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Defining Well-Known Uniform Resource Identifiers (URIs)
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Abstract

This memo defines a path prefix for "well-known locations", "/.well-known/", in selected Uniform Resource Identifier (URI) schemes.

Note to Readers

RFC EDITOR: please remove this section before publication

This draft is a proposed revision of RFC5875.

The issues list for this draft can be found at https://github.com/mnot/I-D/labels/rfc5785bis [1].

The most recent (often, unpublished) draft is at https://mnot.github.io/I-D/rfc5785bis/ [2].

Recent changes are listed at https://github.com/mnot/I-D/commits/gh-pages/rfc5785bis [3].

See also the draft's current status in the IETF datatracker, at https://datatracker.ietf.org/doc/draft-nottingham-rfc5785bis/ [4].

Status of This Memo

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Table of Contents

1. Introduction 2
1.1. Appropriate Use of Well-Known URIs 3
2. Notational Conventions 4
3. Well-Known URIs 4
4. Security Considerations 5
5. IANA Considerations 5
5.1. The Well-Known URI Registry 5
5.1.1. Registration Template 6
6. References 6
6.1. Normative References 6
6.2. Informative References 7
6.3. URIs 7
Appendix A. Frequently Asked Questions 8
Appendix B. Changes from RFC5785 8
Author's Address 8

1. Introduction

Some applications on the Web require the discovery of policy or other information about an origin [RFC6454] (sometimes called "site-wide metadata") before making a request. For example, the Robots Exclusion Protocol (http://www.robotstxt.org/ [5]) specifies a way for automated processes to obtain permission to access resources; likewise, the Platform for Privacy Preferences [W3C.REC-P3P-20020416] tells user-agents how to discover privacy policy before interacting with an origin server.

While there are several ways to access per-resource metadata (e.g., HTTP headers, WebDAV's PROPFIND [RFC4918]), the perceived overhead

(either in terms of client-perceived latency and/or deployment difficulties) associated with them often precludes their use in these scenarios.

When this happens, one solution is designating a "well-known location" for data or services related to the origin, so that it can be easily located. However, this approach has the drawback of risking collisions, both with other such designated "well-known locations" and with pre-existing resources.

To address this, this memo defines a path prefix in HTTP(S) URIs for these "well-known locations", "/.well-known/". Future specifications that need to define a resource for such metadata can register their use to avoid collisions and minimise impingement upon origins' URI space.

Well-known URIs can also be used with other URI schemes, but only when those schemes' definitions explicitly allow it.

1.1. Appropriate Use of Well-Known URIs

There are a number of possible ways that applications could use well-known URIs. However, in keeping with the Architecture of the World-Wide Web [W3C.REC-webarch-20041215], well-known URIs are not intended for general information retrieval or establishment of large URI namespaces.

Rather, they are designed to facilitate discovery of information about an origin when it isn't practical to use other mechanisms; for example, when discovering policy that needs to be evaluated before a resource is accessed, or when the information applies to many (or all) of the origin's resources.

As such, the well-known URI space was created with the expectation that it will be used to make policy information and other metadata about the origin available directly (if sufficiently concise), or provide references to other URIs that provide it. In general, the information it contains should be applicable to most Web origins (while acknowledging that many will not use a particular well-known location, for various reasons).

In particular, well-known URIs are not a "protocol registry" for applications and protocols that wish to use HTTP as a substrate. Even if a particular origin is dedicated to the protocol in question, it is inappropriate to devote a URL on all origins to a specialist protocol that has little or no potential benefit for them.

Instead, such applications and protocols are encouraged to used a URI to bootstrap their operation, rather than using a hostname and a well-known URI.

Exceptionally, the registry expert(s) may approve such a registration for documents in the IETF Stream [RFC5741], in consultation with the IESG, provided that the protocol in question cannot be bootstrapped with a URI (e.g., the discovery mechanism can only carry a hostname). However, merely making it easier to locate it is not a sufficient reason. Likewise, future use unsupported by the specification in question is not sufficient reason to register a well-known location.

Well-known locations are also not suited for information on topics other than the origin that they are located upon; for example, creating a well-known resource about a business entity or organisational structure presumes that Internet hosts and organisations share structure, and are likely to have significant deployment issues in environments where this is not true.

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 RFC 2119 [RFC2119].

3. Well-Known URIs

A well-known URI is a URI [RFC3986] whose path component begins with the characters "/.well-known/", and whose scheme is "HTTP", "HTTPS", or another scheme that has explicitly been specified to use well-known URIs.

Applications that wish to mint new well-known URIs MUST register them, following the procedures in Section 5.1.

For example, if an application registers the name 'example', the corresponding well-known URI on 'http://www.example.com/' would be 'http://www.example.com/.well-known/example'.

Registered names MUST conform to the segment-nz production in [RFC3986]. This means they cannot contain the "/" character.

Note that this specification defines neither how to determine the authority to use for a particular context, nor the scope of the metadata discovered by dereferencing the well-known URI; both should be defined by the application itself.

Typically, a registration will reference a specification that defines the format and associated media type to be obtained by dereferencing the well-known URI.

It MAY also contain additional information, such as the syntax of additional path components, query strings and/or fragment identifiers to be appended to the well-known URI, or protocol-specific details (e.g., HTTP [RFC7231] method handling).

