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The ORIGIN Extension in HTTP/3

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Abstract

The ORIGIN frame for HTTP/2 is equally applicable to HTTP/3, but it needs to be separately registered. This document describes the ORIGIN frame for HTTP/3.

Status of This Memo

This is an Internet Standards Track document.

This document is a product of the Internet Engineering Task Force (IETF). It represents the consensus of the IETF community. It has received public review and has been approved for publication by the Internet Engineering Steering Group (IESG). Further information on Internet Standards is available in Section 2 of RFC 7841[1].

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Table of Contents

1. Introduction

Existing RFCs define extensions to HTTP/2 [HTTP/2] that remain useful in HTTP/3. Appendix A.2 of [HTTP/3] describes the required updates for HTTP/2 frames to be used with HTTP/3.

[ORIGIN] defines the HTTP/2 ORIGIN frame, which indicates what origins are available on a given connection. It defines a single HTTP/2 frame type.

1.1. Notational Conventions

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 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

The frame diagram in this document uses the format defined in Section 1.3 of [QUIC-TRANSPORT] to illustrate the order and size of fields.

2. The ORIGIN HTTP/3 Frame

The ORIGIN HTTP/3 frame allows a server to indicate what origin or origins [RFC6454] the server would like the client to consider as one or more members of the Origin Set (Section 2.3 of [ORIGIN]) for the connection within which it occurs.

The semantics of the frame payload are identical to those of the HTTP/2 frame defined in [ORIGIN]. Where HTTP/2 reserves stream 0 for frames related to the state of the connection, HTTP/3 defines a pair of unidirectional streams called "control streams" for this purpose.

Where [ORIGIN] indicates that the ORIGIN frame is sent on stream 0, this should be interpreted to mean the HTTP/3 control stream: that is, the ORIGIN frame is sent from servers to clients on the server's control stream.

HTTP/3 does not define a Flags field in the generic frame layout. As no flags have been defined for the ORIGIN frame, this specification does not define a mechanism for communicating such flags in HTTP/3.

2.1. Frame Layout

The ORIGIN frame has a layout that is nearly identical to the layout used in HTTP/2; the information is restated here for clarity. The ORIGIN frame type is 0x0c (decimal 12), as in HTTP/2. The payload contains zero or more instances of the Origin-Entry field.

```
HTTP/3 Origin-Entry {
  Origin-Len (16),
  ASCII-Origin (..),
}

HTTP/3 ORIGIN Frame {
  Type (i) = 0x0c,
  Length (i),
  Origin-Entry (..) ...,
}
```

Figure 1: ORIGIN Frame Layout

An Origin-Entry is a length-delimited string. Specifically, it contains two fields:

Origin-Len: An unsigned, 16-bit integer indicating the length, in octets, of the ASCII-Origin field.

ASCII-Origin: An OPTIONAL sequence of characters containing the ASCII serialization of an origin ([RFC6454], Section 6.2) that the sender asserts this connection is or could be authoritative for.

3. Security Considerations

This document introduces no new security considerations beyond those discussed in [ORIGIN] and [HTTP/3].

4. IANA Considerations

This document registers a frame type in the "HTTP/3 Frame Types" registry defined by [HTTP/3], located at <https://www.iana.org/assignments/http3-parameters/>.

Value:	0x0c
Frame Type:	ORIGIN
Status:	permanent
Reference:	Section 2
Date:	2023-03-14
Change Controller:	IETF
Contact:	HTTP WG <ietf-http-wg@w3.org>

5. References

5.1. Normative References

[HTTP/2] Thomson, M., Ed. and C. Benfield, Ed., "HTTP/2", RFC 9113, DOI 10.17487/RFC9113, June 2022, <https://www.rfc-editor.org/info/rfc9113>.

[HTTP/3] Bishop, M., Ed., "HTTP/3", RFC 9114, DOI 10.17487/RFC9114, June 2022, <https://www.rfc-editor.org/info/rfc9114>.

[ORIGIN] Nottingham, M. and E. Nygren, "The ORIGIN HTTP/2 Frame", RFC 8336, DOI 10.17487/RFC8336, March 2018, <https://www.rfc-editor.org/info/rfc8336>.

[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>.

5.2. Informative References

[QUIC-TRANSPORT] Iyengar, J., Ed. and M. Thomson, Ed., "QUIC: A UDP-Based Multiplexed and Secure Transport", RFC 9000, DOI 10.17487/RFC9000, May 2021, <https://www.rfc-editor.org/info/rfc9000>.

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