

Digital Imaging and Communications in Medicine (DICOM)

Supplement 13 Queue Management Service Class

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Convention

46
48

In several places text in the existing Standard is changed. Changes are indicated with additional text in underlined font, and removed text in ~~strike-through~~ font. These changes are not indicated by change bars in the margins.

4

Changes since Final Text for Letter Ballot are indicated by underline, strikethrough, and margin change bars.

Foreword

2 The American College of Radiology (ACR) and the National Electrical Manufacturers Association (NEMA)
4 formed a joint committee to develop a standard for Digital Imaging and Communications in Medicine
(DICOM). This DICOM Standard and the corresponding Supplements to the DICOM Standard were
developed according to the NEMA procedures.

6 DICOM is developed in liaison with other standardization organizations including CEN TC251 in Europe
8 and JIRA in Japan, with review also by other organizations including IEEE, HL7 and ANSI in the USA.

10 This document is a Supplement to the DICOM Standard. It is an extension to PS 3.3, 3.4 and 3.6 of the
published DICOM Standard which consists of the following parts:

- 12 PS: 3.1 - Introduction and Overview
- 14 PS: 3.2 - Conformance
- PS: 3.3 - Information Object Definitions
- 16 PS: 3.4 - Service Class Specifications
- PS: 3.5 - Data Structures and Encoding
- 18 PS: 3.6 - Data Dictionary
- PS: 3.7 - Message Exchange
- 20 PS: 3.8 - Network Communication Support for Message Exchange
- PS: 3.9 - Point-to-Point Communication Support for Message Exchange
- 22 PS: 3.10 - Media Storage and File Format
- PS: 3.11 - Media Storage Application Profiles
- 24 PS: 3.12 - Media Format and Physical Media for Media Interchange
- PS: 3.13 - Print Management Point-to-Point Communication Support

26 These parts are related but independent documents.

28 This Supplement includes the definition of the Queue Management Service Class and of the Print Queue
30 IOD.

Scope and Field of Application

32 This Supplement describes the management of queues in a network environment. It contains the Queue
Management Service Class and the Print Queue Management SOP Class Definition, which is the first of a
34 set of application specific queues which will share a similar behavior.

36 In addition, a more flexible definition of Normalized IODs is included in changes to PS 3.3.

38 Queue Management covers the following functions:

- 40 - request and monitor the content of a queue
- 42 - manipulate the content of a queue (e.g. prioritize jobs, delete queue entry)

Since this document proposes changes to existing Parts of DICOM the reader should have a working
2 understanding of the Standard.

4 This Supplement includes a number of Addenda to existing Parts of DICOM:

6 - PS: 3.3 Addendum: Print Queue Information Object Definitions

8 - PS: 3.4 Addendum: Queue Management Service Class

10 - PS: 3.6 Addendum: Queue Data Dictionary

Part 3 Information Object Definitions

Modify Section 6.1 Information Object Definition

2

6.1 INFORMATION OBJECT DEFINITION

4 An Information Object Definition (IOD) is an object-oriented abstract data model used to specify
6 information about Real-World Objects. An IOD provides communicating Application Entities with a
6 common view of the information to be exchanged.

8 An IOD does not represent a specific instance of a Real-World Object, but rather a class of Real-World
10 Objects which share the same properties. An IOD used to generally represent a single class of Real-
10 World Objects is called a Normalized Information Object. An IOD which includes information about related
10 Real-World Objects it is called a Composite Information Object.

12

6.1.1 Composite IOD

14 A Composite IOD is an Information Object Definition which represents parts of several entities included in
14 the DICOM Model of the Real-World. This Model is introduced in Section 7 of this part. Such an IOD
16 includes Attributes which are not inherent in the Real-World Object that the IOD represents but rather are
16 inherent in related Real-World Objects.

18

20 These related Real-World Objects provide a complete context for the exchanged information. When an
20 instance of a Composite IOD is communicated, this entire context is exchanged between Application
22 Entities. Relationships between Composite IOD Instances shall be conveyed in this contextual
22 information.

24 The Composite IODs are specified in Annex A of Part 3 of this Part.

6.1.2 Normalized IOD

26 A Normalized IOD is an Information Object Definition which generally represents a single entity in the
28 DICOM Model of the Real-World. ~~Such an IOD includes Attributes which are only inherent in the Real-
World Object that the IOD represents.~~

30

32 In this Standard, strict definition of Normalized Object Definitions has been not been applied. Application
of strict definitions would often result in unnecessary complexity and reduced performance of
implementations for several applications.

