

IQPACS SYNCRAD

DICOM 3.0 Conformance Statement

Revision history

Revision	Date	Description	Author
1	02-05-2003	Release	S.C. Info World S.R.L.

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C O N T E N T S

1. INTRODUCTION

- 1.1. Purpose of this document**
- 1.2. IQPACS SyncRad overview**
- 1.3. General acronyms, abbreviations and definitions**
- 1.4. Interoperability**
- 1.5. References**

2. IMPLEMENTATION MODEL

- 2.1. Application data flow diagram**
- 2.2. Functional definitions of the AE**
 - 2.2.1. Image transfer – STORAGE SCU**
 - 2.2.2. Receiving and storing images – STORAGE SCP**
- 2.3. Sequencing of Real-World Activities**

3. AE SPECIFICATIONS

- 3.1. SOP Classes**
- 3.2. Association Establishment Policies**
 - 3.2.1 General**
 - 3.2.2 Number of Associations**
 - 3.2.3 Asynchronous Nature**
- 3.3. Association Initiation Policy**
 - 3.3.1. Real World Activity: Request to verify a trusted node**
 - 3.3.1.1. Associated Real World Activity**

3.3.1.2 Presentation Contexts

3.3.2. Real World Activity: Request to Transfer Images

3.3.2.1 Associated Real World Activity

3.3.2.2 Presentation Contexts

3.4. Association Acceptance Policy

3.4.1. Real World Activity: Respond to Verification Request

3.4.1.1 Associated Real World Activity

3.4.1.2 Presentation Contexts

3.4.2. Real World Activity: Store Images

3.4.2.1 Associated Real World Activity

3.4.2.2 Presentation Contexts

3.5 Transfer Syntax Selection Policies

4. COMMUNICATION PROFILES

4.1. Supported Communications Stacks (parts 8, 9)

4.2. TCP/IP Stack

5. EXTENSIONS/SPECIALIZATIONS/PRIVATIZATIONS

6. CONFIGURATION

6.1. AE Title/Presentation Address Mapping

6.2. Configurable Parameters

7. SUPPORT OF EXTENDED CHARACTER SETS

8. CODES AND CONTROLLED TERMINOLOGY

1. INTRODUCTION

1.1. Purpose of this document

This document describes the conformance to the DICOM standard, version 3 for the **IQPACS SyncRad** application and follows the contents and structuring requirements of DICOM PS 3.2. InfoWorld is continually improving and enhancing the functionalities of its products based on customer requirements. This document is updated as appropriate.

1.2. IQPACS SyncRad overview

IQPACS SyncRad is mainly intended moving teleradiology messages between teleradiology users situated in different locations (the teleradiology messages are similar to email messages and they contain DICOM images).

The application uses DICOM as the interface to the external world. The IQPACS SyncRad accepts DICOM association requests for the purpose of storing images. It initiates DICOM association requests for the purpose of sending images to an external application entity.

1.3. General acronyms, abbreviations and definitions

AE – Application Entity

DB – Database

DICOM – Digital Imaging and Communications in Medicine

DICOM node = other DICOM compliant application entities with which communication can be established

DICOMDIR – DICOM directory

DIMSE – DICOM Message Service Element

DIMSE-C – DICOM Message Service Element – Composite

DIMSE-N – DICOM Message Service Element – Normalized

ID – Identifier

IQPACS – InfoMediQ Picture Archiving and Communication System

MPPS – Modality performed Procedure Step

PACS – Picture Archiving and Communication System

PDU – Protocol Data Unit

RIS – Radiology Information System

SCP – Service Class Provider

SCU – Service Class User

SOP – Service-Object Pair

TCP/IP – Transmission Control Protocol

Trusted node = see DICOM node

UID – Unique Identifier

1.4. Interoperability

This Conformance Statement and the DICOM standard do not guarantee interoperability of the IQPACS SyncRad with other vendors' applications or equipment. The user must compare the relevant DICOM Conformance Statements and if a successful interconnection should be possible, the user is responsible to specify an appropriate test suite and to validate the interoperability, which is required.

1.5. References

American College of Radiology – National Electrical Manufacturers Association (ACR-NEMA) Digital Imaging and Communications in Medicine – DICOM v3.0

2. IMPLEMENTATION MODEL

IQPACS SyncRad contains a single Application Entity that implements the Verification Service Class and the Storage Service Class as a Service Class User (SCU) and a Service Class Provider (SCP).

IQPACS SyncRad provides the following DICOM 3.0 functions:

- Verification of a link at the application level using the DICOM 3.0 verify service class as a SCP and SCU;
- Storage for images using the DICOM 3.0 Storage service class as a SCP;
- Sending images to other DICOM nodes in the network using the DICOM 3.0 Storage service class as a SCU;

