

DICOM Conference 2017

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DICOM Conformance

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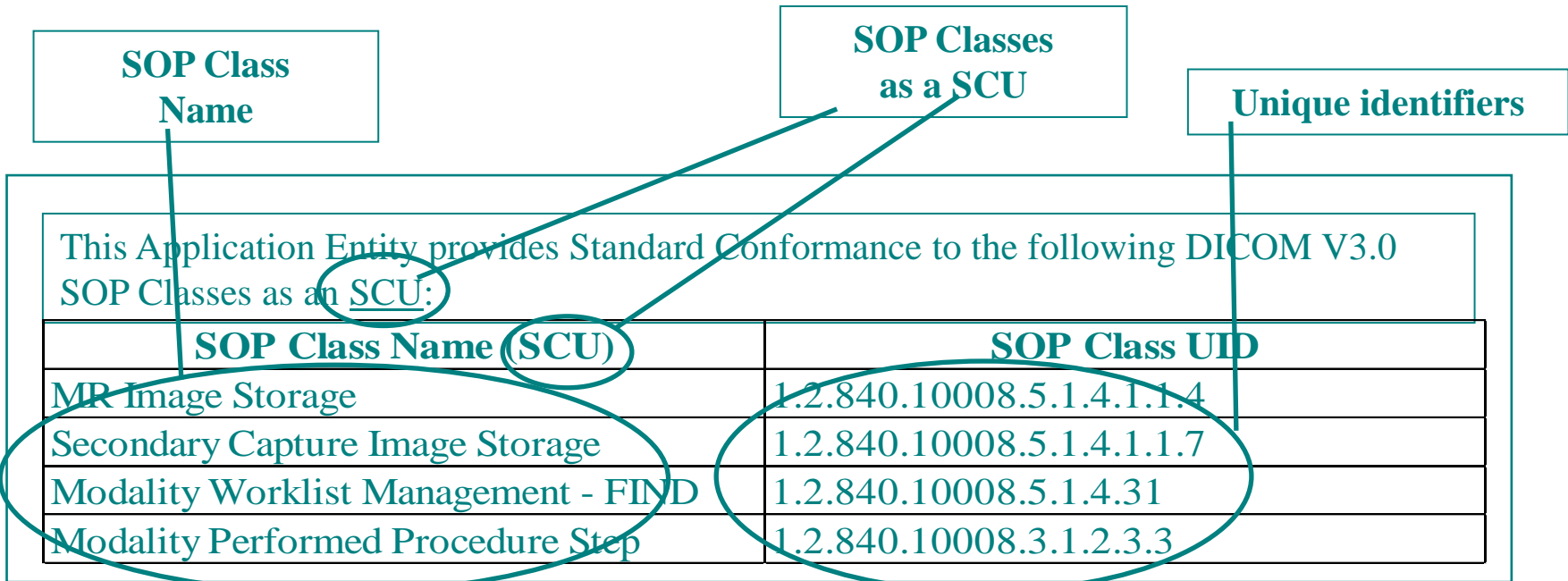


- **DICOM Conformance is not as for other standards**
 - When a product is conformant to the DICOM standard it does *not* mean that it conforms to the *entire* standard
- **DICOM has many items to which you *can* conform**
 - SOP Classes (in either role)
 - Transfer Syntaxes
 - Character Sets
 - ...
- **A product only conforms to a *subset* of all options**
 - This subset of options matches the function of that product
 - E.g. workflow-wise it would not make much sense to have an MR scanner to be able to print ECGs (although technically that would be quite feasible)



- **Vendors document which aspects and options of DICOM their products implement in DICOM Conformance Statements (DCS)**
 - DCS can range from 30-250 pages, depending on the capabilities of the product
 - One needs to compare DCS to evaluate if products can interoperate as intended (considering individual workflow)
 - Base check (comparing SOP Class support) is simple
 - Sometimes this is not sufficient and a more detailed analysis is necessary
- **DCS are typically published on vendor's web site**

Compare a product's SCU table with another's SCP table:



SOP Class Name

SOP Classes as a SCU

Unique identifiers

This Application Entity provides Standard Conformance to the following DICOM V3.0 SOP Classes as an SCU:

SOP Class Name (SCU)	SOP Class UID
MR Image Storage	1.2.840.10008.5.1.4.1.1.4
Secondary Capture Image Storage	1.2.840.10008.5.1.4.1.1.7
Modality Worklist Management - FIND	1.2.840.10008.5.1.4.31
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3

On page 53 of an existing DCS of an Ultrasound device:

US Region Calibration	Sequence of Ultrasound Regions	(0018,6011)	1	One created for each US region displayed
	>Region Location Min x0	(0018,6018)	1	
	>Region Location Min y0	(0018,601A)	1	
	>Region Location Max x1	(0018,601C)	1	
	>Region Location Max y1	(0018,601E)	1	
	>Physical Units X Direction	(0018,6024)	1	
	>Physical Units Y Direction	(0018,6026)	1	
	>Physical Delta X	(0018,602C)	1	
	>Physical Delta Y	(0018,602E)	1	
	>Reference Pixel x0	(0018,6020)	3	
	>Reference Pixel y0	(0018,6022)	3	
	>Ref. Pixel Physical Value X	(0018.6028)	3	

In the introduction section of an existing DCS of a cardiology system:

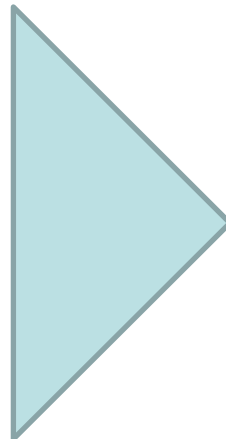
Workplace **provides support for the DICOM US Region Calibration Module.**

When ultrasound images contain this module, the Workplace is able to interpret the region calibration data provided by the ultrasound acquisition unit.

Standard pixel spacing attributes are also supported if provided with ultrasound captures.

- **Many interoperability issues attributed to DICOM are in reality a result of the different needs of products and the flexibility of DICOM to support these needs**

- They often could have been identified upfront by a detailed analysis of the DCS
- Performing such an analysis today requires lots of expertise
- DICOM intends to make this easier by improving the structure and content of the DCS



Everybody working with DCS is requested to take part in a survey:

https://docs.google.com/forms/d/e/1FAIpQLSeBm4YwlnB_yz4AVZhBOQXIK2KhzXi_XZppLDspcsrdXm_uXA/viewform?c=0&w=1

(open for the next 4 weeks)

- **State of the art**

- **Vendors self-assess their conformance claims**

- Is the practice for more than 20 years
- Is actually a rather effective system
 - Naturally there is liability in case a product does not behave according to the claimed features

- **Product to product testing**

- Can be arranged by mutual agreement
- Can be arranged during IHE Connectathons, verifying specific use cases



- **DICOM defines *no* predefined test approaches / test cases, and there are neither ‘approved’ test tools nor such test sets**

- DICOM WG31 is looking in this area, also related to conformance assessments

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Thank you for your attention!