

# COBRA SOFTWARE AG

CONRAD

Conformance Statement

Revision 1.4.5

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## **1 Introduction**

### **1.1 Purpose of this Document**

This document is a provisional DICOM Conformance Statement for the software product CONRAD developed by COBRA Software AG Switzerland.

CONRAD is a RIS which acts as a service class provider for DIMSE-N services. Unless otherwise stated, all features conform with the DICOM V3.0 specification; all mandatory elements are supported.

### **1.2 Sources for this Document**

ACR-NEMA Digital Imaging and Communications in Medicine (DICOM) V3.0 Final draft, 1996

## 2. Implementation Model

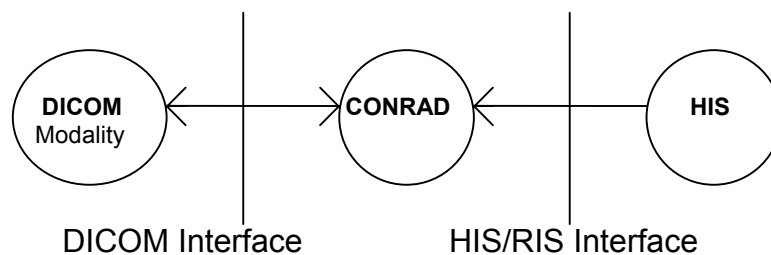
CONRAD includes the following components:

One or more interfaces to devices in the hospital information system based on standards such as HL7 or UN/EDI

CONRAD is a DICOM service class provider for the following service classes:

- patient management
- visit management
- study management
- basic worklist management

### 2.1 Application Data Flow Diagram



#### 2.1.1 N-EVENT Reports

Depending on the configuration, CONRAD will receive event notifications from the HIS. This information will be stored in the CONRAD database. Depending on the configuration, CONRAD will send matching DICOM events to specified devices in the PACS. Distribution time and pattern for each class are software configurable CONRAD tables.

#### 2.1.2 N-GET Requests

N-GET requests for patient, visit, study and interpretation information are responded to by CONRAD. All information returned within N-GET request are obtained from the CONRAD database.

#### 2.1.3 N-CREATE/N-SET/N-GET Study Component

At the present implementation CONRAD will not accept requests to N-CREATE, N-SET, N-GET study component.

#### **2.1.4 C-FIND Modality Worklist**

CONRAD will accept requests to C-FIND, a modality worklist.

#### **2.2 Functional Definitions of Aes**

CONRAD is implemented as a single application entity for a service class provider.

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

CONRAD does not necessarily need a connection to HIS. Triggers for creating and deleting patient/study can also be generated by CONRAD functionality.

CONRAD can be configured as a "stand-alone" system in environments where connections to HIS are not possible.

### 3. AE Specifications

#### 3.1 CONRAD Specifications

CONRAD provides Standard Conformance to the following DICOM V3.0 Verification Class as an SCU and SCP.

SOP Class	SOP Class UID
Verification	1.2.840.10008.1.1

CONRAD provides Standard Conformance to the following DICOM V3.0 Management Classes as an SCP

SOP Class	SOP Class UID
Detached Patient Management	1.2.840.10008.3.1.2.1.1
Detached Visit Management	1.2.840.10008.3.1.2.3.1
Detached Study Management	1.2.840.10008.3.1.2.4.1
Detached Result Management	1.2.840.10008.3.1.2.5.1
Detached Interpretation Management	1.2.840.10008.3.1.2.6.1
Modality Worklist Information Model	1.2.840.10008.5.1.4.31

#### 3.1.1 Association Establishment Policies

##### 3.1.1.1 General

The maximum number of simultaneous associations accepted by CONRAD is limited to 10 at the current implementation.

CONRAD does not support asynchronous operations window negotiation, other than the default as specified by the DICOM specification.

CONRAD will respond to implementation identifying information with the following parameters:

```

Implementation Class UID      1.2.840.999999.9.9.
; ** ; Implementation Class UID      1.2.840.999999.9.9.
Implementation Version Number CONRAD.01

```

**3.1.2 Association Initiation by real world activity**

**3.1.2.2 real world activity - detached patient management**

**3.1.2.2.1 Associated real world activity - detached patient management**

CONRAD will send DIMSE-N EVENT-REPORT to indicate that a change of relevant patient data has occurred. The following events are supported:

patient created	new patient added to CONRAD database
patient deleted	patient records purged in database
patient updated	patient data modified by user or HIS intervention

