

DICOM Correction Proposal

STATUS	Final Text
Date of Last Update	2019/01/22
Person Assigned	Wim Corbijn
Submitter Name	Jeroen Medema
Submission Date	2018/03/01

Correction Number	CP1797
Log Summary: Update definition of SOP Class, inclusion of Media Storage Service and Web Services	
Name of Standard PS3.1-8, PS3.10-12, PS3.15-16, PS3.19, PS3.21 2018e	
Rationale for Correction A Service-Object Pair (SOP) Class is currently defined by the union of an IOD and a DIMSE Service Group (section 6.5 of PS3.4). A DIMSE Service Group specifies one or more operations/notifications defined in PS3.7 that are applicable to an IOD (see section 6.4 of PS3.4). As the operations/notifications in PS3.7 are clearly not applicable for web services and media storage, it is necessary to extend either the definition of a DIMSE Service Group or the definition of a SOP Class. It makes most sense to extend the definition of a SOP Class, as DIMSE (and hence the DIMSE Service Group) is quite related to the traditional networking capabilities of DICOM. Furthermore, it has been defined in section I.1.2 of PS3.4 that SOP Classes of the Media Storage Service Class are implemented using the Media Storage Operations. Note that PS3.4, Annex I needs to be changed too, firstly to adapt to the new definition of SOP Class, and secondly to be clear on what can be stored on Media, as this is currently unclear / incorrect (mixture of IOD and SOP Class). Note that the definition of SOP Class in PS3.3 (section 6.5) needs to be adapted in line with the changes made because of the above. Furthermore, there is another definition of SOP Class in section 6.3.2.1 of PS3.10; this should be retired, and a reference to the PS3.4 definition should be made. In WG-06 it has been decided that PS3.1 will have the definition of SOP Class, and all other parts will refer to that definition. Appropriately changed the CP; also corrected references to SOP Instance.	
Correction Wording:	

Item #1a: Changes in PS3.1, section 3

...

Service-Object Pair Class (SOP Class)

The pair of an Information Object and either a DIMSE Service Group, a Media Storage Service, or a Web Service.

Item #1b: Changes in PS3.1, section 4

...

DIMSE

DICOM Message Service Element

Item #2: Changes in PS3.4, section 3.3

This Part of the Standard makes use of the following terms defined in PS3.1:

- a. Attribute
- b. Command
- c. Data Dictionary
- d. Information Object
- e. Message
- f. **Service-Object Pair Class (SOP Class)**

Item #2b: Changes in PS3.4, section 3.9

3.9 DICOM Service Class Definitions

...

~~**Service-Object Pair (SOP) Class: the union of a specific set of DIMSE Services and one related Information Object Definition (as specified by a Service Class Definition) that completely defines a precise context for communication of operations on such an object or notifications about its state.**~~

Item #3: Changes in PS3.4, section 6

...

6.3 On-Line Communication and Media Storage Services

For on-line communication the DIMSE Services **and Web Services** allow a DICOM Application Entity to invoke an operation or notification across a network or a point-to-point interface. DIMSE Services are defined in PS3.7 **and Web Services are defined in PS3.18**.

For media storage interchange, Media Storage Services allow a DICOM Application Entity to invoke media storage related operations.

Media Storage Services are discussed in PS3.10.

6.4 DIMSE Service Group

A DIMSE Service Group specifies one or more operations/notifications defined in [PS3.7](#) that are applicable to an IOD.

DIMSE Service Groups are defined in this Part of the DICOM Standard, in the specification of a Service-Object Pair Class.

6.5 Service-Object Pair (SOP) Class

~~**A Service-Object Pair (SOP) Class is defined by the union of an IOD and a DIMSE Service Group.**~~
The SOP Class definitions in **PS3.4** contains the rules and semantics that may restrict the use of the services in the DIMSE Service Group or the Attributes of the IOD. **PS3.10 and PS3.18 contain the rules and semantics that may restrict the attributes of the IOD or the use of the services in the Media Storage Services and the Web Services respectively.**

The selection of SOP Classes is used by Application Entities to establish an agreed set of capabilities to support their interaction **for SOP Classes based on DIMSE Services**. This negotiation is performed at

Association establishment time as described in PS3.7. An extended negotiation allows Application Entities to further agree on specific options within a SOP Class.

