JSON Patch
draft-pbryan-json-patch-02

Abstract

JSON Patch defines the media type "application/json-patch", a JSON
document structure for expressing a sequence of partial modifications
to a JSON document.

Status of this Memo

Copyright Notice

Table of Contents

1. Introduction

[JavaScript Object Notation (JSON)](#) *[RFC4627]* is a common format for the exchange and storage of structured data. [HTTP PATCH](#) *[RFC5789]* extends [HTTP](#) *[RFC2616]* with a method to perform partial modifications to resources.

The JSON Patch media type "application/json-patch" is a JSON document structure for expressing a sequence of partial modifications to a JSON document, suitable for use with the HTTP PATCH method.

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 [RFC 2119](#) *[RFC2119]*.

3. [Document Structure](#)

A JSON Patch document contains a JSON array of objects. Each object contains an operation to apply to the target JSON document.

A sample JSON Patch document:

```
[
    { "remove": "/a/b/c" },
    { "add": "/a/b/c", "value": "foo" },
    { "replace": "/a/b/c", "value": "bar" }
]
```

Evaluation of a JSON Patch document begins with a target JSON
document to modify. Operations are applied sequentially in the order
they appear in the array. Each operation in the sequence is applied
to the target document. The resulting modified document becomes the
target for the next operation. The process repeats until all
operations are successfully applied.

4. Operations

The operation to perform is expressed in the name of a member in the
operation object, with that member's value holding a string
containing the [JSON Pointer], which references the value to modify.
It is an error condition if an operation object contains more than
one operation member.

4.1. add

The "add" operation adds a new value into an object or array. The
value to be added is specified in the operation object's "value"
member.

If adding to an object, it is an error condition if the member to be
added in the object already exists.

If adding to an array, all elements at or above the specified index
are shifted one position to the right. It is an error condition if
the specified index is greater than the number of elements in the
existing array.

4.2. remove

The "remove" operation removes a value from an object or array.

If removing an element from an array, all elements above the
specified index are shifted one position to the left.

It is an error condition if the value to be removed does not exist.

4.3. replace

The "replace" operation replaces an existing value with a new value.
This operation is equivalent to expressing a "remove" operation for a
value, followed immediately by an "add" operation for the same value.
The value to be replaced is specified in the operation object's
"value" member.

It is an error condition if the value to be replaced does not exist.

5. Error Handling

In the event of an error condition, evaluation of the JSON Patch document terminates and modification of the target document fails to complete.

6. Acknowledgements

The structure of a JSON Patch document was informed by the XML Patch document *[RFC5261]* specification.

7. IANA Considerations

The Internet media type for a JSON Patch document is application/json-patch.

Type name: application

Subtype name: json-patch

Required parameters: none

Optional parameters: none

Encoding considerations:
   Per JSON *[RFC4627]*: 8bit if UTF-8; binary if UTF-16 or UTF-32.

Security considerations:
   See Security Considerations in section 8.

Interoperability considerations: N/A

Published specification:
   draft-pbryan-json-patch-02

Applications that use this media type:
   HTTP clients and servers.

Additional information: N/A

        *.json-patch

        *TEXT

Person & email address to contact for further information:
   Paul C. Bryan <paul.bryan@forgerock.com>

Intended usage: COMMON

Restrictions on usage: none

Author: Paul C. Bryan <paul.bryan@forgerock.com>

Change controller: Paul C. Bryan <paul.bryan@forgerock.com>

8. Security Considerations

This specification has the same security considerations as JSON [RFC4627] and JSON Pointer [JSON Pointer].

9. References

9.1. Normative References

[RFC2119]	Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.
[RFC4627]	Crockford, D., "The application/json Media Type for JavaScript Object Notation (JSON)", RFC 4627, July 2006.
[JSON Pointer]	Bryan, P. and K. Zyp, "JSON Pointer", October 2011.

9.2. Informative References

[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.
[RFC5261]	Urpalainen, J., "An Extensible Markup Language (XML) Patch Operations Framework Utilizing XML Path Language (XPath) Selectors", RFC 5261, September 2008.
[RFC5789]	Dusseault, L. and J. Snell, "PATCH Method for HTTP", RFC 5789, March 2010.

Appendix A. Examples

Appendix A.1. Adding an Object Member

An example target JSON document:

```
{
  "foo": "bar"
}
```

A JSON Patch document:

```
[
  { "add": "/baz", "value": "qux" }
]
```

The resulting JSON document:

```
{
  "baz": "qux",
  "foo": "bar"
}
```

Appendix A.2. Adding an Array Element

An example target JSON document:

```
{
  "foo": [ "bar", "baz" ]
}
```

A JSON Patch document:

```
[
  { "add": "/foo/1", "value": "qux" }
]
```

The resulting JSON document:

```
{
  "foo": [ "bar", "qux", "baz" ]
}
```

Appendix A.3. Removing an Object Member

An example target JSON document:

```
{
  "baz": "qux",
  "foo": "bar"
}
```

A JSON Patch document:

```
[
  { "remove": "/baz" }
]
```

The resulting JSON document:

```
{
  "foo": "bar"
}
```

Appendix A.4. Removing an Array Element

An example target JSON document:

```
{
  "foo": [ "bar", "qux", "baz" ]
}
```

A JSON Patch document:

```
[
    { "remove": "/foo/1" }
]
```

The resulting JSON document:

```
{
    "foo": ["bar", "baz"]
}
```

Appendix A.5. Replacing a Value

An example target JSON document:

```
{
  "baz": "qux",
  "foo": "bar"
}
```

A JSON Patch document:

```
[
    { "replace": "/baz", "value": "boo" }
]
```

The resulting JSON document:

```
{
  "baz": "boo",
  "foo": "bar"
}
```

Author's Address

Paul C. Bryan editor Bryan ForgeRock US, Inc. 201 NE Park Plaza Drive
Suite 196 Vancouver, WA 98684 USA Phone: +1 604 783 1481 EMail:
paul.bryan@forgerock.com