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The I-JSON Message Format
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Abstract

I-JSON is a restricted profile of JSON designed to maximize interoperability and increase confidence that software can process it successfully with predictable results.

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Table of Contents

1. Introduction	2
1.1. Terminology	2
1.2. Requirements Language	2
2. I-JSON Messages	3
2.1. Encoding and Characters	3
2.2. Numbers	3
2.3. Object constraints	3
3. Software Behavior	4
4. Acknowledgements	4
5. Security Considerations	4
6. Normative References	4
Author's Address	5

1. Introduction

RFC4627bis describes the JSON data interchange format, which is widely used in Internet protocols. For historical reasons, that specification allows the use of language idioms and text encoding patterns which are likely to lead to interoperability problems and software breakage, particularly when a program receiving JSON data uses automated software to map it into native programming-language structures or database records. RFC4627 describes practices which may be used to avoid these interoperability problems.

This document specifies I-JSON, short for "Internet JSON". The unit of definition is the "I-JSON message". I-JSON messages are also "JSON texts" as defined in RFC4627bis but with certain extra constraints which enforce the good interoperability practices described in that specification.

1.1. Terminology

The terms "object", "member", "array", "number", "name", and "string" in this document are to be interpreted as described in RFC4627bis.

1.2. Requirements Language

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].

2. I-JSON Messages

An I-JSON message is a JSON object, as defined by RFC4626bis. This allows protocol designers to add new data items to messages, should that become necessary, without breaking existing deployments. In other words, it makes a Must-Ignore policy possible.

When an I-JSON message is transmitted over the Internet, since it is a JSON text as defined in RFC4627bis, it may be described using the Internet Media Type "application/json". Specifications whose messages are specified to be I-JSON messages SHOULD specify the use of a media type of the form "application/XXX+i-json", where XXX is specific to the specification.

2.1. Encoding and Characters

I-JSON messages MUST be encoded using UTF-8 [RFC3629].

Object member names, and string values in arrays and object members, MUST NOT include code points which identify Surrogates or Noncharacters.

This applies both to characters encoded directly in UTF-8 and to those which are escaped; thus, "\uDEAD" is always illegal.

2.2. Numbers

Software which implements IEEE 754-2008 binary64 (double precision) numbers [IEEE754] is generally available and widely used. Implementations which generate I-JSON messages MUST NOT assume that receiving implementations can process numeric values with greater magnitude or precision than provided by those numbers. I-JSON messages SHOULD NOT include numbers which express greater magnitude or precision than an IEEE 754 double precision number provides, for example 1E400 or 3.141592653589793238462643383279.

For applications such as cryptography, where much larger numbers are reasonably required, it is RECOMMENDED to encode them in JSON string values. This requires that the receiving program understand the intended semantic of the value.

2.3. Object constraints

Objects in I-JSON messages MUST NOT have members with duplicate names.

Implementations which generate I-JSON messages MUST NOT assume that the order of object members in those messages is available to software which receives them.

3. Software Behavior

When software reads data which it expects to be an I-JSON message, but the data violates one of the MUST constraints in the previous section (for example, contains an object with a duplicate key, or a UTF-8 encoding error), that software MUST NOT trust nor act on the content of the message.

Designers of protocols which use I-JSON messages SHOULD provide a way, in this case, for the receiver of the erroneous data to signal the problem to the sender.

4. Acknowledgements

I-JSON is entirely dependent on the design of JSON, largely due to Douglas Crockford. The specifics were strongly influenced by the contributors to the design of RFC4627bis on the IETF JSON Working Group.

5. Security Considerations

All the security considerations which apply to JSON (see RFC4627bis) apply to I-JSON. There are no additional security considerations specific to I-JSON.

6. Normative References

- [IEEE754] IEEE, "IEEE Standard for Floating-Point Arithmetic", 2008, <<http://grouper.ieee.org/groups/754/>>.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.
- [RFC3629] Yergeau, F., "UTF-8, a transformation format of ISO 10646", STD 63, RFC 3629, November 2003.
- [RFC4627] Crockford, D., "The application/json Media Type for JavaScript Object Notation (JSON)", RFC 4627, July 2006.
- [RFC6838] Freed, N., Klensin, J., and T. Hansen, "Media Type Specifications and Registration Procedures", BCP 13, RFC 6838, January 2013.

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