

# **IQPACS RADIVISION**

*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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# 1. INTRODUCTION

## 1.1. Purpose of this document

This document describes the conformance to the DICOM standard, version 3 for the **IQPACS RADIVISION** 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 RADIVISION overview

**IQPACS System** is a completely DICOM compliant picture and archiving system intended for the radiology and imagistic departments. IQPACS connects to any type of modality, processes and stores DICOM images in long and short time archive.

The application is written in Java code and uses Microsoft SQL Server.

**IQPACS RADIVISION** is mainly intended for routing messages concerning the integrity of data, and the modifications for patient and study information.

The application uses DICOM as the interface to the external world. The IQPACS RADIVISION accepts DICOM association requests and it also initiates DICOM association requests.

## 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 RadiVision 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 RadiVision contains a single Application Entity that implements the Verification Service Class, the Query/Retrieve Service Class, the Results Management and the Interpretation Management as a Service Class User (SCU), Patient Management and Study Management as a Service Class Provider (SCP) and as a Service Class User (SCU) and Study Content Notification and Modality Worklist as a SCP.

IQPACS RadiVision 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;
- Retrieval/sending of data from or to other AE using the DICOM Query/Retrieve service class as a SCP and SCU;
- Sending/receiving patient and study related information using the Patient Management and Study Management Services
- Creating a modality worklist using the Modality Worklist Information Model

## 2.1. Application data flow diagram

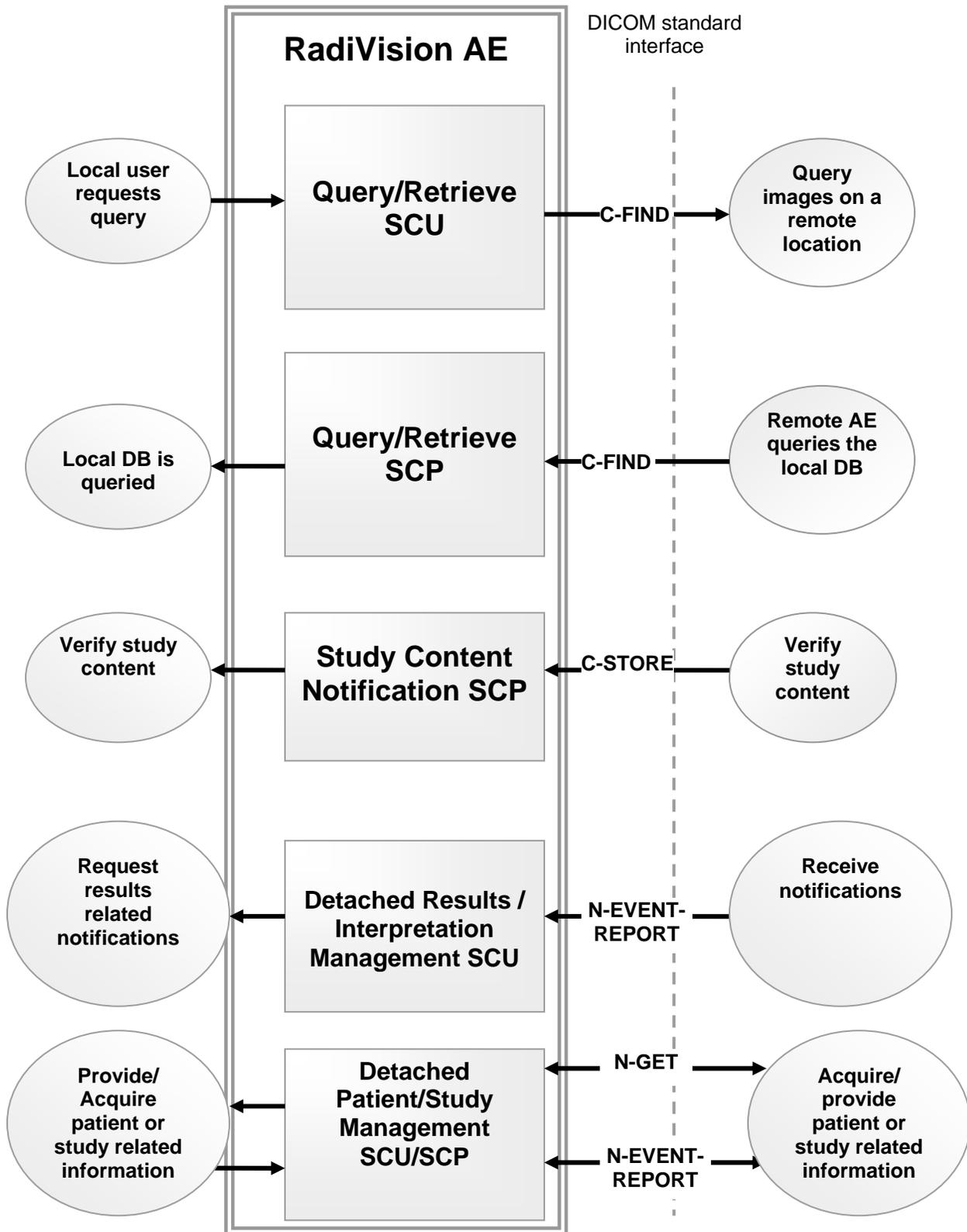


Figure 2.1. Application Data Flow Diagram

## 2.2. Functional definitions of the AE

The IQPACS RadiVision is an application providing the data storage interface for the IQPACS clients or other vendor diagnosis applications. Each request will be handled by IQPACS RadiVision as a unique thread.

