Propagating ECN across IP tunnel
Headers Separated by a Shim

draft-ietf-tsvwg-rfc6040update-shim-05
(posted this morning, sorry)

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Problem #1

- RFC6040 “Tunnelling of ECN”; scope was all IP-in-IP tunnels
- rfc6040update-shim 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)

- Standards track, so it can update standards track RFC6040 and shim tunnel RFCs
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
## Survey of IP-shim-(L2)-IP encaps

<table>
<thead>
<tr>
<th>Protocol</th>
<th>RFC</th>
<th>STDs or widely deployed</th>
<th>AOK</th>
<th>NOK: 6040 shim updates</th>
<th>NOK: non-IETF: update recom’n’d</th>
<th>Safe config protocol</th>
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Why update some protocols but not others?

• In all cases, each base protocol RFC has been updated with an “operator safe configuration” clause
  • Places ref to ECN problem and solution in “Updated by” header

• Protocol Spec:
  
  if ( ( a maintainer of the protocol could be found) 
      && (it seemed like code might get updated) 
      && (I was confident I knew the implications of the update) ) 
  {I proposed fix to the control plane protocol, iterated, done}
  else
Updates to standards track tunnel RFCs added this IETF cycle

- **AMT (Automatic Multicast Tunnelling)**
  - Updates to RFC 7450:
    - defined new flag on Request message for gateway to declare its ECN capability to the relay that will tunnel towards it (unidirectional)
    - Operator required to follow safe config in present spec
  - ACK: Jake Holland

- **GRE (Generic Routing Encapsulation)**
  - Update to RFC2784:
    - Operator required to follow safe config in present spec
  - Referred to (but not updated) 4 control protocols that are known to set up GRE tunnels
    - MIP4, MIP6, PMIP, IKEv2
  - ACK: Sri Gundavelli
Status and Next Steps
draft-ietf-tsvwg-rfc6040update-shim-05

- Rev posted this morning (sorry)
- Milestone: WGLC Sep 2017
- Been pushing to meet that, ready now - not so late

- Corridor chat this week might lead to updates to outstanding protocols (Teredo, (P)MIP)
  - Assume not
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Q&A
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