Note

The SOP Class as defined in the DICOM Information Model is equivalent in ISO/OSI terminology to the Managed Object Class. Readers familiar with object-oriented terminology will recognize the SOP Class operations (and notifications) as comprising the methods of an object class.

6.5.1 Normalized and Composite SOP Classes

DICOM defines two types of SOP Classes, Normalized and Composite. **For DIMSE Services,** Normalized SOP Classes are defined as the union of a Normalized IOD and a set of DIMSE-N Services, **while** Composite SOP Classes are defined as the union of a Composite IOD and a set of DIMSE-C Services. **Media Storage Services only support Composite IODs and Web Services support both Normalized and Composite SOP Classes.**

Note

SOP Class Specifications play a central role for defining DICOM conformance requirements. It allows DICOM Application Entities to select a well-defined application level subset of this Standard to which they may claim conformance. See PS3.2.

...

Item #4: Changes in PS3.4, Annex I

I Media Storage Service Class (Normative)

I.1 Overview

I.1.1 Scope

The Media Storage Service Class defines an application-level class-of-service that facilitates the simple transfer of images and associated information between DICOM AEs by means of Storage Media. It supports:

- a. The Interchange of images and a wide range of associated information.

I.1.2 Service Definition

DICOM AEs ~~implement support~~ a SOP Class of the Media Storage Service Class by **supporting performing** one or more roles among the three roles FSC, FSR or FSU. SOP Classes of the Media Storage Service Class ~~are implemented using use~~ the Media Storage ~~Operations Services~~ (M-WRITE, M-READ, M-DELETE, M-INQUIRE FILE-SET and M-INQUIRE FILE). ~~These sS~~ **Services provided by these Operations** are defined in PS3.10.

...

I.4 Media Storage ~~Standard~~ SOP Classes

The SOP Classes in the Media Storage Service Class identify the Composite IODs to be stored. The **IODs of the following ~~Standard~~ SOP Classes are defined can be stored:**

- all **IODs of the** SOP Classes specified for the DIMSE C-STORE based Storage Service Class identified in Table B.5-1
- all **IODs of the** SOP Classes specified for the DIMSE C-STORE based Non-Patient Object Storage Service Class identified in Table GG.3-1
- **the IOD of** the media directory SOP Class identified in Table I.4-1

Table I.4-1. Media Storage Standard SOP Classes

SOP Class Name	SOP Class UID	IOD Specification (defined in PS3.3)
Media Storage Directory Storage	1.2.840.10008.1.3.10	Basic Directory IOD

Note

1. Except for the Media Storage Directory SOP Class, all the SOP Classes in the Media Storage Service Class are assigned the same UID Value as the corresponding network communication SOP Classes. This was done to simplify UID assignment. Although these SOP Classes are based on different **Operations Services**, the context of their usage should unambiguously distinguish a SOP Class used for Media Storage from a network communication SOP Class.
2. The storage of Normalized Print SOP Instances on media was previously defined in DICOM. They have been retired. See PS 3.4-1998.
3. The storage of Detached and Standalone SOP Instances on media was previously defined in DICOM. They have been retired. See PS 3.4-2004.

Item #5: Changes in PS3.2, section 3

3.4 DICOM Introduction and Overview Definitions

This Part makes use of the following terms defined in PS3.1:

- a. Information Object
- b. **Service-Object Pair Class (SOP Class)**

...

3.6 DICOM Service Class Specification Definitions

This Part makes use of the following terms defined in PS3.4:

- a. Real-World Activity
- b. Service Class.
- c. Service Class User (SCU)
- d. Service Class Provider (SCP)
- e. ~~Service-Object Pair (SOP) Class~~
- f. Meta SOP Class.

Item #6: Changes in PS3.3, section 3

3.3 DICOM Introduction and Overview Definitions

This Part of the Standard makes use of the following terms defined in PS3.1:

...

Message

See PS3.1.

Service-Object Pair Class (SOP Class)

See PS3.1.

3.4 DICOM Service Class Specifications

This Part of the Standard makes use of the following terms defined in PS3.4:

...