**3.1.2.2.2 presentation context table - detached patient management**

CONRAD supports the following transfer syntaxes

table 1

transfer syntax	UID
DICOM implicit VR little endian transfer syntax	1.2.840.10008.1.2

table 2

abstract syntax	SOP class	SOP class UID	transfer syntax	role	extended neg
detached patient management	patient	1.2.840.10008.3.1.2.1.1	all from table 1	SCP	None

**3.1.2.2.3 SOP specific conformance - detached patient management**

CONRAD supports the following elements for this SOP class:

table 3

Event type name	attribute name	tag
patient created	specific character set	0800,0005
	instance creation date	0800,0012
	instance creation time	0800,0013
	instance creator UID	0800,0014
	patient name	0010,0010
	patient ID	0010,0020
	patient birth date	0010,0030
	patient sex	0010,0040

patient deleted	specific character set	0008,0005
	patients name	0010,0010
	patient id	0010,0012
patient updated	specific character set	0008,0005
	patient name	0010,0010
	patient ID	0010,0020
	all updated attributes	

**3.1.2.3 real world activity - detached visit management**

**3.1.2.3.1 Associated real world activity - detached visit management**

CONRAD will send DIMSE-N EVENT-REPORT to indicate that a change of relevant visit data has occurred. The following events are supported:

- visit created                      new visit added to CONRAD database
- visit deleted                      visit records purged in database
- visit updated                      visit data modified by user or HIS intervention
- patient discharged                patient discharged from hospital

**3.1.2.3.2 presentation context table - detached patient management**

CONRAD supports the following transfer syntaxes

table 4

<b>transfer syntax</b>	<b>UID</b>
DICOM implicit VR little endian transfer syntax	1.2.840.10008.1.2

table 5

abstract syntax		transfer syntax	role	extended neg
SOP class	SOP class UID			
detached visit management	1.2.840.10008.3.1.2.2.1	all from table 4	SCP	None

### 3.1.2.3.3 SOP specific conformance - detached visit management

CONRAD supports the following elements for this SOP class:

table 6

Event type name	attribute name	tag	
visit created	specific character set	0800,0005	
	instance creation date	0800,0012	
	instance creation time	0800,0013	
	instance creator UID	0008,0014	
	referenced patient sequence	0008,1120	
	referenced SOP class UID	0008,1150	
	referenced SOP instance UID	0008,1155	
	visit status ID	0038,0008	
	scheduled admission date	0038,001A	
	scheduled admission time	0038,001B	
	scheduled patient inst. residence	0038,001E	
visit deleted	specific character set	0008,0005	
	referenced patient sequence	0008,1120	
	referenced SOP class UID	0008,1150	
	referenced SOP instance UID	0008,1155	
	visit status ID	0038,0008	
visit updated	specific character set	0008,0005	
	referenced patient sequence	0008,1120	
	referenced SOP class UID	0008,1150	
	referenced SOP instance UID	0008,1155	
	visit status ID	0038,0008	
	all updated attributes		
patient discharged	specific character set	0800,0005	
	instance creator UID	0008,0014	
	referenced patient sequence	0008,1120	
	referenced SOP class UID	0008,1150	
	referenced SOP instance UID	0008,1155	
	visit status ID	0038,0008	
	discharged date	0038,0030	
	discharged time	0038,0032	

### 3.1.2.4 real world activity - detached study management

#### 3.1.2.4.1 Associated real world activity - study management

CONRAD will send DIMSE-N EVENT-REPORT to indicate that a change of relevant study data has occurred. The following events are supported:

study created	new study added to CONRAD database
study scheduled	study has been scheduled
study updated	study record modified in CONRAD database
study deleted	study records purged in database
study completed	study has been completed

#### 3.1.2.4.2 presentation context table - detached study management

CONRAD supports the following transfer syntaxes:

table 7

transfer syntax	UID
DICOM implicit VR little endian transfer syntax	1.2.840.10008.1.2

table 8

abstract syntax		transfer syntax	role	extended neg
SOP class	SOP class UID			
detached study management	1.2.840.10008.3.1.2.3.1	all from table 8	SCP	None

