



Configuring Quality of Service

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Quality of Service

Cisco UCS provides the following methods to implement quality of service:

- System classes that specify the global configuration for certain types of traffic across the entire system
- QoS policies that assign system classes for individual vNICs
- Flow control policies that determine how uplink Ethernet ports handle pause frames

System Classes

Cisco UCS uses Data Center Ethernet (DCE) to handle all traffic inside a Cisco UCS instance. This industry standard enhancement to Ethernet divides the bandwidth of the Ethernet pipe into eight virtual lanes. System classes determine how the DCE bandwidth in these virtual lanes is allocated across the entire Cisco UCS instance.

Each system class reserves a specific segment of the bandwidth for a specific type of traffic. This provides a level of traffic management, even in an oversubscribed system. For example, you can configure the Fibre Channel Priority system class to determine the percentage of DCE bandwidth allocated to FCoE traffic.

The following table describes the system classes:

System Class	Description
Platinum Priority Gold Priority Silver Priority Bronze Priority	A configurable set of system classes that you can include in the QoS policy for a service profile. Each system class manages one lane of traffic. All properties of these system classes are available for you to assign custom settings and policies.
Best Effort Priority	A system class that sets the quality of service for the lane reserved for Basic Ethernet traffic. Some properties of this system class are preset and cannot be modified. For example, this class has a drop policy that allows it to drop data packets if required.
Fibre Channel Priority	A system class that sets the quality of service for the lane reserved for Fibre Channel over Ethernet traffic. Some properties of this system class are preset and cannot be modified. For example, this class has a no-drop policy that ensures it never drops data packets.

Quality of Service Policies

QoS policies assign a system class to the outgoing traffic for a vNIC or vHBA. This system class determines the quality of service for that traffic.

You must include a QoS policy in a vNIC policy or vHBA policy and then include that policy in a service profile to configure the vNIC or vHBA.

Flow Control Policies

Flow control policies determine whether the uplink Ethernet ports in a Cisco UCS instance send and receive IEEE 802.3x pause frames when the receive buffer for a port fills. These pause frames request that the transmitting port stop sending data for a few milliseconds until the buffer clears.

For flow control to work between a LAN port and an uplink Ethernet port, you must enable the corresponding receive and send flow control parameters for both ports. For Cisco UCS, the flow control policies configure these parameters.

When you enable the send function, the uplink Ethernet port sends a pause request to the network port if the incoming packet rate becomes too high. The pause remains in effect for a few milliseconds before traffic is reset to normal levels. If you enable the receive function, the uplink Ethernet port honors all pause requests from the network port. All traffic is halted on that uplink port until the network port cancels the pause request.

Because you assign the flow control policy to the port, changes to the policy have an immediate effect on how the port reacts to a pause frame or a full receive buffer.

Configuring QoS System Classes

Procedure

- Step 1** In the **Navigation** pane, click the **LAN** tab.
- Step 2** In the **LAN** tab, expand **LAN ► LAN Cloud** .
- Step 3** Select the **QoS System Class** node.
- Step 4** In the **General** tab, update the following properties for the system class you want to configure to meet the traffic management needs of the system:
- Note** Some properties may not be configurable for all system classes.

Name	Description
Enabled check box	<p>If checked, the associated QoS class is configured on the fabric interconnect and can be assigned to a QoS policy.</p> <p>If unchecked, the class is not configured on the fabric interconnect and any QoS policies associated with this class default to Best Effort Priority.</p> <p>Note This field is always checked for Best Effort Priority and Fibre Channel Priority.</p>
Cos field	<p>The class of service. You can enter an integer value between 0 and 6, with 0 being the lowest priority and 6 being the highest priority.</p> <p>Note This field is set to 7 for internal traffic and to any for Best Effort Priority. Both of these values are reserved and cannot be assigned to any other priority.</p>
Packet Drop check box	<p>If checked, packet drop is allowed for this class. If unchecked, packets cannot be dropped during transmission.</p> <p>Besides the Fibre Channel Priority class, which never allows dropped packets, only one other class can have this field unchecked.</p>
Weight drop-down list	<p>This can be:</p> <ul style="list-style-type: none"> • An integer between 1 and 10. If you enter an integer, Cisco UCS determines the percentage of network bandwidth assigned to the priority level as described in the Weight (%) field. • best-effort. • none.
Weight (%) field	<p>To determine the bandwidth allocated to a channel, Cisco UCS:</p> <ol style="list-style-type: none"> 1 Adds the weights for all of the channels 2 Divides the channel weight by the sum of all weights to get a percentage

