MRT-FRR with Segment Routing Labels

draft-agv-rtgwg-spring-segment-routing-mrt-03
IETF-97

Anil Kumar S N
Gaurav Agrawal
Vinod Kumar S
C. Bowers

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Motivation

A 100% coverage fast-reroute solution for IP/LDP traffic using Maximally Redundant Trees (MRT).

Associated algorithms all implemented and verified.

MRT Architecture (RFC 7812) and Algorithm (RFC 7811) drafts are now IETF standards

Goal is to extend MRT for Segment Routing

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Changes since the -02

- Thanks to Chris for providing valuable suggestions/text.
    He is also a co-author now!

- Utilize the existing SR Algorithm field , instead of IGP MT-ID.
    - Defines two additional algorithm values correspond to MRT-RED and
        MRT-BLUE.
    - Define Segment routing MRT Profile.

Introduction to MRT-FRR with SR

1. Re-Use EXISTING IGP extensions for MRT.
   - Carry new SR MRT Profile.

2. New SR Algorithm value for MRT-Blue and MRT-Red.

3. Re-Use EXISTING IGP extensions for SR to advertise MRT capability.
   - use algorithm tlv/sub-tlv

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SR-Algorithm TLV [I-D.ietf-ospf-segment-routing-extensions]

 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|             Type              |             Length            |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|   Algorithm 1 | Algorithm...  |   Algorithm n |               |
+---------------------------------------------------------------+
|                                                               |
+                                                               +


SR-Algorithm Sub-TLV[I-D.ietf-isis-segment-routing-extensions]

 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|    Type       |    Length     |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Algorithm 1   | Algorithm 2   | Algorithm ... | Algorithm n   |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```
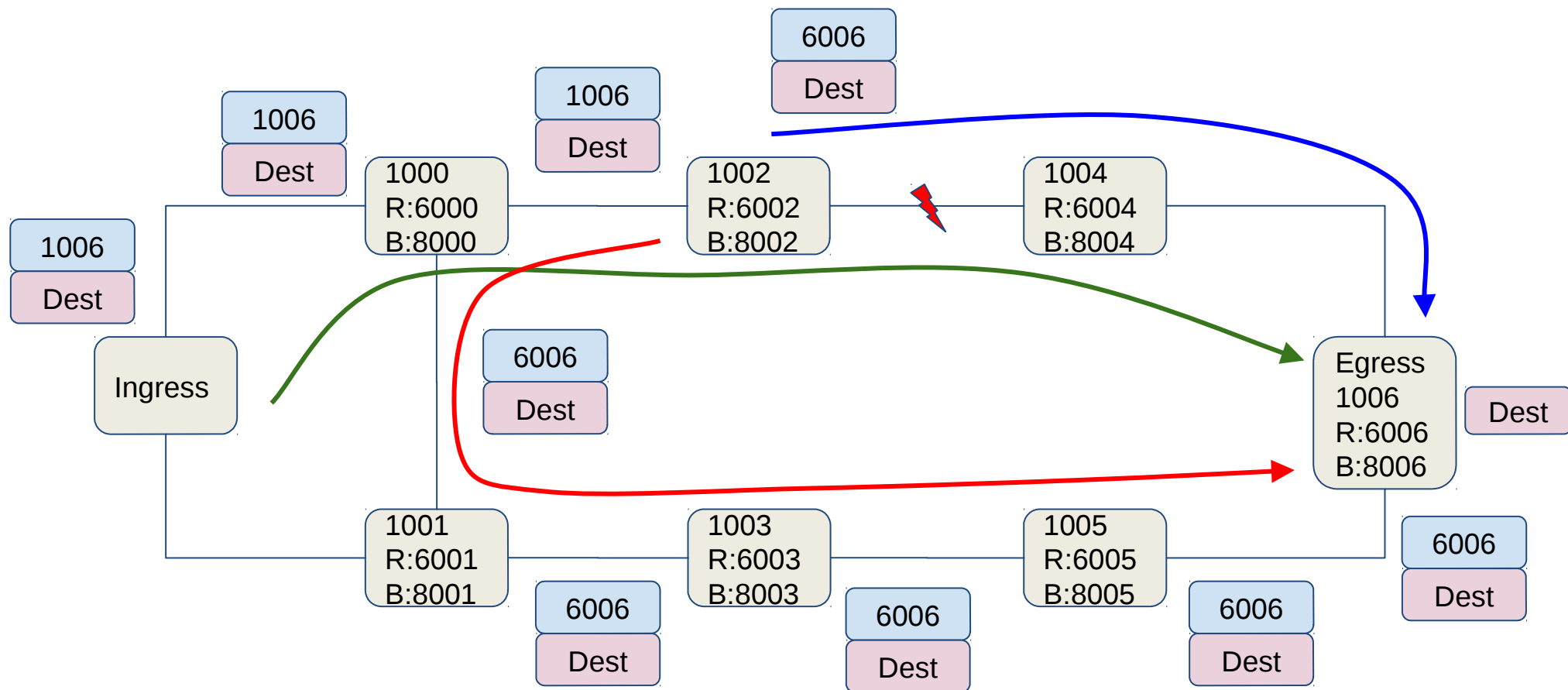
4. Re-Use EXISTING IGP extensions for SR MRT SID/Label advertisement
   - Advertise two additional SID corresponding to MRT-BLUE and MRT-RED for each prefix segment.