#### 3.1.2.4.3 SOP specific conformance - detached study management

CONRAD supports the following elements for this SOP class:

table 9

Event type name	attribute name	tag
study created	specific character set	0008,0005
	instance creation date	0008,0012
	referenced patient sequence	0008,1120
	referenced SOP class UID	0008,1150
	referenced SOP instance UID	0008,1155
	referenced visit sequence	0008,1125
	referenced SOP class UID	0008,1150
	referenced SOP instance UID	0008,1155
	instance creation time	0008,0013
	instance creator UID	0008,0014
	study status ID	0032,000A

	all other defined attributes	
study deleted	specific character set	0008,0005
	study status ID	0032,000A
study updated	specific character set	0008,0005
	all updated attributes	
study completed		
	referenced study sequence	0008,1111
	referenced SOP class UID	0008,1150
	referenced SOP instance UID	0008,1155
	study completion date	0032,1050
	study completion time	0032,1051
study scheduled	specific character set	0008,0005
	instance creation date	0008,0012
	referenced patient sequence	0008,1120
	referenced SOP class UID	0008,1150
	referenced SOP instance UID	0008,1155
	referenced visit sequence	0008,1125
	referenced SOP class UID	0008,1150
	referenced SOP instance UID	0008,1155
	scheduled study start date	0032,1000
	scheduled study start time	0032,1001
	study status ID	0032,000A

### 3.1.2.5 real world activity - detached result management

#### 3.1.2.5.1 Associated real world activity - detached result management

CONRAD will send DIMSE-N EVENT-REPORT to indicate that a change of relevant result data has occurred. The following events are supported:

result created	new results added to CONRAD database
result updated	result record modified in CONRAD database
result deleted	result records purged in database

#### 3.1.2.5.2 presentation context table - detached result management

CONRAD supports the following transfer syntaxes

table 10

transfer syntax	UID
DICOM implicit VR little endian transfer syntax	1.2.840.10008.1.2

table 11

abstract syntax		transfer syntax	role	extended neg
SOP class	SOP class UID			
detached result management	1.2.840.10008.3.1.2.5.1	all from table 10	SCP	None

### 3.1.2.5.3 SOP specific conformance - detached result management

CONRAD supports the following element for this SOP class:

table 12

Event type name	attribute name	tag
result created	specific character set	0008,0005
	instance creation date	0008,0012
	referenced study sequence	0008,0119
	referenced SOP class UID	0008,1150
	referenced SOP instance UID	0008,1155
	referenced interpretation sequence	0008,0119
	referenced SOP class UID	0008,1150
	referenced SOP instance UID	0008,1155
	instance creation time	0008,0013
	instance creator UID	0008,0014
	result ID	4008,0040
	all other defined attributes	
results deleted	specific character set	0008,0005
	Results ID	4008,0040
results updated	specific character set	0008,0005
	all updated attributes	

**3.1.2.6 real world activity - detached interpretation management**

**3.1.2.6.1 Associated real world activity - detached interpretation management**

CONRAD will send DIMSE-N EVENT-REPORT to indicate that a change of relevant interpretation data's have been occurred. The following events are supported:

- interpretation created      new interpretation added to CONRAD database
- interpretation transcribed      interpretation record modified in CONRAD database
- result approved      interpretation record approved

**3.1.2.6.2 presentation context table - detached interpretation management**

CONRAD supports the following transfer syntaxes:

table 13

transfer syntax	UID
DICOM implicit VR little endian transfer syntax	1.2.840.10008.1.2

table 14

abstract syntax	SOP class UID	transfer syntax	role	extended neg
detached interpretation management	1.2.840.10008.3.1.2.6.1	all from table 13	SCP	None

**3.1.2.6.3 SOP specific conformance - detached interpretation management**

CONRAD supports the following elements for this SOP class:

table 15

Event type name	attribute name	tag
interpretation created	specific character set	0008,0005
	instance creation date	0008,0012
	referenced result sequence	0008,1100
	referenced SOP class UID	0008,1150
	referenced SOP instance UID	0008,1155
	result ID	4008,0040
	all other defined attributes	

interpretation transcr.	specific character set	0008,0005
	Interpret. transcribed date	4008,0108
	Interpretation Author	4008,010C
	Interpretation Transcription Time	4008,0109
	Interpretation Status ID	4008,0212
	Interpretation Type ID	4008,0210
interpretation approved	specific character set	0008,0005
	Interpretation Approver	4008,0111

**3.1.3 association acceptance policy**

**3.1.3.1 real world activity - detached patient management**

**3.1.3.1.1 associated real world management - detached patient management**

CONRAD will respond to DIMSE N-GET requests to retrieve patient demographic information. CONRAD does not support any other DIMSE-N commands as an SCP with this presentation context.

table 16

<b>transfer syntax</b>	<b>UID</b>
DICOM implicit VR little endian transfer syntax	1.2.840.10008.1.2

table 17

abstract syntax		transfer syntax	role	extended neg
SOP class	SOP class UID			
detached patient management	1.2.840.10008.3.1.2.1.1	all from table 16	SCP	None

