



# Configuring Network-Related Policies

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This chapter includes the following sections:

- [Configuring vNIC Templates, page 1](#)
- [Configuring Ethernet Adapter Policies, page 5](#)
- [Configuring Network Control Policies, page 9](#)

## Configuring vNIC Templates

### vNIC Template

This policy defines how a vNIC on a server connects to the LAN. This policy is also referred to as a vNIC LAN connectivity policy.

You need to include this policy in a service profile for it to take effect.

### Creating a vNIC Template

#### Before You Begin

This policy requires that one or more of the following resources already exist in the system:

- Named VLAN
- MAC pool
- QoS policy
- LAN pin group
- Statistics threshold policy

## Procedure

- Step 1** In the **Navigation** pane, click the **LAN** tab.
- Step 2** On the **LAN** tab, expand **LAN ► Policies**.
- Step 3** Expand the node for the organization where you want to create the policy.  
If the system does not include multi-tenancy, expand the **root** node.
- Step 4** Right-click the **vNIC Templates** node and choose **Create vNIC Template**.
- Step 5** In the **Create vNIC Template** dialog box:
- a) In the **General** area, complete the following fields:

Name	Description
<b>Name</b> field	The name of the vNIC template.
<b>Description</b> field	A user-defined description of the template.
<b>Fabric ID</b> field	The fabric interconnect associated with the component. If you want vNICs created from this template to be able to access the second fabric interconnect if the default one is unavailable, check the <b>Enable Failover</b> check box.  <b>Note</b> Do not select <b>Enable Failover</b> if you plan to associate vNICs created from this template with servers that have a Cisco UCS 82598KR-CI 10-Gigabit Ethernet Adapter. If you do so, Cisco UCS Manager generates a configuration fault when you associate the service profile with the server.
<b>Target</b> list box	A list of the possible targets for vNICs created from this template. This can be: <ul style="list-style-type: none"> <li>• <b>Adapter</b>—The vNICs apply to all adapters.</li> <li>• <b>VM</b>—The vNICs apply to all virtual machines.</li> </ul>
<b>Template Type</b> field	This can be: <ul style="list-style-type: none"> <li>• <b>Initial Template</b>—vNICs created from this template are not updated if the template changes.</li> <li>• <b>Updating Template</b>—vNICs created from this template are updated if the template changes.</li> </ul>

- b) In the **VLANs** area, use the table to select the VLAN to assign to vNICs created from this template. The table contains the following columns:

Name	Description
<b>Select</b> column	Check the check box in this column for each VLAN you want to use.
<b>Name</b> column	The name of the VLAN.

Name	Description
Native VLAN column	To designate one of the VLANs as the native VLAN, click the radio button in this column.
Create VLAN link	Click this link if you want to create a VLAN.

c) In the **Policies** area, complete the following fields:

Name	Description
MTU field	The maximum transmission unit, or packet size, that vNICs created from this vNIC template should use. Enter an integer between 1500 and 9216.
MAC Pool drop-down list	The MAC address pool that vNICs created from this vNIC template should use.
QoS Policy drop-down list	The quality of service policy that vNICs created from this vNIC template should use.
Network Control Policy drop-down list	The network control policy that vNICs created from this vNIC template should use.
Pin Group drop-down list	The LAN pin group that vNICs created from this vNIC template should use.
Stats Threshold Policy drop-down list	The statistics collection policy that vNICs created from this vNIC template should use.

**Step 6** Click **OK**.

### What to Do Next

Include the vNIC template in a service profile.

## Deleting a vNIC Template

### Procedure

- Step 1** In the **Navigation** pane, click the **LAN** tab.
- Step 2** On the **LAN** tab, expand **LAN > Policies > Organization\_Name**.
- Step 3** Expand the **vNIC Templates** node.
- Step 4** Right-click the policy you want to delete and choose **Delete**.
- Step 5** If Cisco UCS Manager GUI displays a confirmation dialog box, click **Yes**.

## Binding a vNIC to a vNIC Template

You can bind a vNIC associated with a service profile to a vNIC template. When you bind the vNIC to a vNIC template, Cisco UCS Manager configures the vNIC with the values defined in the vNIC template. If the existing vNIC configuration does not match the vNIC template, Cisco UCS Manager reconfigures the vNIC. You can only change the configuration of a bound vNIC through the associated vNIC template. You cannot bind a vNIC to a vNIC template if the service profile that includes the vNIC is already bound to a service profile template.




