

# **BASIC WORKLIST MANAGEMENT SERVER**

**Version 2.0**

**DICOM Conformance Statement**

2012/12/14



# 1. Implementation model

The server runs on top of Windows system to respond to the worklist requests. It runs as a process that accepts association requests from external applications. The server creates a separated thread for each association request. Therefore, each thread communicates only with the requesting application.

## 1.1 Data flow

Figure 1 illustrates the relation between the server and external applications.

The aforementioned service does not perform any other operations except responding to the requests received via DICOM connection.

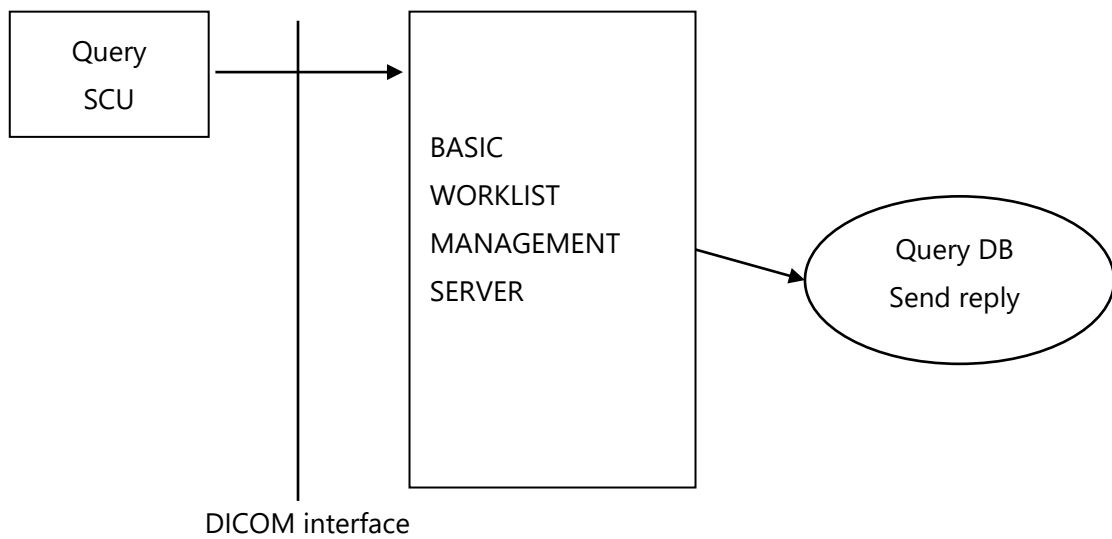


Fig 1. Worklist server implementation model

## 1.2 Application Entity function definition

Once the server is launched, it is waiting for the connections from other applications via certain TCP/IP ports. When a DICOM association is requested from another application, the server confirms the request by using the database and the logic.

1. The server looks up the control table in order to confirm whether the name of the requested application contained in the association request has been defined.
2. The server looks up the control table in order to find the application defined in the association request as the name of the requesting application. It confirms whether the name of the requesting application matches the value stored in the control table.

## 2.AE Specification

The server can be called multiple times from a single equipment unit and operate by using one instance. Moreover, every time the association request is received, the server generates a copy of itself. Calling the server and creating its copy express the same application entity.

### 2.1 AE Worklist Specification

The server, as an SCP, provides the standard conformance with the following DICOM 3.0 SCP classes.

Table 2. The SOP classes that the server supports as an SCP

SOP Class Name	SOP Class UID
Confirmation SOP class	1.2.840.10008.5.1.4.1.1
Modality Worklist Information Model – FIND	1.2.840.10008.5.1.4.31

#### 2.1.1 Association Establishment Policy

##### 2.1.1.1 Summary

On receiving a C-FIND request from another application entity, the server attempts to initiate the association.

The default maximum PDU size for communication with the server is 32 KB.

##### 2.1.1.2 Number of associations

The number of simultaneous associations the server can accept is restricted by the kernel parameters of the basic TCP/IP implementation. Also, although the server generates a thread pool according to the settings at startup, the number of simultaneous associations substantially depends on the mentioned parameters.

##### 2.1.1.3 Asynchronous nature

The server does not support asynchronous operation and does not perform asynchronous window negotiation.

##### 2.1.1.4 Implementation Identifying Information

The server provides the implementation class UID 1.2.392.200036.9142.10000302.

### 2.2 Real-World Activity – Requesting

The server accepts associations from the nodes attempting to perform worklist request.

#### 2.2.1 Presentation Context Table

Table 5 illustrates the Presentation Contexts that the server can accept in response to the query

operations.

Table 5. Acceptable Presentation Contexts for request class

Presentation Contexts					
Abstract syntax		Transfer syntax		Role	Extended Negotiation
Name	UID	Name	UID		
Modality worklist Request/ Acquisition information model - FIND	1.2.840.10008.5.1.4.31	DICOM Implicit VR Little endian	1.2.840.10008.1.2	SCP	None
		DICOM Explicit VR Little endian	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big endian	1.2.840.10008.1.2.2		

## 2.2.2 SOP Specific Conformance for Query SOP class

The server supports the modules listed in Table 6 as follows. However, because the server does not update the database, it depends on the updating application whether the reply to the request can be received.