CONRAD supports the following elements for this SOP class:

table 18 detached patient management Object N-GET attributes

attribute name	tag
specific character set	0008,0005
patient name	0010,0010
patient ID	0010,0020
patient birth date	0010,0030
patient sex	0010,0040
other patient ID	0010,1000

patient birth name	0010,1005
patient address	0010,1040
contrast allergies	0010,2110
country of residence	0010,2150
region of residence	0010,2152
patient telephone number	0010,2154
patient comment	0010,4000

CONRAD returns one of the following status codes:

table 19

service status	further meaning	protocol codes	related fields	description
error	failed	0110		operation not successful
success	success	0000		operation successful

#### **3.1.3.1.4 presentation context acceptance criterion - detached patient management**

CONRAD always accepts a presentation context for the detached patient management.

#### **3.1.3.1.5 transfer syntax selection policies - detached patient management**

CONRAD supports only little endian implicit transfer syntax.

### 3.1.3.2 real world activity -detached visit management

#### 3.1.3.2.1 associated real world management - detached visit management

CONRAD will respond to DIMSE N-GET requests to retrieve visit information. CONRAD does not support any other DIMSE-N command as an SCP with this presentation context.

table 20

<b>transfer syntax</b>	<b>UID</b>
DICOM implicit VR little endian transfer syntax	1.2.840.10008.1.2

table 21

abstract syntax		transfer syntax	role	extended neg
SOP class	SOP class UID			
detached visit management	1.2.840.10008.3.1.2.2.1	all from table 20	SCP	None

CONRAD supports the following elements for this SOP class:

table 22 detached visit management Object N-GET attributes

attribute name	tag
specific character set	0008,0005
visit Status ID	0038,0008
curent patient location	0038,0300
admitting date	0038,0020
admitting time	0038,0021
referring physician's name	0008,0090
referring physician's address	0008,0092
referring physician's phone number	0008,0094
discharge date	0038,0030
discharge time	0038,0032
scheduled admission date	0038,001A
scheduled admission time	0038,001B
scheduled discharge date	0038,001C
scheduled discharge time	0038,001D
referenced patient sequence	0008,1120
referenced SOP Class UID	0008,1150
referenced SOP Instance UID	0008,1155
referenced study sequence	0008,1110
referenced SOP class UID	0008,1150
referenced SOP instance UID	0008,1155

CONRAD returns one of the following status codes:

table 23

service status	further meaning	protocol codes	related fields	description
error	failed	0110		operation not successful
success	success	0000		operation successful

#### 3.1.3.2.4 presentation context acceptance criterion - detached visit management

CONRAD always accepts a presentation context for the detached patient management.

#### 3.1.3.2.5 transfer syntax selection policies - detached visit management

CONRAD supports only little endian implicit transfer syntax.

#### 3.1.3.3 real world activity - detached study management

##### 3.1.3.3.1 associated real world management - detached study management

CONRAD will respond to DIMSE N-GET requests to retrieve study information. CONRAD does not support any other DIMSE-N command as an SCP with this presentation context.

table 24

transfer syntax	UID
DICOM implicit VR little endian transfer syntax	1.2.840.10008.1.2

table 25

abstract syntax		transfer syntax	role	extended neg
SOP class	SOP class UID			
detached study management	1.2.840.10008.3.1.2.3.1	all from table 24	SCP	None

CONRAD supports the following elements for this SOP class:

table 26 detached study management Object N-GET attributes

attribute name	tag
specific character set	0008,0005
study ID	0020,0010
study ID instance UID	0020,000D
study status ID	0032,000A
scheduled study start date	0032,1000
scheduled study start time	0032,1001
scheduled study stop date	0032,1010
scheduled study stop time	0032,1011
scheduled study stop location	0032,1020
reason for study	0032,1030
requesting service	0032,1033
requesting physician	0032,1032
requested procedure description	0032,1060
requested procedure code sequence	0032,1064
code value	0008,0100
coding scheme	0008,0102
code meaning	0008,0104
study date	0008,0020
study time	0008,0030
accession number	0008,0050
study completion date	0032,1050
study completion time	0032,1051
study verified date	0032,0032
name of physician reading study	0032,1060
study read date	0032,0034
referenced patient sequence	0008,1120
referenced SOP class UID	0008,1150
referenced SOP instance UID	0008,1155
referenced visit sequence	0008,1125
referenced SOP class UID	0008,1150
referenced SOP instance UID	0008,1155

CONRAD returns one of the following status codes:

table 27

service status	further meaning	protocol codes	related fields	description
error	failed	0110		operation not successful
success	success	0000		operation successful

**3.1.3.3.4 presentation context acceptance criterion - detached study management**

CONRAD always accepts a presentation context for the detached patient management.

