Virtual Services Container

Prerequisites for a Virtual Services Container

- A Cisco device installed with an operating system release that supports virtual services and has the needed system infrastructure required for specific applications like Cisco Plug-In for OpenFlow.

Note Refer to the corresponding release notes for information about which operating system release supports the features and necessary infrastructure.

- Release notes for Cisco Catalyst 3850 Series Switches

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- An open virtual application (OVA) package that is compatible with the device operating system has been downloaded from an FTP server connected to the device. The OVA package is available for download in the same location as your system image (.bin) file.
- Enough memory is available for the installation and deployment of the application. The container and its applications require 256 MB.

Information about Virtual Services Container

Virtual Services Containers and Applications

A virtual services container is a virtualized environment on a device. It is also referred to as a virtual machine (VM), virtual service, or container.

You can install an application within a virtual services container. The application runs in the virtual services container of the operating system of a device. The application is delivered as an open virtual application (OVA), which is a tar file with a .ova extension. The OVA package is installed and enabled on a device through the device CLI.

Cisco Plug-In for OpenFlow is an example of an application that can be deployed within a virtual services container.

Some of the files that can be found in an OVA file are the following:

- Virtual machine definition file, in libvirt XML format, with Cisco extensions.
- Manifest file, listing the contents of a distribution. It contains the hash information for each file in the OVA package.
- Certificate file containing the signature of a manifest file. This file is used in validating the integrity of an OVA package.
- Version file, used to check compatibility with the virtualization infrastructure.

Related Topics

Cisco Plug-in for OpenFlow and Virtual Services Container
Installing and Activating an Application in a Virtual Services Container, on page 2

How to Configure a Virtual Services Container

Installing and Activating an Application in a Virtual Services Container

This task copies an open virtual application (OVA) package from an FTP file location, installs the application in a virtual services container, provisions the application, and activates it.

SUMMARY STEPS

1. **enable**
2. **copy** *from***:**//*source-directory-url destination-directory-url*
3. **virtual-service install name** *virtual-services-name* **package** *file*
4. **configure terminal**
5. **virtual-service** *virtual-services-name*
6. **activate**
7. **end**
8. **copy running-config startup-config**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Switch> enable`	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	**copy** *from***:**//*source-directory-url destination-directory-url* **Example:** `Switch# copy tftp://myserver.com/downloads/ofa-1.1.64144n-cat3000-SSA-k9.ova flash: ofa-1.1.64144n-cat3000-SSA-k9.ova`	Downloads the new OVA package to the device for upgrade. Possible values are: • flash: • tftp: Ensure you have configured the **ip tftp source-interface** *mgmt_interface* for the tftp to be usable.
Step 3	**virtual-service install name** *virtual-services-name* **package** *file* **Example:** `Switch# virtual-service install name openflow_agent package flash: ofa-1.1.64144n-cat3000-SSA-k9.ova`	Installs an OVA package from the specified location onto a device. Ensure that the ova file is located in the root directory of the storage device The *virtual-services-name* defined here should be used in all occurrences of this argument in this document.
Step 4	**configure terminal** **Example:** `Switch# configure terminal`	Enters the global configuration mode.

	Command or Action	Purpose
Step 5	**virtual-service** *virtual-services-name* **Example:** `Switch(config)# virtual-service openflow_agent`	Configures a virtual services container and enters virtual services configuration mode. Observe these guidelines: • Use the *virtual-services-name* defined during installation of the application. • Ensure that installation is complete before proceeding to the next step using the **show virtual-service list** command.
Step 6	**activate** **Example:** `Switch(config-virt-serv)# activate`	Activates the installed virtual services container.
Step 7	**end** **Example:** `Switch(config-virt-serv)# end`	Exits virtual services configuration mode and enters privileged EXEC mode.
Step 8	**copy running-config startup-config** **Example:** `Switch# copy running-config startup-config`	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

What to Do Next

You can now begin using your application.

Related Topics

Verifying Installation of Virtual Services Container Applications, on page 5
Configuration Examples for Virtual Services Container Installation , on page 10

Verifying Installation of Virtual Services Container Applications

SUMMARY STEPS

1. **show virtual-service [global]**
2. **show virtual-service detail** [**name** *virtual-services-name*]
3. **show virtual-service list**
4. **show virtual-service storage pool list**
5. **show virtual-service storage volume list**
6. **show virtual-service version name** *virtual-services-name* **installed**
7. **show virtual-service tech-support**
8. **show virtual-service redundancy state**
9. **show virtual-service utilization name** *virtual-services-name*
10. **show virtual-service utilization statistics CPU**

DETAILED STEPS

Step 1 **show virtual-service [global]**
This command displays available memory, disk space, and CPU allocated for applications.

