# Propagating ECN across IP tunnel Headers Separated by a Shim

draft-ietf-tsvwg-rfc6040update-shim-04

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Problem #1

- RFC6040 "Tunnelling of ECN"; scope was all IP-in-IP tunnels

- 6040bis clarifies that scope of RFC6040 includes cases with shim

  - most feasible to propagate ECN if shim 'tightly coupled' (added in same step as IP outer)

IPv4 or v6
shim
IPv4 or v6

IPv4 or v6
L2
shim
IPv4 or v6

?
L2
shim
IPv4 or v6

outer
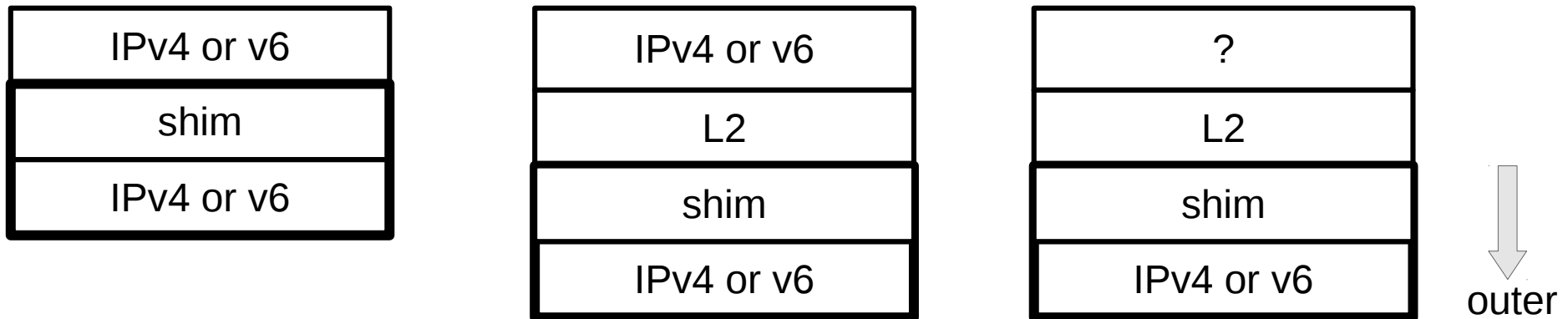
- Standards track, so it can update standards track RFC6040 and shim tunnel RFCs

Survey of IP-shim-(L2)-IP encaps

| Protocol	RFC	STDs or widely deployed	AOK	NOK: 6040shim updates	NOK: non-IETF: update recommended
Geneve	nvo3-geneve	✓	✓		
GUE	intarea-gue	✓	✓		
SFC	7665	✓	N/A?		
VXLAN	7348	✓			✓
VXLAN-GPE	nvo3-vxlan-gpe	✗			
LISP	6830	✓	✓		
CAPWAP	5415	✓	✓		
Teredo	4380	✓		✓	
GTP	v1, v1U,v2C	✓			✓
GRE	2784	✓		✓	
NVGRE	7637	✓		⇧	
L2TPv3	3931	✓		✓	
L2TPv2	2661	✓		✓	
PPTP	2637	✗			
AYIYA	www.sixxs.net	✗			
6a44	6751	✗			
SEAL	5320	✗			

Updates text
for standards track tunnel RFCs

- General ACKs: Alia Atlas for helping to widen then narrow the list
  Tom Herbert, Joe Touch and Mohamed Boucadair

- L2TPv2 & L2TPv3
  - discussed at length on l2tpext list
  - ACK: Carlos Pignataro and Ignacio Goyret
  - written update text to refer to RFC 6040
  - defined and written IANA registry text for L2TP attribute-value-pair (AVP) for tunnel initiator to agree ECN capability with remote tunnel endpoint

- GRE
  - update text refers to RFC 6040
  - no response to questions on int-area list
  - "is it true that there are no automated GRE tunnel set-up protocols?"

- Teredo
  - update text refers to RFC 6040
  - ACK: Praveen Balasubramanian (Christian Huitema was original author, but just left company)
  - open question on tunnel setup – resolution in progress

