Cisco Nexus 1000V for VMware vSphere Port Profile Configuration Guide, Release 5.x

First Published: 2014-08-22

Last Modified: 2019-03-27

C O N T E N T S

New and Changed Information

This chapter contains the following sections:

- New and Changed Information, on page 1

New and Changed Information

This section lists new and changed content in this document by software release.

To find additional information about new features or command changes, see the following:

- *Cisco Nexus 1000V Release Notes*
- *Cisco Nexus 1000V Command Reference*

Table 1: New and Changed Information

Feature	Description	Changed in Release	Where Documented
Port binding	You can configure a static port binding with the **auto** option.	4.2(1)SV1(4a)	Configuring Port Binding for a vEthernet Port Profile, on page 24
Port binding	You can configure a port binding with the **dynamic** [**auto**] option.	4.2(1)SV1(4a)	Configuring Port Binding for a vEthernet Port Profile, on page 24
Port channel	The "Creating a Port Profile for a Port Channel" chapter was moved into the *Cisco Nexus 1000V Interface Configuration Guide*.	4.2(1)SV1(4)	Configuring Port Channels
Port binding	You can configure port binding for vEthernet port profiles that affects how VMware port IDs are assigned.	4.2(1)SV1(4)	Configuring Port Binding for a vEthernet Port Profile, on page 24

Feature	Description	Changed in Release	Where Documented
Restrict the visibility of Port Profiles	Restricts port profile visibility by user or user group.	4.2(1)SV1(4)	Restricting Port Profile Visibility on the VSM
mtu command added	The **mtu** command replaces the **system mtu** command for uplink, Ethernet type port profiles.	4.2(1)SV1(4)	Creating a System Port Profile, on page 40
system mtu command removed	The **system mtu** command is removed and replaced by the **mtu** command for port profiles.	4.2(1)SV1(4)	Creating a System Port Profile, on page 40
show port-profile sync-status command added	Displays interfaces that are out of sync with the port profile.	4.2(1)SV1(4)	Verifying the Port Profile Configuration, on page 69
show port-profile virtual usage command added	Displays the port profile usage by interface.	4.2(1)SV1(4)	Verifying the Port Profile Configuration, on page 69
Atomic Inheritance	Port profile configuration applied to member interfaces.	4.2(1)SV1(4)	Atomic Inheritance, on page 6
Port Profile Rollback	After configuration failure, a port profile and its member interfaces are rolled back to the last good configuration.	4.2(1)SV1(4)	Rollbacks to a Consistent Configuration, on page 7
Interface Quarantine	After a configuration failure, interfaces are shut down to maintain accurate configuration.	4.2(1)SV1(4)	Interface Quarantines, on page 7
system mtu command	This command allows you to preserve a non-default MTU setting on the PNIC attached to the Cisco Nexus 1000V across reboots of the ESX server.	4.0(4)SV1(3)	Creating a System Port Profile, on page 40
show running-config port-profile	New command for displaying the port profile configuration.	4.0(4)SV1(2)	Verifying the Port Profile Configuration, on page 69

Feature	Description	Changed in Release	Where Documented
Uplink port profile	Port profiles are not classified as uplinks, but are configured as Ethernet or vEthernet links.	4.0(4)SV1(2)	Cisco Nexus 1000V Interface Configuration Guide
Configuration limits	Added configuration limits for vEthernet interfaces, vEthernet trunks, port profiles, system profiles, and PVLANs.	4.0(4)SV1(2)	Port Profile Configuration Limits, on page 11
vPC-Host Mode	Support for the following: • Manual creation of subgroups. • Connecting to upstream switches that do not support port channels using MAC Pinning.	4.0(4)SV1(2)	Cisco Nexus 1000V Interface Configuration Guide
MAC Pinning	Connecting to upstream switches that do not support port channels using the MAC-pinning command.	4.0(4)SV1(2)	Cisco Nexus 1000V Interface Configuration Guide
Static Pinning	Support for pinning or directing traffic for a vEthernet interface, control VLAN, or packet VLAN to a specific port channel subgroup.	4.0(4)SV1(2)	Cisco Nexus 1000V Interface Configuration Guide
Port Profile Type	Creation of port-profiles includes the optional type field, which specifies the port profile as either Ethernet or vEthernet. By default, a port profile is created as a vEthernet type.	4.0(4)SV1(2)	Creating a Port Profile, on page 12

Feature	Description	Changed in Release	Where Documented
[**no**] **capability uplink** command	The capability uplink command has been superseded by the **port-profile** [**type** {**ethernet** | **vethernet**}] *name* command. To configure a port profile with an uplink capability, configure the port profile as an Ethernet type.	4.0(4)SV1(2)	Creating a Port Profile, on page 12
show running-config command	This command now shows the port profile type (Ethernet or vEthernet). Also, you can optionally specify to show only the port profile configurations.	4.0(4)SV1(2)	Verifying the Port Profile Configuration, on page 69
show port-profile *name* command	This command shows the port profile type and does not show the capability uplink. This command also shows the pinning and channel-group configuration.	4.0(4)SV1(2)	Verifying the Port Profile Configuration, on page 69

Overview

This chapter contains the following sections:

Information About Port Profiles and Port Groups

A port profile is a collection of interface-level configuration commands that are combined to create a complete network policy.

A port group is a representation of a port profile on the VMware vCenter server. Every port group on the VMware vCenter server is associated with a port profile on the Cisco Nexus 1000V. Network administrators configure port profiles, and then server administrators can use the corresponding port groups on the VMware vCenter server to assign ports to port profiles.

In the VMware vCenter Server, a port profile is represented as a port group. You assign the vEthernet or Ethernet interfaces to a port group in VMware vCenter to do the following:

- Define port configuration by policy.

- Apply a single policy across a large number of ports.

Port profiles are created on the VSM and propagated to VMware vCenter Server as VMware port groups using the VMware VIM API. After propagation, a port profile appears within VMware vSphere Client and is available to apply to the vNICs on a virtual machine.

Live Policy Changes

Port profiles are not static entities but dynamic policies that can change as network needs change. Changes to active port profiles are applied to each switch port that is using the profile, which simplifies the process of applying new network policies or changing an existing policy.

Information About Uplink Profiles

Port profiles also manage the physical NICs within a VMware ESX host. When a port profile is defined, the network administrator determines whether the profile will be used to manage vEthernet interfaces or physical NICs. By default, the port profile is assumed to be used for vEthernet management.

To define a port profile for use on physical NICs, the network administrator must create the profile as an Ethernet type. When this option is used, the port profile will be available only to the server administrator to apply to physical NICs within an VMware ESX server.

> **Note**
>
> In an installation where multiple Ethernet port profiles are active on the same VEM, we recommend that they do not carry the same VLAN(s). The allowed VLAN list should be mutually exclusive.
>
> Overlapping VLANs can be configured but may cause duplicate packets to be received by virtual machines in the network.
>
> When hosting your vCenter as a Virtual-Machine behind a VEM, vEthernet port profile must have the VLAN configured as System VLAN. Also, the Uplink ethernet port profile must carry this VLAN as System VLAN on any one of the Uplinks.

Uplink port profiles are applied to a physical NIC when a VMware ESX host is first added to the Cisco Nexus 1000V. The server administrator is presented with a dialog box in which they can select the following:

- Physical NICs to associate with the VEM
- Uplink port profiles to associate with the physical NICs

In addition, the server administrator can apply uplink port profiles to interfaces that are added to the VEM after the host has been added to the switch.

Information About Port Profile Inheritance

You can apply the configuration from an existing port profile as the default configuration for another port profile. This process is called *inheritance*. The configuration of the parent is copied to and stored in the child port profile. You can also override the inheritance by configuring the attributes explicitly in the child port profile.

You can also explicitly remove port profile inheritance, so that a port profile returns to the default settings, except where there has been a direct configuration.

Consistent Port Profile Configuration

Atomic Inheritance

To maintain a consistent configuration among the interfaces in a port profile, the entire port profile configuration is applied to its member interfaces (this process is sometimes referred to as inheritance).

This is new in Release 4.2(1)SV1(4), and the concept is called Atomic Inheritance. In previous Cisco Nexus 1000V releases, whatever configuration could be applied from the port profile was applied to its interfaces, and whatever was not applicable was ignored.

Rollbacks to a Consistent Configuration

When you update the configuration in a port profile, its member interfaces are also updated. If the configuration fails, the port profile and its member interfaces are rolled back to the last known good configuration for the port profile.

Interface Quarantines

Port profile interfaces are sectioned off and shut down when a port profile configuration is in error. This process is a new feature in Release 4.2(1)SV1(5.1), and is called an Interface Quarantine.

When an interface is quarantined, it maintains its mapping to the port profile, but is administratively shut down until you explicitly bring it up using the no shutdown command. If the port profile configuration is still in error, then the interface is again shut.

If you create a port profile with a command error, such as a private VLAN mapping error or service policy map error, and then attempt to apply this port profile to an interface, the interface shuts down. The error is not copied to the interface and a system message is generated with details of the error. In this case, you must correct the error in the port profile, return the interface to service, and apply the corrected port profile to the interface.

CHAPTER 3

Creating Port Profiles

This chapter contains the following sections:

Information About Port Profiles

Information About Port Profile States

The following table describes port profile behavior.

State	Behavior
Disabled (the default)	When disabled, a port profile behaves as follows: • Its configuration is not applied to assigned ports. • If exporting policies to a VMware port group, the port group is not created on the vCenter Server.
Enabled	When enabled, a port profile behaves as follows: • Its configuration is applied to assigned ports. • If configured with the VMware port-group attribute, the port group is created on the vCenter Server.

Information About vEthernet Port Binding

You can configure static, dynamic, or ephemeral port binding for vEthernet port profiles. The following table shows how this setting controls how ports are assigned in the VMware port group.

Type	Behavior
Static (the default)	A DVPortID is assigned from the port group pool when you first assign the port group to the port. The DVPortID persists for the life of the network adapter. The port group has a fixed number of ports.
Dynamic	A DVPortID is assigned to a virtual machine only when the virtual machine is powered on and its NIC is in a connected state. The DVPortID is freed when the virtual machine is powered off or the virtual machine's NIC is disconnected. Virtual machines connected to a port group configured with dynamic binding must be powered on and off through the VMware vCenter Server. Dynamic binding can be used in environments where you have more virtual machines than available ports but do not plan to have a greater number of virtual machines active than you have available ports. For example, if you have 300 virtual machines and 100 ports, but will never have more than 90 virtual machines active at one time, dynamic binding would be appropriate for your port group.
Ephemeral	A new DVPortID is assigned to the port every time the VM is powered on. The port keeps this same DVPortID while the VM is up. All available distributed virtual switch (DVS) ports are shared. Ports are not allocated from the port group pool. **Note** If a system administrator changes the port profile assignment for an interface, any manual configuration on the interface is purged if either port profile is configured with ephemeral port binding. This purging of manual configurations occurs regardless of the auto purge setting. The VMware Virtual Infrastructure Methodology (VIM) automatically deletes virtual Ethernet interfaces (vEths) that are attached to port profiles with ephemeral port binding. For information about configuring auto purge using the **svs veth auto-config-purge** command, see the *Cisco Nexus 1000V for VMware Interface Configuration Guide*.

Guidelines and Limitations for Creating Port Profiles

- Once a port profile is created as either an Ethernet or vEthernet type, you cannot change the type.

- In an installation where multiple Ethernet port profiles are active on the same VEM, we recommend that they do not carry the same VLAN(s). The allowed VLAN list should be mutually exclusive. Overlapping VLANs can be configured but may cause duplicate packets to be received by virtual machines in the network.

- To maintain consistency between the port profile definition and what is applied to an interface, if a port profile modification is rejected by any port, the modification is also rejected by the port profile.

- If you create a port profile with a command error, for example a private VLAN mapping error or service policy map error, an attempt to apply this port profile to an interface shuts down the interface. The error

is not copied to the interface and a system message is generated with details of the error. In this case, you must correct the error in the port profile. Then return the interface to service and apply the corrected port profile using the following command sequence:

1. **no shutdown**

2. **default shutdown**

Note   Behavior during shutdown: In 5.2(1)SV3(1.1) and later, when you shut down a virtual Ethernet interface or a port profile assigned to virtual Ethernet interfaces, the corresponding link goes down. In releases earlier than 5.2(1)SV3(1.1), the corresponding link remains up.

