

Network Working Group  
Internet-Draft  
Intended status: Informational  
Expires: December 9, 2012

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June 7, 2012

JSON Hypertext Application Language  
draft-kelly-json-hal-00

## Abstract

This document proposes a media type for representing resources with hyperlinks.

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## 1. Introduction

There is an emergence of non-HTML HTTP applications ("Web APIs") which use hyperlinks to direct clients around their resources.

The JSON Hypertext Application Language (HAL) is a standard which establishes conventions for expressing hyperlinks with JSON [[RFC4627](#)].

HAL is a generic media type with which Web APIs can be developed and exposed as series of links. Clients of these APIs can select links by their link relation type and traverse them in order to progress through the application.

HAL's conventions result in a uniform interface for serving and consuming hypertext, enabling the creation of general-purpose libraries that can be re-used on any API utilising HAL.

The primary design goals of HAL are generality and simplicity. HAL can be applied to many different domains, and imposes the minimal amount of structure necessary to cover the key hypertext requirements (links and embedded documents).

## 2. Requirements

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](#)].

## 3. HAL Documents

A HAL Document uses the format described in [[RFC4627](#)] and has the media type "application/hal+json".

Its root object MUST be a Resource Object.

For example:

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```
GET /orders/523 HTTP/1.1
Host: example.org
Accept: application/hal+json
```

```
HTTP/1.1 200 OK
Content-Type: application/hal+json
```

```
{
  "_links": {
    "self": { "href": "/orders/523" },
    "warehouse": { "href": "/warehouse/56" },
    "invoice": { "href": "/invoices/873" }
  },
  "currency": "USD",
  "status": "shipped",
  "total": 10.20
}
```

Here, we have a HAL document representing an order resource with the URI `/orders/523`. It has `warehouse` and `invoice` links, and its own state in the form of `currency`, `status`, and `total` properties.

#### [4. Resource Objects](#)

A Resource Object represents a resource.

It has two reserved properties `_links` and `_embedded`, which

represent Links and Embedded Resources respectively.

All other properties MUST be valid JSON, and represent the current state of the resource.

#### [4.1.](#) Links

The reserved "\_links" property is REQUIRED.

It is an object whose names are link relation types (as defined by [[RFC5988](#)]) and values are either a Link Object or an array of Link Objects. The subject resource of these links is the Resource Object of which the containing "\_links" object is a property.

It MUST have a "self" property whose value is a Link Object whose target SHOULD be the URI of the subject resource.

#### [4.2.](#) Embedded Resources

The reserved "\_embedded" property is OPTIONAL

It is an object whose names are link relation types (as defined by [[RFC5988](#)]) and values are either a Resource Object or an array of Resource Objects.

### [5.](#) Link Objects

A Link Object represents a hyperlink. It has the following properties:

#### [5.1.](#) href

The "href" property is REQUIRED.

Its value is either a URI [[RFC3986](#)] or a URI Template [[RFC6570](#)].

If the value is a URI Template then the Link Object SHOULD have a "templated" attribute whose value is true.

## [5.2.](#) templated

The "templated" property is OPTIONAL.

Its value is boolean and SHOULD be true when the Link Object's "href" property is a URI Template.

## [5.3.](#) title

The "title" property is OPTIONAL.

Its value is a string and is intended for labeling the link with a human-readable identifier (as defined by [[RFC5988](#)]).

## [5.4.](#) hreflang

The "hreflang" property is OPTIONAL.

Its value is a string and is intended for indicating the language of the target resource (as defined by [[RFC5988](#)]).

## [6.](#) Example Document

The following is an example document representing a list of orders

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```
GET /orders HTTP/1.1
Host: example.org
Accept: application/hal+json
```

```
HTTP/1.1 200 OK
Content-Type: application/hal+json
```

```
{
  "_links": {
    "self": { "href": "/orders" },
    "next": { "href": "/orders?page=2" },
    "find": { "href": "/orders/{?id}", "templated": true }
  },
  "_embedded": {
    "orders": [{
```

```

    "_links": {
      "self": { "href": "/orders/123" },
      "basket": { "href": "/baskets/98712" },
      "customer": { "href": "/customers/7809" }
    },
    "total": 30.00,
    "currency": "USD",
    "status": "shipped",
  },{
    "_links": {
      "self": { "href": "/orders/124" },
      "basket": { "href": "/baskets/97213" },
      "customer": { "href": "/customers/12369" }
    },
    "total": 20.00,
    "currency": "USD",
    "status": "processing"
  ]
},
currentlyProcessing: 14,
shippedToday: 20
}

```

Here, the order list document provides a "next" link directing to the next page, and a "find" link containing a URI Template which can be expanded with an 'id' variable to go directly to a specific order.

It also has two embedded resources, "orders". Each of these has its own links to the associated "basket" and "customer" resources, and properties showing their "total", "currency" and "status".

Additionally, the order list resource has its own properties "currentlyProcessing" and "shippedToday".

## [7.](#) Security Considerations

TBD

## [8.](#) IANA Considerations

TBD

## 9. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
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## Appendix A. Acknowledgements

Thanks to Darrel Miller, Mike Amundsen, and everyone in hal-discuss for their suggestions and feedback.

The author takes all responsibility for errors and omissions.

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