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

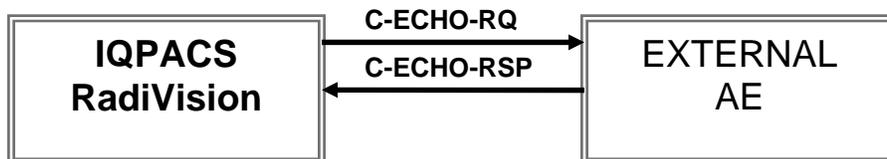
1. SCP for C-Echo operations to Verification service class users
2. SCP for C-Find operations to Query / Retrieve service class users
3. SCP for C-Store operations to Study Content Notification service class users
4. SCP for N-Get and N-Event-Report operations to Detached Patient (Study) Management service class users

IQPACS RadiVision 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-Find operations from Query / Retrieve service class providers
3. SCU of C-Store operations from Storage service class providers
4. SCU for N-Get and N-Event-Report operations from Detached Patient (Study) Management service class providers and Results (Interpretation) Management service class providers

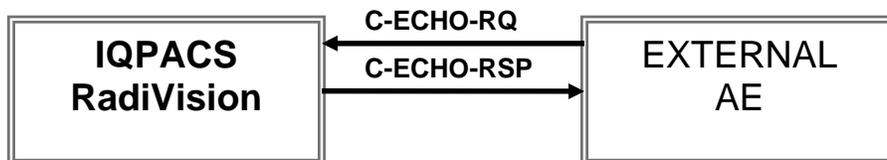
### 2.2.1. Verify – Verification SCU/SCP

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



*Figure 2.2. Verification SCU*

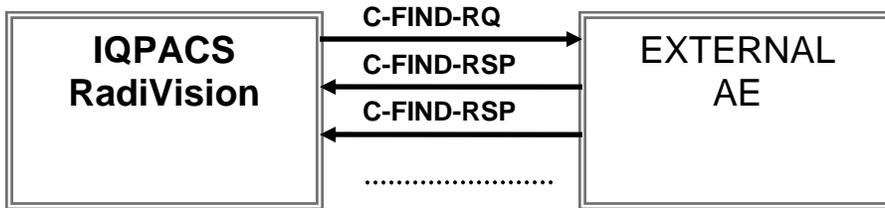
When IQPACS RadiVision receives a request to verify a current DICOM association (C-ECHO-RQ), it responds with the C-ECHO-RSP primitive.



*Figure 2.3. Verification SCP*

### 2.2.2. Query an external AE – Query/Retrieve SCU

When the IQPACS RadiVision queries an external database, it sends a C-FIND-RQ with the attributes to be matched. A list of the attributes used for matching is described in the table 3.5.

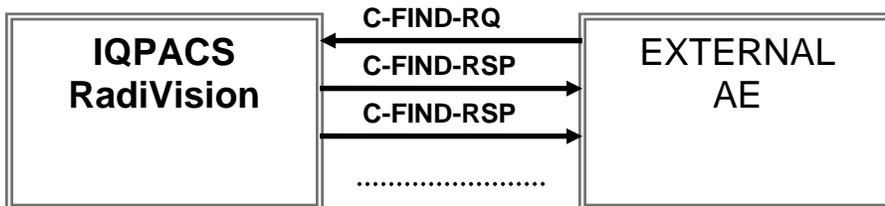


*Figure 2.4. Query/Retrieve SCU*

### 2.2.3. Query database – Query/Retrieve SCP

When the IQPACS RadiVision receives a query request (C-FIND-RQ), the database is queried for matches using the all the attributes supplied by the requesting application entity. The IQPACS RadiVision searches its database and generates a C-FIND-RSP for each match. A list of the attributes used for matching is described in the table 3.15.

While IQPACS RadiVision is performing the matching process, C-FIND operations can be interrupted by the calling AE through the use of C-CANCEL-RQ.



*Figure 2.5. Query database*

### **2.3. Sequencing of Real-World Activities**

Not applicable.

## 3. AE SPECIFICATIONS

### 3.1. SOP Classes

IQPACS RadiVision 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
PatientRootQueryRetrieveInformationModelFIND	1.2.840.10008.5.1.4.1.2.1.1
StudyRootQueryRetrieveInformationModelFIND	1.2.840.10008.5.1.4.1.2.2.1
PatientStudyOnlyQueryRetrieveInformationModelFIND	1.2.840.10008.5.1.4.1.2.3.1
DetachedPatientManagement	1.2.840.10008.3.1.2.1.1
DetachedStudyManagement	1.2.840.10008.3.1.2.3.1
ModalityPerformedProcedureStep	1.2.840.10008.3.1.2.3.3
DetachedResultsManagement	1.2.840.10008.3.1.2.5.1
DetachedInterpretationManagement	1.2.840.10008.3.1.2.6.1

*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
PatientRootQueryRetrieveInformationModelFIND	1.2.840.10008.5.1.4.1.2.1.1
StudyRootQueryRetrieveInformationModelFIND	1.2.840.10008.5.1.4.1.2.2.1
PatientStudyOnlyQueryRetrieveInformationModelFIND	1.2.840.10008.5.1.4.1.2.3.1
DetachedPatientManagement	1.2.840.10008.3.1.2.1.1
DetachedStudyManagement	1.2.840.10008.3.1.2.3.1
BasicStudyContent Notification	1.2.840.10008.1.9
Modality Worklist Information Model -FIND	1.2.840.10008.5.1.4.31
General Purpose Worklist Information Model - FIND	1.2.840.10008.5.1.4.32.1

*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 RadiVision initiates associations for:

- testing a trusted node
- query another DICOM node
- get detached information

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

#### 3.3.1.1. Associated Real World Activity

The IQPACS RadiVision 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 query a DICOM node

#### 3.3.2.1. Associated real-world activity

The IQPACS RadiVision queries an external application entity against matching the attributes supplied in the query request. A list of the supported optional keys is listed in the table below. The list contains only the attributes in the C-FIND request.