For more information, see the *Cisco Nexus 1000V Troubleshooting Guide*.

• MTU can only be configured for uplink, Ethernet type port profiles.

• If you configure MTU for an Ethernet port profile, your ESX host may generate the following error:

```
2010 Nov 15 04:35:27 my-n1k %VEM_MGR-SLOT3-1-VEM_SYSLOG_ALERT: vssnet :
sf_platform_set_mtu: Failed setting MTU for VMW port with portID 33554475.
```

In this case, the MTU value that you have set is not supported by the virtual Ethernet module (VEM) physical NIC. See your VMware documentation for more information about supported MTU for PNIC.

• Before configuring a port profile, the Cisco Nexus 1000V software must be initially configured. For information, see the *Cisco Nexus 1000V Installation and Upgrade Guide*.

• The Cisco Nexus 1000V must be connected to the VMware vCenter Server.

Port Profile Configuration Limits

The following table lists the configuration limits for port profiles.

Feature	VEM	DVS
Ports per port profile	1024	2048
Port profiles	6144	6144

For information about the number of port profiles and system port profiles that are currently created, and the number of port profiles and system port profiles that are available, run the following command: **show resource-availability port-profile**.

Default Settings

The following table lists the default settings in the port profile configuration.

Parameter	Default
capability l3control	No

Parameter	Default
description	—
administrative state	all ports disabled
switchport mode (**access** or **trunk**)	**access**
system vlan *vlan_list*	—
type	**vethernet**
access port vlan	VLAN 1
max-ports	32
min-ports	1
vmware port-group *name*	Port profile name
vEthernet port-bindings	Static

Configuring Port Profiles

Creating a Port Profile

Before you begin

- You are logged in to the CLI in EXEC mode.

- You know whether the ports need to be initialized with system settings.

- You have identified the characteristics needed for this port profile.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **port-profile** [**type** {**ethernet** | **vethernet**}] *name*	Enters port profile configuration mode for the named port profile. If the port profile does not already exist, it is created using the following characteristics: • *name*—The port profile name can contain up to 80 alphanumeric characters, is not case-sensitive, and must be unique for each port profile on the Cisco Nexus 1000V. The port profile name cannot contain any spaces.

	Command or Action	Purpose
		Note Starting with Cisco Nexus 1000V Release 5.2(1)SV3(1.2), the port profile name can include all ASCII special characters except forward slash (/), back slash (\), percent (%), and question mark (?).
		Note For Cisco Nexus 1000V Release 5.2(1)SV3(1.1), the port profile name can include the following special characters: period (.), underscore (_), and hyphen (-).
		• **type**—(Optional) The port profile type can be Ethernet or vEthernet. Once configured, the type cannot be changed. The default is the vEthernet type.
		Defining a port profile type as Ethernet allows the port profile to be used for physical (Ethernet) ports. In the vCenter Server, the corresponding port group can be selected and assigned to physical ports (PNICs).
		Note If a port profile is configured as an Ethernet type, it cannot be used to configure VMware virtual ports.
Step 3	(Optional) switch(config-port-prof)# **description** *profile_description*	Adds a description of up to 80 ASCII characters to the port profile. This description is automatically pushed to the vCenter Server.
Step 4	(Optional) switch(config-port-prof)# **show port-profile** [**brief** | **expand-interface** | **usage**] [**name***profile-name*]	Displays the configuration for verification.
Step 5	switch(config-port-prof)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.
		Note We recommend that you copy the running configuration to the startup configuration after creating a port profile. This ensures that there are no discrepancies between the configurations in the vCenter Server and the VSM after a VSM reload.

Example

This example shows how to create a new port profile:

```
switch(config)# port-profile type ethernet AllAccess1
switch(config-port-prof)# description all_access
switch(config-port-prof)# show port-profile name AllAccess1
port-profile AllAccess1
  description: all_access
  type: ethernet
  status: disabled
  pinning control-vlan: -
  pinning packet-vlan: -
  max ports: -
  inherit:
  config attributes:
  evaluated config attributes:
  assigned interfaces:
  port-group:
  system vlans: none
  capability l3control: no
  capability iscsi-multipath: no
  capability vxlan: no
  capability l3-vservice: no
  port-profile role: none
  port-binding: static
switch(config-port-prof)# copy running-config startup-config
[########################################] 100%
Copy complete, now saving to disk (please wait)...
```

Configuring VMware Attributes

Before you begin

- You are logged in to the CLI in EXEC mode.

- You know if you will configure the VMware port group with the same name as the port profile or if you will specify an alternate name for the VMware port group.

Procedure

	Command or Action	**Purpose**
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **port-profile** [**type** {**ethernet** | **vethernet**}] *name*	Enters port profile configuration mode for the named port profile. If the port profile does not already exist, it is created using the following characteristics: - *name*—The port profile name can be up to 80 alphanumeric characters and must be unique for each port profile on the Cisco Nexus 1000V.

	Command or Action	Purpose
		• **type**—(Optional) The port profile type can be Ethernet or vEthernet. Once configured, the type cannot be changed. The default is the vEthernet type.
		Defining a port profile type as Ethernet allows the port profile to be used for physical (Ethernet) ports. In the vCenter Server, the corresponding port group can be selected and assigned to physical ports (PNICs).
		Note If a port profile is configured as an Ethernet type, it cannot be used to configure VMware virtual ports.
Step 3	switch(config-port-prof)# **vmware port-group** [*pg_name*]	Designates the port profile as a VMware port group. The port profile is mapped to a VMware port group of the same name unless you specify a name here. When you connect the VSM to vCenter Server, the port group is distributed to the virtual switch on the vCenter Server.
Step 4	switch(config-port-prof)# **max-ports** *num*	Designates the maximum number of ports that can be assigned to this non-uplink port profile. The default is 32 ports. When the specified maximum number of ports is reached, no more ports can be assigned.
Step 5	(Optional) switch(config-port-prof)# **show port-profile** [**brief** | **expand-interface** | **usage**] [**name** *profile-name*]	Displays the configuration for verification.
Step 6	(Optional) switch(config-port-prof)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Port Mode Configuration

VLAN Ranges

In accordance with the IEEE 802.1Q standard, up to 4094 VLANs are supported. The following table describes the available VLAN ranges and their use.

Table 2: VLAN Ranges

VLAN Numbers	Range	Usage
1	Normal	Cisco default. You can use this VLAN, but you cannot modify or delete it.
2-1005	Normal	You can create, use, modify, and delete these VLANs.
1006-4094	Extended	You can create, name, and use these VLANs. You cannot change the following parameters: • State is always active. • VLAN is always enabled. You cannot shut down these VLANs.
3968-4047 and 4094	Internally allocated	These 80 VLANs, plus VLAN 4094, are allocated for internal device use. You cannot create, delete, or modify any VLANs within the block reserved for internal use.

Configuring a Trunking Profile

Before you begin

• You are logged in to the CLI in EXEC mode.

• You have already created the port profile using the Creating a Port Profile, on page 12 procedure.

• You know the needed VLAN configuration for this port profile and that it is to be used in trunk mode.

• A VLAN must already be created on the switch before you can assign it to a port profile.

• You know the supported VLAN ranges described in VLAN Ranges, on page 15.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **port-profile** [**type** {**ethernet** | **vethernet**}] *name*	Enters port profile configuration mode for the named port profile. If the port profile does not already exist, it is created using the following characteristics:

	Command or Action	**Purpose**
		• *name*—The port profile name can be up to 80 alphanumeric characters and must be unique for each port profile on the Cisco Nexus 1000V.
		• **type**—(Optional) The port profile type can be Ethernet or vEthernet. Once configured, the type cannot be changed. The default is the vEthernet type.
		Defining a port profile type as Ethernet allows the port profile to be used for physical (Ethernet) ports. In the vCenter Server, the corresponding port group can be selected and assigned to physical ports (PNICs).
		Note If a port profile is configured as an Ethernet type, it cannot be used to configure VMware virtual ports.
Step 3	switch(config-port-prof)# **switchport mode trunk**	Designates that the interfaces are to be used as a trunking ports. A trunk port transmits untagged packets for the native VLAN and transmits encapsulated, tagged packets for all other VLANs.
Step 4	switch(config-port-prof)# **no shutdown**	Administratively enables all ports in the profile.
Step 5	(Optional) switch(config-port-prof)# **switchport trunk allowed vlan** {*allowed-vlans* | **add** *vlans* | **except** *vlans* | **remove** *vlans* | **all** | **none**}	Designates the port profile as trunking and defines VLAN access to it as follows: • *allowed-vlans*—Defines VLAN IDs that are allowed on the port. Valid range is from 1 through 4094. • **add**—Lists VLAN IDs to add to the list of those allowed on the port. • *vlan*—Defines VLAN IDs to be acted upon according to the keyword associated with it. Valid range is from 1 through 4094. • **except**—Lists VLAN IDs that are not allowed on the port. • **remove**—Lists VLAN IDs whose access is to be removed from the port. • **all**—Indicates that all VLAN IDs are allowed on the port, unless exceptions are also specified.

	Command or Action	Purpose
		• **none**—Indicates that no VLAN IDs are allowed on the port.
		Note If you do not configure allowed VLANs, the default VLAN 1 is used as the allowed VLAN.
Step 6	(Optional) switch(config-port-prof)# **switchport trunk native vlan** *vlan-id*	Sets the trunking native characteristics when the interface is in trunking mode. If you do not configure a native VLAN, then the default VLAN 1 is used as the native VLAN.
Step 7	(Optional) switch(config-port-prof)# **show port-profile** [**brief** | **expand-interface** | **usage**] [**name** *profile-name*]	Displays the configuration for verification.
Step 8	(Optional) switch(config-port-prof)# **copy running-config startup-config**	Saves the running configuration persistently through reboots and restarts by copying it to the startup configuration.

Example

This example shows how to configure a trunking port profile, allowing all VLANs, and setting VLAN 3 as its native VLAN:

```
switch# configure terminal
switch(config)# port-profile TrunkProf
switch(config-port-prof)# switchport mode trunk
switch(config-port-prof)# no shutdown
switch(config-port-prof)# switchport trunk allowed vlan all
switch(config-port-prof)# switchport trunk native vlan 3
switch(config-port-prof)# show port-profile name TrunkProf
port-profile TrunkProf
  description:
  type: vethernet
  status: disabled
  capability l3control: no
  pinning control-vlan: -
  pinning packet-vlan: -
  system vlans: none
  port-group:
  max ports: 32
  inherit:
  config attributes:
    switchport mode trunk
    switchport trunk native vlan 3
    switchport trunk allowed vlan all
    no shutdown
  evaluated config attributes:
    switchport mode trunk
    switchport trunk native vlan 3
    switchport trunk allowed vlan all
    no shutdown
```

```
      assigned interfaces:
      port-group:
      system vlans: none
      capability l3control: no
      capability iscsi-multipath: no
      capability vxlan: no
      capability l3-vservice: no
      port-profile role: none
      port-binding: static
switch(config-port-prof)#
```

Configuring an Access Profile

An access port transmits packets on only one untagged VLAN. You can specify the VLAN, and it becomes the access VLAN. If you do not specify a VLAN for an access port, that interface carries traffic only on the default VLAN 1.

Procedure

	Command or Action	**Purpose**
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **port-profile** [**type** {**ethernet** | **vethernet**}] *name*	Enters port profile configuration mode for the named port profile. If the port profile does not already exist, it is created using the following characteristics:
		• *name*—The port profile name can be up to 80 alphanumeric characters and must be unique for each port profile on the Cisco Nexus 1000V.
		• **type**—(Optional) The port profile type can be Ethernet or vEthernet. Once configured, the type cannot be changed. The default is the vEthernet type.
		Defining a port profile type as Ethernet allows the port profile to be used for physical (Ethernet) ports. In the vCenter Server, the corresponding port group can be selected and assigned to physical ports (PNICs).
		Note If a port profile is configured as an Ethernet type, it cannot be used to configure VMware virtual ports.
Step 3	switch(config-port-prof)# **switchport mode access**	Designates that the interfaces are used as access ports.
Step 4	switch(config-port-prof)# **no shutdown**	Administratively enables all ports in the profile.

