [Obtaining the Cisco Nexus Data Broker Embedded Software for OpenFlow](#), page 7
- [Upgrading From Release 2.x to Release 3.0](#), page 8
- [Installing and Activating the Cisco Nexus Data Broker Embedded Software for OpenFlow](#), page 9
- [Configuring the Cisco Plug-in for OpenFlow](#), page 10
- [Logging in to the Cisco Nexus Data Broker GUI](#), page 11

Obtaining the Cisco Nexus Data Broker Embedded Software for OpenFlow

Procedure

- Step 1** In a web browser, navigate to [Cisco.com](https://www.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 extract the **Cisco Nexus Data Broker Release 3.0.0** application bundle zip file. The application bundle zip file contains the following:
 - The Cisco Nexus Data Broker Software Application package, for example, **ndb1000-sw-app-emb-k9-3.0.0.ova**
 - The Cisco Plug-in for OpenFlow package, **ofa_mmemb-2.1.4-r2-nxos-SPA-k9.ova**
-

What to Do Next

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

Upgrading From Release 2.x to Release 3.0

This process involves using the GUI to download the configuration, perform the upgrade, and then upload the configuration.

Procedure

	Command or Action	Purpose
Step 1	Navigate to the System tab under Administration .	The System Administration window is displayed.
Step 2	Click Download Configuration .	It downloads the configuration in a zip file format. The name of the zip file is configuration_startup.zip .
Step 3	Save the configuration file on your local desktop.	
Step 4	Stop the Cisco Nexus Data Broker. Deactivate and uninstall the old instance.	
Step 5	Install Cisco Nexus Data Broker 3.0 instance.	
Step 6	Navigate to the System tab under Administration .	The System Administration window is displayed.
Step 7	Click Upload Configuration .	It uploads the configuration that you have downloaded. It restores the configuration in the new version.
Step 8	Restart the Cisco Nexus Data Broker by performing no activate within the virtual service and by activating it again.	

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

Before You Begin



Note

You cannot install a new version of the Cisco Nexus Data Broker Embedded if you already have an existing Cisco Monitor Manager Embedded application installed and active.

Before you begin installing a new version of the Cisco Nexus Data Broker Embedded, you must:

- Deactivate your current Cisco Monitor Manager Embedded OVA file.
- Uninstall the Cisco Monitor Manager Embedded OVA file.



Important

Ensure that you have at least 1 GB of available space in the bootflash. The `ofa_mmemb-2.1.4-r2-nxos-SPA-k9.ova` and `ndb1000-sw-app-emb-k9-3.0.0.ova` file require a total of 850 MB of space in the bootflash for the decompression and installation processes.

Procedure

	Command or Action	Purpose
Step 1	<code>switch# copy [scp: ftp: http:] //download_dir ofa_mmemb-2.1.4-r2-nxos-SPA-k9.ova bootflash:vrf management</code>	Copies the Cisco Plug-in for OpenFlow package from the directory where you downloaded it to the switch.
Step 2	<code>switch# copy [scp: ftp: http:] //download_dir ndb1000-sw-app-emb-k9-3.0.0.ova bootflash:vrf management</code>	Copies the Cisco Nexus Data Broker Embedded package from the directory where you downloaded it to the switch.
Step 3	<code>switch# show virtual-service list</code>	Monitors the status of the copy processes.
Step 4	<code>switch# virtual-service install name ofa_ndbemb package bootflash:ofa_mmemb-2.1.4-r2-nxos-SPA-k9.ova</code>	Installs the Cisco Plug-in for OpenFlow package on the switch.
Step 5	<code>switch# virtual-service install name ndb_emb package bootflash:ndb1000-sw-app-emb-k9-3.0.0.ova</code>	Installs the Cisco Nexus Data Broker Embedded package on the switch.
Step 6	<code>switch# show virtual-service list</code>	Monitors the status of the installations. Note Do not continue until both OVA files have been successfully installed.

