Log Summary:  Fix DICOMweb DICOM Media Types

Rationale for Correction:
Supplement 183 seems to have broken retrieval of DICOM media types.
In the original DICOMweb text, DICOM retrieve endpoints (/study/{uid}, /series/{uid}, /instance/{uid}), the response:

- Is always some flavor of "multipart/related"
- Is either
  - multipart/related; type="application/dicom"
  - multipart/related; type="application/octet-stream"
  - multipart/related; type="image/{subtype}"
  - multipart/related; type="video/{subtype}"

(see http://dicom.nema.org/medical/dicom/2018e/output/chtml/part18/sec_6.5.html#sect_6.5.1.2)

According to the current Part 18, the response payload for these endpoints is unclear but implied to be one of:

- application/dicom
- multipart/related; type="application/octet-stream"

There is a section that describes DICOM multipart payloads (http://dicom.nema.org/medical/dicom/current/output/chtml/part18/sect_8.7.3.5.html#sect_8.7.3.5.1) but it is hard to work out how it relates to this endpoint and it still excludes the compressed pixel data payloads.

Correction Wording:

 Update PS 3.18 Section 8.6.1.2.1 Multipart Payload Syntax as follows

Figure 8.6.1 shows the correspondence between the IOD representation and a multipart payload.

( FIGURE 8.6.1 and its caption is moved to another section )

Update PS 3.18 Section 8.7.3.5 DICOM Media Type Syntax as follows

8.7.3.5 DICOM Media Type Syntax

The syntax of DICOM Media Types is:

\[ \text{dicom-media-type} = \left( \text{dcm-singlepart} \ / \ \text{dcm-multipart} \right) \ [\text{dcm-parameters}] \]
Where

dcm-singlepart = dcm-mp-name

dcm-multipart ;see Section 8.7.3.5.1

dcm-parameters = transfer-syntax-mp

                     / charset-mp
                     ;see Section 8.7.3.5.3

dcm-mp-name = dcom / dicom-metadata / dicom-xml / dicom-json

dicom = "application/dicom"
dicom-metadata = "application/dicom-xml" / "application/dicom-json"
dicom-xml = "application/dicom+xml" / "application/dicom+json"
dicom-json = "application/dicom+json"
octet-stream = "application/octet-stream"

dicom-image-pixel = "image/jpeg" / "image/dicom-rle" / "image/jls" / "image/jp2" / "image/jpx"
dicom-video-pixel = "video/mpeg2" / "video/mp4"

All DICOM Media Types may have a Transfer Syntax parameter, but its usage may be constrained by the service for which they are used.

Note

The application/dicom+xml and application/dicom+json Media Types may have a Transfer Syntax parameter in order to specify the encoding of base64 data.

All DICOM Media Types may have a character set parameter, but its usage may be constrained by the service for which they are used.

8.7.3.5.1 DICOM Multipart Media Types

The syntax of multipart media types is:

dcm-multipart = "multipart/related"

                     OWS ";" OWS "type" "=" dcm-mp-mp-name
                     OWS ";" OWS "boundary" "=" boundary
                     [dcm-parameters]
                     [related-parameters]

Where

dcm-mp-mp-name = dcom / dicom-xml / dicom-json / octet-stream / dicom-image-pixel / dicom-video-pixel

See Section 8.6.1.2.1 for the definition of boundary and related-parameters.

Each multipart media type shall include a "type" parameter that defines the media type of the parts and shall also include a "boundary" parameter that specifies the boundary string that is used to separate the parts.

Note: e.g.

Accept: multipart/related; type="application/octet-stream",
multipart/related; type="image/*"; boundary="", multipart/related;
type="video/*"; boundary=""
8.7.3.5.1.1 Mapping Between IOD Representation and Multipart Payload

The mapping between IOD representation of an instance and the http multipart payload depends on the structure of the source IOD and the encoding media type used to encode the http message.

Single-frame image SOP instance pixel data is always encoded in a single message part

Multi-frame image SOP instance pixel data can be encoded as:

- One uncompressed message part
- One compressed multi-frame image message part
- One video message part
- Multiple compressed single-frame image message parts: one for each frame

Figure 8.7-1 shows the correspondence between the IOD representation and a multipart payload.  [FIGURE 8.6.1 and its updated caption is moved here]

8.7.3.5.1.2 DICOM Multipart Metadata Media Types

The syntax of multipart media types is:

dcm-multipart = "multipart/related"
  OWS ";" OWS "type" "=" dcm-metadata
  OWS ";" OWS "boundary=" boundary
  [dcm-parameters]
  [related-parameters]

Where

dcm-metadata = dicom-xml / dicom-json

See Section 8.6.1.2.1 for the definition of boundary and related-parameters.

Each multipart media type shall include a "type" parameter that defines the media type of the parts and shall also include a "boundary" parameter that specifies the boundary string that is used to separate the parts.

