

DICOM Correction Proposal

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Correction Number	CP1582
Log Summary:	Add STOW-RS support for consumer media types
Name of Standard	PS3.3, PS3.18 2016c
Rationale for Correction:	<p>Currently mobile or browser applications want to use STOW-RS to upload DICOM instances, but these user agents may not know how to extract the Pixel Data Macro values from an image in a consumer oriented media type such as JPEG or PNG. This functionality is needed for the IHE WIC Profile.</p> <p>In addition, in WADO-RS and STOW-RS when an Encapsulated Document (0042,0011) attribute is contain in bulk data they are currently specified to have a Content-Type value of 'application/octet-stream'. It would be better to have a more specific media type for encapsulated documents such as 'application/pdf' or 'text/xml'. This would be true whether the Content-Type header field is in the message header or a part header in a multipart payload.</p> <p>Goals:</p> <ul style="list-style-type: none"> • Allow mobile and browser applications to upload images and video in non-DICOM media types. • Allow the Content-Type header field of HTTP messages or their parts contain a media type value that is the same as that in the MIME Type of Encapsulated Document (0042,0012) attribute. <p>Issue:</p> <p>Should we provide a mechanism that allows any values in the List of MIME Types (0042,0014) attribute to be included in the Content-Type header field, perhaps using a media type parameter?</p> <p>Correction Wording:</p>

- 5 *Update PS3.3, Annex C.7.6.3 as follows, to refactor the Image Pixel Macro to separate the Pixel Data Attribute from the descriptive attributes and move them to an Image Pixel Description Macro, in order to allow the descriptive attributes to be used as a group without the encoded data, and without disrupting other invocations of the Image Pixel Macro than that from the Image Pixel Module:*

C.7.6.3 Image Pixel Module

- 10 Table C.7-11a describes the Image Pixel Module.

Table C.7-11a. Image Pixel Module Attributes

Attribute Name	Tag	Type	Attribute Description
<i>Include Table C.7-11c "Image Pixel Description Macro Attributes"</i>			<p>Required if the IOD is not being transferred in a STOW-RS Request and is not encoded as metadata and compressed bulk pixel data. May be present otherwise.</p> <p>See PS3.18, Section 6.6.</p> <p>Note. When the IOD is encoded as metadata in a STOW-RS Request and the bulk pixel data is compressed, the STOW-RS origin server is required to be able to derive appropriate values for the Image Pixel Macro attributes from the compressed bit stream.</p>
Pixel Data	(7FE0,0010)	1C	<p>A data stream of the pixel samples that comprise the Image. See Section C.7.6.3.1.4 for further explanation.</p> <p>Required if Pixel Data Provider URL (0028,7FE0) is not present.</p>
Pixel Data Provider URL	(0028,7FE0)	1C	<p>A URL of a provider service that supplies the pixel data of the Image.</p> <p>Required if the image is to be transferred in one of the following presentation contexts identified by Transfer Syntax UID:</p> <ul style="list-style-type: none"> • 1.2.840.10008.1.2.4.94 (DICOM JPIP Referenced Transfer Syntax) • 1.2.840.10008.1.2.4.95 (DICOM JPIP Referenced Deflate Transfer Syntax) <p>Note</p> <p>The VR of this attribute has changed from UT to UR.</p>
Pixel Padding Range Limit	(0028,0121)	1C	<p>Pixel value that represents one limit (inclusive) of a range of padding values used together with Pixel Padding Value (0028,0120) as defined in the General Equipment Module. See Section C.7.5.1.1.2 for further explanation.</p> <p>Required if pixel padding is to be defined as a range rather than a single value.</p> <p>Note</p> <ul style="list-style-type: none"> • The Value Representation of this Attribute is determined by the value of Pixel Representation (0028,0103). • Pixel Padding Value (0028,0120) is also required when this Attribute is present.

Table C.7-11b specifies the common attributes that describe **and encode** the pixel data of the image.

