

Applications Area Working Group
Internet-Draft
Intended status: Standards Track
Expires: January 5, 2015

P. Hoffman
VPN Consortium
J. Snell

July 4, 2014

JSON Merge Patch
draft-ietf-appsawg-json-merge-patch-04

Abstract

This specification defines the JSON merge patch format and processing rules. The merge patch format is primarily intended for use with the HTTP PATCH method as a means of describing a set of modifications to a subset of target resource's content.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of [BCP 78](#) and [BCP 79](#).

Internet-Drafts are working documents of the Internet Engineering Task Force (IETF). Note that other groups may also distribute working documents as Internet-Drafts. The list of current Internet-Drafts is at <http://datatracker.ietf.org/drafts/current/>.

Internet-Drafts are draft documents valid for a maximum of six months and may be updated, replaced, or obsoleted by other documents at any time. It is inappropriate to use Internet-Drafts as reference material or to cite them other than as "work in progress."

This Internet-Draft will expire on January 5, 2015.

Copyright Notice

Copyright (c) 2014 IETF Trust and the persons identified as the document authors. All rights reserved.

This document is subject to [BCP 78](#) and the IETF Trust's Legal Provisions Relating to IETF Documents (<http://trustee.ietf.org/license-info>) in effect on the date of publication of this document. Please review these documents carefully, as they describe your rights and restrictions with respect to this document. Code Components extracted from this document must include Simplified BSD License text as described in Section 4.e of the Trust Legal Provisions and are provided without warranty as described in the Simplified BSD License.

Table of Contents

1.	Introduction	2
2.	Processing Merge Patch Documents	3
3.	Example	4
4.	IANA Considerations	5
5.	Security Considerations	6
6.	Acknowledgements	6
7.	Normative References	6
Appendix A.	Example Test Cases	6
	Authors' Addresses	8

[1.](#) Introduction

This specification defines the JSON merge patch document format, processing rules, and associated MIME media type identifier. The merge patch format is primarily intended for use with the HTTP PATCH method [[RFC5789](#)] as a means of describing a set of modifications to a subset of target resource's content.

A JSON merge patch document describes changes to be made to a target JSON document using a syntax that closely mimics the document being modified. Recipients of a merge patch document determine the exact set of changes being requested by comparing the content of the provided patch against the current content of the target document. If the provided merge patch contains members that do not appear within the target, those members are added. If the target does contain the member, the value is replaced. Null values in the merge patch are given special meaning to indicate the removal of existing values in the target.

A JSON merge patch document can only be a JSON array or a JSON object.

For example, given the following original JSON document:

```
{
  "a": "b",
  "c": {
    "d": "e",
    "f": "g"
  }
}
```


Changing the value of "a" and removing "f" can be achieved by sending:

```
PATCH /target HTTP/1.1
Host: example.org
Content-Type: application/merge-patch+json
```

```
{
  "a": "z",
  "c": {
    "f": null
  }
}
```

When applied to the target resource, the value of the "a" member is replaced with "z" and "f" is removed, leaving the remaining content untouched.

This design means that merge patch documents are suitable for describing modifications to JSON documents that primarily use objects for their structure and do not make use of explicit null values. The merge patch format is not appropriate for all JSON syntaxes.

In this document, the key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" are to be interpreted as described in [[RFC2119](#)].

2. Processing Merge Patch Documents

JSON merge patch documents describe, by example, a set of changes that are to be made to a target resource. Recipients of merge patch documents are responsible for comparing the merge patch with the current content of the target resource to determine the specific set of change operations to be applied to the target.

To apply the merge patch document to a target resource, the system MUST execute the following function, described in pseudocode. For this description, the function is called MergePatch, and it takes two arguments: the target resource document and the merge patch document.


```
define MergePatch(Target, Patch):
  if Patch is an Object:
    if Target is not an Object:
      Target = {} # Ignore the contents and set it to an empty Object
    for each Key/Value pair in Patch:
      if Value is null:
        if Key exists in Target:
          remove the Key/Value pair from Target
        else:
          Target[Key] = MergePatch(Target[Key], Value)
      return Target
    else:
      return Patch
```

3. Example

For example, given the following example JSON document:

```
{
  "title": "Goodbye!",
  "author" : {
    "givenName" : "John",
    "familyName" : "Doe"
  },
  "tags": [ "example", "sample" ],
  "content": "This will be unchanged"
}
```