Name	Description
	3 Allocates that percentage of the bandwidth to the channel
MTU drop-down list	The maximum transmission unit for the channel. This can be: <ul style="list-style-type: none"> • An integer between 1538 and 9216. This value corresponds to the maximum packet size. • fc—A predefined packet size of 2240. • normal—A predefined packet size of 1359. <p>Note This field is always set to fc for Fibre Channel Priority.</p>
Multicast Optimized check box	If checked, the class is optimized to send packets to multiple destinations simultaneously. <p>Note This option is not applicable to the Fibre Channel Priority.</p>

Step 5 Click **Save Changes**.

Creating a QoS Policy

Procedure

- Step 1** In the **Navigation** pane, click the **LAN** tab.
- Step 2** In the **LAN** tab, expand **LAN ► Policies**.
- Step 3** Expand the node for the organization where you want to create the pool. If the system does not include multi-tenancy, expand the **root** node.
- Step 4** Right-click **QoS Policy** and select **Create QoS Policy**.
- Step 5** In the **Create QoS Policy** dialog box:
- In the **Name** field, enter a unique name for the policy.
 - From the **Priority** drop-down list, select the system class you want to assign to traffic through the vNIC.
 - Click **OK**.
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What to Do Next

Include the QoS policy in a vNIC template.

Deleting a QoS Policy

If you delete a QoS policy that is in use or disable a system class that is used in a QoS policy, any vNIC which uses that QoS policy is assigned to the Best Effort Priority system class. In a system that implements multi-tenancy, Cisco UCS Manager first attempts to find a matching QoS policy in the organization hierarchy.

Procedure

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- Step 1** In the **Navigation** pane, click the **LAN** tab.
 - Step 2** On the **Servers** tab, expand **Servers** ► **Policies** ► *Organization_Name*.
 - Step 3** Expand the **QoS Policies** node.
 - Step 4** Right-click the QoS policy you want to delete and select **Delete**.
 - Step 5** If Cisco UCS Manager displays a confirmation dialog box, click **Yes**.
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Creating a Flow Control Policy

Before You Begin

Configure the network port with the corresponding setting for the flow control that you need. For example, if you enable the send setting for flow-control pause frames in the policy, make sure that the receive parameter in the network port is set to on or desired. If you want the Cisco UCS port to receive flow-control frames, make sure that the network port has a send parameter set to on or desired. If you do not want to use flow control, you can set the send and receive parameters on the network port to off.

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 **Flow Control Policies** node and select **Create Flow Control Policy**.
 - Step 5** In the **Create Flow Control Policy** wizard, 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.
Priority field	This can be:

Name	Description
	<ul style="list-style-type: none"> • auto—Cisco UCS and the network negotiate whether PPP is used on this fabric interconnect • on—PPP is enabled on this fabric interconnect
Receive field	This can be: <ul style="list-style-type: none"> • off—Pause requests from the network are ignored and traffic flow continues as normal • on—Pause requests are honored and all traffic is halted on that uplink port until the network cancels the pause request
Send field	This can be: <ul style="list-style-type: none"> • off—Traffic on the port flows normally regardless of the packet load. • on—Cisco UCS sends a pause request to the network if the incoming packet rate becomes too high. The pause remains in effect for a few milliseconds before traffic is reset to normal levels.

Step 6 Click OK.

What to Do Next

Associate the flow control policy with an uplink Ethernet port or port channel.

Deleting a Flow Control Policy

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 **Flow Control Policies** node.
- Step 4** Right-click the policy you want to delete and select **Delete**.
- Step 5** If Cisco UCS Manager displays a confirmation dialog box, click **Yes**.