Service-Object Pair Class (SOP Class)

—**See PS3.4.**

Item #7: Changes in PS3.3, section 6

6.3 On-Line Communication and Media Storage Services

For on-line communication the DIMSE Services **and Web Services** allow a DICOM Application Entity to invoke an operation or notification across a network or a point-to-point interface. DIMSE Services are defined in PS3.7 **while Web Services are defined in PS3.18.**

For media storage interchange, Media Storage Services allow a DICOM Application Entity to invoke media storage related operations.

Media Storage Services are discussed in PS3.10.

...

6.5 Service-Object Pair (SOP) Class (SOP Class)

~~A Service-Object Pair (SOP) Class is defined by the union of an IOD and a DIMSE Service Group.~~
The SOP Class definitions in **PS3.4** contains the rules and semantics that may restrict the use of the services in the DIMSE Service Group or the Attributes of the IOD. **PS3.10 and PS3.18 contain the rules and semantics that may restrict the attributes of the IOD or the use of the services in the Media Storage Services and the Web Services respectively.**

The selection of SOP Classes is used by Application Entities to establish an agreed set of capabilities to support their interaction **for SOP Classes based on DIMSE Services**. This negotiation is performed at Association establishment time as described in PS3.7. An extended negotiation allows Application Entities to further agree on specific options within a SOP Class.

Note

The SOP Class as defined in the DICOM Information Model is equivalent in ISO/OSI terminology to the Managed Object Class. Readers familiar with object-oriented terminology will recognize the SOP Class operations (and notifications) as comprising the methods of an object class.

6.5.1 Normalized and Composite SOP Classes

DICOM defines two types of SOP Classes, Normalized and Composite. **For DIMSE Services**, Normalized SOP Classes are defined as the union of a Normalized IOD and a set of DIMSE-N Services, **while** Composite SOP Classes are defined as the union of a Composite IOD and a set of DIMSE-C Services. **Media Storage Services only support Composite IODs and Web Services supports both Normalized and Composite SOP Classes.**

Note

SOP Class Specifications play a central role for defining DICOM conformance requirements. It allows DICOM Application Entities to select a well-defined application level subset of this Standard to which they may claim conformance. See PS3.2.

Item #8: Changes in PS3.5, section 3

...

3.5 DICOM Introduction and Overview Definitions

This part of the standard makes use of the following terms defined in PS3.1:

- a) Attribute
- b) Command Element
- c) Data Dictionary
- d) **Service-Object Pair Class (SOP Class)**

...

3.8 DICOM Service Class Specifications Definitions

This part of the standard makes use of the following terms defined in PS3.4:

- a) Service-Object Pair (~~SOP~~) **InstanceClass (SOP Instance)**

Item #9: Changes in PS3.6, section 3

3.1 DICOM Introduction and Overview Definition

This part of the standard makes use of the following term defined in PS3.1:

Attribute

See PS3.1.

Service-Object Pair Class (SOP Class)

See PS3.1.

...

3.5 DICOM Service Class Specifications Definitions

This part of the standard makes use of the following terms defined in PS3.4:

Service-Object Pair Instance (SOP Instance)

See PS3.4.

Item #10: Changes in PS3.7, section 3

3.6 DICOM Introduction and Overview Definitions

This part of the Standard makes use of the following terms defined in PS3.1:

- a. Attribute
- b. Command
- c. Command Stream
- d. Data Stream
- e. Message
- f. **Service-Object Pair (SOP) Class**

...

3.8 DICOM Service Class Definitions

This part of the Standard makes use of the following terms defined in PS3.4:

- a. Service Class
- b. Service Class User (SCU)
- c. Service Class Provider (SCP)
- ~~d. Service-Object Pair (SOP) Class~~
- e. Service-Object Pair (SOP) Instance
- f. Related General SOP Class

Item #11: Changes in PS3.8, section 3

...

3.8 DICOM Service Class Definitions

This part of the Standard makes use of the following terms defined in PS3.4:

- a. **Service-Object Pair Instance (SOP Instance)**

Item #12: Changes in PS3.10, section 3.4

This Part of the Standard makes use of the following terms defined in PS3.1:

- a. Attribute;
- b. **Service-Object Pair Class (SOP Class)**.