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Table C.7-11b. Image Pixel Macro Attributes

Attribute Name	Tag	Type	Attribute Description
<i><u>Include Table C.7-11c "Image Pixel Description Macro Attributes"</u></i>			
Samples per Pixel	{0028,0002}	4	Number of samples (planes) in this image. See Section C.7.6.3.1.1 for further explanation.
Photometric Interpretation	{0028,0004}	4	Specifies the intended interpretation of the pixel data. See Section C.7.6.3.1.2 for further explanation.
Rows	{0028,0010}	4	Number of rows in the image.
Columns	{0028,0011}	4	Number of columns in the image.
Bits Allocated	{0028,0100}	4	Number of bits allocated for each pixel sample. Each sample shall have the same number of bits allocated. Bits Allocated (0028,0100) shall be either 1, or a multiple of 8. See PS3.5 for further explanation.
Bits Stored	{0028,0101}	4	Number of bits stored for each pixel sample. Each sample shall have the same number of bits stored. See PS3.5 for further explanation.
High Bit	{0028,0102}	4	Most significant bit for pixel sample data. Each sample shall have the same high bit. High Bit (0028,0102) shall be one less than Bits Stored (0028,0101). See PS3.5 for further explanation.
Pixel Representation	{0028,0103}	4	Data representation of the pixel samples. Each sample shall have the same pixel representation. Enumerated Values: 0000H — unsigned integer. 0001H — 2's complement
Pixel Data	{7FE0,0010}	1G	A data stream of the pixel samples that comprise the Image. See Section C.7.6.3.1.4 for further explanation. Required if Pixel Data Provider URL (0028,7FE0) is not present.
Planar Configuration	{0028,0006}	4G	Indicates whether the pixel data are sent color by plane or color by pixel. Required if Samples per Pixel (0028,0002) has a value greater than 1. See

Attribute Name	Tag	Type	Attribute Description
			Section C.7.6.3.1.3 for further explanation.
Pixel Aspect Ratio	(0028,0034)	4C	Ratio of the vertical size and horizontal size of the pixels in the image specified by a pair of integer values where the first value is the vertical pixel size, and the second value is the horizontal pixel size. Required if the aspect ratio values do not have a ratio of 1:1 and the physical pixel spacing is not specified by Pixel Spacing (0028,0030), or Imager Pixel Spacing (0018,1164) or Nominal Scanned Pixel Spacing (0018,2010), either for the entire image or per frame in a Functional Group Macro. See Section C.7.6.3.1.7.
Smallest Image Pixel Value	(0028,0106)	3	The minimum actual pixel value encountered in this image.
Largest Image Pixel Value	(0028,0107)	3	The maximum actual pixel value encountered in this image.
Red Palette Color Lookup Table Descriptor	(0028,1101)	4C	Specifies the format of the Red Palette Color Lookup Table Data (0028,1201). Required if Photometric Interpretation (0028,0004) has a value of PALETTE COLOR or Pixel Presentation (0008,9205) at the image level equals COLOR or MIXED. See Section C.7.6.3.1.5 for further explanation.
Green Palette Color Lookup Table Descriptor	(0028,1102)	4C	Specifies the format of the Green Palette Color Lookup Table Data (0028,1202). Required if Photometric Interpretation (0028,0004) has a value of PALETTE COLOR or Pixel Presentation (0008,9205) at the image level equals COLOR or MIXED. See Section C.7.6.3.1.5 for further explanation.
Blue Palette Color Lookup Table Descriptor	(0028,1103)	4C	Specifies the format of the Blue Palette Color Lookup Table Data (0028,1203). Required if Photometric Interpretation (0028,0004) has a value of PALETTE COLOR or Pixel Presentation (0008,9205) at the image level equals COLOR or MIXED. See Section C.7.6.3.1.5 for further explanation.
Red Palette Color Lookup Table Data	(0028,1201)	4C	Red Palette Color Lookup Table Data. Required if Photometric Interpretation (0028,0004) has a value of PALETTE COLOR or Pixel Presentation (0008,9205) at the image level equals COLOR or MIXED. See Section C.7.6.3.1.6 for further explanation.
Green Palette Color Lookup Table Data	(0028,1202)	4C	Green Palette Color Lookup Table Data. Required if Photometric Interpretation (0028,0004) has a value of PALETTE COLOR or Pixel Presentation (0008,9205) at the image level equals COLOR or MIXED. See Section C.7.6.3.1.6 for further explanation.

