

Measurements concerning the DSCP for a LE PHB

R Secchi, A Venne, A Custura
University of Aberdeen

DSCP for Lower Effort (LE)

RFC4594 specified LE using CS1 : 001 000

Priority inversion with respect to BE (default)

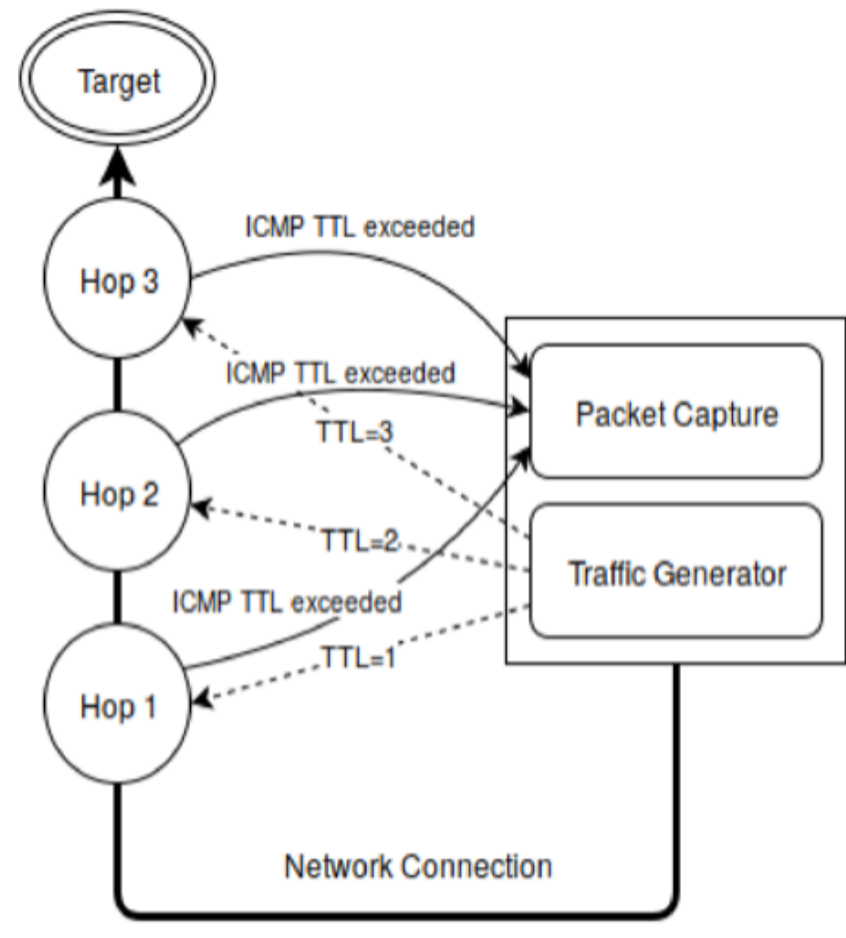
Need a DSCP with 000 XXX

tsvwg-le-phb suggests DSCP 2 : 000 010

Will this actually work in today's network?

PATHscope Measurements

- Tool created packets with increasing TTL
- Captured ICMP type 11 messages
- Measurements from 3 Digital Ocean vantage points to 300 targets randomly chosen from Alexa Top 1 Million list, using both TCP & UDP



DSCP 2 may not be a good choice

Bleaching of DiffServ upper 3 bits (ToS bleaching)

AF11, AF21, AF31, AF41	XXX 010	→	000 010	DSCP 2
AF12, AF22, AF32, AF42, VA	XXX 100	→	000 100	DSCP 4
AF13, AF23, AF33, AF43, EF	XXX 110	→	000 110	DSCP 6

View from Digital Ocean data (900 unique source-destination pairs)

