DICOM CONFORMANCE STATEMENT

**FOR
CANON RADIOLOGY INFORMATION SYSTEM**

RapideyeAgent™
VERSION V4.0

CANON MEDICAL SYSTEMS CORPORATION

Trademarks

RapideyeAgent is a trademark of Canon Medical Systems Corporation.
This document may include trademarks or registered trademarks of other companies.

IMPORTANT!

(1) No part of this document may be copied or reprinted, in whole or in part, without written permission.

(2) The contents of this document are subject to change without prior notice and without our legal obligation.

(3) Please refer to the Canon Medical Systems Corporation website for the most recent version of this conformance statement.
Global:https://www.medical.canon/Interoperability/DICOM/EN
Japan:https://www.medical.canon/Interoperability/DICOM/JP

1. CONFORMANCE STATEMENT OVERVIEW

Table 1-1 provides an overview of the network services supported by RapideyeAgent^{TM}.

Table 1-1
NETWORK SERVICES

SOP Classes	User of Service (SCU)	Provider of Service (SCP)
Verification		
Verification	No	Yes
Workflow Management		
Modality Worklist	No	Yes
Modality Performed Procedure Step	No	Yes

2. TABLE OF CONTENTS

3. INTRODUCTION

3.1 REVISION HISTORY

REV.	Date of Issue	Author	Description
Nil	July 17, 2015	TMSC	Initial version
A	October 15, 2015	TMSC	Update definitions, terms and abbreviations
			Update association acceptance policy of MWM SCP AE
			Update association acceptance policy of MPPS SCP AE
			Update supported N-CREATE/N-SET attributes for MPPS (Table 4.2-21)
			Update configuration parameters table (Table 4.4-3)
			Update tag lists for ISO-IR 87 (Table 6-1)
B	January 4, 2018	Canon Medical Systems	Change of company name
C	February 20, 2018	Canon Medical Systems	Change of Implementation Version Name
			Update modality worklist C-FIND SCP AE supported return key elements (Table 4.2-13)
			Update configuration parameters table (Table 4.4-3)

3.2 AUDIENCE

This document is intended for hospital staff, health system integrators, software designers or implementers. It is assumed that the reader has a working understanding of DICOM.

3.3 REMARKS

DICOM, by itself, does not guarantee interoperability. However, the Conformance Statement facilitates a first-level validation for interoperability between different applications supporting the same DICOM functionality.

This Conformance Statement is not intended to replace validation with other DICOM equipment to ensure proper exchange of information intended.

The scope of this Conformance Statement is to facilitate communication with Canon Medical Systems and other vendors' Medical equipment. The Conformance Statement should be read and understood in conjunction with the DICOM Standard [DICOM]. However, by itself it is not guaranteed to ensure the desired interoperability and a successful interconnectivity.

The user should be aware of the following important issues:
— The comparison of different conformance statements is the first step towards assessing interconnectivity between Canon Medical Systems and non- Canon Medical Systems equipment.
— Test procedures should be defined to validate the desired level of connectivity.
— The DICOM standard will evolve to meet the users' future requirements. Canon Medical Systems is actively involved in developing the standard further and therefore reserves the right to make changes to its products or to discontinue its delivery.

3.4   DEFINITIONS, TERMS AND ABBREVIATIONS

Definitions, terms and abbreviations used in this document are defined within the different parts of the DICOM standard.

Abbreviations and terms are as follows:

AE	Application Entity
MPPS	Modality Performed Procedure Step
MWM	Modality Worklist Management
PDU	Protocol Data Unit
SCU	Service Class User (DICOM client)
SCP	Service Class Provider (DICOM server)
SOP	Service-Object Pair
UID	Unique Identifier

3.5   REFERENCES

[DICOM] Digital Imaging and Communications in Medicine (DICOM), NEMA PS 3.1-3.20

4. NETWORKING

4.1 IMPLEMENTATION MODEL

4.1.1 Application Data Flow

Figure 4.1-1
APPLICATION DATA FLOW DIAGRAM

DICOM Standard Interface
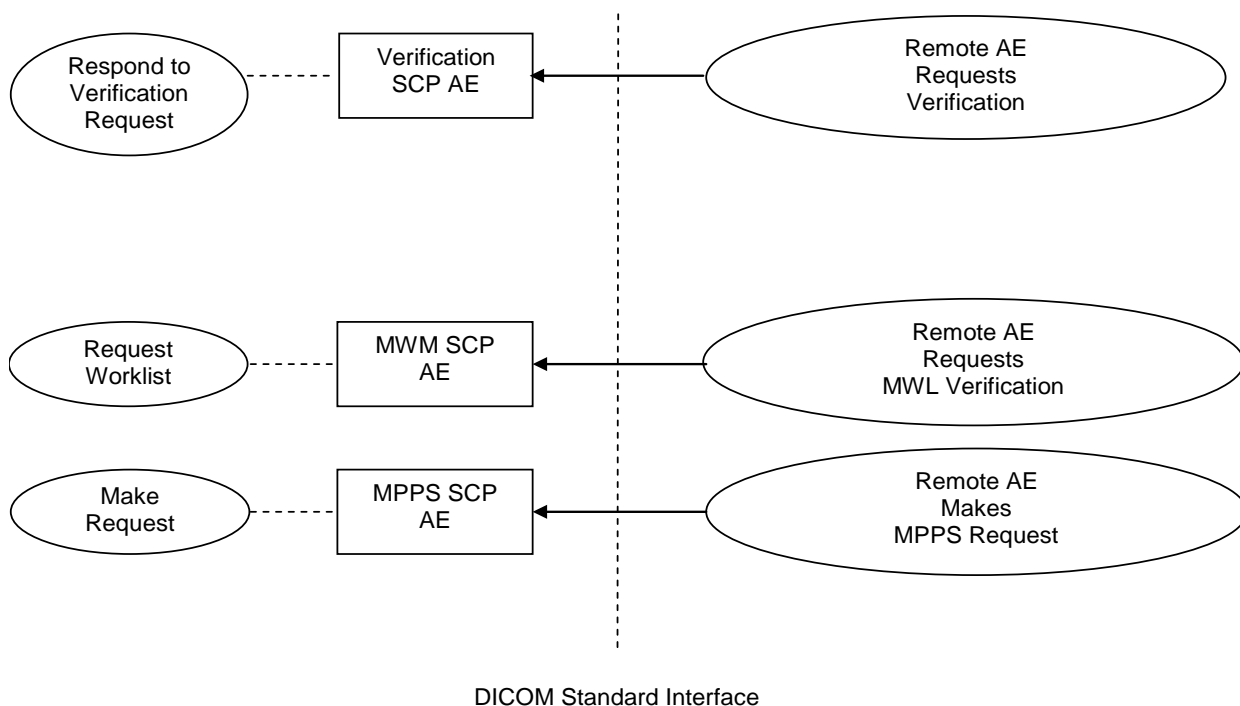
— The Verification SCP AE can respond to C-ECHO requests from the specified DICOM destination.