34

Note: An example is the Print Queue IOD. Attributes from the IODs in the Basic and Referenced Print
Management IODs are combined in the Print Queue IOD. This allows an SCP to provide all relevant
information in a single N-Get Service Element. Otherwise several Service Elements would be required
to return the attributes from individual Normalized IODs. This requires less network traffic to convey
the information, thus improving system performance.

40

42 The Print Queue IOD has been classified as a Normalized IOD to allow operations by DIMSE-N
Services since most devices which support the Print Queue Management SOP Class also support the
Basic Print Management Meta SOP Class in which the DIMSE-N Service Elements are used. This
facilitates efficient implementations of the Print Queue Management SOP Class.

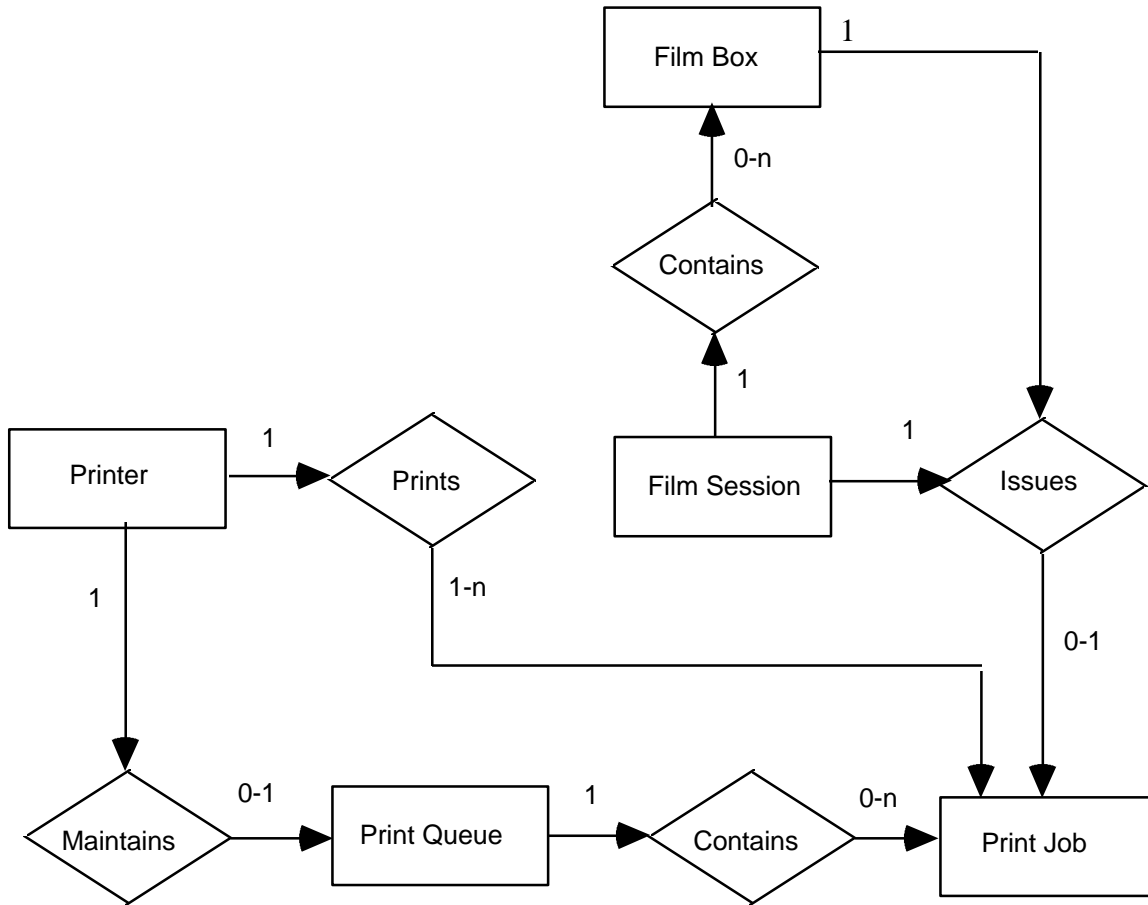
44

When an instance of a Normalized IOD is communicated, the context for that instance is not actually exchanged. Instead, the context is provided through the use of pointers to related Normalized IOD Instances.

The Normalized IODs are specified in Annex B of Part 3 of this Part.