17% of paths modified the DSCP

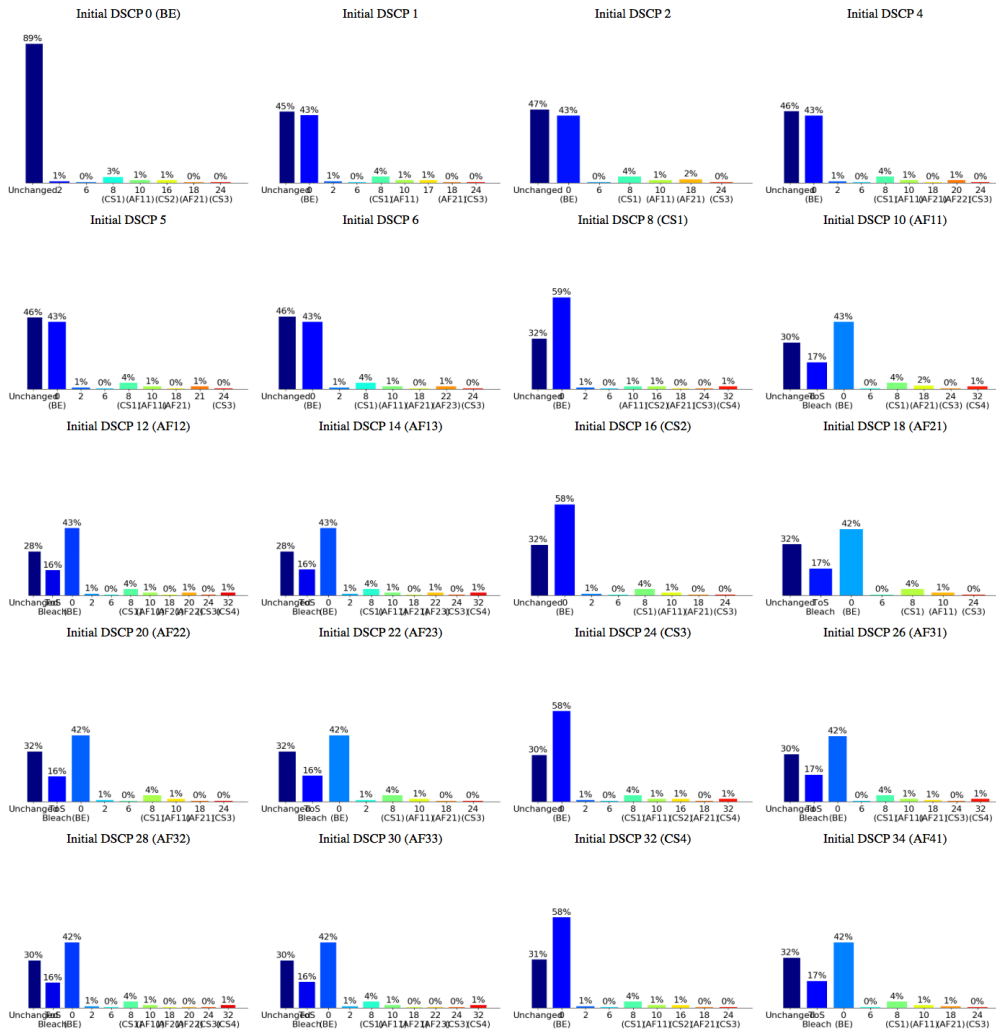
10% reset upper 3 bits (ToS bleach)

Many common classes would be mapped to LE!

View from access networks

neat

Observed DSCP at end of path
Number of paths : 177
Average number of hops per path : 19.9



Edgetrace 177 paths from different access networks: 16% ToS Bleaching

Pathscope tests for 9202 unique source-destination pairs in European mobile networks (MONROE): Router pathologies of 705 routers: 4.7% ToS bleach

Q & A

Acknowledgments

PATHscope

EU H2020 MONROE

(<https://www.monroe-project.eu/>)

Edgetrace

(<https://github.com/uoahrg/edgetrace>)

EU H2020 NEAT

(<https://www.neat-project.org/>)

Example

Suppose flow chooses AF2X PHB group and BE:
AF21, AF22, AF23, BE

In a local DS network, AF2X are mapped to > default
After ToS bleaching:

AF21 becomes mapped to LE (DSCP2)

BE, AF23, AF24 is mapped to default PHB?

This is not good: “i.e., when resources become scarce, best-effort traffic has precedence over LE traffic and may preempt it” – priority inversion