IETF 96 – Berlin July 2016

A YANG Data Model for MPLS Base and Static LSPs

(draft-ietf-mpls-base-yang-01)

(draft-ietf-mpls-static-yang-01)

Tarek Saad	(Cisco) -- Presenter
Kamran Raza	(Cisco)
Rakesh Gandhi	(Cisco)
Xufeng Liu	(Ericsson)
Vishnu Pavan Beeram	(Juniper)
Himanshu Shah	(Ciena)
Igor Bryskin	(Huawei)
Jescia Chen	(Huawei)
Raqib Jones	(Brocade)
Bin Wen	(Comcast)

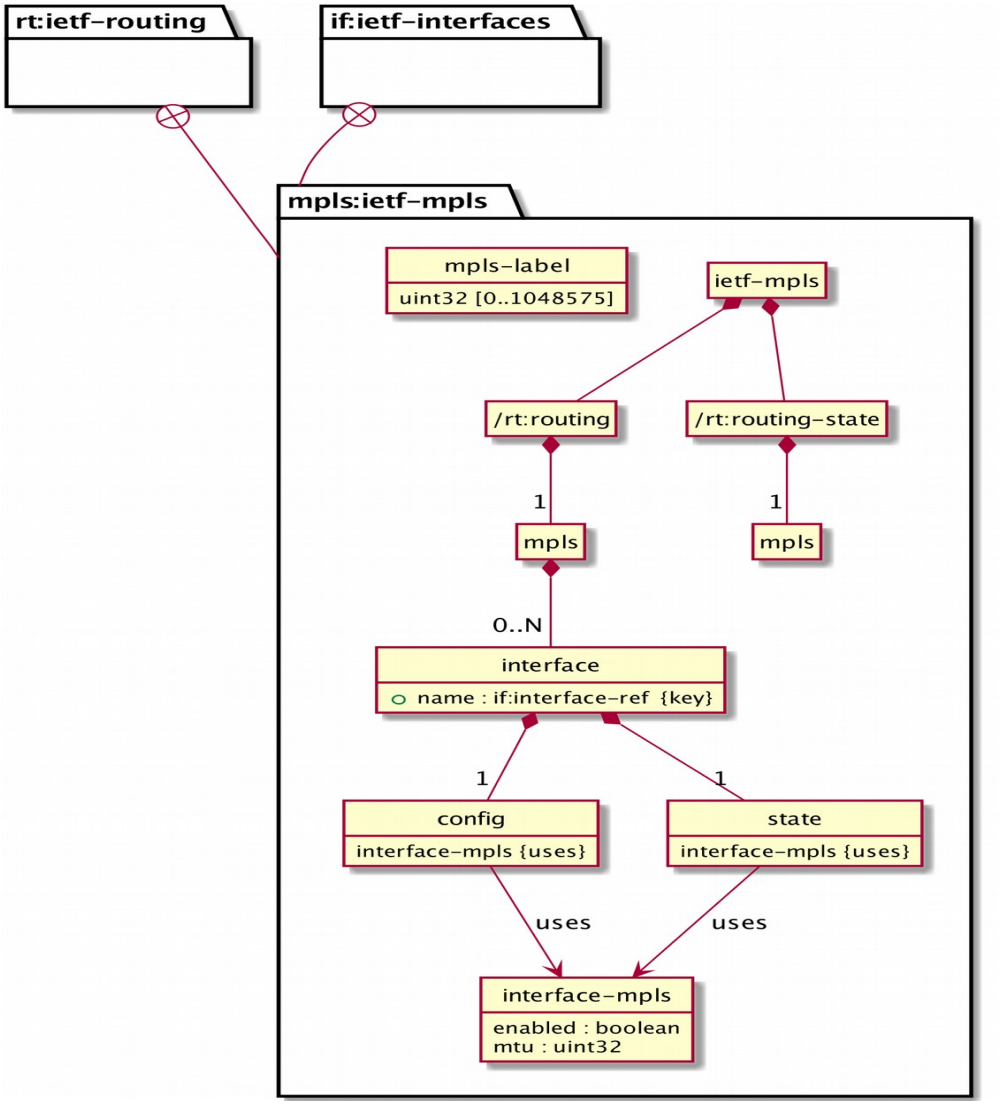
Background

- The goal of this draft is to specify two YANG models:
  - MPLS Base
  - MPLS Static LSPs
- The MPLS base YANG model
  - Augments the routing data model [I-D.ietf-netmod-routing-cfg]
  - Defines MPLS types and interface list and properties
  - Augmented by other MPLS protocols
- The MPLS Static LSP module:
  - Models MPLS Static LSPs: P2P, P2MP, and MP2MP
  - Covers uni- and bi directional LSPs