2.1. Application data flow diagram

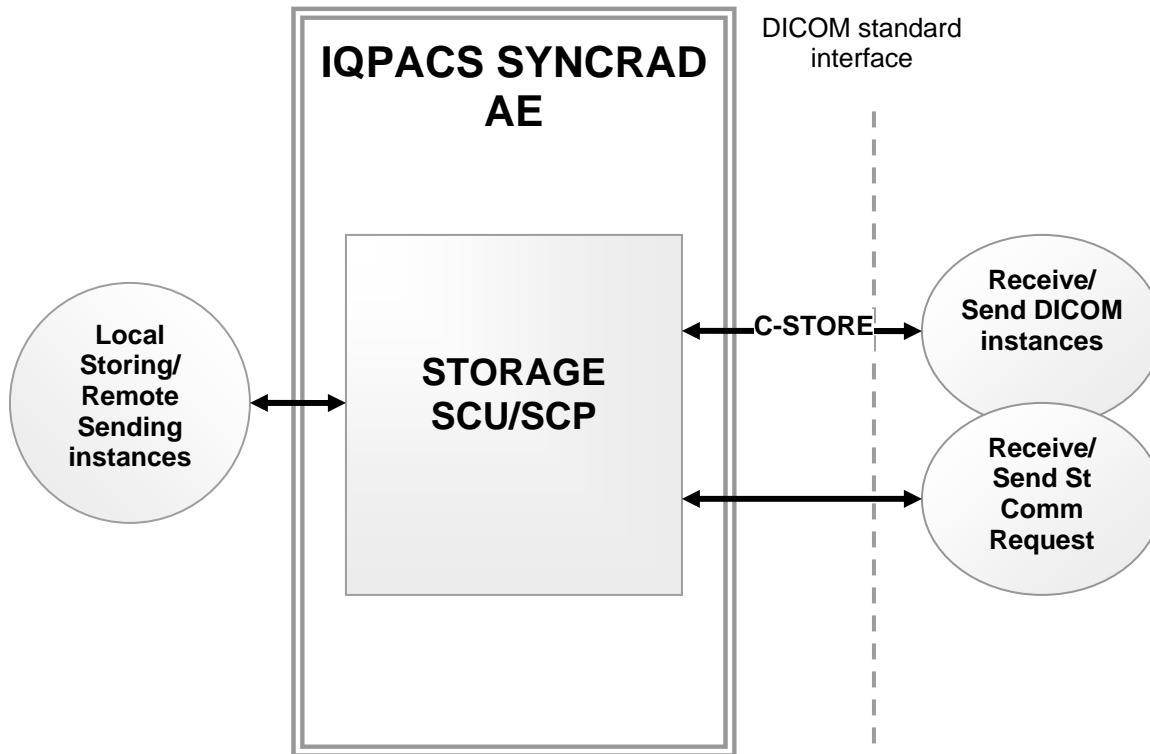


Figure 2.1. Application Data Flow Diagram

2.2. Functional definitions of the AE

IQPACS SyncRad acts as a service class provider (SCP) in the following roles:

1. SCP for C-Echo operations to Verification service class users
2. SCP for C-Store operations to Storage service class users

IQPACS SyncRad acts as a service class user (SCU) in the following roles:

1. SCU of C-Echo operations from Verification service class providers
2. SCU of C-Store operations from Storage service class providers

2.2.1. Verify – Verification SCU/SCP

In order to test a link to another DICOM AE, the IQPACS SyncRad requests verification of communication using the C-ECHO request primitive. Upon receipt of the C-ECHO confirmation, the IQPACS SyncRad determines the verification is complete.

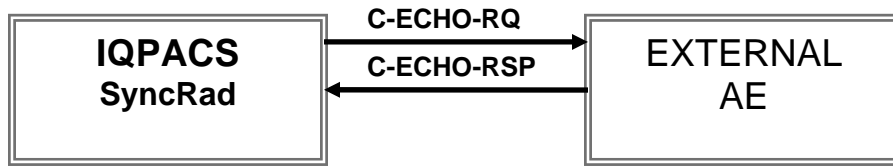


Figure 2.2. Verification SCU

When IQPACS SyncRad receives a request to verify a current DICOM association (C-ECHO-RQ), it responds with the C-ECHO-RSP primitive.

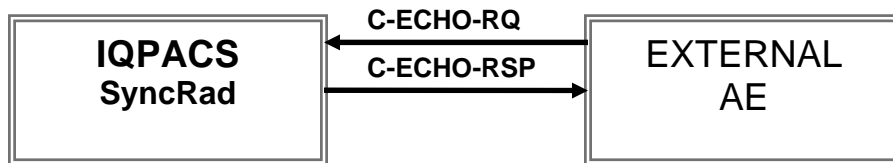


Figure 2.3. Verification SCP

2.2.2. Image transfer – STORAGE SCU

Storage SCU is responsible for transferring DICOM instances to external AEs. The C-STORE DIMSE-C Service is the mechanism used to transfer the instances.

The IQPACS SyncRad acts as a Storage SCU when it initiates a C-STORE-RQ.



Figure 2.4. Image Transfer

2.2.5. Receiving and storing images – STORAGE SCP

When IQPACS SyncRad receives a request to store images (C-STORE-RQ), the received image is stored on a local hard disk. The location for storing the instances and the policies for removing the instances from the on-line storage are configurable.



Figure 2.5. Receiving and storing images

2.3. Sequencing of Real-World Activities

Not applicable.

