2016/02/18

The following changes have been made relative to the previously published PS3 2015c release of the standard, by incorporating the changes specified in the supplements and correction items.

The Final Text of all applied Supplements and Correction Proposals is available at ftp://medical.nema.org/medical/dicom/final/

Production Notes

The DocBook XML files are the source format, and all other formats are rendered from it.

The PDF format is rendered from the DocBook XML, and remains the "official" (authoritative) form of the standard. The PDF contains hyperlinks to sections, figures and tables both within and between parts (which in the latter case work if you are reading the PDF in a tool that supports linking to other parts.

The two HTML formats are provided for the convenience of those who find them easier to navigate within a browser, and though the appearance and organization is different, the content is the same. One form consists of entire parts in one very large HTML page, and the other consist of chunks of sections with navigation elements. Both forms are hyper-linked within and between parts. The figures in the HTML are SVG, so a browser that supports SVG is required (most contemporary browsers do).

All paragraphs (<p/> elements) in the HTML files of this release, are uniquely identified with a hypertext anchor (<a/> element), each of which has an id attribute (derived from the source DocBook <para/> element xml:id attribute). These unique identifiers will remain stable in subsequent releases, so they may be reliably used as the persistent targets of hyperlinks relative to the current release base URL, and are more specific than the existing anchors for entire sections or tables. Unlike the section and table anchors, there is no semantic significance to the syntax of the identifiers (i.e., they are UUIDs, rather than being derived from the section or table numbering pattern). Subsequent releases will add new identifiers for new paragraphs and text split out of existing paragraphs into new paragraphs, and will, if possible, empty, rather than entirely remove, existing paragraphs that are retired (in order to avoid dead links).

The DOCX (for Word) and ODT (for OpenOffice or LibreOffice) formats are provided for the convenience of future Supplement and CP editors. Their main claim to fame is that they exist at all, and though they are viewable and editable, they are lacking many features of the Word source of previous release, for example the use of styles for section headings. They do contain embedded hyperlinks, and these are also present in the table of contents, even though the page numbers rendered in the table of contents may be meaningless. To reiterate, the intent of these files is to provide a source to cut and past into new Word documents, and not to be functional documents in their own right. Since Word does not support SVG, all figures embedded in the DOCX files have been rasterized to a fixed resolution and are adequate for position only and are not editable and are not intended to be a substitute for the SVG figures.

The rendering pipeline used to produce these files is available but requires some expertise to use it. It is not supported. To achieve quality rendering, the use of some commercial tools was necessary, to supplement the many open source tools that were also used. Oxygen (commercial) was used as the XML editor since it supports a WYSIWG authoring mode. OpenOffice (open source) was used as the equation editor. The DocBook (open source, version docbook-xsl-ns-1.78.1) style sheets were used to create the HTML and intermediate FO form used to created the PDF and DOCX. MathML equations were converted to SVG using pMML2SVG (open source, version pMML2SVG-0.8.5). RenderX XEP (commercial) was used to produce the PDF, and XMLmind FO-Converter (commercial) was used to produce the DOCX. The difference files were produced using DeltaXML DocBook Compare (commercial).

Some characteristics of the DocBook XML may be of interest to those performing automated processing or extraction:

- Zero width spaces (U+200B) are used in some places to allow long words (such as PS3.6 keywords and UIDs) to break within table columns and avoid tables becoming too wide to fit on a page. These need to be filtered out before using these words literally.
- Enumerated values and defined terms are formalized in PS3.3 as DocBook variablelist elements with a title identifying them as such, to facilitate their automated detection and extraction.
- Template and context group tables in PS 3.16 are preceded by variablelist elements defining whether or not they are extensible, etc., again to enable automated extraction.
- Hyperlinks (xref and link elements) are used extensively but may obscure the identifier of what is being linked to from the perspective of automated extraction. It may be useful to consult the olink targetdb files that are included in the package to "look up" the target of such links, rather than reinventing this mechanism, which is used by the DocBook stylesheets for cross-document linking. E.g., one can look up "sect_TID_300" in "output/html/targetdb/PS3_16_target.db" to determine that it has a "number" of "TID 300" and a "ttl" of "Measurement", etc.

Changes to Parts

General Changes

- Customize header and footer content in chunked html to include release, part name and hyperlinked "breadcrumb" trail to parent sections.
- Add registered trademark of DICOM, HL7, SNOMED, LOINC, etc., and corresponding text in foreword of all parts.

