



I E T F[®]

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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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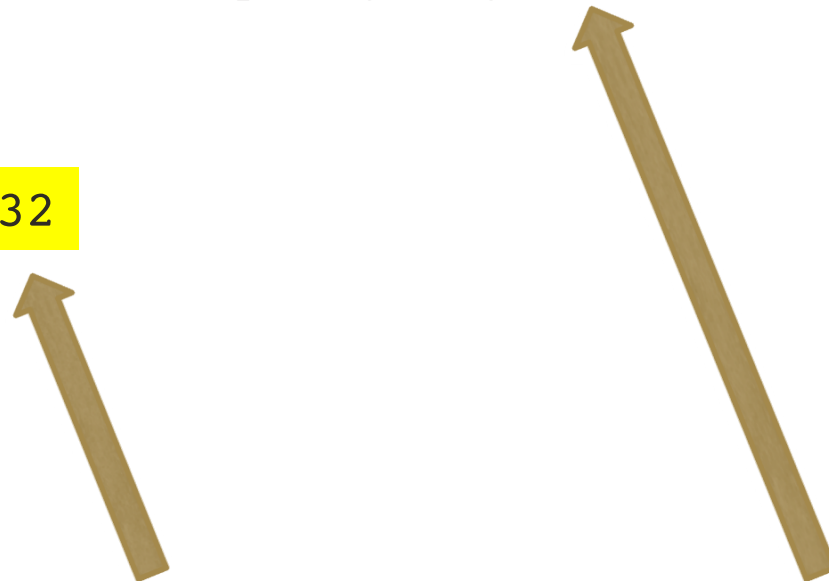
1.	Introduction	3
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Document Map (MPLS)

draft-ietf-spring-segment-routing

RFC3032

draft-ietf-spring-segment-routing-mpls

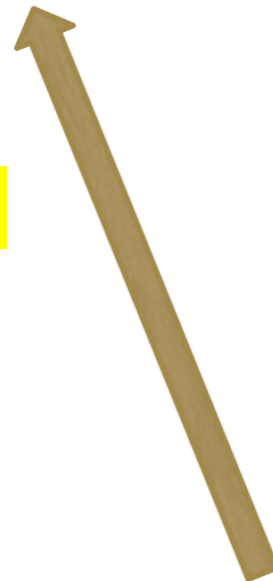


Document Map (IPv6)

