MUM-EU-2013
@Zagreb, Croatia

QoS

RouterOS v6

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About Me

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MikroTik Training Center

- The first MikroTik Training Center in Asia Pasific, has taught at least 1600 participants (94 classes).
- Mikrotik Academy Coordinator.

RouterOS v6 Full Release almost ready!

now v6rc11/12

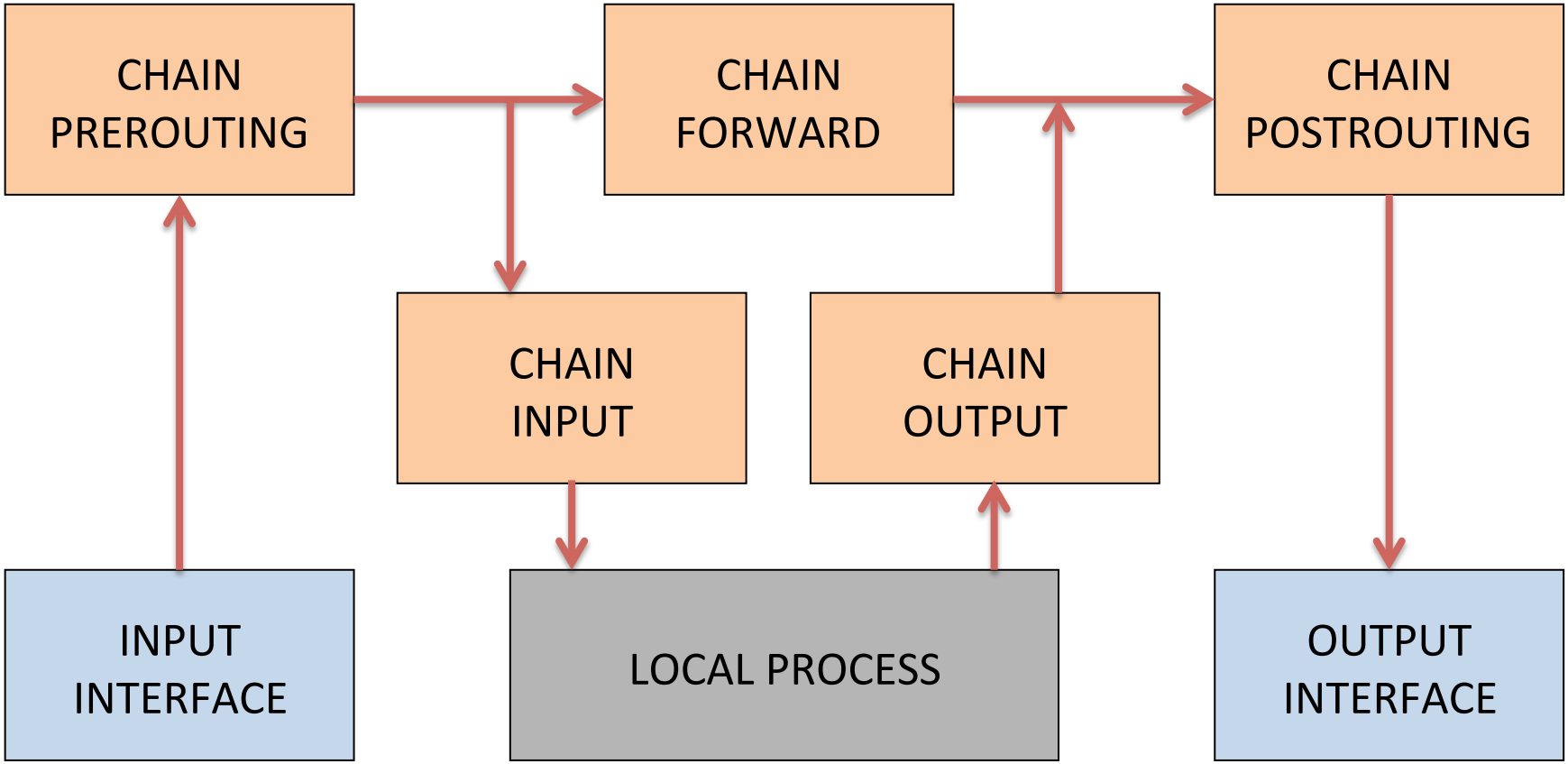
QoS

Some fundamental change
on RoS v6

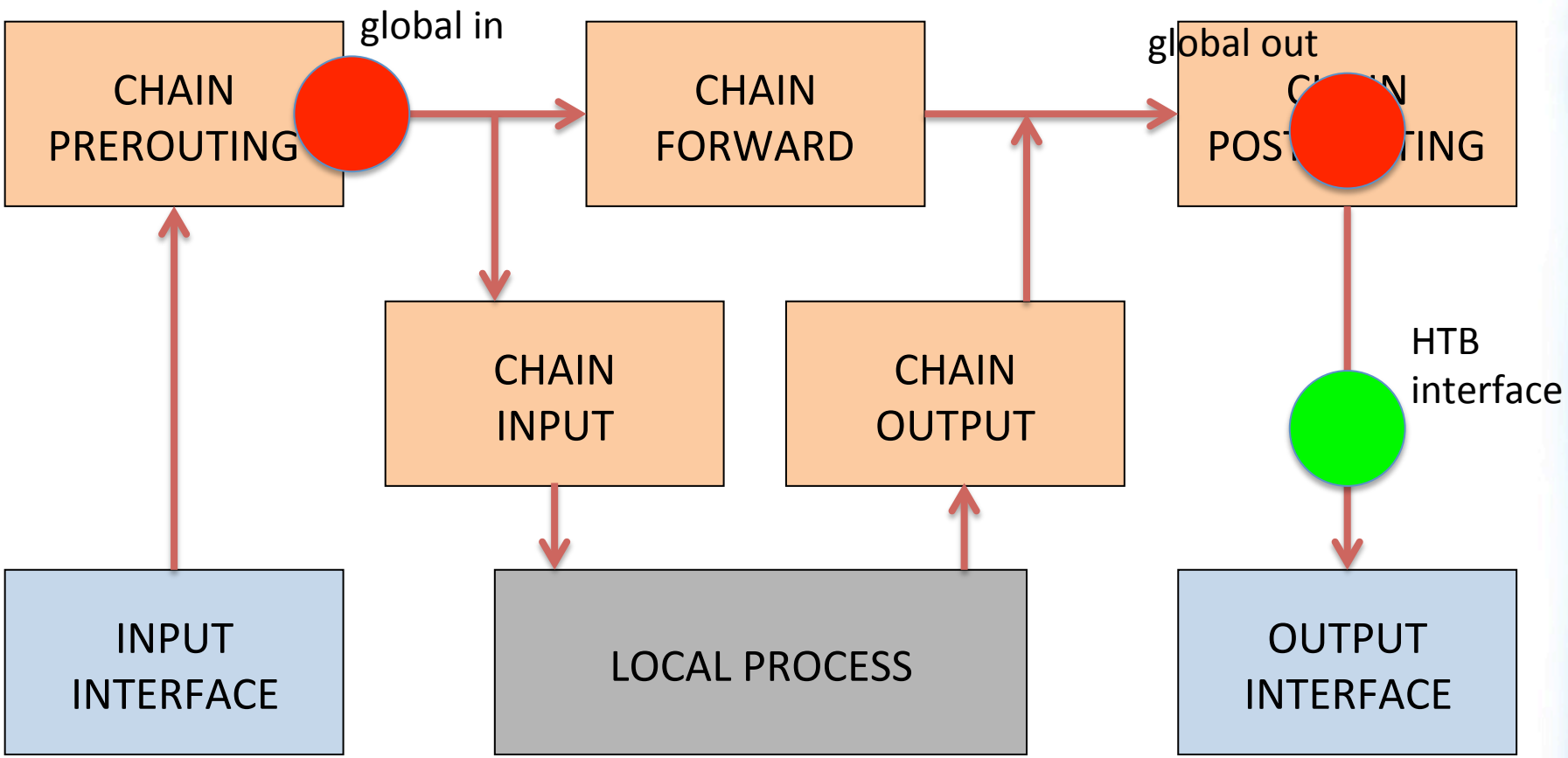
QoS di v5

- Simple Queue
  - queue will be done in global-in, global-out or global-total
- Queue Tree
  - queue on interface, or
  - in global-in, global-out or global-total

Packet Flow!


CHAIN
PREROUTING
CHAIN
FORWARD
CHAIN
POSTROUTING
CHAIN
INPUT
CHAIN
OUTPUT
INPUT
INTERFACE
LOCAL PROCESS
OUTPUT
INTERFACE

Packet Flow and QoS v5



QoS Problem in RoS v5

- No specific queue for traffic to the router, global-in will process the traffic into the router and the traffic through the router
- Two times queue processing (Global in and global out) for traffic through the router.