Attribute Name	Tag	Type	Attribute Description
Blue Palette Color Lookup Table Data	{0028,1203}	4C	Blue Palette Color Lookup Table Data. Required if Photometric Interpretation (0028,0004) has a value of PALETTE COLOR or Pixel Presentation (0008,9205) at the image level equals COLOR or MIXED. See Section C.7.6.3.1.6 for further explanation.
ICC Profile	{0028,2000}	3	An ICC Profile encoding the transformation of device-dependent color stored pixel values into PCS Values. See Section C.11.15.1.1. When present, defines the color space of color Pixel Data (7FE0,0010) values, and the output of Palette Color Lookup Table Data (0028,1201-1203). Note The profile applies only to Pixel Data (7FE0,0010) at the same level of the Data Set and not to any icons nested within sequences, which may or may not have their own ICC profile specified.
Color Space	{0028,2002}	3	A label that identifies the well-known color space of the image. Shall be consistent with any ICC Profile (0028,2000) that is also present. See Section C.11.15.1.2.

Table C.7-11c specifies the common attributes that describe the pixel data of the image.

Table C.7-11c. Image Pixel Description Macro Attributes

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Attribute Name	Tag	Type	Attribute Description
<u>Samples per Pixel</u>	{0028,0002}	<u>1</u>	Number of samples (planes) in this image. See Section C.7.6.3.1.1 for further explanation.
<u>Photometric Interpretation</u>	{0028,0004}	<u>1</u>	Specifies the intended interpretation of the pixel data. See Section C.7.6.3.1.2 for further explanation.
<u>Rows</u>	{0028,0010}	<u>1</u>	Number of rows in the image.
<u>Columns</u>	{0028,0011}	<u>1</u>	Number of columns in the image
<u>Bits Allocated</u>	{0028,0100}	<u>1</u>	Number of bits allocated for each pixel sample. Each sample shall have the same number of bits allocated. Bits Allocated (0028,0100) shall be either 1, or a multiple of 8.

<u>Attribute Name</u>	<u>Tag</u>	<u>Type</u>	<u>Attribute Description</u>
			<u>See PS3.5 for further explanation.</u>
<u>Bits Stored</u>	<u>(0028,0101)</u>	<u>1</u>	<u>Number of bits stored for each pixel sample. Each sample shall have the same number of bits stored. See PS3.5 for further explanation.</u>
<u>High Bit</u>	<u>(0028,0102)</u>	<u>1</u>	<u>Most significant bit for pixel sample data. Each sample shall have the same high bit. High Bit (0028,0102) shall be one less than Bits Stored (0028,0101). See PS3.5 for further explanation.</u>
<u>Pixel Representation</u>	<u>(0028,0103)</u>	<u>1</u>	<u>Data representation of the pixel samples. Each sample shall have the same pixel representation.</u> <u>Enumerated Values:</u> <u>0000H unsigned integer.</u> <u>0001H 2's complement</u>
<u>Planar Configuration</u>	<u>(0028,0006)</u>	<u>1C</u>	<u>Indicates whether the pixel data are sent color-by-plane or color-by-pixel. Required if Samples per Pixel (0028,0002) has a value greater than 1. See Section C.7.6.3.1.3 for further explanation.</u>
<u>Pixel Aspect Ratio</u>	<u>(0028,0034)</u>	<u>1C</u>	<u>Ratio of the vertical size and horizontal size of the pixels in the image specified by a pair of integer values where the first value is the vertical pixel size, and the second value is the horizontal pixel size. Required if the aspect ratio values do not have a ratio of 1:1 and the physical pixel spacing is not specified by Pixel Spacing (0028,0030), or Imager Pixel Spacing (0018,1164) or Nominal Scanned Pixel Spacing (0018,2010), either for the entire Image or per-frame in a Functional Group Macro. See Section C.7.6.3.1.7.</u>
<u>Smallest Image Pixel Value</u>	<u>(0028,0106)</u>	<u>3</u>	<u>The minimum actual pixel value encountered in this image.</u>
<u>Largest Image Pixel Value</u>	<u>(0028,0107)</u>	<u>3</u>	<u>The maximum actual pixel value encountered in this image.</u>
<u>Red Palette Color Lookup Table Descriptor</u>	<u>(0028,1101)</u>	<u>1C</u>	<u>Specifies the format of the Red Palette Color Lookup Table Data (0028,1201). Required if Photometric Interpretation (0028,0004) has a value of PALETTE COLOR or Pixel Presentation (0008,9205) at the image level equals COLOR or MIXED. See Section C.7.6.3.1.5 for further explanation.</u>
<u>Green Palette Color Lookup Table Descriptor</u>	<u>(0028,1102)</u>	<u>1C</u>	<u>Specifies the format of the Green Palette Color Lookup Table Data (0028,1202). Required if Photometric Interpretation (0028,0004) has a value of PALETTE</u>

