

PCN Encoding

draft-ietf-pcn-baseline-encoding-04

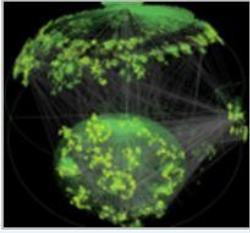
draft-ietf-pcn-3-in-1-encoding-00

draft-ietf-pcn-3-state-encoding-00

draft-ietf-pcn-psdm-encoding-00

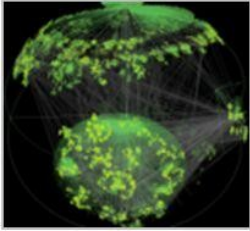
Philip Eardley on behalf of:

Toby Moncaster (all), Bob Briscoe (all), Michael Menth (not 3-in-1), Jozef Babiarz (PSDM)



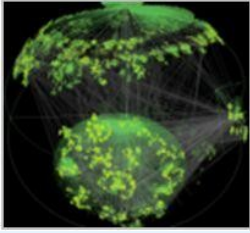
Baseline

- 2 iterations,
- Completed WG LC, now in “Publication Requested”
- No significant changes.
- Clarifications from WGLC & Gorry Fairhurst reviews
 - Added Section 4.3.1 to clarify why we need the not-PCN codepoint.
 - Stated that the PCN WG will maintain a list of PCN-compatible DSCPs. This should help avoid inter-operability issues.
 - Abstract re-written.
 - Clarified throughout that this re-uses the ECN bits in the IP header.
 - Re-arranged order of terminology section for clarity.
 - Table 2 replaced with new table and text.
 - Security considerations re-written.
 - Appendixes re-written to improve clarity.



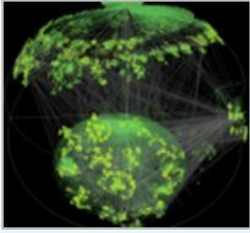
Baseline vs Experimental encodings

			ECN Field		
	DSCP	00	10	01	11
Baseline	DSCP1	Not-PCN	NM	EXP	M
<i>PSDM</i>	DSCP1	Not-PCN	NM ExM	NM ThM	M
<i>Basic 3 state</i>	DSCP1	Not-PCN	NM	CU/EXP	ExM
	DSCP2	Not-PCN	CU/EXP	CU/EXP	ThM
<i>Extended 3 state</i>	DSCP1	Not-PCN	NM	NM(CE)	ExM
	DSCP2	Not-PCN	NM(ECT(0))	NM(ECT(1))	ThM
<i>3-in-1</i>	DSCP1	Not-PCN	NM	ThM	ExM



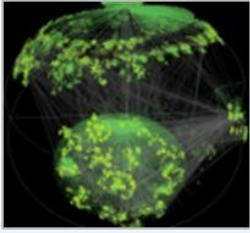
draft-ietf-pcn-psdm-encoding-00

- WG i-d from draft-menth-pcn-psdm-encoding without change
- Basic idea:
 - Threshold mark (only) ECN-01 pkts; excess mark (only) ECN-10 pkts
 - Ingress sets ECN-01 for "signalling admission request" pkts & ECN-10 for data pkts
 - Egress checks whether marked pkts are data or adm request (look in higher layer)
 - Gets both PCN-marked states with 1 DSCP & existing tunnels (but extra ingress & egress behaviour etc)



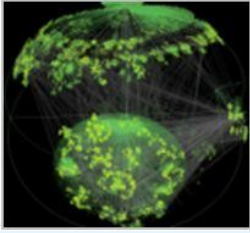
draft-ietf-pcn-3-in-1-encoding-00

- WG i-d from draft-briscoe-pcn-3-in-1-encoding
- Basic idea: obvious solution if tunnelling behaviour is sorted out
- Minor updates only:
 - Introduction altered to include new standard description of PCN.
 - References updated.
 - Terminology brought into line with [I-D.ietf-pcn-marking-behaviour].



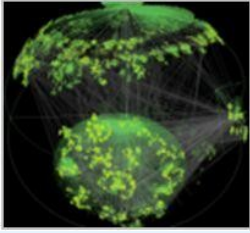
draft-ietf-pcn-3-state-encoding-00

- WG i-d from draft-moncaster-pcn-3-state-encoding)
- Basic idea of “base 3 state”:
 - Get both PCN-marked states with 2 DSCPs & existing tunnels
- Basic idea of “extended 3 state”
 - Adds limited end-to-end ECN support preserved (also: Get both PCN-marked states with 2 DSCPs & existing tunnels)
- Quite a lot of wording changes (encoding & principles unchanged):
 - Imposed structure /guidelines /consistency with baseline doc (about how to write encoding extensions)



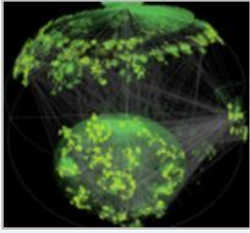
Discussion questions 1 (mine!)