The level of the query	Optional Key	Tag
Patient level	PatientID	(0010,0020)
	PatientFirstName	(0010,0010)
	PatientLastName	
	PatientBirthDate	(0010,0030)
	PatientBirthName	(0010,0032)
Study level	ModalitiesInStudy	(0008,0061)
	StudyStatusID	(0032,000A)
	StudyArrivalDate	(0008,0020)
	NameOfPhysicianReadingStudy	(0008,1060)
	RequestingPhysician	(0032,1032)
	InterpretationDiagnosesCode	(4008,0117)
	Accession Number	(0008,0050)
	Study Priority	(0032,000C)
Series level	PerformingPhysicianName	(0008,1050)
		(0008,0060)

**Table 3.4. Optional Keys supported**

#### 3.3.2.2. Presentation Contexts

The presentation context shown in the following table is used for querying an external DICOM node:

Abstract Syntax		Transfer Syntax	Role	Extended negotiation
Name	UID			
PatientRootQueryRetrieveInformationModel IFIND	1.2.840.10008.5.1.4.1.2.1.1	Case 1*	SCU	No
StudyRootQueryRetrieveInformationModel FIND	1.2.840.10008.5.1.4.1.2.2.1	Case 1*	SCU	No
PatientStudyOnlyQueryRetrieveInformationModel FIND	1.2.840.10008.5.1.4.1.2.3.1	Case 1*	SCU	No

\*Note: Case 1 – The transfer syntaxes supported are listed in **table 3.31**

**Table 3.5. Presentation Contexts to query a DICOM node**

### 3.3.3. Real world activity: Receive notifications – patient/study

### 3.3.3.1. Associated Real World Activity

IQPACS RadiVision is able to receive an unsolicited notification of a change in the Detached Patient Management SOP Instance or Detached Study Management SOP Instance, using the N-EVENT-REPORT service.

### 3.3.3.2. Presentation Contexts

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

Abstract Syntax		Transfer Syntax	Role	Extended negotiation
Name	UID			
DetachedPatientManagement	1.2.840.10008.3.1.2.1.1	Case 1*	SCU	No
DetachedStudyManagement	1.2.840.10008.3.1.2.3.1	Case 1*	SCU	No

\*Note: Case 1 – The transfer syntaxes supported are listed in **table 3.31**

### **Table 3.6. Presentation contexts to receive notifications**

The attributes that the IQPACS RadiVision will be able to interpret as a SCU are shown in the following tables:

Specific Character Set	(0008,0005)
Instance Creation Date	(0008,0012)
Instance Creation Time	(0008,0013)
Instance Creator UID	(0008,0014)
Patient Name	(0010,0010)
Patient ID	(0010,0020)
Issuer Of Patient ID	(0010,0021)
Other Patient IDs	(0010,1000)
Other Patient Names	(0010,1001)
Patient Birth Name	(0010,1005)
Mother Birth Name	(0010,1060)
Medical Record Locator	(0010,1090)
Occupation	(0010,2180)
Birth Date	(0010,0030)
Birth Time	(0010,0032)
Sex	(0010,0040)
Patient Size	(0010,1020)
Patient Weight	(0010,1030)
Address	(0010,1040)
Military Rank	(0010,1080)
Branch Of Service	(0010,1081)
Country Residence	(0010,2150)
Region Residence	(0010,2152)
Telephone Numbers	(0010,2154)
Ethnic Group	(0010,2160)
Religious Preference	(0010,21F0)

Comments	(0010,4000)
Medical Alerts	(0010,2000)
Contrast Allergies	(0010,2110)
Smoking Status	(0010,21A0)
Patient History	(0010,21B0)
Pregnancy Status	(0010,21C0)
Last Menstrual Date	(0010,21D0)
Special Needs	(0038,0050)
Patient State	(0038,0500)

**Table 3.7. Patient notification event information**

Study Instance UID	(0020,000D)
Accession Number	(0008,0050)
Study ID	(0020,0010)
Study ID Issuer	(0032,0012)
Other Study Numbers	(0020,1070)
Study Status ID	(0032,000A)
Study Priority ID	(0032,000C)
Study Comments	(0032,4000)
Scheduled Start Date	(0032,1000)
Scheduled Start Time	(0032,1001)
Scheduled Stop Date	(0032,1010)
Scheduled Stop Time	(0032,1011)
Scheduled Location	(0032,1020)
Scheduled Location AETitle	(0032,1021)
Reason For Study	(0032,1030)
Requesting Physician	(0032,1032)
Requesting Service	(0032,1033)
Requested Procedure Description	(0032,1060)
Requested Contrast Agent	(0032,1070)
Study Arrival Date	(0032,1040)
Study Arrival Time	(0032,1041)
Study Date	(0008,0020)
Study Time	(0008,0030)
Study Completion Date	(0032,1050)
Study Completion Time	(0032,1051)
Study Verified Date	(0032,0032)
Study Verified Time	(0032,0033)
Modalities In Study	(0008,0061)
Series In Study	(0020,1000)
Acquisitions In Study	(0020,1004)
Name Physician Reading	(0008,1060)
Study Read Date	(0032,0034)
Study Read Time	(0032,0035)
Referenced Visit Sequence	(0008,1125)
>Referenced SOP Class UID	(0008,1150)
>Referenced SOP Instance UID	(0008,1155)
Referenced Patient Sequence	(0008,1120)
>Referenced SOP Class UID	(0008,1150)
>Referenced SOP Instance UID	(0008,1155)
Referenced Results Sequence	(0008,1100)

Referenced Performed Procedure Step Sequence	(0008,1111)
>Referenced SOP Class UID	(0008,1150)
>Referenced SOP Instance UID	(0008,1155)
Requested Procedure Code Sequence	(0032,1064)
>Code Value	(0008,0100)
>Coding Scheme Designator	(0008,0102)
>Coding Scheme Version	(0008,0103)
>Code Meaning	(0008,0104)
Instance Creation Time	(0008,0013)
Instance Creator UID	(0008,0014)
Specific Character Set	(0008,0005)

**Table 3.8. Study notification event information**

### 3.3.4. Real world activity: Obtain information – patient/study

#### 3.3.4.1. Associated Real World Activity

The IQPACS RadiVision can be configured so that when receiving a new patient/study to get information from RadiVision, using N-GET Detached Patient Management or N-GET Detached Study Management service.