Attribute Name	Tag	Type	Attribute Description
			COLOR or Pixel Presentation (0008,9205) at the image level equals COLOR or MIXED. See Section C.7.6.3.1.5 for further explanation.
<u>Blue Palette Color Lookup Table Descriptor</u>	(0028,1103)	1C	Specifies the format of the Blue Palette Color Lookup Table Data (0028,1203). Required if Photometric Interpretation (0028,0004) has a value of PALETTE COLOR or Pixel Presentation (0008,9205) at the image level equals COLOR or MIXED. See Section C.7.6.3.1.5 for further explanation.
<u>Red Palette Color Lookup Table Data</u>	(0028,1201)	1C	Red Palette Color Lookup Table Data. Required if Photometric Interpretation (0028,0004) has a value of PALETTE COLOR or Pixel Presentation (0008,9205) at the image level equals COLOR or MIXED. See Section C.7.6.3.1.6 for further explanation.
<u>Green Palette Color Lookup Table Data</u>	(0028,1202)	1C	Green Palette Color Lookup Table Data. Required if Photometric Interpretation (0028,0004) has a value of PALETTE COLOR or Pixel Presentation (0008,9205) at the image level equals COLOR or MIXED. See Section C.7.6.3.1.6 for further explanation.
<u>Blue Palette Color Lookup Table Data</u>	(0028,1203)	1C	Blue Palette Color Lookup Table Data. Required if Photometric Interpretation (0028,0004) has a value of PALETTE COLOR or Pixel Presentation (0008,9205) at the image level equals COLOR or MIXED. See Section C.7.6.3.1.6 for further explanation.
<u>ICC Profile</u>	(0028,2000)	3	<p>An ICC Profile encoding the transformation of device-dependent color stored pixel values into PCS-Values.</p> <p>See Section C.11.15.1.1.</p> <p>When present, defines the color space of color Pixel Data (7FE0,0010) values, and the output of Palette Color Lookup Table Data (0028,1201-1203).</p> <p>Note</p> <p>The profile applies only to Pixel Data (7FE0,0010) at the same level of the Data Set and not to any icons nested within sequences, which may or may not have their own ICC profile specified.</p>
<u>Color Space</u>	(0028,2002)	3	<p>A label that identifies the well-known color space of the image. Shall be consistent with any ICC Profile (0028,2000) that is also present.</p> <p>See Section C.11.15.1.2.</p>

Update PS3.18, Section 6.5 as follows:
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6.5.1 WADO-RS - RetrieveStudy

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6.5.1.2.2 Bulk Data Response

- ...