3. AE SPECIFICATIONS

3.1. SOP Classes

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

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
AmbulatoryECGWaveformStorage	1.2.840.10008.5.1.4.1.1.9.1.3
BasicTextSR	1.2.840.10008.5.1.4.1.1.88.11
BasicVoiceAudioWaveformStorage	1.2.840.10008.5.1.4.1.1.9.4.1
CardiacElectrophysiologyWaveformStorage	1.2.840.10008.5.1.4.1.1.9.3.1
ComprehensiveSR	1.2.840.10008.5.1.4.1.1.88.33
ComputedRadiographyImageStorage	1.2.840.10008.5.1.4.1.1.1
CTImageStorage	1.2.840.10008.5.1.4.1.1.2
DigitalIntraoralXRayImageStorageForPresentation	1.2.840.10008.5.1.4.1.1.1.3
DigitalIntraoralXRayImageStorageForProcessing	1.2.840.10008.5.1.4.1.1.1.3.1
DigitalMammographyXRayImageStorageForPresentation	1.2.840.10008.5.1.4.1.1.1.2
DigitalMammographyXRayImageStorageForProcessing	1.2.840.10008.5.1.4.1.1.1.2.1
DigitalXRayImageStorageForPresentation	1.2.840.10008.5.1.4.1.1.1.1
DigitalXRayImageStorageForProcessing	1.2.840.10008.5.1.4.1.1.1.1.1
EnhancedMRIImageStorage	1.2.840.10008.5.1.4.1.1.4.1
EnhancedSR	1.2.840.10008.5.1.4.1.1.88.22
GeneralECGWaveformStorage	1.2.840.10008.5.1.4.1.1.9.1.2
GrayscaleSoftcopyPresentationStateStorage	1.2.840.10008.5.1.4.1.1.11.1
HemodynamicWaveformStorage	1.2.840.10008.5.1.4.1.1.9.2.1
KeyObjectSelectionDocument	1.2.840.10008.5.1.4.1.1.88.59
MammographyCADSR	1.2.840.10008.5.1.4.1.1.88.50
MRIImageStorage	1.2.840.10008.5.1.4.1.1.4
MRSpectroscopyStorage	1.2.840.10008.5.1.4.1.1.4.2
MultiframeColorSecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7.4
MultiframeGrayscaleByteSecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7.2
MultiframeGrayscaleWordSecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7.3
MultiframeSingleBitSecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7.1
NuclearMedicineImageStorage	1.2.840.10008.5.1.4.1.1.20
NuclearMedicineImageStorageRetired	1.2.840.10008.5.1.4.1.1.5
PositronEmissionTomographyImageStorage	1.2.840.10008.5.1.4.1.1.128
RawDataStorage	1.2.840.10008.5.1.4.1.1.66
RTBeamsTreatmentRecordStorage	1.2.840.10008.5.1.4.1.1.481.4
RTBrachyTreatmentRecordStorage	1.2.840.10008.5.1.4.1.1.481.6
RTDoseStorage	1.2.840.10008.5.1.4.1.1.481.2
RTImageStorage	1.2.840.10008.5.1.4.1.1.481.1
RTPlanStorage	1.2.840.10008.5.1.4.1.1.481.5
RTStructureSetStorage	1.2.840.10008.5.1.4.1.1.481.3
RTTreatmentSummaryRecordStorage	1.2.840.10008.5.1.4.1.1.481.7
SecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7
StandaloneCurveStorage	1.2.840.10008.5.1.4.1.1.9
StandaloneModalityLUTStorage	1.2.840.10008.5.1.4.1.1.10

StandaloneOverlayStorage	1.2.840.10008.5.1.4.1.1.8
StandalonePETCurveStorage	1.2.840.10008.5.1.4.1.1.129
StandaloneVOILUTStorage	1.2.840.10008.5.1.4.1.1.11
TwelveLeadECGWaveformStorage	1.2.840.10008.5.1.4.1.1.9.1.1
UltrasoundImageStorage	1.2.840.10008.5.1.4.1.1.6.1
UltrasoundImageStorageRetired	1.2.840.10008.5.1.4.1.1.6
UltrasoundMultiframeImageStorage	1.2.840.10008.5.1.4.1.1.3.1
UltrasoundMultiframeImageStorageRetired	1.2.840.10008.5.1.4.1.1.3
VLEndoscopicImageStorage	1.2.840.10008.5.1.4.1.1.77.1.1
VImageStorageRetired	1.2.840.10008.5.1.4.1.1.77.1
VLMicroscopicImageStorage	1.2.840.10008.5.1.4.1.1.77.1.2
VMultiframeImageStorageRetired	1.2.840.10008.5.1.4.1.1.77.2
VLPhotographicImageStorage	1.2.840.10008.5.1.4.1.1.77.1.4
VLSlideCoordinatesMicroscopicImageStorage	1.2.840.10008.5.1.4.1.1.77.1.3
XRayAngiographicBiPlaneImageStorageRetired	1.2.840.10008.5.1.4.1.1.12.3
XRayAngiographicImageStorage	1.2.840.10008.5.1.4.1.1.12.1
XRayRadiofluoroscopicImageStorage	1.2.840.10008.5.1.4.1.1.12.2

Table 3.1. Supported SOP Classes in the SCU role

And to the following DICOM V3.0 SOP Classes as an SCP:

