Aggregate EtherChannel Quality of Service

The Aggregate EtherChannel Quality of Service (QoS) feature allows you to apply an aggregate egress-queuing policy-map on a port-channel main interface or subinterface. This feature enables QoS support on the aggregate port-channel main interface for the Cisco ASR 1000 Series Aggregation Services Routers.

- Restrictions for Aggregate EtherChannel Quality of Service, on page 1
- Information About Aggregate EtherChannel Quality of Service, on page 2
- How to Configure Aggregate EtherChannel Quality of Service, on page 3
- How to Unconfigure Aggregate EtherChannel Quality of Service, on page 4
- Configuration Examples for Aggregate EtherChannel Quality of Service, on page 5
- How to Configure Aggregate EtherChannel Subinterface Quality of Service, on page 6
- How to Unconfigure Aggregate EtherChannel Subinterface Quality of Service, on page 8
- Configuration Examples for Aggregate EtherChannel Subinterface Quality of Service, on page 9
- Additional References, on page 10
- Feature Information for Aggregate EtherChannel Quality of Service, on page 11

Restrictions for Aggregate EtherChannel Quality of Service

- The configuration of QoS on Ethernet Virtual Circuit (EVC) with an aggregate port-channel interface is not supported.
- Point-to-Point Protocol over Ethernet (PPPoE) and IP over Ethernet (IPoE) sessions in the context of the Intelligent Services Gateway (ISG) and Intelligent Wireless Access Gateway (iWAG) (with or without QoS) across an aggregate port-channel interface is not supported.
- Virtual Private LAN Services (VPLS) with QoS on an aggregate port-channel interface is not supported.
- Xconnect with QoS on an aggregate port-channel interface is not supported.
- The use of fragment and service-fragment Modular QoS CLI (MQC) keywords in conjunction with the aggregate port-channel interface type is not supported.
- The aggregate-type port-channel interfaces have the following limitations:
  - All the member links of a port channel must be of the same speed. This prevents a potential packet reordering issue. It is not supported to combine Gigabit Ethernet, Fast Ethernet, or Ethernet interfaces into the same port channel.
• 10-Gigabit Ethernet is supported in Cisco IOS XE 3.16.3 or later (it is not supported in Cisco IOS XE 3.17). 10-Gigabit Ethernet is also supported in Cisco IOS XE Denali 16.3 and later.

• MPOL policy applied on both aggregate port-channel main interface and port-channel sub-interface is not supported by any Cisco IOS XE 3S release and is not supported on Cisco IOS XE Everest 16.5.x or earlier.

• QoS on an aggregate port-channel subinterface is not supported for Cisco IOS XE 3.16.2 or earlier (and it is also not supported in Cisco IOS XE 3.17).

### Information About Aggregate EtherChannel Quality of Service

#### Supported Features for Aggregate EtherChannel Quality of Service

The Aggregate EtherChannel Quality of Service feature supports:

• Flow-based load balancing

• Up to three levels of hierarchy

• Configuration of shaping, absolute bandwidth, and relative bandwidth

• A minimum amount of bandwidth for subclasses (VLANs)

• Input QoS (policing and marking) and output QoS (all queuing features) that are enabled simultaneously on an aggregate port-channel main interface and subinterface

#### Unsupported Feature Combinations for Aggregate EtherChannel Quality of Service

The following combinations of tunnel-type interfaces with QoS are not supported:

• Generic Routing Encapsulation (GRE) tunnels with queuing policy-maps applied, which egress via a port channel with aggregate queuing

• Static virtual tunnel interface (SVTI) and dynamic virtual tunnel interface (DVTI ) with queuing QoS applied, which egress via a port channel with aggregate queuing

• Sub-interface belongs to service group and sub-interface applied with service-policy cannot be configured on the same aggregate port-channel simultaneously

• MPOL - policy applied on both aggregate port-channel main interface and port-channel sub-interface

---

**Note**

Tunnels without queuing QoS (described above) are supported, but are not recommended because hashing algorithms may overload a given physical interface without adequate diversity in IP addresses.
Scalability for Aggregate EtherChannel Quality of Service

The QoS policy can be applied to an aggregate port-channel interface subject to the following scalability limits:

- Up to 8 port channels
- Up to 4 member links in a port channel
- Member links can be split across multiple shared port adapters (SPAs) and SPA interface processor (SIP) cards

How to Configure Aggregate EtherChannel Quality of Service

This procedure describes how to configure Aggregate EtherChannel QoS on the Cisco ASR 1000 Series Aggregation Services Routers.