QoS Problem in RoS v5

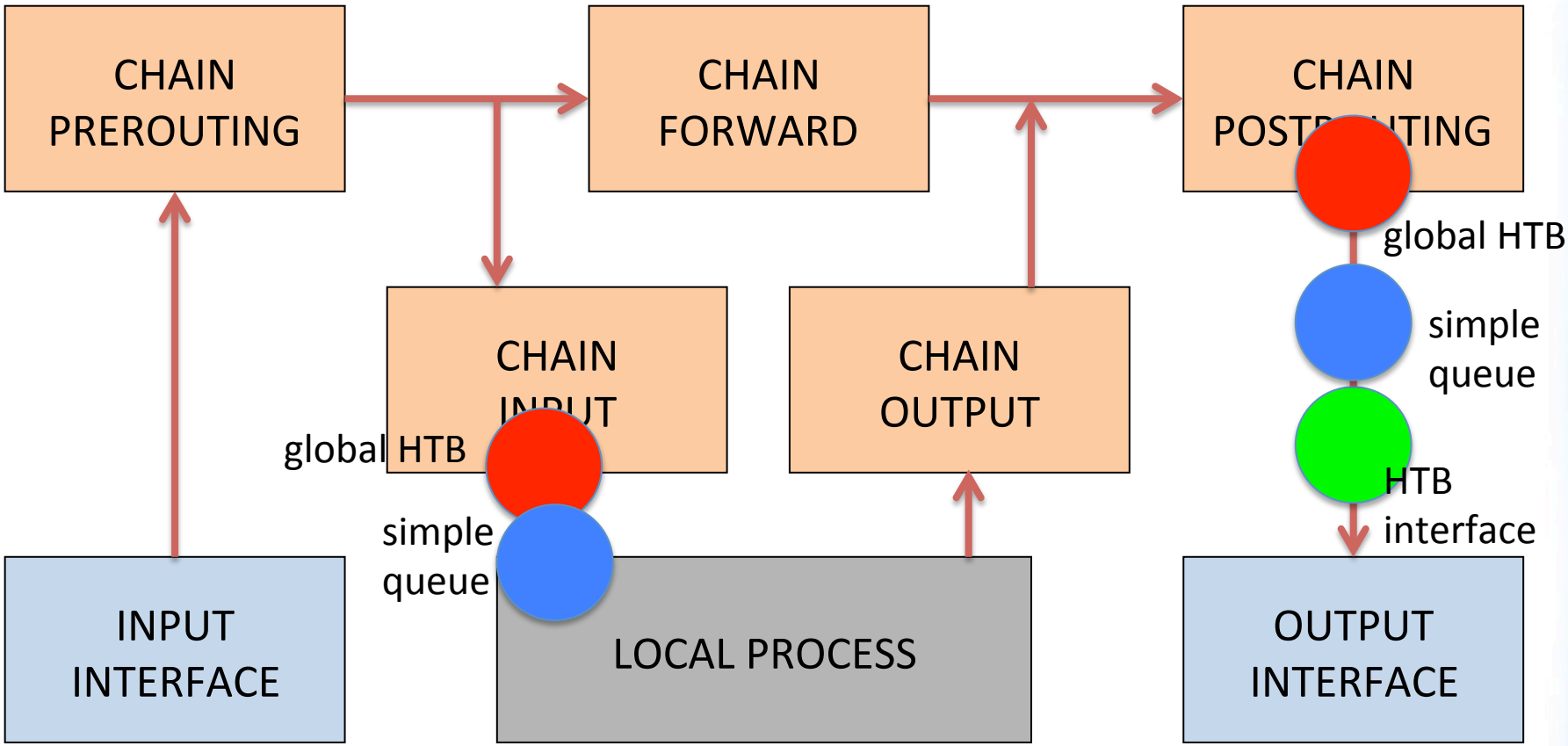
- Queue tree – PCQ on parent interface - natted network, queue for uplink traffic does not work perfectly, because PCQ done after src-nat
  - src-address already changed to router ip address in src-nat.
  - pcq see only one src-address

QoS RoS v6

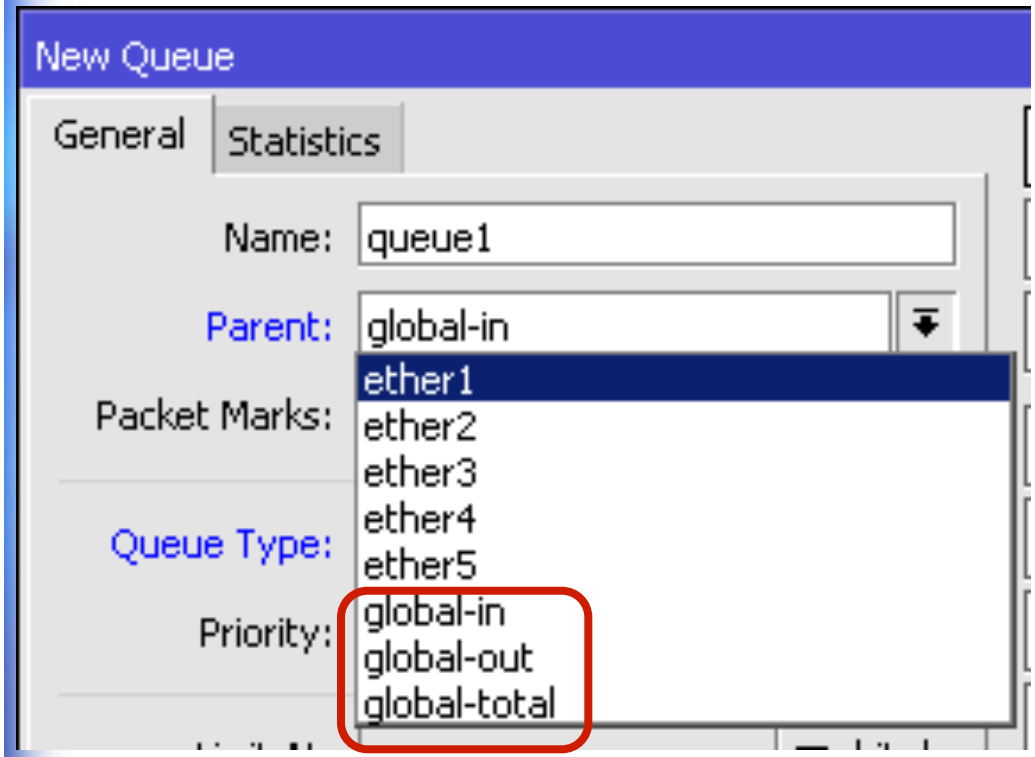
No more **global-in** and **global-out**, replaced by a "global" located after the "input" and at global-out position.

Simple queue is a specific process, located after “global”.