Modify the DICOM Model of the Real World in Section 6

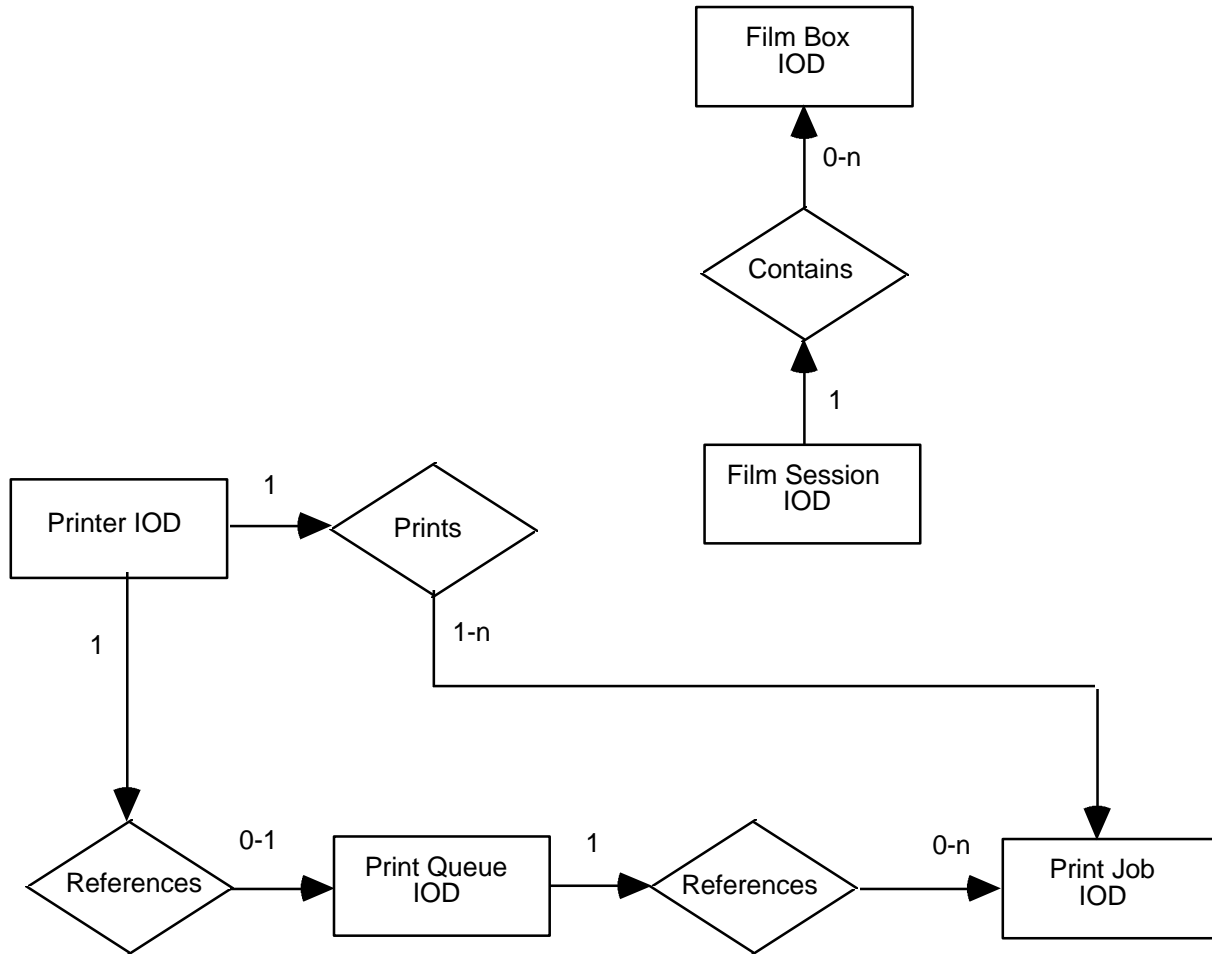
DICOM Model of the Real World



10

2

DICOM Information Model



4

Add Section B.15 Print Queue Information Object Definition

6 B.15 PRINT QUEUE INFORMATION OBJECT DEFINITION

B.15.1 IOD Description

8 The Print Queue IOD is an abstraction of a print queue. The Print Queue IOD is related to the Printer IOD, which corresponds to one printer or a group of printers (see also PS 3.4).

10

12 The Print Queue IOD describes the content and status of the queue. The Print Queue IOD contains a list of queue entries. A queue entry is an abstraction of the print job transaction and is the basic information entity to monitor the execution of the print process. A print job contains one film or multiple films, all
14 belonging to the same film session.

With the Print Queue IOD, an SCU can monitor all jobs in the queue. In addition, the SCU can manage jobs for which it knows the Owner ID.

