



# Creating Port Profiles

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## 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: <ul style="list-style-type: none"> <li>• Its configuration is not applied to assigned ports.</li> </ul>
Enabled	When enabled, a port profile behaves as follows: <ul style="list-style-type: none"> <li>• Its configuration is applied to assigned ports.</li> </ul>

### Information About vEthernet Port Binding

You can configure either 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	<p><b>Please verify if the dynamic port profile is related to the vcenter server in the enterprise.</b></p> <p>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.</p> <p>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, then dynamic binding would be appropriate for your port group.</p>

Type	Behavior
Ephemeral	<p>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.</p> <p><b>Note</b> 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 your auto purge setting.</p>

## Guidelines and Limitations for Creating Port Profiles

- Once a port profile is created, you cannot change the type.
- In an installation where multiple port profiles are active on the same VEM, it is recommended 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 rejected by the port profile too.
- If you create a port profile with a command error, for example a private VLAN mapping error or service policy map error, then 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

- Before configuring a port profile, the Cisco Nexus 1000V software must be initially configured.

## Default Settings

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

Parameter	Default
capability l3control	No
description	-
administrative state	all ports disabled
switchport mode (access or trunk)	access

Parameter	Default
system vlan <i>vlan_list</i>	-
type	vethernet
access port vlan	VLAN 1
max-ports	32
min-ports	32
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
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	switch(config)# <b>port-profile</b> [type <b>vethernet</b> ] <i>name</i>	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: <ul style="list-style-type: none"> <li>• <i>name</i>—The port profile name can be up to 80 characters and must be unique for each port profile on the Cisco Nexus 1000V.</li> <li>• <b>type</b>—(Optional) The port profile type is vEthernet.</li> </ul>
<b>Step 3</b>	switch(config-port-prof)# <b>description</b> <i>profile_description</i>	(Optional) Adds a description of up to 80 ASCII characters in length to the port profile.

	Command or Action	Purpose
<b>Step 4</b>	switch(config-port-prof)# <b>show port-profile</b> [brief   expand-interface   usage] [name profile-name]	(Optional) Displays the configuration for verification.
<b>Step 5</b>	switch(config-port-prof)# <b>copy running-config startup-config</b>	(Optional) Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

## 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
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	switch(config)# <b>port-profile</b> [type 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: <ul style="list-style-type: none"> <li>• <b>name</b>—The port profile name can be up to 80 characters and must be unique for each port profile on the Cisco Nexus 1000V.</li> <li>• <b>type</b>—(Optional) The port profile type is vEthernet.</li> </ul>
<b>Step 3</b>	switch(config-port-prof)# <b>max-ports num</b>	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.
<b>Step 4</b>	switch(config-port-prof)# <b>show port-profile</b> [brief   expand-interface   usage] [name profile-name]	(Optional) Displays the configuration for verification.

	Command or Action	Purpose
<b>Step 5</b>	<code>switch(config-port-prof)# copy running-config startup-config</code>	(Optional) 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 128 active VLANs are supported and the valid range for VLANs is 1-4094. The following table describes the available VLAN ranges and their use.

**Table 1: 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: <ul style="list-style-type: none"> <li>• State is always active.</li> <li>• VLAN is always enabled.</li> </ul> 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 Trunk Port Profile

Use this procedure to configure a trunk port profile.

## Before You Begin

- You are logged in to the CLI in EXEC mode.
- You have already created the port profile.
- 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.

## Procedure

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- Step 1** `switch# configure terminal`  
Enters global configuration mode.
- Step 2** `switch(config)# [no] vlan vlan-id`  
Creates or deletes, and saves in the running configuration, a VLAN or a range of VLANs.
- Step 3** `switch(config)# port-profile [type 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 characters and must be unique for each port profile on the Cisco Nexus 1000V.
  - *type*—(Optional) The port profile type is vEthernet.
- 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 {allowed-vlans | add add-vlans | except except-vlans | remove 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.
  - **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.
  - **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.

**Note** If you do not configure allowed VLANs, then the default VLAN 1 is used as the allowed VLAN.

- Step 6** `switch(config-port-prof)# no shutdown`  
Administratively enables all ports in the profile.
- Step 7** `switch(config-port-prof)# state enabled`  
Enables the port profile and applies its configuration to the assigned ports.
- Step 8** `switch(config-port-prof)# system vlan vlan-id`  
Adds system VLAN to this port profile.
- Step 9** `switch(config-port-prof)# publish port-profile <name>`  
Publishes port profile to Cisco Prime Network Services Controller.
- Step 10** (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.