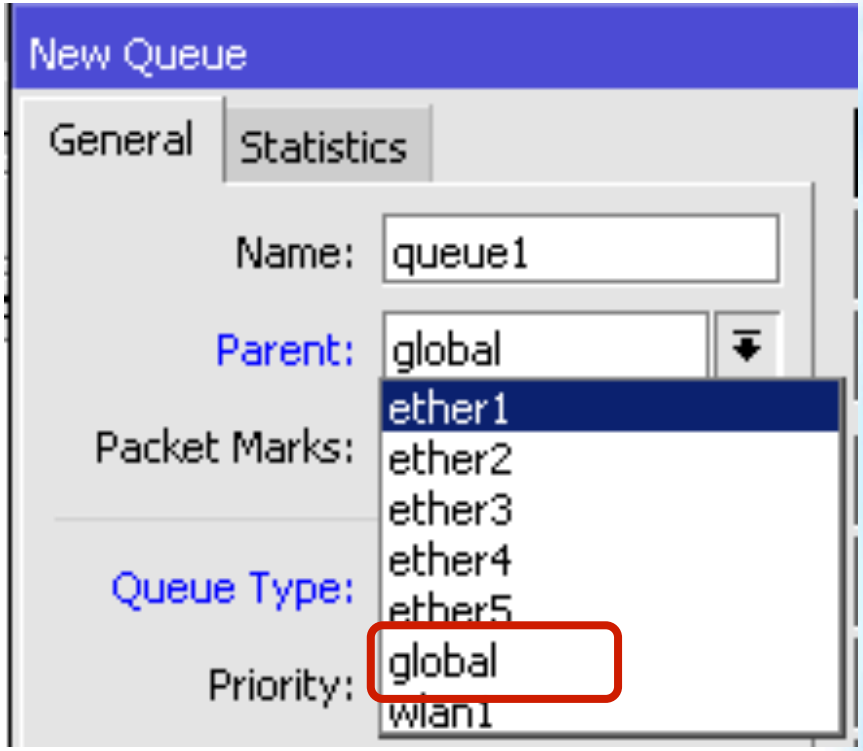
Packet Flow and QoS v6



Queue Tree v5 dan v6

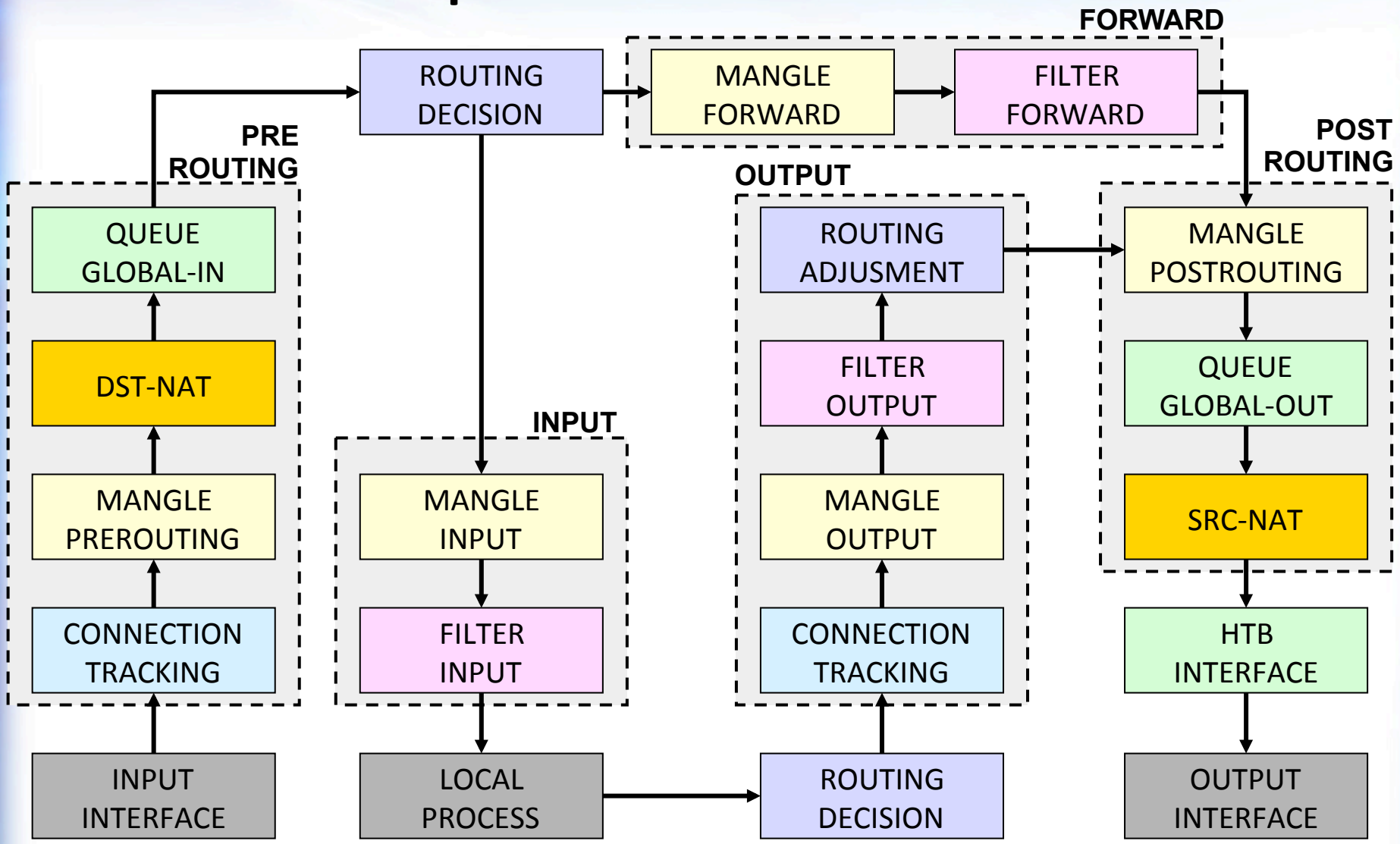


RoS v5

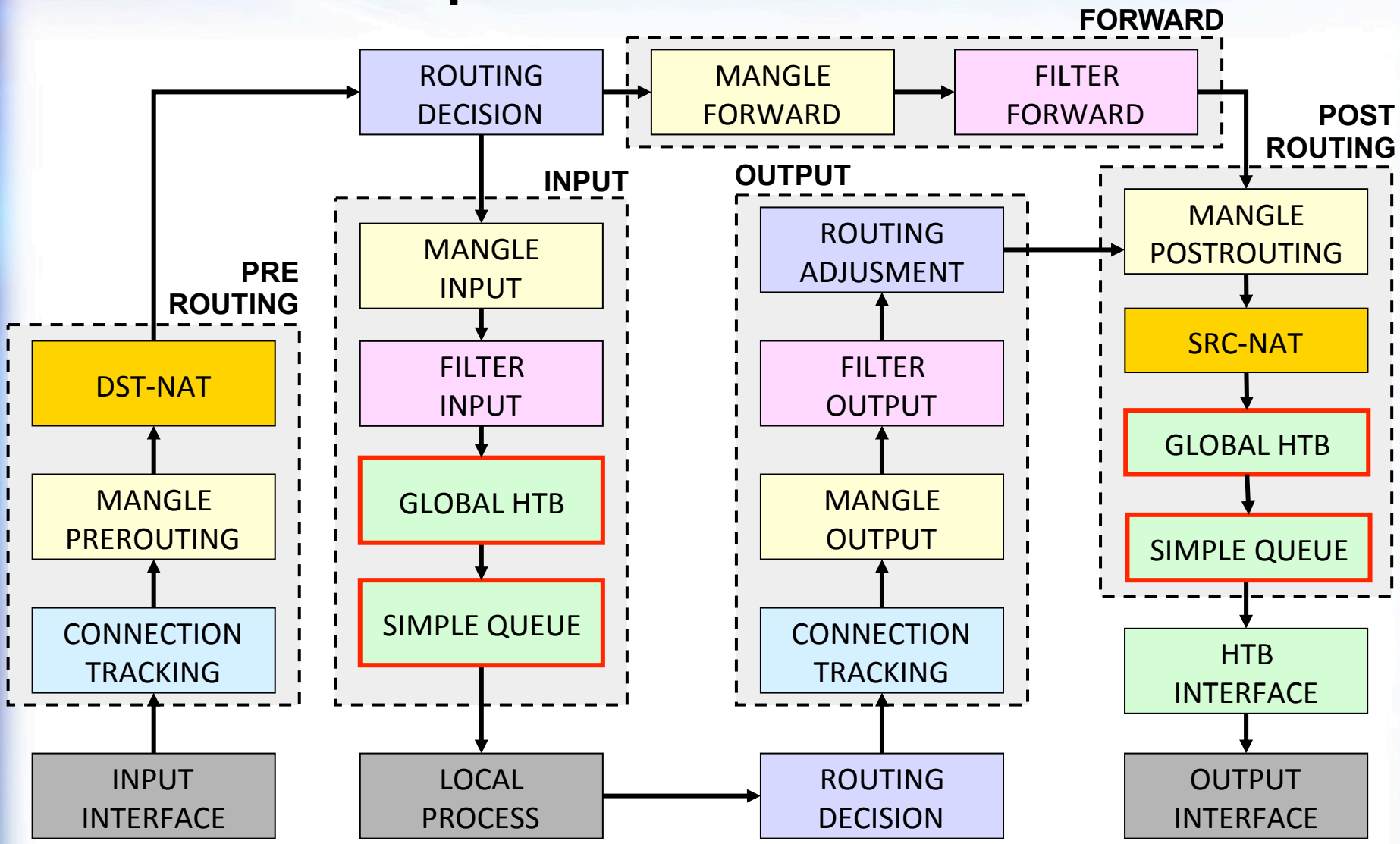


RoS v6

Simple Packet Flow v5



Simple Packet Flow v6



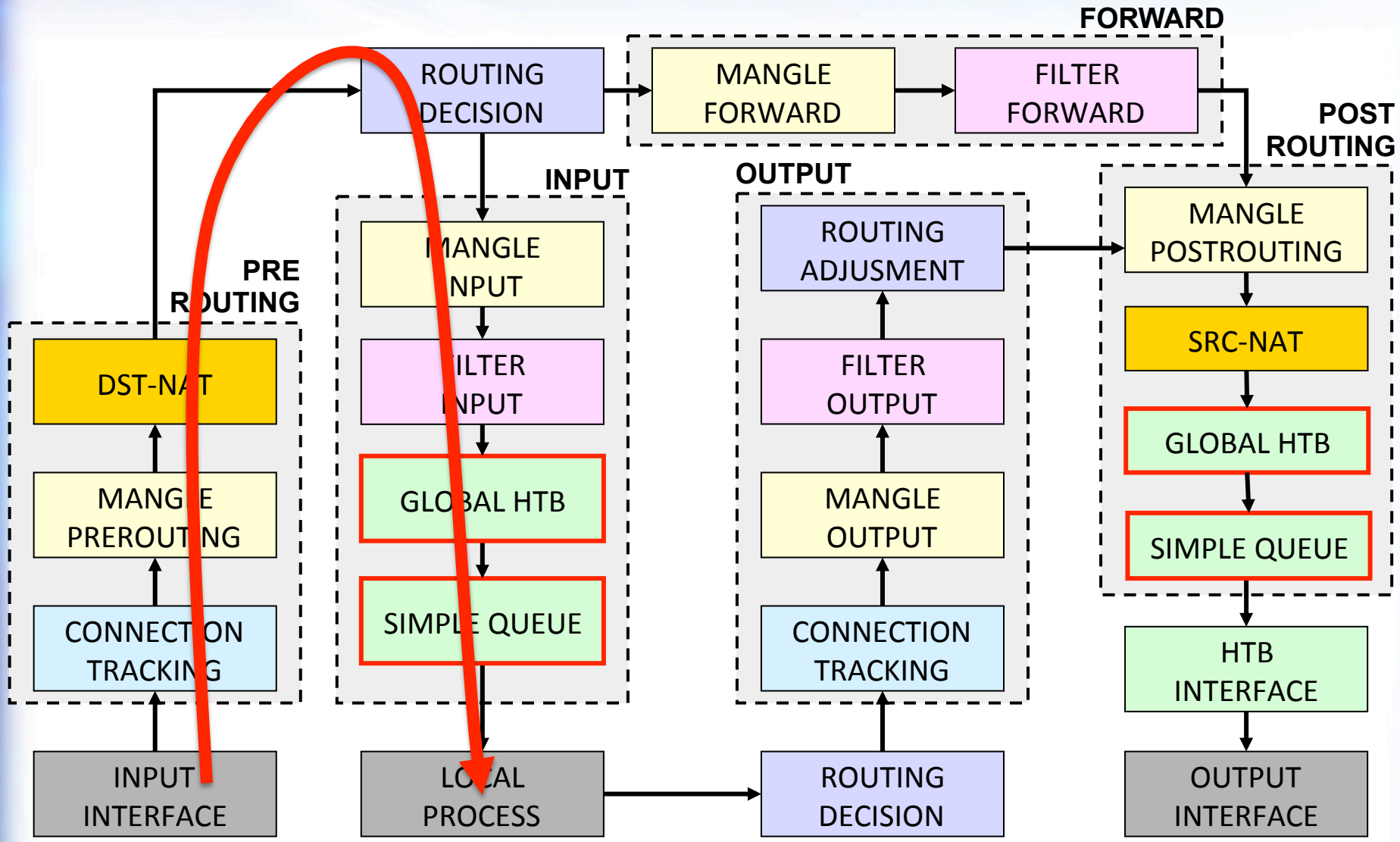
Mangle – Queue RoSv6

- Traffic to the router
  - we can do mangle (packet-mark) specifically on chain=input
  - queue tree with parent=global and packet mark
- Contoh

