A YANG Data Model for
MPLS Base and Static LSPs

(draft-saad-mpls-static-yang-02)

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Background

- ➤ The goal of this draft is to specify two YANG models:
  - ▪ MPLS Base
  - ▪ MPLS Static LSPs

- ➤ The MPLS base YANG module serves as a **<u>base</u>** framework for configuring and managing an MPLS switching subsystem
  - ▪ Augments the core routing data model [I-D.ietf-netmod-routing-cfg] with additional data specific to MPLS switching
  - ▪ Defines Base MPLS types and MPLS interface list and properties
  - ▪ Augmentation by other MPLS protocol modules expected
    - · TE, LDP, and LSP static

- ➤ The MPLS Static LSP module:
  - ▪ Augments the MPLS base YANG module

Update

- ➤ Draft initially introduced at IETF-94, Yokohama

- ➤ Update to augmentation path to reflect recent change in core routing data model [I-D.ietf-netmod-routing-cfg] (removal of routing-instance)

- ➤ MPLS RT Review [-02 Version] is underway
  - Reviewers: Sam Aldrin, Huub van Helvoort, Carlos Pignataro, and Mach Chen
  - Received comments from Huub

- ➤ Interest in generalizing the Static LSP Model to non-MPLS technologies
  - Rather than defining Static LSP models for each technology MPLS, OTN, WDM

Open Issue #1
Static LSP model for non-MPLS Technologies

➢ Issue - current Static LSP model is MPLS centric

- ▪ Need Static LSPs functions for multiple other technologies, OTN, WDM, etc.

➢ Proposal – regroup/restructure of MPLS Static LSP module:

- ▪ Decouple Static LSP model from MPLS technology
  - · Abstracting it into technology agnostic data model (similar to TE generic model)
- ▪ Utilize model attachment capability (e.g. mount) to apply generic Static LSP model to different technologies
- ▪ Augment generic Static LSP model with technology specific data

Open Issue #2
MPLS-RT reviewer comments (from Huub)

➢ Comment#1: draft should be split into two separate documents:

- one for describing the MPLS base YANG module, and
- one for describing the MPLS Static LSP module

➢ Comments/other: nits, will be addressed

➢ Proposal/resolution-

- Authors agree to divide the two into separate drafts
- This facilitates generalizing into generic Static LSP model

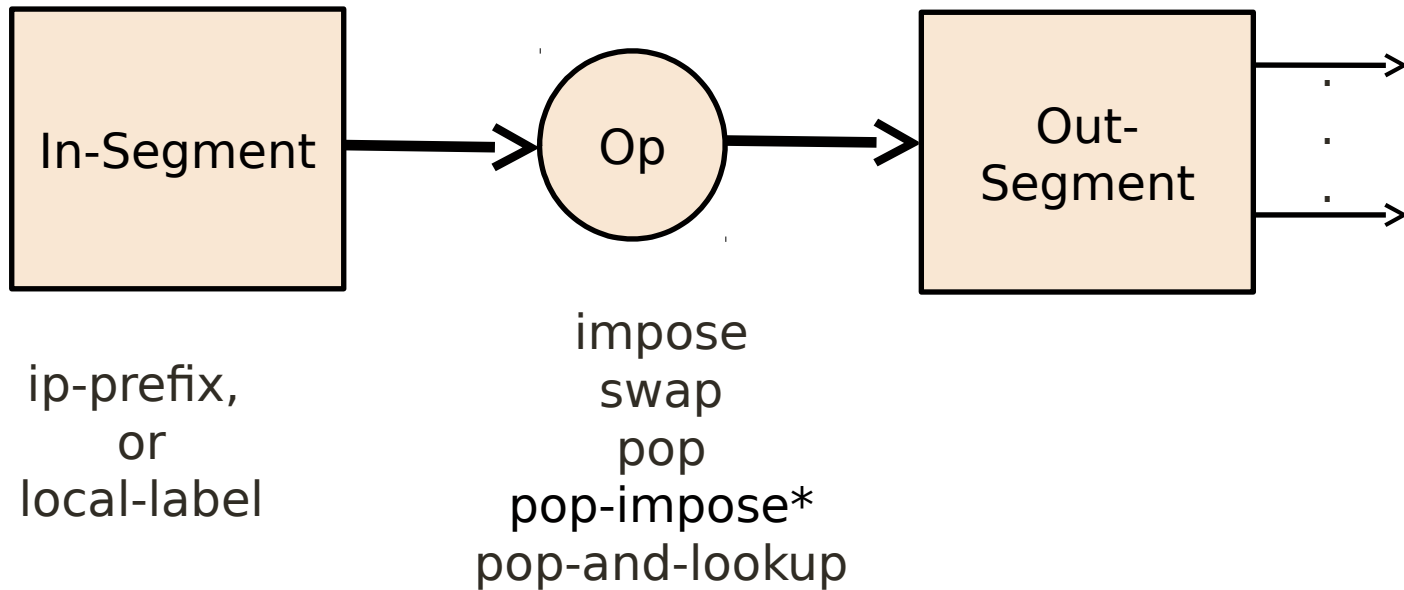# Open Issue #2
MPLS-RT reviewer comments (from Carlos)

➢ Comment#1: suggest draft to be split into two separate documents

➢ Comment#1: use of "loadshare"

  ▪ Relevant for multiple paths with unequal weights

➢ Comments/other: nits, will be addresses

➢ Question: Does this model allow the creation of a Label Stack, in which there is a label with index 1, a label with index 5, and nothing defined in between?

  ▪ Answer: Yes, as currently defined, the index is simply a unique key in the list and not the offset in label stack

Next Steps

➢ Address outstanding comments

➢ Soliciting more comments MPLS RT reviewers and WG

➢ Close on approach to generalize Static LSP model to multiple technologies

Backup Slides

MPLS Static LSPs: Building Blocks (2)

In-Segment

Op

Out-Segment

ip-prefix,
or
local-label

impose
swap
pop
pop-impose*
pop-and-lookup

MPLS Static LSPs: Building Blocks

➤ An MPLS Static LSP is defined as an ordered set of following three:

- In-segment
- Operation
- Out-segment

➤ In-Segment: Incoming segment of an LSP that is used as a lookup key for taking a forwarding action.

➤ Operation: Operation (or action) that needs to be performed if lookup succeeds.

➤ Out-Segment: Outgoing segment of an LSP that contains the actual forwarding information

- An Out-segment typically comprise 1 or more forwarding paths

MPLS Static LSPs: Forwarding Path

- Two types of forwarding paths defined:
  - Simple path
    - Uni-path
    - Basic attributes
  - Path List
    - Multi-path
    - Enhanced attributes (such as protection)

- Path attributes:
  - Table Id (next revision)
  - Nexthop address
  - Nexthop interface
  - Label stack (0 or more labels)
  - Load factor
  - Role (primary / backup etc)
  - Path-Id / Backup path-id for protection

MPLS Base: Tree Diagram - Rev -00

mpls-base interface

```
module: ietf-mpls
augment /rt:routing/rt:routing-instance:
    +--rw mpls
      +--rw interface* [name]
        +--rw name      if:interface-ref
        +--rw config
        | +--rw enabled
        +--ro state
          +--ro enabled
```