4 B.15.2 IOD Modules

6 **Table A.14-1**
PRINT QUEUE IOD MODULES

Module	Reference
SOP Common Information	C.12.1.
General Queue Module	C.14.1
Print Queue Module	C.14.2

8 **Append the following entries to Table C.13-3: Basic Film Session Presentation Module**

10 C.13.1 Basic Film Session Presentation Module

12 **Table C.13-3**
BASIC FILM SESSION PRESENTATION MODULE

Attribute Name	Tag	Description
Owner ID	(2100, 0160)	Identification of the owner of the film session

14 **Add section C.14: Queue Management Specific Modules**

16 C.14 QUEUE MANAGEMENT SPECIFIC MODULES

C.14.1 General Queue Module

18 **Table C.14-1**
GENERAL QUEUE MODULE

Attribute Name	Tag	Description
Queue Status	(2120, 0010)	Status of the queue; Defined Terms: NORMAL = queue can accept new jobs FULL = queue is full, new jobs cannot be accepted, however existing jobs are being processed by the SCP HALTED = queue is halted (e.g. by a service person), new jobs cannot be accepted, existing jobs may or may not be processed and reprioritizing and deletion of jobs may or may not be accepted by the SCP

C.14.2 Print Queue Module

2

**Table C.14.2-1
PRINT GENERAL QUEUE MODULE**

Attribute Name	Tag	Description
Print Job Description Sequence	(2120, 0050)	A list of Attributes describing each Print Job in the queue. Zero or more items shall be included in this sequence. Items in this sequence shall be listed in the following order: Print Job now being printed Pending Print Jobs in the order in which they are expected to be printed Any Print Jobs which have failed and will not be printed Any Print Jobs which have been successfully completed It is not a requirement that the SCP maintain a record and report failed and completed jobs. However, it may choose to maintain and report on these Print Jobs for some time after the Print Jobs have been completed or failed.
>Print Job ID	(2100, 0010)	Human readable identification of the Print Job. The ID shall be unique in the context of the Print Job Sequence.
>Execution Status	(2100, 0020)	See Execution Status in Section C.13.8
>Execution Status Info	(2100, 0030)	See Execution Status Info in Section C.13.8
>Creation Date	(2100, 0040)	Date of print job creation
>Creation Time	(2100, 0050)	Time of print job creation
>Print Priority	(2000, 0020)	See Table C.13-1.
>Origin AE	(2100, 0070)	DICOM Application Entity Title that issued the print job
>Destination AE	(2100, 0140)	DICOM Application Entity Title that performs the print job
>Printer Name	(2110, 0030)	User defined name identifying the printer
>Film Destination	(2000, 0040)	See Table C.13-1.
>Film Session Label	(2000,0050)	Human readable label that identifies the film session
>Owner ID	(2100, 0160)	Identification of the owner of the film session
>Medium Type	(2000, 0030)	See Table C.13-1.
>Number Of Films	(2100, 0170)	Number of films in print job (= number of films in film session times number of copies)
>Referenced Print Job Sequence	(2120, 0070)	A sequence which provides references to the corresponding Print Job SOP Class/Instance pair. Only a single Item shall be permitted in this sequence.
>>Referenced SOP Class UID	(0008, 1150)	Uniquely identifies the Referenced SOP Class.
>>Referenced SOP Instance UID	(0008, 1155)	Uniquely identifies the Referenced SOP Instance.

Part 4 Service Class Specifications

Modify Section 6.1.2 as shown.

6.1.2 Normalized IOD

A Normalized IOD is an Information Object Definition which generally represents a single entity in the DICOM Model of the Real-World. Such an IOD includes Attributes which are only inherent in the Real-World Object that the IOD represents.

In this Standard, strict definition of Normalized Object Definitions has been not been applied. Application of strict definitions would often result in unnecessary complexity and reduced performance of implementations for several applications.

Modify the DICOM Model of the Real World in Section 7 as shown in the Part 3 modifications of this Supplement

Modify the DICOM Information Model in Section 7 as shown in the Part 3 modifications of this Supplement

Add the following entry to section H.4.1.2.1.1: N-CREATE attributes of Basic Film Session SOP Class

H.4.1.2.1 N-CREATE

Table H.4-2
N-CREATE ATTRIBUTE LIST

Attribute Name	Tag	Usage SCU/SCP
Owner ID	(2100, 0160)	U/U

Note: Owner ID (2100,0160) is a user option for the Basic Film Session. However, SCUs that also implement the Print Queue Management Service Class are required to supply Owner ID to successfully delete or re-prioritize Print Jobs in the printer queue (see section 1.5.2.3.1).

Add the following to H.4.1.2.4.1 and H.4.2.2.4.1

H.4.1.2.4.1 Attributes

The arguments of the N-ACTION are defined in Table H.4-3.