  /ip firewall mangle add src-address=10.1.1.1 chain=**input** action=mark-packet mark-packet=p1

  /queue tree add packet-mark=p1 parent=**global** max-limit=1m

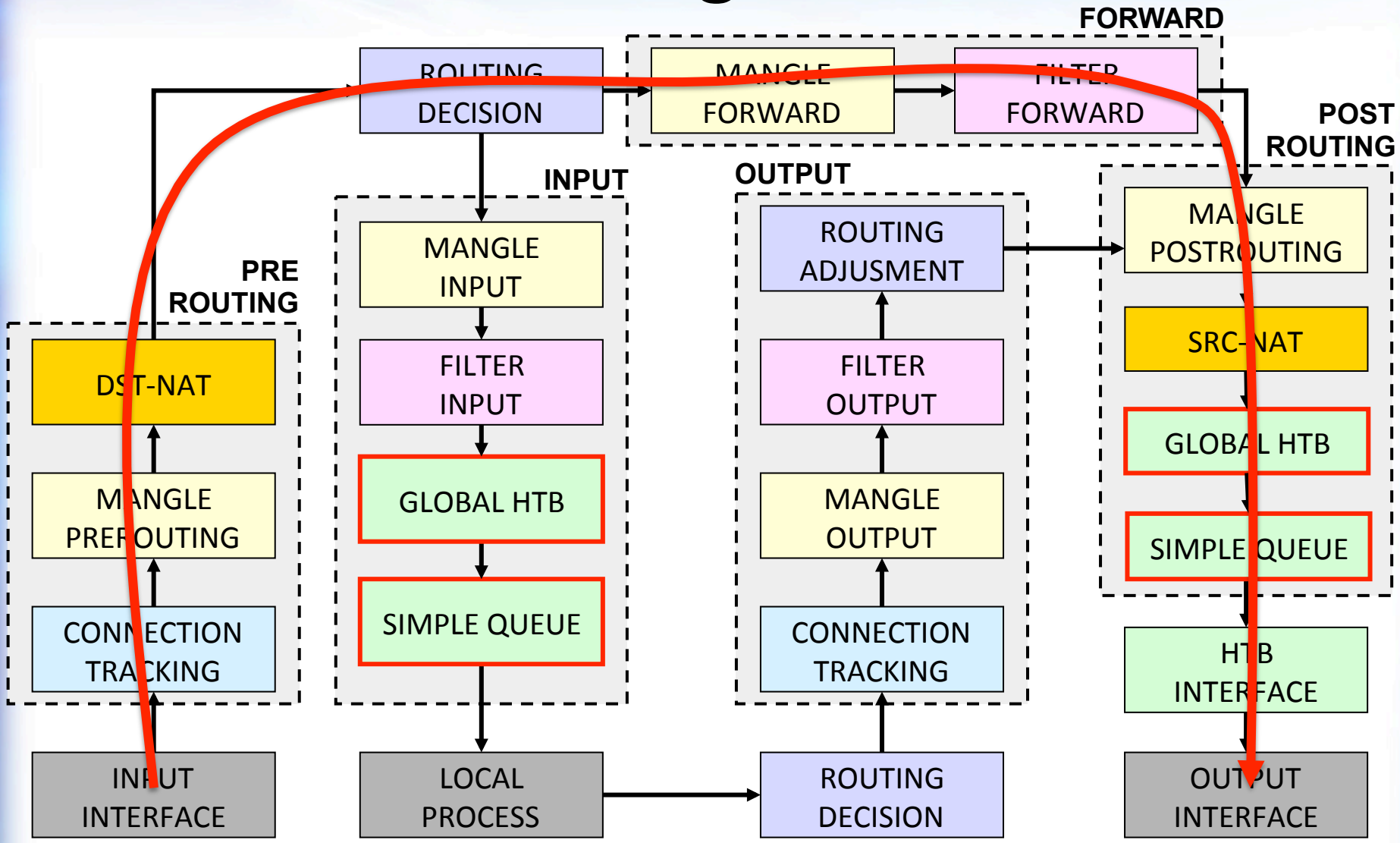
Traffic to the router



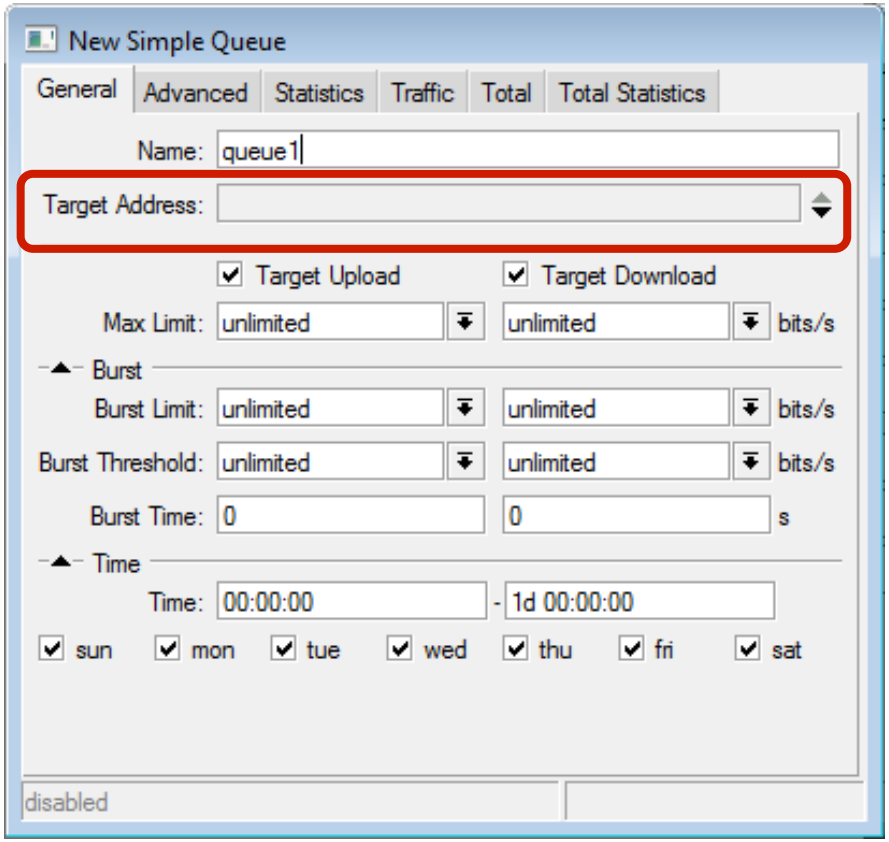
Mangle - Queue

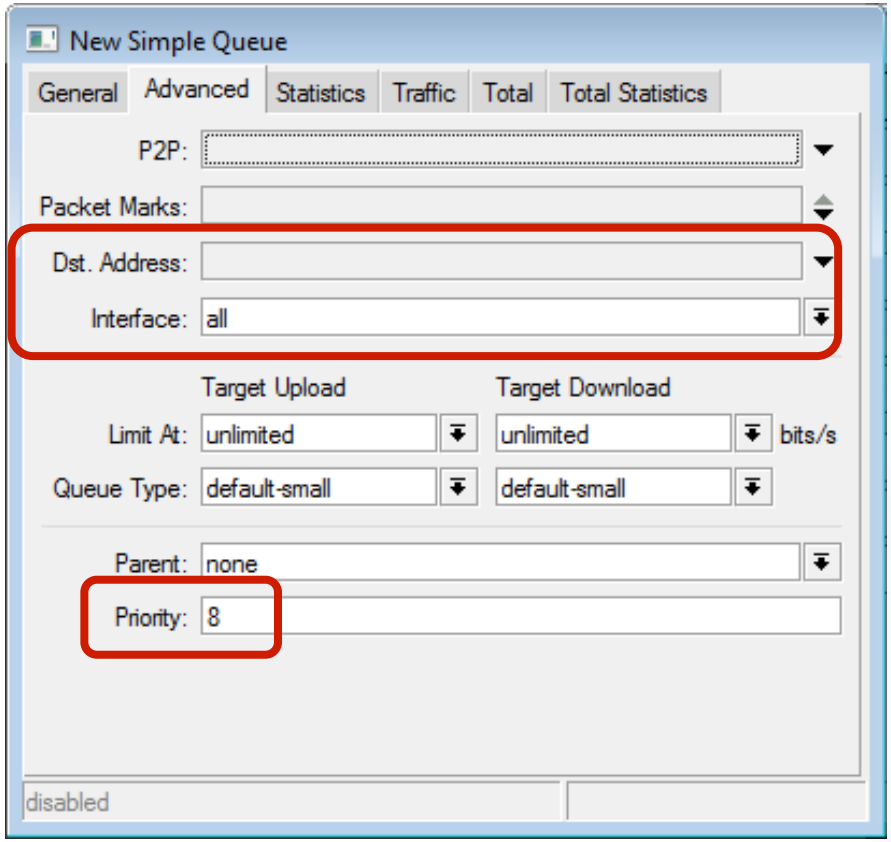
- Traffic from the router
  - same as previous version
- Traffic through the router
  - mangle can be done specifically at chain=forward