SUMMARY STEPS

1. `enable`
2. `configure terminal`
3. `platform qos port-channel-aggregate port-channel-number`
4. `interface port-channel port-channel-number`
5. `service-policy {output} policy-map`
6. `service-policy {input} policy-map`

DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> <code>enable</code></td>
<td>Enables privileged EXEC mode. Enter your password if prompted.</td>
</tr>
<tr>
<td><strong>Example:</strong> Router&gt; enable</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong> <code>configure terminal</code></td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td><strong>Example:</strong> Router# configure terminal</td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong> <code>platform qos port-channel-aggregate port-channel-number</code></td>
<td>Enables the aggregate port-channel interface.</td>
</tr>
<tr>
<td><strong>Example:</strong> router(config)# platform qos port-channel-aggregate 1</td>
<td></td>
</tr>
<tr>
<td><strong>Step 4</strong> <code>interface port-channel port-channel-number</code></td>
<td>Enters interface configuration mode to configure a specific port channel.</td>
</tr>
<tr>
<td><strong>Example:</strong> router(config)# interface port-channel 1</td>
<td></td>
</tr>
</tbody>
</table>
Attaches a policy-map to an output interface to be used as the service policy for that interface.

```
Step 5
service-policy (output) policy-map
Example:
router(config-if)# service-policy output egress_policy
```

Attaches a policy-map to an input interface to be used as the service policy for that interface.

```
Step 6
service-policy (input) policy-map
Example:
router(config-if)# service-policy input ingress_policy
```
Configuration Examples for Aggregate EtherChannel Quality of Service

Example: Configuring Aggregate Port-Channel Interface

```plaintext
Router# configure terminal
Router(config)# platform qos port-channel-aggregate 1
Router(config)# interface port-channel 1
Router(config-if)# interface GigabitEthernet1/0/1
Router(config-if)# channel-group 1
Router(config-if)# interface GigabitEthernet1/0/0
Router(config-if)# channel-group 1
Router(config-if)# interface port-channel 1.1
Router(config-subif)# encap
Router(config-subif)# encapsulation dot
Router(config-subif)# encapsulation dot1Q 2
Router(config-subif)# ip addr 14.0.1.2 255.255.255.0
Router(config-subif)# interface port-channel 1.2
Router(config-subif)# encapsulation dot1Q 3
Router(config-subif)# ip addr 14.0.2.2 255.255.255.0
Router(config-subif)# interface port-channel 1.3
Router(config-subif)# encapsulation dot1Q 4
Router(config-subif)# ip addr 14.0.3.2 255.255.255.0
Router(config-subif)# end
```

Example: Configuring a Class Map for QoS

```plaintext
Router# configure terminal
Router(config)# class-map vlan_2
Router(config-cmap)# match vlan 2
Router(config-cmap)# class-map vlan_3
Router(config-cmap)# match vlan 3
Router(config-cmap)# class-map vlan_4
Router(config-cmap)# match vlan 4
Router(config-cmap)# class-map prec1
Router(config-cmap)# match precedence 1
Router(config-cmap)# class-map prec2
Router(config-cmap)# match precedence 2
Router(config-cmap)# class-map prec3
Router(config-cmap)# match precedence 3
Router(config-cmap)# class-map prec4
Router(config-cmap)# match precedence 4
Router(config-cmap)# end
```

Example: Configuring a Policy-Map for QoS

```plaintext
Router# configure terminal
Router(config)# policy-map child-vlan
Router(config-pmap)# class precl
Router(config-pmap-c)# police cir percent 20
Router(config-pmap-c-policy)# exit
Router(config-pmap-c)# priority level 1
```
Example: Applying QoS to Port Channel Interface

Router# configure terminal
Router(config)# interface port-channel 1
Router(config-if)# service-policy output egress_policy
Router(config-if)# service-policy input ingress_policy
Router(config-if)# end

