

NAME

TAPRIO – Time Aware Priority Shaper

SYNOPSIS

```
tc qdisc ... dev dev parent classid [ handle major: ] taprio num_tc tcs
    map P0 P1 P2 ... queues count1@offset1 count2@offset2 ...
    base-time base-time clockid clockid
    sched-entry <command 1> <gate mask 1> <interval 1>
    sched-entry <command 2> <gate mask 2> <interval 2>
    sched-entry <command 3> <gate mask 3> <interval 3>
    sched-entry <command N> <gate mask N> <interval N>
```

DESCRIPTION

The TAPRIO qdisc implements a simplified version of the scheduling state machine defined by IEEE 802.1Q-2018 Section 8.6.9, which allows configuration of a sequence of gate states, where each gate state allows outgoing traffic for a subset (potentially empty) of traffic classes.

How traffic is mapped to different hardware queues is similar to **mqprio(8)** and so the **map** and **queues** parameters have the same meaning.

The other parameters specify the schedule, and at what point in time it should start (it can behave as the schedule started in the past).

PARAMETERS

num_tc Number of traffic classes to use. Up to 16 classes supported.

map

The priority to traffic class map. Maps priorities 0..15 to a specified traffic class. See **mqprio(8)** for more details.

queues

Provide count and offset of queue range for each traffic class. In the format, **count@offset**. Queue ranges for each traffic classes cannot overlap and must be a contiguous range of queues.

base-time

Specifies the instant in nanoseconds, using the reference of **clockid**, defining the time when the schedule starts. If 'base-time' is a time in the past, the schedule will start at

$\text{base-time} + (N * \text{cycle-time})$

where N is the smallest integer so the resulting time is greater than "now", and "cycle-time" is the sum of all the intervals of the entries in the schedule;

clockid

Specifies the clock to be used by qdisc's internal timer for measuring time and scheduling events.

sched-entry

There may multiple **sched-entry** parameters in a single schedule. Each one has the

sched-entry <command> <gatemask> <interval>

format. The only supported <command> is "S", which means "SetGateStates", following the IEEE

802.1Q-2018 definition (Table 8-7). <gate mask> is a bitmask where each bit is associated with a traffic class, so bit 0 (the least significant bit) being "on" means that traffic class 0 is "active" for that schedule entry. <interval> is a time duration, in nanoseconds, that specifies for how long that state defined by <command> and <gate mask> should be held before moving to the next entry.

EXAMPLES

The following example shows how a traffic schedule with three traffic classes ("num_tc 3"), which are separated into different traffic classes, we are going to call these TC 0, TC 1 and TC 2. We could read the "map" parameter below as: traffic with priority 3 is classified as TC 0, priority 2 is classified as TC 1 and the rest is classified as TC 2.

The schedule will start at instant 1528743495910289987 using the reference CLOCK_TAI. The schedule is composed of three entries each of 300us duration.

```
# tc qdisc replace dev eth0 parent root handle 100 taprio \
    num_tc 3 \
    map 2 2 1 0 2 2 2 2 2 2 2 2 2 2 2 2 \
    queues 1@0 1@1 2@2 \
    base-time 1528743495910289987 \
    sched-entry S 01 300000 \
    sched-entry S 02 300000 \
    sched-entry S 04 300000 \
    clockid CLOCK_TAI
```

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