Example:
```
Switch# show virtual-service

Virtual Service Global State and Virtualization Limits:

Infrastructure version : 1.5
Total virtual services installed : 1
Total virtual services activated : 1

Machine types supported   : LXC
Machine types disabled    : KVM

Maximum VCPUs per virtual service : 1
Resource virtualization limits:
Name                         Quota     Committed     Available
------------------------------------------------------------------
system CPU (%)                   6             1             5
memory (MB)                    256           256             0
flash (MB)                     256           219            37
```

Step 2 **show virtual-service detail** [**name** *virtual-services-name*]
This command displays a list of resources committed to a specified application, including attached devices.

Example:
```
Switch# show virtual-service detail name openflow_agent


Virtual service openflow_agent detail
  State                : Activated
```

```
  Package information
    Name                : ofa-1.1.64148n-cat3000-SSA-k9.ova
    Path                :
flash:/virtual-instance/OVA/openflow_agent/ofa-1.1.64148n-cat3000-SSA-k9.ova
    Application
      Name              : CiscoPluginForOpenFlow
      Installed version : 1.1.64148n
      Description       : Cisco Plug-in for OpenFlow
    Signing
      Key type          : Cisco key
      Method            : SHA-512
    Licensing
      Name              : Not Available
      Version           : Not Available

  Resource reservation
    Disk                : 135 MB
    Memory              : 256 MB
    CPU                 : 1% system CPU

  Attached devices
    Type              Name        Alias
    ---------------------------------------
    Disk               _rootfs
    Disk              /mnt/ofa
    Disk              /cisco/...
    Serial/shell
    Serial/aux
    Serial/Syslog                 serial2
    Serial/Trace                  serial3
    Watchdog
```

Step 3 **show virtual-service list**

This command displays an overview of resources utilized by the applications.

Example:

```
Switch# show virtual-service list

Virtual Service List:

Name                      Status              Package Name
------------------------------------------------------------------------------
openflow_agent            Activated           ofa-1.1.64148n-cat3000-SSA-k9.ova
```

Step 4 **show virtual-service storage pool list**

This command displays an overview of storage locations (pools) used for virtual service containers.

Example:

```
Switch# show virtual-service storage pool list

Virtual-Service storage pool list

Name                    Pool Type   Path
```

```
------------------------------------------------------------------------
virt_strg_pool_fl     Directory   /flash/virt_strg_pool_fl
```

Step 5 **show virtual-service storage volume list**
This command displays an overview of storage volume information for virtual service containers.

Example:

```
Switch# show virtual-service storage volume list

Virtual-Service storage volume list

Name                         Capacity    In Use      Virtual-Service
-------------------------------------------------------------------------------
_rootfs.openflow_agent     130 MB      Yes         openflow_agent
```

Step 6 **show virtual-service version name** *virtual-services-name* **installed**
This command displays the version of an installed application.

Example:

```
Switch# show virtual-service version name openflow_agent installed

Virtual service openflow_agent installed version:
 Name : CiscoPluginForOpenFlow
 Version : 1.1.64148n
```

Step 7 **show virtual-service tech-support**
Displays all relevant container-based information.

Step 8 **show virtual-service redundancy state**

Example:

```
Switch# show virtual-service redundancy state

Virtual Service Redundancy State:

Switch No.       Role        Configure sync status      OVA sync status
-------------------------------------------------------------------------
1                Active      N/A                        N/A
```

Displays state of virtual-services.

