

# Requirements for MPLS Label Stack Indicators and Ancillary Data

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**draft-bocci-mpls-miad-adi-requirements-02**

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# Overview

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- Captures the key requirements for both ancillary data and indicators in the MPLS label stack to support network actions that use that ancillary data
- Product of the MPLS Open Design Team
- Requirements largely derived from a number of proposals for additions to the MPLS label stack to allow decisions about actions based on application data
  - Application data (ancillary data) can exist within or below the label stack
  - Actions can be performed by intermediate (transit) or terminating LSRs on the LSP
- Requirements are on protocol design, NOT implementations

# Draft Structure

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- Terminology
  - New Terms needed to define new objects in MPLS
- General Requirements
  - A set of design principles that underpin this work
- Requirements on Ancillary Data Indicators
- Requirements on Ancillary Data itself

# Key New Terminology

May change depending on framework draft

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## Ancillary Data:

- Data relating to the MPLS packet that may be used to affect the forwarding or other processing of that packet, either at an LER [RFC4221] or LSR. This data may be encoded within the label stack (in-stack data), and/or after the bottom of the label stack (post-stack data).

## Ancillary Data Indicator (ADI):

- An indicator in the MPLS label stack that ancillary data exists in this packet. It MAY also indicate the specific type of the ancillary data.

## End-to-End and Hop-By-Hop:

- These need to be defined in the framework.

# General Requirements

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These are mainly about ensuring consistency of the design with MPLS, and efficiency of the protocol.

- 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 [RFC3031], [RFC3032].
- If extensions to the MPLS data plane are required, they MUST NOT be inconsistent with the MPLS architecture [RFC3031], [RFC3032].
- The design of any mechanism SHOULD be such that an LSR is able to efficiently parse the label stack.
- Mechanisms MUST NOT add more labels to the stack than is necessary.

# Requirements on ADIs

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Specific requirements on the design of ancillary data indicators

These address the following themes:

- The need for an ADI
- Coexistence of the ADI (which is in the label stack) with existing MPLS mechanisms
- The need for mechanisms to enable a head end LER to know whether and where in the label stack to insert an ADI on an LSP
- ADI Support for end to end and hop by hop processing of ancillary data

# Requirements on Ancillary Data

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High level requirements on the design of ancillary data

These address the following themes:

- Coexistence of the ancillary data (which may be in the label stack) with existing MPLS mechanisms, incl. post-stack e.g. CW & G-ACH
- Protocol efficiency: ensure ancillary data is not too deep in the packet
- Whether processing impacts the immediate forwarding operation or if mis-ordering is allowed (fast-path vs. slow path processing depends on the application)
- Scope of ancillary data: MAY be control/maintenance or MAY be related to the user traffic
- Security: Solution is needed to verify authenticity of ancillary data. Design must not expose confidential information.

# Summary

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- Several versions of the draft have been reviewed line-by-line in the MPLS Open Design Team
- Needs some editorial clean up and merge of duplicate requirements
- One set of comments received on v02 which need to be addressed
- Once this is done, authors believe the draft is mature and ready for MPLS working group adoption