To PSD or not to PSD? That is the Question

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ISD

• The case for ISD is made.
• However:
  • ISD may consume stack space in quantities that stress some implementations.
  • Parameters carried in ISD are of necessity limited in size.
  • ISD may interact with ECMP.
  • ISD that changes from packet to packet may change ECMP selected path
  • ISD that changes along the path could confusing and difficult to manage and would potentially change the ECMP selected path in an “unpredictable” way.
ISD Non-label bits

• A proposal is that ISD that changes should only be carried in the top 11 bits.

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| S | TC | ---TTL--- | Label |
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• Messy to encode any significant set of contiguous bits in this format

• In discussions it was assumed that this restriction would only apply to parameters that change along the path, but it probably also needs to apply to parameters that vary packet to packet in the same flow.
ISD EL

- There has been discussion on this topic at MPLS MNA DT and Interims
- One proposal is to mandate ELI/EL on any path that MAY carry an ISD parameter that would result in inconsistent ECMP, however
  - Extra 2 LSEs per packet
  - Not all routers support it.
PSD

• PSD use cases are not yet well specified, although a number have been put forward.

• PSD solutions are not yet well developed, and the need is not universally accepted by the WG.

• PSD would be difficult for some forwarders to access particularly if the label stack was large (e.g. SR and significant ISD).

• PSD interacts with other post stack information needed by the application parameters such as Control Words. Methods of carrying PSD and non-IP payloads need to be defined.

• PSD may have a greater capacity to carry AD and has no ECMP issues (assuming the IP alias issue is avoided – 1st Nibble)
Possible PSD Use Cases Not Be Precluded

• Time of flight
  • Precision time transfer – (more integrated than RFC8196)
  • Enhanced QoS solutions
    • Kill late packets
    • Priorities packets for JIT delivery
    • An embedded solution vs the DETNET overlay solution

• OAM
  • We have OAM solutions not using PSD. Will some OAM applications require embedded information?

• Security

• Fragmentation
ISD/PSD Compatibility - To Be Discussed

• The MNA design needs to include a simple elegant method that indicates the presence of PSD.
  • An example of such a method might be an ISD flag carried in a minimal MNA header or an ISD Op-code to indicated the presence of PSD.

• Development of PSD solutions needs to be able to proceed in parallel with development of ISD solutions.
PSD Discussion So Far

• To date the issues have been discussed:
  • On the list by a subset of the community.
  • In MNA interim meetings

• To come to a satisfactory conclusion for the community, we need to hear from others.

• Please review the material to date and present your views on the list or in the interim meetings.
Please Discuss