FLEX ALGO IN IP NETWORK

draft-bonica-lsr-ip-flexalgo

IETF 109

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Agenda

- Introduction
- Use cases
- Proposed Solution
Introduction

- IGP Flex-Algorithm computes constraint-based paths to SR-MPLS prefix segments and SRv6 locators
  - Therefore IGP Flex-Algorithms cannot be deployed in the absence of SR-MPLS and SRv6
- This draft extends IGP Flex-Algorithm, allowing it to compute constraint-based paths to IPv4 and IPv6 prefixes
  - So Flex-Algorithms can be deployed in the absence of SR-MPLS and SRv6
Egress Node Procedures

- Loopback interface is associated with one more IP addresses
- Each loopback address is associated with an IP flex-algo
- If packet sent to a loopback address associated with flex-algo, it follows the constraint-based path calculated by that flex-algo
  - Otherwise, the packet follows the IGP least-cost path
Advertising IP Algorithms

- Each participating node advertises an IP Algorithm sub-tlv
  - Router capability in ISIS
  - Router information LSA in OSPF

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<th>Type</th>
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<tbody>
<tr>
<td>Algorithm 1</td>
<td>Algorithm 2</td>
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Advertising Flex-Algorithm Definitions (FAD)

- All routers participating in IP-flex algo must agree on the FAD
- Selected nodes within the IGP domain advertise FADs
- We can leverage FAD protocol machinery from Sections 5, 6 and 7 of I-D.ietf-lsr-flex-algo
Advertising IP Flex-algo reachability TLVs

- Associate IP/IPV6 prefix with flex-algo, new TLVs are define in ISIS
  - IPV4 Algorithm prefix reachability TLV
  - IPV6 Algorithm prefix reachability TLV
  - These TLVS share the sub-TLV space define for TLV 135,235,236,237 (not all sub-TLVs are applicable)

```
+--------+--------+--------+--------+
|        | Metric  |        |        |
|        |         |        |        |
| Flags  | Algorithm|        |        |
| Pfx Length | Prefix (variable)... |
| Sub-tlv-len | Sub-TLVs (variable) . . |
```

Note: ISIS TLV for illustration purpose.
Advertising IP Flex-algo reachability Continue….

- Associate IP/IPV6 prefix with flex-algo, new TLVs are define in OSPF
  - IPV4 Algorithm prefix reachability TLV (OSPFv2)
- OSPFv2 IP Algo Prefix reachability TLV
  - Advertise via TOP level TLV in OSPFv2 Extended prefix Opaque LSA.

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<th>Sub-TLVs (variable)</th>
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Juniper Business Use Only
Calculating IP flex algo path

- IP flex algorithm is yet another application of flex-algorithm
- It follows the same procedures for calculating path (Section 10 and 11 of I-D.ietf-lsr-flex-algo).
- For computing path to node, it must use IP flex algo participation and it is independent of any other flex algo (SR and SRV6).
- LFA can be used to protect constraint-based paths
Next steps

- Call for adoption
Thank you