PS3.1

- CP 1490

PS3.2

- Sup 156
- Sup 181
- Sup 184
- Sup 187

PS3.3

- Capitalize IOL correctly in section headings
- Sort General Series Module Modality Defined Terms into alphabetical order of term
- Fix -1 that is rendering as 2 in Word/ODT for Pixel Intensity Relationship Sign due to XFC bug in auto list numbering detection, by making the first item "+1" rather than "1" (OK since VR is SS not string)
- Correct color-by-pixel term for Pixel Representation in Table C.8.17.2-1 to be 0, not 2
- Move example sentence about diffusion post-processed images back into note per pre-conversion text in C.8.16.1.3.
- Split presentation states into separate table in IOD overview to support addition of Sup 156.
- Split structured reports into separate table in IOD overview to support addition of Sup 187.
- Sup 156
- Sup 181
- Sup 184
- Sup 187
- CP 1431
- CP 1432
- CP 1441
- CP 1444
- CP 1445
- CP 1446
- CP 1452
- CP 1454

- CP 1456
- CP 1457
- CP 1458
- CP 1459
- CP 1460
- CP 1461
- CP 1462
- CP 1463
- CP 1471
- CP 1472
- CP 1473
- CP 1475
- CP 1476
- CP 1477
- CP 1478
- CP 1480
- CP 1486
- CP 1487
- CP 1488
- CP 1489
- CP 1496
- CP 1499
- CP 1502
- CP 1504
- CP 1512
- CP 1516

PS3.4

- Correct tags used for Performed Procedure Step Start/End DateTime in UPS (were Date-only MPPS tags despite correct name)
- Sup 156
- Sup 181
- Sup 184
- Sup 187
- CP 1441

- CP 1501

PS3.5

- Use YBR_FULL (with underscore, not YBR FULL) in description of RLE.
- Move normative text about decompression behavior out of note in MPEG-4 to match style in all other transfer syntaxes.
- Sup 181
- CP 1066; also added OL from Sup 181 in list of non-short VL VRs
- CP 1302; also corrected Table K.3-1 alphabetic/phonetic order to match revised text, and moved "English name" with alphabetic
- CP 1357
- CP 1447
- CP 1451
- CP 1499

PS3.6

- Correct DICONDE ST VM 1-n, add new DICONDE data elements for revised E2339
- Correct entity from Waveform to Spatial Registration in Figure A.39-1 to match 2011 in which it was correct
- List Papyrus 3 Implicit VR Little Endian Transfer Syntax as a retired UID, since though never published was used and should not be reassigned.
- List Carl Zeiss OPT Macular Cube misused NEMA root SOP Class as a retired UID, since though never published was used and should not be reassigned.
- Add Papyrus 3 MR SOP Class as a retired UID, since though never published was used and should not be reassigned.
- Show CP 1365 Data Elements as retired (was not done as it should have been in 2014b).
- List data elements (0018,0061) and (0400,0315) that were misused by an implementer but are not standard and should not be re-assigned.
- Sup 156
- Sup 181
- Sup 184
- Sup 187
- CP 1364
- CP 1431
- CP 1432
- CP 1441; unretire Destination AE (2100,0140)
- CP 1454
- CP 1457
- CP 1458
- CP 1460

- CP 1461
- CP 1470
- CP 1476
- CP 1478
- CP 1487
- CP 1496
- CP 1499
- CP 1504
- CP 1516

PS3.7

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PS3.8

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PS3.10

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PS3.11

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PS3.12

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PS3.14

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PS3.15

- Correct spelling of ParticipantObjectSensistity to ParticipantObjectSensitivity.
- Sup 156
- Sup 181
- CP 1485
- CP 1496

PS3.16

- Correct row reference in condition for laterality in TID 10022
- Correct row reference in condition for Site Of in TID 10022
- Remove quotes around units code value for Glucose in Row 11 of TID 10024

- User hyperlinks for TID (nnnn) pattern, where nnn is 1400, 1401, 1402.
- Correct row numbering in TID 1607.
- Correct Figure A-8 to show TID 4002 as child of 4001 not 4020 (to match actual template structure and pre-DocBook conversion standard)
- Hyperlink NCIt codes.
- Add SRT CSD that was missing for one occurrence of (M-34200, SRT, "Stenosis").
- Provide Wahl reference for SUVpeak and remove unfulfilled notes about providing references for lesion to background codes.
- Fix URL for country codes in CID 5001.
- Update SNOMED permission statement and add VetSCT statement.
- Sup 156
- Sup 181
- Sup 184
- Sup 187
- CP 1448
- CP 1449
- CP 1457
- CP 1464
- CP 1465
- CP 1466
- CP 1467
- CP 1468
- CP 1469
- CP 1470
- CP 1473
- CP 1478
- CP 1493
- CP 1494
- CP 1496
- CP 1497
- CP 1498
- CP 1516

PS3.17

- Remove mention of CP 1387 in example

- Use code 109106 already assigned in place of ddddd1 in legacy conversion example.
- Sup 156
- Sup 181
- Sup 187
- CP 1444
- CP 1457
- CP 1471