Item #13: Changes in PS3.10, section 6.2.3.1

6.2.3.1 DICOM SOP Classes

DICOM SOP Classes and associated Information Object Definitions (IODs) are used to convey specific medical imaging information at the Data Format Layer. ~~SOP Classes and IODs used for Media Storage shall follow the framework established in PS3.3 and PS3.4.~~ Examples of such IODs are modality images, patient information, results, etc.

The use of DICOM IODs in conjunction with Media Storage Services forms a number of Media Storage Service Object Pair Classes or SOP Classes. Media Storage Services (e.g., read, write, delete, etc.) shall be performed through the DICOM File Service. The content of the resulting DICOM Files shall be formatted according to the DICOM File Format as specified below.

Note

- ~~The concept of a SOP Class in the Media Storage context is equivalent to the concept of SOP Class introduced in PS3.3 and PS3.4 for network related operations (DIMSE Operations).~~
- ~~Both Composite and Normalized IODs and SOP Classes may be used in the Media Storage context.~~

[PS3.4](#) defines a number of SOP Classes that may be used for Media Storage, [in PS3.4, Annex I](#). These SOP Classes are based on DICOM Standard IODs that may be found in [PS3.3](#).

The structure and encoding of a Data Set representing the data associated with a SOP Class shall follow [PS3.5](#). The specification of Transfer Syntaxes that may be used to encode such a Data Set, is also defined in [PS3.5](#).

Item #14: Changes in PS3.11, section 3

...

3.2 DICOM Introduction and Overview Definitions

This part of the Standard makes use of the following terms defined in PS3.1 of the DICOM Standard:

- a. Attribute
- b. **Service-Object Pair Class (SOP Class)**

...

3.6 DICOM Message Exchange Definitions

This part of the Standard makes use of the following terms defined in PS3.7 of the DICOM Standard:

- ~~a. Service Object Pair (SOP) Class~~
- ~~b. Service Object Pair (SOP) Instance~~
- c. Implementation Class UID

...

3.9 DICOM Service Class Definitions

This part of the Standard makes use of the following terms defined in PS3.4:

- a. **Service-Object Pair Instance (SOP Instance)**

Item #15: Changes in PS3.12, section 3

3.3 DICOM Service Class Definitions

This part of the Standard makes use of the following terms defined in PS3.4:

- a. **Service-Object Pair Instance (SOP Instance)**

Item #16: Changes in PS3.15, section 3

...

3.5 DICOM Introduction and Overview Definitions

This part of the Standard makes use of the following terms defined in PS3.1 of the DICOM Standard:

- a. Attribute
- b. **Service-Object Pair Class (SOP Class)**

Item #17: Changes in PS3.16, section 3

...

3.4 DICOM Introduction and Overview Definitions

This Part of the Standard makes use of the following terms defined in PS3.1:

- a. **Service-Object Pair Class (SOP Class)**

3.5 DICOM Service Class Definitions

This part of the Standard makes use of the following terms defined in PS3.4:

- a. **Service-Object Pair Instance (SOP Instance)**

Item #18: Changes in PS3.18, section 4

4.1 Web Services Definitions

...

Web Access to DICOM Objects

A service enabling the user agent to retrieve DICOM Objects managed by an origin server, through HTTP/HTTPS protocol.

4.2 DICOM Introduction and Overview Definitions

This Part of the Standard makes use of the following terms defined in PS3.1:

- a. **Service-Object Pair (SOP) Class**

4.3 DICOM Service Class Definitions

This part of the Standard makes use of the following terms defined in PS3.4:

- a. **Service-Object Pair (SOP) Instance**

Item #19: Changes in PS3.19, section 3

...

3.3 DICOM Introduction and Overview Definitions

This Part of the Standard makes use of the following terms defined in PS3.1:

- a. Attribute
- b. **Service-Object Pair Class (SOP Class)**

...

3.8 DICOM Service Class Definitions

This part of the Standard makes use of the following terms defined in PS3.4:

- a. **Service-Object Pair Instance (SOP Instance)**

Item #20: Changes in PS3.21, section 3

...

3.2 DICOM Introduction and Overview Definitions

This Part of the Standard makes use of the following terms defined in PS3.1:

- a. **Service-Object Pair Class (SOP Class)**

3.3 DICOM Service Class Definitions

This part of the Standard makes use of the following terms defined in PS3.4:

- b. **Service-Object Pair Instance (SOP Instance)**