Note that this specification does not define a format or media-type for the resource located at "/.well-known/" and clients should not expect a resource to exist at that location.

Well-known URIs are only valid when rooted in the top of the path's hierarchy; they MUST NOT be used in other parts of the path. For example, "/.well-known/example" is a valid use, but "/foo/.well-known/example" is not.

4. Security Considerations

This memo does not specify the scope of applicability of metadata or policy obtained from a well-known URI, and does not specify how to discover a well-known URI for a particular application. Individual applications using this mechanism must define both aspects.

Applications minting new well-known URIs, as well as administrators deploying them, will need to consider several security-related issues, including (but not limited to) exposure of sensitive data, denial-of-service attacks (in addition to normal load issues), server and client authentication, vulnerability to DNS rebinding attacks, and attacks where limited access to a server grants the ability to affect how well-known URIs are served.

Security-sensitive applications using well-known locations should consider that some server administrators might be unaware of its existence (especially on operating systems that hide directories whose names begin with "."). This means that if an attacker has write access to the .well-known directory, they would be able to control its contents, possibly without the administrator realising it.

5. IANA Considerations

5.1. The Well-Known URI Registry

This document specifies procedures for the well-known URI registry, first defined in [RFC5785].

Well-known URIs are registered on the advice of one or more experts (appointed by the IESG or their delegate), with a Specification Required (using terminology from [RFC8126]).

To allow for the allocation of values prior to publication, the expert(s) may approve registration once they are satisfied that such a specification will be published.

Registration requests can be sent to the wellknown-uri-review@ietf.org mailing list for review and comment, with an appropriate subject (e.g., "Request for well-known URI: example").

5.1.1. Registration Template

URI suffix: The name requested for the well-known URI, relative to "/.well-known/"; e.g., "example".

Change controller: For Standards-Track RFCs, state "IETF". For others, give the name of the responsible party. Other details (e.g., postal address, e-mail address, home page URI) may also be included.

Specification document(s): Reference to the document that specifies the field, preferably including a URI that can be used to retrieve a copy of the document. An indication of the relevant sections may also be included, but is not required.

Related information: Optionally, citations to additional documents containing further relevant information.

6. References

6.1. Normative References

[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>.

[RFC3986] 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>.

[RFC5741] Daigle, L., Ed., Kolkman, O., Ed., and IAB, "RFC Streams, Headers, and Boilerplates", RFC 5741, DOI 10.17487/RFC5741, December 2009, <https://www.rfc-editor.org/info/rfc5741>.

[RFC6454] Barth, A., "The Web Origin Concept", RFC 6454, DOI 10.17487/RFC6454, December 2011, <https://www.rfc-editor.org/info/rfc6454>.

[RFC8126] Cotton, M., Leiba, B., and T. Narten, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 8126, DOI 10.17487/RFC8126, June 2017, <https://www.rfc-editor.org/info/rfc8126>.

6.2. Informative References

[RFC4918] Dusseault, L., Ed., "HTTP Extensions for Web Distributed Authoring and Versioning (WebDAV)", RFC 4918, DOI 10.17487/RFC4918, June 2007, <https://www.rfc-editor.org/info/rfc4918>.

[RFC5785] Nottingham, M. and E. Hammer-Lahav, "Defining Well-Known Uniform Resource Identifiers (URIs)", RFC 5785, DOI 10.17487/RFC5785, April 2010, <https://www.rfc-editor.org/info/rfc5785>.

[RFC7231] Fielding, R., Ed. and J. Reschke, Ed., "Hypertext Transfer Protocol (HTTP/1.1): Semantics and Content", RFC 7231, DOI 10.17487/RFC7231, June 2014, <https://www.rfc-editor.org/info/rfc7231>.

[W3C.REC-P3P-20020416] Marchiori, M., "The Platform for Privacy Preferences 1.0 (P3P1.0) Specification", World Wide Web Consortium Recommendation REC-P3P-20020416, April 2002, <http://www.w3.org/TR/2002/REC-P3P-20020416>.

6.3. URIs

[1] https://github.com/mnot/I-D/labels/rfc5785bis

[2] https://mnot.github.io/I-D/rfc5785bis/

[3] https://github.com/mnot/I-D/commits/gh-pages/rfc5785bis

[4] https://datatracker.ietf.org/doc/draft-nottingham-rfc5785bis/

[5] http://www.robotstxt.org/

Appendix A. Frequently Asked Questions

1. Aren't well-known locations bad for the Web?

   They are, but for various reasons - both technical and social - they are sometimes necessary. This memo defines a "sandbox" for them, to reduce the risks of collision and to minimise the impact upon pre-existing URIs on sites.

2. Why /.well-known?

   It's short, descriptive, and according to search indices, not widely used.

3. What impact does this have on existing mechanisms, such as P3P and robots.txt?

   None, until they choose to use this mechanism.

4. Why aren't per-directory well-known locations defined?

   Allowing every URI path segment to have a well-known location (e.g., "/images/.well-known/") would increase the risks of colliding with a pre-existing URI on a site, and generally these solutions are found not to scale well, because they're too "chatty".

5. I want to use a well-known location to make it easy to configure my protocol that uses HTTP.

   This is not what well-known locations are for; see Section 1.1.

Appendix B. Changes from RFC5785

- Discuss appropriate and inappropriate uses more fully
- Adjust IANA instructions
- Update references
- Various other clarifications

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