How to Configure Aggregate EtherChannel Subinterface Quality of Service

SUMMARY STEPS

1. enable
2. configure terminal
3. platform qos port-channel-aggregate port-channel-number
4. interface port-channel port-channel-number
5. interface port-channel port-channel-number.subinterface-number
6. service-policy {output} policy-map
7. service-policy {input} policy-map
8. end
### DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
</table>
| **Step 1**  
**Example:**  
Device> enable                                               | Enables privileged EXEC mode.                                                                                                         |
| **Step 1**  
**Example:**  
Device> enable                                               | Enter your password if prompted.                                                                                                     |
| **Step 2**  
**Example:**  
Device# configure terminal                                  | Enters global configuration mode.                                                                                                    |
| **Step 3**  
**Example:**  
Device(config)# platform qos port-channel-aggregate 1       | Enables the aggregate port-channel interface.                                                                                         |
| **Step 4**  
**Example:**  
Device(config)# interface port-channel 1                    | Enters interface configuration mode to configure a specific port channel.                                                           |
| **Step 5**  
**Example:**  
Device(config)# interface port-channel 1.2                  | Enters interface configuration mode to configure a specific port channel subinterface.                                               |
| **Step 6**  
**Example:**  
Device(config-if)# service-policy output egress_policy       | Attaches a policy-map to an output interface to be used as the service policy for that interface.                                   |
| **Step 7**  
**Example:**  
Device(config-if)# service-policy input ingress_policy      | Attaches a policy-map to an input interface to be used as the service policy for that interface.                                    |
| **Step 8**  
**Example:**  
Device(config)# end                                          | Exits global configuration mode.                                                                                                     |
How to Unconfigure Aggregate EtherChannel Subinterface Quality of Service

SUMMARY STEPS

1. enable
2. configure terminal
3. no interface port-channel port-channel-number.subinterface
4. no platform qos port-channel-aggregate port-channel-number
5. end

DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> enable</td>
<td>Enables privileged EXEC mode. Enter your password if prompted.</td>
</tr>
<tr>
<td><strong>Example:</strong> Device&gt; enable</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong> configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td><strong>Example:</strong> Device# configure terminal</td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong> no interface port-channel port-channel-number.subinterface</td>
<td>Unconfigures a specific port channel subinterface.</td>
</tr>
<tr>
<td><strong>Example:</strong> Device(config)# no interface port-channel 1.2</td>
<td></td>
</tr>
<tr>
<td><strong>Step 4</strong> no platform qos port-channel-aggregate port-channel-number</td>
<td>Disables the aggregate port-channel interface and removes the required QoS policies on it.</td>
</tr>
<tr>
<td><strong>Example:</strong> Device(config)# no platform qos port-channel-aggregate 1</td>
<td></td>
</tr>
<tr>
<td><strong>Step 5</strong> end</td>
<td>Exits global configuration mode.</td>
</tr>
<tr>
<td><strong>Example:</strong> Device(config)# end</td>
<td></td>
</tr>
</tbody>
</table>
Configuration Examples for Aggregate EtherChannel Subinterface Quality of Service

Example: Configuring Aggregate Port-Channel Interface and Subinterface

```
Device# configure terminal
Device(config)# platform qos port-channel-aggregate 2
Device(config)# interface port-channel 2
Device(config-if)# interface GigabitEthernet1/1/1
Device(config-if)# channel-group 2
Device(config-if)# interface GigabitEthernet1/1/0
Device(config-if)# channel-group 2
Device(config-if)# interface port-channel 2.200
Device(config-subif)# encapsulation dot1Q 200
Device(config-subif)# ip addr 15.0.1.2 255.255.255.0
Device(config-subif)# interface port-channel 2.300
Device(config-subif)# encapsulation dot1Q 300
Device(config-subif)# ip addr 15.0.2.2 255.255.255.0
Device(config-subif)# end
```

Example: Configuring a Class Map for QoS

```
Device# configure terminal
Device(config)# class-map vlan_2
Device(config-cmap)# match vlan 2
Device(config-cmap)# class-map vlan_3
Device(config-cmap)# match vlan 3
Device(config-cmap)# class-map vlan_4
Device(config-cmap)# match vlan 4
Device(config-cmap)# class-map prec1
Device(config-cmap)# match precedence 1
Device(config-cmap)# class-map prec2
Device(config-cmap)# match precedence 2
Device(config-cmap)# class-map prec3
Device(config-cmap)# match precedence 3
Device(config-cmap)# class-map prec4
Device(config-cmap)# match precedence 4
Device(config-cmap)# end
```