— The MWM SCP AE accepts Association Requests for Modality Worklist from MWL SCUs and responds to queries from these SCUs. When a query is received the MWM SCP AE engages in local real-world activity Scheduled Procedure Queries. This results in a set of matching responses that the MWM SCP AE returns to the MWL SCU.

— The MPPS SCP AE accepts Association Requests for Modality Performed Procedure Step from MPPS SCUs and responds to N-CREATE and N-SET Requests from these SCUs. When the N-SET request is made, with a Status of COMPLETED then an association is made between the DICOM Studies that were created, and the corresponding exams in the RIS database. The MPPS SCP AE then returns N-SET or N-CREATE status to the MPPS SCU.

4.1.2 Functional Definition of AEs

4.1.2.1   Functional Definition of Verification SCP AE

The Verification SCP AE waits for another application to connect at the presentation address configured for its Application Entity Title. The Verification SCP AE will accept Associations with Presentation Contexts for SOP Classes of the Verification Service Classes.

4.1.2.2   Functional Definition of MWM SCP AE

The MWM SCP AE waits for another application to connect at the presentation address configured for its Application Entity Title. When another application connects, MWM SCP AE expects it to be a DICOM application. The MWM SCP AE will accept Associations with Presentation Contexts for SOP Classes of the DICOM Modality Worklist Query Service Class. It will query the RIS database for a list of Scheduled Procedure Steps matching the query and will return a pending C-FIND response for each match.

4.1.2.3   Functional Definition of MPPS SCP AE

The MPPS SCP AE waits for another application to connect at the presentation address configured for its Application Entity Title. When another application connects, the MPPS SCP expects it to be a DICOM application. The MPPS SCP AE will accept Associations with Presentation Contexts SOP Classes of the DICOM Modality Performed Procedure Step Service Class and Verification Service Class. Reception of a MPPS N-CREATE or N-SET Request may result in updates to various tables in the RIS database and may result in changes to the tracking status of the Requested Procedure(s) referenced within the message.

4.1.3 Sequencing of Real-World Activities
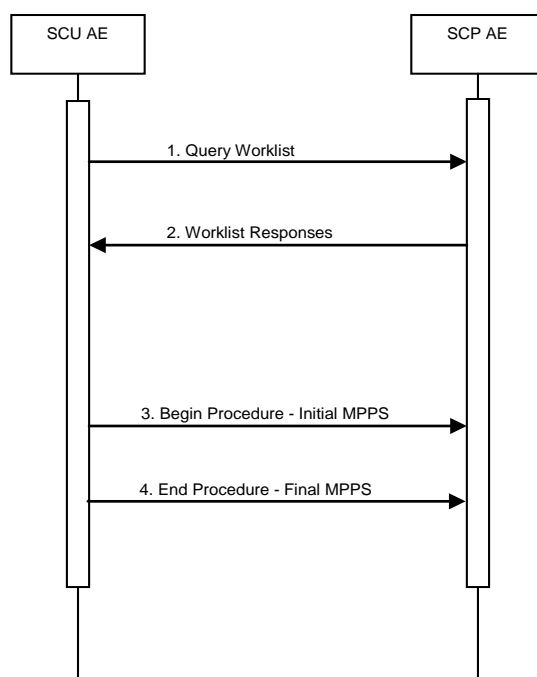
Figure 4.1-2
SEQUENCING CONSTRAINTS

Under typical scheduled workflow conditions the sequencing constraints illustrated in Figure 4.1-2 apply:
1. Query Worklist : The Modality queries for a worklist of Scheduled Procedure Steps

2. Worklist Responses : SCP AE searches its database and returns matches to the query

3. Begin Procedure - Initial MPPS : SCU AE begins performance of a Procedure Step and sends the MPPS N-CREATE

4. End Procedure - Final MPPS : SCU AE completes or discontinues the procedure and sends the MPPS N-SET with status of COMPLETE or DISCONTINUED

Other workflow situations (e.g. unscheduled procedure steps) will have other sequencing constraints. Some activities may be omitted according to situations.

4.2 AE SPECIFICATIONS

4.2.1 Verification SCP AE Specifications

4.2.1.1 SOP Class

The Verification SCP AE provides Standard Conformance to the following DICOM SOP classes:

Table 4.2-1
SOP CLASSES FOR VERIFICATION SCP AE

SOP Class Name	SOP Class UID	SCU	SCP
Verification	1.2.840.10008.1.1	No	Yes

4.2.1.2 Association Policies

4.2.1.2.1 General

The DICOM standard application context name for DICOM is always accepted.