**3.1.3.3.5 transfer syntax selection policies - detached study management**

CONRAD supports only little endian implicit transfer syntax.

**3.1.3.4 real world activity - detached interpretation management**

**3.1.3.4.1 associated real world management - interpretation study management**

CONRAD will respond to DIMSE N-GET requests to retrieve interpretation information. CONRAD does not support any other DIMSE-N command as an SCP with this presentation context.

table 28

<b>transfer syntax</b>	<b>UID</b>
DICOM implicit VR little endian transfer syntax	1.2.840.10008.1.2

table 29

abstract syntax		transfer syntax	role	extended neg
SOP class	SOP class UID			
detached inter-pretation management	1.2.840.10008.3.1.2.6.1	all from table 28	SCP	None

CONRAD supports the following elements for this SOP class:

table 30 detached interpretation management Object N-GET attributes

attribute name	tag
specific character set	0008,0005
interpretation ID	4008,0200
interpretation ID issuer	4008,0202
Interpretation Status ID	4008,0212
Interpretation recorded date	4008,0100
interpretation recorded time	4008,0101
interpretation recorder	4008,0102
interpretation text	4008,010B
interpretation author	4008,010C
accession number	0008,0050

CONRAD returns one of the following status codes:

table 31

service status	further meaning	protocol codes	related fields	description
error	failed	0110		operation not successful
success	success	0000		operation successful

**3.1.3.4.2 presentation context acceptance criterion - detached interpretation management**

CONRAD always accepts a presentation context for the detached patient management.

**3.1.3.4.3 transfer syntax selection policies - detached interpretation management**

CONRAD supports only little endian implicit transfer syntax.

**3.1.3.5 real world activity - modality worklist management**

**3.1.3.5.1 associated real world management - modality worklist management**

CONRAD will accept DIMSE C-FIND's.

table 32

<b>transfer syntax</b>	<b>UID</b>
DICOM implicit VR little endian transfer syntax	1.2.840.10008.1.2

table 33

abstract syntax		transfer syntax	role	extended neg
SOP class	SOP class UID			
modality worklist info model FIND	1.2.840.10008.5.1.4.31	all from table 32	SCP	None

**3.1.3.5.2 SOP specific conformance - modality worklist management**

CONRAD provides standard conformance to the DICOM basic worklist management service class.

CONRAD supports the following matching keys:

matching key type	
Sv	single value match
wc	wildcard match
dr	date range match

CONRAD supports the following elements for this SOP class:

table 34 modality worklist information model attributes

module	attribute name	tag	match	return
	specific character set	0008,0005		1C
sched.proc. step	sched. procedure step seq.	0040,0100		
	sched. procedure start date	0040,0002	dr	1
	sched. procedure start time	0040,0003	dr	1
	Modality	0008,0060	sv	1
	sched. performing physician	0040,0008	wc	1
	sched. procedure desc.	0040,0005		1C
requested proc.	requested procedure ID	0040,1001		1
	requested procedure descr.	0032,1060		1C
	reason for requested proc.	0040,1002		3
	requested procedure code seq.	0032,1064		1C
	code value	0008,0100		1C
	coding scheme designator	0008,0102		1C
	study instance UID	0020,000D	sv	1
	Referenced SOP class UID	0008,1150		1C
	Referenced SOP instance UID	0008,1155		1C
visit information	admission ID	0008,0050	sv	2
visit status	current patient location	0038,0030		2
visit relationship	referenced patient sequence	0008,1120		2
	referenced SOP class UID	0008,1150		2
	referenced SOP inst. UID	0008,1155		2
patient information	patient name	0010,0010	wc	1
	patient ID	0010,0020	sv	1
patient demographic	patient birth date	0010,0030		2
	patient sex	0010,0040		2
patient medical	contrast allergies	0010,2110		2

#### **4. Communication profiles**

CONRAD provides DICOM V3.0 TCP/IP network communication support as defined in part 8 of the DICOM standard.

##### **4.1 TCP/IP stack**

CONRAD inherits the TCP/IP stack from the computer system upon which it executes on Unix ,VMS and Microsoft NT systems.  
On DOS system the TCP/IP stack from ftp corporation is needed.

##### **4.2 physical medium supported**

CONRAD is indifferent to the physical medium over which TCP/IP is executed.

#### **5. extension, specializations, privatizations**

#### **6. support for extended character sets**

CONRAD supports the following character sets:

ISO R6	basic G0 set
ISO IR 100	Latin alphabet No 1