A user-agent wishing to change the value of the "title" member from "Goodbye!" to the value "Hello!", add a new "phoneNumber" member, remove the "familyName" from the "author" object, and remove the word sample from the "tags" Array, would send the following request:

```
PATCH /my/resource HTTP/1.1
Host: example.org
Content-Type: application/merge-patch+json
```

```
{
  "title": "Hello!",
  "phoneNumber": "+01-123-456-7890",
  "author": {
    "familyName": null
  },
  "tags": [ "example" ]
}
```


The resulting JSON document would be:

```
{
  "title": "Hello!",
  "author" : {
    "givenName" : "John"
  },
  "tags": [ "example" ],
  "content": "This will be unchanged",
  "phoneNumber": "+01-123-456-7890"
}
```

4. IANA Considerations

This specification registers the following additional MIME Media Types:

Type name: application

Subtype name: merge-patch+json

Required parameters: None

Optional parameters: None

Encoding considerations: Resources that use the "application/merge-patch+json" media type are required to conform to the "application/json" Media Type and are therefore subject to the same encoding considerations specified in [Section 6 \[RFC7159\]](#).

Security considerations: As defined in this specification

Published specification: This specification.

Applications that use this media type: None currently known.

Additional information:

Magic number(s): N/A

File extension(s): N/A

Macintosh file type code(s): TEXT

Person & email address to contact for further information: James M Snell <jasnell@gmail.com>

Intended usage: COMMON

Restrictions on usage: None.

Author: James M Snell <jasnell@gmail.com>

Change controller: IESG

5. Security Considerations

The "application/merge-patch+json" Media Type allows user agents to indicate their intention that the server determine the specific set of change operations to be applied to a target resource. As such, it is the server's responsibility to determine the appropriateness of any given change as well as the user agent's authorization to request such changes. How such determinations are made is considered out of the scope of this specification.

All of the the security considerations discussed in [Section 5 \[RFC5789\]](#) apply to all uses of the HTTP PATCH method with the "application/merge-patch+json" Media Type.

6. Acknowledgements

Many people contributed significant ideas to this document. These people include, but are not limited to, James Manger, Matt Miller, Carsten Bormann, and Bjoern Hoehrmann. [[NOTE: If you contributed and we missed your name, please let us know.]]

7. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC5789] Dusseault, L. and J. Snell, "PATCH Method for HTTP", [RFC 5789](#), March 2010.
- [RFC7159] Bray, T., "The JavaScript Object Notation (JSON) Data Interchange Format", [RFC 7159](#), March 2014.

[Appendix A](#). Example Test Cases

ORIGINAL	PATCH	RESULT
-----	-----	-----
<code>{"a": "b"}</code>	<code>{"a": "c"}</code>	<code>{"a": "c"}</code>
<code>{"a": "b"}</code>	<code>{"b": "c"}</code>	<code>{"a": "b", "b": "c"}</code>
<code>{"a": "b"}</code>	<code>{"a": null}</code>	<code>{}</code>
<code>{"a": "b", "b": "c"}</code>	<code>{"a": null}</code>	<code>{"b": "c"}</code>
<code>{"a": ["b"]}</code>	<code>{"a": "c"}</code>	<code>{"a": "c"}</code>
<code>{"a": "c"}</code>	<code>{"a": ["b"]}</code>	<code>{"a": ["b"]}</code>
<code>{"a": { "b": "c" }}</code>	<code>{"a": { "b": "d", "c": null }}</code>	<code>{"a": { "b": "d" }}</code>
<code>{"a": [{"b": "c" }] }</code>	<code>{"a": [1]}</code>	<code>{"a": [1]}</code>
<code>["a", "b"]</code>	<code>["c", "d"]</code>	<code>["c", "d"]</code>
<code>{"a": "b"}</code>	<code>["c"]</code>	<code>["c"]</code>
<code>{"a": "foo"}</code>	<code>null</code>	<code>null</code>
<code>{"a": "foo"}</code>	<code>"bar"</code>	<code>"bar"</code>
<code>{"e": null}</code>	<code>{"a": 1}</code>	<code>{"e": null, "a": 1}</code>
<code>[1, 2]</code>	<code>{"a": "b", "c": null}</code>	<code>{"a": "b"}</code>
<code>{}</code>	<code>{"a": {"bb": {"ccc": null}}}</code>	<code>{"a": {"bb": {}}}</code>

Authors' Addresses

Paul Hoffman
VPN Consortium

Email: paul.hoffman@vpnc.org

James M Snell

Email: jasnell@gmail.com