

LBE transparency on GEANT

TF-NGN meeting – BERLIN

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CoS traceroute

- **Modified version of traceroute developed by SEQUIN to help the discovery of the DSCP changes along the path. It allows to verify if the DSCP values are the expected ones.**

```
[root]# ./traceroute -t 184 193.171.2.1
traceroute to 193.171.2.1 (193.171.2.1), 30 hops max, 40 byte
packets
 1  css7-ATM4-0-0-101-dmsk.man.poznan.pl (150.254.160.62)  1 ms  1
ms  1
ms
 2  150.254.163.118 (150.254.163.118)  2 ms  2 ms  2 ms
 3  z-pozmanu-oc3.poznan-gw.pol34.pl (212.191.127.49)  2 ms  2 ms  2
ms
 4  pol-34.pl1.pl.geant.net (62.40.103.109)  2 ms  2 ms  2 ms
 5  pl.cz1.cz.geant.net (62.40.96.45)  22 ms  (TOS=0!)  22 ms  22 ms
 6  cz.del.de.geant.net (62.40.96.38)  30 ms  30 ms  30 ms
 7  del-1.de2.de.geant.net (62.40.96.130)  30 ms  30 ms  31 ms
 8  de.at1.at.geant.net (62.40.96.5)  43 ms  43 ms  43 ms
 9  aconet-gw.at1.at.geant.net (62.40.103.2)  43 ms  43 ms  43 ms
10  193.171.2.1 (193.171.2.1)  45 ms  *  45 ms
```

LBE transparency

- **Marking on a Juniper M series**
 - **Marking only on output-queue (just before the packet emission)**
 - **Four output-queues per port (in general)**
 - **For each output-queue, two loss-priorities (doesn't mean they are defined or different)**
 - **For one pair *<output-queue, loss-priority>*, one tagging value is applied to all the packets in this output-queue and with this loss-priority (or no re-tagging)**

Current Queue utilisation

Queue 0 (weight 5) - loss-priority

low Best Effort tag DSCP 0

high DWS tag DSCP 32

Queue 1 (weight 90) - loss-priority

low Premium IP tag DSCP 46

high /

Queue 2 - Unused (reserved for LBE)

Queue 3 (weight 5) - network control

low Network control tag DSCP 48

high Network control tag DSCP 56

LBE transparency

- **GOAL : LBE transparency**
 - Currently the LBE packets are classified in the LBE queue, and are tagged as Best Effort - DSCP 0
 - Should avoid the re-tagging to DSCP 0.
- **Solution: remove the tagging done for the Best Effort <queue0, low loss-priority>**
- **Easy: no**
 - Because the marking to BE on GEANT is used to change the service to BE for the packets using the Premium IP tagging and the DWS one without being allowed.

Solutions

- **These packets have to be classified in another unused <queue, loss-priority>**
 - unused queue: <queue2, loss-priority high> and allocate to the queue a weight of 1.
 - <Premium queue, high> (not good bcs Premium protection)
 - move all the network control traffic <queue3, low> and <queue3, high> into <queue3, low>
 - => <queue3, high> available for tagging to BE
- **Network control classification in <queue3, low> under investigation (but not likely).**

Solution

Queue 0 (weight 5) - loss-priority

low	Best Effort	NO re-tagging
high	DWS	tag DSCP 32

Queue 1 (weight 90) - loss-priority

low	Premium IP	tag DSCP 46
high	/	

Queue 2 (weight 1) – loss-priority

low	Unused (reserved for LBE - DSCP 8)	
high	tag to BE unauthorised PIP and DWS	

Queue 3 (weight 4) - network control

low	Network control	tag DSCP 48
high	Network control	tag DSCP 56

Implications

- **Once LBE service deployed (-> classified in queue 2)**
 - **On the first GEANT router, the errant PIP and DWS treated as LBE (queue weight) for tagging purpose.**
 - **Then, on the next routers as BE (because tagged as BE on the first one).**
- **Acceptable solution?**
- **ECN bits kept unchanged.**