

The IPv6 Jumbo Payload Option

<[draft-ietf-ipngwg-jumbo-00.txt](#)>

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Abstract

This document describes the Jumbo Payload option for IPv6, which is used to send IPv6 packets with payloads longer than 65,535 octets. This option is relevant only for IPv6 nodes that may be attached to links with a link MTU greater than 65,575 octets, and need not be implemented or understood by IPv6 nodes that do not support attachment to links with such large MTUs.

1. Introduction

jumbo (jum'b0),

n., pl. -bos, adj.

-n.

1. a person, animal, or thing very large of its kind.

-adj.

2. very large: the jumbo box of cereal.

[1800-10; orig. uncert.; popularized as the name of a large elephant purchased and exhibited by P.T. Barnum in 1882]

-- www.infoplease.com

The IPv6 header [[IPv6](#)] has a 16-bit Payload Length field and, therefore, supports payloads up to 65,535 octets long. This document specifies an IPv6 hop-by-hop option, called the Jumbo Payload option, that carries a 32-bit length field in order to allow transmission of IPv6 packets with payloads between 65,536 and 4,294,967,295 octets in length. Packets with such long payloads are colloquially referred to as "jumbograms".

The Jumbo Payload option is relevant only for IPv6 nodes that may be attached to links with a link MTU greater than 65,575 octets (that is, 65,535 + 40, where 40 octets is the size of the IPv6 header). The Jumbo Payload option need not be implemented or understood by IPv6 nodes that do not support attachment to links with MTU greater than 65,575.

On links with configurable MTUs, the MTU must not be configured to a value greater than 65,575 octets if there are nodes attached to that link that do not support the Jumbo Payload option.

2. Format of the Jumbo Payload Option

The Jumbo Payload option is carried in an IPv6 Hop-by-Hop Options header, immediately following the IPv6 header. This option has an alignment requirement of $4n + 2$. (See [IPv6, [Section 4.2](#)] for discussion of option alignment.) The option has the following format:


```

+-----+-----+-----+-----+-----+-----+
| Option Type | Opt Data Len |
+-----+-----+-----+-----+-----+-----+
|                               Jumbo Payload Length                               |
+-----+-----+-----+-----+-----+-----+

```

Option Type 8-bit value C2 (hexadecimal).

Opt Data Len 8-bit value 4.

Jumbo Payload Length 32-bit unsigned integer. Length of the IPv6 packet in octets, excluding the IPv6 header but including the Hop-by-Hop Options header and any other extension headers present. Must be greater than 65,535.

3. Usage of the Jumbo Payload Option

The Payload Length field in the IPv6 header must be set to zero in every packet that carries the Jumbo Payload option.

If a node that understands the Jumbo Payload option receives a packet whose IPv6 header carries a Payload Length of zero and a Next Header value of zero (meaning that a Hop-by-Hop Options header follows), and whose link-layer framing indicates the presence of octets beyond the IPv6 header, the node must proceed to process the Hop-by-Hop Options header in order to determine the actual length of the payload from the Jumbo Payload option.

The Jumbo Payload option must not be used in a packet that carries a Fragment header.

Higher-layer protocols that use the IPv6 Payload Length field to compute the value of the Upper-Layer Packet Length field in the checksum pseudo-header described in [IPv6, [Section 8.1](#)] must instead use the Jumbo Payload Length field for that computation, for packets that carry the Jumbo Payload option.

Nodes that understand the Jumbo Payload option are required to detect a number of possible format errors, and if the erroneous packet was not destined to a multicast address, report the error by sending an ICMP Parameter Problem message [[ICMPv6](#)] to the packet's source. The following list of errors specifies the values to be used in the Code and Pointer fields of the Parameter Problem message:

error: IPv6 Payload Length = 0 and
IPv6 Next Header = Hop-by-Hop Options and
Jumbo Payload option not present

Code: 0

Pointer: high-order octet of the IPv6 Payload Length

error: IPv6 Payload Length != 0 and
Jumbo Payload option present

Code: 0

Pointer: Option Type field of the Jumbo Payload option

error: Jumbo Payload option present and
Jumbo Payload Length < 65,536

Code: 0

Pointer: high-order octet of the Jumbo Payload Length

error: Jumbo Payload option present and
Fragment header present

Code: 0

Pointer: high-order octet of the Fragment header.

A node that does not understand the Jumbo Payload option is expected to respond to erroneously-received jumbograms as follows, according to the IPv6 specification:

error: IPv6 Payload Length = 0 and
IPv6 Next Header = Hop-by-Hop Options

Code: 0

Pointer: high-order octet of the IPv6 Payload Length

error: IPv6 Payload Length != 0 and
Jumbo Payload option present

Code: 2

Pointer: Option Type field of the Jumbo Payload option

4. Security Considerations

The Jumbo Payload option does not introduce any known new security concerns.

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6. References

- [IPv6] Deering, S., R. Hinden, Internet Protocol Version 6 (IPv6) Specification, Internet Draft, August 1998.
- [ICMPv6] Conta, A., S. Deering, ICMP for the Internet Protocol Version 6 (IPv6), Internet Draft, August 1998.