Traffic through the router



Simple Queue di RoSv5

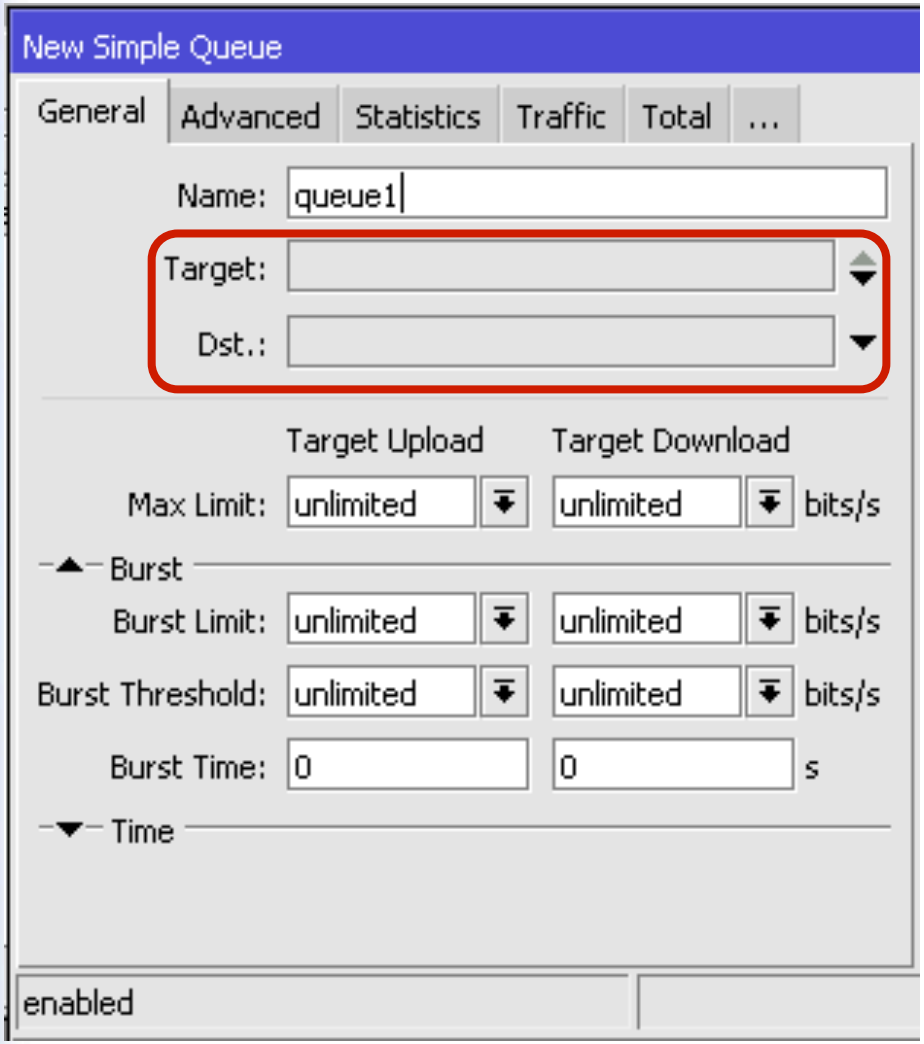


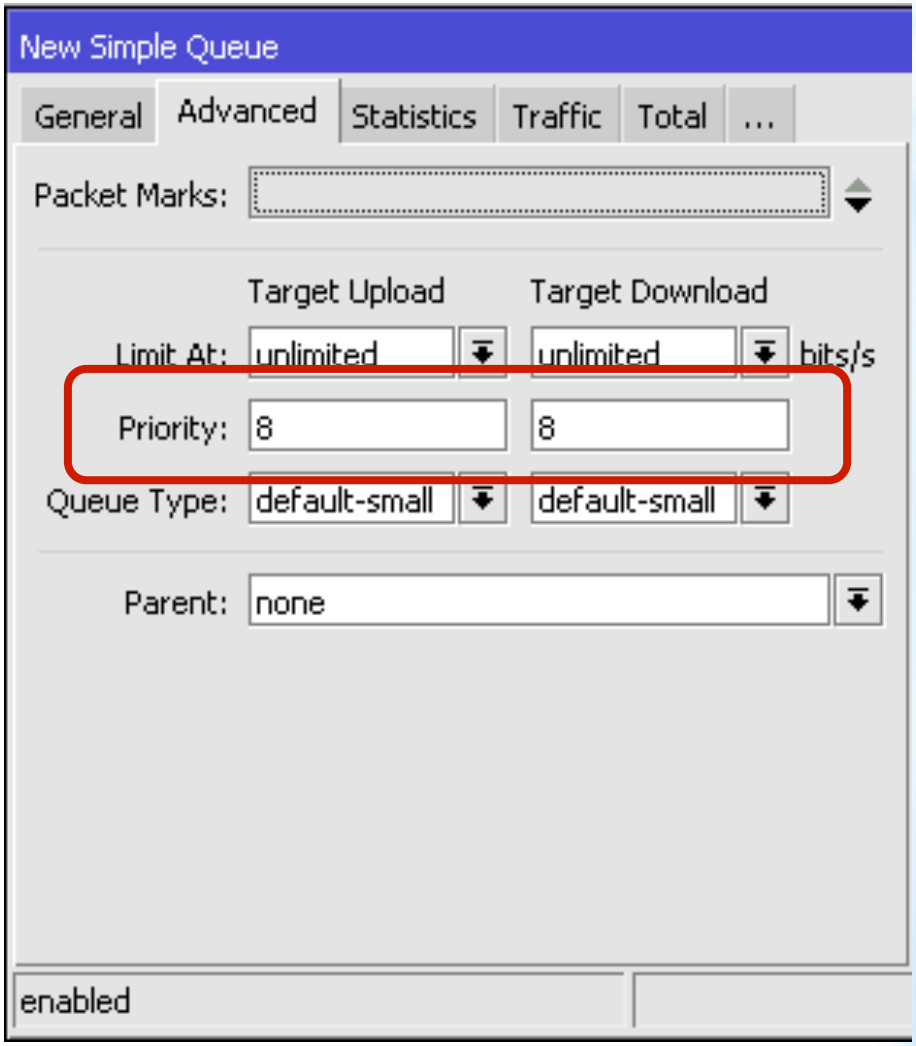


Simple Queue RoSv5

- There are 2 type of target: target address and interface
- Destination use only IP address (not interface)
- Same priority parameter for downlink and uplink

Simple Queue at RoSv6





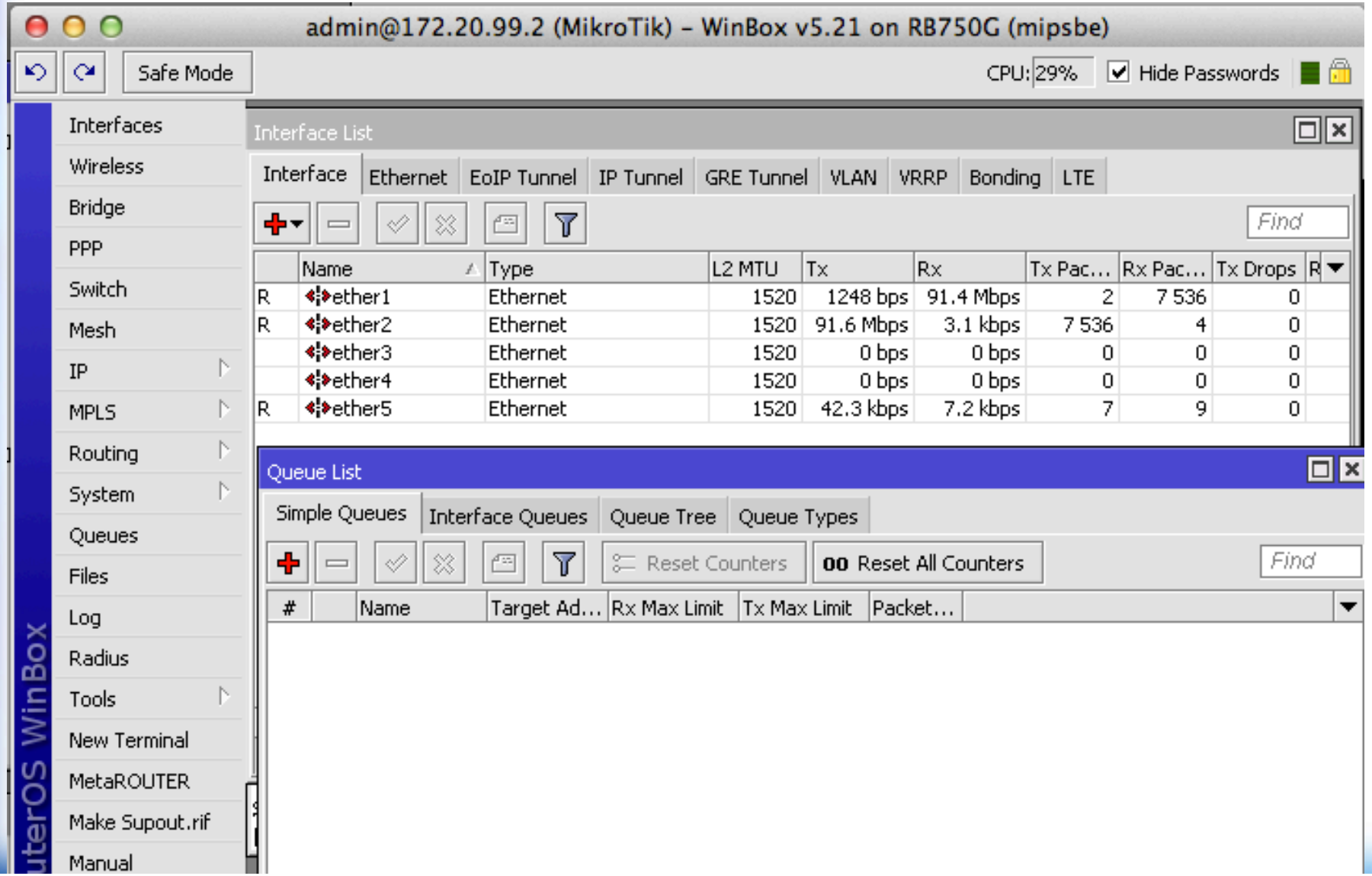
Simple Queue v6

- Target address and interface combined to “target”
- dst-address changed to “dst”, can take IP address and also interface

