Problem Statement

- Hybrid Network: different routing protocols run in different regions.

- Not many routers in some regions. There is only one hop forwarding in some other regions.

- Multicast services are provided in this hybrid network by using PIM currently.

If we deploy a BIER domain in each IGP region:

- Border router needs to maintain overlay state.

- Border router must convert BIER encapsulation.

- Multiple BIER encap/decap functions lead to inefficient forwarding.
Problem Statement

What if we have one BIER domain spanning all the regions?
• No overlay state on border routers
• No BIER decap/encap on border routers

But how to signal across multiple routing regions?
Solution 1/2

• BIER sub-TLV re-advertised with BIER Prefix redistributed by border routers from one routing region to another
  – Throughout the whole BIER domain across multiple regions, allowing each node to build forwarding state
  – Just like OSPF inter-area case

• BIER MPLS Encapsulation sub-TLV may be included but not needed in the re-advertised BIER sub-TLV
  – Needed only if an internal BFR may send BIER packets directly to an external BFR
Solution 2/2

- Individual BIER Prefixes may be summarized into summary/aggregation/default routes by the border routers.
  - A single summary/aggregation/default route may cover many BFR-IDs

- BIER Proxy Range sub-TLVs are attached to the summary/aggregation/default prefix advertisement.

```
<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
<th>subdomain-id</th>
<th>resv</th>
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<tbody>
<tr>
<td>------</td>
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</tbody>
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| BFR-id | BFR-id range |
```

- Multiple BIER proxy range sub-TLVs may be used if the BFR-ids covered by the prefix are allocated from different ranges.

- No more one-to-one mapping between individual BIER Prefixes and BFR-IDs
  - Multicast Overlay needs to include BFER-IDs when signaling to BFIRs
• Any comment is welcomed ^

Thanks!