	Command or Action	**Purpose**
Step 5	(Optional) switch(config-port-prof)# **switchport access vlan** [*vlan-id-access*]	Assigns an access VLAN ID to this port profile.
		Note If you do not specify a VLAN ID, VLAN 1 is used automatically.
Step 6	(Optional) switch(config-port-prof)# **show port-profile** [**brief** | **expand-interface** | **usage**] [**name** *profile-name*]	Displays the configuration for verification.
Step 7	(Optional) switch(config-port-prof)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to configure a port profile with switch access ports, enabling the ports, and then adding an access VLAN:

```
switch# configure terminal
switch(config)# port-profile AccessProf
switch(config-port-prof)# switchport mode access
switch(config-port-prof)# no shutdown
switch(config-port-prof)# switchport access vlan 300
switch(config-port-prof)# show port-profile name AccessProf
port-profile AccessProf
  description: allaccess4
  type: vethernet
  status: disabled
  capability l3control: no
  pinning control-vlan: -
  pinning packet-vlan: -
  system vlans: none
  port-group: AccessProf
  max ports: 5
  inherit:
  config attributes:
    switchport mode access
    switchport access vlan 300
    no shutdown
  evaluated config attributes:
    switchport mode access
    switchport access vlan 300
    no shutdown
  assigned interfaces:
  port-group:
  system vlans: none
  capability l3control: no
  capability iscsi-multipath: no
  capability vxlan: no
  capability l3-vservice: no
  port-profile role: none
  port-binding: static
switch(config-port-prof)#
```

Clearing a Port Management Policy

You can remove either of the following port management policies from an existing port profile configuration:

- **shutdown**
- **switchport mode**

✎

Note   After removing the configuration for an attribute, the attribute does not appear in **show** command output.

Before you begin

- You are logged in to the CLI in EXEC mode.

Procedure

	Command or Action	**Purpose**
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **port-profile** *name*	Enters port profile configuration mode for the named port profile.
Step 3	**default** {**shutdown** | **switchport mode**}	Removes either the shutdown or the switchport mode configuration from the port profile: • **shutdown**—Reverts port profile ports to the shutdown state. • **switchport mode**—Reverts port profile ports to switch access ports.
Step 4	(Optional) switch(config-port-prof)# **show port-profile** [**brief** | **expand-interface** | **usage**] [**name** *profile-name*]	Displays the configuration for verification.
Step 5	(Optional) switch(config-port-prof)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to change the administrative state of a port profile back to its default setting (all ports disabled):

```
switch# configure treminal
switch(config)# port-profile AccessProf
switch(config-port-prof)# default shutdown
switch(config-port-prof)# show port-profile name AccessProf
port-profile AccessProf
  description: allaccess4
```

```
type: vethernet
status: disabled
capability l3control: no
pinning control-vlan: 8
pinning packet-vlan: 8
system vlans: none
port-group: AccessProf
max ports: 5
inherit:
config attributes:
  switchport mode access
evaluated config attributes:
  switchport mode access
assigned interfaces:
port-group:
system vlans: none
capability l3control: no
capability iscsi-multipath: no
capability vxlan: no
capability l3-vservice: no
port-profile role: none
port-binding: static
switch(config-port-prof)#
```

Port Binding for vEthernet Port Profiles Configuration

Configuring a Default Port Binding Type

You can configure the type of port binding (static, dynamic, or ephemeral) to apply by default to all new vEthernet port profiles.

Before you begin

- You are logged in to the CLI in EXEC mode.

- You know the type of port binding (static, dynamic, or ephemeral) you want to use as a default for all new vEthernet port profiles.

- You can use the `port-binding static auto expand` command to use more than 1024 ports per profile (up to the platform limit).

Procedure

	Command or Action	**Purpose**
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **port-profile default port-binding** {**static** [**auto**] **dynamic** [**auto**] | **ephemeral**}	Configures a default port binding type to be applied automatically to all new vEthernet port profiles unless explicitly configured otherwise:
		• **Static**—A DVPortID is assigned from the port group pool when you first assign the port group to the port. The DVPortID

	Command or Action	Purpose
		persists for the life of the network adapter. The port group has a fixed number of ports.
		If you include the **auto** option, the Cisco Nexus 1000V creates port profiles with both min-ports and max-ports, which are initially inherited from the global defaults and which you can redefine at a later time. By configuring the binding type with the **auto** option, the Cisco Nexus 1000V adjusts the number of ports per profile created at the vCenter server based on the usage of the port groups.
		• **Dynamic**—A DVPortID is assigned to a virtual machine only when the virtual machine is powered on and its NIC is in a connected state. The DVPortID is freed when the virtual machine is powered off or the virtual machine's NIC is disconnected.
		The **auto** option for dynamic binding works as described for static binding.
		• **Ephemeral**—A new DVPortID is assigned to the port every time the VM is powered on. The port keeps this same DVPortID while the VM is up. All available DVS ports are shared. Ports are not allocated from the port group pool.
Step 3	(Optional) switch(config-port-prof)# **show running-config**	Displays the configuration for verification.
Step 4	(Optional) switch(config-port-prof)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to configure the dynamic port binding type as the default for all new vEthernet port profiles created:

```
switch# configure terminal
switch(config)# port-profile default port-binding dynamic
switch(config-port-prof)#
```

Configuring Port Binding for a vEthernet Port Profile

You can use this procedure to configure the type of port binding (static, dynamic, or ephemeral) for an existing vEthernet port profile.

Note   Max-port configuration and ephemeral port-binding are opposite provisioning configurations. Max-port configuration involves reserving the DVPorts for future use in the vCenter Server, whereas ephemeral port-binding releases DVPorts when a VM is powered off. Every port profile on Cisco Nexus 1000V has a default static port-binding with the default max-port configuration set to 32. If you change the port binding to ephemeral, the max-port configuration becomes invalid.

Before you begin

- You are logged in to the CLI in EXEC mode.
- You have already created the vEthernet port profile using .
- You know the type of port binding (static, dynamic, or ephemeral) you want to apply to this vEthernet port profile.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **port-profile** [**type** {**vethernet**}] *profile-name*	Enters port profile configuration mode for the named vEthernet port profile.
Step 3	switch(config-port-prof)# **port-binding** {**static** [**auto**] **dynamic** [**auto**] | **ephemeral**}	Configures a default port binding type to be applied automatically to all new vEthernet port profiles unless explicitly configured otherwise:
		• **Static**—A DVPortID is assigned from the port group pool when you first assign the port group to the port. The DVPortID persists for the life of the network adapter. The port group has a fixed number of ports.
		If you include the **auto** option, the Cisco Nexus 1000V creates port profiles with both min-ports and max-ports, which are initially inherited from the global defaults and which you can redefine at a later time. By configuring the binding type with the **auto** option, the Cisco Nexus 1000V will adjust the number of ports per profile created at the vCenter server based on the usage of the port groups.

	Command or Action	Purpose
		• **Dynamic**—A DVPortID is assigned to a virtual machine only when the virtual machine is powered on and its NIC is in a connected state. The DVPortID is freed when the virtual machine is powered off or the virtual machine's NIC is disconnected. The **auto** option for dynamic binding works as described above for static binding. • **Ephemeral**—A new DVPortID is assigned to the port every time the VM is powered on. The port keeps this same DVPortID while the VM is up. All available DVS ports are shared. Ports are not allocated from the port group pool.
Step 4	(Optional) switch(config-port-prof)# **show port-profile** [**name** *profile-name*]	Displays the configuration for verification.
Step 5	(Optional) switch(config-port-prof)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to configure the dynamic port binding type for the existing port profile named target-pp:

```
switch# configure terminal
switch(config)# port-profile target-pp
switch(config-port-prof)# port-binding dynamic
switch(config-port-prof)#
```

Configuring a Port Profile with Dynamic or Static Port Binding

You can configure a port profile (static or dynamic) with or without the auto option.

Before you begin

You are logged in to the CLI in EXEC mode.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.

	Command or Action	Purpose
Step 2	switch(config)# **port-profile** [**type** {**vethernet**}] *profile-name*	Enters port profile configuration mode for the named vEthernet port profile.
Step 3	switch(config-port-prof)# **vmware port-group** [*pg_name*]	Designates the port profile as a VMware port group. The port profile is mapped to a VMware port group of the same name unless you specify a name here. When you connect the VSM to vCenter Server, the port group is distributed to the virtual switch on the vCenter Server.
Step 4	switch(config-port-prof)# **port-binding** {**static** [**auto** [**expand**]] **dynamic** [**auto**] | **ephemeral**}	Configures a default port binding type to be applied automatically to all new vEthernet port profiles unless explicitly configured otherwise: • **static**—A DVPortID is assigned from the port group pool when you first assign the port group to the port. The DVPortID persists for the life of the network adapter. The port group has a fixed number of ports. If you include the **auto** option, the Cisco Nexus 1000V creates port profiles with both min-ports and max-ports, which are initially inherited from the global defaults and which you can redefine at a later time. By configuring the binding type with the **auto** option, the Cisco Nexus 1000V adjusts the number of ports per profile created at the vCenter server based on the usage of the port groups. By configuring the binding type with the **auto expand** option, the vCenter server automatically increases the number of ports per profile (up to the DVS maximum value) without any involvement from the Cisco Nexus 1000V. The number of ports per profile can be higher than the specified max-ports limit. • **Dynamic**—A DVPortID is assigned to a virtual machine only when the virtual machine is powered on and its NIC is in a connected state. The DVPortID is freed when the virtual machine is powered off or the virtual machine's NIC is disconnected.

	Command or Action	Purpose
		The **auto** option for dynamic binding works as described above for static binding.
		• **Ephemeral**—A new DVPortID is assigned to the port every time the VM is powered on. The port keeps this same DVPortID while the VM is up. All available DVS ports are shared. Ports are not allocated from the port group pool.
Step 5	switch(config-port-prof)# **max-ports** *number*	Designates the maximum number of ports that can be assigned to this non-uplink port profile. The default value is the global default at the time of port profile creation.
		When the specified maximum number of ports is reached, no more ports can be assigned. This is not applicable when the **static auto expand** port binding is used as described in the previous step.
		The valid range is 1 to 1024.
		Note Do not configure a value less than min-ports.
Step 6	switch(config-port-prof)# **min-ports** *number*	Designates the minimum number of ports that can be assigned to this non-uplink port profile. The default value is the global default at the time of port profile creation.
		The valid range is 1 to 1024.
		Note Do not configure a value greater than max-ports.
Step 7	switch(config-port-prof)# **state enabled**	Enables the port profile and applies its configuration to the assigned ports. If the port profile is a VMware port group, the port group will be created in the vswitch on vCenter Server.
Step 8	(Optional) switch(config-port-prof)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to configure the dynamic auto port binding type:

```
switch# configure terminal
switch(config)# port-profile type vethernet dynamic_auto_pp
```

```
switch(config-port-prof)# vmware port-group
switch(config-port-prof)# port-binding dynamic auto
switch(config-port-prof)# max-ports 128
switch(config-port-prof)# min-ports 64
switch(config-port-prof)# state enabled
switch(config-port-prof)# copy running-config startup-config
```

Verifying Port Binding on vCenter Server

Before you begin

You are logged in to vCenter Server on the host.

Procedure

Step 1   From your DVS in the **Networking** tab, choose the port group.

Step 2   Click the **Summary** tab.

The **General** area of the **Summary** tab displays the type of port binding for this port group.