This example shows how to configure a trunk port profile.

```
switch# configure terminal
switch(config)# port-profile port-profile type vethernet Trunk_To_Cloud
switch(config-port-prof)# switchport mode trunk
switch(config-port-prof)# switchport trunk allowed vlan 72,2315-2350
switch(config-port-prof)# no shutdown
switch(config-port-prof)# state enabled
switch(config-port-prof)# max ports 64
switch(config-port-prof)# system vlan 72
switch(config-port-prof)# publish port-profile
switch(config-port-prof)#
```

## Configuring an Access Port 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

- Step 1** `switch# configure terminal`  
Enters global configuration mode.
- Step 2** `switch(config)# [no] vlan vlan-id`  
Creates or deletes, and saves in the running configuration, a VLAN or a range of VLANs.
- Step 3** `switch(config)# port-profile type 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 characters and must be unique for each port profile on the Cisco Nexus 1000V.
  - *type*—(Optional) The port profile type is vEthernet.



- Step 4** switch(config-port-prof)# **switchport mode access**  
Sets port mode access.
- Step 5** switch(config-port-prof)# **switchport access vlan** [vlan-id-access]  
Assigns an access VLAN ID to this port profile.
- Note** 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. If you do not specify a VLAN ID, then VLAN 1 is used automatically.
- Step 6** switch(config-port-prof)# **no shutdown**  
Administratively enables all ports in the profile.
- Step 7** switch(config-port-prof)# **state enabled**  
Enables the port profile and applies its configuration to the assigned ports.
- Step 8** switch(config-port-prof)# **system vlan** vlan-id  
Adds system VLAN to this port profile. Specify the VLAN as configured in step 5.
- Step 9** switch(config-port-prof)# **publish port-profile** <name>  
Publishes port profile to Cisco Prime Network Services Controller.
- 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.

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This example shows how to configure a port profile for InterCloud Switch management interface:

```
switch# configure terminal
switch(config)# port-profile type vethernet mgmt-access
switch(config-port-prof)# switchport mode access
switch(config-port-prof)# switchport access vlan 72
switch(config-port-prof)# no shutdown
switch(config-port-prof)# state enabled
switch(config-port-prof)# system vlan 72
switch(config-port-prof)# publish port-profile mgmt-access
switch(config-port-prof)#
```

## Clearing a Port Management Policy

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

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




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

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### Before You Begin

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

**Procedure**

	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	switch(config)# <b>port-profile name</b>	Enters port profile configuration mode for the named port profile.
<b>Step 3</b>	<b>default {shutdown   switchport mode}</b>	Removes either the shutdown or the switchport mode configuration from the port profile. <ul style="list-style-type: none"> <li>• <b>shutdown</b>—Reverts port profile ports to the shutdown state.</li> <li>• <b>switchport mode</b>—Reverts port profile ports to switch access ports.</li> </ul>
<b>Step 4</b>	switch(config-port-prof)# <b>show port-profile [brief   expand-interface   usage] [name profile-name]</b>	(Optional) Displays the configuration for verification.
<b>Step 5</b>	switch(config-port-prof)# <b>copy running-config startup-config</b>	(Optional) Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

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

```
switch# configure terminal
switch(config)# port-profile AccessProf
switch(config-port-prof)# default shutdown
switch(config-port-prof)# show port-profile name AccessProf
switch(config-port-prof)#
```

## Port Binding for vEthernet Port Profiles Configuration

### Configuring a Default Port Binding Type

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

#### Before You Begin

Before beginning this procedure, you must know or do the following:

- 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.

