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# HTTP Server *ush
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Abstract

This document defines a suite of HTTP semantic extensions, named the *ush family, that propels HTTP towards new application use cases. HTTP/QUIC clients opt-in to features via an HTTP setting.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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This Internet-Draft will expire on September 23, 2018.

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## 1. Introduction

HTTP server push is a feature of HTTP/2 [RFC7540] and HTTP/QUIC [QUIC-HTTP] that allows a server to pre-emptively send HTTP resources to a client in association with a previous client-initiated request. Server push broke ground for new HTTP semantics that offer new HTTP application use cases; this has kicked the door down for additional semantics.

Much of the success of HTTP Server Push can be attributed to its syllable count and structure. The phrase rolls off the tongue with clear and concise meaning. To capitalise on this, the document defines a suite of HTTP semantic extensions with identical syllabic structure: the *ush family (pronounced aster-ush). Members of the *ush family enhance Server Push in various ways.

For each member of the *ush family, this document adds a new HTTP/2 SETTINGS Parameter (to those defined by [RFC7540] Section X.Y.Z), and a new HTTP/QUIC SETTINGS Parameter to those defined by [QUIC-HTTP] Section 5.2.5.

## 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 BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

## 2. The SETTINGS_ENABLE_CUSH Parameter

The new parameter is SETTINGS_ENABLE_CUSH (type = 0xfab01). This setting can be used to enable Server Cush, a more luxurious (cushy) form of Server Push. The value of the parameter is an integer that MUST be 0 or 1. Any value other than 0 or 1 MUST be treated as a connection error of type PROTOCOL_ERROR.

The initial value is 0, which indicates that "cattle class" Server Push is preferred.

## 3. The SETTINGS_ENABLE_DUSH Parameter

The new parameter is SETTINGS_ENABLE_DUSH (type = 0xfab02). This setting can be used to enable Server Dush, a more violent form of Server Push. The value of the parameter is an integer that MUST be 0 or 1. Any value other than 0 or 1 MUST be treated as a connection error of type PROTOCOL_ERROR.

The initial value is 0, which indicates that "care bear" Server Push is preferred.

## 4. The SETTINGS_ENABLE_GUSH Parameter

The new parameter is SETTINGS_ENABLE_GUSH (type = 0xfab03). This setting can be used to enable Server Gush, a mode of Server Push that supports sudden overflows. The value of the parameter is an integer

that MUST be 0 or 1. Any value other than 0 or 1 MUST be treated as a connection error of type PROTOCOL_ERROR.

The initial value is 0, which indicates that "emotionally reserved" Server Push is preferred.

## 5. The SETTINGS_ENABLE_HUSH Parameter

The new parameter is SETTINGS_ENABLE_HUSH (type = 0xfab04). This setting can be used to enable Server Hush, semantically equivalent to SETTINGS_ENABLE_PUSH but more polite. The value of the parameter is an integer that MUST be 0 or 1. Any value other than 0 or 1 MUST be treated as a connection error of type PROTOCOL_ERROR.

The initial value is 0, which indicates that Server Push is not permitted.

## 6. The SETTINGS_ENABLE_KUSH Parameter

The new parameter is SETTINGS_ENABLE_KUSH (type = 0xfab05). This setting can be used to enable Server Kush, a more mellow form of Server Push whose legality varies across territories. The value of the parameter is an integer that MUST be 0 or 1. Any value other than 0 or 1 MUST be treated as a connection error of type PROTOCOL_ERROR.

The initial value is 0, which indicates that "legal" Server Push is preferred.

## 7. The SETTINGS_ENABLE_LUSH Parameter

The new parameter is SETTINGS_ENABLE_LUSH (type = 0xfab06). This setting can be used to enable Server Lush, which permits only the push of resources related to vegetation. The value of the parameter is an integer that MUST be 0 or 1. Any value other than 0 or 1 MUST be treated as a connection error of type PROTOCOL_ERROR.

The initial value is 0, which indicates that "eco-broad" Server Push is preferred.

## 8. The SETTINGS_ENABLE_MUSH Parameter

The new parameter is SETTINGS_ENABLE_MUSH (type = 0xfab07). Mush has negative connotations so this setting is reserved and MUST NOT be used.

## 9. The SETTINGS_ENABLE_RUSH Parameter

The new parameter is SETTINGS_ENABLE_RUSH (type = 0xfab08). This setting can be used to enable Server Rush, a mode that enables a server to push resources more quickly. The value of the parameter is an integer that MUST be 0 or 1. Any value other than 0 or 1 MUST be treated as a connection error of type PROTOCOL_ERROR.

