DICOM
Digital Imaging and Communications in Medicine

DICOM Conformance

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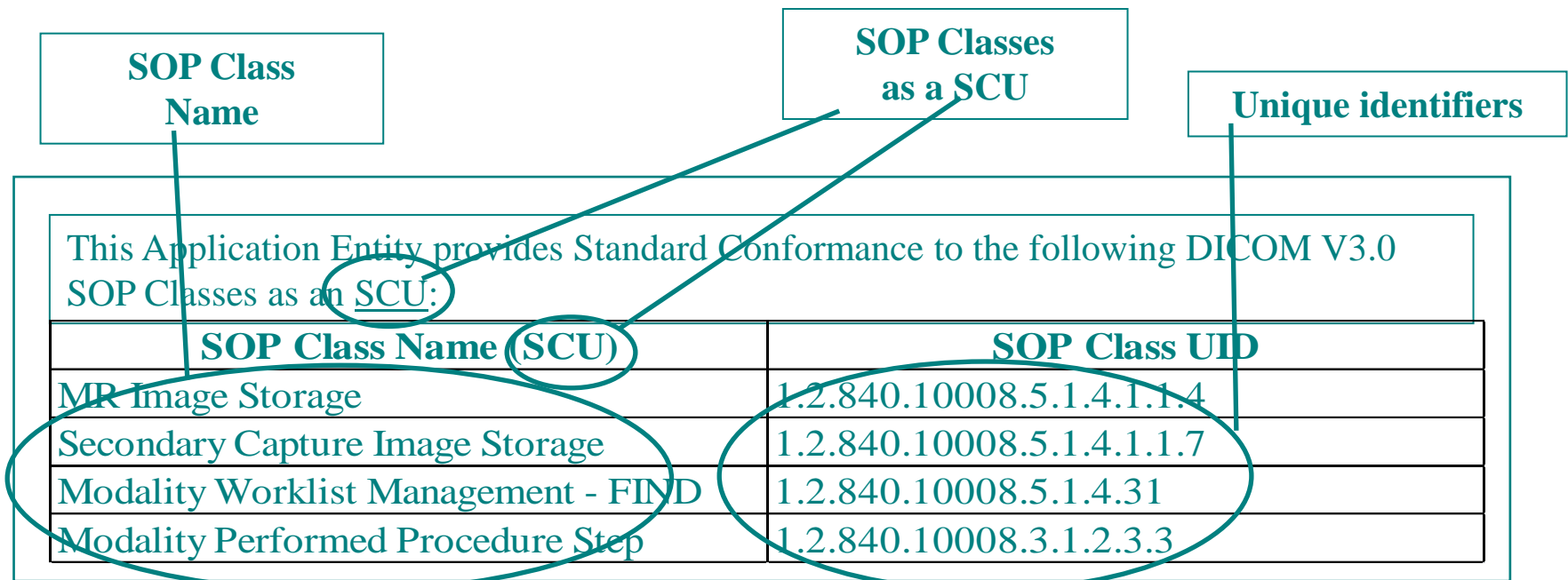
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Introduction

- **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)

Claiming Conformance

- **The DICOM Conformance Statement (DCS) of a product is a claim of the vendor that declares what options of DICOM are offered by that product**
  - **When it is not declared, it is assumed that it is not offered**
  - **When it is offered, it does not mean it has to be used**
    - A PACS may be able to store text encoded in the Thai character set, but in Germany that feature will probably not be used a lot, if at all
- **A DCS offers several functions**
  - **For potential customers: to compare similar systems on their interoperability, or to asses whether a potential new system fits their existing interoperability eco-system**
  - **For hospital integrators: to configure systems for optimal interoperability during the entire workflow**
  - **For users: to know and utilize the DICOM related features**

Integrator Capabilities

- **At a minimum, the hospital integrators need to read SOP Class tables**

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

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

Assessing Interoperability

Example

- **If you have a printer that is a DICOM SCP for *Print SOP Class$_A$* and you want your new scanner to be able to send prints directly to that printer, then this scanner need to be an SCU of *Print SOP Class$_A$*.**

- **To achieve the same, you could, alternatively, verify that the scanner can store to your PACS or printing workstation and look for *that* to be the SCU of *Print SOP Class$_A$*.**

Also assess the workflow!

DICOM Functionality

- **Products choose freely which DICOM features to support. DICOM *doesn't* tell them *which* features to implement.**

- **DICOM *does* tell them *how* to implement the features once they have chosen them.**

- **Note that some options are mandatory to implement**
  - **E.g. support of the default transfer syntax (DICOM Implicit VR Little Endian Transfer Syntax)**

Publishing Claims

- **There is no regulatory requirement to have a DCS**
  - **FDA requirement: unless you claim conformance**
- **But a DCS is typically published on the vendor's web site**
  - **Also provided to regulators**
  - **Part of the official documentation**

- **Note that DICOM does not maintain a repository or registry of DCSs**

DICOM Conformance Statement

Template has been defined in the DICOM standard

1. Overview (support of SOP Classes as SCU and SCP)
2. Table of Contents
3. Introduction
4. Networking
   - Implementation Model
   - AE Specifications
   - Network interfaces
   - Configuration
5. Media Interchange
6. Support of Character Sets
7. Security
8. Annexes

> Typically a DCS is 50-250 pages, depending on the functionality of the product. It contains a lot of details and is not a 'page turner'.

Assessing Conformance Claims

- ## 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!