- Each item in the response is one of:

- an uncompressed bulk data element encoded in Little Endian binary format with the following headers:

30 • Content-Type: application/octet-stream

- Content-Location: {BulkDataURL}

- **an Encapsulated Document (0042,0011) bulk data element from a SOP Instance in the Study encoded in the media type specified in MIME Type of Encapsulated Document (0042,0012) in the Instance with the following header fields:**

35 • **Content-Type: {media-type}**

- **Content-Location: {BulkDataURL}**

- a compressed bulk data element from a SOP Instance in the Study encoded in a single-frame compression {MediaType} with the following headers:

- ...

40 ...

6.5.2 WADO-RS - RetrieveSeries

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6.5.2.2.2 Bulk Data Response

- Content-Type:

45 • multipart/related; type= application/octet-stream; boundary={MessageBoundary}

- multipart/related; type={MediaType}; boundary={MessageBoundary}

- The entire multipart response contains all bulk data for the specified Series that can be converted to one of the requested media types.

- Each item in the response is one of:

50 • an uncompressed bulk data element encoded in Little Endian binary format with the following headers:

- Content-Type: application/octet-stream

- Content-Location: {BulkDataURL}

- **an Encapsulated Document (0042,0011) bulk data element from a SOP Instance in the Series encoded in the media type specified in MIME Type of Encapsulated Document (0042,0012) in the Instance with the following header fields:**

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- **Content-Type: {media-type}**

- **Content-Location: {BulkDataURL}**

...

6.5.3 WADO-RS - RetrievalInstance

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6.5.3.2.2 Bulk Data Response

- Content-Type:
 - multipart/related; type=application/octet-stream; boundary={MessageBoundary}
 - multipart/related; type={MediaType}; boundary={MessageBoundary}
- 65 • The entire multipart response contains all bulk data for the specified Instance that can be converted to one of the requested media types.
- Each item in the response is one of:
 - an uncompressed bulk data element encoded in Little Endian binary format with the following headers:
 - Content-Type: application/octet-stream
 - 70 • Content-Location: {BulkDataURL}
 - **an Encapsulated Document (0042,0011) bulk data element encoded in the media type specified in MIME Type of Encapsulated Document (0042,0012) in the Instance with the following header fields:**
 - **Content-Type: {media-type}**
 - **Content-Location: {BulkDataURL}**
 - 75 • a compressed bulk data element ...

...

6.5.5 WADO-RS - RetrieveBulkdata

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6.5.5.2.1 Bulk Data Response

- 80 • Content-Type:
 - multipart/related; type=application/octet-stream; boundary={MessageBoundary}
- The single item in the response is one of:
 - an uncompressed bulk data element encoded in Little Endian binary format with the following headers:
 - Content-Type: application/octet-stream [dcm-parameters]
 - 85 • Content-Location: {BulkDataURL}
 - **an Encapsulated Document (0042,0011) bulk data element from a SOP Instance encoded in the media type specified in MIME Type of Encapsulated Document (0042,0012) in the Instance with the following header fields:**
 - **Content-Type: {media-type}**
 - 90 • **Content-Location: {BulkDataURL}**
 - a compressed bulk data element from a SOP Instance encoded in a single-frame ...

...

Update PS3.18, Section 6.6 as follows:

95 6.6 STOW-RS Request/Response

The STOW-RS Service defines one action type. An implementation shall support the following action type:

1. Store Instances

This action creates new resources for the given SOP Instances on the Server or appends to existing resources on the Server.

100 All request messages are HTTP/1.1 multipart messages. The organization of SOP Instances into message parts depends on whether the SOP Instances are structured as [PS3.10](#) binary instances, or metadata and bulk data.

[PS3.10](#) binary instances shall be encoded with one message part per DICOM Instance.

105 **When the request message contains compressed bulk data with a Content Type that is one of the media types specified in Table 6.6-1, the request may omit the Image Pixel Description Macro attributes and the origin server will derive them from the compressed bit stream. Some media types do not directly correspond to a DICOM Transfer Syntax and the origin server will transform the received bit stream into an uncompressed or lossless (reversibly) compressed Transfer Syntax.**

Note.