#### 3.3.4.2. Presentation Contexts

The presentation context used for getting patient or study related information is presented in the following table:

Abstract Syntax		Transfer Syntax	Role	Extended negotiation
Name	UID			
DetachedPatientManagement	1.2.840.10008.3.1.2.1.1	Case 1*	SCU	No
DetachedStudyManagement	1.2.840.10008.3.1.2.3.1	Case 1*	SCU	No

\*Note: Case 1 – The transfer syntaxes supported are listed in **table 3.31**

**Table 3.9. Presentation contexts to obtain information**

The attributes that the IQPACS RadiVision will be able to interpret as a SCU are shown in the following tables:

Study Instance UID	(0020,000D)
Accession Number	(0008,0050)
Study ID	(0020,0010)
Study ID Issuer	(0032,0012)
Other Study Numbers	(0020,1070)
Study Status ID	(0032,000A)
Study Priority ID	(0032,000C)
Study Comments	(0032,4000)
Scheduled Start Date	(0032,1000)
Scheduled Start Time	(0032,1001)
Scheduled Stop Date	(0032,1010)
Scheduled Stop Time	(0032,1011)
Scheduled Location	(0032,1020)

Scheduled Location A Etitle	(0032,1021)
Reason For Study	(0032,1030)
Requesting Physician	(0032,1032)
Requesting Service	(0032,1033)
Requested Procedure Description	(0032,1060)
Requested Contrast Agent	(0032,1070)
Study Arrival Date	(0032,1040)
Study Arrival Time	(0032,1041)
Study Date	(0008,0020)
Study Time	(0008,0030)
Study Completion Date	(0032,1050)
Study Completion Time	(0032,1051)
Study Verified Date	(0032,0032)
Study Verified Time	(0032,0033)
Modalities In Study	(0008,0061)
Series In Study	(0020,1000)
Acquisitions In Study	(0020,1004)
Name Physician Reading	(0008,1060)
Study Read Date	(0032,0034)
Study Read Time	(0032,0035)
Referenced Visit Sequence	(0008,1125)
>Referenced SOP Class UID	(0008,1150)
>Referenced SOP Instance UID	(0008,1155)
Referenced Patient Sequence	(0008,1120)
>Referenced SOP Class UID	(0008,1150)
>Referenced SOP Instance UID	(0008,1155)
Referenced Results Sequence	(0008,1100)
Referenced Performed Procedure Step Sequence	(0008,1111)
>Referenced SOP Class UID	(0008,1150)
>Referenced SOP Instance UID	(0008,1155)
Requested Procedure Code Sequence	(0032,1064)
>Code Value	(0008,0100)
>Coding Scheme Designator	(0008,0102)
>Coding Scheme Version	(0008,0103)
>Code Meaning	(0008,0104)
Instance Creation Time	(0008,0013)
Instance Creator UID	(0008,0014)
Specific Character Set	(0008,0005)

**Table 3.10. Detached Management SOP Class N-GET Attributes – patient**

Study Instance UID	(0020,000D)
Accession Number	(0008,0050)
Study ID	(0020,0010)
Study ID Issuer	(0032,0012)
Other Study Numbers	(0020,1070)
Study Status ID	(0032,000A)
Study Priority ID	(0032,000C)
Study Comments	(0032,4000)
Scheduled Start Date	(0032,1000)
Scheduled Start Time	(0032,1001)
Scheduled Stop Date	(0032,1010)
Scheduled Stop Time	(0032,1011)

Scheduled Location	(0032,1020)
Scheduled Location AETitle	(0032,1021)
Reason For Study	(0032,1030)
Requesting Physician	(0032,1032)
Requesting Service	(0032,1033)
Requested Procedure Description	(0032,1060)
Requested Contrast Agent	(0032,1070)
Study Arrival Date	(0032,1040)
Study Arrival Time	(0032,1041)
Study Date	(0008,0020)
Study Time	(0008,0030)
Study Completion Date	(0032,1050)
Study Completion Time	(0032,1051)
Study Verified Date	(0032,0032)
Study Verified Time	(0032,0033)
Modalities In Study	(0008,0061)
Series In Study	(0020,1000)
Acquisitions In Study	(0020,1004)
Name Physician Reading	(0008,1060)
Study Read Date	(0032,0034)
Study Read Time	(0032,0035)
Referenced Visit Sequence	(0008,1125)
>Referenced SOP Class UID	(0008,1150)
>Referenced SOP Instance UID	(0008,1155)
Referenced Patient Sequence	(0008,1120)
>Referenced SOP Class UID	(0008,1150)
>Referenced SOP Instance UID	(0008,1155)
Referenced Results Sequence	(0008,1100)
Referenced Performed Procedure Step Sequence	(0008,1111)
>Referenced SOP Class UID	(0008,1150)
>Referenced SOP Instance UID	(0008,1155)
Requested Procedure Code Sequence	(0032,1064)
>Code Value	(0008,0100)
>Coding Scheme Designator	(0008,0102)
>Coding Scheme Version	(0008,0103)
>Code Meaning	(0008,0104)
Instance Creation Time	(0008,0013)
Instance Creator UID	(0008,0014)
Specific Character Set	(0008,0005)

**Table 3.11. Detached Management SOP Class N-GET Attributes - study**

### 3.4. Association Acceptance Policy

The associations that can be accepted by the IQPACS RadiVision can be established at the configuration level. RadiVision is able to accept associations in the following situations:

- for storing instances received from modalities or other DICOM nodes (C-STORE)
- Interrogation (C-FIND)
- Study Content Notifications
- Provide detached patient/study information/notification

At the configuration level, these services can be denied by the system administrator if this is considered to be necessary.

### 3.4.1. Real World Activity: Respond to Verification Request

#### 3.4.1.1 Associated Real World Activity

When IQPACS RadiVision 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 3.12. Presentation contexts to verification request**

### 3.4.2. Real World Activity: Respond to Query Database Request

#### 3.4.2.1 Associated Real World Activity

When queried by an external application entity, the IQPACS RadiVision is able to perform matching for the attributes in the table below, contained in the Identifier of a C-FIND request.

