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Format for Literal IPv6 Addresses in URL's

Status of this Memo

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Abstract

This document defines the format for literal IPv6 Addresses in URL's for implementation in World Wide Web browsers. This format has been implemented in the IPv6 versions of several widely deployed browsers including Microsoft Internet Explorer, Mozilla, and Lynx. It is also intended to be used in the IPv6 version of the service location protocol.

This document includes an update to the generic syntax for Uniform Resource Identifiers defined in RFC 2396 [URL]. It defines a syntax for IPv6 addresses and allows the use of "[" and "]" within a URI explicitly for this reserved purpose.

1. Introduction

The textual representation defined for literal IPv6 addresses in [ARCH] is not directly compatible with URL's. Both use ":" and "." characters as delimiters. This document defines the format for literal IPv6 Addresses in URL's for implementation in World Wide Web browsers. The goal is to have a format that allows easy "cut" and "paste" operations with a minimum of editing of the literal address.

The format defined in this document has been implemented in the IPv6 versions of several widely deployed browsers including Microsoft Internet Explorer, Mozilla, and Lynx. It is also intended to be used in the IPv6 version of the service location protocol.

1.1 Requirements

The keywords MUST, MUST NOT, REQUIRED, SHALL, SHALL NOT, SHOULD, SHOULD NOT, RECOMMENDED, MAY, and OPTIONAL, if and where they appear in this document, are to be interpreted as described in [KEYWORDS].

World Wide Web browsers SHOULD implement the format of IPv6 literals in URL's defined in this document. Other types of applications and protocols that use URL's MAY use this format.

2. Literal IPv6 Address Format in URL's Syntax

To use a literal IPv6 address in a URL, the literal address should be enclosed in "[" and "]" characters. For example the following literal IPv6 addresses:

```
FEDC:BA98:7654:3210:FEDC:BA98:7654:3210
1080:0:0:0:8:800:200C:4171
3ffe:2a00:100:7031::1
1080::8:800:200C:417A
::192.9.5.5
::FFFF:129.144.52.38
2010:836B:4179::836B:4179
```

would be represented as in the following example URLs:

```
http://[FEDC:BA98:7654:3210:FEDC:BA98:7654:3210]:80/index.html
http://[1080:0:0:0:8:800:200C:417A]/index.html
http://[3ffe:2a00:100:7031::1]
http://[1080::8:800:200C:417A]/foo
http://[::192.9.5.5]/ipng
http://[::FFFF:129.144.52.38]:80/index.html
http://[2010:836B:4179::836B:4179]
```

3. Changes to RFC 2396

This document updates the generic syntax for Uniform Resource Identifiers defined in RFC 2396 [URL]. It defines a syntax for IPv6 addresses and allows the use of "[" and "]" within a URI explicitly for this reserved purpose.

The following changes to the syntax in RFC 2396 are made:
(1) change the 'host' non-terminal to add an IPv6 option:

```
host          = hostname | IPv4address | IPv6reference
ipv6reference = "[" IPv6address "]"
```

where IPv6address is defined as in RFC2373 [ARCH].

(2) Replace the definition of 'IPv4address' with that of RFC 2373, as it correctly defines an IPv4address as consisting of at most three decimal digits per segment.

(3) Add "[" and "]" to the set of 'reserved' characters:

```
reserved    = ";" | "/" | "?" | ":" | "@" | "&" | "=" | "+" |
              "$" | "," | "[" | "]"
```

and remove them from the 'unwise' set:

```
unwise      = "{" | "}" | "|" | "\" | "^" | "'"
```

4. Security Considerations

The use of this approach to represent literal IPv6 addresses in URL's does not introduce any known new security concerns.

5. IANA Considerations

None.

6. Authors' Addresses

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7. References

[ARCH] Hinden, R. and S. Deering, "IP Version 6 Addressing Architecture", RFC 2373, July 1998.

[STD-PROC] Bradner, S., The Internet Standards Process -- Revision 3, BCP 9, RFC 2026, October 1996.

[URL] Fielding, R., Masinter, L. and T. Berners-Lee, "Uniform Resource Identifiers: Generic Syntax", RFC 2396, August 1998.

8. Full Copyright Statement

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