- 110 1. **This allows a user agent to use consumer media types to encode the pixel data even though it may not have:**
- **the pixel data in a form that directly corresponds to a lossless (reversible) DICOM Transfer Syntax, or**
 - **an API to access the information required to populate the Image Pixel Description Macro.**
- 115 2. **If the supplied compressed bit stream is in a lossless (reversible) format, the intent is to allow full fidelity retrieval of the decompressed pixels, not the format in which it happened to be submitted.**
3. **If the supplied compressed bit stream is in a lossy (irreversible) format, there will be a corresponding DICOM Transfer Syntax, and the origin server is not expected to recompress it causing further loss.**

120 Metadata and bulk data requests will be encoded in the following manner (see [Figure 6.5-1 Mapping between IOD and HTTP message parts](#)):

- All XML request messages shall be encoded as described in the Native DICOM Model defined in [PS3.19](#) with one message part per XML object; **the attributes of the Image Pixel Description Macro may be omitted for the media types specified in Table 6.6-1.**
- 125 • All JSON requests shall be encoded as an array of DICOM JSON Model Objects defined in [Annex F](#); **the attributes of the Image Pixel Description Macro may be omitted for the media types specified in Table 6.6-1.**
- **Uncompressed bulk data (with the exception of encapsulated document element) and uncompressed** pixel data shall be encoded in a Little Endian format using the application/octet-stream media type with one message part per bulk data item.
- Compressed pixel data shall be encoded in one of two ways:
 - 130 • Single-frame pixel data encoded using a single-frame media type (one message part)
 - Multi-frame or video pixel data encoded using a multi-frame media type (multiple frames in one message part)

Compressed pixel data shall be encoded using the media types and transfer syntaxes specified in Table 6.1.1.8-3b.
- 135 • **An Encapsulated Document (0042,0011) bulk data element shall be encoded using the media-type from the MIME Type of Encapsulated Document (0042,0012) attribute with one message part per bulk data item.**

Compressed pixel data shall be encoded using the media types and transfer syntaxes specified in Table 6.1.1.8-3b. Media types corresponding to several DICOM Transfer Syntax UIDs may require a transfer-syntax parameter to convey the Transfer Syntax the compressed pixel data is encoded in.

The request header field Content-Type is used to indicate the media type of the payload.

140 The Service shall support uncompressed bulk data (multipart/related; type="application/octet-stream").

Table 6.6-1 contains a list of media types containing compressed pixel data from which an origin server shall be able to derive the Image Pixel Data Description Macro Attribute values.

Requirements are specified in Table 6.6-1 as follows:

- 145 • **Transform - No DICOM Transfer Syntax exists; shall be transformed by the origin server into an uncompressed or lossless compressed Transfer Syntax (the choice of which is at the discretion of the origin server).**
- **Unchanged - Shall be encapsulated in the corresponding DICOM Transfer Syntax without further lossy compression**

150 **Table 6.6-1: Media Type Transformation to Transfer Syntaxes**

<u>Media Type</u>	<u>Requirement</u>
<u>image/gif</u>	<u>Transform</u>
<u>Image/jp2</u>	<u>Unchanged</u>
<u>image/jpeg</u>	<u>Unchanged</u>
<u>image/jpx</u>	<u>Unchanged</u>
<u>image/png</u>	<u>Transform</u>
<u>video/mp4</u>	<u>Unchanged</u>
<u>video/mpeg2</u>	<u>Unchanged</u>

Note:

- 155 **1. In the case of pixel data supplied as image/gif or image/png, the origin server may transform the color representation from indexed color to true color (RGB) as necessary to conform to any Photometric Interpretation constraints specified by the IOD (i.e., if PALETTE COLOR is not permitted); such a transformation is considered lossless.**
- 2. If the number of bits per channel of an image/png file is not supported by the IOD, a lossless transformation cannot be performed.**
- 3. An animated image/gif will be converted into a multi-frame image; image/png does not support animation, and MNG is not included in Table 6.6-1.**
- 160 **4. Any transparency information present in an image/gif or image/png file will be discarded, since DICOM does not support the concept of transparency.**
- 5. If an alpha channel is supplied in an image/png file, and the IOD does not support the RGBA Photometric Interpretation, the alpha channel will be discarded (i.e., considered to consist of all opaque values, consistent with the policy of discarding any transparency information).**

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6.6.1 STOW-RS - Store Instances

This action stores one or more DICOM instances associated with one or more study instance unique identifiers (SUID). The request message can be DICOM or metadata and bulk data depending on the "Content-Type", and is encapsulated in a multipart request body.