Table 4.2-2
DICOM APPLICATION CONTEXTS FOR VERIFICATION SCP AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.1.2.2 Number of Associations

The Verification SCP AE accepts 5 Associations at a time.

Table 4.2-3
NUMBERS OF ASSOCIATIONS ACCEPTED FOR VERIFICATION SCP AE

Maximum Number of Simultaneous Associations	5

4.2.1.2.3 Asynchronous Nature

The Verification SCP AE does not support asynchronous communication (multiple incomplete transactions on a single association).

4.2.1.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

Table 4.2-4
DICOM IMPLEMENTATION CLASS AND VERSION FOR VERIFICATION SCP AE

Implementation Class UID	1.2.392.200036.9116.7.20.1
Implementation Version Name	CM_TRS_DCM_V1.0

4.2.1.3 Association Initiation Policy
The Verification SCP AE does not initiate Associations.

4.2.1.4   Association Acceptance Policy

4.2.1.4.1   Activity - Verify Connectivity

4.2.1.4.1.1   Description and Sequencing of Activity

ECHO-SCU AE initiates association through user control.
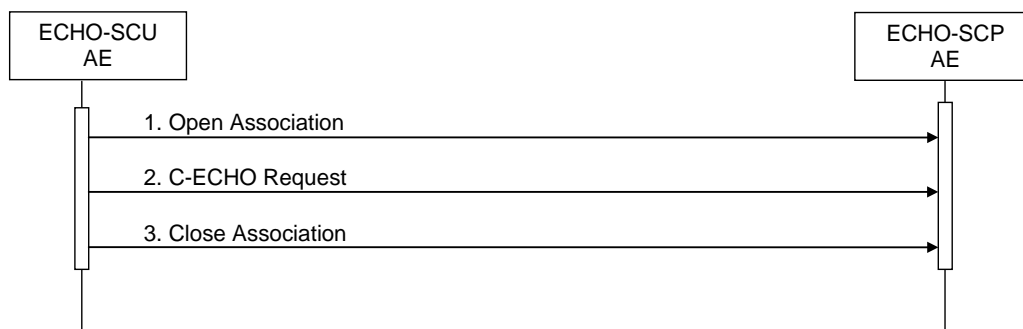
Figure 4.2-1
SEQUENCING OF ACTIVITY – VERIFY CONNECTIVITY

The following sequencing restrictions, illustrated in figure 4.2-1, apply when the ECHO-SCU AE:

1.   ECHO-SCU AE opens a new association with the specified destination AE.
2.   ECHO -SCU AE sends C-ECHO requests.
3.   ECHO -SCU AE closes the Association.

4.2.1.4.1.2 Accepted Presentation Contexts

The Verification SCP AE will accept Presentation Contexts as shown in the following table:

Table 4.2-5
ACCEPTED PRESENTATION CONTEXTS BY VERIFICATION SCP AE

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name	UID		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

4.2.1.4.1.3 SOP Specific Conformance for Verification SOP Class

The Verification SCP AE provides standard conformance to the Verification SOP Class as an SCP.

4.2.2 MWM SCP AE Specification

4.2.2.1 SOP Classes

The MWM SCP AE provides Standard Conformance to the following SOP Classes:

Table 4.2-6
SOP CLASSES FOR MWM SCP AE

SOP Class Name	SOP Class UID	SCU	SCP
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	No	Yes

4.2.2.2 Association Policies

4.2.2.2.1 General

The DICOM standard application context name for DICOM 3.0 is always accepted:

Table 4.2-7
DICOM APPLICATION CONTEXT FOR MWM SCP AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.2.2.2 Number of Associations

The MWM SCP AE supports 5 Associations at a time.

Table 4.2-8
NUMBER OF ASSOCIATIONS INITIATED FOR MWM SCP AE

Maximum number of simultaneous Associations	5

4.2.2.2.3 Asynchronous Nature

The MWM SCP AE does not support asynchronous communication (multiple incomplete transactions on a single association).

4.2.2.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

Table 4.2-9
DICOM IMPLEMENTATION CLASS AND VERSION FOR MWM SCP AE

| Implementation Class UID	1.2.392.200036.9116.7.20.1
Implementation Version Name	CM_TRS_DCM_V1.0

4.2.2.3   Association Initiation Policy

4.2.2.3.1   Activity – Update Worklist

4.2.2.3.1.1   Description and Sequencing of Activities

The MWM SCP AE accepts Associations only if they have valid Presentation Contexts.

If none of requested Presentation Contexts are accepted then the Association Request itself is rejected.