The Action Reply argument is encoded as a DICOM Data Set. The Data Set only contains the Attribute Referenced Print Job Sequence (2100,0500) which includes the Referenced SOP Class UID (0008,1150) and the Referenced SOP Instance UID (0008,1155).

If the SCP supports the Print Job SOP Class or Print Queue Management , the Action Reply argument is contained in the N-ACTION response. Otherwise, the Action Reply is not contained in the N-ACTION response.

**Table H.4-3
N-ACTION ARGUMENTS**

Action Type Name	Action Type ID	Attribute	Tag	Usage SCU/SCP
PRINT	1	Referenced Print Job Sequence	(2100,0500)	-/MC (Required if Print Job SOP Class is supported)
		>Referenced SOP Class UID	(0008,1150)	-/MC (Required if Referenced Print Job Sequence (2100,0500) is present)
		>Referenced SOP Instance UID	(0008,1155)	-/MC (Required if Referenced Print Job Sequence (2100,0500) is present)
		>Print Job ID	(2100,0010)	-/MC (Required if Print Queue Management SOP Class is supported)

H.4.2.2.4.1 Attributes

The arguments of the N-ACTION are defined as shown in Table H.4-8.

The Action Reply argument is encoded as a DICOM Data Set. The Data Set only contains the Attribute Referenced Print Job Sequence (2100,0500) which includes the Referenced SOP Class UID (0008,1150) and the Referenced SOP Instance UID (0008,1155).

If the SCP supports the Print Job SOP Class or Print Queue Management , the Action Reply argument is contained in the N-ACTION response. Otherwise, the Action Reply is not contained in the N-ACTION response.

**Table H.4-8
N-ACTION ARGUMENTS**

Action Type Name	Action Type ID	Attribute	Tag	Usage SCU/SCP
PRINT	1	Referenced Print Job Sequence	(2100,0500)	-/MC (Required if Print Job SOP Class is supported)
		>Referenced SOP Class UID	(0008,1150)	-/MC (Required if Referenced Print Job Sequence (2100,0500) is present)
		>Referenced SOP Instance UID	(0008,1155)	-/MC (Required if Referenced Print Job Sequence (2100,0500) is present)
		>Print Job ID	(2100,0010)	-/MC (Required if Print Queue Management SOP Class is supported)

2

Add Print Job ID to the table in section H.4.5.2.1.1 N-EVENT-REPORT.
--

2 H.4.5.2.1 N-EVENT-REPORT

4 **Table H.4-14**
NOTIFICATION EVENT INFORMATION

Event type Name	Event type ID	Attribute	Tag	Usage SCU/SCP
PENDING	1	<u>Print Job ID</u>	(2100, 0010)	U/MC (Required if Print Queue Management SOP Class is supported)
		Printer Name	(2110, 0030)	U/U
		Film Session Label	(2000, 0050)	U/U
		Execution Status Info	(2100, 0030)	U/M
PRINTING	2	<u>Print Job ID</u>	(2100, 0010)	U/MC (Required if Print Queue Management SOP Class is supported)
		Printer Name	(2110, 0030)	U/U
		Film Session Label	(2000, 0050)	U/U
		Execution Status Info	(2100, 0030)	U/M
DONE	3	<u>Print Job ID</u>	(2100, 0010)	U/MC (Required if Print Queue Management SOP Class is supported)
		Printer Name	(2110, 0030)	U/U
		Film Session Label	(2000, 0050)	U/U
		Execution Status Info	(2100, 0030)	U/M
FAILURE	4	<u>Print Job ID</u>	(2100, 0010)	U/MC (Required if Print Queue Management SOP Class is supported)
		Printer Name	(2110, 0030)	U/U
		Film Session Label	(2000, 0050)	U/U
		Execution Status Info	(2100, 0030)	U/M

6

Add Film Destination to the table in section H.4.6.2.1.1 N-EVENT-REPORT Attributes of Printer SOP Class

2 H.4.6.2.1 N-EVENT-REPORT

4 **Table H.4-16**
NOTIFICATION EVENT INFORMATION

Event type Name	Event type ID	Attribute	Tag	Usage SCU/SCP
NORMAL	1			
WARNING	2	Printer Name	(2110, 0030)	U/U
		Film Destination	(2000, 0040)	U/U
		Printer Status Info	(2110, 0020)	U/M
FAILURE	3	Printer Name	(2110, 0030)	U/U
		Film Destination	(2000, 0040)	U/U
		Printer Status Info	(2110, 0020)	U/M

6 Add Annex I: Queue Management Service Class

Annex I (Normative) Queue Management Service Class

8 I.1 SCOPE

10 The Queue Management Service Class defines an application-level class-of-service which facilitates the management of queues in a network. The Queue Management Service Class covers the following functions:

- 12 - request and monitor the content of a queue
- 14 - manipulate the content of a queue (e.g. prioritize jobs, delete queue entry)

16 The Queue Management Service Class covers a set of application specific queues (e.g. printer queue) which all share a similar behavior.