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**Important** If the vNIC is reconfigured when you bind it to a template, Cisco UCS Manager reboots the server associated with the service profile.

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### Procedure

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- Step 1** In the **Navigation** pane, click the **Servers** tab.
  - Step 2** On the **Servers** tab, expand **Servers** ► **Service Profiles**.
  - Step 3** Expand the node for the organization that includes the service profile with the vNIC you want to bind. If the system does not include multi-tenancy, expand the **root** node.
  - Step 4** Expand *Service\_Profile\_Name* ► vNICs.
  - Step 5** Click the vNIC you want to bind to a template.
  - Step 6** In the **Work** pane, click the **General** tab.
  - Step 7** In the **Actions** area, click **Bind to a Template**.
  - Step 8** In the **Bind to a vNIC Template** dialog box, do the following:
    - a) From the **vNIC Template** drop-down list, choose the template to which you want to bind the vNIC.
    - b) Click **OK**.
  - Step 9** In the warning dialog box, click **Yes** to acknowledge that Cisco UCS Manager may need to reboot the server if the binding causes the vNIC to be reconfigured.
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## Unbinding a vNIC from a vNIC Template

### Procedure

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- Step 1** In the **Navigation** pane, click the **Servers** tab.
- Step 2** On the **Servers** tab, expand **Servers** ► **Service Profiles**.
- Step 3** Expand the node for the organization that includes the service profile with the vNIC you want to unbind. If the system does not include multi-tenancy, expand the **root** node.

- Step 4** Expand *Service\_Profile\_Name* ► vNICs.
  - Step 5** Click the vNIC you want to unbind from a template.
  - Step 6** In the **Work** pane, click the **General** tab.
  - Step 7** In the **Actions** area, click **Unbind from a Template**.
  - Step 8** If Cisco UCS Manager GUI displays a confirmation dialog box, click **Yes**.
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## Configuring Ethernet Adapter Policies

### Ethernet and Fibre Channel Adapter Policies

These policies govern the host-side behavior of the adapter, including how the adapter handles traffic. For example, you can use these policies to change default settings for the following:

- Queues
- Interrupt handling
- Performance enhancement
- RSS hash
- Failover in a cluster configuration with two fabric interconnects

**Note**

For Fibre Channel adapter policies, the values displayed by Cisco UCS Manager may not match those displayed by applications such as QLogic SANsurfer. For example, the following values may result in an apparent mismatch between SANsurfer and Cisco UCS Manager:

- **Max LUNs Per Target**—SANsurfer has a maximum of 256 LUNs and does not display more than that number. Cisco UCS Manager supports a higher maximum number of LUNs.
  - **Link Down Timeout**—In SANsurfer, you configure the timeout threshold for link down in seconds. In Cisco UCS Manager, you configure this value in milliseconds. Therefore, a value of 5500 ms in Cisco UCS Manager displays as 5s in SANsurfer.
  - **Max Data Field Size**—SANsurfer has allowed values of 512, 1024, and 2048. Cisco UCS Manager allows you to set values of any size. Therefore, a value of 900 in Cisco UCS Manager displays as 512 in SANsurfer.
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#### Operating System Specific Adapter Policies

By default, Cisco UCS provides a set of Ethernet adapter policies and Fibre Channel adapter policies. These policies include the recommended settings for each supported server operating system. Operating systems are sensitive to the settings in these policies. Storage vendors typically require non-default adapter settings. You can find the details of these required settings on the support list provided by those vendors.

**Important**

We recommend that you use the values in these policies for the applicable operating system. Do not modify any of the values in the default policies unless directed to do so by Cisco Technical Support.

However, if you are creating an Ethernet adapter policy for a Windows OS (instead of using the default Windows adapter policy), you must use the following formulas to calculate values that work with Windows:

$$\text{Completion Queues} = \text{Transmit Queues} + \text{Receive Queues}$$

$$\text{Interrupt Count} = (\text{Completion Queues} + 2) \text{ rounded up to nearest power of 2}$$

For example, if Transmit Queues = 1 and Receive Queues = 8 then:

$$\text{Completion Queues} = 1 + 8 = 9$$

$$\text{Interrupt Count} = (9 + 2) \text{ rounded up to the nearest power of 2} = 16$$

## Creating an Ethernet Adapter Policy

**Tip**

If the fields in an area are not displayed, click the **Expand** icon to the right of the heading.

