Network Working Group
Internet-Draft
Expires: December 18, 2006

M. Nottingham
June 16, 2006

HTTP Header Linking
draft-nottingham-http-link-header-00

Status of this Memo

By submitting this Internet-Draft, each author represents that any applicable patent or other IPR claims of which he or she is aware have been or will be disclosed, and any of which he or she becomes aware will be disclosed, in accordance with Section 6 of BCP 79.

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF), its areas, and its working groups. Note that other groups may also distribute working documents as Internet-Drafts.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

The list of current Internet-Drafts can be accessed at http://www.ietf.org/ietf/1id-abstracts.txt.

The list of Internet-Draft Shadow Directories can be accessed at http://www.ietf.org/shadow.html.

This Internet-Draft will expire on December 18, 2006.

Copyright Notice

Copyright (C) The Internet Society (2006).

Abstract

This specification clarifies the status of the Link HTTP header and introduces the complimentary Profile and Link-Template HTTP headers.

Table of Contents

1. Introduction 3
2. Notational Conventions 3
3. The Link Header Field 3
4. The Profile Header Field 4
5. The Link-Template Header Field 5
6. IANA Considerations 6
7. Security Considerations 6
8. References 7
8.1. Normative References 7
8.2. Informative References 7
Appendix A. Acknowledgements 7
Author's Address 8
Intellectual Property and Copyright Statements 9

1. Introduction

A means of indicating the relationships between documents on the Web has been available for some time in HTML, and was considered as a HTTP header in [RFC2068], but removed from [RFC2616], due to a lack of implementation experience.

There have since surfaced many cases where a means of including this information in HTTP headers has proved useful. However, because it was removed, the status of the Link header is unclear, leading some to consider minting new application-specific HTTP headers instead of reusing it.

Additionally, the complementary "profile" mechanism -- which is often used to disambiguate link relationship types -- is not available as a HTTP header.

This specification seeks to address these shortcomings. It also introduces a new header, Link-Template, that allows the structure of links to be described.

2. Notational Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14, [RFC2119], as scoped to those conformance targets.

This specification uses the Augmented Backus-Naur Form (ABNF) notation of [RFC2616], and explicitly includes the following rules from it: quoted-string, token, SP (space), ALPHA (letters), DIGIT (decimal digit). Additionally, the following rules are included from [RFC3986]: URI-Reference, reserved, unreserved.

3. The Link Header Field

The Link entity-header field provides a means for describing a relationship between two resources, generally between the requested resource and some other resource. An entity MAY include multiple Link values. Links at the metainformation level typically indicate relationships like hierarchical structure and navigation paths. The Link field is semantically equivalent to the <LINK> element in HTML.

```
Link           = "Link" ":" #("<" URI-Reference ">"
                 *( ";" link-param ) )

link-param     = ( ( "rel" "=" relationship )
                 | ( "rev" "=" relationship )
                 | ( "title" "=" quoted-string )
                 | ( "anchor" "=" <"> URI-Reference <"> )
                 | ( link-extension ) )

link-extension = token [ "=" ( token | quoted-string ) ]

relationship   = sgml-name
                 | ( <"> sgml-name *( SP sgml-name) <"> )

sgml-name      = ALPHA *( ALPHA | DIGIT | "." | "-" )
```

Relationship values are case-insensitive and MAY be extended within the constraints of the sgml-name syntax. The title parameter MAY be used to label the destination of a link such that it can be used as identification within a human-readable menu. The anchor parameter MAY be used to indicate a source anchor other than the entire current resource, such as a fragment of this resource or a third resource.

Examples of usage include:

```
Link: <http://www.cern.ch/TheBook/chapter2>; rel="Previous"
Link: <mailto:timbl@w3.org>; rev="Made"; title="Tim Berners-Lee"
```

The first example indicates that chapter2 is previous to this resource in a logical navigation path. The second indicates that the person responsible for making the resource available is identified by the given e-mail address.

4. The Profile Header Field

The Profile entity-header field provides a means to indicate the meta data profile of the entity. Commonly, it is used to disambiguate the meaning of relationships in links.

Note that this URI MAY be used as either an identifier (e.g., to uniquely identify links, without dereferencing the URI), or as a link that is intended to be dereferenced.

The Profile field is semantically equivalent to the profile attribute of the HEAD element in HTML [W3C.REC-html401-19991224]. Note, however, that its use is not limited to HTML entities.

```
    Profile       = "Profile" ":" #("<" URI-Reference ">")
```

For example:

```
    Profile: <http://www.acme.com/profiles/core>
    Profile: <http://example.com/p1>, </profiles/other-profile>
```

5. The Link-Template Header Field

The Link-Template entity-header field provides a means for describing the structure of a link between two resources, so that new links can be generated.

It does so through by allowing brace ("{}") -delimited strings to be interposed throughout a URI reference. These correspond to variables which, after being replaced with content in a relation-specified manner, are semantically equivalent to the corresponding Link header.

