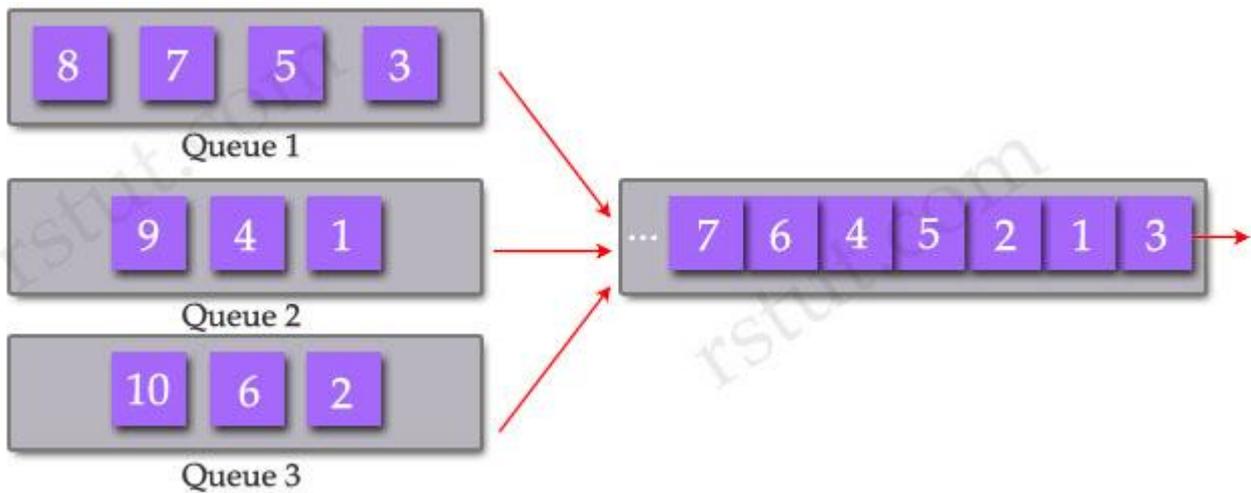


Round Robin Shaping

The round robin uses multiple queues and dispatches one packet from each queue in each round with no prioritization. For example, it dispatches:

- Dispatch one packet from Queue 1
- Dispatch one packet from Queue 2
- Dispatch one packet from Queue 3
- Repeat from Queue 1

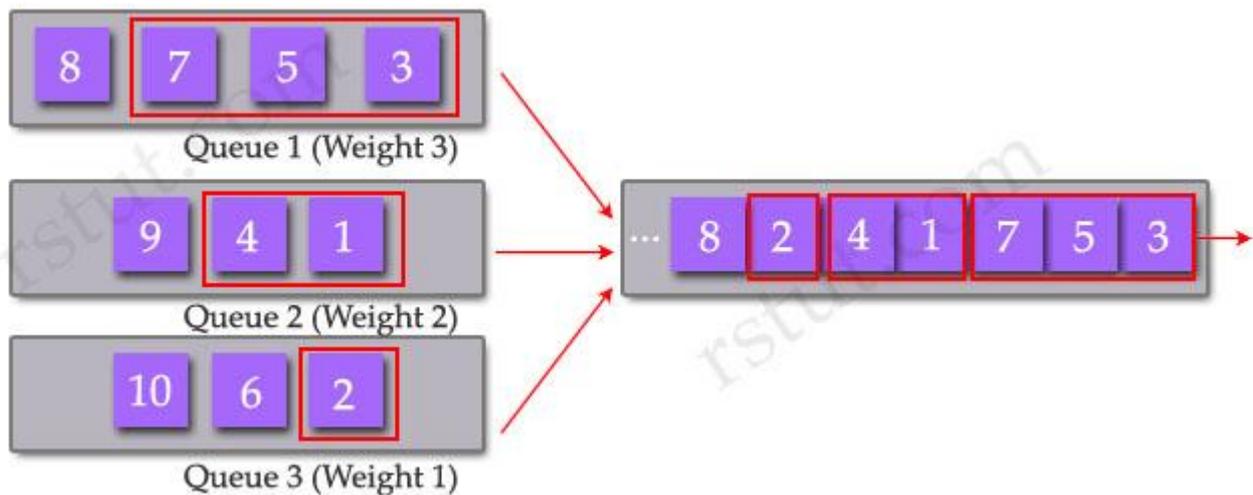


There are three implementations of Round Robin scheduling and they include Weighted Round Robin (WRR), Deficit Weighted Round Robin (DWRR) and Shaped Round Robin (SRR).

- The Weighted Round Robin allows prioritization, meaning that it assigns a “weight” to each queue and dispatches packets from each queue proportionally to an assigned weight.

For example:

- Dispatch 3 packets from Queue 1 (Weight 3)
- Dispatch 2 packets from Queue 2 (Weight 2)
- Dispatch 1 packet from Queue 1 (Weight 1)
- Repeat from Queue 1 (dispatch 3 next packets)



Unlike Priority Queuing, which always empties the first queue before going to the next queue, this kind of queue prevents starvation of other applications such as if a large download is in progress.

The Weighted Round Robin can be used with Strict Priority by setting its weight to 0. That means packets in the other queues will not be serviced until queue 4 is emptied.

The problem of WRR is the router is allowed to send the entire packet even if the sum of all bytes is more than the threshold and can make other applications starved.

The Deficit Round Robin solves problem of WRR by keeping track of the number of “extra” bytes dispatched in each round – the “deficit” and then add the “deficit” to the number of bytes dispatched in the next round.

Shaped Round Robin (SRR) is scheduling service for specifying the rate at which packets are dequeued. With SRR there are two modes, shaped and shared.

Shaped mode is only available on the egress queues. Shaped egress queues reserve a set of port bandwidth and then send evenly spaced packets as per the reservation. Shared egress queues are also guaranteed a configured share of bandwidth, but do not reserve the bandwidth.

In Shared mode, if a higher priority queue is empty, instead of the server waiting for that reserved bandwidth to expire, the lower priority queue can take the unused bandwidth. Neither shaped SRR nor shared SRR is better than the other. Shared SRR is used to get the maximum efficiency out of a queuing system, because unused time slots can be reused by queues with excess traffic. This is not possible in a standard Weighted Round Robin. Shaped SRR is used to shape a queue or set a hard limit on how much bandwidth a queue can use. When you use shaped SRR, you can shape queues within a port’s overall shaped rate.