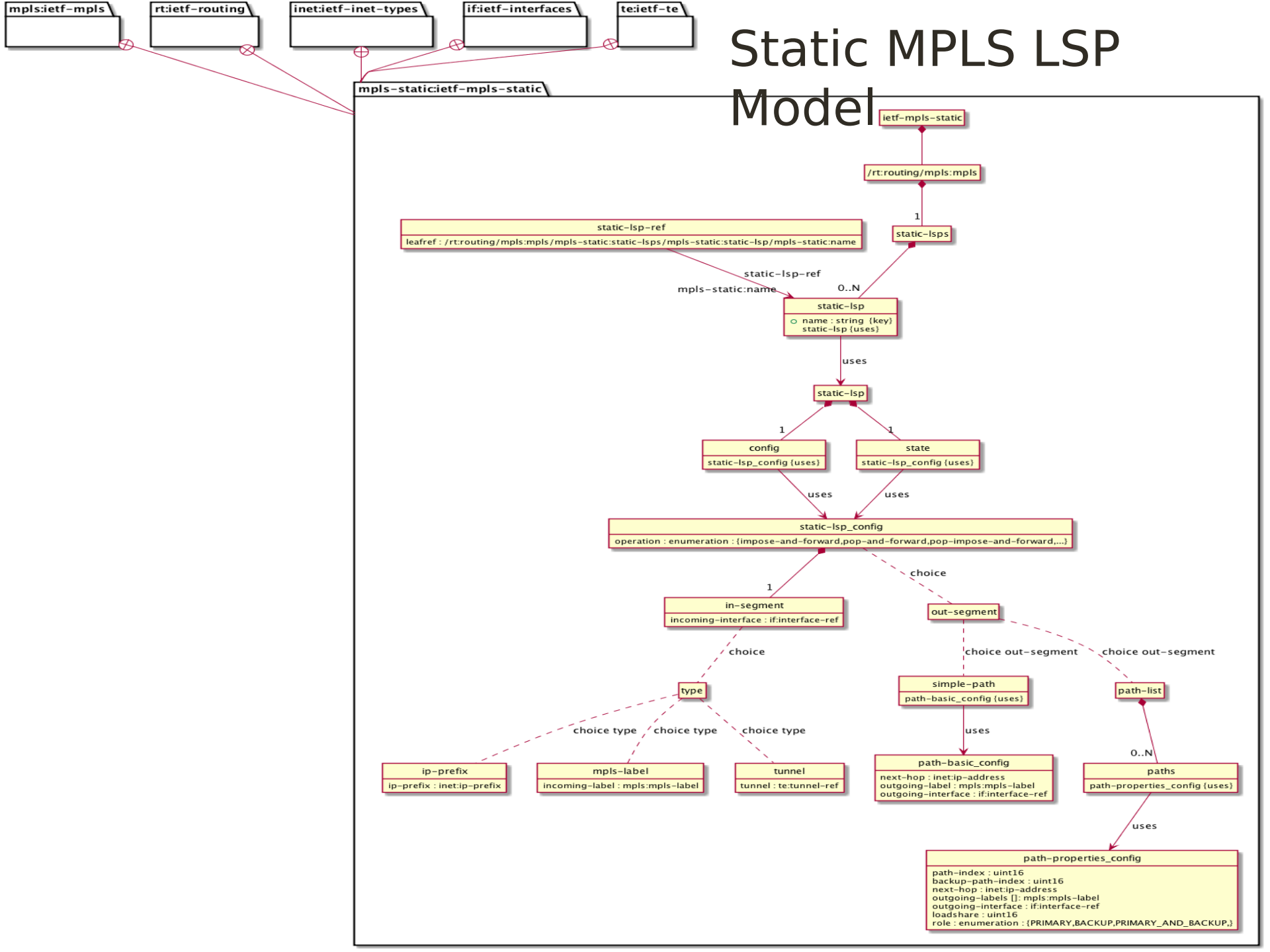
Update
(Static LSP Model)

- Added extended MPLS Static LSP module to cover optional features:
  - Per LSP bandwidth allocation, priority
  - Bidirectional Static LSP(s)
  - Work-in-progress modeling:
    - Static MPLS MP2MP and P2MP LSPs
    - Make-before-break for Static LSP
    - End-to-end path protection for Static LSP
- New additional fields for Static LSP model:
  - New FEC mappings