20 I.2 ASSOCIATION NEGOTIATION

22 The Queue Management Service Class uses an association which may be the same or different from the association that controls the corresponding server (e.g. Print Management SCP).

24 Note: There is a 1-to-1 relation between the Queue Management Service Class Provider and the
26 corresponding server (e.g. Print Management SCP).

28 The association negotiation procedure is used to negotiate the supported SOP Classes. PS 3.7 specifies the association procedure.

30 The Queue Management Service Class does not support extended negotiation.

2 The release of an association shall not have any effect on the contents of the queue.

4 **I.3 CONFORMANCE STATEMENT**

6 A Conformance Statement for the implementation of this SOP Classes shall follow PS 3.2.

8 The SCU Conformance Statement shall specify the following items:

- 10 - the maximum number of supported associations at the same time
- 12 - a list of supported SOP Classes
- 14 - for each of the supported SOP Classes, a list of supported optional SOP Class attributes and
DIMSE Service Elements
- 16 - for each supported N-EVENT-REPORT Service Element, a list of supported Event Type IDs
- 18 - for each supported N-ACTION Service Element, a list of supported Action Type IDs
- 20 - for each supported mandatory and optional attribute, the valid range of values

22 The SCP Conformance Statement shall specify the following items:

- 24 - the maximum number of supported associations at the same time
- 26 - a list of supported SOP Classes
- 28 - whether restoration of the queue occurs at power-on: yes or no
- 30 - the behavior of N-ACTION Service Element (whether the priority of a job can be changed or
32 whether the job can be deleted while the job is being processed)
- 34 - for each of the supported SOP Classes, a list of supported optional SOP Class attributes and
DIMSE Service Elements
- 36 - for each supported N-EVENT-REPORT Service Element, a list of supported Event Type IDs
- 38 - for each supported N-ACTION Service Element, a list of supported Action Type IDs
- 40 - for each supported mandatory and optional attribute:
 - 42 - the valid range of values
 - 44 - the default value if no value is supplied by the SCU
- 46 - the status code (FAILURE or WARNING) if a SCU supplies a value which out of range
- 48 - for each supported DIMSE service, the SCP behavior for all specific status codes

50

I.4 PRINT QUEUE MANAGEMENT SOP CLASS DEFINITION

2 The Print Queue Management SOP Class allows SCUs to:

- 4 - monitor the status of the print queue
- 6 - obtain information about all the jobs in the queue
- 8 - delete and change the priority of jobs for which it knows the Owner ID

10 The Print Job SOP Class shall be supported by SCPs in conjunction with this SOP Class.

12 Note: SCUs may choose to not support the Print Job SOP Class. If they do not, they will not receive notification of the Print Job UID and the Print Job ID when the job is submitted to the queue.

I.4.1 Information Object Description

16 The Print Queue IOD is an abstraction of a queue of one printer or of a group of printers. The Print Queue IOD is related to the Printer IOD, which describes the printer or the group of printers.

18 The Print Queue Management SOP Instance is created by the SCP during start-up of the device managing the queue and has a well-known SOP Instance UID.

22 The Print Queue IOD describes the content and status of the queue. It contains a list of queue entries. A queue entry is an abstraction of the Print Job transaction and is the basic information entity to monitor the execution of the print process. A Print Job contains one film or multiple films, all belonging to the same Film Session.

26 Print jobs are added to the queue by the SCP as a result of the SCU's N-ACTION on a Film Session or Film Box. Print jobs may be removed from the queue by the SCP when they are successfully printed or successfully deleted as a result of the SCU's N-ACTION=DELETE.

30 It is not a requirement that the SCP maintain a record and report failed and completed jobs. However, it may choose to maintain and report on these Print Jobs for some time after the Print Jobs have been completed or failed.

