

Integrating the HRR Scheduler and SAR Scheduler

The proper integration of the two schedulers is an important element of the router's ATM QoS support. Three QoS port modes control integration of the two schedulers:

- Default integrated QoS port mode—ATM application controls the scheduling facilities of the SAR scheduler.
- Low-latency QoS port mode—HRR scheduler controls the traffic rate.
- Low-CDV QoS port mode—HRR scheduler and the SAR scheduler work together to schedule traffic.

Improper configuration of the two schedulers might create an inefficient scenario in which extra latency is introduced, or might cause the scheduler to underuse the link.

To configure integration of the schedulers, use the **qos-mode-port** commands listed in Table 1.

Table 1: qos-mode-port Commands

| Command | Backpressure | SAR Buffering | Scheduling |
|--|--------------|---------------|-------------|
| no qos-mode-port (default integrated mode) | VC and port | significant | SAR |
| qos-mode-port low-cdv | port | normal | SAR and HRR |
| qos-mode-port low-latency | port | minimal | HRR |
| qos-mode-port | port | minimal | HRR |



NOTE: For ERX7xx models, ERX14xx models, and the ERX310 router, the *qos-mode-port* commands are valid only for the major interface on port 0.

To properly integrate the schedulers, make sure that the HRR and the SAR schedulers shape packets at the same rate. If the HRR scheduler sends packets at a higher rate than the SAR scheduler shapes them, the SAR scheduler can become congested and block the entire port.

To manage the integration of the HRR and the SAR schedulers:

1. Specify the cell-based shaping mode.
See Configuring the QoS Shaping Mode for ATM Interfaces.
2. Configure low-CDV QoS port mode to ensure that the HRR and SAR schedulers are configured at the same rate.
See Configuring Low-CDV Mode for Per-Port Queuing on ATM Interfaces.
3. Configure the QoS application to control the SAR scheduler's operation. In this mode you configure both schedulers using scheduler profiles and QoS profiles.

The E Series router then ensures that VPs and VCs are shaped to the same rates in both schedulers.



NOTE: You can also use the QoS cell mode application with QoS parameters to manage the integration of HRR and SAR schedulers.

Specifying the QoS cell mode application with the **qos-parameter-define** command enables you to configure a port with either frame or cell shaping mode and then configure the port for low-CDV port mode.

- Related Topics**
- For more information about scheduler profiles, see Scheduler Hierarchy Overview
 - For more information about configuring QoS profiles, see QoS Profile Overview
 - For more information about configuring QoS parameters, see QoS Parameter Overview

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