

Proposed New DSCP:  
Non Queue Building (NQB)  
[draft-white-tsvwg-nqb-02](#)

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- Goal
  - Low latency and low loss for “sparse” traffic flows
  - Code point describes a verifiable behavior, not a value judgement
  - No incentive to mismark packets
- Applicability
  - Dual-queue L4S link:
    - Identify non-congestion controlled flows that can coexist with L4S traffic in the LL-queue
  - Links with QoS classes that have optimizations for sparse traffic
- Use Cases
  - Cable Broadband (DOCSIS) link
  - LTE/5G link
  - WiFi link

# Updates draft-01 -> draft-02

- Main changes
  - Merges “LoLa” (developed for LTE) into “NQB”
  - Explicit use cases section discussing DOCSIS, Mobile (LTE), WiFi
- Other changes
  - In “Comparison to Existing Approaches” section , reference “RD” mechanism, and previous “LoLa” approach.
  - Discusses implications on RFC8325 (“Mapping Diffserv to IEEE 802.11”)

# Queue Protection Mechanism

- Draft recommends that the PHB include a QP mechanism
  - i.e. monitor queue depth and identify flows that are causing queue growth. Redirect such flows.
- Not needed in nodes that provide per-flow isolation (e.g. fq)
- Example algorithm provided in:
  - [draft-briscoe-docsis-q-protection-00](#)

# Non-Queue-Building (NQB) flow definition

- Non-congestion-controlled
- Claims that it will not cause a queue, i.e.
  - Relatively low peak data rate – expects to remain below available capacity in path
- If it does cause queue build-up, will suffer some consequences
  - In L4S with Queue Protection, mismarked packets would get reclassified to Classic Queue
    - May see higher latency, may arrive out of order
  - In LTE/5G, may see higher loss (?)
  - In fq\_codel, will suffer from its own queue delay

# NQB PHB definition

- Not a guaranteed service
- A node supporting the NQB PHB MUST queue non-queue-building traffic separate from queue-building traffic.
- *This queue SHOULD disable AQM-induced packet drops for NQB marked packets.\**  
\*not yet in the draft
- This queue SHOULD support a latency-based queue protection mechanism that is able to identify QB behavior in flows that are classified into the NQB queue, and to redirect flows causing queue build-up to a QB queue.
- Networks that support the NQB PHB SHOULD preserve the NQB DSCP when forwarding via an interconnect.
- Specific requirements for DOCSIS, LTE/5G, 802.11

# Proposal: NQB = 0x2A (42, 0b101010)

- A currently unassigned codepoint in DSCP Pool 1 (standards action)
- Some implementations may wish to utilize a single queue for NQB and EF traffic
  - NQB = 0x2A = 0b101010
  - EF = 0x2E = 0b101110
  - single classifier (0b101\*10) would match both
- WiFi APs commonly default to mapping DSCP = 0b10\*\*\*\* to the Video Access Category (AC\_VI)
  - Draft recommends that RFC8325 devices implement mapping NQB to UP\_6 (AC\_VI) as well.

Common Defaults in WMM

DSCP	WiFi Access Category
000*** 011***	Background (AC_BK)
001*** 010***	Best Effort (AC_BE)
10****	Video (AC_VI)
11****	Voice (AC_VO)

# Comments received (mailing list & offline)

- Add 5G nomenclature to Mobile section
- Mobile networks make use of highly variable channel capacity via deep buffering. Would be interesting to run lab tests to investigate the queue-depth & queue-protection implications.
- [offline] for LTE change:
  - “...MUST ... [use] ... low-latency ... bearer with QCI 7 ....”
  - to:
  - “...MUST ... [use] ... low-latency ... bearer, e.g. with QCI 7 ....”.
- Several network operators (mobile & cable) and others expressing interest

# Seeking WG adoption