

Accurate ECN Feedback

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tools.ietf.org/html/draft-kuehlewind-tcpm-accurate-ecn-02

tools.ietf.org/html/draft-kuehlewind-tcpm-accurate-ecn-option-01

Motivation

- Enable improvements in TCP congestion reaction based on detailed ECN feedback
- ECN (RFC3168) limits feedback signal
- MUST match with requirements

<http://tools.ietf.org/html/draft-ietf-tcpm-accecn-reqs-05>

Updates since IETF88

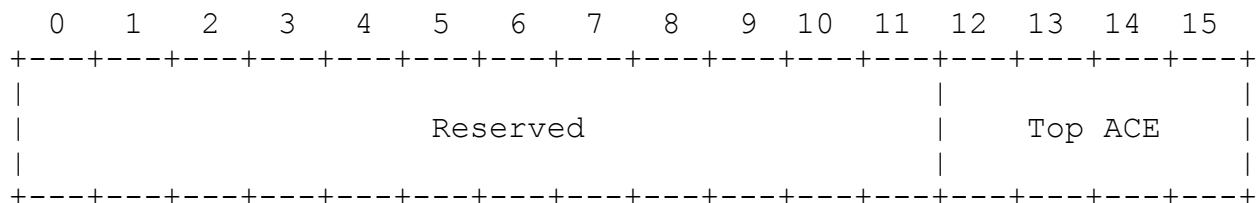
- Focus on Requirements Document
- **Acc ECN using Codepoints**
would use existing header bits only
 - Segment granularity
- **Acc ECN TCP Option**
would use 12 byte option
 - Payload byte granularity easily possible

AccECN feedback using codepoints

- Redefinition of the ECN TCP flags:

ECI	NS	CWR	ECE	CI (base5)	E1 (base3)
0	0	0	0	0	-
1	0	0	1	1	-
2	0	1	0	2	-
3	0	1	1	3	-
4	1	0	0	4	-
5	1	0	1	-	0
6	1	1	0	-	1
7	1	1	1	-	2

- Auxiliary signaling in unused URG pointer field:
 - Only when URG flag not set
 - May be cleared by middleboxes with limited impact



AccECN TCP option

- New TCP option
 - Allows much higher granularity

Kind: TBD

Length: 12 bytes

Kind	12	ECT(0)	ECT(1)	CE	non-ECT	loss	CE in bytes
1	1	2	2	1	1	1	3

- Additional refinements possible
 - Consolidate counters for bytes only (except loss)
 - RFC6994 experimental option

TCP ECN mechanisms

Requirement	Classic ECN	ECN Nonce	AccECN CP	AccECN TCP Opt	DCTCP
Resilience	+	+	0	+	-
Timeliness	0	0	+	+	-
Integrity	-	0	+	+	-
Accuracy	-	-	0	+	-
Complexity	++	+	-	0	0
Overhead	+	+	+	-	0
Compatibility	0	0	+	+	-

Next steps

- Discussion of proposals on list
- Adoption of a mechanism once the requirements are accepted

Thank you