Example
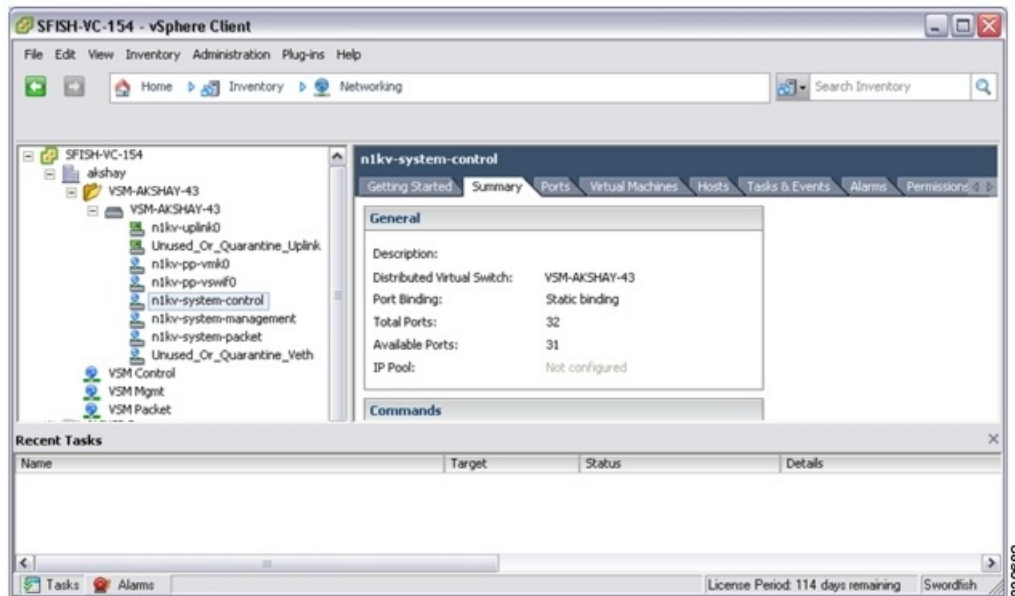
Enabling a Port Profile

Before you begin

- You are logged in to the CLI in EXEC mode.

- You have already created the port profile using Creating a Port Profile, on page 12.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **port-profile** [**type** {**vethernet**}] *profile-name*	Enters port profile configuration mode for the named vEthernet port profile.
Step 3	switch(config-port-prof)# **state enabled**	Enables the port profile and applies its configuration to the assigned ports. If the port profile is a VMware port group, the port group will be created in the vswitch on vCenter Server.
Step 4	switch(config-port-prof)# **show port-profile** [**brief**	**expand-interface**	**usage**] [**name** *profile-name*]	Displays the configuration for verification.
Step 5	(Optional) switch(config-port-prof)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to enable a port profile:

```
switch# configure terminal
switch(config)# port-profile AccessProf
switch(config-port-prof)# state enabled
switch(config-port-prof)# show port-profile name AccessProf
  port-profile AccessProf
  type: Vethernet
  description: allaccess4
  status: enabled
  pinning control-vlan: -
  pinning packet-vlan: -
  max ports: 32
  inherit:
  config attributes:
    channel-group auto mode on
  evaluated config attributes:
    channel-group auto mode on
  assigned interfaces:
  port-group:
  system vlans: none
  capability l3control: no
```

```
      capability iscsi-multipath: no
      capability vxlan: no
      capability l3-vservice: no
      port-profile role: none
      port-binding: static
switch(config-port-prof)#
```

Removing a Port Profile

Before you begin

- You are logged in to the CLI in EXEC mode.

- If the port profile is inherited by another port profile, you need to remove the inheritance from the other port profile before removing this port profile. If you do not remove the inheritance first, the procedure fails. See Removing Inherited Policies from a Port Profile, on page 36.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	(Optional) switch(config)# **show running-configuration port-profile** *profile_name*	Displays the configuration of the specified port profile.
Step 3	switch(config)# **no port-profile** *profile_name*	Removes the port profile configuration and operational settings. **Note** A port profile cannot be deleted if an associated vEthernet interface is active. To delete a port profile, you must remove all of the active vEthernet interfaces from this port profile or migrate them to another port profile. Then you can delete the port profile. When you remove a port profile that is mapped to a VMware port group, the associated port group and settings within the vCenter Server are also removed.
Step 4	(Optional) switch(config)# **show port-profile virtual usage** [**name** *profile-name*]	Displays the configuration for verification.
Step 5	(Optional) switch(config)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to remove a port profile that still has an active vEthernet interface associated with it:

```
switch# configure terminal
switch(config)# show running-configuration port-profile temp
version 5.2(1)SV3(1.1)
port-profile type vethernet temp
switchport mode access
switchport access vlan 1331
ip port access-group acl in
no showutdown
max-ports 5
state enabled
vmware port-group
interface Vethernet252
inherit port-profile temp

swich(config)# no port-profile temp
ERROR: Profile cannot be deleted if associated interface is active
swich(config)#
```

You log into the VMware vCenter and edit the settings of the virtual machine that has the network adapter that is using the port profile named temp. You migrate the vEthernet interface to another port profile named VM_PP_NIC1_VLAN_1331.

```
swich(config)# show running-config port-profile temp
version 5.2(1)SV3(1.1)
port-profile type vethernet temp
switchport mode access
switchport access vlan 1331
no showutdown
max-ports 5
state enabled
vmware port-group

swich(config)# show port-profile virtual usage name temp
--------------------------------------------------------------------------------
Port Profile Port Adapter Owner
--------------------------------------------------------------------------------

swich(config)# no port-profile temp
swich(config)# show port-profile virtual usage name temp
ERROR: port-profile temp does not exist
swich(config)#
```

Standards for Creating Port Profiles

No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.

Feature History for Port Profiles

Feature Name	Release	Feature Information
Port binding	4.2(1)SV1(4a)	You can configure a static port binding with the **auto** option. You can configure a port binding with the **dynamic** [**auto**] option.
Atomic inheritance	4.2(1)SV1(4)	Port profile configuration applied to member interfaces.
Port profile rollback	4.2(1)SV1(4)	After a configuration failure, a port profile and its member interfaces are rolled back to the last good configuration.
Interface quarantine	4.2(1)SV1(4)	After a configuration failure, interfaces are shut down to maintain an accurate configuration.
Port profile type	4.0(4)SV1(2)	Port profile types are configured as either Ethernet or vEthernet (the default).
[**no**] **capability uplink** command	4.0(4)SV1(2)	Replaced the **capability uplink** command with the **port-profile** [**type** {**ethernet** | **vethernet**}] *name* command. To configure a port profile with an uplink capability, configure the port profile as an Ethernet type. Removed the **no capability uplink** command.
Port profiles	4.0(4)SV1(1)	This feature was introduced.

C H A P T E R **4**

Configuring Port Profile Inheritance

This chapter contains the following sections:

Information About Port Profile Inheritance

You can apply the configuration from an existing port profile as the default configuration for another port profile. This process is called inheritance. The configuration of the parent port profile is copied to and stored in the child port profile. You can also override the inheritance by configuring the attributes explicitly in the child port profile.

The following table lists the port profile inheritance settings.

	Can it be inherited?	
Port Profile Setting	**Yes**	**No**
acl	X	
capability iscsi-multipath	X	
capability l3 control		X
channel group	X	
default (resets characteristic to its default)	X	
description		X
inherit	X	
interface state (shut/no shut)	X	
mtu		X
name	X	

	Can it be inherited?	
Port Profile Setting	Yes	No
netflow	X	
pinning	X	
port security	X	
private vlan configuration	X	
service-port	X	
state (enabled or disabled)		X
switchport mode (access or trunk)	X	
system vlan vlan list		X
virtual-service-domain	X	
vlan configuration	X	
VMware max-ports		X
VMware port-group name		X

Guidelines and Limitations for Configuring Port Profile Inheritance

- Inherited port profiles cannot be changed or removed from an interface using the Cisco Nexus 1000V CLI. This can only be done through the VMware vCenter Server.

- Inherited port profiles are automatically configured by the Cisco Nexus 1000V when the ports are attached on the hosts. This is done by matching up the VMware port group assigned by the system administrator with the port profile that created it.

- You can change a setting directly on a port profile to override the inherited settings.

- You can also explicitly remove port profile inheritance, so that a port profile returns to the default settings, except where there has been a direct configuration. For more information, see Removing Inherited Policies from a Port Profile, on page 36.

- The Cisco Nexus 1000V software must be initially configured. For information, see the *Cisco Nexus 1000V Installation and Upgrade Guide*.

- The Cisco Nexus 1000V must be connected to the VMware vCenter Server.

- Once a port profile is created, you cannot change its type (Ethernet or vEthernet).

Inheriting a Configuration from a Port Profile

You can apply the configuration from an existing port profile as the default configuration for another port profile.

You are familiar with the port profile characteristics and whether they can be inherited.

Tip   The port profile type cannot be inherited from another port profile.

Before you begin

- You are logged in to the CLI in EXEC mode.

- To identify the port profile with a configuration you want to use, use the **show port profiles** command to view your existing port profiles.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **port-profile** [**type** {**ethernet** | **vethernet**}] *name*	Enters port profile configuration mode for the named port profile. If the port profile does not already exist, it is created using the following characteristics:
		• *name*—The port profile name can be up to 80 alphanumeric characters and must be unique for each port profile on the Cisco Nexus 1000V.
		• **type**—(Optional) The port profile type can be Ethernet or vEthernet. Once configured, the type cannot be changed. The default is the vEthernet type.
		Defining a port profile type as Ethernet allows the port profile to be used for physical (Ethernet) ports. In the vCenter Server, the corresponding port group can be selected and assigned to physical ports (PNICs).
		Note If a port profile is configured as an Ethernet type, it cannot be used to configure VMware virtual ports.

	Command or Action	Purpose
Step 3	switch(config-port-prof)# **inherit port-profile** *name*	Adds the inherited configuration of the named profile as a default configuration.
Step 4	(Optional) switch(config-port-prof)# **show port-profile** [**brief**	**expand-interface**	**usage**] [*name profile-name*]	Displays the configuration for verification.
Step 5	(Optional) switch(config-port-prof)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to inherit the port profile configuration of another port profile:

```
switch# configure terminal
switch(config)# port-profile AllAccess2
switch(config-port-prof)# inherit port-profile AllAccess1
switch(config-port-prof)# show port-profile name AllAccess2
port-profile AllAccess2
  description:
  type: vethernet
  status: disabled
  capability l3control: no
  pinning control-vlan: -
  pinning packet-vlan: -
  system vlans: none
  port-group:
  max ports: 32
  inherit: port-profile AllAccess1
  config attributes:
  evaluated config attributes:
  assigned interfaces:
  port-group:
  system vlans: none
  capability l3control: no
  capability iscsi-multipath: no
  capability vxlan: no
  capability l3-vservice: no
  port-profile role: none
  port-binding: static
switch(config-port-prof)#
```

Removing Inherited Policies from a Port Profile

If you have configured policies independently of inheritance, they will not be removed when you remove the inheritance. Only the policies that are configured solely through the inheritance are removed.

Before you begin

You are logged in to the CLI in configuration mode.

Procedure

	Command or Action	**Purpose**
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	(Optional) switch(config)# **show port-profile virtual usage name** *profile_name*	Displays the policies inherited in the named port profile.
Step 3	switch(config)# **port-profile** *name*	Enters port profile configuration mode for the named port profile.
Step 4	switch(config-port-prof)# **no inherit port-profile** *profile_name*	Removes the inherited policies from the named port profile. The port profile settings are returned to the defaults, except for the port profile type and any settings that were explicitly configured independent of those inherited.
Step 5	(Optional) switch(config-port-prof)# **show port-profile virtual usage name** *profile_name*	Displays the policies inherited for verification of the removal.
Step 6	(Optional) switch(config-port-prof)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to remove inherited policies from a port profile:

```
switch# configure terminal
switch(config)# show port-profile virtual usage name AccessProf
switch(config)# port-profile Access4
switch(config-port-prof)# no inherit port-profile AccessProf
switch(config-port-prof)# show port-profile virtual usage name AccessProf
switch(config-port-prof)# copy running-config startup-config
```

Configuring System Port Profiles

This chapter contains the following sections:

Information About System Port Profiles

System port profiles are designed to establish and protect those ports and VLANs which need to be configured before the Virtual Ethernet Module (VEM) contacts the Virtual Supervisor Module (VSM).

For this reason, the following ports must use system VLANs:

- Control and packet VLANs in the uplinks that communicate with the VSM.

- Management VLAN in the uplinks and VMware kernel NICs used for VMware vCenter server connectivity or SSH or Telnet connections.

- Storage VLAN used by the VSM for VM file system access in the uplinks and VMware kernel NICs used for iSCSI or network file systems. This is needed only in the host that runs the VSM on the VEM.

- VSM ports on the VEM must be system ports.

