PCN Encoding for Packet-Specific Dual Marking (PSDM)

draft-menth-pcn-psdm-encoding-00

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Baseline Encoding vs. Packet-Specific Dual Marking (PSDM)

- **Similarity**
  - **Possibly could use Voice-Admit DSCP for PCN traffic**
  - **One DSCP**
  - **Use ECN field for**
    - Differentiation of PCN traffic from non-PCN traffic
    - PCN encoding
- **Difference**
  - **Baseline encoding supports only one marking scheme in a PCN domain**
  - **PSDM-encoding supports two marking schemes in a network, but only one per packet**
    - Excess Marking
    - Exhaustive Marking

Motivation for PSDM

- **Motivation**
  - **Robust, probe-based (signalled) AC:** probe packets need exhaustive (threshold) marking based on admissible rate
  - **As well support FT:** PCN data packets need excess marking based on supportable rate
- **Idea**
  - Use excess and exhaustive (threshold) marking in same network
  - All PCN traffic is subject to both meters
  - Probe packets are subject to exhaustive marking only
  - PCN data packets are subject to excess marking only
  - ECN bits are used to tell routers which meter marks which packet
  - Excess and exhaustive marking re-mark packets to the same codepoint “11”
  - Egress node knows if packet is probe or PCN data, therefore infers whether packet was excess or exhaustive marked

PCN Codepoints - Redefinition of ECN Field

- **ECN field: Semantic**
  - "00" not-PCN: Voice-Admit traffic not subject to PCN control
  - "10" not-excess-marked (not-ExM): unmarked PCN traffic subject to excess marking
  - "01" not-exhaustive-marked (not-EhM): unmarked PCN traffic subject to exhaustive marking
  - "11" marked (M): marked traffic

Applicability of PCN Encoding for PSDM

- **Only AC**
  - Use exhaustive marking only (single marking)
  - All packets not-EhM “01” marked at ingress
- **Only FT**
  - Use excess marking only (single marking)
  - All packets not-ExM “10” marked at ingress
- **AC & FT (SM) as per charny-pcn-single-marking**
  - Use excess marking only (single marking – meter configured rate set to admission level)
  - All packets not-ExM “10” marked at ingress
- **Probe-based (signalled) AC & FT**
  - Use excess and exhaustive marking (dual marking)
  - All PCN traffic is subject to both meters, but only to one marker
  - Probe packets are not-EhM “01” market at ingress
  - PCN data packets are not-ExM “10” market at ingress

PSDM Limitation – options going forward

- end-to-end ECN can be supported through tunneling in PCN domain
  - Until end-to-end PCN is defined
- not supported CL style AC & FT when both are used) (measurement of marking at egress)
  - Requires 2nd DSCP

DSCP	Not-ECT **"00"**	ECT(0) **"10"**	ECT(1) **"01"**	CE **"11"**
PSDM using single DSCP				
DSCP 1	Not-PCN	Not-ExM	Not-EhM	M
Simple evolution from SM to CL for both AC & FT encoding				
DSCP 1 (FT)	Not-PCN	Not-ExM	Not-used	M (ETM)
DSCP 2 (AC)	Not-PCN	Not-used	Not-EhM	M (ThM)

Note: end-to-end ECN can be supported through tunneling in PCN domain until end-to-end PCN is defined

Further analysis required

Conclusion

- PCN encoding for packet-specific dual marking (PSDM)
  - Requires only one DSCP (possibly Voice-Admit)
  - Extension of “baseline encoding”
  - Supports two concurrent marking schemes (excess and exhaustive marking)
  - More (at least 4) deployment scenarios possible than with “draft 02 of baseline encoding”

Motion

- Would like that PCN WG adopt the encoding method defined in draft-menth-pcn-psdm-encoding-00 as WG work item.