- Do we want to go forward with all 4 exptl encodings to RFC?
 - 3-in-1 looks best IF ecn tunnelling behaviour is sorted [I-D.ietf-tsvwg-ecn-tunnel].
 - Base-3-state IF enough DSCPs but tunnel behaviour not sorted
 - Extended-3-state IF also want (some) e2e ecn support & don't want to tunnel across PCN-domain
 - PSDM interesting if can assume adm ctrl signalling pkts
- How do we decide this?
- Should we combine them into one RFC?
- The names of 3-state &/or 3-in-1 make my head hurt



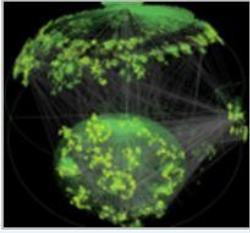
Discussion questions 2 (mine!)

- How should the expts be run?
 - Request any DSCPs used for PCN are registered with WG?
 - Request results are presented to WG?
 - Suggest questions that would be interesting to answer?
 - Comparative implementation complexity?
 - Extra DSCP vs adm signalling?
 - Is e2e ecn useful? If yes, is tunnelling it ok?
 - Should we define criteria or formalise process?



Backup

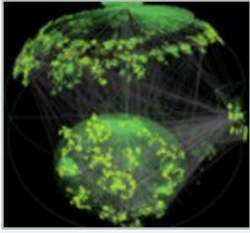
- Michael's PSDM SLIDES...



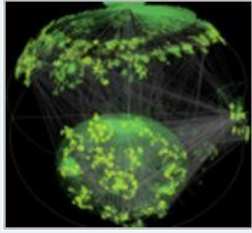
PCN Encoding for Packet-Specific Dual Marking (PSDM) draft-menth-pcn-psdm-encoding-00

Michael Menth, Jozef Babiarez,
Toby Moncaster, Bob Briscoe

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

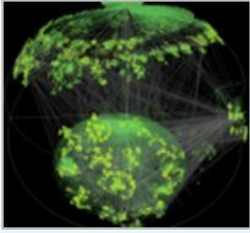


- Similarity
 - Use Voice-Admit DSCP for PCN traffic
 - Use ECN field for
 - Differentiation of PCN traffic from non-PCN traffic
 - PCN encoding
- Difference
 - Baseline encoding supports only one marking scheme in a PCN domain
 - PSDM-encoding supports two marking schemes in a network, but only one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



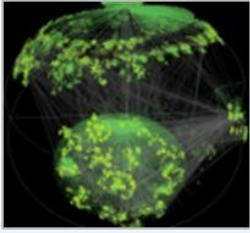
Motivation for PSDM

- Motivation
 - Robust FT method: PCN data packets need excess marking based on supportable rate
 - Probe-based AC: probe packets need threshold marking based on admissible rate
- Idea
 - Use excess and threshold marking in same network
 - All PCN traffic subject to both meters
 - Probe packets subject to threshold marking only
 - PCN data packets subject to excess marking only
 - Hide details from routers: use PCN codepoint to tell routers which marking applies to unmarked packet
 - Excess and threshold marking re-mark packets to same marked codepoint
 - Infer from type of marked packet whether packet was excess or threshold marked



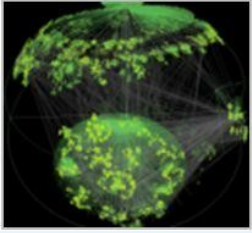
PCN Codepoints

- Redefinition of ECN field
 - 00: not-PCN
 - 10: not-excess-marked (not-ExM)
 - 01: not-threshold-marked (not-ThM)
 - 11: marked (M)
- Semantic
 - not-PCN: Voice-Admit traffic not subject to PCN control
 - not-ExM: unmarked PCN traffic subject to excess marking
 - not-ThM: unmarked PCN traffic subject to threshold marking
 - M: marked traffic



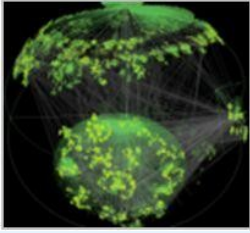
Applicability of PCN Encoding for PSDM

- Only AC
 - Use threshold marking only (single marking)
 - All packets not-ThM marked at ingress
- Only FT
 - Use excess marking only (single marking)
 - All packets not-ExM marked at ingress
- Probe-based AC & FT
 - Use excess and threshold marking (dual marking)
 - All PCN traffic is subject to both meters, but only to one marker
 - Probe packets are not-ThM at ingress
 - PCN data packets are not-ExM at ingress



What about End-to-End ECN for PCN Traffic?

- Different story
 - Use tunnelling across PCN domain to preserve ECN bits if desired
 - Use special tunnel to provide PCN marking to applications if desired



Conclusion

- PCN encoding for packet-specific dual marking (PSDM)
 - Requires only one DSCP (Voice-Admit)
 - Extension of „baseline encoding“
 - Supports two concurrent marking schemes (excess and threshold marking)
 - More deployment scenarios possible than with „baseline encoding“