I.4.2 DIMSE Service Group

36 The DIMSE Services applicable to the IOD are shown in Table I.4-1.

38 **Table I.4-1**
DIMSE SERVICE GROUP

DIMSE Service Element	Usage SCU/SCP
N-EVENT-REPORT	M/M
N-GET	U/M
N-ACTION	U/M

40 The meaning of the Usage SCU/SCP is described in section H.2.4.

42 This section describes the behavior of the DIMSE Services, which are specific for this Information Object.

44 The general behavior of the DIMSE services is specified in PS 3.7.

I.4.2.1 N-EVENT-REPORT

2 The N-EVENT-REPORT Service Element is used to report execution status changes to the SCU in an asynchronous way.

I.4.2.1.1 Attributes

6 The arguments of the N-EVENT-REPORT Service Element are defined in table I.4-2.

8 **Table I.4-2**
N-EVENT-REPORT ATTRIBUTES

Event type Name	Event type ID	Description	Attribute	Tag	Usage SCU/ SCP
HALTED	1	Queue operation is halted	-	-	U/M
FULL	2	Queue is full	-	-	U/M
NORMAL	3	Queue is operational	-	-	U/M

10 The Notification Event Information attributes are encoded as a data set.

12 PS 3.2 allows the return of any standard Attribute of the SOP Class that is the subject of an
14 N-EVENT REPORT whether or not the Attribute is listed in the N-EVENT REPORT Attributes Table. In
16 the case of N-EVENT REPORT for the Print Queue Management SOP Class, SCPs shall not return
Owner ID (2100,0160) regardless of whether the SCU requested it or not.

18 Note: The reason SCPs are not to return Owner ID is to minimize the chance of non-authorized entities
deleting or re-prioritizing Print Jobs in the print queue.

I.4.2.1.2 Behavior

22 The SCP shall use the N-EVENT-REPORT Service Element to inform the SCU about a change of the
queue status.

24 The SCP shall only use the N-EVENT-REPORT Service Element within the context of an Association that
26 supports the Print Queue SOP Instance

Notes

1. In the case the Print Queue SOP Instance is supported by multiple associations at the same time,
30 then the Event Type may be multi-casted over these active associations.
2. The ability of the SCP to establish an Association to convey the N-EVENT-REPORT is not
32 supported.
3. An SCU may choose to support both the Print Queue Management SOP Class and the Print Job
34 SOP Class. If both SOP Classes are supported and the Association(s) on which the SCU and the SCP
36 are communicating, are open, the SCU could receive two N-EVENT REPORTs when a change in the
38 queue status occurs. One will indicate the change to the specific Print Job submitted by the SCU. The
other will indicate the change the to Print Queue.

40 The SCU shall return the confirmation from the N-EVENT-REPORT operation.

I.4.2.2 N-GET

44 The N-GET Service Element is used to retrieve an instance of the Print Queue Management SOP Class.

I.4.2.2.1 Attributes

2 The arguments of the N-GET Service Element are defined in table I.4-3.

4

**Table I.4-3
N-GET ATTRIBUTES**

Attribute Name	Tag	Usage SCU/SCP
Queue Status	(2120, 0010)	U/M
Print Job Description Sequence	(2120, 0050)	U/MC (Required if one or more Print Jobs are in the queue)
>Print Job ID	(2100, 0010)	U/MC (Required if the sequence is present)
>Execution Status	(2100, 0020)	U/MC (Required if the sequence is present)
>Execution Status Info	(2100, 0030)	U/MC (Required if the sequence is present)
>Creation Date	(2100, 0040)	U/U
>Creation Time	(2100, 0050)	U/U
>Print Priority	(2000, 0020)	U/MC (Required if the sequence is present)
>Origin AE	(2100, 0070)	U/U
>Destination AE	(2100, 0140)	U/U
>Printer Name	(2110, 0030)	U/MC (Required if the sequence is present)
>Film Destination	(2000, 0040)	U/U
>Film Session Label	(2000,0050)	U/U
>Medium Type	(2000, 0030)	U/U
>Number Of Films	(2100, 0170)	U/U
>Referenced Print Job Sequence	(2120, 0070)	U/MC (Required if the sequence is present)
>>Referenced SOP Class UID	(0008, 1150)	U/MC (Required if the sequence is present)
>>Referenced SOP Instance UID	(0008, 1155)	U/MC (Required if the sequence is present)

6

The meaning of the Usage SCU/SCP is described in section H.2.4.

8

Note: Attribute Print Job ID (2100,0010) identifies the print job. It is supplied by the print management SCP and contained in the Action Reply to the N-ACTION that caused the print job to be entered into the print queue.

10

12

PS 3.2 allows the return of any standard Attribute of the SOP Class that is the subject of an N-GET whether or not the Attribute is listed in the N-GET Attributes Table. In the case of N-GET for the Print Queue Management SOP Class, SCPs shall not return Owner ID (2100,0160) regardless of whether the SCU requested it or not.