8.7.3.5.1.3 DICOM Multipart Bulk Data Media Types

The syntax of multipart media types is:

dcm-multipart = "multipart/related"
  OWS ";" OWS "type" "=" dcm-bulkdata
  OWS ";" OWS "boundary=" boundary
  [dcm-parameters]
  [related-parameters]

Where

dcm-bulkdata = octet-stream

See Section 8.6.1.2.1 for the definition of boundary and related-parameters.

Each multipart media type shall include a "type" parameter that defines the media type of the parts and shall also include a "boundary" parameter that specifies the boundary string that is used to separate the parts.

8.7.3.5.1.4 DICOM Multipart Compressed Pixel Data Media Types
The syntax of multipart media types is:

\[
dcm-multipart = \text{"multipart/related"} \\
\text{OWS ";" OWS "type" "=" dcm-compressed-pixel} \\
\text{OWS ";" OWS "boundary" boundary} \\
\text{[dcm-parameters]} \\
\text{[related-parameters]}
\]

Where

\[
dcm-compressed-pixel = \text{dicom-image-pixel / dicom-video-pixel}
\]

See Section 8.6.1.2.1 for the definition of boundary and related-parameters.

Each multipart media type shall include a "type" parameter that defines the media type of the parts and shall also include a "boundary" parameter that specifies the boundary string that is used to separate the parts.

\[
\text{Table 8.9.3-2. Response Header Fields (Retrieve Capabilities Transaction)}
\]

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Origin Server Usage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content-Type</td>
<td>dcm-media-type</td>
<td>M</td>
<td>The media-type of the payload</td>
</tr>
<tr>
<td>Content-Length</td>
<td>uint</td>
<td>C</td>
<td>Shall be present if a content encoding has not been applied to the payload</td>
</tr>
<tr>
<td>Content-Encoding</td>
<td>encoding</td>
<td>C</td>
<td>Shall be present if a content encoding has been applied to the payload</td>
</tr>
</tbody>
</table>

\[
\text{Commented [JW1]: Media types for this payload are not dicom-media-types as defined elsewhere} \\
\text{Commented [JW2]: Should be unsigned long. Look for other instances of this.} \\
\]

\[
\text{Commented [JW3]: Maps to categories labelled but not described in previous table.} \\
\text{Commented [JW4]: No RS retrieve services can return a single Part 10 object. It is always multipart.} \\
\]

\[
\text{Table 10.4.4-1. Default, Required, and Optional Media Types (Retrieve Transaction)}
\]

<table>
<thead>
<tr>
<th>Media Type Category</th>
<th>Media Type</th>
<th>Usage</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>DICOM Media Types</td>
<td>multipart/related; type=&quot;application/dicom&quot;</td>
<td>Required</td>
<td>Section 8.7.3.1</td>
</tr>
<tr>
<td></td>
<td>application/dicom+json</td>
<td>Default</td>
<td>Section 8.7.3.2</td>
</tr>
<tr>
<td></td>
<td>multipart/related; type=&quot;application/dicom+xml&quot;</td>
<td>Required</td>
<td>Section 8.7.3.2</td>
</tr>
<tr>
<td></td>
<td>multipart/related; type=&quot;application/octet-stream&quot;</td>
<td>Required</td>
<td>Section 8.7.3.3.1</td>
</tr>
<tr>
<td></td>
<td>DICOM Multipart Compressed Pixel Data Media Types</td>
<td>Optional</td>
<td>Section 8.7.3.5.4</td>
</tr>
<tr>
<td>Rendered Media Types</td>
<td>Rendered Media Types</td>
<td>Optional</td>
<td>Section 8.7.4</td>
</tr>
<tr>
<td></td>
<td>Rendered Media Types</td>
<td>Optional</td>
<td>Section 8.7.4</td>
</tr>
</tbody>
</table>

\[
\text{Update PS 3.18 Table 10.5.4-1. Default, Required, and Optional Media Types (Store Transaction)}
\]

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### Table 10.5.4-1. Default, Required, and Optional Media Types

<table>
<thead>
<tr>
<th>Media Type</th>
<th>Usage</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>multipart/related; type=&quot;application/dicom&quot;</td>
<td>Required</td>
<td>Section 8.7.3.1</td>
</tr>
<tr>
<td>multipart/related; type=&quot;application/dicom+json&quot;</td>
<td>Default</td>
<td>Section 8.7.3.2</td>
</tr>
<tr>
<td>multipart/related; type=&quot;application/dicom+xml&quot;</td>
<td>Required</td>
<td>Section 8.7.3.2</td>
</tr>
<tr>
<td>multipart/related; type=&quot;application/octet-stream&quot;</td>
<td>Required</td>
<td>Section 8.7.3.3</td>
</tr>
<tr>
<td><strong>DICOM Multipart Compressed Pixel Data Media Types</strong></td>
<td>Optional</td>
<td>Section 8.7.3.5.4</td>
</tr>
</tbody>
</table>