SOP Class Name	SOP Class UID
Verification	1.2.840.10008.1.1
AmbulatoryECGWaveformStorage	1.2.840.10008.5.1.4.1.1.9.1.3
BasicTextSR	1.2.840.10008.5.1.4.1.1.88.11
BasicVoiceAudioWaveformStorage	1.2.840.10008.5.1.4.1.1.9.4.1
CardiacElectrophysiologyWaveformStorage	1.2.840.10008.5.1.4.1.1.9.3.1
ComprehensiveSR	1.2.840.10008.5.1.4.1.1.88.33
ComputedRadiographyImageStorage	1.2.840.10008.5.1.4.1.1.1
CTImageStorage	1.2.840.10008.5.1.4.1.1.2
DigitalIntraoralXRayImageStorageForPresentation	1.2.840.10008.5.1.4.1.1.1.3
DigitalIntraoralXRayImageStorageForProcessing	1.2.840.10008.5.1.4.1.1.1.3.1
DigitalMammographyXRayImageStorageForPresentation	1.2.840.10008.5.1.4.1.1.1.2
DigitalMammographyXRayImageStorageForProcessing	1.2.840.10008.5.1.4.1.1.1.2.1
DigitalXRayImageStorageForPresentation	1.2.840.10008.5.1.4.1.1.1.1
DigitalXRayImageStorageForProcessing	1.2.840.10008.5.1.4.1.1.1.1.1
EnhancedMRIImageStorage	1.2.840.10008.5.1.4.1.1.4.1
EnhancedSR	1.2.840.10008.5.1.4.1.1.88.22
GeneralECGWaveformStorage	1.2.840.10008.5.1.4.1.1.9.1.2
GrayscaleSoftcopyPresentationStateStorage	1.2.840.10008.5.1.4.1.1.11.1
HemodynamicWaveformStorage	1.2.840.10008.5.1.4.1.1.9.2.1
KeyObjectSelectionDocument	1.2.840.10008.5.1.4.1.1.88.59
MammographyCADSR	1.2.840.10008.5.1.4.1.1.88.50
MRIImageStorage	1.2.840.10008.5.1.4.1.1.4
MRSpectroscopyStorage	1.2.840.10008.5.1.4.1.1.4.2
MultiframeColorSecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7.4
MultiframeGrayscaleByteSecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7.2
MultiframeGrayscaleWordSecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7.3
MultiframeSingleBitSecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7.1
NuclearMedicineImageStorage	1.2.840.10008.5.1.4.1.1.20
NuclearMedicineImageStorageRetired	1.2.840.10008.5.1.4.1.1.5

PositronEmissionTomographyImageStorage	1.2.840.10008.5.1.4.1.1.128
RawDataStorage	1.2.840.10008.5.1.4.1.1.66
RTBeamsTreatmentRecordStorage	1.2.840.10008.5.1.4.1.1.481.4
RTBrachyTreatmentRecordStorage	1.2.840.10008.5.1.4.1.1.481.6
RTDoseStorage	1.2.840.10008.5.1.4.1.1.481.2
RTImageStorage	1.2.840.10008.5.1.4.1.1.481.1
RTPlanStorage	1.2.840.10008.5.1.4.1.1.481.5
RTStructureSetStorage	1.2.840.10008.5.1.4.1.1.481.3
RTTreatmentSummaryRecordStorage	1.2.840.10008.5.1.4.1.1.481.7
SecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7
StandaloneCurveStorage	1.2.840.10008.5.1.4.1.1.9
StandaloneModalityLUTStorage	1.2.840.10008.5.1.4.1.1.10
StandaloneOverlayStorage	1.2.840.10008.5.1.4.1.1.8
StandalonePETCurveStorage	1.2.840.10008.5.1.4.1.1.129
StandaloneVOILUTStorage	1.2.840.10008.5.1.4.1.1.11
TwelveLeadECGWaveformStorage	1.2.840.10008.5.1.4.1.1.9.1.1
UltrasoundImageStorage	1.2.840.10008.5.1.4.1.1.6.1
UltrasoundImageStorageRetired	1.2.840.10008.5.1.4.1.1.6
UltrasoundMultiframeImageStorage	1.2.840.10008.5.1.4.1.1.3.1
UltrasoundMultiframeImageStorageRetired	1.2.840.10008.5.1.4.1.1.3
VLEndoscopicImageStorage	1.2.840.10008.5.1.4.1.1.77.1.1
VImageStorageRetired	1.2.840.10008.5.1.4.1.1.77.1
VLMicroscopicImageStorage	1.2.840.10008.5.1.4.1.1.77.1.2
VLMultiframeImageStorageRetired	1.2.840.10008.5.1.4.1.1.77.2
VLP photographicImageStorage	1.2.840.10008.5.1.4.1.1.77.1.4
VLSlideCoordinatesMicroscopicImageStorage	1.2.840.10008.5.1.4.1.1.77.1.3
XRyAngiographicBiPlaneImageStorageRetired	1.2.840.10008.5.1.4.1.1.12.3
XRyAngiographicImageStorage	1.2.840.10008.5.1.4.1.1.12.1
XRyRadiofluoroscopicImageStorage	1.2.840.10008.5.1.4.1.1.12.2

Table 3.2. Supported SOP Classes in the SCP role

3.2. Association Establishment Policies

3.2.1 General

All associations with IQPACS Image Server are established using the DICOM 3.0 Standard application context. All the parameters regarding association initiation or acceptance can be modified at the configuration level. These parameters are:

- the connection timeout
- the acceptance timeout (with a default value of 5000 ms)
- the dimse timeout
- the maximum length Protocol Data Unit (with a default value of 16352 bytes)
- the maximum number of operations invoked (with a default value of 500)
- the close delay (with a default value of 5000 ms)

3.2.2 Number of Associations

The number of permitted associations can be set at the configuration level in an interval between 1 and unlimited, depending on the available resources.

3.2.3 Asynchronous Nature

Not supported.

3.3. Association Initiation Policy

The IQPACS SyncRad initiates associations for:

- testing a trusted node
- image acquisition from another DICOM node

3.3.1. Real World Activity: Request to verify a trusted node

3.3.1.1. Associated Real World Activity

The IQPACS SyncRad initiates an association to verify application level communication with a peer DICOM application entity.