## Procedure

	Command or Action	Purpose
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	switch(config)# <b>port-profile default</b> <b>port-binding {static [auto]</b> <b>dynamic [auto]  </b> <b>ephemeral}</b>	Configures a default port binding type to be applied automatically to all new vEthernet port profiles unless explicitly configured otherwise: <ul style="list-style-type: none"> <li>• <b>Static:</b> 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 <b>auto</b> option, Cisco Nexus 1000V creates port profiles with both min-ports and max-ports, which are initially inherited from the global defaults and can be redefined by the user at a later time. By configuring the binding type with the <b>auto</b> option, Cisco Nexus 1000V adjusts the number of ports per profile created at the vCenter server based on the usage of the port groups.</li> <li>• <b>Dynamic:</b> 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 <b>auto</b> option for dynamic binding works as described for static binding.</li> <li>• <b>Ephemeral:</b> 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.</li> </ul>
<b>Step 3</b>	switch(config-port-prof)# <b>show running-config</b>	(Optional) Displays the configuration for verification.
<b>Step 4</b>	switch(config-port-prof)# <b>copy running-config</b> <b>startup-config</b>	(Optional) Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

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.

## Before You Begin

- You are logged in to the CLI in EXEC mode.
- You have already created the vEthernet port profile.
- 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
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	switch(config)# <b>port-profile</b> [type { <b>vethernet</b> }] <i>profile-name</i>	Enters port profile configuration mode for the named vEthernet port profile.
<b>Step 3</b>	switch(config-port-prof)# <b>port-binding</b> { <b>static</b> [ <b>auto</b> ] <b>dynamic</b> [ <b>auto</b> ]   <b>ephemeral</b> }	<p>Configures a default port binding type to be applied automatically to all new vEthernet port profiles unless explicitly configured otherwise:</p> <ul style="list-style-type: none"> <li>• <b>Static:</b> <p>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.</p> <ul style="list-style-type: none"> <li>◦ <b>auto:</b> Port profiles are created with both min-ports and max-ports, which are initially inherited from the global defaults and can be redefined by the user at a later time. By configuring the binding type with the <b>auto</b> 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.</li> </ul> </li> <li>• <b>Dynamic:</b> <p>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.</p> <ul style="list-style-type: none"> <li>◦ See <b>auto</b> option above.</li> </ul> </li> <li>• <b>Ephemeral:</b></li> </ul>

	Command or Action	Purpose
		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.
<b>Step 4</b>	switch(config-port-prof)# <b>show port-profile</b> [name <i>profile-name</i> ]	(Optional) Displays the configuration for verification.
<b>Step 5</b>	switch(config-port-prof)# <b>copy running-config</b> <b>startup-config</b>	(Optional) Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

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)#
```

## Enabling a Port Profile

### Before You Begin

- You are logged in to the CLI in EXEC mode.
- You have already created the port profile.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	switch(config)# <b>port-profile</b> [type {vethernet}] <i>profile-name</i>	Enters port profile configuration mode for the named vEthernet port profile.
<b>Step 3</b>	switch(config-port-prof)# <b>state enabled</b>	Enables the port profile and applies its configuration to the assigned ports.
<b>Step 4</b>	switch(config-port-prof)# <b>publish</b> <b>port-profile</b> <name>	Publishes port profile to Cisco Prime Network Services Controller.
<b>Step 5</b>	switch(config-port-prof)# <b>show port-profile</b> [ <b>brief</b>   <b>expand-interface</b>   <b>usage</b> ] [name <i>profile-name</i> ]	Displays the configuration for verification.

	Command or Action	Purpose
<b>Step 6</b>	switch(config-port-prof)# <b>copy running-config startup-config</b>	(Optional) Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

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)# publish port-profile AccessProf
switch(config-port-prof)# show port-profile name AccessProf
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.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	switch(config)# <b>show port-profile virtual usage name</b> <i>profile_name</i>	(Optional) Verifies if active interfaces use this port profile. <b>Note</b> You cannot remove a port profile if there are active interfaces associated with it.
<b>Step 3</b>	switch(config)# <b>no port-profile</b> <i>profile_name</i>	Removes the port profile configuration and operational settings.
<b>Step 4</b>	switch(config)# <b>show port-profile</b> [ <b>name</b> <i>profile-name</i> ]	(Optional) Displays the configuration for verification.
<b>Step 5</b>	switch(config)# <b>copy running-config startup-config</b>	(Optional) Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

This example shows how to remove a port profile:

```
switch# configure terminal
switch(config)# no port-profile AccessProf
switch(config)# show port-profile name AccessProf
ERROR: port-profile AccessProf does not exist
switch(config)# copy running-config startup-config
switch(config)#
```

## Feature History for Port Profiles

Feature Name	Releases	Feature Information
Port Profiles	Release 5.2(1)IC1(1.1)	This feature was introduced.