The level of the query	Optional Key	Tag
<b>Patient level</b>	PatientBirthDate	(0010,0030)
	PatientBirthTime	(0010,0032)
	PatientSex	(0010,0040)
	IssuerOfPatientID	(0010,0021)
	OtherPatientIDs	(0010,1000)
	OtherPatientNames	(0010,1001)
	PatientBirthName	(0010,1005)
	PatientMotherBirthName	(0010,1060)
	MedicalRecordLocator	(0010,1090)
	Occupation	(0010,2180)
	ConfidentialityPatientData	(0040,3001)
	PatientSize	(0010,1020)
	PatientWeight	(0010,1030)
	PatientAddress	(0010,1040)
	MilitaryRank	(0010,1080)
	BranchOfService	(0010,1081)
	CountryOfResidence	(0010,2150)
	PatientPhoneNumbers	(0010,2154)
EthnicGroup	(0010,2160)	
PatientReligiousPreference	(0010,21F0)	

	PatientComments	(0010,4000)
	MedicalAlerts	(0010,2000)
	ContrastAllergies	(0010,2110)
	SmokingStatus	(0010,21A0)
	AdditionalPatientHistory	(0010,21B0)
	PregnancyStatus	(0010,21C0)
	LastMenstrualDate	(0010,21D0)
	SpecialNeeds	(0038,0050)
	PatientState	(0038,0500)
	InstanceCreationDate	(0008,0012)
	InstanceCreationTime	(0008,0013)
<b>Study level</b>	StudyDescription	(0008,1030)
	ModalitiesInStudy	(0008,0061)
	StudyStatusID	(0032,000A)
	StudyPriorityID	(0032,000C)
	StudyComments	(0032,4000)
	StudyArrivalDate	(0032,1040)
	StudyArrivalTime	(0032,1041)
	StudyCompletionDate	(0032,1050)
	StudyCompletionTime	(0032,1051)
	StudyVerifiedDate	(0032,0032)
	StudyVerifiedTime	(0032,0033)
	SeriesInStudy	(0020,1000)
	AcquisitionsInStudy	(0020,1001)
	StudyIDIssuer	(0032,0012)
	OtherStudyNumbers	(0020,1070)
	NameOfPhysicianReadingStudy	(0008,1060)
	StudyReadDate	(0032,0034)
	StudyReadTime	(0032,0035)
	ScheduledStudyStartDate	(0032,1000)
	ScheduledStudyStartTime	(0032,1001)
	ScheduledStudyStopDate	(0032,1010)
	ScheduledStudyStopTime	(0032,1011)
	ScheduledStudyLocation	(0032,1020)
	ScheduledStudyLocationAET	(0032,1021)
	ReasonforStudy	(0032,1030)
	RequestingPhysician	(0032,1032)
	RequestingService	(0032,1033)
	RequestedProcedureDescription	(0032,1060)
	RequestedContrastAgent	(0032,1070)
	InterpretationAuthor	(4008,010C)
	InterpretationDiagnosesCode	(4008,0117)
	InterpretationStatusID	(4008,0212)
	ObservationDateTime	(0040,A032)
ConceptNameCodeSq	(0040,A043)	
<b>Series level</b>	SeriesDate	(0008,0021)
	SeriesTime	(0008,0031)
	SeriesDescription	(0008,103E)
	Laterality	(0020,0060)
	BodyPartExamined	(0018,0015)
	PatientPosition	(0018,5100)
	PPSStartDate	(0040,0244)
	PPSStartTime	(0040,0245)

	Manufacturer	(0008,0070)
	StationName	(0008,1010)
	ManufacturerModelName	(0008,1090)
	PerformingPhysicianName	(0008,1050)
	OperatorName	(0008,1070)
	SeriesCommentsRetired	
<b>Image (Instance) level</b>	PatientOrientation	(0020,0020)
	ImageType	(0008,0008)
	AcquisitionNumber	(0020,0012)
	AcquisitionDate	(0008,0022)
	AcquisitionTime	(0008,0032)
	OverlayNumber	(0020,0022)
	CurveNumber	(0020,0024)
	LUTNumber	(0020,0026)
	ContentDate	(0008,0023)
	ContentTime	(0008,0033)
	Rows	(0028,0010)
	Columns	(0028,0011)
	BitsAllocated	(0028,0100)
	NumberOfFrames	(0028,0008)
	PresentationLabel	(0070,0080)
	PresentationDescription	(0070,0081)
	PresentationCreationDate	(0070,0082)
	PresentationCreationTime	(0070,0083)
	PresentationCreatorName	(0070,0084)
	CompletionFlag	(0040,A491)
CompletionFlagDescription	(0040,A492)	
VerificationFlag	(0040,A493)	
ObservationDateTime	(0040,A032)	
ConceptNameCodeSq	(0040,A043)	

**Table 3.13. Optional Keys supported**

**Note:** “Match only” means that the specified attribute will not be returned in a C-FIND response, only the matching will be verified for that attribute.

The IQPACS RadiVision is able to respond to a General Purpose Scheduled Procedure Steps (GP-SPS) query matching its search criteria.

A list of the supported keys is listed in the table below.

<b>SPS Information</b>	
Human Performer	(0040,4009)
Work Item	
Scheduled interval date	
Procedure Step Priority	(0040,4003)
Expected Completion Interval	(0040,4011)
Scheduled Procedure Step Status	(0040,0020)
Scheduled Procedure Step Comments	
Station Code	
Application Code	
Location Code	
<b>PATIENTS</b>	
ID	

Last Name	
First Name	
Birth Name	(0010,1005)
Sex	(0010,0040)
Sort on	
<b>STUDIES</b>	
Accession no.	(0008,0050)
Referring Physician	
Exam Type	
Interval Study Date	(0008,0020)
Requesting Physician	(0032,1032)
Report Status	
Sort on	

***Table 3.14. Attributes for the General Purpose Worklist Information Model***

The IQPACS RadiVision is able to download patient demographic information from the HIS, in order to verify that the person to be examined is the intended subject and to schedule a procedure to the modality. This is useful for automating the process of obtaining patient related information, the human operator intervention at the modality becoming minimal – no more demographic patient information is needed to be introduced.

