

Multipart Content-Format for CoAP
draft-fossati-core-multipart-ct-05

Abstract

This memo defines application/multipart-core, an application-independent media-type that can be used to combine representations of several different media types into a single CoAP message-body with minimal framing overhead, each along with a CoAP Content-Format identifier.

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[1.](#) Introduction

This memo defines application/multipart-core, an application-independent media-type that can be used to combine representations of several different media types into a single CoAP [[RFC7252](#)] message-body with minimal framing overhead, each along with a CoAP Content-Format identifier.

This simple and efficient binary framing mechanism can be employed to create application specific request and response bodies which build on multiple already existing media types.

Applications using the application/multipart-core Content-Format define the internal structure of the application/multipart-core representation.

For example, one way to structure the sub-types specific to an application/multipart-core container is to always include them at the same fixed position. This specification allows to indicate that an optional part is not present by substituting a null value for the representation of the part.

Optionally, an application might use the general format defined here, but also register a new media type and an associated Content-Format identifier -- typically one in the range 10000-64999 -- instead of using application/multipart-core.

[2.](#) Multipart Content-Format Encoding

A representation of media-type application/multipart-core contains a collection of zero or more representations, each along with their respective content format.

The collection is encoded as a CBOR [[RFC7049](#)] array with an even number of elements. The second, fourth, sixth, etc. element is a byte string containing a representation, or the value "null" if an optional part is indicated as not given. The first, third, fifth, etc. element is an unsigned integer specifying the content format ID of the representation following it. Where needed by an application, each such format identifying element alternatively can be a text string giving the media type name plus potentially some parameters.

For example, a collection containing two representations, one with content format ID 42 and one with content format ID 0, looks like this in CBOR diagnostic notation:

```
[42, h'0123456789abcdef', 0, h'3031323334']
```

For illustration, the structure of an application/multipart-core representation can be described by the CDDL [[I-D.ietf-cbor-cddl](#)] specification in Figure 1:

```
multipart-core = [* multipart-part]
multipart-part = (type: uint .size 2 / text, part: bytes / null)
```

Figure 1: CDDL for application/multipart-core

3. IANA Considerations

3.1. Registration of media type application/multipart-core

IANA is requested to register the following media type [[RFC6838](#)]:

Type name: application

Subtype name: multipart-core

Required parameters: N/A

Optional parameters: N/A

Encoding considerations: binary

Security considerations: See the Security Considerations Section of RFCthis

Interoperability considerations: N/A

Published specification: RFCthis

Applications that use this media type: Applications that need to combine representations of potentially several media types into one, e.g., EST-CoAP [[I-D.ietf-ace-coap-est](#)]

Fragment identifier considerations: N/A

Additional information:

Deprecated alias names for this type: N/A

Magic number(s): N/A

File extension(s): N/A

Macintosh file type code(s): N/A

Person & email address to contact for further information:
iesg@ietf.org

Intended usage: COMMON

Restrictions on usage: N/A

Author: CoRE WG

Change controller: IESG

Provisional registration? (standards tree only): no

3.2. Registration of a Content-Format identifier for application/multipart-core

IANA is requested to register the following Content-Format to the "CoAP Content-Formats" subregistry, within the "Constrained RESTful Environments (CoRE) Parameters" registry, from the IETF Review space (specifically, 256..999):

Media Type	Encoding	ID	Reference
application/multipart-core	--	TBD1	RFcthis

4. Security Considerations

The security considerations of [[RFC7049](#)] apply. In particular, resource exhaustion attacks may employ large values for the byte

string size fields, or deeply nested structures of recursively embedded application/multipart-core representations.

5. References

5.1. Normative References

- [RFC7049] Bormann, C. and P. Hoffman, "Concise Binary Object Representation (CBOR)", [RFC 7049](#), DOI 10.17487/RFC7049, October 2013, <<https://www.rfc-editor.org/info/rfc7049>>.
- [RFC7252] Shelby, Z., Hartke, K., and C. Bormann, "The Constrained Application Protocol (CoAP)", [RFC 7252](#), DOI 10.17487/RFC7252, June 2014, <<https://www.rfc-editor.org/info/rfc7252>>.

5.2. Informative References

- [I-D.ietf-ace-coap-est]
Stok, P., Kampanakis, P., Kumar, S., Richardson, M., Furuhez, M., and S. Raza, "EST over secure CoAP (EST-coaps)", [draft-ietf-ace-coap-est-01](#) (work in progress), June 2018.
- [I-D.ietf-cbor-cddl]
Birkholz, H., Vigano, C., and C. Bormann, "Concise data definition language (CDDL): a notational convention to express CBOR data structures", [draft-ietf-cbor-cddl-02](#) (work in progress), February 2018.
- [RFC6838] Freed, N., Klensin, J., and T. Hansen, "Media Type Specifications and Registration Procedures", [BCP 13](#), [RFC 6838](#), DOI 10.17487/RFC6838, January 2013, <<https://www.rfc-editor.org/info/rfc6838>>.

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