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BIER Encapsulation
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Abstract

Bit Index Explicit Replication (BIER) is a new multicast forwarding paradigm which doesn't require an explicit tree-building protocol and doesn't require intermediate routers to maintain any multicast state. This document proposes a transport-indepdent BIER encapsulation header which is applicable in any kind of transport networks.

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[1.](#) Introduction

Bit Index Explicit Replication (BIER)

[[I-D.wijnands-bier-architecture](#)] is a new multicast forwarding paradigm which doesn't require an explicit tree-building protocol and doesn't require intermediate routers to maintain any multicast state. As described in [[I-D.wijnands-bier-architecture](#)], BIER requires that a multicast data packet (e.g., an IP packet or an MPLS packet) to be encapsulated with a BIER header that carries the information needed for supporting the BIER forwarding procedures. This information at least includes Set-Identifier (SI), Multi-Topology Identifier (MT-ID) and BitString. The SI and the BitString are used together to identify the set of egress BFRs (BFERs) to which the packet must be delivered. In addition, to indicate what type of payload is following the BIER header, a protocol type field is necessary. This document proposes a transport-independent BIER encapsulation header which is applicable in any kind of transport networks.

[1.1.](#) Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#) [[RFC2119](#)].

[2.](#) Terminology

This memo makes use of the terms defined in [[I-D.wijnands-bier-architecture](#)].

BitString: The variable-length BitString field that, together with the SI field, identifies all the destination BFERs for this packet.

ToS: The usage of this field is no different from that of the Type of Service (ToS) field in the IPv4 header.

TTL: The usage of this field is no different from that of the Time to Live (TTL) field in the IPv4 header.

4. Transport Encapsulation for BIER Header

Since the BIER encapsulation format as specified in [Section 3](#) is transport-independent, it can be encapsulated with any type of transport encapsulation headers, such as Ethernet header, PPP header, IP header, MPLS header, GRE header, UDP header etc. It requires for each possible transport encapsulation header to be able to indicate the payload is an BIER header. For instance, In the BIER-in-MAC encapsulation case, the EtherType field in the Ethernet header is used. In the BIER-in-IP encapsulation case, the Protocol or Next-Header field in the IPv4 or IPv6 header is used. In the BIER-in-MPLS encapsulation case, either the Protocol Type field [[I-D.xu-mpls-payload-protocol-identifier](#)] within the MPLS packet or a to-be-assigned Extended Special Purpose label [[RFC7274](#)] is used.

5. Acknowledgements

TBD.

6. IANA Considerations

This document includes a request to IANA to allocate an EtherType code, IPv4 protocol type code, IPv6 Next-Header code, UDP destination port for carrying the BIER-encapsulated packet over the corresponding transport networks. Furthermore, This document includes a request to IANA to allocate an EtherType code for VXLAN and VXLAN-GPE.

7. Security Considerations

TBD.

8. References

8.1. Normative References

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