When queried against the modality worklist, the IQPACS RadiVision is able to perform matching and return the attributes in the table below, contained in the Identifier of a C-FIND request. Attributes that can be “matched” are presented in the table below:

<b>Description</b>	<b>Tag</b>
<b>SOP common</b>	
Specific Character Set	(0008,0005)
<b>Scheduled Procedure Step</b>	
Scheduled Procedure Step Sequence	(0040,0100)
>Scheduled Station AE Title	(0040,0001)
>Scheduled Procedure Step Start Date	(0040,0002)
>Scheduled Procedure Step Start Time	(0040,0003)
Modality	(0008,0060)
Scheduled Performing Physician's Name	(0040,0006)
>Scheduled Procedure Step Description	(0040,0007)
>Scheduled Station Name	(0040,0010)
>Scheduled Procedure Step Location	(0040,0011)
>Scheduled Protocol Code Sequence	(0040,0008)
>>Code Value	(0008,0100)
>>Coding Scheme Version	(0008,0103)
>>Coding Scheme Designator	(0008,0102)
>>Code Meaning	(0008,0104)
>>Protocol Context Sequence	(0040,0440)
>>>Value Type	(0040,A040)
>>>Concept Name Code Sequence	(0040,A043)
>>>>Code Value	(0008,0100)
>>>>Coding Scheme Designator	(0008,0102)

>>>>Coding Scheme Version	(0008,0103)
>>>>Code Meaning	(0008,0104)
>>>DateTime	(0040,A120)
>>>Person Name	(0040,A123)
>>>Text Value	(0040,A160)
>>>Concept Code Sequence	(0040,A168)
>>>>Code Value	(0008,0100)
>>>>Coding Scheme Designator	(0008,0102)
>>>>Coding Scheme Version	(0008,0103)
>>>>Code Meaning	(0008,0104)
>>>Numeric Value	(0040,A30A)
>>>Measurement Units Code Sequence	(0040,08EA)
>>>>Code Value	(0008,0100)
>>>>Coding Scheme Designator	(0008,0102)
>>>>Coding Scheme Version	(0008,0103)
>>>>Code Meaning	(0008,0104)
>Pre-Medication	(0040,0012)
>Scheduled Procedure Step ID	(0040,0009)
>Requested Contrast Agent	(0032,1070)
>Scheduled Procedure Step Status	(0040,0020)
<b>Requested Procedure</b>	

Requested Procedure ID	(0040,1001)
Requested Procedure Description	(0032,1060)
Requested Procedure Code Sequence	(0032,1064)
>Code Value	(0008,0100)
>Coding Scheme Designator	(0008,0102)
>Coding Scheme Version	(0008,0103)
>Code Meaning	(0008,0104)
Study Instance UID	(0020,000D)
Referenced Study Sequence	(0008,1110)
>Referenced SOP Class UID	(0008,1150)
>Referenced SOP Instance UID	(0008,1155)
Requested Procedure Priority	(0040,1003)
Patient Transport Arrangements	(0040,1004)
<b>Imaging Service Request</b>	
Accession Number	(0008,0050)
Requesting Physician	(0032,1032)
Referring Physician's Name	(0008,0090)
<b>Visit Identification</b>	
Admission ID	(0038,0010)
Visit Identification Module	
<b>Visit Status</b>	
Current Patient Location	(0038,0300)

<b>Visit Relationship</b>	
Referenced Patient Sequence	(0008,1120)
>Referenced SOP Class UID	(0008,1150)
>Referenced SOP Instance UID	(0008,1155)
<b>Patient Identification</b>	
Patient's Name	(0010,0010)
Patient ID	(0010,0020)
<b>Patient Demographic</b>	
Patients Birth Date	(0010,0030)
Patient's Sex	(0010,0040)
Patient's Primary Language Code Sequence	(0010,0101)
>Code Value	(0008,0100)
>Coding Scheme Designator	(0008,0102)
>Code Meaning	(0008,0104)
>Patient's Primary Language Code Modifier Sequence	(0010,0102)
>>Code Value	(0008,0100)
>>Coding Scheme Designator	(0008,0102)
>>Code Meaning	(0008,0104)
Patient's Weight	(0010,1030)
Confidentiality constraint on patient data	(0040,3001)
<b>Patient Medical</b>	
Patient State	(0038,0500)
Pregnancy Status	(0010,21C0)
Medical Alerts	(0010,2000)
Contrast Allergies	(0010,2110)
Special Needs	(0038,0050)

**Table 3.15. C-FIND attributes**

### 3.4.2.2. Presentation Context

The presentation context shown in the following table is used when IQPACS RadiVision is queried by an external DICOM node:

Abstract Syntax		Transfer Syntax	Role	Extended negotiation
Name	UID			
PatientRootQueryRetrieveInformationModel FIND	1.2.840.10008.5.1.4.1.2.1.1	Case 1*	SCP	No
StudyRootQueryRetrieveInformationModel FIND	1.2.840.10008.5.1.4.1.2.2.1	Case 1*	SCP	No
PatientStudyOnlyQueryRetrieveInformationModel FIND	1.2.840.10008.5.1.4.1.2.3.1	Case 1*	SCP	No
Modality Worklist Information Model -FIND	1.2.840.10008.5.1.4.31	Case 1*	SCP	No
General Purpose Worklist Information Model - FIND	1.2.840.10008.5.1.4.32.1	Case 1*	SCP	No

\*Note: Case 1 – The transfer syntaxes supported are listed in **table 3.31**

**Table 3.16. Presentation contexts to query database request**

The following table lists the C-FIND status values, with their meaning, that may be returned by the IQPACS RadiVision.

