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**JSON Pointer**  
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Abstract

JSON Pointer defines a string syntax for identifying a specific value within a JSON document.

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## **1. Introduction**

This specification defines JSON Pointer, a string syntax for identifying a specific value within a JavaScript Object Notation (JSON) [RFC4627] text document. This syntax is intended to be easily expressed in JSON string values and Uniform Resource Identifier (URI) [RFC3986] fragment identifiers.

## **2. 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 [RFC2119].

This specification expresses normative syntax rules using Augmented Backus-Naur Form [RFC5234] (ABNF) notation.

## **3. Syntax**

A JSON Pointer is a [Unicode] string containing a sequence of zero or more reference tokens, each prefixed by a '/' (%x2F) character.

If a reference token contains '/' (%x2F) or '\' (%x5C) characters, such characters MUST each be prefixed (escaped) with a '\' (%x5C) character.

ABNF syntax:

```
json-pointer = *( "/" reference-token )
reference-token = *( unescaped / escaped )
unescaped = %x00-2E / %x30-5B / %x5D-10FFFF
escaped = "\" ( "/" / "\" )
```

It is an error condition if a JSON Pointer value does not conform to this syntax.

## **4. Evaluation**

Evaluation of a JSON Pointer begins with a reference to the root value of a JSON text document and completes with a reference to some value within the document. Each reference token in the JSON Pointer is sequentially evaluated.

Evaluation of each reference token begins by unescaping any escaped character sequence; this is performed by simply the '\' (escape)



prefix. The reference token then modifies which value is referenced according to the following scheme:

If the currently referenced value is a JSON object, the new referenced value is the object member with the name identified by the reference token. If a referenced member name is not unique, which member is referenced is undefined.

If the currently referenced value is a JSON array, the reference token MUST contain an unsigned base-10 integer value, and the new referenced value is the array element with the zero-based index identified by the token.

If a reference token is being evaluated against a concrete JSON document, the implementation MAY evaluate each token against a concrete value, and terminate evaluation with an error condition if a evaluation fails to resolve a concrete value.

## **5. JSON String Representation**

A JSON Pointer MAY be represented in a JSON string value. Per [\[RFC4627\]](#), [section 2.5](#), all instances of quotation mark '"' (%x22), reverse solidus '\' (%x5C) and control (%x00-1F) characters MUST be escaped.

## **6. URI Fragment Identifier Representation**

A JSON Pointer MAY be represented in a URI fragment identifier. The JSON pointer MUST be UTF-8 [\[RFC3629\]](#) encoded as octets; octets in the URI "unreserved" set SHOULD be percent-encoded, per [\[RFC3986\]](#), [section 2.5](#).

## **7. Error Handling**

In the event of an error condition, evaluation of the JSON Pointer fails to complete.

## **8. IANA Considerations**

This document has no IANA actions.



## **9. Security Considerations**

A given JSON Pointer is not guaranteed to reference an actual JSON value. Implementations should be aware of this and take appropriate precautions.

## **10. Acknowledgements**

The following individuals contributed ideas, feedback and wording, which contributed to the content of this specification:

Carsten Bormann, Jacob Davies, Martin J. Duerst, Bjoern Hoehrmann, Mark Nottingham, Drew Perttula, Julian Reschke.

## **11. Normative References**

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- [RFC3629] Yergeau, F., "UTF-8, a transformation format of ISO 10646", STD 63, [RFC 3629](#), November 2003.
- [RFC3986] Berners-Lee, T., Fielding, R., and L. Masinter, "Uniform Resource Identifier (URI): Generic Syntax", STD 66, [RFC 3986](#), January 2005.
- [RFC4627] Crockford, D., "The application/json Media Type for JavaScript Object Notation (JSON)", [RFC 4627](#), July 2006.
- [RFC5234] Crocker, D. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF", STD 68, [RFC 5234](#), January 2008.
- [Unicode] The Unicode Consortium, "The Unicode Standard, Version 6.0", October 2011, <<http://www.unicode.org/versions/Unicode6.0.0/>>.

## **Appendix A. Examples**





The following examples illustrate the use of JSON Pointers in URI fragments for a JSON text document located at `http://example.com/example.json`, with the following value:

```
{
  "foo": {
    "bar": [ "element0", "element1" ],
    "inner object": {
      "baz": "qux"
    }
  }
}
```

`http://example.com/example.json#`

Resolves to the object value at the root of the JSON text document.

`http://example.com/example.json#/foo`

Resolves to the object value of the "foo" member in the root object.

`http://example.com/example.json#/foo/inner%20object`

Resolves to the object value of the "inner object" member in the "foo" object value in the root object.

`http://example.com/example.json#/foo/inner%20object/baz`

Resolves to the string value "qux", which is the value of the "baz" member in the "inner object" member in the "foo" member in the root object.

`http://example.com/example.json#/foo/bar/0`

Resolves to the string value "element0", which is the first value in the "bar" array in the "foo" member in the root object.

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