MPLS NETWORK ACTION (MNA) SUB-STACK SOLUTION (DRAFT-IETF-MPLS-MNA-HDR-07)

Jaganbabu Rajamanickam (jrajamin@cisco.com)
Rakesh Gandhi (rgandhi@cisco.com)
Royer Zigler (royi.zigler@broadcom.com)
Haoyu Song (haoyu.song@futurewei.com)
Kireeti Kompella (kireeti.ietf@gmail.com)
REVIEW COMMENTS RECEIVED DURING WG LC

1. Extend Format-B LSE to carry Additional Data
2. Update Format-C LSE to carry U bit
3. Define No-Operation Opcode
4. Implementation Status
5. Editorial Changes
6. Pending Comments
7. Next Steps
EXTENDED FORMAT-B LSE TO CARRY ADDITIONAL DATA

Changes

- Added 3-bit Network Action Length (NAL) field to extend Format-B LSE to carry additional data
- Adjusted the existing Network Action Sub-Stack (NASL) field to align the Format-B's NAL field with the NAL field of the Format-C LSE
**UPDATED FORMAT-C LSE TO CARRY U BIT**

### Changes
- **U bit:** Unknown network action handling
- **Added a U bit in Format-C LSE**
- **Reduced the NAL field from 4 bits to 3 bits**

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**Figure: 3 Previous version of Format-C LSE**

```
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+------------------------------------------+
| Opcode | Data | S | Data | NAL |
+------------------------------------------+
```

**Figure: 4 New version of Format-C LSE**

```
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+------------------------------------------+
| Opcode | Data | S | U | Data | NAL |
+------------------------------------------+
```
DEFINE NO-OPERATION OPCODE 2 (FORMAT B LSE)

Purpose

• This reserved opcode does not perform any Network Action and MUST be skipped
• Cleaner approach than using Flag-Based NAI Opcode with zeros in Data field
University of Tuebingen Implementation

The solution defined in this document has been implemented using P4 pipeline. The implementation code could be found at:

- https://github.com/uni-tue-kn/P4-MNA
In Section 3.

**OLD**

This document describes how network actions and their optional ancillary data are encoded as part of an NAS as a stack of LSEs.

**NEW**

This document describes how network actions and their optional ancillary data are encoded as part of an NAS as a stack of LSEs. **Mechanisms that allow sharing of ancillary data AD between multiple network actions encoded in the same NAS can be described in other documents and do not rely on any explicit provision in the encodings described in this document.**
NEXT STEPS

• Welcome WG review comments and suggestions on the updates
• Early Allocation of MNA Label bSPL
• Complete WG Last Call
THANK YOU!
# ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviations</th>
<th>Meaning</th>
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<tbody>
<tr>
<td>AD</td>
<td>Ancillary Data</td>
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<tr>
<td>BOS</td>
<td>Bottom of Stack</td>
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<tr>
<td>bSPL</td>
<td>Base Special Purpose Label</td>
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<tr>
<td>DEX</td>
<td>Direct Export</td>
</tr>
<tr>
<td>E2E</td>
<td>Edge-To-Edge</td>
</tr>
<tr>
<td>HBH</td>
<td>Hop By Hop</td>
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<tr>
<td>I2E</td>
<td>Ingress-To-Egress</td>
</tr>
<tr>
<td>IHS</td>
<td>Ingress-To-Egress, Hop-By-Hop or Select Processing Scope</td>
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<tr>
<td>IOAM</td>
<td>In Situ OAM</td>
</tr>
<tr>
<td>ISD</td>
<td>In-Stack Data</td>
</tr>
<tr>
<td>MNA</td>
<td>MPLS Network Action</td>
</tr>
<tr>
<td>MSD</td>
<td>Maximum Stack Depth</td>
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<tr>
<td>NAI</td>
<td>Network Action Indicator</td>
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<tr>
<td>NAI-OP</td>
<td>Network Action Indicator Opcode</td>
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<td>NAS</td>
<td>Network Action Sub-Stack</td>
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<td>POT</td>
<td>Proof of Transit</td>
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<tr>
<td>PSD</td>
<td>Post-Stack Data</td>
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<tr>
<td>PSNA</td>
<td>Post-Stack Network Action</td>
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<tr>
<td>RLD</td>
<td>Readable Label Depth</td>
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