Problem #2: unique to ECN

- Both Diffserv (traffic class) and ECN have to propagate across layers
  - DS propagates 'requirements' down
  - ECN propagates...
    - ECN field down (copy)
    - congestion experienced (CE) up
- forwarded ECN constructed from inner and outer on decap [RFC6040]
- If ECN decap behaviour absent, encap MUST zero ECN outer
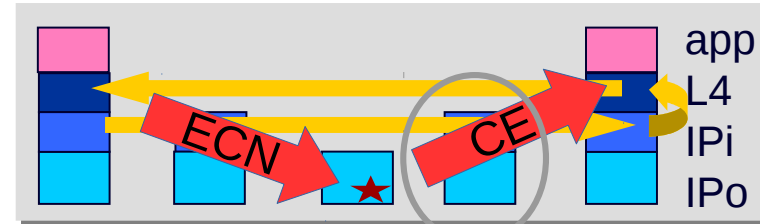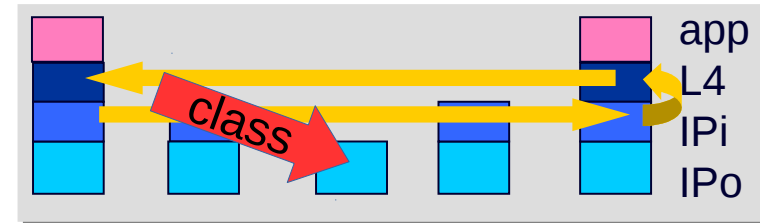
incoming inner	incoming outer			
	Not-ECT	ECT(0)	ECT(1)	CE
Not-ECT	Not-ECT	Not-ECT	Not-ECT	drop
ECT(0)	ECT(0)	ECT(0)	ECT(1)	CE
ECT(1)	ECT(1)	ECT(1)	ECT(1)	CE
CE	CE	CE	CE	CE
	Outgoing header			
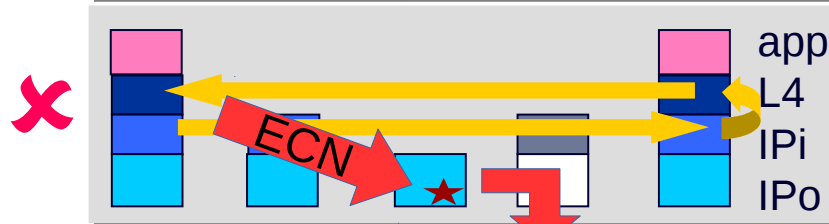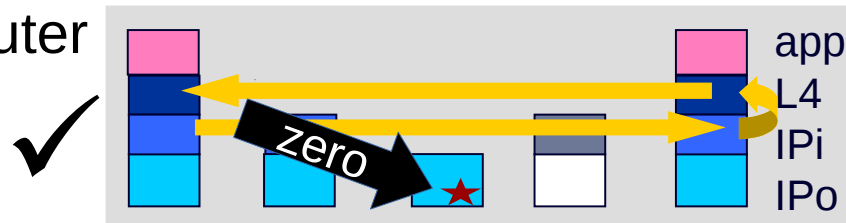
Compliance requirement for non-RFC6040 implementations!?

- Written as an operator config requirement
    - if decap does not, or might not, propagate ECN to RFC 6040 (or equiv), if possible, the operator MUST configure the ingress to zero the outer ECN field
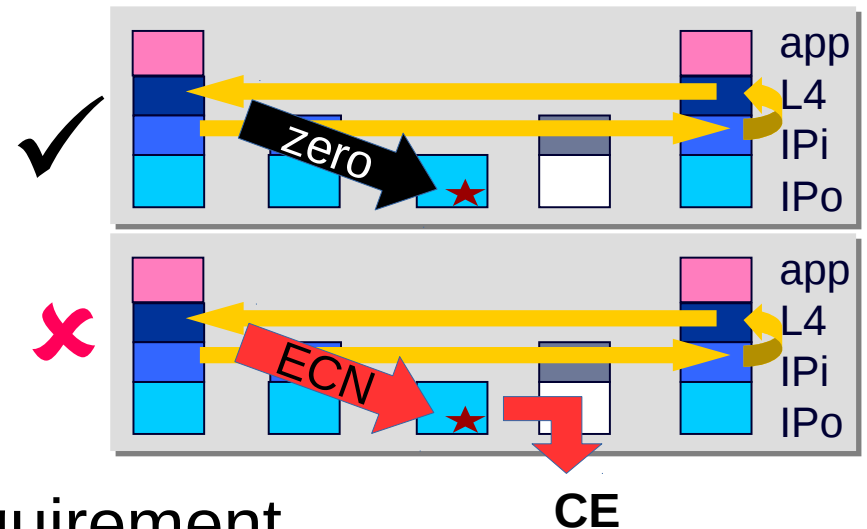
- Prerequisite implementation requirement
    - Config of ECN encap MUST be independent from DSCP encap

- Added text updates RFC 6040, and shim tunnel RFCs

Status and Next Steps
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- 4 revs in last IETF cycle

- Milestone: WGLC Sep 2017

- Been pushing to meet that, still feasible

- Await comments on Thu from int-area heads-up

- Teredo open issue: mtg next week to close off