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DICOM Committee
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Digital Imaging and Communications in Medicine (DICOM) -
Application/dicom MIME Sub-type Registration

Status of this Memo

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Abstract

This document describes the registration of the MIME sub-type application/dicom (Digital Imaging and Communications in Medicine). The baseline encoding is defined by the DICOM Standards Committee in "Digital Imaging and Communications in Medicine".

1. DICOM Definition

Digital Imaging and Communications in Medicine (DICOM) specifies protocols and formats for the exchange of images, time-based waveforms, reports, and associated information for medical applications.

Individual DICOM objects (such as images) may be encapsulated in files and exchanged by e-mail using the Media Type defined herein. In addition, a set of DICOM files may be described by an index file, DICOMDIR, which may accompany the files that it references.

2. IANA Registration

MIME media type name: Application

MIME subtype name: dicom

Required parameters:

"id" is constructed from a DICOM File ID (see DICOM PS3.11). The total length is limited to 71 characters. Each component is limited to 8 characters. The delimiter is a forward slash "/". There is never a leading delimiter (i.e., this is not a traditional path from a root directory).

If a DICOMDIR (which provides an index of files) is included, then it will refer to other DICOM files in the file set by use of this File ID. The File ID is not encoded within each DICOM file. If a DICOMDIR is not present, then the "id" parameter may be absent. Note that the DICOMDIR will also have a Media Type of application/dicom and is distinguished from other files by its ID of "DICOMDIR".

For example:

```
"ROOTDIR/SUBDIR1/MRSCAN/A789FD07/19991024/ST00234/S00003/I00023"
```

Each component shall be character strings made of characters from a subset of the G0 repertoire of ISO 8859. This subset consists of uppercase alphabetic characters, numeric characters and underscore. The following characters are permissible:

A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V,
W, X, Y, Z (uppercase)
1, 2, 3, 4, 5, 6, 7, 8, 9, 0 and _ (underscore)

Optional parameters:

none

Encoding considerations:

The DICOM information is binary, therefore the encoding used shall support lossless transfer of binary information. Typically, the Content-Transfer-Encoding would be set to "Base64".

Multiple DICOM parts should be included as a Multipart/related entity [2387]. Receiving agents shall also support multiple parts as a Multipart/mixed entity. When multiple DICOM parts are included, one of the parts may be a DICOMDIR, in which case, all the files referred to by the DICOMDIR shall also be present. The DICOMDIR is not required to be the first Application/dicom part encoded in the message, in which case the optional "start" parameter should refer to the content-id of the part containing the DICOMDIR.

Multiple DICOM Application/dicom parts may be included with other types of parts as a Multipart/mixed entity.

Security considerations:

Application/dicom parts contain medical information, including individual demographic information. Accordingly, their exchange should be restricted to a secure network or within a secure wrapper that protects a patient's right to confidentiality according to local and national policy. The specific security mechanisms are outside the scope of this proposal. Such mechanisms as Secured MIME (S/MIME) [2633] or similar might be appropriate.

Interoperability considerations:

Because DICOM information is specific to the medical (imaging) domain, generic e-mail applications may not be able to interpret the information.

The Media Type has been designed in order to allow for

- (i) DICOM aware applications to interoperate,
- (ii) generic applications to save the files in a form recognizable as DICOM files, that a DICOM application may subsequently use.

Published specification:

The Digital Imaging and Communications in Medicine (DICOM) Standard is a standard of the DICOM Standards Committee, published by the National Electrical Manufacturers Association (NEMA), 1300 N. 17th Street, Rosslyn, Virginia 22209 USA, (<http://medical.nema.org>).

Applications which use this media:

Biomedical imaging applications.

Additional information:

1. Magic number(s): "DICM" after 128 byte preamble indicates DICOM PS 3.10 file
2. File extension(s): ".dcm" is recommended for files saved to disk (other than DICOMDIR)

3. Macintosh file type code: Macintosh File Type "DICM" is
 recommended

4. Object Identifiers: none

Person to contact for further information:

1. Name: Howard Clark
2. E-mail: how_clark@nema.org

Intended usage:

Common

Interchange of biomedical images.

Author/Change controller:

DICOM Standards Committee

3. References

- [DICOM] DICOM Standards Committee, "Digital Imaging and
 Communications in Medicine", 2001.
- [2387] Levinson, E., "The MIME Multipart/Related Content-type", RFC
 2387, August 1998.
- [2633] Ramsdell, B., "S/MIME Version 3 Message Specification", RFC
 2633, June 1999.

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