This request is performed using the C-ECHO request primitive. The remote DICOM AE, supporting the Verification SOP Class SCP role, issues a C-ECHO response primitive. Upon receipt of the C-ECHO confirmation, the SCU determines that verification is complete.

3.3.1.2 Presentation Contexts

Abstract Syntax		Transfer Syntax		Role	Extended negotiation
Name	UID	Name	UID		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	No

Table 3.3. Presentation Contexts to verify a DICOM association

3.3.2. Real World Activity: Request to Transfer Images (copy images, auto-route images)

3.3.2.1 Associated Real World Activity

The IQPACS SyncRad initiates C-STORE requests when selecting instances from the local hard disk and copying them to an external Storage SCP AE. The Storage SCU invokes a C-STORE DIMSE Service with every instance to be sent. If a successful C-STORE response is received for the C-STORE request initiated by the Storage SCU this means that the instance has been stored and a new C-STORE-RQ can be initiated for the next instance. If a failed C-STORE response is received, this won't imply any further action from the Storage SCU as long as the Storage service class does not guarantee that the data will be archived.

3.3.2.2 Presentation Contexts

The presentation context shown in the following table is used for transfer request:

Abstract Syntax		Transfer Syntax	Role	Extended negotiation
Name	UID			
AmbulatoryECGWaveformStorage	1.2.840.10008.5.1.4.1.1.9.1.3	Case 1*	SCU	No
BasicTextSR	1.2.840.10008.5.1.4.1.1.88.11	Case 1*	SCU	No
BasicVoiceAudioWaveformStorage	1.2.840.10008.5.1.4.1.1.9.4.1	Case 1*	SCU	No
CardiacElectrophysiologyWaveformStorage	1.2.840.10008.5.1.4.1.1.9.3.1	Case 1*	SCU	No
ComprehensiveSR	1.2.840.10008.5.1.4.1.1.88.33	Case 1*	SCU	No
ComputedRadiographyImageStorage	1.2.840.10008.5.1.4.1.1.1	Case 2*	SCU	No
CTImageStorage	1.2.840.10008.5.1.4.1.1.2	Case 2*	SCU	No
DigitalIntraoralXRayImageStorageForPresentation	1.2.840.10008.5.1.4.1.1.1.3	Case 2*	SCU	No
DigitalIntraoralXRayImageStorageForProcessing	1.2.840.10008.5.1.4.1.1.1.3.1	Case 2*	SCU	No
DigitalMammographyXRayImageStorageForPresentation	1.2.840.10008.5.1.4.1.1.1.2	Case 2*	SCU	No
DigitalMammographyXRayImageStorageForProcessing	1.2.840.10008.5.1.4.1.1.1.2.1	Case 2*	SCU	No
DigitalXRayImageStorageForPresentation	1.2.840.10008.5.1.4.1.1.1.1	Case 2*	SCU	No
DigitalXRayImageStorageForProcessing	1.2.840.10008.5.1.4.1.1.1.1.1	Case 2*	SCU	No
EnhancedMRIImageStorage	1.2.840.10008.5.1.4.1.1.4.1	Case 2*	SCU	No
EnhancedSR	1.2.840.10008.5.1.4.1.1.88.22	Case 1*	SCU	No
GeneralECGWaveformStorage	1.2.840.10008.5.1.4.1.1.9.1.2	Case 1*	SCU	No
GrayscaleSoftcopyPresentationStateStorage	1.2.840.10008.5.1.4.1.1.11.1	Case 1*	SCU	No
HemodynamicWaveformStorage	1.2.840.10008.5.1.4.1.1.9.2.1	Case 1*	SCU	No
KeyObjectSelectionDocument	1.2.840.10008.5.1.4.1.1.88.59	Case 1*	SCU	No
MammographyCADSR	1.2.840.10008.5.1.4.1.1.88.50	Case 1*	SCU	No
MRIImageStorage	1.2.840.10008.5.1.4.1.1.4	Case 2*	SCU	No
MRSpectroscopyStorage	1.2.840.10008.5.1.4.1.1.4.2	Case 2*	SCU	No
MultiframeColorSecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7.4	Case 2*	SCU	No
MultiframeGrayscaleByteSecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7.2	Case 2*	SCU	No
MultiframeGrayscaleWordSecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7.3	Case 2*	SCU	No
MultiframeSingleBitSecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7.1	Case 2*	SCU	No
NuclearMedicineImageStorage	1.2.840.10008.5.1.4.1.1.20	Case 2*	SCU	No
NuclearMedicineImageStorageRetired	1.2.840.10008.5.1.4.1.1.5	Case 2*	SCU	No
PositronEmissionTomographyImageStorage	1.2.840.10008.5.1.4.1.1.128	Case 2*	SCU	No

