Overview

– A generic way of extending IGMPv3/MLDv2 messages
  • Defines extension type and registry

– Defines a type extension for BIER
  • Used for IGMPv3/MLDv2 BIER overlay when IGMPv3/MLDv2 messages are BIER encapsulated
  • Used by BIER ingress/egress routers

– This draft probably belongs in the pim WG since it defines an IGMP/MLD extension and registry, while current use case is in bier WG for IGMP/MLD overlay (draft-ietf-bier-mld).
IGMP/MLD Additional Data

- In RFC 3376 (IGMPv3)
  4.1.10. Additional Data
  If the Packet Length field in the IP header of a received Query indicates that there are additional octets of data present, beyond the fields described here, IGMPv3 implementations MUST include those octets in the computation to verify the received IGMP Checksum, but MUST otherwise ignore those additional octets. When sending a Query, an IGMPv3 implementation MUST NOT include additional octets beyond the fields described here.

- Similar language for reports, and for queries/reports in RFC 3810
Example IGMP query with extension as additional data

```
| 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 = 0x11 | Max Resp Code | Checksum |
+------------------------------------------------------------------+
| Group Address |
+------------------------------------------------------------------+
| Resv |S| QRV | QQIC | Number of Sources (N) |
+------------------------------------------------------------------+
| Source Address [1] |
+-------------------+
| Source Address [2] |
+-------------------+
| Source Address [N] |
|……|
+-------------------+
|Extension Type | Extension Value |
~                 ~
+------------------------------------------------------------------+
```
Extension Type

- We think it is good to have an extension type in case there may be multiple extensions for different purposes.
- Implementations that support a specific type processes the type as defined.
- Implementations that don’t support an extension type, as well as current implementations, treat it as Additional Data in the RFC and does not process the type.
- Extensions should not be common. Cannot expect router and host implementations in general to be updated.
IGMP/MLD BIER Extension

- IGMP/MLD BIER Overlay (draft-ietf-bier-mld) uses IGMP/MLD with BIER encapsulation to signal receiver interest between BIER routers.
- When a BIER router receives an IGMP/MLD Report, it needs to know the BIER Sub-Domain ID, BFR-Prefix and BFR-ID of the sender.
  - This determines the Sub-Domain and Bit-set to use when forwarding multicast data over BIER
- For debugging, logging and querier election, it may also be useful for queries.
- draft-ietf-bier-mld states that all BIER encapsulated IGMPv3/MLDv2 messages MUST use the BIER extension.
- Only BIER routers need to support extension. Never used without BIER encapsulation.
IGMP/MLD BIER Extension

Format

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
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|Extension Type | Sub-domain ID |         BFR-ID                |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                           BFR-Prefix                          |
~                                                               ~
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+

– The extension type would be a fixed value assigned by IANA identifying this particular format
– The remaining fields identifies the BIER router that originated the IGMP/MLD message