draft-ietf-spring-segment-routing

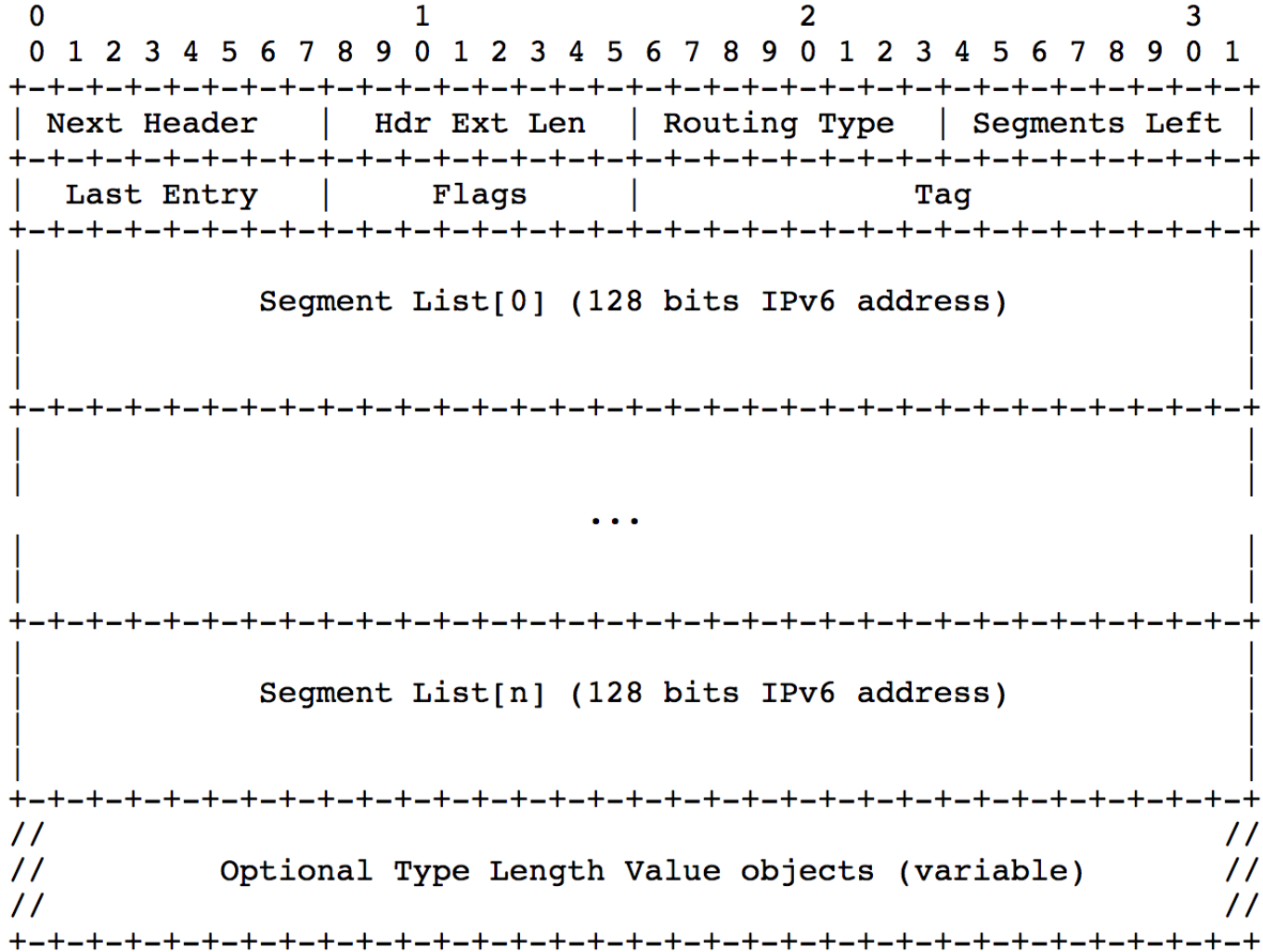


draft-ietf-6man-segment-routing-header



draft-filsfils-spring-srv6-network-programming

SRH



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

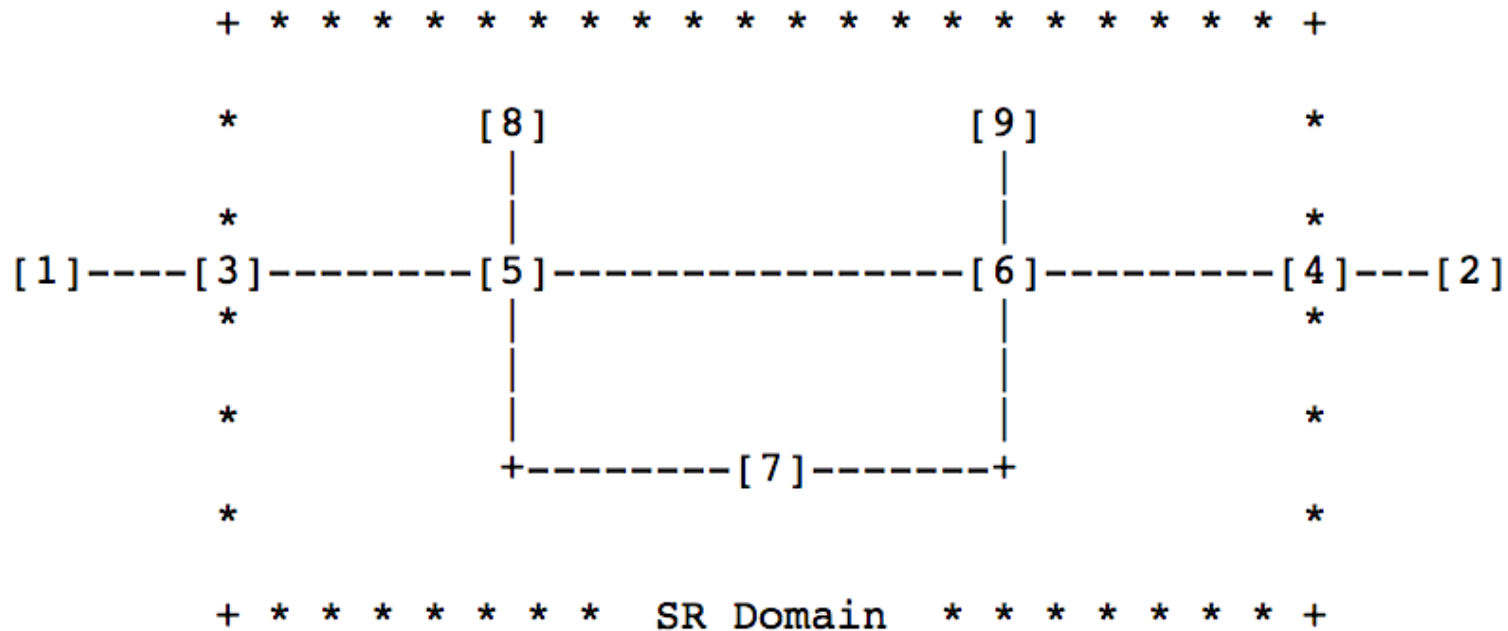
SRv6 END SID

- 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

Illustrations

Example Packet Processing

- Intra SR Domain (node 8 to node 9)
- Transit Through SR Domain (node 1 to node 2)



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