Only associations with Application Entity Titles of DICOM partner nodes will be accepted that are configured on the administration interface. If MWM SCP AE receives a query (C-FIND) request then the response(s) will be sent over the same Association used to send the C-FIND-Request.

```
  ┌──────────┐                                              ┌──────────┐
  │   MWM    │                                              │   MWM    │
  │  SCU AE  │                                              │  SCP AE  │
  └──────────┘                                              └──────────┘
       │                                                          │
       │            1. Open Association                           │
       │─────────────────────────────────────────────────────────▶│
       │            2. MWL C-FIND Request                         │
       │─────────────────────────────────────────────────────────▶│
       │            3a. 0 to N Pending C-FIND Responses           │
       │◀─────────────────────────────────────────────────────────│
       │                                                          │
       │            3b. Check for C-FIND Cancel Request       ┌──┐│
       │                                                      │  ││
       │                                                      └──┘│
       │            4. final C-FIND Response                      │
       │◀─────────────────────────────────────────────────────────│
       │            5. Close Association                          │
       │─────────────────────────────────────────────────────────▶│
       │                                                          │
```
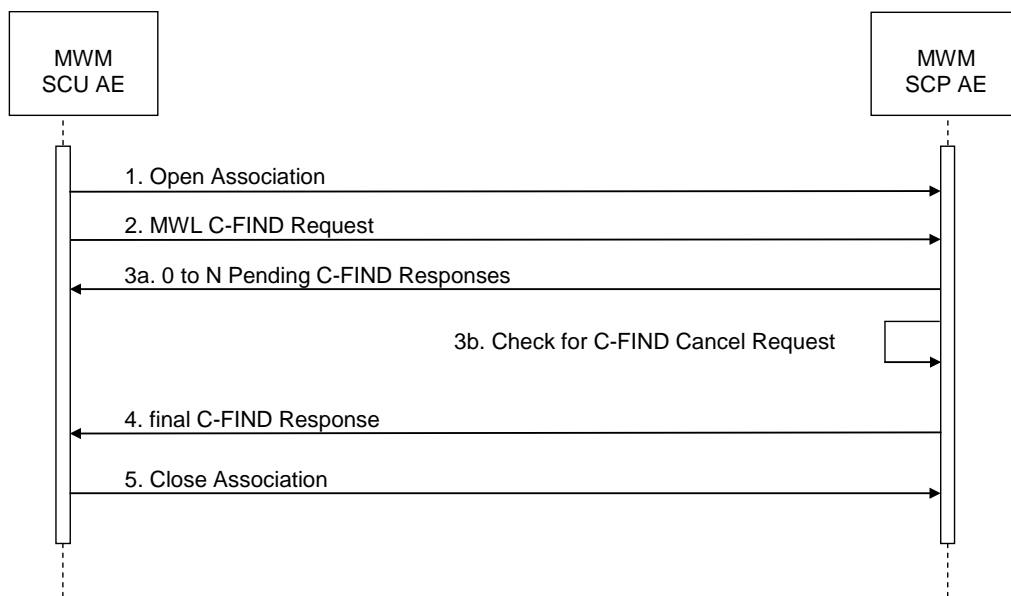
Figure 4.2-2
SEQUENCING DIAGRAM FOR ACTIVITY – CONFIGURED AE REQUESTS MWL QUERY

The following sequencing constraints illustrated in Figure 4.2-2 apply to the MWM SCP AE for handling Modality Worklist queries (C-FIND-Requests):

1. The MWM SCU AE opens an Association with the MWM SCP AE for the purpose of querying for a Modality Worklist

2. The MWM SCU AE sends an MWL C-FIND query to the MWM SCP AE

3. The MWM SCP AE queries its database using the attributes from the C-FIND Request and returns 0 to N C-FIND responses depending on matches returned from the database. The MWM SCP AE checks for a C-FIND Cancel Request after a configured number of responses are sent. If a Cancel is received then no further Pending responses are sent.

4. The MWM SCP AE sends the final C-FIND response

5. The MWM SCU AE closes the Association

4.2.2.3.1.2   Accepted Presentation Contexts

The MWM SCP AE will accept Presentation Contexts as shown in the following table:

Table 4.2-10
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY UPDATE WORKLIST

Presentation Context Table					
Abstract Syntax		**Transfer Syntax**		**Role**	**Ext. Neg.**
Name	**UID**	**Name List**	**UID List**		
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

4.2.2.3.1.3   SOP Specific Conformance for Modality Worklist SOP Class

The MWM SCP AE will return the Status Code values in C-FIND Responses as shown in the Table below.

Table 4.2-11
MODALITY WORKLIST C-FIND RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Status Code	Behavior
Success	Matching is complete	0000	The SCP has completed the matches. Worklist items are available for display or further processing.
Refused	Out of Resources	A700	The Association is aborted using A-ABORT and the worklist query is marked as failed. The status meaning is logged and reported to the user if an interactive query. Any additional error information in the Response will be logged.
Failed	Identifier does not match SOP Class	A900	The Association is aborted using A-ABORT and the worklist query is marked as failed. The status meaning is logged and reported to the user if an interactive query. Any additional error information in the Response will be logged.
Failed	Unable to Process	Cxxx	The Association is aborted using A-ABORT and the worklist query is marked as failed. The status meaning is logged and reported to the user if an interactive query. Any additional error information in the Response will be logged.
Cancel	Matching terminated due to Cancel request	FE00	If the query was cancelled due to too many worklist items then the SCP has completed the matches. Worklist items are available for display or further processing. Otherwise, the Association is aborted using A-ABORT and the worklist query is marked as failed. The status meaning is logged and reported to the user if an interactive query.
Pending	Matches are continuing	FF00	The worklist item contained in the Identifier is collected for later display or further processing.
Pending	Matches are continuing – Warning that one or more Optional Keys were not supported	FF01	The worklist item contained in the Identifier is collected for later display or further processing. The status meaning is logged only once for each C-FIND operation.
*	*	Any other status code	The Association is aborted using A-ABORT and the worklist is marked as failed. The status meaning is logged and reported to the user if an interactive query. Any additional error information in the Response will be logged.

The MWM SCP AE supports matching on the following elements.

Table 4.2-12
MODALITY WORKLIST SCP AE SUPPORTED MATCHING KEY ELEMENTS

Description / Module	Tag	Matching Key Type	Matching Type
Scheduled Procedure Step Sequence			
>Scheduled Procedure Step Sequence	(0040,0100)	Required	Sequence Matching.
>Scheduled station AE title	(0040,0001)	Required	Single Value Matching Only.
>Scheduled Procedure Step Start Date	(0040,0002)	Required	Single Value Matching or Range Matching.
>Scheduled Procedure Step Start Time	(0040,0003)	Required	Single Value Matching or Range Matching.
>Modality	(0008,0060)	Required	Single Value Matching.
>Scheduled Performing Physician's Name	(0040,0006)	Required	Single Value Matching or Wild Card Matching.
Patient Identification Module			
>Patient's Name	(0010,0010)	Required	Single Value Matching or Wild Card Matching.
>Patient ID	(0010,0020)	Required	Single Value Matching.