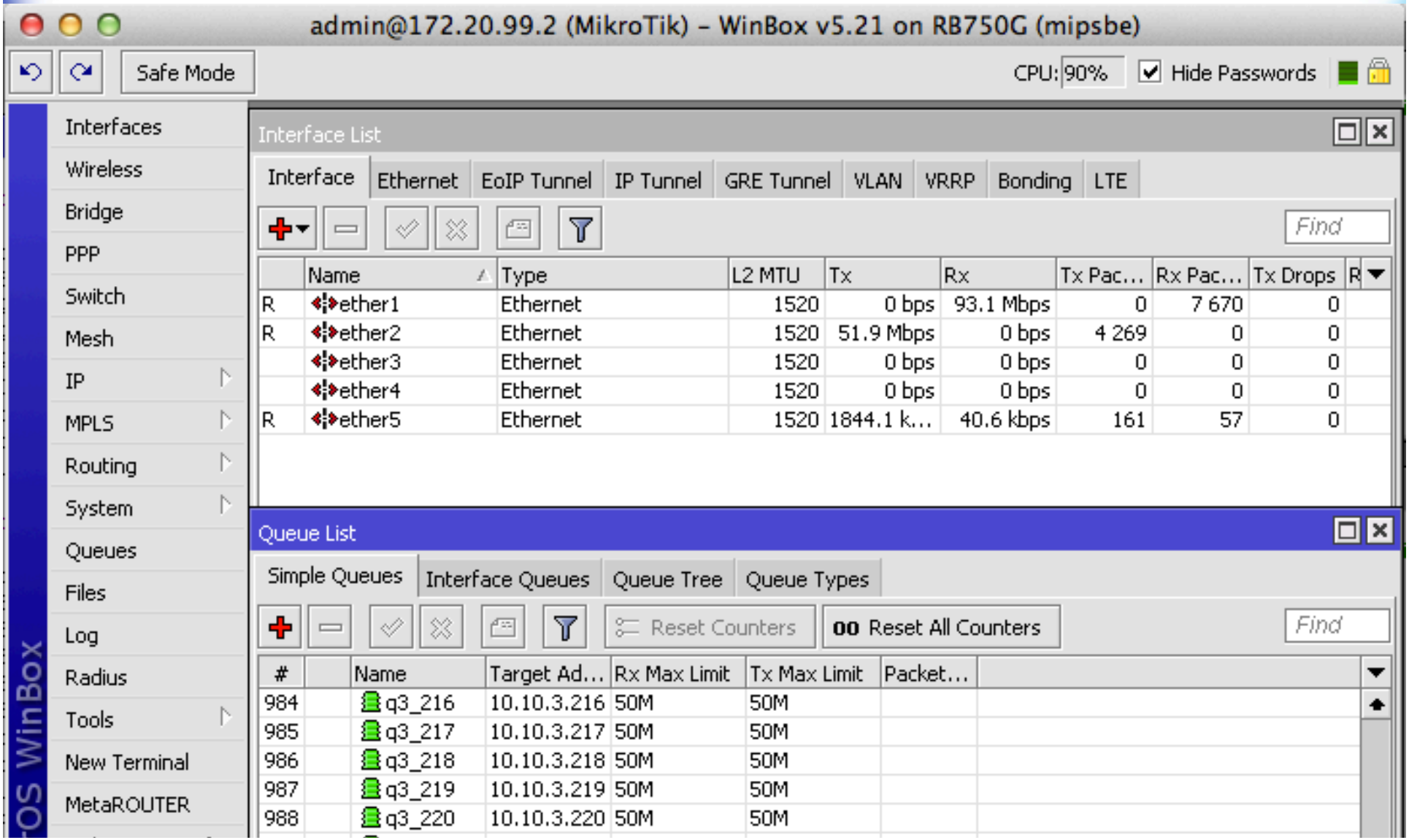
Simple Queue in ROSv6

- Completely new algorithm, build in kernel, faster
- Still in sequential processing
- Target parameter is mandatory
- If target=0/0 in the first rule, no traffic for others queue

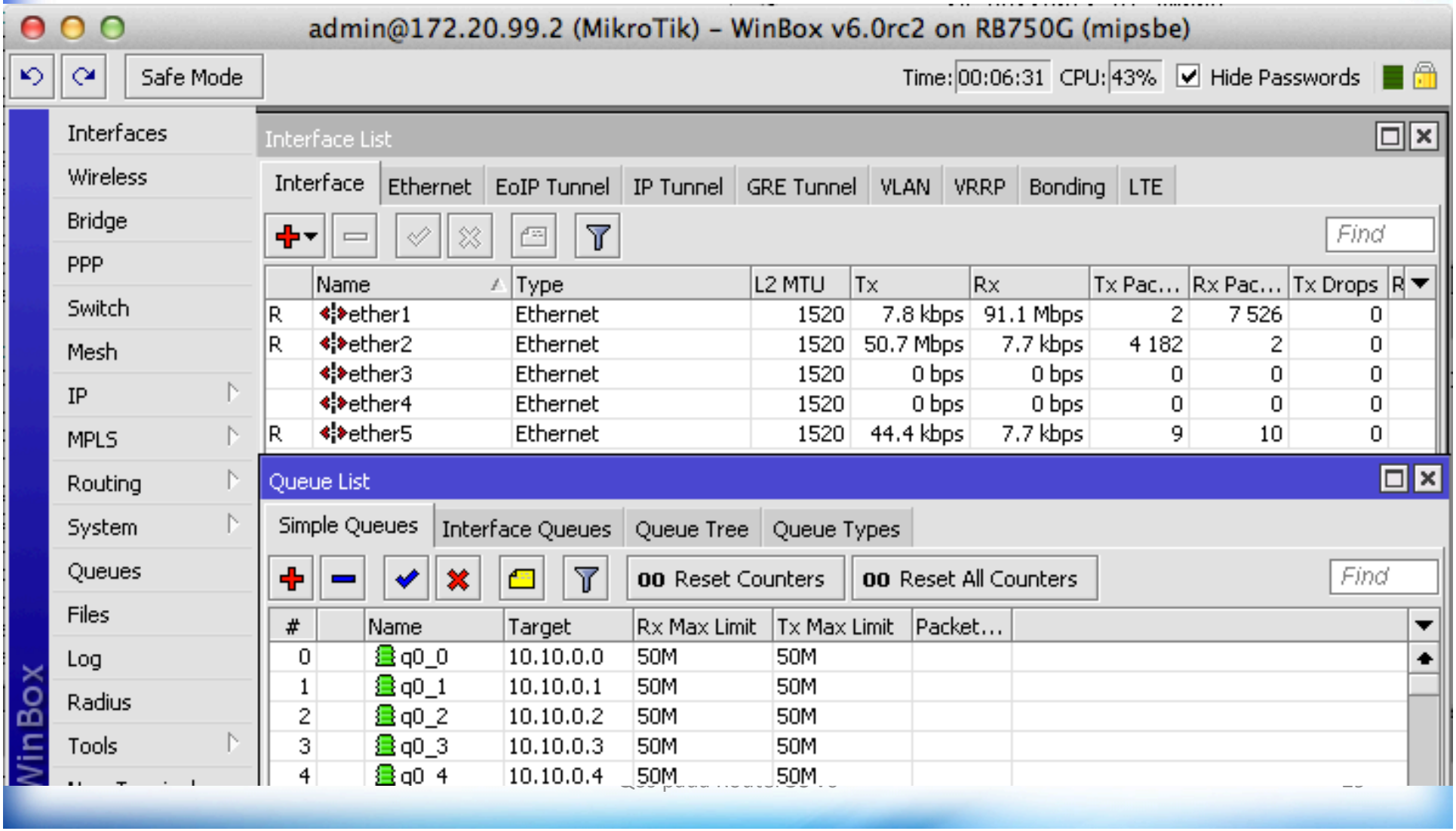
0 simple queue, 100 mbps, RB750G v5.21



1000 simple queue, 100 mbps, RB750G v5.21



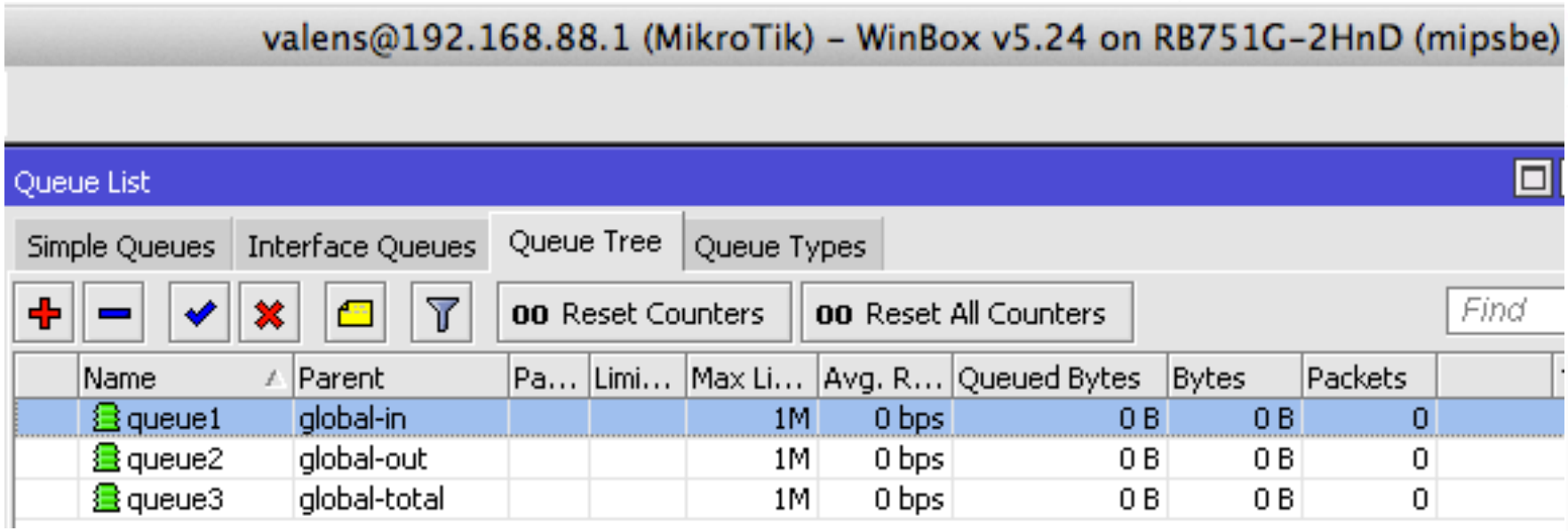
1000 simple queue, 100 mbps, RB750G v6rc2



