RFC 9652
The Link-Template HTTP Header Field

Abstract

This specification defines the Link-Template HTTP header field, providing a means for describing the structure of a link between two resources so that new links can be generated.

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.

Information about the current status of this document, any errata, and how to provide feedback on it may be obtained at https://www.rfc-editor.org/info/rfc9652.

Copyright Notice

Table of Contents

1. Introduction

[URI-TEMPLATE] defines a syntax for templates that, when expanded using a set of variables, results in a URI [URI].

This specification defines a HTTP header field [HTTP] for conveying templates for links in the headers of a HTTP message. It is complimentary to the Link header field defined in Section 3 of [WEB-LINKING], which carries links directly.

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.

This specification uses the following terms from [STRUCTURED-FIELDS]: List, String, Display String, and Parameter.

2. The Link-Template Header Field

The Link-Template header field is a Structured Field [STRUCTURED-FIELDS] that serializes one or more links into HTTP message metadata. It is semantically equivalent to the Link header field defined in Section 3 of [WEB-LINKING], except that the link target and link anchor can contain URI Templates [URI-TEMPLATE].

Its value is a List of Strings. Each String is a URI Template, and Parameters on it carry associated metadata.

For example:

```
Link-Template: "/{username}"; rel="item"
```

indicates that a resource with the relation type "item" for a given "username" can be found by expanding the "username" variable into the template given.

The link target (as defined in Section 2 of [WEB-LINKING]) is the result of expanding the URI Template [URI-TEMPLATE] (being converted to an absolute URI after expansion, if necessary).

The link context and link relation type for the link (as defined in Section 2 of [WEB-LINKING]) are conveyed using the "anchor" and "rel" Parameters, as they are for the Link header field in Section 3 of [WEB-LINKING]. Their values **MUST** be Strings.

However, the "anchor" Parameter **MAY** contain a URI Template. For example:

```
Link-Template: "/books/{book_id}/author";
               rel="author"; anchor="#{book_id}"
```

Here, the link to the author for a particular book in a list of books can be found by following the link template.

This specification defines additional semantics for the "var-base" Parameter on templated links; see Section 2.1.

The link's target attributes (as defined in Section 2.2 of [WEB-LINKING]) are conveyed using other Parameters, in a manner similar to the Link header field. These Parameter values **MUST** be Strings, unless they contain non-ASCII characters, in which case they **MUST** be Display Strings. Note that some target attribute names will not serialize as Structured Field Parameter keys (see Section 3.1.2 of [STRUCTURED-FIELDS]).

For example:

```
Link-Template: "/author"; rel="author";
               title=%"Bj%c3%b6rn J%c3%a4rnsida"
```

Implementations **MUST** support all levels of template defined by [URI-TEMPLATE] in the link String and the anchor Parameter.

2.1. The 'var-base' Parameter

When a templated link has a 'var-base' Parameter, its value conveys a URI-reference that is used as a base URI for the variable names in the URI Template. This allows template variables to be globally identified, rather than specific to the context of use.

Dereferencing the URI for a particular variable might lead to more information about the syntax or semantics of that variable; specification of particular formats for this information is out of scope for this document.

To determine the URI for a given variable, the value given is used as a base URI in reference resolution (as specified in [URI]). If the resulting URI is still relative, the context of the link is used as the base URI in a further resolution; see [WEB-LINKING].

For example:

```
Link-Template: "/widgets/{widget_id}";
               rel="https://example.org/rel/widget";
               var-base="https://example.org/vars/"
```

indicates that a resource with the relation type "https://example.org/rel/widget" can be found by expanding the "https://example.org/vars/widget_id" variable into the template given.

If the current context of the message that the header appears within is "https://example.org/", the same information could be conveyed by this header field:

```
Link-Template: "/widgets/{widget_id}";
               rel="https://example.org/rel/widget";
               var-base="/vars/"
```

3. Security Considerations

The security considerations for the Link header field in [WEB-LINKING] and those for URI Templates [URI-TEMPLATE] apply.

Target attributes that are conveyed via Display Strings can be vulnerable to a wide variety of attacks. See [UNICODE-SECURITY] for advice regarding their handling. Specific advice is not given by this specification since there are a variety of potential use cases for such attributes.

4. IANA Considerations

This specification enters the "Link-Template" field name into the "Hypertext Transfer Protocol (HTTP) Field Name Registry".

Field Name	Status	Reference
Link-Template	Permanent	This document

Table 1

5. Normative References

[HTTP]   Fielding, R., Ed., Nottingham, M., Ed., and J. Reschke, Ed., "HTTP Semantics", STD 97, RFC 9110, DOI 10.17487/RFC9110, June 2022, <https://www.rfc-editor.org/info/rfc9110>.

[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>.

[STRUCTURED-FIELDS]   Nottingham, M. and P.-H. Kamp, "Structured Field Values for HTTP", RFC 9651, DOI 10.17487/RFC9651, September 2024, <https://www.rfc-editor.org/info/rfc9651>.

[UNICODE-SECURITY]   Davis, M. and M. Suignard, "Unicode Security Considerations", Unicode Technical Report #16, 19 September 2014, <https://www.unicode.org/reports/tr36/>. Latest version available at <https://www.unicode.org/reports/tr36/>.

[URI]   Berners-Lee, T., Fielding, R., and L. Masinter, "Uniform Resource Identifier (URI): Generic Syntax", STD 66, RFC 3986, DOI 10.17487/RFC3986, January 2005, <https://www.rfc-editor.org/info/rfc3986>.

[URI-TEMPLATE]   Gregorio, J., Fielding, R., Hadley, M., Nottingham, M., and D. Orchard, "URI Template", RFC 6570, DOI 10.17487/RFC6570, March 2012, <https://www.rfc-editor.org/info/rfc6570>.

[WEB-LINKING]   Nottingham, M., "Web Linking", RFC 8288, DOI 10.17487/RFC8288, October 2017, <https://www.rfc-editor.org/info/rfc8288>.

Author's Address

Mark Nottingham
Prahran
Australia
Email: mnot@mnot.net
URI: https://www.mnot.net/