Guidelines and Limitations for System Port Profiles

- System VLANs must be used sparingly and only as described in the Information About System Port Profiles, on page 39.

- For maximum system port profiles per host and DVS, see the Port Profile Configuration Limits, on page 11.

- In a single ESX host, one VLAN can be a system VLAN on one port but a regular VLAN on another.

- You cannot delete a system VLAN when the port profile is in use.

- You can add or delete VLANs that are not system VLANs when the port profile is in use because one or more distributed virtual switch (DVS) ports are carrying that profile.

- System VLANs can be added to a port profile, even when the port profile is in use.

- You can only delete a system VLAN from a port profile after removing the port profile from service to prevent accidentally deleting a critical VLAN, such as the management VLAN for a host, or the storage VLAN for the VSM.

- A system port profile cannot be converted to a port profile that is not a system port profile.

- The native VLAN on a system port profile can be a system VLAN but it does not have to be.

- When a system port profile is in use, you can change the native VLAN as follows:

    - From one VLAN that is not a system VLAN to another VLAN that is not a system VLAN.

    - From a VLAN that is not a system VLAN to a system VLAN

    - From one system VLAN to another system VLAN

- When a system port profile is in use, you cannot change the native VLAN from a system VLAN to a VLAN that is not a system VLAN.

- Reboots of the ESX can result in a maximum transmission unit (MTU) mismatch and failure of the VSM and VEM. If you use an MTU other than 1500 (the default), for example in networks with jumbo frames, then you must configure the MTU in the system port profile so that it is preserved across reboots of the ESX.

Creating a System Port Profile

A system port profile must be of the Ethernet type because it is used for physical ports. In this procedure, you configure the Ethernet type.

Before you begin

- You are logged in to the CLI in EXEC mode.

- The VSM is connected to vCenter Server.

- You have configured the following:

    - Port admin status is active (no shutdown).

    - Port mode is access or trunk.

    - VLANs that are to be used as system VLANs already exist.

    - VLANs are configured as access VLANs or trunk-allowed VLANs.

- In an installation where multiple Ethernet port profiles are active on the same VEM, we recommend that they do not carry the same VLAN(s). The allowed VLAN list should be mutually exclusive. Overlapping VLANs can be configured but may cause duplicate packets to be received by virtual machines in the network.

- For more information, see the *Cisco Nexus 1000V Interface Configuration Guide*.

Procedure

	Command or Action	**Purpose**
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **port-profile** [**type** {**ethernet** | **vethernet**}] *name*	Enters port profile configuration mode for the named port profile. If the port profile does not already exist, it is created using the following characteristics: • *name*—The port profile name can be up to 80 alphanumeric characters and must be unique for each port profile on the Cisco Nexus 1000V. • **type**—(Optional) The port profile type can be Ethernet or vEthernet. Once configured, the type cannot be changed. The default is the vEthernet type. Defining a port profile type as Ethernet allows the port profile to be used for physical (Ethernet) ports. In the vCenter Server, the corresponding port group can be selected and assigned to physical ports (PNICs). **Note** If a port profile is configured as an Ethernet type, it cannot be used to configure VMware virtual ports. Once a port profile is created, you cannot change its type (Ethernet or vEthernet).
Step 3	(Optional) switch(config-port-prof)# **description** *profile-description*	Adds a description of up to 80 ASCII characters in length to the port profile. This description is automatically pushed to vCenter Server.
Step 4	switch(config-port-prof)# **switchport mode trunk**	Designates that the interfaces are to be used as a trunking ports. A trunk port transmits untagged packets for the native VLAN and transmits encapsulated, tagged packets for all other VLANs.
Step 5	switch(config-port-prof)# **switchport trunk allowed vlan** {*vlan-id-list* | **all** | **none** | [**add** | **except** | **remove** {*vlan-list*}]}	Designates the port profile as trunking and defines VLAN access to it as follows:

	Command or Action	**Purpose**
		• **allowed vlan**—Defines VLAN IDs that are allowed on the port.
		• **all**—Indicates that all VLAN IDs are allowed on the port, unless exceptions are also specified.
		• **none**—Indicates that no VLAN IDs are allowed on the port.
		• **add**—Lists VLAN IDs to add to the list of those allowed on the port.
		• **except**—Lists VLAN IDs that are not allowed on the port.
		• **remove**—Lists VLAN IDs whose access is to be removed from the port.
		If you do not configure allowed VLANs, the default VLAN 1 is used as the allowed VLAN.
Step 6	switch(config-port-prof)# **no shutdown**	Changes the port to administrative status so that system VLAN can be configured.
		Note If you do not change the port state, you will see the following error when you try to configure system VLAN:
		ERROR: Cannot set system vlans. Change port admin status to 'no shutdown' and retry.
Step 7	switch(config-port-prof)# **system vlan** *vlan-id-list*	Adds system VLANs to this port profile.
Step 8	(Optional) switch(config-port-prof)# **mtu** *mtu-size*	Designates the MTU size.
		• If you do not set the MTU size here, the default of 1500 is used.
		• The MTU size must be an even number between 1500 and 9000.
		The MTU size you set must be less than or equal to the fixed system jumbomtu size of 9000.
		The MTU configured on an interface takes precedence over the MTU configured on a port profile.
		For more information, see the *Cisco Nexus 1000V Interface Configuration Guide*.

	Command or Action	Purpose
Step 9	(Optional) switch(config-port-prof)# **show port-profile** [**brief**	**expand-interface**	**usage**] [*name profile-name*]	Displays the configuration for verification.
Step 10	(Optional) switch(config-port-prof)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to create a system port profile:

```
switch# configure terminal
switch(config)# port-profile AccessProf
switch(config-port-prof)# description "System profile for critical ports"
switch(config-port-prof)# system vlan 1
switch(config-port-prof)# show port-profile name AccessProf
port-profile AccessProf
  description:
  type: vethernet
  status: disabled
  capability l3control: no
  pinning control-vlan: -
  pinning packet-vlan: -
  system vlans: 1
  port-group:
  max ports: 32
  inherit: port-profile xyz
  config attributes:
    switchport mode access
    switchport access vlan 1
    switchport trunk allowed vlan 1-10
    channel-group auto mode on sub-group cdp
    no shutdown
  evaluated config attributes:
    switchport mode access
    switchport access vlan 1
    switchport trunk allowed vlan 1-10
    mtu 1500
    channel-group auto mode on sub-group cdp
    no shutdown
  assigned interfaces:
  port-group:
  system vlans: none
  capability l3control: no
  capability iscsi-multipath: no
  capability vxlan: no
  capability l3-vservice: no
  port-profile role: none
  port-binding: static
switch(config-port-prof)#
```

Deleting System VLANs from a Port

Before you begin

- You are logged in to vCenter Server.

- The VSM is connected to vCenter Server.

Procedure

Step 1   From the vCenter Server, delete the port from the DVS.

Step 2   Add the port to the vCenter Server with a different or modified port profile.

Modifying the System VLANs in a Trunk Mode Port Profile

You can change the set of system VLANs in a trunk mode port profile without removing all system VLANs.

Before you begin

- You are logged in to the vCenter server.

- You are logged in to the Cisco Nexus 1000V CLI in EXEC mode.

- The VSM is connected to the vCenter Server.

- You know the VLAN ID of a system VLAN in your network. It does not matter which system VLAN it is.

- You know the VLAN IDs of the system VLANs required for the port profile you are modifying.

Procedure

Step 1   From the upstream switch for each VEM that carries this profile, shut off the switch port that carries the control VLAN.

Step 2   Convert the port profile to an access profile with a system VLAN.

See Converting a Port Profile to an Access Profile with a System VLAN, on page 45

Step 3   Convert the access port profile back to a trunk profile.

See Converting an Access Port Profile to a Trunk Port Profile, on page 46

Step 4   From the upstream switch for each VEM that carries this profile, unshut the switchport that carries the control VLAN.

The VEMS are reconnected to the VSM.

Converting a Port Profile to an Access Profile with a System VLAN

You can use this procedure to change the set of system VLANs in a trunk mode port profile without removing all system VLANs.

Procedure

	Command or Action	**Purpose**
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **port-profile** [**type** {**ethernet** | **vethernet**}] *name*	Enters port profile configuration mode for the named port profile. If the port profile does not already exist, it is created using the following characteristics:
		• *name*—The port profile name can be up to 80 alphanumeric characters and must be unique for each port profile on the Cisco Nexus 1000V.
		• **type**—(Optional) The port profile type can be Ethernet or vEthernet. Once configured, the type cannot be changed. The default is the vEthernet type.
		Defining a port profile type as Ethernet allows the port profile to be used for physical (Ethernet) ports. In the vCenter Server, the corresponding port group can be selected and assigned to physical ports (PNICs).
		Note If a port profile is configured as an Ethernet type, it cannot be used to configure VMware virtual ports.
Step 3	switch(config-port-prof)# **no system vlan**	Remove the system VLAN from a port profile.
Step 4	switch(config-port-prof)# **switchport mode access**	Sets port mode access.
Step 5	switch(config-port-prof)# **switchport access vlan** *vlan-id*	Set the access mode of an interface.
Step 6	switch(config-port-prof)# **no shutdown**	Changes the port to administrative status so that system VLANs can be configured.

	Command or Action	Purpose
		Note If you do not change the port state, you will see the following error when you try to configure system VLAN:ERROR: Cannot set system vlans. Change port admin status to 'no shutdown' and retry.
Step 7	switch(config-port-prof)# **system vlan** *vlan-id-list*	Adds system VLANs to this port profile.

The trunk port profile is converted to an access port profile with a system VLAN.

Example

This example shows how to convert a trunk port profile to an access port profile:

```
switch# configure terminal
switch(config)# port-profile Trunk_System_Prof
switch(config-port-prof)# no system vlan
switch(config-port-prof)# switchport mode access
switch(config-port-prof)# switchport access vlan 300
switch(config-port-prof)# system vlan 300
switch(config-port-prof)#
```

Converting an Access Port Profile to a Trunk Port Profile

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **port-profile** [**type** {**ethernet** | **vethernet**}] *name*	Enters port profile configuration mode for the named port profile. If the port profile does not already exist, it is created using the following characteristics: • *name*—The port profile name can be up to 80 alphanumeric characters and must be unique for each port profile on the Cisco Nexus 1000V. • **type**—(Optional) The port profile type can be Ethernet or vEthernet. Once configured, the type cannot be changed. The default is the vEthernet type. Defining a port profile type as Ethernet allows the port profile to be used for physical (Ethernet) ports. In the vCenter Server, the corresponding port group can

	Command or Action	**Purpose**
		be selected and assigned to physical ports (PNICs).
		Note If a port profile is configured as an Ethernet type, it cannot be used to configure VMware virtual ports.
Step 3	switch(config-port-prof)# **switchport mode trunk**	Designates that the interfaces are to be used as trunking ports. A trunk port transmits untagged packets for the native VLAN and transmits encapsulated, tagged packets for all other VLANs.
Step 4	**system vlan** *vlan-id-list*	Adds system VLANs to this port profile.
Step 5	(Optional) switch(config-port-prof)# **show port-profile** [**brief**	**expand-interface**	**usage**] [*name profile-name*]	Displays the configuration for verification.
Step 6	(Optional) switch(config-port-prof)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to convert an access port profile to a trunk port profile:

```
switch# config terminal
switch(config)# port-profile Trunk_System_Prof
switch(config-port-prof)# switchport mode trunk
switch(config-port-prof)# system vlan 114,115
switch(config-port-prof)# show port-profile name Trunk_System_Prof
port-profile Trunk_System_Prof
  description:
  type: vethernet
  status: enabled
  pinning control-vlan: -
  pinning packet-vlan: -
  max ports: 32
  inherit:
  config attributes:
    switchport mode trunk
    switchport trunk allowed vlan all
    no shutdown
  evaluated config attributes:
    switchport mode trunk
    switchport trunk allowed vlan all
    mtu 1500
    no shutdown
  assigned interfaces:
  port-group:
  system vlans: 114,115
  capability l3control: no
```

```
                    capability iscsi-multipath: no
                    capability vxlan: no
                    capability l3-vservice: no
                    port-profile role: none
                    port-binding: static
                switch(config-port-prof)# copy running-config startup-config
```

Modifying System VLANs in an Access Mode Port Profile

You can change the set of system VLANs in an access port profile without removing all system VLANs.

