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S. Krishnan
J. Halpern
Ericsson
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Reserving bits in the IPv6 header for future use
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Abstract

The IPv6 header does not contain any reserved bits for future expansion. This document sets aside 4 bits from the flow label field for future expansion.

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1. Introduction

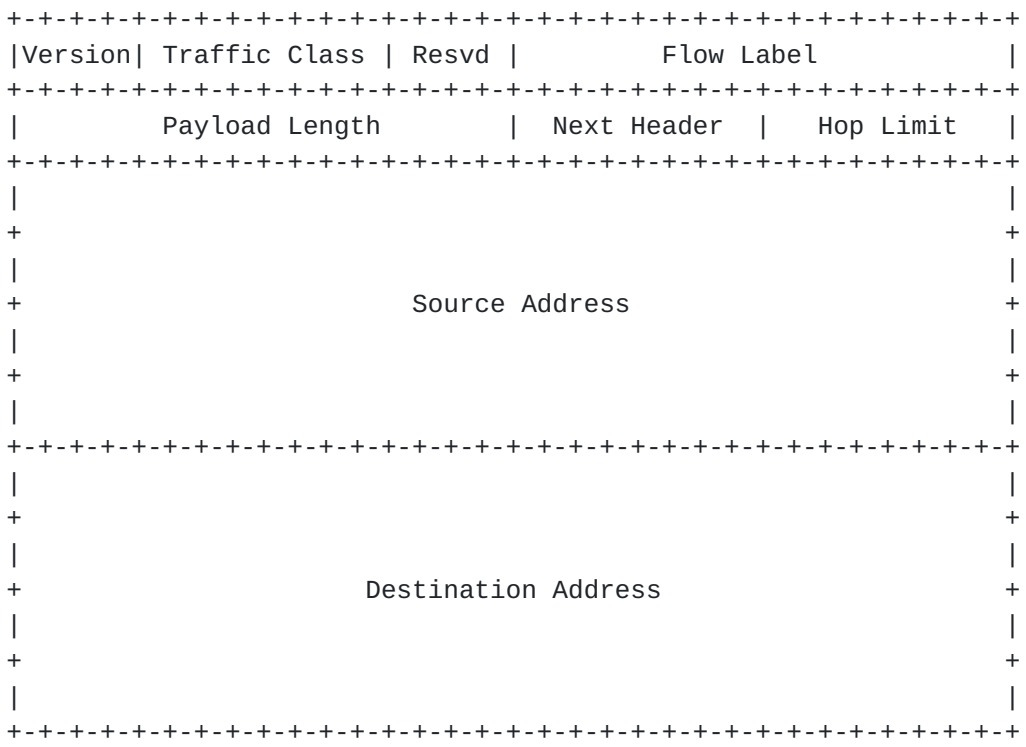
The IPv6 header does not contain any reserved bits and all bits in the header are currently accounted for. This means that it is not possible to develop any future extension mechanisms that require bits in the IPv6 header. Mechanisms such as ECN were possible in IPv4 because there were bits available in the IPv4 header. e.g. Re-ECN is a proof of concept mechanism for ConEx that uses an unused bit (Bit 48) in the IPv4 header. It cannot be implemented analogously in the IPv6 header. This document proposes reducing the size of the flow label field from 20 bits to 16 bits and setting aside 4 bits for future use.

2. Conventions used in this document

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 [RFC2119].

3. New IPv6 header format

This document updates Section 3 of [RFC2460] to reduce the length of the flow label field from 20 bits to 16 bits, and in the process creating a 4 bit reserved field. All other fields in the IPv6 header remain unchanged from [RFC2460].



Resvd 4-bit reserved field.

Flow Label 16-bit flow label.

All other fields are same as those defined by [RFC2460]

Figure 1: Modified IPv6 header format

Senders MUST set the bits in the reserved field to zero and receivers MUST ignore them.

4. Future use of the reserved bits

New mechanisms that require allocation of one or more of the reserved bits MUST require Standards Action as specified in [RFC5226].

5. Acknowledgements

The authors would like to Pekka Savola, Christian Huitema, and Ingemar Johansson for the discussions that led to this document.

6. Security Considerations

This document does not bring up any new security issues.

7. IANA Considerations

This document does not require any IANA action.

8. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC2460] Deering, S. and R. Hinden, "Internet Protocol, Version 6 (IPv6) Specification", RFC 2460, December 1998.

[RFC5226] Narten, T. and H. Alvestrand, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 5226, May 2008.

Authors' Addresses

Suresh Krishnan
Ericsson
8400 Blvd Decarie
Town of Mount Royal, Quebec
Canada

Email: suresh.krishnan@ericsson.com

Joel Halpern
Ericsson

Email: joel.halpern@ericsson.com