RawDataStorage	1.2.840.10008.5.1.4.1.1.66	Case 1*	SCU	No
RTBeamsTreatmentRecordStorage	1.2.840.10008.5.1.4.1.1.481.4	Case 1*	SCU	No
RTBrachyTreatmentRecordStorage	1.2.840.10008.5.1.4.1.1.481.6	Case 1*	SCU	No
RTDoseStorage	1.2.840.10008.5.1.4.1.1.481.2	Case 1*	SCU	No
RTImageStorage	1.2.840.10008.5.1.4.1.1.481.1	Case 2*	SCU	No
RTPlanStorage	1.2.840.10008.5.1.4.1.1.481.5	Case 1*	SCU	No
RTStructureSetStorage	1.2.840.10008.5.1.4.1.1.481.3	Case 1*	SCU	No
RTTreatmentSummaryRecordStorage	1.2.840.10008.5.1.4.1.1.481.7	Case 1*	SCU	No
SecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7	Case 2*	SCU	No
StandaloneCurveStorage	1.2.840.10008.5.1.4.1.1.9	Case 1*	SCU	No
StandaloneModalityLUTStorage	1.2.840.10008.5.1.4.1.1.10	Case 1*	SCU	No
StandaloneOverlayStorage	1.2.840.10008.5.1.4.1.1.8	Case 2*	SCU	No
StandalonePETCurveStorage	1.2.840.10008.5.1.4.1.1.129	Case 1*	SCU	No
StandaloneVOILUTStorage	1.2.840.10008.5.1.4.1.1.11	Case 1*	SCU	No
TwelveLeadECGWaveformStorage	1.2.840.10008.5.1.4.1.1.9.1.1	Case 1*	SCU	No
UltrasoundImageStorage	1.2.840.10008.5.1.4.1.1.6.1	Case 2*	SCU	No
UltrasoundImageStorageRetired	1.2.840.10008.5.1.4.1.1.6	Case 2*	SCU	No
UltrasoundMultiframeImageStorage	1.2.840.10008.5.1.4.1.1.3.1	Case 2*	SCU	No
UltrasoundMultiframeImageStorageRetired	1.2.840.10008.5.1.4.1.1.3	Case 2*	SCU	No
VLEndoscopicImageStorage	1.2.840.10008.5.1.4.1.1.77.1.1	Case 2*	SCU	No
VLImageStorageRetired	1.2.840.10008.5.1.4.1.1.77.1	Case 2*	SCU	No
VLMicroscopicImageStorage	1.2.840.10008.5.1.4.1.1.77.1.2	Case 2*	SCU	No
VLMultiframeImageStorageRetired	1.2.840.10008.5.1.4.1.1.77.2	Case 2*	SCU	No
VLPhotographicImageStorage	1.2.840.10008.5.1.4.1.1.77.1.4	Case 2*	SCU	No
VLSlideCoordinatesMicroscopicImageStorage	1.2.840.10008.5.1.4.1.1.77.1.3	Case 2*	SCU	No
XRayAngiographicBiPlaneImageStorageRetired	1.2.840.10008.5.1.4.1.1.12.3	Case 2*	SCU	No
XrayAngiographicImageStorage	1.2.840.10008.5.1.4.1.1.12.1	Case 2*	SCU	No
XrayRadiofluoroscopicImageStorage	1.2.840.10008.5.1.4.1.1.12.2	Case 2*	SCU	No

*Note: Case 1 – The transfer syntaxes supported are listed in **table 3.8**

*Note: Case 2 – The transfer syntaxes supported are listed in **table 3.8**

Table 3.4. Presentation contexts to transfer instances

3.4. Association Acceptance Policy

The IQPACS SyncRad is able to accept associations in the following situations:

- for storing instances received from modalities or other DICOM nodes (C-STORE)
- for verifying a link

3.4.1. Real World Activity: Respond to Verification Request

3.4.1.1 Associated Real World Activity

When IQPACS SyncRad receives a request to verify a current DICOM association (C-ECHO-RQ), it responds with the C-ECHO-RSP primitive.

3.4.1.2 Presentation Contexts

The presentation context used for verification is presented in the following table:

Abstract Syntax		Transfer Syntax		Role	Extended negotiation
Name	UID	Name	UID		
Verification	1.2.840.10008.1.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	No

Table 3.5. Presentation contexts to verification request

3.4.2. Real World Activity: Store Images

3.4.2.1 Associated Real World Activity

The IQPACS SyncRad is responsible with storing the instances received from other DICOM nodes. The IQPACS SyncRad will issue a failed response if it is unable to store the instance. The incorrect formatted data will not be taken into account and will not be stored.

3.4.2.2 Presentation Contexts

The presentation contexts shown in the following tables are acceptable for the IQPACS SyncRad to store the corresponding images.

Abstract Syntax		Transfer Syntax	Role	Extended negotiation
Name	UID			
AmbulatoryECGWaveformStorage	1.2.840.10008.5.1.4.1.1.9.1.3	Case 1*	SCU	No
BasicTextSR	1.2.840.10008.5.1.4.1.1.88.11	Case 1*	SCU	No
BasicVoiceAudioWaveformStorage	1.2.840.10008.5.1.4.1.1.9.4.1	Case 1*	SCU	No
CardiacElectrophysiologyWaveformStorage	1.2.840.10008.5.1.4.1.1.9.3.1	Case 1*	SCU	No
ComprehensiveSR	1.2.840.10008.5.1.4.1.1.88.33	Case 1*	SCU	No
ComputedRadiographyImageStorage	1.2.840.10008.5.1.4.1.1.1	Case 2*	SCU	No
CTImageStorage	1.2.840.10008.5.1.4.1.1.2	Case 2*	SCU	No
DigitalIntraoralXRayImageStorageForPresentation	1.2.840.10008.5.1.4.1.1.1.3	Case 2*	SCU	No
DigitalIntraoralXRayImageStorageForProcessing	1.2.840.10008.5.1.4.1.1.1.3.1	Case 2*	SCU	No
DigitalMammographyXRayImageStorageForPresentation	1.2.840.10008.5.1.4.1.1.1.2	Case 2*	SCU	No