Service Status	Status Code	Meaning
Unable To Process	C000	The C-FIND query identifier is valid for the specified SOP Class but cannot be used to query the database
Success	0000	Matching is complete
Pending	FF00	Matches are continuing

**Table 3.17. C-FIND response values**

The IQPACS RadiVision ignores the Priority attribute in the C-FIND-RQ messages.

### 3.4.3. Real World Activity: Provide patient/study related information

#### 3.4.3.1 Associated Real World Activity

IQPACS RadiVision is able to provide patient or study related information to other DICOM nodes using N-GET Detached Patient Management or N-GET Detached Study Management service.

#### 3.4.3.2 Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended negotiation
Name	UID			
DetachedPatientManagement	1.2.840.10008.3.1.2.1.1	Case 1*	SCU	No
DetachedStudyManagement	1.2.840.10008.3.1.2.3.1	Case 1*	SCU	No

\*Note: Case 1 – The transfer syntaxes supported are listed in **table 3.31**

**Table 3.18. Presentation contexts to provide patient/study information**

The attributes that the IQPACS RadiVision will be able to interpret as a SCP are shown in the following tables:

Specific Character Set
Referenced Study Sequence
>Referenced SOP Class UID)
>Referenced SOP Instance UID
Referenced Visit Sequence
>Referenced SOP Class UID
>Referenced SOP Instance UID
Patient's Name
Patient ID
Patient's Birth Date
Patient's Birth Time
Patient's Sex
Referenced Patient Alias
SOP Instance UIDs
Issuer Of Patient ID
Other Patient IDs
Other Patient Names
Birth Name
Mother Birth Name
Medical Record Locator
Occupation
Patient Size
Patient Weight
Address
Military Rank
Branch Of Service
Country Residence
Region Residence
Telephone Numbers
Ethnic Group
Religious Preference
Comments
Medical Alerts
Contrast Allergies
Smoking Status
Patient History
Pregnancy Status
Last Menstrual Date
Special Needs
Patient State

**Table 3.19. Detached Management SOP Class N-GET Attributes – patient**

Specific Character Set
Referenced Study Sequence
>Referenced SOP Class UID
>Referenced SOP Instance UID
Referenced Visit Sequence
>Referenced SOP Class UID
>Referenced SOP Instance UID

Patient's Name
Patient ID
Patient's Birth Date
Patient's Sex
Referenced Patient Alias
SOP Instance UIDs
Accession Number
Study ID Issuer
Other Study Numbers
Study Status ID
Study Priority ID
Study Comments
Scheduled Start Date
Scheduled Start Time
Scheduled Stop Date
Scheduled Stop Time
Scheduled Location
Scheduled Location AETitle
Reason For Study
Requesting Physician
Requesting Service
Requested Procedure Description
Requested Contrast Agent
Study Arrival Date
Study Arrival Time
Study Date
Study Time
Study Completion Date
Study Completion Time
Study Verified Date
Study Verified Time
Modalities In Study
Series In Study
Acquisitions In Study
Name Physician Reading
Study Read Date
Study Read Time

***Table 3.20. Detached Management SOP Class N-GET Attributes – study***

### **3.4.4. Real World Activity: Accept notifications about patient/study related information**

#### **3.4.4.1 Associated Real World Activity**

IQPACS RadiVision is able to modify patient or study related information when receiving notifications invoked by a SCP through the use of the DIMSE N-EVENT-REPORT Service used in conjunction with the appropriate Detached Patient Management SOP Instance or detached Study Management SOP Instance.

### 3.4.4.2 Presentation Contexts

Abstract Syntax		Transfer Syntax	Role	Extended negotiation
Name	UID			
DetachedPatientManagement	1.2.840.10008.3.1.2.1.1	Case 1*	SCU	No
DetachedStudyManagement	1.2.840.10008.3.1.2.3.1	Case 1*	SCU	No

\*Note: Case 1 – The transfer syntaxes supported are listed in **table 3.31**

**Table 3.21. Presentation contexts to accept notifications**

The attributes that the IQPACS RadiVision will be able to interpret as a SCU are shown in the following tables:

Specific Character Set
Instance Creation Date
Instance Creation Time
Instance Creator UID
Patient Name
Patient ID
Issuer Of Patient ID
Other Patient IDs
Other Patient Names
Birth Name
Mother Birth Name
Medical Record Locator
Occupation
Birth Date
Birth Time
Sex
Patient Size
Patient Weight
Address
Military Rank
Branch Of Service
Country Residence
Region Residence
Telephone Numbers
Ethnic Group
Religious Preference
Comments
Medical Alerts
Contrast Allergies
Smoking Status
Patient History
Pregnancy Status
Last Menstrual Date

Special Needs
Patient State

**Table 3.22. Patient notification event information**

Study Instance UID
Accession Number
Study ID
Study ID Issuer
Other Study Numbers
Study Status ID
Study Priority ID
Study Comments
Scheduled Start Date
Scheduled Start Time
Scheduled Stop Date
Scheduled Stop Time
Scheduled Location
Scheduled Location AETitle
Reason For Study
Requesting Physician
Requesting Service
Requested Procedure Description
Requested Contrast Agent
Study Arrival Date
Study Arrival Time
Study Date
Study Time
Study Completion Date
Study Completion Time
Study Verified Date
Study Verified Time
Modalities In Study
Series In Study
Acquisitions In Study
Name Physician Reading
Study Read Date
Study Read Time
Referenced Visit Sequence
>Referenced SOP Class UID
>Referenced SOP Instance UID
Referenced Patient Sequence
>Referenced SOP Class UID
>Referenced SOP Instance UID
Referenced Results Sequence
Referenced Performed Procedure Step Sequence
>Referenced SOP Class UID
>Referenced SOP Instance UID
Requested Procedure Code Sequence

>Code Value
>Coding Scheme Designator
>Coding Scheme Version
>Code Meaning
Instance Creation Time
Instance Creator UID
Specific Character Set

**Table 3.23. Study notification event information**

**3.4.5. Real World Activity: Verify if it has all the images that currently make the Study and return this information to the SCU**

**3.4.5.1 Associated Real World Activity**

The IQPACS RadiVision is able to receive the Study Content Notification through the use of the DIMSE C-STORE.