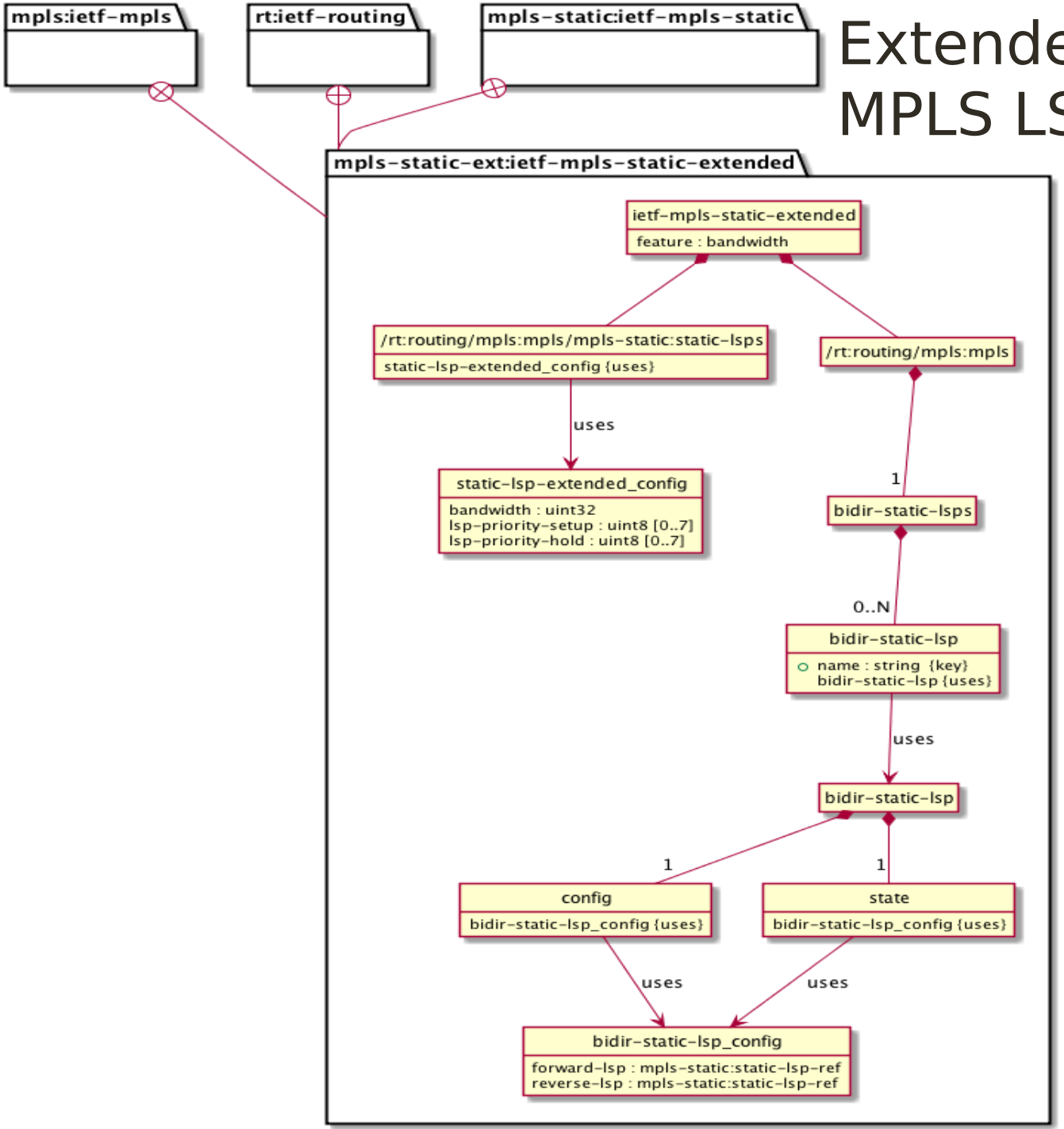
Base MPLS Model



Static MPLS LSP Model



Extended Static MPLS LSP Model



Open Issues

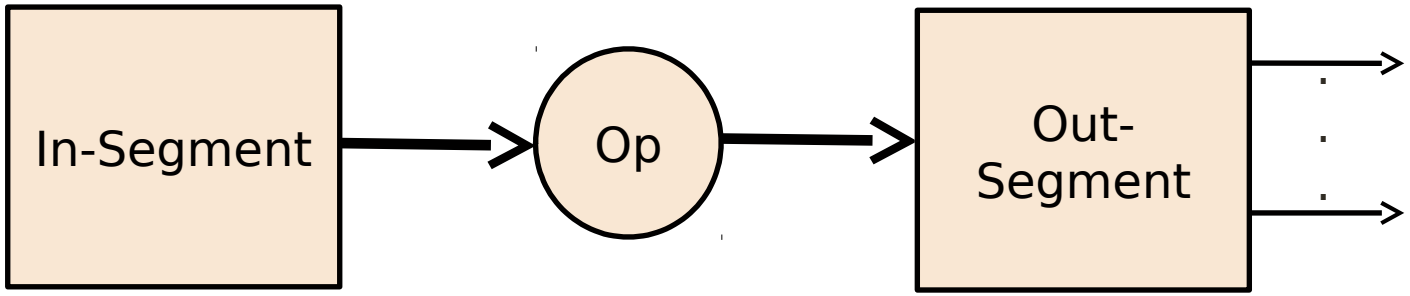
- Issue – Reuse of Static LSP model for non-MPLS Technologies
  - current model is MPLS centric
  - Need to cover other technologies, e.g. OTN, WDM, etc.
- Proposal – regroup/restructure of MPLS Static LSP module:
  - Decouple Static LSP model from MPLS technology
    - Abstracting it into technology agnostic data model (similar to TE generic model)
  - Reuse the generic model for multiple technologies:
    - Option #1: define grouping that each technology can reuse
    - Option #2: utilize model mount capability
    - Option #3: Generic LSP with an attribute to define LSP technology type

Next Steps

- Complete modeling of:
  - Static MPLS MP2MP and P2MP LSPs
  - Make-before-break for Static LSP
  - End-to-end path protection for Static LSP
- Close on approach for generalizing Static LSP model to multiple technologies
- Soliciting review and feedback from WG

Backup Slides

MPLS Static LSPs: Building Blocks (2)



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