DigitalMammographyXRayImageStorageForProcessing	1.2.840.10008.5.1.4.1.1.1.2.1	Case 2*	SCU	No
DigitalXRayImageStorageForPresentation	1.2.840.10008.5.1.4.1.1.1.1	Case 2*	SCU	No
DigitalXRayImageStorageForProcessing	1.2.840.10008.5.1.4.1.1.1.1.1	Case 2*	SCU	No
EnhancedMRIImageStorage	1.2.840.10008.5.1.4.1.1.4.1	Case 2*	SCU	No
EnhancedSR	1.2.840.10008.5.1.4.1.1.88.22	Case 1*	SCU	No
GeneralECGWaveformStorage	1.2.840.10008.5.1.4.1.1.9.1.2	Case 1*	SCU	No
GrayscaleSoftcopyPresentationStateStorage	1.2.840.10008.5.1.4.1.1.11.1	Case 1*	SCU	No
HemodynamicWaveformStorage	1.2.840.10008.5.1.4.1.1.9.2.1	Case 1*	SCU	No
KeyObjectSelectionDocument	1.2.840.10008.5.1.4.1.1.88.59	Case 1*	SCU	No
MammographyCADSR	1.2.840.10008.5.1.4.1.1.88.50	Case 1*	SCU	No
MRImageStorage	1.2.840.10008.5.1.4.1.1.4	Case 2*	SCU	No
MRSpectroscopyStorage	1.2.840.10008.5.1.4.1.1.4.2	Case 2*	SCU	No
MultiframeColorSecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7.4	Case 2*	SCU	No
MultiframeGrayscaleByteSecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7.2	Case 2*	SCU	No
MultiframeGrayscaleWordSecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7.3	Case 2*	SCU	No
MultiframeSingleBitSecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7.1	Case 2*	SCU	No
NuclearMedicineImageStorage	1.2.840.10008.5.1.4.1.1.20	Case 2*	SCU	No
NuclearMedicineImageStorageRetired	1.2.840.10008.5.1.4.1.1.5	Case 2*	SCU	No
PositronEmissionTomographyImageStorage	1.2.840.10008.5.1.4.1.1.128	Case 2*	SCU	No
RawDataStorage	1.2.840.10008.5.1.4.1.1.66	Case 1*	SCU	No
RTBeamsTreatmentRecordStorage	1.2.840.10008.5.1.4.1.1.481.4	Case 1*	SCU	No
RTBrachyTreatmentRecordStorage	1.2.840.10008.5.1.4.1.1.481.6	Case 1*	SCU	No
RTDoseStorage	1.2.840.10008.5.1.4.1.1.481.2	Case 1*	SCU	No
RTImageStorage	1.2.840.10008.5.1.4.1.1.481.1	Case 2*	SCU	No
RTPlanStorage	1.2.840.10008.5.1.4.1.1.481.5	Case 1*	SCU	No
RTStructureSetStorage	1.2.840.10008.5.1.4.1.1.481.3	Case 1*	SCU	No
RTTreatmentSummaryRecordStorage	1.2.840.10008.5.1.4.1.1.481.7	Case 1*	SCU	No
SecondaryCaptureImageStorage	1.2.840.10008.5.1.4.1.1.7	Case 2*	SCU	No
StandaloneCurveStorage	1.2.840.10008.5.1.4.1.1.9	Case 1*	SCU	No
StandaloneModalityLUTStorage	1.2.840.10008.5.1.4.1.1.10	Case 1*	SCU	No
StandaloneOverlayStorage	1.2.840.10008.5.1.4.1.1.8	Case 2*	SCU	No
StandalonePETCurveStorage	1.2.840.10008.5.1.4.1.1.129	Case 1*	SCU	No
StandaloneVOILUTStorage	1.2.840.10008.5.1.4.1.1.11	Case 1*	SCU	No
TwelveLeadECGWaveformStorage	1.2.840.10008.5.1.4.1.1.9.1.1	Case 1*	SCU	No
UltrasoundImageStorage	1.2.840.10008.5.1.4.1.1.6.1	Case 2*	SCU	No

UltrasoundImageStorageRetired	1.2.840.10008.5.1.4.1.1.6	Case 2*	SCU	No
UltrasoundMultiframeImageStorage	1.2.840.10008.5.1.4.1.1.3.1	Case 2*	SCU	No
UltrasoundMultiframeImageStorageRetired	1.2.840.10008.5.1.4.1.1.3	Case 2*	SCU	No
VLEndoscopicImageStorage	1.2.840.10008.5.1.4.1.1.77.1.1	Case 2*	SCU	No
VLImageStorageRetired	1.2.840.10008.5.1.4.1.1.77.1	Case 2*	SCU	No
VLMicroscopicImageStorage	1.2.840.10008.5.1.4.1.1.77.1.2	Case 2*	SCU	No
VMultiframeImageStorageRetired	1.2.840.10008.5.1.4.1.1.77.2	Case 2*	SCU	No
VLP photographicImageStorage	1.2.840.10008.5.1.4.1.1.77.1.4	Case 2*	SCU	No
VLSlideCoordinatesMicroscopicImageStorage	1.2.840.10008.5.1.4.1.1.77.1.3	Case 2*	SCU	No
XRayAngiographicBiPlaneImageStorageRetired	1.2.840.10008.5.1.4.1.1.12.3	Case 2*	SCU	No
XrayAngiographicImageStorage	1.2.840.10008.5.1.4.1.1.12.1	Case 2*	SCU	No
XrayRadiofluoroscopicImageStorage	1.2.840.10008.5.1.4.1.1.12.2	Case 2*	SCU	No