170 6.6.1.1 Request

The specific Service resource to be used for the Store Instances action shall be as follows:

- Resource
 - {SERVICE}/studies/{StudyInstanceUID}, where

- 175
- {SERVICE} is the base URL for the service. This may be a combination of scheme (either HTTP or HTTPS), host, port, and application.
 - {StudyInstanceUID} (optional) is the study instance UID for a single study. If not specified, instances can be from multiple studies. If specified, all instances shall be from that study; instances not matching the StudyInstanceUID shall be rejected.

Note

180 **It is not necessary that the study referenced by the Study Instance UID in the resource (and in the provided instances) exists on the server, however it is necessary that it be a valid UID. The client may have obtained an appropriate UID from elsewhere or generated it as described in Chapter 9 “Unique Identifiers (UIDs)” in PS3.5 and Annex B “Creating a Privately Defined Unique Identifier (Informative)” in PS3.5.**

- 185
- Method

- POST

- Headers

- Content-Type - The representation scheme being posted to the RESTful service. The types allowed for this request header are as follows:

- 190
- multipart/related; type=application/dicom; boundary={messageBoundary}

Specifies that the post is PS3.10 binary instances. All STOW-RS providers must accept this Content-Type.

- multipart/related; type=application/dicom+xml; boundary={messageBoundary}

Specifies that the post is PS3.19 XML metadata and bulk data. All STOW-RS providers shall accept this Content-Type.

- 195
- multipart/related; type=application/dicom+json; boundary={messageBoundary}

Specifies that the post is DICOM JSON metadata and bulk data. All STOW-RS providers shall accept this Content-Type.

Note

200 ~~**It is not necessary that the study referenced by the StudyInstanceUID in the resource (and in the provided instances) exists on the server, however it is necessary that it be a valid UID. The client may have obtained an appropriate UID from elsewhere or generated it as described in Chapter 9 “Unique Identifiers (UIDs)” in PS3.5 and Annex B “Creating a Privately Defined Unique Identifier (Informative)” in PS3.5.**~~

6.6.1.1.1 DICOM Request Message Body

205 The DICOM Request Message has a multipart body.

- Content-Type:

- multipart/related; type=application/dicom; boundary={MessageBoundary}

- The multipart request body contains every instance to be stored. Each instance is in a separate part of the multipart body.

- 210
- Each part in the multipart body represents a DICOM SOP Instance with the following HTTP headers:

- Content-Type: application/dicom

6.6.1.1.2 XML Metadata and Bulk Data Request Message Body

The XML Metadata and Bulk Data Request Message has a multipart body.

- Content-Type:

- 215
- multipart/related; type=application/dicom+xml; boundary={MessageBoundary}
 - The multipart request body contains all the metadata and bulk data to be stored. If the number of bulk data parts does not correspond to the number of unique BulkDataURIs in the metadata then the entire message is invalid and will generate an error status line.
 - Each body part is either DICOM PS3.19 XML metadata or a bulk data item from a SOP Instance sent as part of the Store operation. The first part of the multipart message must be XML metadata.
 - Each bulk data item must be preceded by all metadata items that contain a reference to it.

Note

225 This requires that all bulk data items for an instance must be preceded by the XML metadata for that instance and if a bulk data item is included in multiple instances it must be preceded by the XML metadata for each instance in which it is included.