### Procedure

- Step 1** In the **Navigation** pane, click the **Servers** tab.
- Step 2** On the **Servers** tab, expand **Servers ► Policies**.
- Step 3** Expand the node for the organization where you want to create the policy. If the system does not include multi-tenancy, expand the **root** node.
- Step 4** Right-click **Adapter Policies** and choose **Create Ethernet Adapter Policy**.
- Step 5** Enter a name and description for the policy in the following fields:

Name	Description
Name field	The name of the policy.
Description field	A description of the policy. We recommend including information about where and when the policy should be used.

- Step 6** (Optional) In the **Resources** area, adjust the following values:

Name	Description
Transmit Queues field	The number of transmit queue resources to allocate. Enter an integer between 1 and 256.
Ring Size field	The number of descriptors in each transmit queue. Enter an integer between 64 and 4096.

Name	Description
<b>Receive Queues</b> field	The number of receive queue resources to allocate. Enter an integer between 1 and 256.
<b>Ring Size</b> field	The number of descriptors in each receive queue. Enter an integer between 64 and 4096.
<b>Completion Queues</b> field	The number of completion queue resources to allocate. In general, the number of completion queue resources you should allocate is equal to the number of transmit queue resources plus the number of receive queue resources. Enter an integer between 1 and 512.
<b>Interrupts</b> field	The number of interrupt resources to allocate. In general, this value should be equal to the number of completion queue resources. Enter an integer between 1 and 514.

**Step 7** (Optional) In the **Options** area, adjust the following values:

Name	Description
<b>Transmit Checksum Offload</b> field	This can be: <ul style="list-style-type: none"> <li>• <b>disabled</b>—The CPU calculates all packet checksums.</li> <li>• <b>enabled</b>—The CPU sends all packets to the hardware so that the checksum can be calculated. This option may reduce CPU overhead.</li> </ul>
<b>Receive Checksum Offload</b> field	This can be: <ul style="list-style-type: none"> <li>• <b>disabled</b>—The CPU validates all packet checksums.</li> <li>• <b>enabled</b>—The CPU sends all packet checksums to the hardware for validation. This option may reduce CPU overhead.</li> </ul>
<b>TCP Segmentation Offload</b> field	This can be: <ul style="list-style-type: none"> <li>• <b>disabled</b>—The CPU segments large TCP packets.</li> <li>• <b>enabled</b>—The CPU sends large TCP packets to the hardware to be segmented. This option may reduce CPU overhead and increase throughput rate.</li> </ul> <p><b>Note</b> This option is also known as Large Send Offload (LSO).</p>
<b>TCP Large Receive Offload</b> field	This can be: <ul style="list-style-type: none"> <li>• <b>disabled</b>—The CPU processes all large packets.</li> </ul>

Name	Description
	<ul style="list-style-type: none"> <li>• <b>enabled</b>—The hardware reassembles all segmented packets before sending them to the CPU. This option may reduce CPU utilization and increase inbound throughput.</li> </ul>
<b>Receive Side Scaling</b> field	<p>RSS distributes network receive processing across multiple CPUs in multiprocessor systems. This can be:</p> <ul style="list-style-type: none"> <li>• <b>disabled</b>—Network receive processing is always handled by a single processor even if additional processors are available.</li> <li>• <b>enabled</b>—Network receive processing is shared across processors whenever possible.</li> </ul>
<b>Failback Timeout</b> field	<p>After a vNIC has started using its secondary interface, this setting controls how long the primary interface must be available before the system resumes using the primary interface for the vNIC.</p> <p>Enter a number of seconds between 0 and 600.</p>
<b>Interrupt Mode</b> field	<p>The preferred driver interrupt mode. This can be:</p> <ul style="list-style-type: none"> <li>• <b>MSI-X</b>—Message Signaled Interrupts(MSI) with the optional extension. This is the recommended option.</li> <li>• <b>MSI</b>—MSI only.</li> <li>• <b>INTx</b>—PCI INTx interrupts.</li> </ul>
<b>Interrupt Coalescing Type</b> field	<p>This can be:</p> <ul style="list-style-type: none"> <li>• <b>min</b>—The system waits for the time specified in the <b>Interrupt Timer</b> field before sending another interrupt event.</li> <li>• <b>idle</b>—The system does not send an interrupt until there is a period of no activity lasting as long as the time specified in the <b>Interrupt Timer</b> field.</li> </ul>
<b>Interrupt Timer</b> field	<p>The time to wait between interrupts or the idle period that must be encountered before an interrupt is sent.</p> <p>Enter a value between 1 and 65535. To turn off interrupt coalescing, enter 0 (zero) in this field.</p>