*Note: Case 1 – The transfer syntaxes supported are listed in **table 3.8**

*Note: Case 2 – The transfer syntaxes supported are listed in **table 3.8**

Table 3.6. Presentation contexts to store instances

For every C-STORE-RQ received, a successful or failed C-STORE response will be send. The Storage SCP always saves the successfully received SOP Instances, so that they will be stored locally. The C-STORE STATUS codes are presented in the following table:

DataSetDoesNotMatchSOPClassError	<ul style="list-style-type: none"> • if one of the following UIDs is missing: <ul style="list-style-type: none"> - StudyInstanceUID, - SeriesInstanceUID, - SOPInstanceUID, - SOPClassUID, • if the SOPClassUID or SOPInstanceUID from Command differs from the one in the Dataset
StorageOutOfResources	if there is no space available for storing in the on-line archive
CannotUnderstand	if a parsing error occurred
ProcessingFailure	when errors occurred when saving the information in the database
CoercionOfDataElements	depending on configurations done, the IQPACS SyncRad generates this message if some attributes where modified
Success	successful storing
SOPClassNotSupported	If the service is inactive

Table 3.7. C-STORE STATUS codes

3.5 Transfer Syntax Selection Policies

When initiating an association the transfer syntaxes supported are depicted in the table below:

	Transfer Syntax	
	Name	UID
Case 1 (TS supported)	Implicit VR Little Endian	1.2.840.10008.1.2
	Explicit VR Little Endian	1.2.840.10008.1.2.1
	Deflated Explicit VR Little Endian	1.2.840.10008.1.2.1.99
	Explicit VR Big Endian	1.2.840.10008.1.2.2
Case 2 (TS supported)	Implicit VR Little Endian	1.2.840.10008.1.2
	Explicit VR Little Endian	1.2.840.10008.1.2.1
	Deflated Explicit VR Little Endian	1.2.840.10008.1.2.1.99
	Explicit VR Big Endian	1.2.840.10008.1.2.2
	JPEG Baseline (Process 1)	1.2.840.10008.1.2.4.50
	JPEG Extended (Process 2 & 4)	1.2.840.10008.1.2.4.51
	JPEG Lossless Non-Hierarchical (Process 14)	1.2.840.10008.1.2.4.57
	JPEG Lossless Non-Hierarchical, First Order Prediction (Process 14 [Selection Value 1])	1.2.840.10008.1.2.4.70
	JPEG 2000 Lossless Image Compression	1.2.840.10008.1.2.4.90
	JPEG 2000 Lossy Image Compression	1.2.840.10008.1.2.4.91
	RLE Lossless	1.2.840.10008.1.2.5

Table 3.8. Supported transfer syntaxes

4. COMMUNICATION PROFILES

4.1. Supported Communications Stacks (parts 8, 9)

The IQPACS SyncRad provides DICOM V3.0 TCP/IP Network Communication Support as defined in PS 3.8 of the standard.

4.2. TCP/IP Stack

The IQPACS SyncRad inherits its TCP/IP stack from the operating system.

4.2.1. Physical Media Support

IQPACS SyncRad is indifferent to the physical media over which TCP/IP operates. It inherits the medium from the operating system upon which it executes. The IQPACS SyncRad platform has been quality assurance tested to work with 10 and 100 Base-T Ethernet media. Therefore, the use of these media is recommended as the primary point of delivering the network traffic to the server platform.

5. EXTENSIONS/SPECIALIZATIONS/PRIVATIZATIONS

Not applicable.

6. CONFIGURATION

6.1. AE Title/Presentation Address Mapping

The AE Title and port for the IQPACS SyncRad is defined at the configuration level.

In order for communication to be established with other DICOM application entities, the AE Title, port and IP address (or host name) must be defined for each application. This information is configurable and can be modified at any time.

6.2. Configurable Parameters

Parameter	Configurable (Yes/No)	Default Value
General Parameters		
Time-out waiting for acceptance or rejection Response to an Association Open Request. (Application Level timeout)	Yes	5000 msec
General DIMSE level time-out values	Yes	60000 msec – incoming 60001 msec – outgoing
Time-out waiting for response to TCP/IP connect request. (Low-level timeout)	Yes	5000
Time-out waiting for acceptance of a TCP/IP message over the network. (Low-level timeout)	Yes	5000
Any changes to default TCP/IP settings, such as configurable stack parameters.	No	-
Close delay	Yes	500 msec
AE Specific Parameters		
Maximum PDU size the AE can receive	Yes	16352 bytes
Maximum PDU size the AE can send	Yes	16352 bytes
AE specific DIMSE level time-out values	Yes	
Number of simultaneous Associations by Service and/or SOP Class	Yes	unlimited

Table 6.1. Configuration parameters table

7. SUPPORT OF EXTENDED CHARACTER SETS

The IQPACS SyncRad also supports:

ISO-IR 100 Latin-1,
ISO-IR 101 Latin-2,
ISO-IR 109 Latin-3,
ISO-IR 110 Latin-4,
ISO-IR 144 Cyrillic,
ISO-IR 127 Arabic,
ISO-IR 126 Greek,
ISO-IR 138 Hebrew,
ISO-IR 148 Latin-5 (Turkish),
EUC-JP Japanese,
TIS-620 Thai

8. CODES AND CONTROLLED TERMINOLOGY

Not applicable