Note that Patient's Name in the MWM SCP is case-sensitive.

The MWM SCP AE supports the following elements as return key attributes.

Table 4.2-13
MODALITY WORKLIST C-FIND SCP AE SUPPORTED RETURN KEY ELEMENTS

Description / Module	Tag	Return Key Type	Types of Matching
SOP Common			
>Specific Character Set	(0008,0005)	1C	This attribute is required if expanded or replacement character sets are used.
Patient Identification Module			
>Patient's Name	(0010,0010)	1	Always Set
>Patient ID	(0010,0020)	1	Always Set
Patient Demographic Module			
>Patients Birth Date	(0010,0030)	2	Not Set when no entry is made
>Patient's Sex	(0010,0040)	2	Not Set when no entry is made
>Patient's Size	(0010,1020)	2	Not Set when no entry is made
>Patient's Weight	(0010,1030)	2	Not Set when no entry is made
>Patient Comments	(0010,4000)	3	Not Set when no entry is made

>Confidentiality Constraint on Patient Data Description	(0040,3001)	2	Always Set Length=0
Patient Medical Module			
>Medical Alerts	(0010,2000)	2	Always Set Length=0
>Contrast Allergies	(0010,2110)	2	Always Set Length=0
>Pregnancy Status	(0010,21C0)	2	Always Set Length=0
>Special Needs	(0038,0050)	2	Not Set when no entry is made
>Patient State	(0038,0500)	2	Always Set Length=0
Scheduled Procedure Step Module			
>Scheduled Procedure Step Sequence	(0040,0100)	1	Always Set
>Scheduled Station AE Title	(0040,0001)	1	Always Set
>Scheduled Procedure Step Start Date	(0040,0002)	1	Always Set
>Scheduled Procedure Step Start Time	(0040,0003)	1	Always Set
>Modality	(0008,0060)	1	Always Set
>Scheduled Performing Physician's Name	(0040,0006)	2	Not Set when no entry is made
> Requested Contrast Agent	(0032,1070)	2C	Always Set Length=0
>Scheduled Procedure Step Description	(0040,0007)	1C	Either The Scheduled Procedure Step Description(0040,0007) or The Scheduled Action Item Code Sequence(0040,0008) or Both Always Set.
>Scheduled Action Item Code Sequence	(0040,0008)	1C	Either The Scheduled Procedure Step Description(0040,0007) or The Scheduled Action Item Code Sequence(0040,0008) or Both Always Set.
>>Code Value	(0008,0100)	1C	Always Set if a Sequence Item is present.
>>Coding Scheme Version	(0008,0103)	3	Not Set when no entry is made
>>Coding Scheme Designator	(0008,0102)	1C	Always Set if a Sequence Item is present.
>>Code Meaning	(0008,0104)	3	Not Set when no entry is made
>Scheduled Procedure Step ID	(0040,0009)	1	Always Set
>Scheduled Station Name	(0040,0010)	2	Not Set when no entry is made
>Scheduled Procedure Step Location	(0040,0011)	2	Not Set when no entry is made
> Pre-Medication	(0040,0012)	2C	Always Set Length=0
Requested Procedure Module			
>Requested Procedure ID	(0040,1001)	1	Always Set
>Requested Procedure Code Sequence	(0032,1064)	1C	Either the Requested Procedure Description

			(0032,1060) or the Requested Procedure Code Sequence (0032,1064) or both always set.
>Code Value	(0008,0100)	1C	Always set if a Sequence Item is present.
>Coding Scheme Designator	(0008,0102)	1C	Always set if a Sequence Item is present.
>Coding Scheme Version	(0008,0103)	3	Length=0 when no entry is made
>Code Meaning	(0008,0104)	3	Length=0 when no entry is made
>Requested Procedure Description	(0032,1060)	1C	Either the Requested Procedure Description (0032,1060) or the Requested Procedure Code Sequence (0032,1064) or both always set.
>Study Instance UID	(0020,000D)	1	Always Set
>Requested Procedure Priority	(0040,1003)	2	Length=0 when no entry is made
>Patient Transport Arrangements	(0040,1004)	2	Always Set Length=0
>Referenced Study Sequence	(0008,1110)	2	Length=0 when no entry is made
> Referenced SOP Class UID	(0008,1150)	1C	Always set if a Sequence Item is present.
Imaging Service Request Module			
>Accession Number	(0008,0050)	2	Always Set
>Requesting Physician	(0032,1032)	2	Not Set when no entry is made
>Referring Physician's Name	(0008,0090)	2	Always Set Length=0
>Requesting Service	(0032,1033)	3	Not Set when no entry is made

4.2.2.4   Association Acceptance Policy

The MWM SCP accepts associations for the following events:

• Verification of the DICOM communication between a remote system and the MWM SCP AE.

• MWM C-Find query.

4.2.3 MPPS SCP AE Specification

4.2.3.1 SOP Classes

The MPPS SCP AE provides Standard Conformance to the following SOP Classes:

Table 4.2-14
SOP CLASSES FOR MPPS SCP AE

SOP Class Name	SOP Class UID	SCU	SCP
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	No	Yes

4.2.3.2 Association Policies

4.2.3.2.1 General

The DICOM standard application context name for DICOM 3.0 is always accepted:

Table 4.2-15
DICOM APPLICATION CONTEXT FOR MPPS SCP AE

Application Context Name	1.2.840.10008.3.1.1.1

4.2.3.2.2 Number of Associations

The MPPS SCP AE initiates 5 Associations at a time.

