

Multi-level Queue Prioritization

Purpose

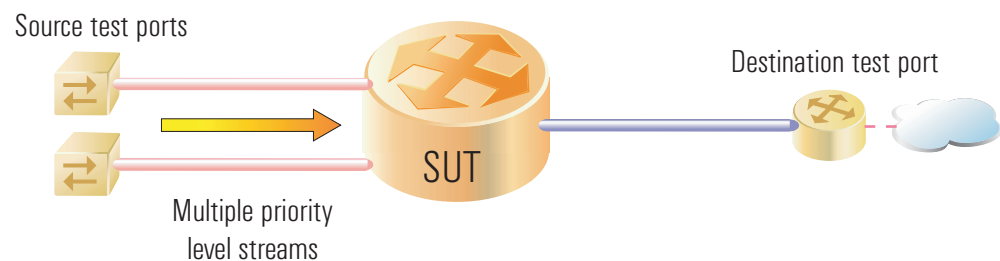
This test measures the basic ability of a router to deliver preferential quality of service for multiple priority streams.

Description

The test uses three test ports: two source and one destination. It sends multiple streams to the SUT from the source ports. Starting with the second highest priority stream, the traffic load is increased to oversubscribe the destination test port. The test then measures changes in throughput, latency, and packet loss in the higher priority stream to ensure that the oversubscription has affected lower priority streams only.

The traffic load on the low priority stream is gradually increased to oversubscribe the output (destination) port. The test then measures whether packets from the low priority stream were delayed and/or dropped.

Configuration



Procedure

- 1 Using a routing protocol, such as RIP or BGP-4, advertise a set of prefixes on the destination test port.
- 2 Send a specified number (N) of streams from the two source test ports to addresses advertised from the destination test port. Set each stream's bandwidth to $1/N^{\text{th}}$ of the zero-loss throughput of the destination test port, and give each stream a different priority level (i.e., give each stream a different ToS precedence level or diffserv priority level).
- 3 Benchmark the nominal packet loss, throughput, and latency for the high priority stream on the destination test port.
- 4 Starting with the second highest priority stream, vary the bandwidth until it oversubscribes the destination test port. Check that the higher priority stream is not affected. If the stream is limited to a certain maximum bandwidth, check that impairments occur to the lower priority streams up to the maximum bandwidth of the varying stream. Only when the varying stream exceeds the maximum bandwidth should packet loss, etc., be observed on the varying stream.
- 5 Repeat the test for each stream, checking that the higher priority streams remain unaffected by the oversubscription.

Variables

- Packet length.
- Time for test. Some routers have very large buffers which can accommodate large bursts of packets without losing packets (although they will exhibit increased packet latency). This needs to be considered.
- Prioritization mechanism and packet contents.

Results

Record the packet loss, throughput, and latency for each stream. The effect on high priority traffic should be minimized as low priority streams are varied.