IPv6/UDP Zero-Checksum

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draft-fairhurst-tsvwg-6man-udpzero-02

Why is this being discussed?

› The fundamental proposal is to allow turning off the UDP checksum, i.e. set it to 0, when using IPv6:

  – At least for outer header in tunnels.

› Intended only for specific applications, especially tunneling.

› A result of two IETF protocols under development:

  – **Automatic IP Multicast Without Explicit Tunnels (AMT)** (draft-ietf-mboned-auto-multicast)

  – **Locator/ID Separation Protocol (LISP)** draft-ietf-lisp

› Checksum change proposed in:

  – **draft-eubanks-chimento-6man-00**

USAGE Impact

› **Tunnel Impact**

  – Uncertain IPv6/UDP with zero checksum will be passed by firewalls

  – Turning off checksum in some systems is impossible or affects whole system

  – Corruption of outer IPv6 header in a packet in the tunnel has affect

    › e.g. Corrupted destination delivers to random host

› **Host Impact**

  – A packet with a corrupted destination arrives at its new target

    › (this will likely drop, since illegal checksum value)

  – A host that turns off checksum as a result of allowing this:

    › Has lost its delivery protection

    › Will be 32000 times more likely to get unintended packets delivered to applications

This has impact on other systems and applications

Revision -01 & -02

› **-01**

  – Added section on validating the current path:

  – Need for applications to negotiate the checksum algorithm in use and verify the method is appropriate on the current path.

  – Added guidance on fragmentation with IPv4 and IPv6.

  – Fixed some NiTs.

› **-02**

  – Added reference to ECMP for tunnels.

  – Clarifies the recommendations at the end of the document.

What we plan to do

1. Propose to perform any checksum rule change in RFC 2460

2. Clarify usage of flow label so it can be used in ECMP hashes, etc.*

3. Propose this document to 6man to identify issues and considerations

* draft-carpenter-flow-ecmp-01

Summary Pro and CONS

› Using UDP with zero checksum does not always seem to meet goals:

 – Yes, gets ECMP to work (but could use flow label for tunnels)

 – May, get you through firewalls (or not)

 – Does restrict the deployability to systems that can be changed

› Has impact on other systems and applications

 – Reduced delivery protection capabilities

 – Especially if this gets deployed for other applications

   › Not comparable with IPv4/UDP without checksum usage