The initial value is 0, which indicates that "lazy" Server Rush is preferred.

## 10. The SETTINGS_ENABLE_TUSH Parameter

The new parameter is SETTINGS_ENABLE_TUSH (type = 0xfab09). This setting can be used to enable Server Tush, a mode where the client will express dissaproval if the server takes too long to fulfill push promises. The value of the parameter is an integer that MUST be 0 or 1. Any value other than 0 or 1 MUST be treated as a connection error of type PROTOCOL_ERROR.

The initial value is 0, which indicates that "polite to the point" Server Push is preferred.

## 11. The SETTINGS_ENABLE_BLUSH Parameter

The new parameter is SETTINGS_ENABLE_BLUSH (type = 0xfab0a). This setting can be used to enable Server Blush, a mode where the server should feel extra shame if it pushes resources that the client did not want. The value of the parameter is an integer that MUST be 0 or 1. Any value other than 0 or 1 MUST be treated as a connection error of type PROTOCOL_ERROR.

The initial value is 0, which indicates that "shameless" Server Push is preferred.

## 12. The SETTINGS_ENABLE_FLUSH Parameter

The new parameter is SETTINGS_ENABLE_FLUSH (type = 0xfab0b). This setting can be used to enable Server Flush, a mode that respects the Coriolis effect across Northen and Southern hemispheres. The value of the parameter is an integer that MUST be 0 or 1. Any value other than 0 or 1 MUST be treated as a connection error of type PROTOCOL_ERROR.

The initial value is 0, which indicates that "universal frame of reference" Server Push is preferred.

## 13. The SETTINGS_ENABLE_PLUSH Parameter

The new parameter is SETTINGS_ENABLE_PLUSH (type = 0xfab0c). This setting is a synonym of SETTINGS_ENABLE_CUSH (Section 2).

## 14. The SETTINGS_ENABLE_SLUSH Parameter

The new parameter is SETTINGS_ENABLE_SLUSH (type = 0xfab0d). This setting can be used to enable Server Slush, a mode that is overly sentimental. This is most appropriate when re-establishing connections to servers. The value of the parameter is an integer that MUST be 0 or 1. Any value other than 0 or 1 MUST be treated as a connection error of type PROTOCOL_ERROR.

The initial value is 0, which indicates that "cold hearted" Server Push is preferred.

## 15. The SETTINGS_ENABLE_SMUSH Parameter

The new parameter is SETTINGS_ENABLE_SMUSH (type = 0xfab0e). This setting can be used to enable Server Mush, a logical union between SETTINGS_ENABLE_GUSH and SETTINGS_ENABLE_SLUSH. The value of the parameter is an integer that MUST be 0 or 1. Any value other than 0 or 1 MUST be treated as a connection error of type PROTOCOL_ERROR.

The initial value is 0, which indicates that "emotionally reserved and cold hearted" Server Push is preferred.

## 16. Security Considerations

There are no additional consideration beyond those presented in [RFC7540] and [QUIC-HTTP].

## 17. IANA Considerations

### 17.1. Registration of SETTINGS_ENABLE_CUSH parameter

This document establishes an entry for the HTTP/2 Settings Registry that is established by [RFC7540]. This document establishes an entry for the HTTP/QUIC Settings Registry that is established by [QUIC-HTTP].

Name: SETTINGS_ENABLE_CUSH

Code: 0xfab01

Specification: This document

### 17.2. Registration of SETTINGS_ENABLE_DUSH parameter

This document establishes an entry for the HTTP/2 Settings Registry that is established by [RFC7540]. This document establishes an entry for the HTTP/QUIC Settings Registry that is established by [QUIC-HTTP].

Name: SETTINGS_ENABLE_DUSH

Code: 0xfab02

Specification: This document

### 17.3. Registration of SETTINGS_ENABLE_GUSH parameter

This document establishes an entry for the HTTP/2 Settings Registry that is established by [RFC7540]. This document establishes an entry for the HTTP/QUIC Settings Registry that is established by [QUIC-HTTP].

Name: SETTINGS_ENABLE_GUSH

Code: 0xfab03

Specification: This document

### 17.4. Registration of SETTINGS_ENABLE_HUSH parameter

This document establishes an entry for the HTTP/2 Settings Registry that is established by [RFC7540]. This document establishes an entry for the HTTP/QUIC Settings Registry that is established by [QUIC-HTTP].

