PCN Encoding Comparison

draft-chan-pcn-encoding-comparison-00

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Outline

- Goals of the draft
- Explanation of Terminology
- Example on using DSCP and ECN Fields
- Example on using Only DSCP Field
- Comparison Criteria
- Open Issues
- Next Steps

Goals of Encoding Comparison

- Survey of existing encoding states and the functional features they are supporting
- Establish Comparison Criteria
- Comparison based on criteria
- Assist the selection of Encoding

Functional Features

- PCN Functional Features:
  - Not-Congested (NC)
  - Admission Control (AC)
  - Flow Termination (FT)
  - ECMP Handling (ECMP-H)
  - PCN-Capable-Transport(PCT)
  - ECN-Nonce is only features of ECN

Encoding States

- In an Encoding option, Each Encoding State is represented by a Bit Pattern
  - Admission Marking (AM)
  - Termination Marking (TM)
  - ECN Capable Transport (ECT(0)) & (ECT(1))
  - Not PCN Capable Transport (Not-PCT)
  - No Congestion Experienced (Not-CE)
  - Affected Marking (AFM)
  - Not DiffServ Capable with Congestion Experienced (NDS-CE)

Issue with “Feature”

- Confusion on the meaning of Functional Feature and its relation to States (initially called modes in the draft)
- Why have another term? Why not use States?
- Why have another definition level between the Algorithms’ needs and the bit pattern?

Proposed Solution - Terminology

- Current: Bit Pattern = State (one to one), Functionality Feature =/= State
  - This is OK when one bit pattern supports one PCN functional need, but complicated when one bit pattern is used for multiple PCN needs
- Proposed: Bit Pattern can represent one or more States, Functionality Feature = State
  - Update the meaning of State and remove use of “Feature”

Example on Using DSCP + ECN Fields (Option 1 as Example)

Option 1	ECN Field				DSCP
	00	01	10	11	
Features	AC	NC/ Nonce	NC/ Nonce	FT	PCT
States	AM	ECT(1)	ECT(0)	TM	PCN

Example on Using Only DSCP Field (Option 11 as Example)

Option 11	DSCP Field			ECN Field
	DSCP0	DSCP1	DSCP2	
Feature	NC	AC/FT	ECMP-H/FT	NA
State	Not-CE	TM	AFM	NA

Criteria

1. Co-Existence of PCN and Non-PCN Taffic
2. Supported PCN Functional Features
3. Required Encoding States
4. Encoding Implementation Requirements

From RFC 4774 (Specifying Alternate Semantics for ECN Field)

5. Different ECN Semantics Capability
6. Old Router Impacts
7. Alternate-ECN Traffic Performance

Open Issues

1. Dependency on using DiffServ to separate PCN traffic from all other traffic. Hence also using DSCP as a means of indicating PCN-Capable, ECT (should we call it “PCT”?) traffic
2. Difference between Bit Encoding vs State vs Features
3. Clarify separation between Encoding Methods and Metering Algorithms
4. Need more review on Comparison Criteria
5. Improve readability
6. Simplify the draft
    a. Reduction of encoding options in draft

Next Steps

1. Progressing this draft as a PCN Working Group draft.
2. Continue improving the draft based on Open Issue resolutions and comments.
3. Targeting draft completion at 70th IETF.
4. Need improvements, reviews, comments, improvements.