Example: Configuring a Policy-Map for QoS

```
Device# configure terminal
Device(config)# policy-map subinterface_child
Device(config-pmap)# class prec1
Device(config-pmap-c)# police cir percent 30
Device(config-pmap-c-police)# exit
Device(config-pmap-c)# priority level 1
Device(config-pmap-c)# class prec2
Device(config-pmap-c)# police cir percent 30
Device(config-pmap-c-police)# exit
Device(config-pmap-c)# priority level 2
Device(config-pmap-c)# class prec3
```
Example: Applying QoS to Port Channel Subinterface

Device(config-pmap-c)# bandwidth remaining ratio 3
Device(config-pmap-c)# class class-default
Device(config-pmap-c)# bandwidth remaining ratio 1
Device(config-pmap-c)#!
Device(config-pmap-c)# policy-map sub_egress_policy
Device(config-pmap-c)# class class-default
Device(config-pmap-c)# shape average 300000000
Device(config-pmap-c)# service-policy subinterface_child
Device(config-pmap-c)#!
Device(config-pmap-c)# policy-map sub_ingress_policy
Device(config-pmap-c)# class class-default
Device(config-pmap-c)# police cir 80000000
Device(config-pmap-c)# end

Example: Applying QoS to Port Channel Subinterface

Device# configure terminal
Device(config)# interface port-channel 2.200
Device(config-if)# service-policy output egress_policy
Device(config-if)# service-policy input ingress_policy
Device(config)# interface port-channel 2.300
Device(config-if)# service-policy output egress_policy
Device(config-if)# service-policy input ingress_policy
Device(config-if)# end

Additional References

Related Documents

<table>
<thead>
<tr>
<th>Related Topic</th>
<th>Document Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco IOS commands</td>
<td>Cisco IOS Master Commands List, All Releases</td>
</tr>
<tr>
<td>QoS commands</td>
<td>Cisco IOS Quality of Service Solutions Command Reference</td>
</tr>
</tbody>
</table>

MIBs

<table>
<thead>
<tr>
<th>MIB</th>
<th>MIBs Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>No new or modified MIBs are supported by this feature.</td>
<td>To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a></td>
</tr>
</tbody>
</table>
Technical Assistance

<table>
<thead>
<tr>
<th>Description</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</td>
<td><a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a></td>
</tr>
</tbody>
</table>

Feature Information for Aggregate EtherChannel Quality of Service

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support.
To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1: Feature Information for Aggregate EtherChannel Quality of Service

<table>
<thead>
<tr>
<th>Feature Name</th>
<th>Releases</th>
<th>Feature Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregate EtherChannel Quality of Service</td>
<td>Cisco IOS XE Release 3.12S</td>
<td>The Aggregate EtherChannel Quality of Service (QoS) feature allows you to apply an aggregate egress-queuing policy-map on a port-channel main interface or subinterface. This feature enables QoS support on the aggregate port-channel main interface for the Cisco ASR 1000 Series Aggregation Services Routers. In Cisco IOS XE Release 3.12S, this feature was implemented on the Cisco ASR 1000 Series Aggregation Services Routers.</td>
</tr>
<tr>
<td>Aggregate GEC QoS 10G support</td>
<td>Cisco IOS XE Release 3.16.3S Cisco IOS XE Denali 16.3.1</td>
<td>In Cisco IOS XE Release 3.16.3S, this feature was implemented on the Cisco ASR 1000 Series Aggregation Services Routers.</td>
</tr>
</tbody>
</table>
### Feature Information for Aggregate EtherChannel Quality of Service

<table>
<thead>
<tr>
<th>Feature Name</th>
<th>Releases</th>
<th>Feature Information</th>
</tr>
</thead>
</table>
| QoS on GEC portchannel subinterface on ASR1K | Cisco IOS XE Release 3.16.3S  
Cisco IOS XE Denali 16.3.1 | In Cisco IOS XE Release 3.16.3S, this feature was implemented on the Cisco ASR 1000 Series Aggregation Services Routers. |
| QoS on GEC portchannel subinterface on ISR 4000 | Cisco IOS XE Everest 16.6.1 | In Cisco IOS XE Everest 16.6.1 release, this feature was implemented on the Cisco ISR 4000 Series Integrated Services Routers. |