Step 9 **show virtual-service utilization name** *virtual-services-name*

Example:

```
Switch# show virtual-service utilization name openflow_agent
Virtual-Service Utilization:

CPU Utilization:
  CPU Time:  0 % (30 second average)
  CPU State: R : Running

Memory Utilization:
  Memory Allocation: 262144 Kb
  Memory Used:       9308 Kb
```

```
Storage Utilization:
  Name: _rootfs, Alias: _rootfs
    RD Bytes:    0                    WR Bytes:    0
    RD Requests: 0                    WR Requests: 0
    Errors:      0
    Capacity(1K blocks):  128908      Used(1K blocks): 82304
    Available(1K blocks): 39948       Usage: 68 %
  Name: cisco, Alias: cisco
    RD Bytes:    0                    WR Bytes:    0
    RD Requests: 0                    WR Requests: 0
    Errors:      0
    Capacity(1K blocks):  2712192     Used(1K blocks): 337908
    Available(1K blocks): 2374284     Usage: 13 %
  Name: /mnt/ofa, Alias: /mnt/ofa
    RD Bytes:    0                    WR Bytes:    0
    RD Requests: 0                    WR Requests: 0
    Errors:      0
    Capacity(1K blocks):  4955        Used(1K blocks): 35
    Available(1K blocks): 4664        Usage: 1  %
  Name: /cisco/core, Alias: /cisco/core
    RD Bytes:    0                    WR Bytes:    0
    RD Requests: 0                    WR Requests: 0
    Errors:      0
    Capacity(1K blocks):  248895      Used(1K blocks): 201014
    Available(1K blocks): 35031       Usage: 86 %
  Name: /tmp1, Alias: /tmp1
    RD Bytes:    0                    WR Bytes:    0
    RD Requests: 0                    WR Requests: 0
    Errors:      0
    Capacity(1K blocks):  2712192     Used(1K blocks): 337908
    Available(1K blocks): 2374284     Usage: 13 %
  Name: /cisco123, Alias: /cisco123
    RD Bytes:    0                    WR Bytes:    0
    RD Requests: 0                    WR Requests: 0
    Errors:      0
    Capacity(1K blocks):  1800824     Used(1K blocks): 42020
    Available(1K blocks): 1758804     Usage: 3  %
```

Displays virtual-services utilization information.

Step 10 **show virtual-service utilization statistics CPU**
Displays virtual service CPU utilization statistics.

Related Topics

Troubleshooting: Installing Applications in a Virtual Services Container
Troubleshooting: Activating Applications in a Virtual Services Container

Deactivating and Uninstalling an Application from a Virtual Services Container

(Optional) Perform this task to uninstall and deactivate an application from within a virtual services container.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **virtual-service** *virtual-services-name*
4. **no activate**
5. **no virtual-service** *virtual-services-name*
6. **end**
7. **virtual-service uninstall name** *virtual-services-name*
8. **copy running-config startup-config**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Switch> enable`	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Switch# configure terminal`	Enters the global configuration mode.
Step 3	**virtual-service** *virtual-services-name* **Example:** `Switch(config)# virtual-service openflow_agent`	Enters virtual services configuration mode to configure a specified application. • Use the *virtual-services-name* defined during installation of the application.
Step 4	**no activate** **Example:** `Switch(config-virt-serv)# no activate`	Disables the application.
Step 5	**no virtual-service** *virtual-services-name* **Example:** `Switch(config)# no virtual-service openflow_agent`	Unprovisions the application. • Use the *virtual-services-name* defined during installation of the application. • This command is optional for all devices running Cisco IOS-XE.

	Command or Action	Purpose
Step 6	**end** **Example:** `Switch(config-virt-serv)# end`	Exits virtual services configuration mode and enters privileged EXEC mode.
Step 7	**virtual-service uninstall name** *virtual-services-name* **Example:** `Switch# virtual-service uninstall name openflow_agent`	Uninstalls the application. • Use the *virtual-services-name* defined during installation of the application. • Run this command only after receiving a successful deactivation response from the device.
Step 8	**copy running-config startup-config** **Example:** `Switch# copy running-config startup-config`	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Related Topics

Collecting Troubleshooting Information

Configuration Examples for Virtual Services Container Installation

Example: Cisco Plug-In for OpenFlow Virtual Services Container Installation

```
Switch# enable
Switch# copy tftp://myserver.com/downloads/ofa-1.1.64148n-cat3000-SSA-k9.ova flash:
ofa-1.1.64148n-cat3000-SSA-k9.ova
Switch# virtual-service install name openflow_agent package
flash:/ofa-1.1.64148n-cat3000-SSA-k9.ova
Switch# configure terminal
Switch(config)# virtual-service openflow_agent
Switch(config-virt-serv)# activate
Switch(config-virt-serv)# end
Switch# copy running-config startup-config
```

Example: Verifying Cisco Plug-In for OpenFlow Virtual Services Container Installation

```
Switch# show virtual-service list

Virtual Service List:


Name                       Status              Package Name
------------------------------------------------------------------------------
openflow_agent             Activated
ofa-1.1.64148n-cat3000-SSA-k9.ova
```

Upgrading a Virtual Services Container

The **virtual-service upgrade** command is not supported. Follow the instructions in the previous sections to deactivate, uninstall, then install and activate the new OVA.

Additional References for the Virtual Services Container

Related Documents

Related Topic	Document Title
Cisco commands	Cisco IOS Master Command List, All Releases

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation and tools. Use these resources to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html