PS3.18

- Correct UN element from Value to InlineBinary in JSON example
- Update bibliography to use biblio elements rather than plain paragraphs
- Update definitions to use glossary elements rather than plain paragraphs
- Sup 174
- CP 1364
- CP 1482 and hyperlink to RFC sections from references
- CP 1491
- CP 1506
- CP 1507
- CP 1510

PS3.19

- CP 1364
- CP 1514

PS3.20

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Supplements Incorporated

Sup 156 Planar MPR Volumetric Presentation State

Sup 174 RESTful Rendering

Sup 181 Tractography Results Storage SOP Class

Sup 184 Brachytherapy Delivery Instruction

Sup 187 Preclinical Small Animal Imaging Acquisition Context

Correction Items Incorporated

CP 1066 Encoding of Attributes with value length > 64kB with Explicit VR

CP 1302 Correct example of Chinese encoding

CP 1357 Allow Unicode Katakana in alphabetic name group

CP 1364 Minor corrections to WADO-RS and STOW-RS

CP 1431 Add Beam Effective Dose in RT Fraction Scheme Module

CP 1432 Add Support for Ion Therapy Scanning Modes

CP 1441 Add UPS scheduled output destination

CP 1444 Add additional dental view sets to Structured Display

CP 1445 Remove In-Stack Position text from figure C.7.6.16-3

CP 1446 Prohibit circular Dimension Index references

CP 1447 Clarify 8 bit in Extended JPEG Transfer Syntax

CP 1448 Add blood normalized IAUC codes

CP 1449 Clarify Modality Device Code Definitions

CP 1451 Remove retired Point Index List attributes in PS3.5 Annex A

CP 1452 Correct Recommended Presentation Opacity explanation

CP 1454 Add color space attribute

CP 1456 Add Operator Identification Sequence to Series Modules

CP 1457 Identification of groups of pre-clinical research small animal subjects

CP 1458 Value representation of real world value first and last values mapped

CP 1459 Add Patient Medical Module to Unified Procedure Step IOD

CP 1460 Add Ion Range and Modulation

CP 1461 Add B1RMS value to MR Enhanced and MR Object

CP 1462 Admission ID missing in MPPS module

CP 1463 Clarify Enhanced US Volume Image and Frame Type Values 3 and 4

CP 1464 Add reference region segmentation property type

CP 1465 Add type of finding to measurement SR templates

CP 1466 Add session to measurements group

CP 1467 Correct time point context relationship

CP 1468 Add defined CIDs for modality and laterality in image library

CP 1469 Remove duplicate rows referencing source image or series for segmentation in volumetric ROI

CP 1470 Small animal anatomy for pre-clinical research

CP 1471 Generalize clinical trials attributes to refer to any type of research

CP 1472 Additional responsible persons

CP 1473 Transverse positioning of pre-clinical research small animal subjects

CP 1475 Add patient defined term for Ultrasound Acquisition Geometry

CP 1476 Add settling phases information and Synch pulse for Functional MRI

CP 1477 Angles for Positioner with Digital Detector

CP 1478 Identification of species and strain of pre-clinical research small animal subjects

CP 1480 Allow multiple items in the MR Receive Coil Sequence

CP 1482 Correct PS3.18 RFC references

CP 1485 Resolve discrepancy in SOP Class multiplicity for ATNA messages

CP 1486 Add RT Ion References

CP 1487 Add Display Origin Coordinates To RTPlan

CP 1488 Clarify RT Image Exposure Attributes in case of MPEG Encoding

CP 1489 Correct description of Surface Scan IOD

CP 1490 Update top level DICOM diagram for Web Services

CP 1491 Incorrect terms in Part 18 Sections 8.2.5 and 8.2.6

CP 1493 Correct code for organ used in segmentation

CP 1494 More Zr 89 monocolonal antibody and other targeted PET radiotracers

CP 1496 Add Tracking Identifier and UID to Segmentation Instances

CP 1497 Add Manganese-52m PET radionuclide

CP 1498 Add Magnetization Transfer Ratio to Image Model Component Semantics for Parametric Maps

CP 1499 Fix CP 1365 setback with Long xxx Index List VR

CP 1501 Add floating point pixel data to list of bulk data attributes

CP 1502 Pixel Intensity Relationship in RT Image

CP 1504 Add Accessory Code To Trays

CP 1506 QIDO-RS maximumResults

CP 1507 WADO-URI region parameter forbidden when Presentation State

CP 1510 Correct UPS-RS errors

CP 1512 Correction of Motion Mode Attribute Reference

CP 1514 Add missing attributes to Coded Terminology Macro

CP 1516 Extend Identified Person or Device Macro