BIER-Ethernet

draft-wang-bier-ethernet

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Background

- BIER-Ethernet: implements BIER forwarding in Ethernet network.
Control Plane Solution

• **The Main Idea:**
  - Define a new sub-sub-TLV to carry BSL information;
  - Then advertise this BSL sub-sub-TLV together with BIER Info sub-TLV in IG P extension/BGP extension.
  - *Already updated and defined in ISIS extension draft*

```
| 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 |
+-----------------------------------------------+
<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSL</td>
<td>Reserved</td>
</tr>
</tbody>
</table>
```

• **BSL Identifier**: identifies the BSL information the sending BFR supports. It may include one or several BSLs; For example:
  - 00000001 identifies BSL is 64;
  - 00000100 identifies BSL is 256;
  - 00101001 identifies BSLs are 2048, 512 and 64;
DATA Plane Solution

Because there requires directions to identify the BIFT table, there should allocate the BSL, sub-domain and SI fields in the updated BIER header, as well as TTL and TOS field. As follow:

```
+-----------------+-----------------+-----------------+-----------------+-----------------+-----------------+-----------------+-----------------+
| Subdomain-ID    | Set ID          | BSL             | TTL             | TOS             |
+-----------------+-----------------+-----------------+-----------------+-----------------+-----------------+-----------------+-----------------+
| BitString (first 32 bits) |
+-----------------+-----------------+-----------------+-----------------+-----------------+-----------------+-----------------+-----------------+
| OAM | Reserved       | Proto           | BFIR-id         |
+-----------------+-----------------+-----------------+-----------------+-----------------+-----------------+-----------------+-----------------+
```

Additionally, mostly, this updated BIER header is immediately after Ethernet header, so there may need a new Ether Type to encode this kind of updated BIER header.
Some updates

1. **Why using BIER-Ethernet? --- For more clean cut design**

   and just let MPLS as an independent layer protocol to help BIER forwarding as it does for IPv4/IPv6/IPmcast traffic. Additionally, the BIER forwarding capability will be also introduced in enterprise/data center, such feature may be newly implemented in switch ASICs, with clean cut design using BIER-ethernet, the implementation will be more clean as well.

2. **BIER Ethernet Considerations for NVO3 network**

   There may be requirements for current switch ASICs in datacenter to implement BIER Ethernet forwarding. And then, there will be a more efficient way to forward BUM traffic, rather than ingress replication and multicast tree.
3. **BIER Ethernet Considerations for MVPN**
   
   In MVPN, the P-tunnels are used for carrying multicast traffic across backbone. BIER tunnel Type is newly defined in [I-D.ietf-bier-mvpn]. The BIER Encapsulation used for multicast tunnel is independent of the MPLS label. Hence, BIER-Ethernet can also be used as P-Tunnel. In other words, there may need a new Tunnel Type to identify BIER-Ethernet Tunnel type, or a new flag to distinguish BIER-MPLS tunnel and BIER-Ethernet Tunnel.

4. **BIER Ethernet Considerations for BIER Traffic Engineering**

   BIER-TE encapsulation format may be the same as BIER encapsulation. However, how to interpret the BitString is totally different. Hence, BIER-Ethernet encapsulation MUST need one identifier to be assigned to identify the BIER header is for BIER forwarding or BIER-TE forwarding. For example, one bit in Reserved field can be reserved for this purpose.
Next Steps

• Call for adoption? "

• Any comments "