Table 4.2-16
NUMBER OF ASSOCIATIONS INITIATED FOR MPPS SCP AE

Maximum number of simultaneous Associations	5

4.2.3.2.3 Asynchronous Nature

The MPPS SCP AE does not support asynchronous communication (multiple outstanding transactions over a single Association).

4.2.3.2.4 Implementation Identifying Information

The implementation information for this Application Entity is:

Table 4.2-17
DICOM IMPLEMENTATION CLASS AND VERSION FOR MPPS SCP AE

Implementation Class UID	1.2.392.200036.9116.7.20.1
Implementation Version Name	CM_TRS_DCM_V1.0

4.2.3.3   Association Initiation Policy

4.2.3.3.1   Activity – Acquire Images

4.2.3.3.1.1   Description and Sequencing of Activities

The MPPS SCP AE accepts Associations only if they have valid Presentation Contexts. If none of requested Presentation Contexts are accepted then the Association Request itself is rejected. Only associations with Application Entity Titles of DICOM partner nodes will be accepted that are configured on the administration interface.
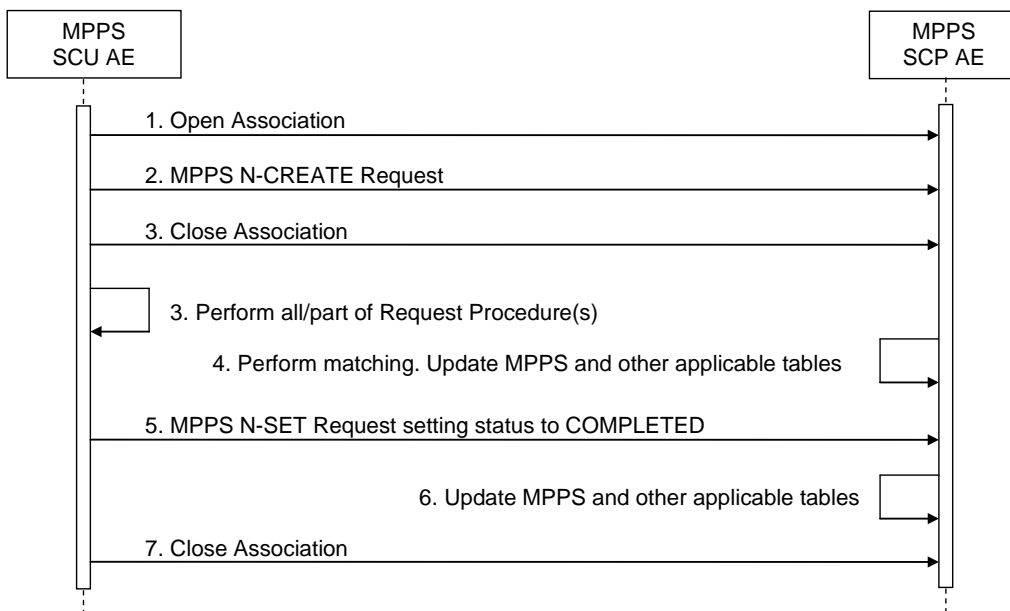
Figure 4.2-3
SEQUENCING DIAGRAM FOR ACTIVITY – CONFIGURED AE MAKES PROCEDURE STEP REQUEST

The following sequencing constraints illustrated in Figure 4.2-3 apply to the MPPS-SCP AE for handling MPPS Requests (N-CREATE-/N-SET-Requests):

1. The MPPS SCU AE opens an Association to update the MPPS SCP AE using MPPS

2. The MPPS SCU AE sends an N-CREATE Request to indicate that it is performing one or more Requested Procedures

3. The MPPS SCU AE performs all or part of the procedure(s)

4. The MPPS SCP AE stores the MPPS and executes the matching algorithm described in the conformance section below. If a successful match is found, then updates to various tables per the N-CREATE are performed. See Table C.4.2-21 for additional detail. In the matching case, the procedure state of the procedure(s) referenced in the MPPS is updated if so configured

5. The MPPS SCU AE sends an N-SET setting the status of the MPPS to COMPLETED

6. The MPPS SCP AE stores the MPPS. If the N-CREATE for this step matched then updates are performed as specified in step 4

7. The MPPS SCU AE closes the Association

4.2.3.3.1.2 Proposed Presentation Contexts

The MPPS SCP AE will accept Presentation Contexts as shown in the following Table:

Table 4.2-18
PROPOSED PRESENTATION CONTEXTS FOR ACTIVITY ACQUIRE IMAGES

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Ext. Neg.
Name	UID	Name List	UID List		
Modality Performed Procedure Step	1.2.840.10008.3.1.2.3.3	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

4.2.3.3.1.3 SOP Specific Conformance for MPPS SOP Class

The MPPS-SCP AE will return the Status Code values in N-CREATE/N-SET Responses as shown in the following table.

Table 4.2-19
MPPS N-CREATE / N-SET RESPONSE STATUS HANDLING BEHAVIOR

Service Status	Further Meaning	Status Code	Behavior
Success	Success	0000	The SCP has completed the operation successfully.
Failure	Processing Failure – Performed Procedure Step Object may no longer be updated	0110	The Association is aborted using A-ABORT and the MPPS is marked as failed. The status meaning is logged and reported to the user. Additional information in the Response will be logged (i.e. Error Comment and Error ID).
Warning	Attribute Value Out of Range	0106	The MPPS operation is considered successful if it is configured that the status would be considered successful.
*	*	Any other status code.	The Association is aborted using A-ABORT and the MPPS is marked as failed. The status meaning is logged and reported to the user.

The behavior of the MPPS SCP AE during communication failure is summarized in the Table below:

Table 4.2-20
MPPS COMMUNICATION FAILURE BEHAVIOR

Exception	Behavior
Timeout	The Association is aborted using A-ABORT and MPPS is marked as failed. The reason is logged and reported to the user.
Association aborted by the SCU or network layers	The MPPS is marked as failed. The reason is logged and reported to the user.