- The first part in the multipart request will contain the following HTTP headers:
 - Content-Type: application/dicom+xml; transfer-syntax={TransferSyntaxUID}
- Subsequent items will contain the following HTTP headers (order is not guaranteed):
 - additional metadata with the following headers:
 - Content-Type: application/dicom+xml; transfer-syntax={TransferSyntaxUID}

230 Where {TransferSyntaxUID} is the UID of the DICOM Transfer Syntax used to encode the inline binary data in the XML metadata.

- **an encapsulated document with the following headers**

- **Content-Type: {media-type}**
 - **Where the media-type is the value of MIME Type of Encapsulated Document (0042,0012) in the Instance.**
- **Content-Location: {BulkDataURI}**
- an uncompressed bulk data element encoded in Little Endian binary format with the following headers:
 - Content-Type: application/octet-stream
 - Content-Location: {BulkDataURI}
- a compressed pixel data object from a SOP Instance in the Study with the following headers:
 - Content-Type: {MediaType}
 - Content-Location: {BulkDataURI}
- Metadata and its associated bulk data shall always be sent in the same POST request.

245 Note

It is not intended that metadata and bulk data be stored separately in multiple POST requests since the service always requires the metadata for context.

6.6.1.1.3 JSON Metadata and Bulk Data Request Message Body

The JSON Metadata and Bulk Data Request Message has a multipart body.

- 250
- Content-Type:
 - multipart/related; type=application/dicom+json; boundary={MessageBoundary}

- The multipart request body contains all the metadata and bulk data to be stored. If the number of bulk data parts does not correspond to the number of unique BulkDataURIs in the metadata then the entire message is invalid and will generate an error status line.
- 255 • The first part in the multipart request will contain a JSON array of DICOM JSON Model Objects (defined in Annex F). Each array element is the metadata from a SOP Instance sent as part of the Store operation. This message part will have the following headers:
 - Content-Type: application/dicom+json; transfer-syntax={TransferSyntaxUID}

Where {TransferSyntaxUID} is the UID of the DICOM Transfer Syntax used to encode the inline binary data in the JSON metadata.

- 260
- Subsequent items will be one of the following:
 - **an encapsulated document with the following headers**
 - **Content-Type: {media-type}**

Where the media-type is the value of MIME Type of Encapsulated Document (0042,0012) in the Instance.

 - 265
 - **Content-Location: {BulkDataURI}**
 - an uncompressed bulk data element encoded in Little Endian binary format with the following headers:
 - Content-Type: application/octet-stream
 - Content-Location: {BulkDataURI}
 - 270 • a compressed pixel data object from a SOP Instance in the Study with the following headers:
 - Content-Type: {MediaType}
 - Content-Location: {BulkDataURI}
- JSON Metadata and its associated bulk data shall always be sent in the same POST request.

Note

- 275 It is not intended that metadata and bulk data be stored separately in multiple POST requests since the service always requires the metadata for context.

6.6.1.2 Action

- 280 The **Service origin server** may coerce or replace values of attributes such as Patient Name, ID, Accession Number, for example, during import of media from an external institution, reconciliation against a master patient index, or reconciliation against an imaging procedure order. The Service may correct, or replace incorrect values, such as Patient Name or ID, for example, when incorrect worklist item was chosen or operator input error occurs.

If any element is coerced or corrected, the Original Attribute Sequence (0400,0561) shall be included in the DICOM Object that is stored and may be included in the PS3.18 XML Store Instances Response Module in the response.

285 Note

For more information on populating the Original Attribute Sequence, see Section C.12.1 “SOP Common Module” in PS3.3.

The origin server shall encapsulate or convert any compressed pixel data received as bulk data into an appropriate DICOM Transfer Syntax, as defined in Table 6.6-1.

- 290 **The origin server shall populate the attributes of the Image Pixel Description Macro, if absent from the Metadata, by deriving them from the compressed pixel data received as bulk data.**

The stored Instance(s) shall fully conform to the IOD and encoding requirements of PS3.3 and PS3.5, respectively.

295 The origin server shall return a status of 415 (Unsupported Media Type) if it cannot convert the bulk data or populate the Image Pixel Description Macro Attribute values.