Faster at ROS 6.0rc12

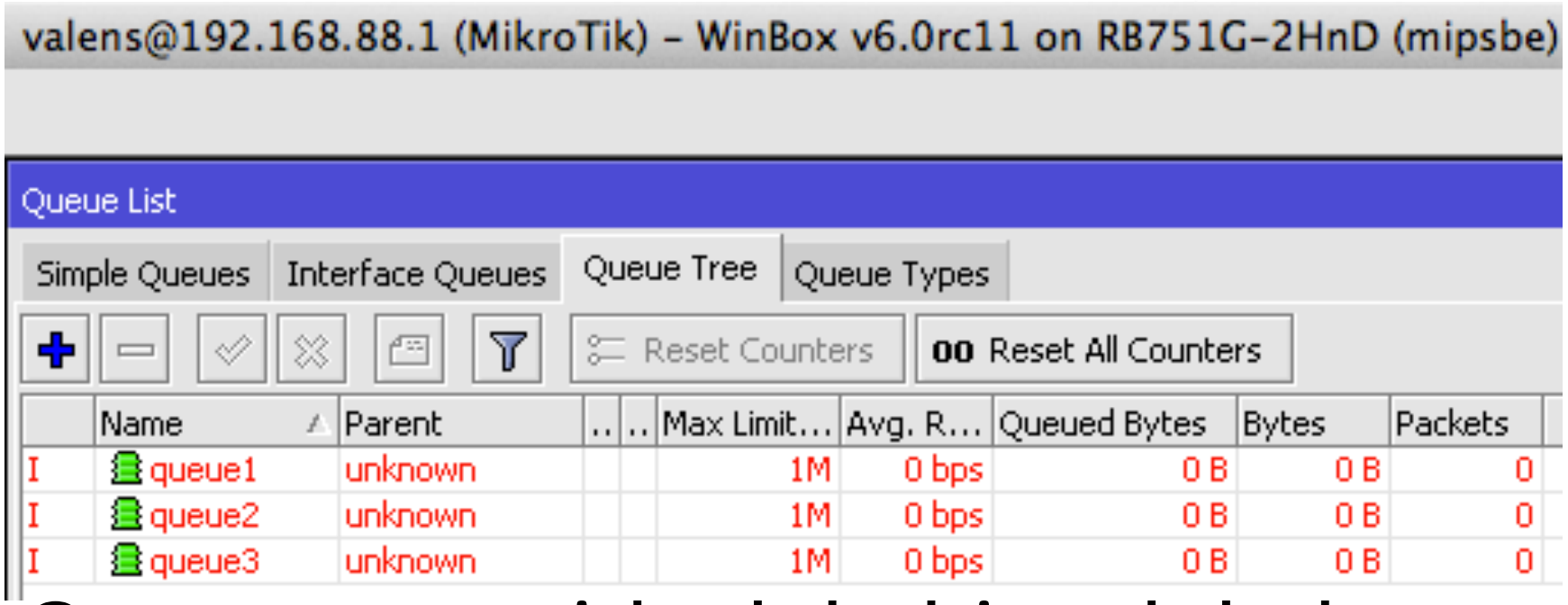
Simple queue on multiple processors router will 9 times faster if there are at least 32 simple queue parents.

Upgrade from RoSv5



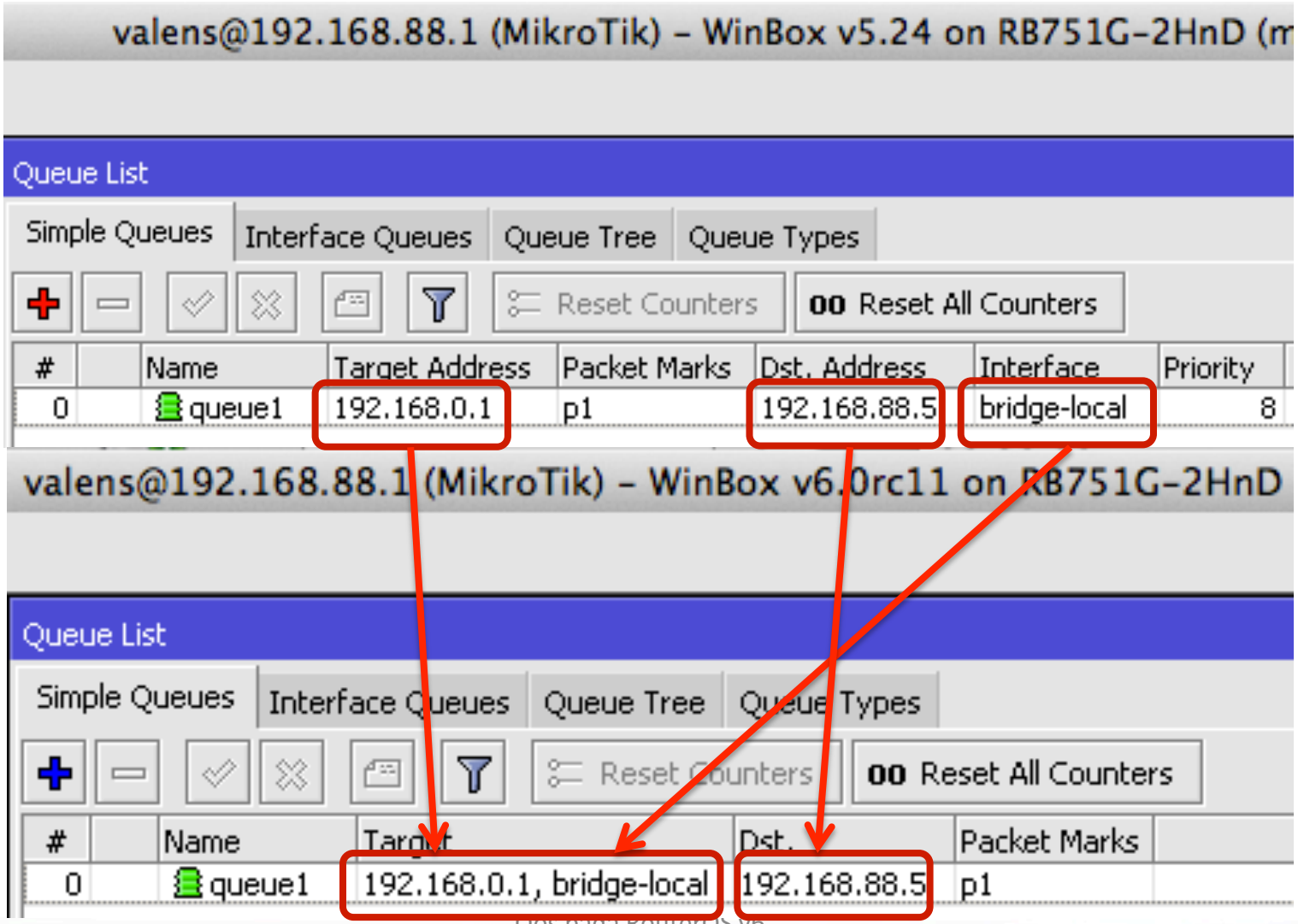
Queue tree with global-in, global-out, and global-total as parent at RoS v5.

