Requirements for MPLS Label Stack Indicators for Ancillary Data
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Overview

- This draft specifies requirements for **indicators in the MPLS label stack** of ancillary data existing **below the label stack**

- Product of the MPLS Open Design Team

- Requirements are for the behaviour of the protocol mechanisms and procedures, not implementations

- Purpose of this document is to identify the toolkit and any new protocol work that is required.

- A primary objective is to avoid piecemeal solutions to different emerging applications

- This new protocol work MUST be based on the existing MPLS architecture.

Terminology

- **Ancillary Data:** Data relating to the MPLS packet that may be used to affect the forwarding or other processing of that packet, either at the LER or LSR. This data may be implicit (i.e. context-specific), encoded withing the label stack (in-stack data), after the bottom of the label stack but not considered a part of the payload, or within the payload

- **Ancillary Data Indicator (ADI):** A indicator in the MPLS label stack that ancillary data exists in this packet. It may also indicate the specific type of the ancillary data.

General Requirements: Architectural Principles

- MPLS combines extensibility, flexibility and efficiency by using control plane context combined with a simple data plane mechanism to allow the network to make forwarding decisions about a packet. Any solution MUST maintain these properties of MPLS.

- Any solutions to these requirements MUST not restrict the generality of MPLS architecture.

- Solutions MUST be able to coexist with and not obsolete existing MPLS mechanisms.

- Ancillary Data Indicators (ADIs) SHOULD make use of existing MPLS data plane operations. If extensions to the MPLS data plane are required, they MUST NOT be inconsistent with the MPLS architecture.

General Requirements: Protocol Capability/Backwards compatibility

- Neither an ADI or ancillary data must be delivered to a node that is not capable of processing it.

- Care needs to be taken in the coexistence of ancillary data and existing post-stack data mechanisms.

- A mechanism is REQUIRED to enable an LER inserting ADIs to determine if the far-end LER can accept and process a packet containing a given ADI.

General Requirements: Protocol

• Any solution MUST respect the principle that Special Purpose Labels are the mechanism of last resort.

• The mechanism to indicate that Ancillary Data is present MUST operate in the context of the top of stack LSE.

• A mechanism is REQUIRED to enable an LER inserting ADIs to determine whether LSRs along the path can parse the label stack and process the ADI at the location it is inserted.

• ADIs SHOULD be supported for both P2P and P2MP paths, but any specific ADI may only be supported for one or the other.

• Data plane mechanisms for ADIs MUST be independent of the control plane type (LDP, RSVP, BGP, static, IGP, etc.).

• A mechanism MUST be defined for control planes (LDP, RSVP, BGP, static, IGP, etc.) to determine the ability of downstream LSRs/LERs to accept/process a given ADI.

• It SHOULD be possible to include indicators for ancillary data for multiple applications in the same <label stack>, but each ADI only supports one application

General Requirements: Security

- A solution must be provided to verify the authenticity of ancillary data processed to LSRs.

- The design of the ADIs and ancillary data must not expose confidential information to the LSRs.

Next Steps

- Clean up duplicate requirements
- Continue to gather requirements from emerging applications and architecture/framework
- Please review and provide feedback
- Thank you!