14

16

18

Note: The reason SCPs are not to return Owner ID is to minimize the chance of non-authorized entities deleting or re-prioritizing Print Jobs in the print queue.

2 **I.4.2.2.2 Status Info**

Status Information is defined in PS 3.3. Implementation specific warning and error codes shall be defined in the Conformance Statement.

6 **I.4.2.2.3 Behavior**

The SCU uses the N-GET Service Element to request the SCP to get a Print Queue SOP Instance. The SCU shall specify the well-known UID of the Print Queue SOP Instance.

10 The SCP shall return the values for the specified attributes of the specified SOP Instance as defined in Table I.4-3.

12 The SCP shall return the status code of the requested SOP Instance retrieval.

14 A Queue Status value of FULL indicates that new jobs cannot be accepted at this time, but that jobs in the queue are being processed and new jobs will be accepted at a later time without human intervention.

18 A Queue Status value of HALTED indicates that no new jobs are being accepted for some other reason, for instance printer service. Existing jobs may or may not be processed and reprioritizing and deletion of jobs may or may not be accepted by the SCP.

22 A Failure status code shall indicate that the SCP has not retrieved the SOP Instance.

24 **I.4.2.3 N-ACTION**

The N-ACTION Service Element is used to manipulate the queue content.

26 **I.4.2.3.1 Attributes**

28 The arguments of the N-ACTION Service Element are defined in table I.4-4.

30 **Table I.4-4
N-ACTION ATTRIBUTES**

Action type Name	Action type ID	Description	Attribute	Tag	Usage SCU/SCP
PRIORITIZE	1	Change priority of queue entry	Print Job ID	(2100,0010)	M/M
			Print Priority	(2000,0020)	M/M
			Owner ID	(2100,0160)	M/M
DELETE	2	Delete queue entry	Print Job ID	(2100, 0010)	M/M
			Owner ID	(2100, 0160)	M/M

32 Note: Owner ID (2100,0160) is user option for the Basic Film Session (see section H.4.1.2.1). However, SCUs, who implement the Print Queue Management SOP Class are required to supply Owner ID to successfully delete or re-prioritize Print Jobs in the printer queue.

36 The ACTION INFORMATION arguments and ACTION REPLY arguments are encoded as a DICOM data set.

1.4.2.3.2 Status

2 The status values which are specific for this SOP Class are defined as follows:

Status	Meaning	Code
Success	Operation successfully completed	0000
Failure	Print queue is halted (no new jobs are being accepted, N-ACTIONS may or may not be processed by the SCP)	C651
	Mismatch of owner IDs	C652
	Action failed because the job was in process	C653

4

1.4.2.3.3 Behavior

6 The SCU may use the N-ACTION Service Element to request the SCP to perform actions on one print job of the queue, associated to a particular printer.

8

Note: The Standard does not specify whether the SCP must be capable of deleting or re-prioritizing jobs that are in process. This is specified in the SCP Conformance Statement.

10

12 The SCP shall only perform the requested operation if the Owner ID in N-ACTION attribute corresponds with the Owner ID of the corresponding print job; otherwise the SCP shall reject the operation.

14

In the case of a successful N-ACTION=DELETE, the Print Job shall not be printed.

16

18 In the case of a successful N-ACTION=PRIORITIZE, the Print Job shall be printed in the order that would have occurred if a new Print Job with the new priority had been entered into the queue at the time the SCP processed the N-ACTION=PRIORITIZE.

20

The SCP shall return the status code of the requested operation. A Failure status code indicates that the requested operation has not been completed by the SCP.

22

24 1.4.3 SOP Class Definition and UID

The Print Queue Management SOP Class UID is "1.2.840.10008.5.1.1.26".

26

1.4.4 Reserved Identification

28 The well-known UID of the Print Queue SOP Instance is "1.2.840.10008.5.1.1.25".

Part 6 Data Dictionary

Add the following entries to the table of PS 3.6 section 6

2

Tag	Name	VR	VM
(2100, 0010)	Print Job ID	SH	1
(2100, 0140)	Destination AE	AE	1
(2100, 0160)	Owner ID	SH	1
(2100, 0170)	Number Of Films	IS	1
(2120, 0010)	Queue Status	CS	1
(2120, 0050)	Print Job Description Sequence	SQ	1
(2120, 0070)	Referenced Print Job Sequence	SQ	1

Add the following entries to the table of PS 3.6 annex A

4

UID Value	UID Name	UID Type	Part
1.2.840.10008.5.1.1.25	Print Queue SOP Instance	Well-known Print Queue SOP Instance	Part 4
1.2.840.10008.5.1.1.26	Print Queue Management SOP Class	SOP Class	Part 4