Name: SETTINGS_ENABLE_HUSH

Code: 0xfab04

Specification: This document

### 17.5. Registration of SETTINGS_ENABLE_KUSH parameter

This document establishes an entry for the HTTP/2 Settings Registry that is established by [RFC7540]. This document establishes an entry for the HTTP/QUIC Settings Registry that is established by [QUIC-HTTP].

Name: SETTINGS_ENABLE_KUSH

Code: 0xfab05

Specification: This document

### 17.6. Registration of SETTINGS_ENABLE_LUSH parameter

This document establishes an entry for the HTTP/2 Settings Registry that is established by [RFC7540]. This document establishes an entry for the HTTP/QUIC Settings Registry that is established by [QUIC-HTTP].

Name: SETTINGS_ENABLE_LUSH

Code: 0xfab06

Specification: This document

### 17.7. Registration of SETTINGS_ENABLE_MUSH parameter

This document establishes an entry for the HTTP/2 Settings Registry that is established by [RFC7540]. This document establishes an entry for the HTTP/QUIC Settings Registry that is established by [QUIC-HTTP].

Name: SETTINGS_ENABLE_MUSH

Code: 0xfab07

Specification: This document

### 17.8. Registration of SETTINGS_ENABLE_RUSH parameter

This document establishes an entry for the HTTP/2 Settings Registry that is established by [RFC7540]. This document establishes an entry for the HTTP/QUIC Settings Registry that is established by [QUIC-HTTP].

Name: SETTINGS_ENABLE_RUSH

Code: 0xfab08

Specification: This document

### 17.9. Registration of SETTINGS_ENABLE_TUSH parameter

This document establishes an entry for the HTTP/2 Settings Registry that is established by [RFC7540]. This document establishes an entry

for the HTTP/QUIC Settings Registry that is established by [QUIC-HTTP].

Name: SETTINGS_ENABLE_TUSH

Code: 0xfab09

Specification: This document

### 17.10. Registration of SETTINGS_ENABLE_BLUSH parameter

This document establishes an entry for the HTTP/2 Settings Registry that is established by [RFC7540]. This document establishes an entry for the HTTP/QUIC Settings Registry that is established by [QUIC-HTTP].

Name: SETTINGS_ENABLE_BLUSH

Code: 0xfab0a

Specification: This document

### 17.11. Registration of SETTINGS_ENABLE_FLUSH parameter

This document establishes an entry for the HTTP/2 Settings Registry that is established by [RFC7540]. This document establishes an entry for the HTTP/QUIC Settings Registry that is established by [QUIC-HTTP].

Name: SETTINGS_ENABLE_FLUSH

Code: 0xfab0b

Specification: This document

### 17.12. Registration of SETTINGS_ENABLE_PLUSH parameter

This document establishes an entry for the HTTP/2 Settings Registry that is established by [RFC7540]. This document establishes an entry for the HTTP/QUIC Settings Registry that is established by [QUIC-HTTP].

Name: SETTINGS_ENABLE_PLUSH

Code: 0xfab0c

Specification: This document

### 17.13. Registration of SETTINGS_ENABLE_SLUSH parameter

This document establishes an entry for the HTTP/2 Settings Registry that is established by [RFC7540]. This document establishes an entry for the HTTP/QUIC Settings Registry that is established by [QUIC-HTTP].

Name: SETTINGS_ENABLE_SLUSH

Code: 0xfab0d

Specification: This document

### 17.14. Registration of SETTINGS_ENABLE_SMUSH parameter

This document establishes an entry for the HTTP/2 Settings Registry that is established by [RFC7540]. This document establishes an entry for the HTTP/QUIC Settings Registry that is established by [QUIC-HTTP].

Name: SETTINGS_ENABLE_SMUSH

Code: 0xfab0e

Specification: This document

## 18. Normative References

[QUIC-HTTP] Bishop, M., Ed., "Hypertext Transfer Protocol (HTTP) over QUIC", draft-ietf-quic-http-08 (work in progress).

[QUIC-TRANSPORT] Iyengar, J., Ed. and M. Thomson, Ed., "QUIC: A UDP-Based Multiplexed and Secure Transport", draft-ietf-quic-transport-08 (work in progress).

[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>.

[RFC7540] Belshe, M., Peon, R., and M. Thomson, Ed., "Hypertext Transfer Protocol Version 2 (HTTP/2)", RFC 7540, DOI 10.17487/RFC7540, May 2015, <https://www.rfc-editor.org/info/rfc7540>.

[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>.

## Appendix A. Acknowledgements

The entire Internet community.

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