Table 6. SOP Common

Description	Tag	Type
Specific Character Set	0008 0005	O

Table 6. Scheduled Procedure Step

Description	Tag	Type
Scheduled Procedure Sequence	0040 0100	R
>Schedule AE Title	0040 0001	R
>Scheduled Date	0040 0002	R
>Scheduled Time	0040 0003	R
>Modality	0008 0060	R
>Scheduled Physician's Name	0040 0006	R
>Scheduled End Time	0040 0005	O
>Scheduled Station Name	0040 0010	O
>Scheduled Location Code	0040 0011	O
>Scheduled Protocol Code Sequence	0040 0008	O
>>Code Value	0008 0100	O
>>Coding Scheme Designator	0008 0102	O
>>Code Meaning	0008 0104	O
>>Pre-Medication	0040 0012	O

>Scheduled Number	0040 0009	O
>Requested Contrast Agent	0032 1070	O

Table 6. Requested Procedure

Description	Tag	Type
Requested Procedure ID	0040 1001	O
Requested Procedure Description	0032 1060	O
Requested Procedure Code Sequence	0032 1064	O
>Code Value	0008 0100	O
>Coding Scheme Designator	0008 0102	O
>Code Meaning	0008 0104	O
Study Instance UID	0020 000D	O
Referenced Study Sequence	0008 1110	O
>Referenced SOP Class UID	0008 1150	O
>Referenced SOP Instance UID	0008 1155	O
Requested Procedure Priority	0040 1003	O
Patient Transport Mode	0040 1004	O

Table 6. Imaging Service Request

Description	Tag	Type
Accession Number	0008 0050	O
Requesting Physician	0032 1032	O
Referring Physician Name	0008 0090	O

Table 6. Visit Identification

Description	Tag	Type
Admission ID	0038 0010	O

Table 6. Visit Status

Description	Tag	Type
Patient Location	0038 0300	O

Table 6. Visit Relationship

Description	Tag	Type
Referenced Patient Sequence	0008 1120	O
>Referenced SOP Class UID	0008 1150	O
> Referenced SOP Instance UID	0008 1155	O

Table 6. Patient Identification

Description	Tag	Type
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Patient's Name	0010 0010	R
Patient ID	0010 0020	R

Table 6. Patient Demographic

Description	Tag	Type
Patient's Birth Date	0010 0030	O
Patient's Sex	0010 0040	O
Patient's Size	0010 1020	O
Patient's Weight	0010 1030	O
Patient Data Confidentiality	0040 3001	O

Table 6. Patient Medical

Description	Tag	Type
Patient State	0038 0500	O
Pregnancy Status	0010 21C0	O
Medical Alerts	0010 2000	O
Allergies	0010 2110	O
Special Needs	0038 0050	O

Table 6.

Description	Tag	Type
Institution Name	0008 0080	O

### 2.2.3 Presentation Context Acceptance Criterion

Whether the server receives association requests from unknown applications depends on the system settings. Only if such requests are allowed, any number of the request SOP classes specified in Table 5 can be accepted. The server does not define a limit for the number of the accepted presentation contexts. Also, among several duplicated presentation contexts, the first accepted one is to be selected.

### 2.2.4 Transfer Syntax Selection Policy

By default, the server selects transfer syntax according to the priority determined in Table 5; however this priority can be changed in the system settings.

## 2.3 Real-World Activity – Confirming

This server accepts the associations from the nodes attempting to perform confirmation on the image server.

### 2.3.1 Related Real-World Activity – Confirming

The real-world activity related to C-ECHO requests attempts to confirm the network and server operations without initiating actual operation of external nodes.

## 2.3.2 Presentation Context Table

Table 8 illustrates the Presentation Contexts the server can accept in response to the confirming operation.

Table 8. Proposed Presentation Contexts of the Server for Confirming Operation

Presentation Contexts					
Abstract Syntax		Transfer Syntax		Role	Extension Negotiation
Name	UID	Name	UID		
Confirm	1.2.840.10008.1.1	DICOM Implicit VR Little endian	1.2.840.10008.1.2	SCP	None
		DICOM Explicit VR Little endian	1.2.840.10008.1.2.1		
		DICOM Explicit VR Big endian	1.2.840.10008.1.2.2		

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## 3. Communication Profile

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### 3.1 TCP/IP Stack

The server provides support for the DICOM V3.0 TCP/IP network communication defined in the part 8 of the DICOM standard.

#### 3.1.1 TCP/IP API

The server is using the TCP/IP stack from Windows system that is running the image server. The subroutine library based on Berkeley sockets interface has been used.

#### 3.1.2 Physical media support

The server exists as a software that can be compiled on various Windows platforms. Therefore, there is no limitation of the physical network. The image server is implemented by using TCP/IP over Ethernet (Thick Wire, Thin Wire, 10 Base T), FDDI (twisted pair into a concentrator, fiber backbone), Tin-Can-Telephone-Net.



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## 4. Extension / Specialization / Privatization

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Not applicable

## 5. Configuration

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The server obtains the configuration information from the “control” database stored in the related database. In this implementation, the related database is an ini file.

### 5.1 AE Title / Presentation Address Mapping

“Application Entity” in the control table is used for mapping between AE titles and presentation address.

### 5.2 Configurable parameters

The following parameters can be configured on the image server.

- Application entity title
- Maximum PDU size
- Number of TCP/IP ports

### 5.3 Support of extended character sets

The server supports [ISO 2022 IR 13] and [ISO 2022 IR 87].