Before you begin

- You are logged in to vCenter Server.

- You are logged in to the Cisco Nexus 1000V CLI in EXEC mode.

- The VSM is connected to vCenter server.

- You know the VLAN IDs of the system VLANs required for the port profile you are modifying.

- From the upstream switch for each VEM that carries this profile, shut off the switch port that carries the control VLAN.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **port-profile** [**type** {**ethernet** | **vethernet**}] *name*	Enters port profile configuration mode for the named port profile. If the port profile does not already exist, it is created using the following characteristics:
		• *name*—The port profile name can be up to 80 alphanumeric characters and must be unique for each port profile on the Cisco Nexus 1000V.
		• **type**—(Optional) The port profile type can be Ethernet or vEthernet. Once configured, the type cannot be changed. The default is the vEthernet type.
		Defining a port profile type as Ethernet allows the port profile to be used for physical (Ethernet) ports. In the vCenter Server, the corresponding port group can be selected and assigned to physical ports (PNICs).

	Command or Action	Purpose
		Note If a port profile is configured as an Ethernet type, it cannot be used to configure VMware virtual ports.
Step 3	switch(config-port-prof)# **system vlan** *vlan-id-list*	Adds system VLANs to this port profile.
Step 4	(Optional) switch(config-port-prof)# **show port-profile** [**brief**	**expand-interface**	**usage**] [*name profile-name*]	Displays the configuration for verification.
Step 5	(Optional) switch(config-port-prof)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to change the set of system VLANs in an access port profile without removing all system VLANs:

```
switch# configure terminal
switch(config)# port-profile Access_System_Prof
switch(config-port-prof)# system vlan 114,115
switch(config-port-prof)# show port-profile name Access_System_prof
port-profile Access_System_Prof
  description:
  type: vethernet
  status: enabled
  pinning control-vlan: -
  pinning packet-vlan: -
  max ports: 32
  inherit:
  config attributes:
    switchport mode access
    switchport trunk allowed vlan all
    no shutdown
  evaluated config attributes:
    switchport mode access
    switchport trunk allowed vlan all
    mtu 1500
    no shutdown
  assigned interfaces:
  port-group:
  system vlans: 114,115
  capability l3control: no
  capability iscsi-multipath: no
  capability vxlan: no
  capability l3-vservice: no
  port-profile role: none
  port-binding: static
switch(config-port-prof)# copy running-config startup-config
```

What to do next

From the upstream switch for each VEM that carries this profile, unshut the switch port that carries the control VLAN.

Feature History for System Port Profiles

Feature Name	Release	Feature Information
mtu	4.2(1)SV1(4)	Removed the **system mtu** command and replaced it with the **mtu** command.
system mtu	4.0(4)SV1(3)	The **system mtu** command lets you preserve a nondefault MTU setting on the PNIC attached to the Cisco Nexus 1000V across reboots of the ESX server.
System port profiles	4.0(4)SV1(1)	This feature was introduced.

CHAPTER **6**

Configuring a Private VLAN in a Port Profile

This chapter contains the following sections:

Information About Private VLANs

Private VLANs (PVLANs) are used to segregate Layer 2 ISP traffic and convey it to a single router interface. PVLANs achieve device isolation by applying Layer 2 forwarding constraints that allow end devices to share the same IP subnet while being Layer 2 isolated. In turn, the use of larger subnets reduces address management overhead.

For more information about PVLANs, see the *Cisco Nexus 1000V Layer 2 Switching Configuration Guide*.

Configuring a Port Profile as a Private VLAN

Before you begin

- You are logged in to the CLI in EXEC mode.

- You know the VLAN IDs for both the primary and secondary VLAN in the private VLAN pair.

- You know whether this private VLAN inherits its configuration.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **port-profile** [**type** {**ethernet** | **vethernet**}] *name*	Enters port profile configuration mode for the named port profile. If the port profile does not already exist, it is created using the following characteristics:

	Command or Action	Purpose
		• *name*—The port profile name can be up to 80 alphanumeric characters and must be unique for each port profile on the Cisco Nexus 1000V.
		• **type**—(Optional) The port profile type can be Ethernet or vEthernet. Once configured, the type cannot be changed. The default is the vEthernet type.
		Defining a port profile type as Ethernet allows the port profile to be used for physical (Ethernet) ports. In the vCenter Server, the corresponding port group can be selected and assigned to physical ports (PNICs).
		Note If a port profile is configured as an Ethernet type, it cannot be used to configure VMware virtual ports.

Step 3	switch(config-port-prof)# **switchport mode private-vlan** {**host**| **promiscuous**|**trunk promiscuous**}	Designates the port profile for use as a private VLAN and defines the ports as follows:
		
		 • **promiscuous**—vEthernet ports that belong to the primary VLAN and communicate with the Layer 3 gateway. Promiscuous ports can communicate with any interface in the PVLAN domain, including those associated with secondary VLANs.
		
		 • **host**—vEthernet ports that belong to the secondary VLAN as one of the following:
		
		     • Community PVLAN host port
		
		     • Isolated PVLAN host port
		
		 • **trunk promiscuous**—A physical Ethernet trunk port that carries both regular non-PVLAN traffic and PVLAN traffic. When traffic comes from a PVLAN host port, the packet is translated to the primary VLAN packet.

Step 4	switch(config-port-prof)# **switchport private-vlan host-association** *primary-vlan secondary-vlan*	Assigns the primary and secondary VLAN IDs to the port profile and saves this association in the running configuration.

	Command or Action	**Purpose**
		• *primary-vlan*—Specifies a primary VLAN ID. You can specify only one primary VLAN ID.
		• *secondary-vlan*—Specifies the secondary VLAN ID. You can specify only one secondary VLAN ID.
Step 5	switch(config-port-prof)# **switchport private-vlan trunk allowed vlan** *vlan-range*	Sets the allowed VLANs and VLAN IDs when interface is in private-vlan trunking mode.
Step 6	switch(config-port-prof)# **switchport private-vlan mapping** *primary_vlan* [**add** | **remove**] *secondary_vlan*	Maps the primary VLAN ID to the secondary VLAN ID for the port profile.
		• *primary-vlan*—Specifies a primary VLAN ID. You can specify only one primary VLAN ID.
		• **add**—Associates the secondary VLAN to the primary VLAN.
		• **remove**—Clears the association between the secondary VLAN and the primary VLAN.
		• *secondary-vlan*—Specifies the secondary VLAN ID. You can specify only one secondary VLAN ID.
Step 7	switch(config-port-prof)# **switchport private-vlan mapping trunk** *primary_vlan* [**add** | **remove**] *secondary_vlan*	Designates the primary private VLAN. The range of valid values is 1 to 3967.
Step 8	(Optional) switch(config-port-prof)# **show port-profile** [**brief** | **expand-interface** | **usage**] [*name profile-name*]	Displays the configuration for verification.
Step 9	(Optional) switch(config-port-prof)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

These examples show different ways that port profiles can be configured as private VLANs:

```
switch# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
switch(config)# port-profile type vethernet pvcomm
switch(config-port-prof)# vmware port-group
switch(config-port-prof)# switchport mode private-vlan host
switch(config-port-prof)# switchport private-vlan host-association 153 154
switch(config-port-prof)# no shutdown
switch(config-port-prof)# state enabled
```

```
switch(config-port-prof)# show run port-profile pv154

!Command: show running-config port-profile pv154
!Time: Fri Jan  7 15:10:43 2011

version 4.2(1)SV1(4)
port-profile type vethernet pv154
  vmware port-group
  switchport mode private-vlan host
  switchport private-vlan host-association 153 154
  no shutdown
  max-ports 1024
  state enabled


switch(config-port-prof)# port-profile type vethernet pvprom
switch(config-port-prof)# vmware port-group
switch(config-port-prof)# switchport mode private-vlan promiscuous
switch(config-port-prof)# switchport private-vlan mapping 153 154-155
switch(config-port-prof)# no shutdown
switch(config-port-prof)# state enabled
switch(config-port-prof)# show run port-profile pvprom

!Command: show running-config port-profile pvprom
!Time: Fri Jan  7 15:11:43 2011

version 4.2(1)SV1(4)
port-profile type vethernet pv153
  vmware port-group
  switchport mode private-vlan promiscuous
  switchport private-vlan mapping 153 154-155
  no shutdown
  max-ports 1024
  state enabled

switch(config-port-prof)# port-profile type ethernet pvpromtrunk
switch(config-port-prof)# vmware port-group
switch(config-port-prof)# switchport mode private-vlan trunk promiscuous
switch(config-port-prof)# switchport private-vlan mapping trunk 153 154-155
switch(config-port-prof)# switchport private-vlan mapping trunk 156 157
switch(config-port-prof)# switchport private-vlan trunk allowed vlan all
switch(config-port-prof)# no shutdown
switch(config-port-prof)# state enabled
switch(config-port-prof)# show run port-profile pvpromtrunk

!Command: show running-config port-profile pvpromtrunk
!Time: Fri Jan  7 15:12:24 2011

version 4.2(1)SV1(4)
port-profile type ethernet pvpromtrunk
  vmware port-group
  switchport mode private-vlan trunk promiscuous
  switchport private-vlan mapping trunk 153 154-155
  switchport private-vlan mapping trunk 156 157
  switchport private-vlan trunk allowed vlan 1-3967,4048-4093
  no shutdown
  state enabled
```

Feature History for Private VLAN Port Profiles

Feature Name	Release	Feature Information
Private VLAN port profiles	4.0(4)SV1(1)	This feature was introduced.

Restricting Port Profile Visibility

This chapter contains the following sections:

Information About Restricting Port Profile Visibility

Port Profile Visibility

You can restrict which VMware vCenter users or user groups have visibility into specific port groups on the Cisco Nexus 1000V.

Before you can restrict the visibility of a port group, the server administrator must define which VMware vCenter users and user groups have access to the Cisco Nexus 1000V DVS top level folder in VMware vCenter Server. The network administrator can then further define the visibility of specific port groups on the Virtual Supervisor Module (VSM). This configuration on the VSM is then published to the VMware vCenter Server so that access to specific port groups is restricted.

Group or User Access

You can save the time of defining access on the VSM per user by, instead, adding new users to groups in VMware vCenter where access is already defined. Group members defined in VMware vCenter automatically gain access to the port groups defined for the group.

You can see in the following figure the relationship between users and groups in vCenter Server and port profiles and port profile roles in Cisco Nexus 1000V.

Figure 1: Port Profile Visibility: User, Groups, Roles, and Port Profiles

Guidelines and Limitations for Restricting Port Profile Visibility

- The server administrator does not propagate access from the DVS down to lower folders. Instead, port group access is defined by the network administrator on the VSM and then published to the VMware vCenter Server.

- The Cisco Nexus 1000V VSM must be connected to the VMware vCenter Server before port profile roles are created or assigned. If this connection is not in place when port profile visibility is updated on the VSM, it is not published to VMware vCenter Server and is not affected.

- The following are guidelines for port profile roles on the VSM:

    - You cannot remove a port profile role if a port profile is assigned to it. You must first remove the role from the port profile.

    - Multiple users and groups can be assigned to a role.

    - Only one role can be assigned to a port profile.

    - A role can be assigned to multiple port profiles.

- You can define up to 256 port profile roles per VSM.

- You can define a total of 16 users and groups per role.

Defining DVS Access in vSphere Client

The server administrator can use this procedure to allow access to the top level Cisco Nexus 1000V DVS folder in vSphere client.

Before you begin

- You are logged in to the vSphere Client.

- You know which users or groups need access to the DVS.

- This procedure defines who can access the Cisco Nexus 1000V DVS. Access to individual port groups is done on the VSM; see .

Procedure

Step 1   In the **vSphere Client** window, do the following:

a) Choose **Inventory > Networking**.

b) Right-click a DVS folder object and choose **Add Permission**.