Upgrade from RoSv5

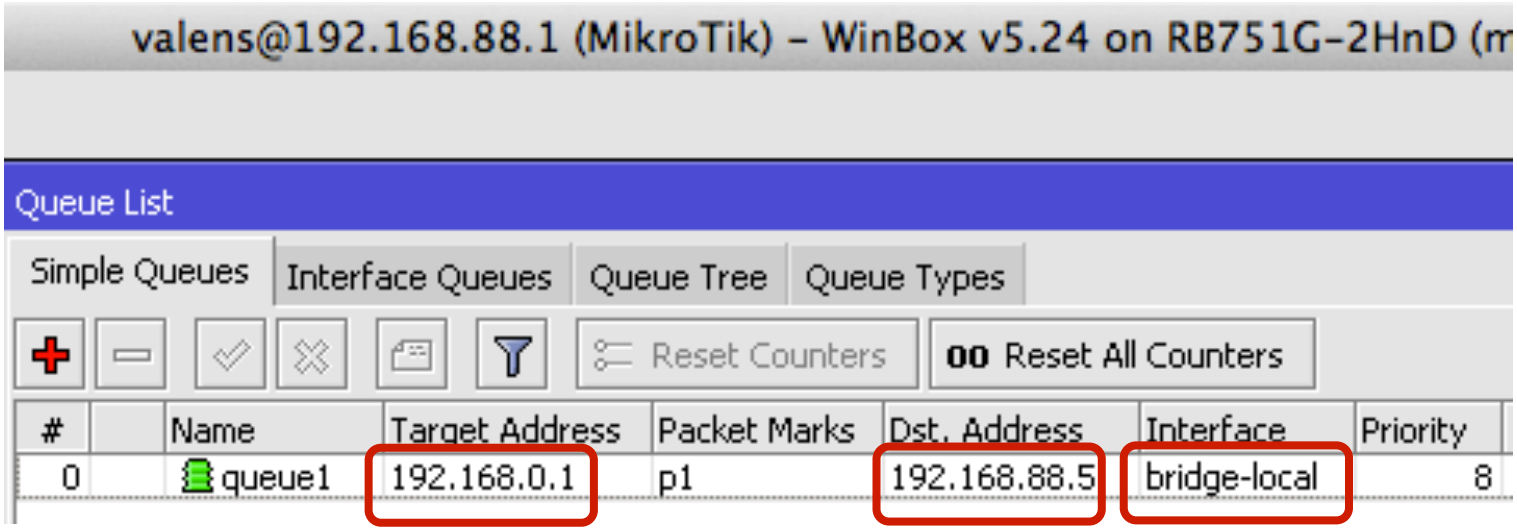


Queue tree with global-in, global-out, and global-total as parent at RoS v5 become invalid at Rosv6.

Simple queue upgrade

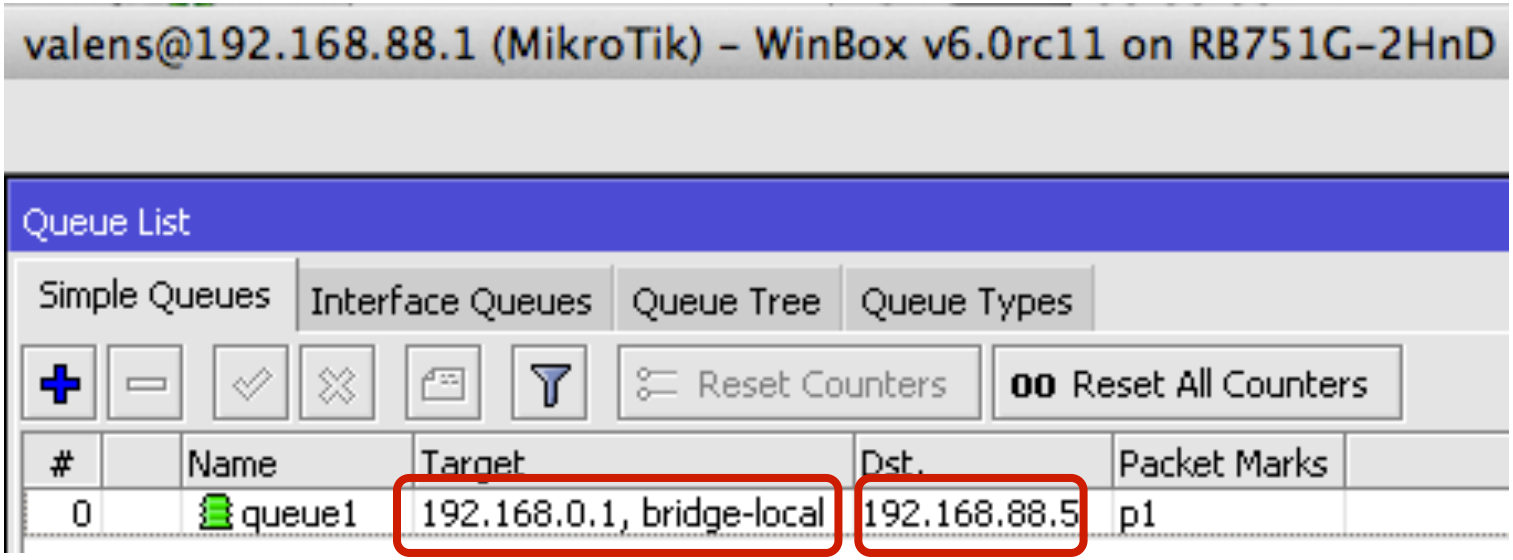


Simple queue upgrade



(Rosv5) Means: traffic for src-address 192.168.0.1 **AND** on interface bridge-local

Simple queue upgrade

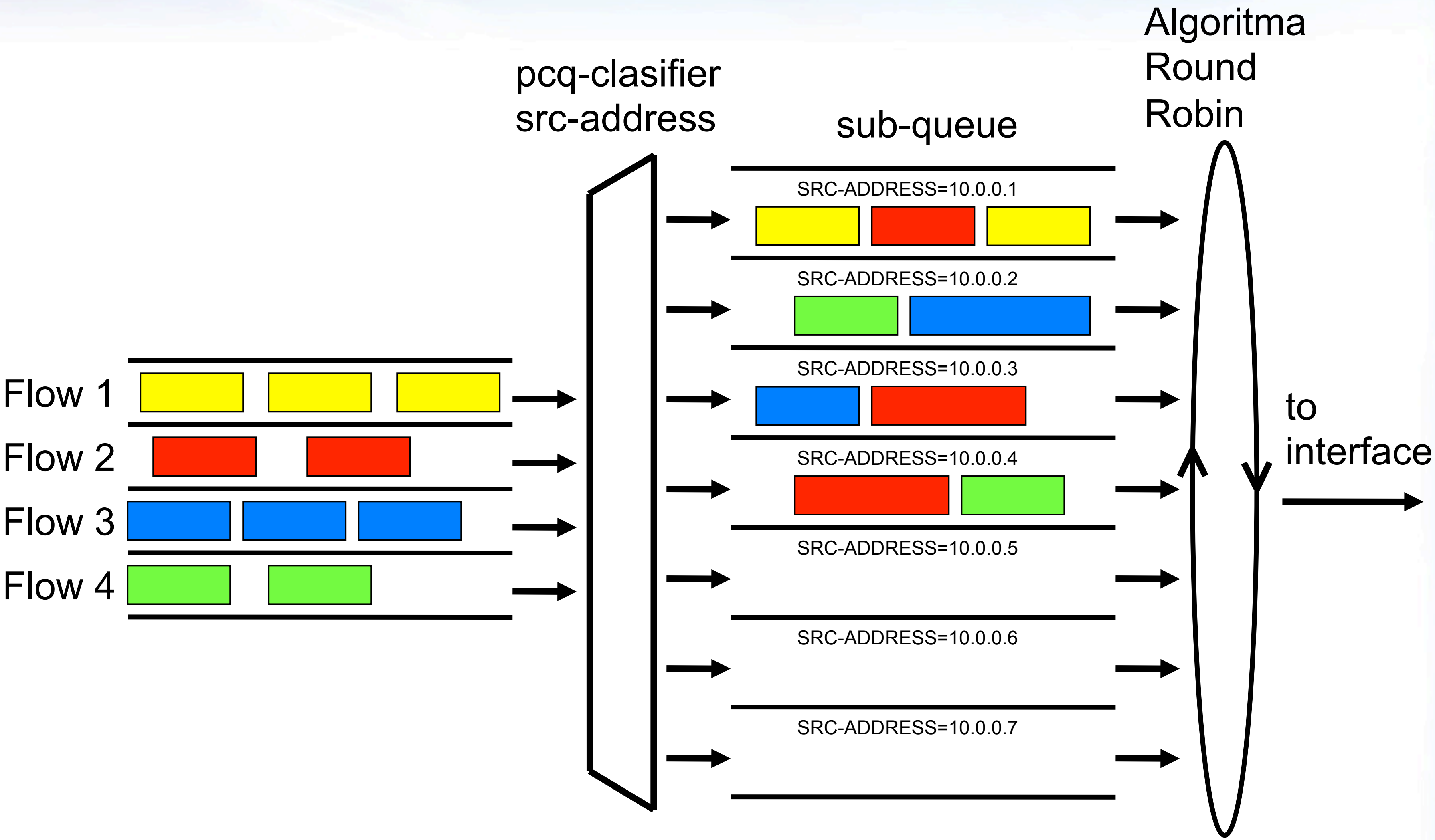


(Rosv6) Means: traffic for src-address 192.168.0.1 **OR** on interface bridge-local

PCQ

- PCQ was introduced to optimize massive QoS systems, where most of the queues are exactly the same for different sub-streams.

PCQ


Algoritma
Round
Robin
pcq-clasifier
src-address
sub-queue
SRC-ADDRESS=10.0.0.1
SRC-ADDRESS=10.0.0.2
SRC-ADDRESS=10.0.0.3
SRC-ADDRESS=10.0.0.4
SRC-ADDRESS=10.0.0.5
SRC-ADDRESS=10.0.0.6
SRC-ADDRESS=10.0.0.7
Flow 1
Flow 2
Flow 3
Flow 4
to
interface

PCQ in ROS v6

- Take sub-stream parameter from Connection Tracking data.
- It is strongly advised to enable Connection Tracking.
- If connection tracking disabled, PCQ will calculate sub-stream in old way

Double QoS

- Is QoS method to do prioritization and client limitation in 1 ROS
  http://mum.mikrotik.com/presentations/CZ09/QoS_Megis.pdf
- On RoS v6, we can not do double QoS with (both) queue tree any more.
- But, we still can do:
  - prioritization : queue tree & mangle forward
  - client limitation : simple queue with target ip address

Thank you

- Comments and suggestions:
  - Valens Riyadi (valens@mikrotik.co.id)

This presentation was developed and sourced from RouterOSv6 Presentation by Janis Megis (MUM-USA-2012).