**3.4.5.2. Presentation Context**

Abstract Syntax		Transfer Syntax	Role	Extended negotiation
Name	UID			
Basic Study Content Notification	1.2.840.10008.1.9	Case 1*	SCP	No

**Table 3.24. Presentation contexts for verifying the study content**

**3.4.5.3. SCP Conformance Requirements**

The IQPACS RadiVision verifies all the instances a SCU announces and constructs a response depending on this criterion.

RESPONSE STATUSES	Service Status Further Meaning Response	Status Codes
Success	Complete Study Content exists on system supporting SCP	0000
	Partial Study Content exists on system supporting SCP	0001
	None of the Study Content exists on system supporting SCP	0002
	It is unknown whether or not study content exists on system supporting SCP	0003
Failure	Failed operation	Cxxx

**Table 3.25. Response statuses**

The information, which is interpreted by the IQPACS RadiVision, is presented in the table below:

Patient's Name	(0010,0010)
Patient ID	(0010,0020)
Study ID	(0020,0010)
Study Instance UID	(0020,000D)
Referenced Series Sequence	(0008,1115)
>Series Instance UID	(0020,000E)
>Retrieve AE Title	(0008,0054)
>Modality	(0008,0060)
>Referenced Image Sequence	(0008,1140)
>>Referenced SOP Class UID	(0008,1150)
>>Reference SOP Instance UID	(0008,1155)
>>Retrieve AE	(0008,0054)

**Table 3.26. Attributes verified**

### 3.4.6. Real World Activity: Receive notifications about a specific real-world result

#### 3.4.6.1 Associated Real World Activity

The IQPACS RadiVision is able to receive from a SCP an unsolicited notification of a change in the Detached Results Management SOP Instance. These notifications shall be invoked by the SCP through the use of the DIMSE N-EVENT-REPORT Service.

The attributes related to the result are presented in the following table:

Specific Character Set	(0008,0005)
Referenced Study Sequence	(0008,1110)
>Referenced SOP Class UID	(0008,1150)
>Referenced SOP Instance UID	(0008,1155)
Referenced Interpretation Sequence	(4008,0040)
>Referenced SOP Class UID	(0008,1150)
>Referenced SOP Instance UID	(0008,1155)
ResultsID	(4008,0040)
ResultsDIssuer	(4008,0042)
Impressions	(4008,0300)
ResultsComments	(4008,4000)

**Table 3.27. Detached Results Management SOP Class N-EVENT-REPORT Attributes**

The attributes related to the interpretation are presented in the following table:

SpecificCharacterSet	
Referenced Results Sequence	
>Referenced SOP Class UID	(0008,1150)
>Referenced SOP Instance UID	(0008,1155)
InterpretationApproverSeq	
>Referenced SOP Class UID	(0008,1150)
>Referenced SOP Instance UID	(0008,1155)
InterpretationDiagnosisCodeSeq	
>Referenced SOP Class UID	(0008,1150)

>Referenced SOP Instance UID	(0008,1155)
InterpretationID	(4008,0200)
InterpretationDIssuer	
InterpretationTypeID	(4008,0210)
InterpretationRecordedDate	(4008,0100)
InterpretationStatusID	(4008,0212)
InterpretationRecordedTime	(4008,0100)
InterpretationRecorder	(4008,0100)
ReferenceToRecordedSound	(4008,0210)
InterpretationTranscriptionDate	
InterpretationTranscriptionTime	
InterpretationAuthor	
InterpretationText	(4008,010B)
InterpretationDiagnosisDescription	
InterpretationTranscriber	

**Table 3.28. Detached Interpretation Management SOP Class N-EVENT-REPORT Attributes**

The valid Results Management states are described in the following table:

State	Specifying IOD	Description
Created	Results	Outcome of completion of Create Results process
Recorded	Interpretation	Interpretation has been recorded
Transcribed	Interpretation	Interpretation has been transcribed
Approved	Interpretation	Interpretation has been approved

**Table 3.29. Results Management States**

### 3.4.6.2. Presentation Context

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

Abstract Syntax		Transfer Syntax	Role	Extended negotiation
Name	UID			
Detached Results Management	1.2.840.10008.3.1.2.5.1	Implicit VR Little Endian	SCU	No
Detached Interpretation Management	1.2.840.10008.3.1.2.6.1	Implicit VR Little Endian	SCU	No

**Table 3.30. Presentation contexts to receive notifications**

## 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 3.31. Supported transfer syntaxes**

## 4. COMMUNICATION PROFILES

### 4.1. Supported Communications Stacks (parts 8, 9)

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

#### 4.2.1. Physical Media Support

IQPACS RadiVision is indifferent to the physical media over which TCP/IP operates. It inherits the medium from the operating system upon which it executes. The RadiVision 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 RadiVision is defined at the configuration level. The default TCP port for the IQPACS RadiVision is 1105.

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. These applications are therefore named DICOM nodes and can be modalities, diagnosis workstations, image servers, other RIS or any other DICOM compliant application. This information is configurable and can be modified at any time.

### 6.2. Configurable Parameters

Parameter	Configurable (Yes/No)	Default Value
<b>General Parameters</b>		
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	<b>5000</b>
Time-out waiting for acceptance of a TCP/IP message over the network. (Low-level timeout)	Yes	<b>5000</b>
Any changes to default TCP/IP settings, such as configurable stack parameters.	No	-
Close delay	Yes	<b>500 msec</b>
<b>AE Specific Parameters</b>		
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**

The server administrator can configure the auto-routing rules for routing messages.

## 7. SUPPORT OF EXTENDED CHARACTER SETS

The IQPACS RadiVision 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