Open Agent Container

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This chapter explains the Open Agent Container (OAC) environment and its installation in the following Cisco Nexus Switches:

- Cisco Nexus 5600 Switches
- Cisco Nexus 6000 Switches

OAC is a 32-bit CentOS 6.7-based container that specifically allows open agents, such as the Chef and Puppet agents to run on these platforms.

Feature History for the Open Agent Container

This table lists the release history for this feature.

Table 1: Feature History for Open Agent Container

Feature Name	Releases	Feature Information
Open Agent Container (OAC)	7.3(0)N1(1)	This feature was introduced in the Cisco Nexus 5600 Switches and the Cisco Nexus 6000 series switches. The following commands were introduced or modified: **virtual-service**, **virtual-service connect**, **virtual-service install**, **virtual-service uninstall,** **virtual-service upgrade**, **show virtual-service list**, and **show virtual-service detail**.

About Open Agent Container

From Cisco NX-OS 7.3(0)N1(1) and later releases, Cisco Nexus 5600 Switches and Cisco Nexus 6000 Series Switches support open agents, such as Chef and Puppet.

However, open agents cannot be directly installed on these platforms. Instead, they run in a special environment—a decoupled execution space within a Linux Container (LXC)—called the Open Agent Container (OAC). Decoupling the execution space from the native host system allows customization of the Linux environment to suit the requirements of the applications without impacting the host system or applications running in other Linux containers.

The OAC is a 32-bit CentOS 6.7-based environment that provides a server like experience to users. This means that after installation and first activation, users are responsible for setting up the DNS information in the /etc/resolv.conf or providing host information in /etc/hosts, etc. as is done on any regular Linux system.

By default, networking in the OAC is done in the default routing table instance. Any additional route that is required (for example, a default route) must be configured in the native switch console and should not be configured using the CentOS commands. To use a different routing instance (for example, the management VRF), use the following commands:

To get a bash shell in the management VRF, run the **chvrf management** command.

To pass the VRF context to the specific command without changing the VRF instance in the shell, run the **chvrf management***cmd*command.

Note The OAC occupies up to 256 MB of RAM and 400 MB of bootflash when enabled.

From within the OAC, the network administrator can perform the following functions:

- Access the network over Linux network interfaces.
- Access the device's volatile tmpfs.
- Access the device CLI using the **dohost** command.
- Access Cisco NX-API.
- Install and run Python scripts.
- Install and run 32-bit Linux applications.

Enabling OAC on Your Switch

Installing and Activating the Open Agent Container

The Open Agent Container (OAC) application software is packaged into a file with a .ova extension (OVA file, which will be hosted at the same location as the NXOS images in the CCO directory and on GitHub). This package must first be copied to a location on the device using the **copy scp:**: command before it is installed on the device. The install keyword extracts the OVA file, validates the contents of the file, creates a virtual service instance, and validates the virtual machine definition file in XML. You don't have to copy

configurations to the startup-configuration file of the device to preserve the installation of the OVA file. Once you download the oac.ova file on to your device, install and activate the OAC. You can install a different OVA file on the active and standby Route Processors. To install and activate OAC on your device, do the following:

Step 1 Add a virtual environment to the device.
switch# **virtual-service name** *virtual-service-name* **package** *package-location-media*

Note The media in which the package is located can be bootflash or any other media, including a USB device.

Note Use the **show virtual-service list** command to view the progress of the installation. After the installation is complete, a message is displayed on the console informing you about the successful installation of the virtual service.

Step 2 After the installation is complete, enter global configuration mode and activate the virtual service.
switch# **configure terminal**

Step 3 Enable the NX-API feature. Communication between the Puppet and Chef agents and the Nexus devices is achieved using the NX-APIs
switch(config)# **feature nxapi**

Step 4 Configure the virtual service and enter virtual service configuration mode.
switch(config)# **virtual-service** *name*

Step 5 Activate the configured virtual service.
switch(config-virt-serv)# **activate**

Note To deactivate the virtual service, use the **no activate** command in virtual service configuration mode.