	Command or Action	Purpose
Step 7	switch# configure terminal	Enters global configuration mode on the switch.
Step 8	switch (config)# virtual-service ofa_ndbemb	Starts the virtual service for the Cisco Plug-in for OpenFlow package and enters virtual service configuration mode on the switch.
Step 9	switch(config-virt-serv)# activate	Activates the Cisco Plug-in for OpenFlow package.
Step 10	switch(config-virt-serv)# exit	Returns to global configuration mode.
Step 11	switch(config)# virtual-service ndb_emb	Starts the virtual service for the Cisco Nexus Data Broker Embedded package and enters virtual service configuration mode on the switch.
Step 12	switch(config-virt-serv)# activate	Activates the Cisco Nexus Data Broker Embedded package.
Step 13	switch(config-virt-serv)# exit	Exits virtual service configuration mode on the switch.
Step 14	switch(config)# show virtual-service list	Monitors the status of the package activations.

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

The steps in this procedure continue the steps that were completed in the previous section.

Before You Begin

Install and activate the Cisco Nexus Data Broker package and the Cisco Plug-in for OpenFlow package.

Enter the following pre-requisite command **hardware profile openflow** for the Cisco Nexus 3000 and 3100 Series switches. Enter the following pre-requisite command **hardware profile forwarding-mode openflow-hybrid** for the Cisco Nexus 3500 Series switches.

Procedure

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. Only expert users should set the *switch_num* number to any value other than 1.

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 switches. This is the default value. Only expert users should set the *pipeline_num* number to any value other than 203.

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.

Procedure

- 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.



Deploying Cisco Nexus Data Broker Embedded for NX-API

This chapter contains the following sections:

- [Obtaining the Cisco Nexus Data Broker Embedded Software for NX-API](#), page 13
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Obtaining the Cisco Nexus Data Broker Embedded Software for NX-API

Procedure

- Step 1** In a web browser, navigate to [Cisco.com](https://www.cisco.com).
 - Step 2** In the center pane, click **Cloud and Systems Management**.
 - Step 3** If prompted, enter your Cisco.com username and password to log in.
 - Step 4** In the right pane, click **Network Controllers and Applications**, and then click **Cisco Nexus Data Broker**.
 - Step 5** Download and extract the **Cisco Nexus Data Broker Software Application** bundle.
The application bundle zip file contains the following:
 - The Cisco Nexus Data Broker Embedded package, **ndb1000-sw-app-emb-k9-3.0.0.ova**
-

What to Do Next

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

Installing and Activating the Cisco Nexus Data Broker Embedded Software for NX-API Mode

Before You Begin



Note

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.

Before you begin installing a new version of the Cisco Nexus Data Broker Embedded, you must:

- Deactivate your current Cisco Monitor Manager Embedded OVA file.
- Uninstall the Cisco Monitor Manager Embedded OVA file.



Important

Ensure that you have sufficient space available in the bootflash. The **ndb1000-sw-app-emb-k9-3.0.0.ova** file require a total of ~55 MB of space in the bootflash for the decompression and installation processes.

Procedure

	Command or Action	Purpose
Step 1	switch# copy [<i>scp: ftp: http:</i>] //download_dir ndb1000-sw-app-emb-k9-3.0.0.ova bootflash:vrf management	Copies the Cisco Nexus Data Broker Embedded package from the directory where you downloaded it to the switch.
Step 2	switch# show virtual-service list	Monitors the status of the copy processes.
Step 3	switch# virtual-service install name ndb_emb package bootflash:ndb1000-sw-app-emb-k9-3.0.0.ova	Installs the Cisco Nexus Data Broker Embedded package on the switch.
Step 4	switch# show virtual-service list	Monitors the status of the installations. Note Do not continue until both OVA files have been successfully installed.
Step 5	switch# configure terminal	Enters global configuration mode on the switch.
Step 6	switch(config)# virtual-service ndb_emb	Starts the virtual service for the Cisco Nexus Data Broker Embedded package and enters virtual service configuration mode on the switch.
Step 7	switch(config-virt-serv)# activate	Activates the Cisco Nexus Data Broker Embedded package.

	Command or Action	Purpose
Step 8	switch(config-virt-serv)# exit	Exits virtual service configuration mode on the switch.
Step 9	switch(config)# show virtual-service list	Monitors the status of the package activations.

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.

Procedure

- 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:
- Enter your username and password.
The default username and password is admin/admin.
 - 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.