**Step 8** Click **OK**.

**Step 9** If Cisco UCS Manager GUI displays a confirmation dialog box, click **Yes**.



## Deleting an Ethernet Adapter Policy

### Procedure

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- Step 1** In the **Navigation** pane, click the **LAN** tab.
- Step 2** On the **LAN** tab, expand **LAN ► Policies ► Organization\_Name**.
- Step 3** Expand the **Adapter Policies** node.
- Step 4** Right-click the Ethernet adapter policy that you want to delete and choose **Delete**.
- Step 5** If Cisco UCS Manager GUI displays a confirmation dialog box, click **Yes**.
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## Configuring Network Control Policies

### Network Control Policy

This policy configures the network control settings for the Cisco UCS instance, including the following:

- Whether the Cisco Discovery Protocol (CDP) is enabled or disabled
- How the VIF behaves if no uplink port is available in end-host mode
- Whether the server can use different MAC addresses when sending packets to the fabric interconnect

### Creating a Network Control Policy

#### Procedure

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- Step 1** In the **Navigation** pane, click the **LAN** tab.
- Step 2** On the **LAN** tab, expand **LAN ► Policies**.
- Step 3** Expand the node for the organization where you want to create the policy.  
If the system does not include multi-tenancy, expand the **root** node.
- Step 4** Right-click the **Network Control Policies** node and select **Create Network Control Policy**.
- Step 5** In the **Create Network Control Policy** dialog box, complete the following fields:

Name	Description
Name field	The name of the policy.  This name can be between 1 and 16 alphanumeric characters. You cannot use spaces or any special characters, and you cannot change this name after the object has been saved.

Name	Description
CDP field	This option determines whether Cisco Discovery Protocol (CDP) is enabled on servers associated with a service profile that includes this policy. This can be: <ul style="list-style-type: none"> <li>• <b>disabled</b></li> <li>• <b>enabled</b></li> </ul>
Action on Uplink Fail field	This option determines how the VIF behaves if no uplink port is available when the fabric interconnect is in end-host mode. This can be: <ul style="list-style-type: none"> <li>• <b>link-down</b>— Changes the operational state of a vNIC to down when uplink connectivity is lost on the fabric interconnect, and enables fabric failover for vNICs.</li> <li>• <b>warning</b>— Maintains server-to-server connectivity even when no uplink port is available, and disables fabric failover when uplink connectivity is lost on the fabric interconnect.</li> </ul> The default is <b>link-down</b> .

**Step 6** In the **MAC Security** area, do the following to determine whether the server can use different MAC addresses when sending packets to the fabric interconnect:

- a) Click the **Expand** icon to expand the area and display the radio buttons.
- b) Click one of the following radio buttons to determine whether forged MAC addresses are allowed or denied when packets are sent from the server to the fabric interconnect:
  - **allow**— All server packets are accepted by the fabric interconnect, regardless of the MAC address associated with the packets.
  - **deny**— After the first packet has been sent to the fabric interconnect, all other packets must use the same MAC address or they will be silently rejected by the fabric interconnect. In effect, this option enables port security for the associated vNIC.

If you plan to install VMware ESX on the associated server, you must configure the **MAC Security** to **allow** for the network control policy applied to the default vNIC. If you do not configure **MAC Security** for **allow**, the ESX installation may fail because the MAC security permits only one MAC address while the installation process requires more than one MAC address.

**Step 7** Click **OK**.

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## Deleting a Network Control Policy

### Procedure

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- Step 1** In the **Navigation** pane, click the **LAN** tab.
  - Step 2** On the **LAN** tab, expand **LAN ► Policies ► *Organization\_Name***.
  - Step 3** Expand the **Network Control Policies** node.
  - Step 4** Right-click the policy you want to delete and select **Delete**.
  - Step 5** If Cisco UCS Manager GUI displays a confirmation dialog box, click **Yes**.
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