Routing Extension for Fast-Reroute Using Maximally Redundant Trees
draft-li-rtgwg-igp-ext-mrt-frr-00

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Background Introduction

• [I-D.ietf-rtgwg-mrt-frr-architecture] describes the architecture based on Maximally Redundant Trees (MRT) to provide 100% coverage for FRR. Protocol extensions and considerations has been proposed.

• The draft defines the detailed IGP extensions and procedures to support MRT FRR.
IS-IS MRT-FRR Sub-TLV (1)

- **IS-IS MRT-FRR sub-TLV**: It is an optional sub-TLV which can be advertised in the router capability TLV([RFC4971]). The information has only level-wide scope.

```
+-----------------------------------+                       No. of Octets
| R | R | R | R |   Primary MT ID   |  2 |
+-----------------------------------+                       No. of Octets
| R | R | R | R | Blue MRT MT ID    |  2 |
+-----------------------------------+                       No. of Octets
| R | R | R | R | Red MRT MT ID     |  2 |
+-----------------------------------+                       No. of Octets
| MRT Capabilities Available       |  2 |
+-----------------------------------+                       No. of Octets
| MRT Algorithm ID|                   |  1 |
+-----------------+                       No. of Octets
| MRT Fd Mechanism|                   |  1 |
+-----------------+                       No. of Octets
| GADAG Root Election Priority    |  2 |
+-----------------------------------+
```

- **Primary MT ID**: Introduced to support multi-instance for MRT FRR.
IS-IS MRT-FRR Sub-TLV (2)

- MRT Capabilities Available: A bitmap to specify the set of MRT capabilities that the router can support.

```
+-----------------------------------------------+
|0|1|2|3|4|5|6|*| Reserved | +-----------------------------------------------+
```

- Bit0 - MRT-BIT
- Bit1 - IP-BIT
- Bit2 - LDP-BIT
- Bit3 - PIM-BIT
- Bit4 - PIMG-BIT
- Bit5 - mLDP-BIT
- Bit6 - mLDPG-BIT
IS-IS MRT-FRR Sub-TLV (3)

- MRT Algorithm ID: Specify the particular MRT algorithm used by the router.

```
+------------------+
| 0 | 1 | * | * | * | * | * | * | *
+------------------+
```

Bit0 - LP-BIT
Bit1 - SPF-BIT
IS-IS MRT-FRR Sub-TLV (4)

both destination and MRT.

- Option B - LDP Topology Label: Use a Topology-Identifier label on top of the IP packet.

```
+----------------+
| Bit0: LDP Dest-Top Label |
| Bit2: IP-in-IPv4       |
| Bit3: IP-in-IPv6       |
| Bit4: Encode MT-ID     |
| Bit3: IP-in-IPv6       |
| Bit4: Encode MT-ID     |
```

- Red MRT Loopback Address and Blue MRT Loopback Address: If IP-in-IPv4 or IP-in-IPv6 are used as forwarding mechanisms for IP, they should be advertised by the Multi-Topology Reachable IPv4/IPv6 Prefixes TLV ([RFC5120]).
OSPF MRT-FRR TLV

- OSPF MRT-FRR TLV: It is an optional TLV which can be advertised in the OSPF router information LSA([RFC4970]). The information has only area-wide scope.

```
+----------------+-----------------+-----------------
| Pri MT ID      | Blue MRT MT ID  | Red MRT MT ID  |
+----------------+-----------------+-----------------
| MT ID          | Blue MRT MT ID  | Red MRT MT ID  |
| MRT Capabilities Available | MRT Algr ID | MRT Fd Mech |```

OSPF MRT-FRR TLV: It is an optional TLV which can be advertised in the OSPF router information LSA([RFC4970]). The information has only area-wide scope.
Next Steps

list)

• Split the draft into two drafts (ISIS and OSPF)?