Table 4.2-21
SUPPORTED N-CREATE/N-SET ATTRIBUTES FOR MPPS

Attribute Name	Tag	N-CREATE	N-SET	Database Updates
SOP Common Module				
Specific Character Set	(0008,0005)	1C	1C	
Performed Procedure Step Relationship Module				
Scheduled Step Attribute Sequence	(0040,0270)	1	N	
>Study Instance UID	(0020,000D)	1	N	
>Referenced Study Sequence	(0008,1110)	2	N	
>>Referenced SOP Class UID	(0008,1150)	1	N	
>>Referenced SOP Instance UID	(0008,1155)	1	N	
>Accession Number	(0008,0050)	2	N	
>Placer Order Number/Imaging ServiceRequest	(0040,2016)	3	N	
>Filler Order Number/Imaging ServiceRequest	(0040,2017)	3	N	
>Requested Procedure ID	(0040,1001)	2	N	
>Requested Procedure Description	(0032,1060)	2	N	
>Scheduled Procedure Step ID	(0040,0009)	2	N	
>Scheduled Procedure Step Description	(0040,0007)	2	N	
>Scheduled Protocol Code Sequence	(0040,0008)	2	N	
>>Code Value	(0008,0100)	1	N	
>>Coding Scheme designator	(0008,0102)	1	N	
>>Coding Scheme Version	(0008,0103)	3	N	
>>Code Meaning	(0008,0104)	3	N	
Patient Name	(0010,0010)	2	N	
Patient ID	(0010,0020)	2	N	
Patient's Birth Date	(0010,0030)	2	N	
Patient's Sex	(0010,0040)	2	N	
Referenced Patient Sequence	(0008,1120)	2	N	
>Referenced SOP Class UID	(0008,1150)	1	N	
>Referenced SOP Instance UID	(0008,1155)	1	N	
Performed Procedure Step Information				
Performed Procedure Step ID	(0040,0253)	1	N	
Performed Station AE Title	(0040,0241)	1	N	
Performed Station Name	(0040,0242)	2	N	
Performed Location	(0040,0243)	2	N	
Performed Procedure Step Start Date	(0040,0244)	1	N	
Performed Procedure Step Start Time	(0040,0245)	1	N	
Performed Procedure Step Status	(0040,0252)	1	1	
Performed Procedure Step Description	(0040,0254)	2	2	

Attribute Name	Tag	N-CREATE	N-SET	Database Updates
Performed Procedure Type Description	(0040,0255)	2	2	
Procedure Code Sequence	(0008,1032)	2	2	
>Code Value	(0008,0100)	1	1	
>Coding Scheme Designator	(0008,0102)	1	1	
>Coding Scheme Version	(0008,0103)	3	3	
>Code Meaning	(0008,0104)	3	3	
Performed Procedure Step End Date	(0040,0250)	2	1	
Performed Procedure Step End Time	(0040,0251)	2	1	
Comments on the Performed Procedure Step	(0040,0280)	3	3	
Image Acquisition Results				
Modality	(0008,0060)	1	N	
Study ID	(0020,0010)	2	N	
Performed Protocol Code Sequence	(0040,0260)	2	2	
>Code Value	(0008,0100)	1	1	
>Coding Scheme Designator	(0008,0102)	1	1	
>Coding Scheme Version	(0008,0103)	3	3	
>Code Meaning	(0008,0104)	3	3	
Performed Series Sequence	(0040,0340)	2	1	
>Performing Physician's Name	(0008,1050)	2	2	
>Protocol Name	(0018,1030)	1	1	
>Operator's Name	(0008,1070)	2	2	
>Series Instance UID	(0020,000E)	1	1	
>Series Description	(0008,103E)	2	2	
>Retrieve AE Title	(0008,0054)	2	2	
Referenced Image Sequence	(0008,1140)	2	2	
>>Referenced SOP Class UID	(0008,1150)	1	1	
>>Referenced SOP Instance UID	(0008,1155)	1	1	
>Referenced Standalone SOP InstanceSequence	(0040,0220)	2	2	
>>Referenced SOP Class UID	(0008,1150)	1	1	
>>Referenced SOP Instance UID	(0008,1155)	1	1	
Radiation Dose				
Anatomic Structure, Space or RegionSequence	(0008,2229)	3	3	
>Code Value	(0008,0100)	3	3	
>Coding Scheme Designator	(0008,0102)	3	3	
>Coding Scheme Version	(0008,0103)	3	3	
>Code Meaning	(0008,0104)	3	3	
Total Time of Fluoroscopy	(0040,0300)	3	3	
Total Number of Exposures	(0040,0301)	3	3	
Distance Source to Detector	(0018,1110)	3	3	