5. SR nodes supports MRT-RED and MRT-BLUE forwarding topology creation and support the computation of FRR paths as per the MRT algorithm.
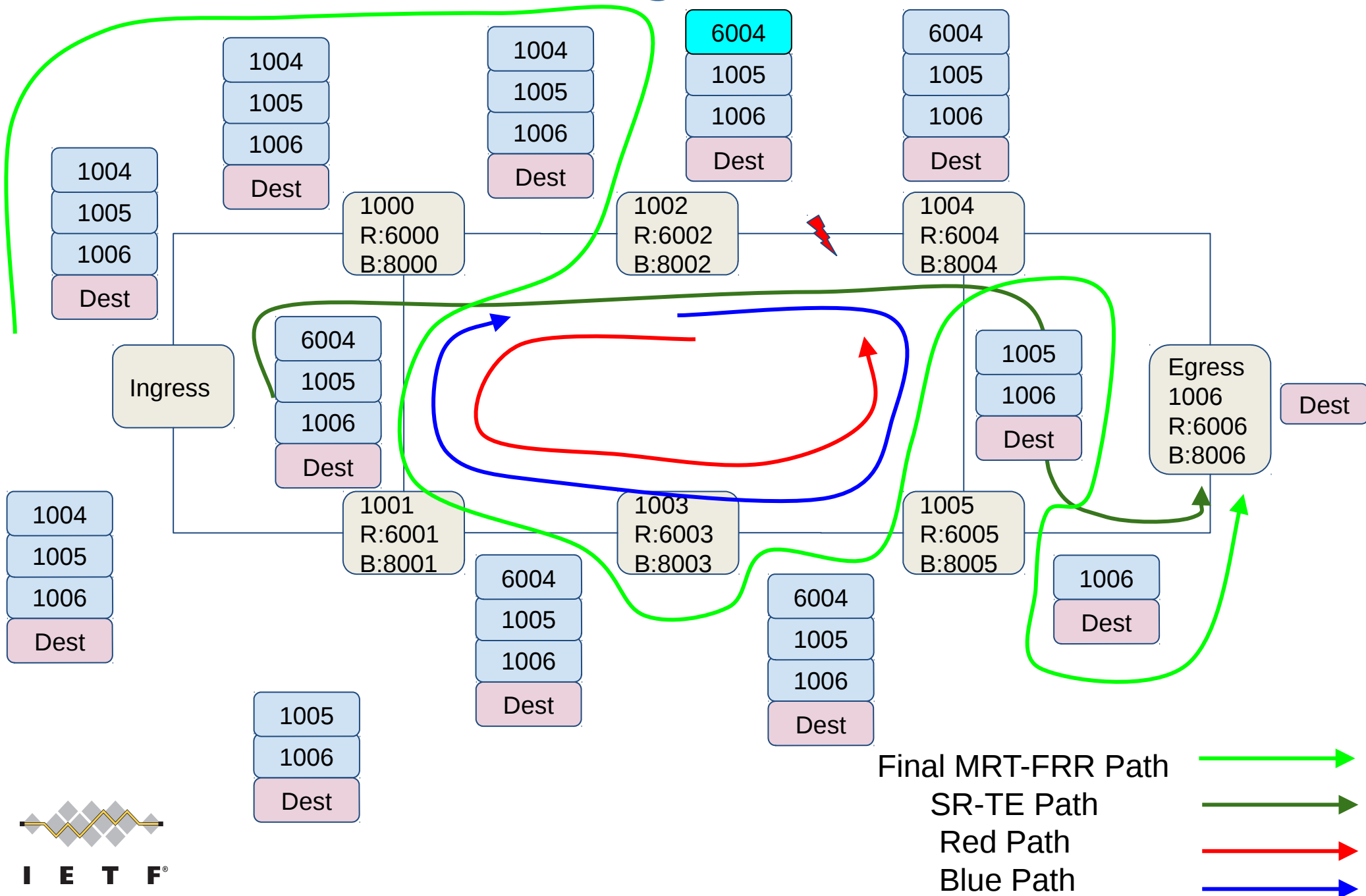
MRT-FRR with Destination based SR

MRT-FRR with Traffic Engineered SR

Final MRT-FRR Path

SR-TE Path

Red Path

Blue Path

Next Step

- Analyze solution to support MRT FRR using named proxy method to support destinations outside MRT Island (Partial deployment scenario).

- Working with authors of draft-peng-rtgwg-mrt-frr-sr-00 to reach a common solution for above requriement.

Request for community Feedback/Suggestions

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Thanks & Questions