

IPv6 Compressed Routing Header with Variable Length Addresses
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Abstract

The IPv6 Routing Header can be used to direct a packet through multiple intermediate IPv6 waypoints toward a final destination. In its simplest form, the routing header includes the full length of each intermediate IPv6 waypoint. This document specifies a method for supporting variable-length compressed IPv6 addresses.

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[1.](#) Introduction

The IPv6 Routing Header [[RFC8200](#)] can be used to direct a packet through multiple intermediate IPv6 waypoints toward a final destination. In its simplest form, the routing header includes the full length of each intermediate IPv6 waypoint. This document specifies a method for supporting variable-length compressed IPv6 addresses.

[2.](#) Terminology

The terminology in the normative references applies.

[3.](#) Requirements

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [BCP 14](#) [[RFC2119](#)][RFC8174] when, and only when, they appear in all capitals, as shown here.

[4.](#) IPv6 Compressed Routing Header with Variable Length Addresses

An IPv6 Compressed Routing Header with Variable length addresses is shown in Figure 1:

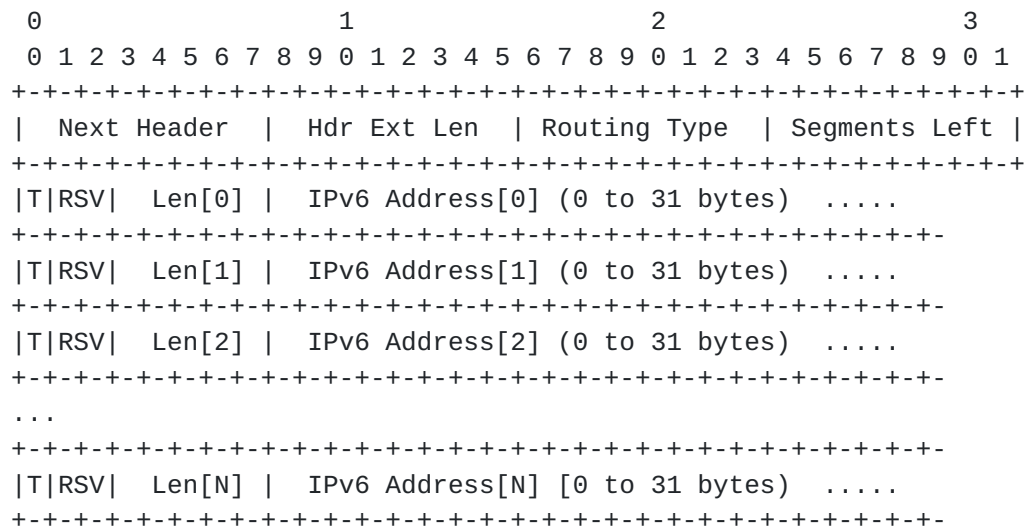


Figure 1: IPv6 Compressed Routing Header with Variable Length Addresses

In this format:

- o Next Header, Hdr Ext Len, Routing Type and Segments Left have the same meaning as for other compressed routing header formats.
- o Immediately following are a set of N type/length/value segments as follows:

- *
- * T indicates whether the following IPv6 Address is compressed on the left-side (most significant bits compressed) or right-side (least significant bits compressed).
- * RSV field is reserved for future use.
- * Len[i] indicates how many contiguous bytes of the left/right compressed IPv6 address follow. Len[i] is a 5-bit field to allow for the case that an IPv6 address is accompanied by an additional piece of information, e.g., a transport port number.
- * IPv6 Address[i] is 0 to 31 bits in length, with either left-side or right-side compression applied.

Note that a similar format appears in [[RFC8138](#)].

5. IANA Considerations

The IANA is instructed to allocate a routing header type value.

6. Security Considerations

Security considerations are the same as for other compressed routing header types.

7. Acknowledgements

TBD

8. References

8.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.
- [RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in [RFC 2119](#) Key Words", [BCP 14](#), [RFC 8174](#), DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.
- [RFC8200] Deering, S. and R. Hinden, "Internet Protocol, Version 6 (IPv6) Specification", STD 86, [RFC 8200](#), DOI 10.17487/RFC8200, July 2017, <<https://www.rfc-editor.org/info/rfc8200>>.

8.2. Informative References

- [RFC8138] Thubert, P., Ed., Bormann, C., Toutain, L., and R. Cragie, "IPv6 over Low-Power Wireless Personal Area Network (6LoWPAN) Routing Header", [RFC 8138](#), DOI 10.17487/RFC8138, April 2017, <<https://www.rfc-editor.org/info/rfc8138>>.

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