Step 6 Return to privileged EXEC mode.
switch(config-virt-serv)# **end**

Example:

The following example shows how to install and activate the OAC in your Cisco NX-OS device. This is followed by the verification command that displays the details of the installed and configured virtual service.

```
switch# virtual-service install name oac package bootflash:oac.ova
switch# configure terminal
switch(config)# feature nxapi
switch(config)# virtual-service oac
switch(config-virt-serv)# activate
switch(config-virt-serv)# end
switch# show virtual-service detail

Virtual service oac detail
  State                 : Activated
  Package information
    Name                : oac.ova
    Path                : bootflash:/oac.ova
    Application
      Name              : OpenAgentContainer
      Installed version : 1.0
      Description       : Cisco Systems Open Agent Container
    Signing
      Key type          : Cisco release key
      Method            : SHA-1
```

```
  Licensing
    Name              : None
    Version           : None
Resource reservation
  Disk                : 400 MB
  Memory              : 256 MB
  CPU                 : 1% system CPU

Attached devices
  Type              Name        Alias
  ---------------------------------------------
  Disk              _rootfs
  Disk              /cisco/core
  Serial/shell
  Serial/aux
  Serial/Syslog                 serial2
  Serial/Trace                  serial3
```

Connecting to the Open Agent Container

To connect to the virtual service environment, use the **virtual-service connect name** *virtual-service-name* **console** command in privileged EXEC mode. In this case, the virtual environment we previously configured is the OAC.

```
switch# virtual-service connect name oac console
```

To access the OAC environment, you must use the following credentials:

username: **root**, password: **oac**.

When you access the OAC environment for the first time, you will be prompted to reset your password immediately. Follow the instructions to reset your password. Once you reset your password, you will have access to the OAC environment.

Note Press Ctrl-C three times to terminate the connection to the OAC and return to the switch console.

Verifying the Networking Environment Inside the Open Agent Container

To ensure that you can install open agents on your switch directly from the Internet, verify the networking environment within the configured OAC.

Step 1 Edit /etc/resolv.conf to point to a DNS server. The default servers are OpenDNS Public DNS (208.67.222.222 and 208.67.220.220).

Step 2 Make sure that you set the correct time in the container. You can set up the Network Time Protocol (NTP) on the host inside the VSH. The time from the host will automatically be synchronized with the OAC.

Step 3 If your switches are behind a firewall without direct connectivity to the internet you will need to use a proxy server.

Step 4 Inside the container, setup the http_proxy and https_proxy to point to your proxy server. (This step is optional.)
export http_proxy="<*your-http-proxy*>"

export https_proxy="<*your-https-proxy*>"

Upgrading the OAC

If there is a new OVA available, you can upgrade the existing installation by using the **virtual-service upgrade name** *virtual-service-name* **package** *package-location-media* command in privileged EXEC mode. To upgrade to a new OVA, you must first deactivate the existing OVA by using the **no activate** command in virtual service configuration mode.

Note Once you upgrade, you will lose all changes and configurations made in old version of the OAC. You will have to start afresh in the new OAC environment.

Example:

The following example shows you how to upgrade to a new OAC.

```
switch# configure terminal
switch(config)# feature nxapi
switch(config)# virtual-service oac
switch(config-virt-serv)# no activate
switch(config-virt-serv)# end
switch(config)# virtual-service install name oac package bootflash:oac1.ova
switch# configure terminal
switch(config)# feature nxapi
switch(config)# virtual-service oac
switch(config-virt-serv)# activate
switch(config-virt-serv)# end
```

Uninstalling the OAC

To uninstall the OAC from the NX-OS device, you must deactivate the OAC first.

Step 1 Enter global configuration mode and deactivate the virtual service.
switch# **configure terminal**

Step 2 Enter virtual service configuration mode.
switch(config)# **virtual-service** *virutal-service-name*

Step 3 Deactivate the configured virtual service.
switch(config-virt-serv)# **no activate**

Step 4 Exit to global configuration mode.
switch(config-virt-serv)# **exit**

Step 5 Disable the configured virtual service.
switch(config)# **no virtual-service** *virtual-service-name*

Step 6 Exit to privileged EXEC mode.
switch(config)# **exit**

Step 7 Uninstall the virtual service.
switch# **virtual-service uninstall name** *virtual-service-name*

Note Use the **show virtual-service list** command to view the progress of the uninstallation. Once the uninstallation is complete, you will see a message on the console about the successful uninstallation of the virtual service.

Example:

The following example shows you how to deactivate and uninstall the OAC from your NX-OS device.

```
switch# configure terminal
switch(config)# virtual-service oac
switch(config-virt-serv)# no activate
switch(config-virt-serv)# exit
switch(config)# no virtual service oac
switch(config)# exit
switch# virtual-service uninstall name oac
```