Operation of Deterministic Networks over MPLS

draft-bryant-detnet-mpls-dp-00

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Purpose

• Extract the MPLS design so that it can be reviewed by more readily reviewed by MPLS and PW experts.

• Ensure that the design and the description of the design is aligned with the language and methods used by the MPLS and PW community.

• Create a starting point for a standalone MPLS dataplane specification.

• Based on draft-ietf-detnet-dp-sol-01. draft-ietf-detnet-dp-sol-03 has only minor amendments for the purpose of this discussion.
The Model

Overlay Model as agreed as priority at last virtual interim. This aligns with the standard MS-PW model. End to End MPLS model seems unlikely to gain traction.
PREF Model

Rep and Elim happens in Edge and Relay Nodes (i.e. T-PEs and S-PEs).

In the limiting case (with PHP) only visible label is the Service Label.

Scope of the S-Label is the receiving DetNet node.

Label is swapped at each DetNet node (just like MS-PW).

PR/EF action at a node is a parameter of the flow group.
Issue – How do we handle S/N?

• Is it fixed at 28 bits?
• In this overlay model, can we live with 28 bits and 0 bits as only lengths?
• If it is to be less than 28 bits is this a parameter or an new DetNet type?
OAM

• We assume that the model in RFC5085 is used.
• Can we constrain it to ACH (VCCV Type 1) only or do we need to support the other VCCV modes?
• Do we need to support GAL as OAM marker in the DetNet layer?
Flow Aggregation

• Explored in more depth than ...sol-01

• We can aggregate at the LSP, as proposed, but we lose visibility of DetNet, and lose aggregation at Relay nodes.
Payload Type

• PWE3 just hovered up everything on an interface and shipped it across to the egress.

• DetNet only supports three types: Ethernet and IPv4 and IPv6
  • MPLS does not use the IP version field for IP type identification.

• Do we need to include a type identifier in the packet either in the CW or via RFC6658, or do we set up an end to end flow for each type?
Setting up a Path

• S-Label allocated by receiving DetNet Node (standard MPLS)
• We can use PW signalling protocols to exchange labels and DetNet parameters between DetNet Peers
• However we need to set up a graph not a linear path, and there is no precedence for this amongst the existing routing protocols.
Next Steps

• Verify that DetNet considers this an accurate reflection of the design.
• Review with MPLS and PW experts.
• Merge back into draft-ietf-detnet-dp-sol or continue as a separate draft, as the WG prefers.
• If the latter, adopt as a WG draft