For example,

```
    Link-Template: <http://example.com/home/{userid}>; rel="home"
```

This link indicates that the "home" link relation can be constructed if the userid variable is known; if it were known to be "bob", this header would be considered equivalent to

```
    Link: <http://example.com/home/bob>; rel="home"
```

This specification does not define when or how template variables are interposed into link templates. Link relations that wish to allow templating SHOULD specify such details.

This specification does not define the correct behaviour in the face of a conflict between a Link-Template header and a Link header with the same relation. Link relations allowing templating SHOULD specify their relative precedence.

Applications SHOULD NOT use link relations that do not explicitly allow such templating in the Link-Template header.

```
    Link-Template  = "Link-Template" ":" #("<" template ">"
                     *( ";" link-param ) )

    template       = *( uri-char | template-var )

    template-var   = "{" 1*( uri-char ) "}"
```

```
uri-char       = ( reserved | unreserved )
```

6. IANA Considerations

This specification requires registration of two Message Header Fields for HTTP [RFC3864]. Note that "Link" is already present in the registry; this registration only updates its specification document.

```
Header field: Link
Applicable protocol: http
Status: standard
Author/change controller:
    IETF  (iesg@ietf.org)
    Internet Engineering Task Force
Specification document(s):
   [ this document ]


Header field: Profile
Applicable protocol: http
Status: standard
Author/change controller:
    IETF  (iesg@ietf.org)
    Internet Engineering Task Force
Specification document(s):
   [ this document ]


Header field: Link-Template
Applicable protocol: http
Status: standard
Author/change controller:
    IETF  (iesg@ietf.org)
    Internet Engineering Task Force
Specification document(s):
   [ this document ]
```

7. Security Considerations

The content of both the Link and Profile headers are not secure, private or integrity-guaranteed, and due caution should be excercised when using them.

Applications that take advantage of these mechanisms should consider the attack vectors opened by automatically following, trusting, or otherwise using links gathered from HTTP headers.

8. References

8.1. Normative References

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC2616] Fielding, R., Gettys, J., Mogul, J., Frystyk, H., Masinter, L., Leach, P., and T. Berners-Lee, "Hypertext Transfer Protocol -- HTTP/1.1", RFC 2616, June 1999.

[RFC3864] Klyne, G., Nottingham, M., and J. Mogul, "Registration Procedures for Message Header Fields", BCP 90, RFC 3864, September 2004.

[RFC3986] Berners-Lee, T., Fielding, R., and L. Masinter, "Uniform Resource Identifier (URI): Generic Syntax", STD 66, RFC 3986, January 2005.

[W3C.REC-html401-19991224] Raggett, D., Hors, A., and I. Jacobs, "HTML 4.01 Specification", W3C REC REC-html401-19991224, December 1999.

8.2. Informative References

[RFC2068] Fielding, R., Gettys, J., Mogul, J., Nielsen, H., and T. Berners-Lee, "Hypertext Transfer Protocol -- HTTP/1.1", RFC 2068, January 1997.

Appendix A. Acknowledgements

This specification lifts the definition of the Link header from RFC2068; credit for it belongs entirely to the authors of and contributors to that document.

The semantics and much of the syntax of the Profile header was defined by HTML 4.01; credit for them belongs to the authors of and contributors to that document.

Joe Gregorio, Marc Hadley and David Orchard contributed to the design of the Link-Template mechanism.

Author's Address

Mark Nottingham

Email: mnot@pobox.com
URI: http://www.mnot.net/

Intellectual Property Statement

The IETF takes no position regarding the validity or scope of any Intellectual Property Rights or other rights that might be claimed to pertain to the implementation or use of the technology described in this document or the extent to which any license under such rights might or might not be available; nor does it represent that it has made any independent effort to identify any such rights. Information on the procedures with respect to rights in RFC documents can be found in BCP 78 and BCP 79.

Copies of IPR disclosures made to the IETF Secretariat and any assurances of licenses to be made available, or the result of an attempt made to obtain a general license or permission for the use of such proprietary rights by implementers or users of this specification can be obtained from the IETF on-line IPR repository at http://www.ietf.org/ipr.

The IETF invites any interested party to bring to its attention any copyrights, patents or patent applications, or other proprietary rights that may cover technology that may be required to implement this standard. Please address the information to the IETF at ietf-ipr@ietf.org.

Disclaimer of Validity

This document and the information contained herein are provided on an "AS IS" basis and THE CONTRIBUTOR, THE ORGANIZATION HE/SHE REPRESENTS OR IS SPONSORED BY (IF ANY), THE INTERNET SOCIETY AND THE INTERNET ENGINEERING TASK FORCE DISCLAIM ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY WARRANTY THAT THE USE OF THE INFORMATION HEREIN WILL NOT INFRINGE ANY RIGHTS OR ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Copyright Statement

Copyright (C) The Internet Society (2006). This document is subject to the rights, licenses and restrictions contained in BCP 78, and except as set forth therein, the authors retain all their rights.

Acknowledgment

Funding for the RFC Editor function is currently provided by the Internet Society.