Step 2   In the **Assign Permissions** window, click **Add**.
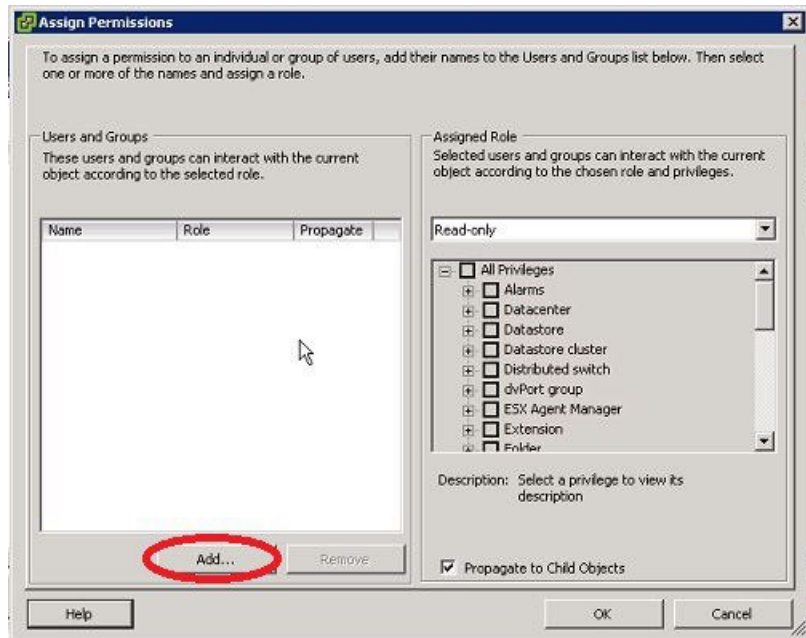
Step 3   In the **Select Users and Groups** window, do the following:

a) Choose the name from the list of users and groups.

b) Click **Add**.
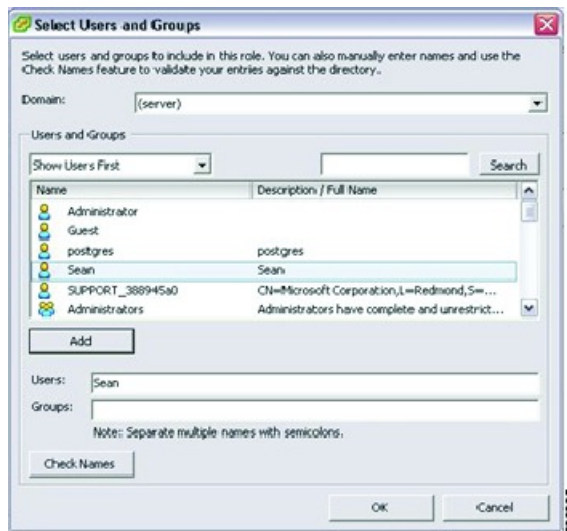
c) Click **OK**.

Step 4   In the **Assign Permissions** window, do the following:

a) From the **Assigned Role** selection list, choose a role for this user or group.

b) Make sure that the **Propagate to Child Objects** check box is unchecked.

c) Click **OK.**
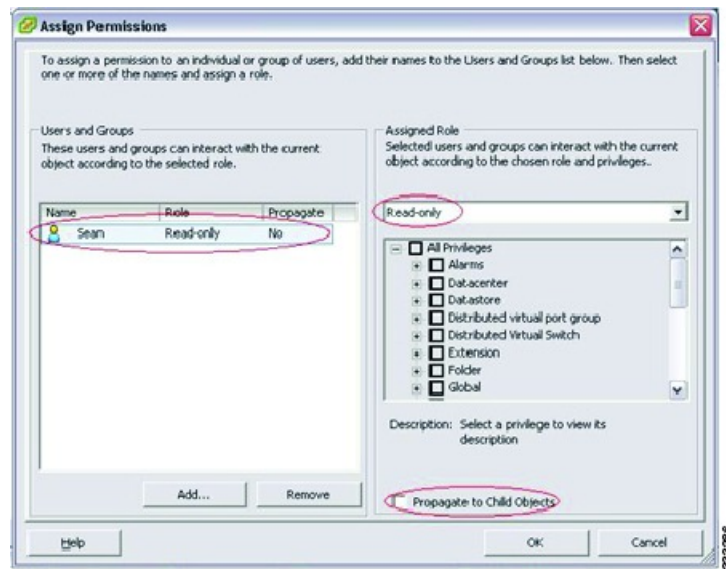
The user is granted the same access to the DVS object.

Note   Do not propagate the role definition here. Specific port group access is configured on the VSM, which is then pushed to vSphere Client.

Step 5   (Optional) In the **vSphere Client** window, click the **Permissions** tab.
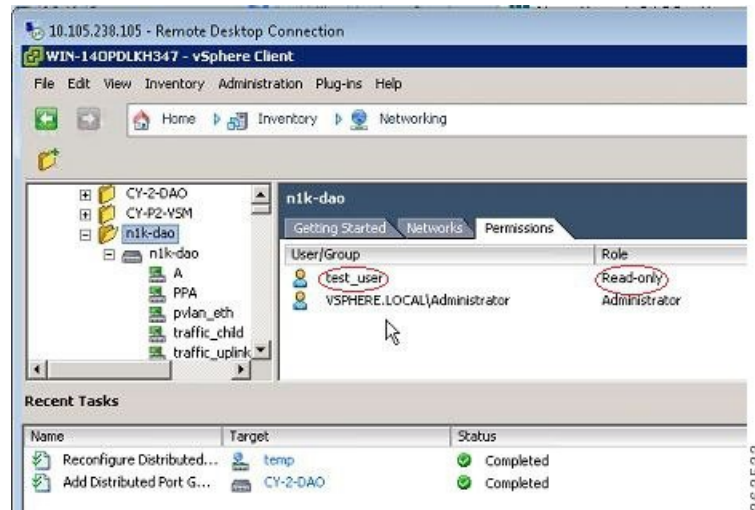
In the example shown, the user is granted read-only access to the DVS folder object and eventually the DVS object.

Step 6   (Optional) In the **vSphere Client** window, under the same DVS object, do the following:

a)   Click any port profile.

b)   Click the **Permissions** tab.
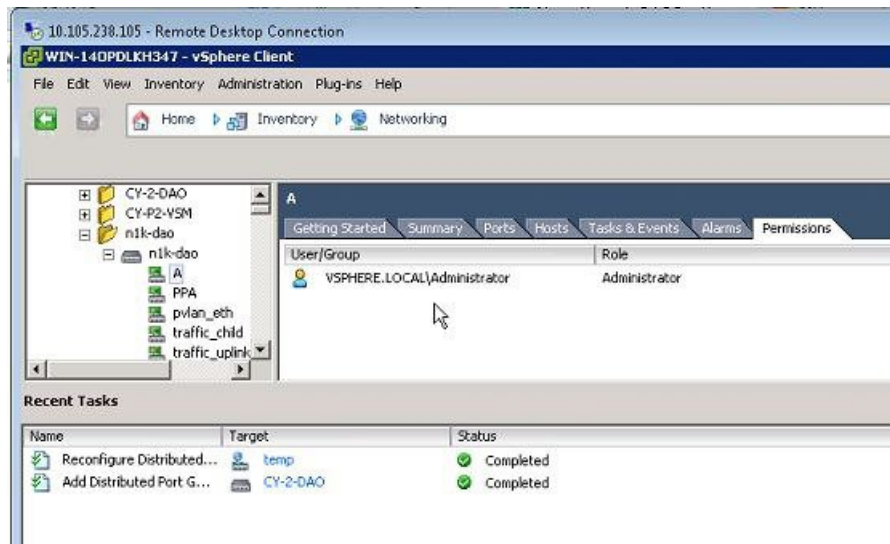
In the example shown, note that the new user is not listed under the **Permissions** tab for port profiles. Access to individual port profile groups is given on the VSM; see Restricting Port Profile Visibility on the VSM, on page 64.

Step 7 (Optional) Log in to vSphere Client using the new user login credentials.

vSphere client shows the list of port profiles the user has access to for any DVS object.
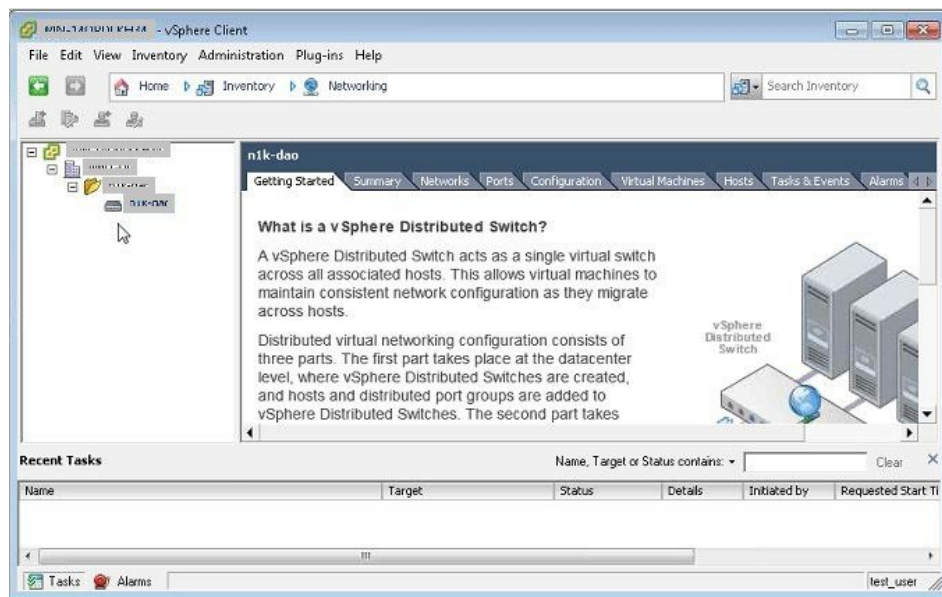
In the example shown, note that no port profiles are listed under the DVS object for the new user.

You can now access the top-level Cisco Nexus 1000V DVS folder according to the assigned role.

| Note | To restrict access to specific port groups, go to Restricting Port Profile Visibility on the VSM, on page 64. |

Enabling the Port Profile Role Feature

Before you begin

You are logged in to the CLI in EXEC mode.

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **feature port-profile-role**	Enables the port profile roles feature to restrict user and group access.
Step 3	(Optional) switch(config)# **show feature**	Displays the configuration for verification.
Step 4	(Optional) switch(config)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to enable the port profile role feature:

```
switch# configure terminal
switch(config)# feature port-profile-role adminUser
switch(config)# show feature
Feature Name         Instance   State
-------------------  --------   --------
dhcp-snooping        1          enabled
http-server          1          enabled
ippool               1          enabled
lacp                 1          enabled
lisp                 1          enabled
lisphelper           1          enabled
netflow              1          disabled
port-profile-roles   1          enabled
private-vlan         1          disabled
sshServer            1          enabled
tacacs               1          enabled
telnetServer         1          enabled
switch(config)# copy running-config startup-config
```

Restricting Port Profile Visibility on the VSM

The network administrator can use this procedure to create a role for restricting port profile visibility on the VSM, which is then pushed to vCenter Server.

Before you begin

- You are logged in to the CLI in EXEC mode.

- You know which users or groups should have access to the role that you are creating.

- You have already created the users and groups to be assigned to this role in vCenter and have access to the Cisco Nexus 1000V DVS folder where the VSM resides. See Defining DVS Access in vSphere Client, on page 59.

- You have enabled the port profile role feature. See Enabling the Port Profile Role Feature, on page 63.

- You have identified the characteristics needed for this role:

    - Role name

    - Role description

    - Users to assign

    - Groups to assign

    - Port profile to assign

Procedure

	Command or Action	Purpose
Step 1	switch# **configure terminal**	Enters global configuration mode.
Step 2	switch(config)# **port-profile-role** *role-name*	Enters port profile role configuration mode for the named role. If the role does not already exist, it is created with the following characteristic: • *role-name*—The role name can contain up to 32 alphanumeric characters and must be unique for each role on the Cisco Nexus 1000V.
Step 3	(Optional) switch(config-port-prof-role)# **description** *role-description*	Adds a description of up to 32 characters to the role. This description is automatically pushed to vCenter Server.
Step 4	(Optional) switch(config-port-prof-role)# **show port-profile-role users**	Displays all the users on vCenter Server who have access to the DVS parent folder and who can be assigned to the role.

