



**I E T F**<sup>®</sup>

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6man Working Group

# Segment Routing Header

draft-ietf-6man-segment-routing-header-14

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# Running Code

- Linux (Feb 2017 – kernel 4.10)
- Cisco (April 2017)
  - 2 OSes (IOS XR, IOS XE)
  - 3 ASICs
- FD.io VPP (April 2017 – 17.04)
- Bell Canada, Barefoot, P4 (May 2017)
- Huawei
  - 3 Platforms with SRH implemented
- Juniper (Prototypes)
- See [draft-filsfils-spring-srv6-interop](#) for interop details

# Agenda

- Last Call Update
- Changes 10-14
- Last Call Issues
- Next Steps

# Last Call Update

# Last Call

- 47 Issues Opened During Last Call
- 130 Emails on 6man mailing list
- 4 Versions of the draft
- 34 Issues Closed
- 13 Issues Remaining

Changes 10-14

# Introduction

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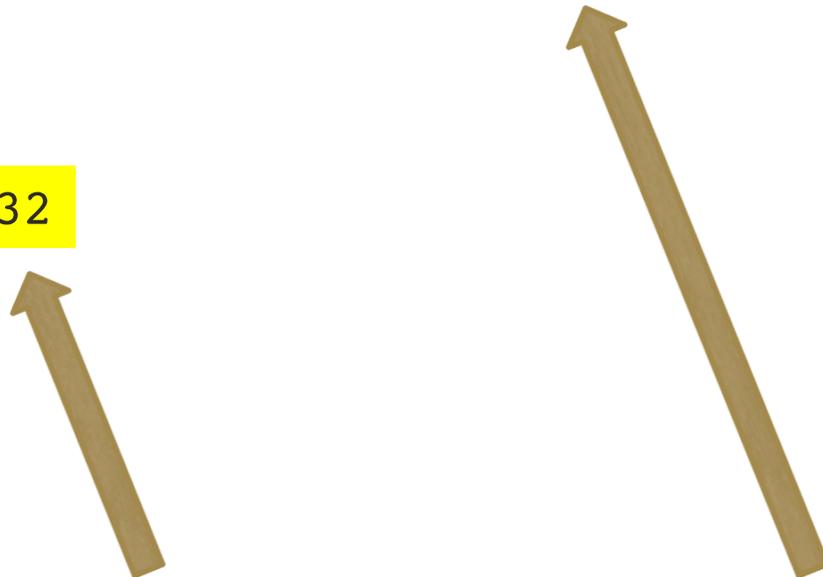
1.	Introduction . . . . .	3
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# Document Map (MPLS)

draft-ietf-spring-segment-routing

RFC3032

draft-ietf-spring-segment-routing-mpls

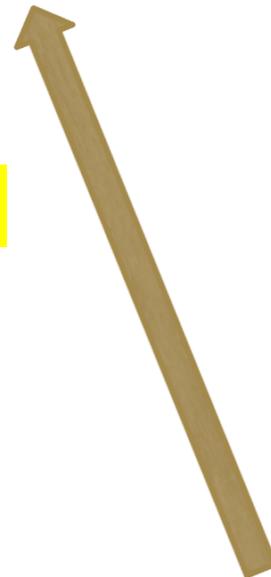


# Document Map (IPv6)

draft-ietf-spring-segment-routing



draft-ietf-6man-segment-routing-header



draft-filsfils-spring-srv6-network-programming



# Flags

- O – OAM: moved to draft-ali-spring-srv6-oam
- P – Protected: deleted allow a FRR draft to define it
- A – Alert: deleted, use Last Entry, Hdr Ext Len and local policy to determine when to process TLVs.
- H – HMAC: deleted, use Last Entry, Hdr Ext Len and local policy to determine when to process HMAC.
- Added IANA registry for extension of flags.

# TLVs

- Deleted Ingress, Egress, Opaque
  - Feedback: not needed
- NSH
  - Moved to draft-xuclad-spring-sr-service-programming
  - Content is as defined by RFC8300
- Padding
  - PADN, PAD0
  - Single PADN or PAD0 as last TLV
- HMAC (No change)

# TLVs

- Non-mutable, Mutable
  - High order bit - 1 TLVs change en route
- Recommend All TLVs are 8 Bytes multiple

# Source SR Nodes

“any node that originates an IPv6 packet with a segment (i.e. SRv6 SID) in the destination address of the IPv6 header”

# Transit Node

“A transit node is any node forwarding an IPv6 packet where the destination address of that packet is not locally configured as a segment nor a local interface.”

# SR Segment Endpoint Node

“any node receiving an IPv6 packet where the destination address of that packet is locally configured as a segment or local interface.”

# Packet Processing

## Source SR Node

- Steer traffic through an SR Policy to build an SRH
- Define Reduced SRH
- ECMP

# Packet Processing

## SR Segment Endpoint Node

- A FIB entry that represents a locally instantiated SRv6 SID
- A FIB entry that represents a local interface, not locally instantiated as an SRv6 SID
- A FIB entry that represents a non-local route
- No Match

# SRv6 END SID

- Section 4.3.1
- ICMPv6 error generation for all error cases
- TLV processing as a matter of local policy
- New SID types? Use section 4.3.1 content as a template



# Deployment Models

- How to treat nodes within an SR Domain vs nodes outside an SR Domain.
- Within
  - Trust them to generate packets SIDs within the domain
- Outside
  - Do not permit packets destined to SIDs within the domain
  - “However the SR Domain may be extended to nodes outside of it via use of the SRH HMAC.”

# Closed Issues

<https://trac.ietf.org/trac/6man/report/9>

# 34 Issues Closed

## Introduction

- Introduction (10)
  - 24, 27, 28, 29, 30, 31, 32, 33, 57, 45
  - Service Based Instructions
  - Interface Addresses
  - SID Routing/Forwarding
  - When/why SRH is processed
  - SRH Insertion at source

# 34 Issues Closed

## SRH

- SRH (16)
  - 34, 35, 36, 39, 40, 41, 42, 43, 44, 58, 59, 60, 65, 52, 53, 56
  - Segments Left consistent with RFC8200
  - Flags (P,O,A)
  - TLVs – Ingress Egress Opaque NSH

# 34 Issues Closed

## SRH Processing

- SRH Processing (8)
  - 22, 23, 47, 48, 49, 50, 51, 56
  - ECMP
  - Multicast
  - Decapsulation
  - END Processing
  - ICMPv6 Error generation

# Open Issues

<https://trac.ietf.org/trac/6man/report/9>

# 13 Open Issues

## Various

- Various Issues (3)
  - 64, 62, 63
  - Should be closed in revision 14, getting confirmation

# 13 Open Issues

## Edge Filtering

- Edge Filtering (3)
  - 25, 26, 68
  - ACL
  - HMAC

# 13 Open Issues

## Tag

- Tag (2)
  - 37, 61
  - Fully define processing

# 13 Open Issues

## TLV

- TLV (5)
  - 38, 54, 55, 62, 67
  - Padding
  - Insertion/deletion
  - Optional processing per local policy

Next Steps

# Next Steps

- Tag
  - Document usage
  
- TLVs
  - More TLV processing text
  - More TLV usage text
  
- HMAC
  - Rewrite Security Section
  - Separate HMAC processing to HMAC definition
  - Show why and how a segment list is secured
  
- Management
  - Data Model
    - SID
    - SRH Encap
  - HMAC

Thank You!

QnA