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Deterministic URI Encoding
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Abstract

The "http" and "https" URI schemes do not have a fixed character encoding. This document defines HTTP headers to enable an explicit indication of the character encoding.

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[1. Introduction](#)

The "http" and "https" URI schemes don't have a fixed character encoding. The URI RFC [[RFC3986](#)] talks about the generic syntax for URI components:

- . Legacy URI components (before 2005) tend to use UTF-8 "or some other superset of the US-ASCII character encoding"
- . New schemes (after 2005) use UTF-8 with percent encoding for reserved characters.

The first bullet explains why the character encoding for "http"

and "https" URIs is not deterministic. This is particularly
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problematic when parsing URIs at the server side or at intermediate proxies (e.g., when looking for a cache hit).

URI's have different components with different character encoding issues.

Per the IDNA rules in [[RFC5890](#)], the host component is encoded using A-labels.

There is more non-determinism with respect to the path and query components. Furthermore, these two components are not necessarily encoded the same way [[Handbook](#)].

This document defines HTTP headers that explicitly state the character encoding for the path and query components.

[1.1. Requirements Language](#)

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](#)].

[2. URI Path and Query Encoding Headers](#)

The URI Path encoding is conveyed in the following header:

```
URI-Path-Encoding = "URI-Path-Encoding" ":" 1charset
```

The URI Query encoding is conveyed in the following header:

```
URI-Query-Encoding = "URI-Query-Encoding" ":" 1charset
```

charset is defined in [section 3.4 of \[RFC2616\]](#). The expected value indicates the character encoding for the path or query component in the URI prior to percent encoding. (A value of UTF-8 does not mean that the URI carries raw UTF-8.)

If the user agent is certain that the path component was formed from percent-encoded UTF-8, it sets the header as follows:

```
URI-Path-Encoding: UTF-8
```

Similarly, for the query component:

```
URI-Query-Encoding: UTF-8
```

This signals that the query component in the URI is in UTF-8 with percent encoding.

Absence of the URI-Path-Encoding or URI-Query-Encoding header is equivalent to the legacy situation of non-determinism with respect to the path or query component, respectively, as mentioned above in [section 1](#).

Likewise, if the URI-Path-Encoding or URI-Query-Encoding header is set to an invalid value or unrecognized charset, this is equivalent to the legacy situation of non-determinism with respect to the path or query component, respectively, mentioned above in [section 1](#).

[3. IANA Considerations](#)

IANA is requested to add these headers to the "Permanent Message Header Field Names" registry. Per [[RFC3864](#)], the template for these headers is specified below.

[3.1. URI-Path-Encoding](#)

Applicable protocol: http

Status: standard

Author/change controller:

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Specification document(s):

This document.

[3.2. URI-Query-Encoding](#)

Applicable protocol: http

Status: standard

Author/change controller:

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Specification document(s):

This document.

4. Security Considerations

Due to the non-deterministic character encoding of URI's, URI parsing at servers or proxies currently may involve trying different possible character encodings searching for a match. This represents a potential attack vector [[RFC6943](#)]. The headers proposed in this document could be used to reduce the attack surface by enabling a more explicit interpretation of the data within a URI, thus preventing unintended consequences.

5. Acknowledgments

Thanks to Ivan Pashov and Wade Hilmo for useful discussions in this space.

This document was prepared using 2-Word-v2.0.template.doc.

6. References

6.1. Normative References

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6.2. Informative References

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