	Command or Action	**Purpose**
Step 5	(Optional) switch(config-port-prof-role)# {**user** | **group**} {*user-name* | *group-name*}	Assigns multiple users and groups to a role. **Note** The users and groups must exist on vCenter Server and must have access to the top-level Cisco Nexus 1000V DVS folder in vSphere Client. For more information, see Defining DVS Access in vSphere Client, on page 59.
Step 6	switch(config-port-prof-role)# **exit**	Exits port-profile-role configuration mode and returns you to global configuration mode.
Step 7	switch(config)# **port-profile** *profile-name*	Enters port profile configuration mode for the named port profile.
Step 8	switch(config-port-prof)# **assign port-profile-role** *role-name*	Assigns the role to a port profile. The port group is updated in vCenter Server and the user or group assigned to this role is granted access. The user or group can assign the port group to a vNIC in a virtual machine or vSWIF or vMKNIC on a host. **Note** Only one role can be assigned to a port profile. A role can be assigned to multiple port profiles.
Step 9	(Optional) switch(config-port-prof)# **show port-profile-role** [**name** *role-name*]	Displays the configuration for verification.
Step 10	(Optional) switch(config-port-prof)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.
Step 11	(Optional) Perform Step 7, on page 62 for the user assigned port profile access in this procedure.	vSphere client shows the list of port profiles that the user has access to for any DVS object.

Example

This example shows how to define access for the allaccess2 port profile by creating and assigning the adminUser port profile role:

```
switch# configure terminal
switch(config)# port-profile-role adminUser
switch(config-port-prof-role)# description adminOnly
switch(config-port-prof-role)# user hdbaar
switch(config-port-prof-role)# exit
switch(config)# port-profile allaccess2
switch(config-port-prof)# assign port-profile-role adminUser
switch(config-port-prof)# show port-profile-role name adminUser

Name: adminUser
Description: adminOnly
```

```
Users:
    hdbaar (user)
Assigned port-profiles:
    allaccess2
switch(config-port-prof)# copy running-config startup-config
```

Removing a Port Profile Role

You can remove a role that was used for restricting port profile visibility on vCenter Server.

Before you begin

- You are logged in to the CLI in EXEC mode.

- Know that you cannot remove a port profile role if a port profile is assigned to it. You must first remove the role from the port profile. This procedure includes a step for doing this action.

Procedure

	Command or Action	**Purpose**
Step 1	(Optional) switch# **show port-profile-role** [*name role-name*]	Displays the port profile role including any port profiles assigned to it. If there are port profiles assigned to the role, you must remove them before you can remove the role.
Step 2	switch# **configure terminal**	Enters global configuration mode.
Step 3	switch(config)# **port-profile** [**type** {**ethernet** | **vethernet**}] *name*	Enters port profile configuration mode for the named port profile. If the port profile does not already exist, it is created using the following characteristics: • *name*—The port profile name can be up to 80 alphanumeric characters and must be unique for each port profile on the Cisco Nexus 1000V. • **type**—(Optional) The port profile type can be Ethernet or vEthernet. Once configured, the type cannot be changed. The default is the vEthernet type. Defining a port profile type as Ethernet allows the port profile to be used for physical (Ethernet) ports. In the vCenter Server, the corresponding port group can be selected and assigned to physical ports (PNICs).

	Command or Action	Purpose
		Note If a port profile is configured as an Ethernet type, it cannot be used to configure VMware virtual ports.
Step 4	switch(config-port-prof)# **no assign port-profile-role** *role-name*	Removes the role from the port profile. The port group is updated in vCenter Server.
Step 5	switch(config-port-prof)# **exit**	Exits port-profile configuration mode and returns you to global configuration mode.
Step 6	switch(config)# **no port-profile-role** *role-name*	Removes the role from the VSM.
Step 7	(Optional) switch# **show port-profile-role** [*name role-name*]	Displays the port profile role including any port profiles assigned to it. If there are port profiles assigned to the role, you must remove them before you can remove the role.
Step 8	(Optional) switch(config)# **copy running-config startup-config**	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to remove a port profile role:

```
switch# show port-profile-role name adminUser
Name: adminUser
Description: adminOnly
Users:
    hdbaar (user)
Assigned port-profiles:
    allaccess2
switch# configure terminal
switch(config)# port-profile allaccess2
switch(config-port-prof)# no assign port-profile-role adminUser
switch(config-port-prof)# exit
switch(config)# no port-profile-role adminUser
switch(config)# show port-profile-role name adminUser
switch(config)# copy running-config startup-config
switch(config)#
```

Feature History for Restricting Port Profile Visibility

This section provides the feature history for restricting port profile visibility.

Feature Name	Release	Feature Information
Restricting port profile visibility	4.2(1)SV1(4)	This feature was introduced.

Verifying the Port Profile Configuration

This chapter contains the following sections:

Verifying the Port Profile Configuration

Use one of the following commands to verify the configuration:

- **show port-profile** [**brief** | **expand-interface** | **usage**] [**name** *profile-name*]

- **show port-profile-role** [**name** *port-profile-role-name*]

- **show running-config port-profile** [*profile-name*]

- **show port-profile-role users**

- **show port-profile sync-status** [**interface** *if-name*]

- **show port-profile virtual usage** [**name** *profile-name*]

For detailed information about the command output, see the *Cisco Nexus 1000V Command Reference*.

show port profile

```
switch# show port-profile
port-profile UpLinkProfile1
  description:
  type: vethernet
  status: disabled
  pinning control-vlan: -
  pinning packet-vlan: -
  max ports: 32
  inherit:
  config attributes:
    channel-group auto mode on mac-pinning
  evaluated config attributes:
    channel-group auto mode on mac-pinning
  assigned interfaces:
  port-group:
  system vlans: none
  capability l3control: no
  capability iscsi-multipath: no
```

```
      capability vxlan: no
      capability l3-vservice: no
      port-profile role: none
      port-binding: static
   port-profile UpLinkProfile2
      description:
      type: vethernet
      status: disabled
      pinning control-vlan: -
      pinning packet-vlan: -
      max ports: 32
      inherit:
      config attributes:
        channel-group auto mode on sub-group cdp
      evaluated config attributes:
        channel-group auto mode on sub-group cdp
      assigned interfaces:
      port-group:
      system vlans: none
      capability l3control: no
      capability iscsi-multipath: no
      capability vxlan: no
      capability l3-vservice: no
      port-profile role: none
      port-binding: static
   port-profile UpLinkProfile3
      description:
      type: vethernet
      status: disabled
      pinning control-vlan: -
      pinning packet-vlan: -
      max ports: 32
      inherit:
      config attributes:
        channel-group auto mode on sub-group manual
      evaluated config attributes:
        channel-group auto mode on sub-group manual
      assigned interfaces:
      port-group:
      system vlans: none
      capability l3control: no
      capability iscsi-multipath: no
      capability vxlan: no
      capability l3-vservice: no
      port-profile role: none
      port-binding: static
   switch#
```

show port-profile name UpLinkProfile

```
switch# show port-profile name UpLinkProfile3
port-profile UpLinkProfile3
   description:
   type: vethernet
   status: disabled
   pinning control-vlan: -
   pinning packet-vlan: -
   max ports: 32
   inherit:
   config attributes:
     channel-group auto mode on sub-group manual
   evaluated config attributes:
     channel-group auto mode on sub-group manual
   assigned interfaces:
```

```
       port-group:
       system vlans: none
       capability l3control: no
       capability iscsi-multipath: no
       capability vxlan: no
       capability l3-vservice: no
       port-profile role: none
       port-binding: static

switch#
```

show port-profile brief

```
switch# show port-profile brief
--------------------------------------------------------------------------------
Port                       Profile    Profile  Conf   Eval   Assigned  Child
Profile                    Type       State    Items  Items  Intfs     Profs
--------------------------------------------------------------------------------
UplinkProfile1             Vethernet  1        3      3      0         0
UplinkProfile2             Ethernet   1        3      3      0         0
Ubuntu-Profile             Vethernet  1        1      3      0         0
pvlan_uplink               Vethernet  1        1      1      0         0
VM_PP                      Vethernet  0        0      0      0         0
L3_mode                    Vethernet  1        3      3      0         0
switch#
```

show port-profile virtual usage

```
switch# show port-profile virtual usage
--------------------------------------------------------------------------------
Port Profile               Port        Adapter        Owner
--------------------------------------------------------------------------------
n1kv-uplink0               Po1
                           Eth3/2      vmnic1         localhost.
                           Eth3/3      vmnic2         localhost.
vlan1767                   Veth7       Net Adapter 1  all-tool-7
                           Veth8       Net Adapter 1  all-tool-8
aipc1765                   Veth4       Net Adapter 1  bl-h-s
inband1766                 Veth6       Net Adapter 3  bl-h-s
mgmt1764                   Veth5       Net Adapter 2  bl-h-s
vpc-mac-uplink             Po7
                           Eth5/2      vmnic1         localhost.
                           Eth5/3      vmnic2         localhost.
ch-vpc-mac-uplink          Po2
                           Po3
                           Eth4/2      vmnic1         VDANIKLNCOS
                           Eth4/3      vmnic2         VDANIKLNCOS
ch-aipc1765                Veth1       Net Adapter 1  bl-h-p
ch-mgmt1764                Veth2       Net Adapter 2  bl-h-p
ch-inband1766              Veth3       Net Adapter 3  bl-h-p
switch#
```

show port-profile expand-interface name UplinkProfile1

```
switch# show port-profile expand-interface name UplinkProfile1
port-profile UplinkProfile1
Ethernet2/2
    switchport mode trunk
    switchport trunk allowed vlan 110-119
    no shutdown
switch#
```

show port-profile expand-interface

```
switch# show port-profile expand-interface
port-profile UplinkProfile1
Ethernet2/2
    switchport mode trunk
    switchport trunk allowed vlan 110-119
    no shutdown

port-profile UplinkProfile2
Ethernet2/3
    switchport mode trunk
    switchport trunk allowed vlan 117
    no shutdown
Ethernet2/4
    switchport mode trunk
    switchport trunk allowed vlan 117
    no shutdown

port-profile Ubuntu-Profile
Vethernet439
    switchport mode access
    switchport access vlan 118
    no shutdown
switch#
```

show port-profile sync-status

```
switch# show port-profile sync-status interface ethernet 3/2
Ethernet3/2
 port-profile: uplink
 interface status: quarantine
 sync status: out of sync
 cached commands:
 errors:
    command cache overrun
 recovery steps:
    bring interface online
switch#
```

show running-config port-profile

```
switch# show running-config port-profile
port-profile type ethernet UplinkProfile1
  description "Profile for critical system ports"
  vmware port-group
  switchport mode access
  switchport access vlan 113
  switchport trunk native vlan 113
  channel-group auto mode on
  no shutdown
port-profile type vethernet UplinkProfile2
  vmware port-group
  max-ports 5
  switchport mode trunk
  switchport trunk native vlan 112
  channel-group auto mode on sub-group cdp
  no shutdown
switch#
```

show port-profile-role

```
switch# show port-profile-role name adminUser

Name: adminUser
Description: adminOnly
Users:
    hdbaar (user)
Assigned port-profiles:
    allaccess2
switch#
```

show port-profile-role users

```
switch# show port-profile-role users
Groups:
  Administrators
  TestGroupB
Users:
  dbaar
  fgreen
  suchen
  mariofr
switch#
```

Feature History for Port Profile Verification

Feature Name	Release	Feature Information
show port-profile-role users	4.2(1)SV1(4)	This command output shows the available users and groups.
show port-profile-role	4.2(1)SV1(4)	This command output shows the configuration for port profile roles.
show running-config port-profile	4.0(4)SV1(2)	This command output shows the configuration for port profiles.
show running-config	4.0(4)SV1(2)	This command output has the following changes: • Shows the port profile type (Ethernet or vEthernet). • Optionally, you can display the running configurations for all port profiles or a specific port profile.
show port-profile *name*	4.0(4)SV1(2)	This command output shows the port profile type, pinning, and channel-group configuration. The uplink capability is removed from the output of this command because port profiles used as uplinks are now configured as Ethernet type instead.
Port profile verification	4.0(4)SV1(1)	This feature was introduced.