

## Chapter 15

# QoS Profile Overview

This chapter provides information for configuring an interface with QoS profiles on E-series routers.

QoS topics are discussed in the following sections:

- QoS Profile Overview on page 133
- Managing System Resources for Nodes and Queues on page 134
- Scaling Subscribers on the TFA ASIC with QoS on page 134

### QoS Profile Overview

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You create an interface hierarchy for QoS by configuring a QoS profile that specifies queue profiles, drop profiles, statistics profiles, and scheduler profiles in combination with interface types. A QoS profile specifies the queue, drop statistics gathering, and scheduler configuration for a subtree of the interface hierarchy. The QoS profile controls the way scheduler nodes, queues, and shadow nodes are bound to the interfaces above its attachment point in the interface hierarchy.

You can attach a QoS profile to the interface at the base of the subtree hierarchy, an ATM VP, or an S-VLAN. For example, a QoS profile attached to an ATM port specifies queuing attributes for interfaces of all types that are stacked over the port.

### Related Topics

- Supported Interface Types for QoS Profiles on page 137
- Configuring a QoS Profile on page 138

## Managing System Resources for Nodes and Queues

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The type of ASIC that each line module uses determines the system resources for nodes and queues.

Line modules with the EFA ASIC hardware provide 85,000 descriptors that are shared between all nodes and queues. Each line module supports a maximum of 49,000 nodes or queues per line module.

Line modules with the FFA ASIC hardware provide 2000 level 1 nodes or queues and 64,000 level 2 nodes or queues. The ES2 4G LM provides 2000 level 1 nodes or queues and 128,000 level 2 nodes or queues. The router implicitly creates the level 2 node. Each line module supports a maximum of 64,000 nodes or queues per line module.

Line modules with the TFA ASIC hardware provide 96,000 descriptors that are shared between all nodes and queues. Each line module supports a maximum of 64,000 nodes or queues.

### Related Topics

- To identify the type of ASIC used by a line module, see the *ERX Module Guide* and the *E120 and E320 Module Guide*
- Scaling Subscribers on the TFA ASIC with QoS on page 134
- For more information about system resource requirements for shadow nodes, see *Managing System Resources for Shadow Nodes* on page 158
- For information about egress memory available on ASIC line modules, see *Memory Requirements for Queue and Buffers* on page 19

## Scaling Subscribers on the TFA ASIC with QoS

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The TFA ASIC on the ES2 10G LM supports a total of 32,000 nodes; however, it requires that each queue stack above a node at both level 1 and level 2, and it cannot skip a level in the scheduler hierarchy. The FFA ASIC also requires that each queue stack above a node at both level 1 and 2, but it also offers more nodes, so the scheduler hierarchy requirement is not as visible. The EFA ASIC does not require queues to stack above any level.

Because the TFA ASIC cannot skip a level in the hierarchy and also offers a smaller amount of nodes, scaling subscribers for triple-play configurations can exhaust node resources. For example, the ethernet-default QoS profile specifies both an IP and a VLAN node. Configuring 16,000 IP over VLAN subinterfaces consumes all 32,000 nodes, with no node resources remaining for other traffic-class groups. By carefully configuring queues on the TFA ASIC, you can scale up to 16,000 subscribers for multiple traffic-class groups in a triple-play configuration.

To conserve nodes on the TFA ASIC, you could apply one of the following configurations:

- If the configuration includes IP and VLANs, you can configure shapers within those queues to control service throughout. For example, in a triple-play environment with voice, video, and data service, you might want to limit the overall rate of traffic using a shared shaper.

At the same time, you might want to individually restrict the maximum rate of each of the services. To conserve node usage, attach shapers to the queue for each service, and attach the shared shaper to the best-effort queue. These queues must be at level 3 in the scheduler hierarchy. Typically, aggregation nodes such as an S-VLAN are placed at level 2. The VLAN queues then feed in to the S-VLAN nodes, which then feed to the level 1 nodes below.

If you do not create a QoS hierarchy with queues at level 3, the system adds phantom nodes to enforce this requirement. To display the hierarchy that is created for the subscriber on the line module, issue the **show qos scheduler-hierarchy** command.

- If the configuration includes S-VLANs, you could configure S-VLAN nodes in the default traffic-class group. Combining S-VLAN and VLAN nodes uses fewer resources than when you combine IP and VLAN nodes. You can also configure additional S-VLAN nodes in other traffic-class groups.

In non-default traffic-class groups, you can configure a group node and VLAN queues. Although this apparently does not consume nodes, it does consume a hidden, phantom node for each queue, to satisfy the level requirement of the TFA ASIC.

Alternatively, use group nodes and shadow nodes.

We recommend that you configure an Ethernet shadow node in the group with the following QoS profile rule:

```
host1(config-qos-profile)#ethernet shadow-node group groupname
```

This rule stacks another node over the group node, so all VLAN queues are stacked above the single shadow node. No nodes are consumed in the traffic-class group.

## Related Topics

- For more information about system resource requirements for shadow nodes, see *Managing System Resources for Shadow Nodes* on page 158
- For QoS system maximums, see *JUNOS Release Notes, Appendix A, System Maximums*
- Monitoring the QoS Profiles Attached to an Interface on page 335