Attribute Name	Tag	N-CREATE	N-SET	Database Updates
Distance Source to Entrance	(0040,0306)	3	3	
Entrance Dose	(0040,0302)	3	3	
Entrance Dose in mGy	(0040,8302)	3	3	
Exposed Area	(0040,0303)	3	3	
Image Area Dose Product	(0018,115E)	3	3	
Comments on Radiation Dose	(0040,0310)	3	3	
Exposure Sequence	(0040,030E)	3	3	
>Radiation Mode	(0018,115A)	3	3	
>KVP	(0018,0060)	3	3	
>X-Ray Tube Current in µA	(0018,8151)	3	3	
>X-Ray Tube Current in mA	(0018,1151)	3	3	
>Exposure Time	(0018,1150)	3	3	
>Filter type	(0018,1160)	3	3	
>Filter Material	(0018,7050)	3	3	
Billing and Material Management Code				
Film Consumption Sequence	(0040,0321)	3	3	
> Number of Films	(2100,0170)	3	3	
> Medium Type	(2000,0030)	3	3	
> Film Size ID	(2010,0050)	3	3	
Billing Supplies and Devices Sequence	(0040,0324)	3	3	
>Billing Item Sequence	(0040,0296)	3	3	
>>Code Value	(0008,0100)	3	3	
>>Coding Scheme Designator	(0008,0102)	3	3	
>>Coding Scheme Version	(0008,0103)	3	3	
>>Code Meaning	(0008,0104)	3	3	
>Quantity Sequence	(0040,0293)	3	3	
>>Quantity	(0040,0294)	3	3	
>>Measuring Units Sequence	(0040,0295)	3	3	
>>>Code Value	(0008,0100)	3	3	
>>>Coding Scheme Designator	(0008,0102)	3	3	
>>>Coding Scheme Version	(0008,0103)	3	3	
>>>Code Meaning	(0008,0104)	3	3	

* "N" stands for "Not allowed".

4.2.3.4 Association Acceptance Policy

The MPPS SCP accepts associations for the following events:

• Verification of the DICOM communication between a remote system and the MPPS SCP.

• Request to Create (N-CREATE) or Update (N-SET) a Performed Procedure Step.

4.3   NETWORK INTERFACES

4.3.1 Physical Network Interface

This Product supports a single network interface. One of the following physical network interfaces will be available depending on installed hardware options:

Table 4.3-1
SUPPORTED PHYSICAL NETWORK INTERFACES

Ethernet 1000baseT
Ethernet 100baseT

4.3.2 Additional Protocols

None.

4.4   CONFIGURATION

4.4.1 AE Title/Presentation Address Mapping

4.4.1.1   Local AE Titles

All local applications use the AE Titles and TCP/IP Ports configured by the Field Service Engineer via the Service/Installation Tool.

Table 4.4-1
AE TITLE CONFIGURATION TABLE

Application Entity	Default AE Title	Default TCP/IP Port
Verification SCP		
MWM SCP	CM_TRS_DCM_V1.0	104
MPPS SCP		

4.4.1.2   Remote AE Title/Presentation Address Mapping

The AE Titles, host names and port numbers of remote applications are configured using the Utility Tool. The system is case-insensitive for the AE Titles and configuration by the same AE Title is prohibited. The Table below shows the character repertoire of the AE Title.

Table 4.4-2
AE TITLE CHARACTER REPERTOIRE

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0x20	SP	!	"	#	$	%	&	'	(	)	*	+	,	-	.	/
0x30	0	1	2	3	4	5	6	7	8	9	:	;	<	=	>	?
0x40	@	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
0x50	P	Q	R	S	T	U	V	W	X	Y	Z	[	\	]	^	_
0x60	`	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
0x70	p	q	r	s	t	u	v	w	x	y	z	{			}	~	

4.4.2 Parameters

Parameters related to general operation can be configured using the Utility Tool. The Table below only shows those configuration parameters relevant to DICOM communication. See the Product's Service Manual for details on general configuration capabilities.

Table 4.4-3
CONFIGURATION PARAMETERS TABLE

Parameter	Configurable (Yes/No)	Default Value
General SCP Parameters		
TCP/IP Listen Port	Yes	104
Maximum PDU length [byte]	No	16,384
Maximum number of DICOM connections	No	15
DICOM Timeout [sec]	Yes	30 (0-60)
Modality Worklist SCP AE Parameters		
Application Entity Title	Yes	CM_TRS_DCM_V1.0
MPPS SCP AE Parameters		
Application Entity Title	Yes	CM_TRS_DCM_V1.0

5. MEDIA INTERCHANGE

RapideyeAgent does not support Media Storage.

6. SUPPORT OF CHARACTER SETS

This product supports the following character sets:

・ISO-IR 6 (default)   ISO 646

・ISO-IR 87 (Japanese)   JIS X 0208 (Kanji)

Character sets other than ISO-IR 6 can be set to the tags listed in the Table below;

Table 6-1
TAG LISTS FOR ISO-IR 87

Attribute Name	Tag	VR
Code Meaning	(0008,0104)	LO
Patient's Name	(0010,0010)	PN
Requesting Service	(0032,1033)	LO

7. SECURITY

This product does not support any specific security measures.

It is assumed that the product is used within a secured environment. It is assumed that a secured environment includes at a minimum:

a. Firewall or router protections to ensure that only approved external hosts have network access to the product.

b. Firewall or router protections to ensure that the product only has network access to approved external hosts and services.

c. Any communication with external hosts and services outside the locally secured environment use appropriate secure network channels (e.g. such as a Virtual Private Network (VPN))

Other network security procedures such as automated intrusion detection may be appropriate in some environments. Additional security features may be established by the local security policy and are beyond the scope of this conformance statement.

8. ANNEXES

8.1 DATA DICTIONARY OF PRIVATE ATTRIBUTES

RapideyeAgent does not use any private attributes.

8.1.1 Created SOP Instances

Not applicable to this product.

8.1.2 Usage of Attributes from received IODs

Not applicable to this product.

8.1.3 Attribute Mapping

Not applicable to this product.

8.1.4 Coerced/Modified Fields

Not applicable to this product.

8.2   DATA DICTIONARY OF PRIVATE ATTRIBUTES

Not applicable to this product.

8.3   CONTROLLED TERMINOLOGY AND TEMPLATES

Not applicable to this product.

8.4   GRAYSCALE IMAGE CONSISTENCY

Not applicable to this product.

8.5   STANDARD EXTENDED/SPECIALIZED/PRIVATE SOP CLASSES

Not applicable to this product.

8.6   PRIVATE TRANSFER SYNTAXES

Not applicable to this product.