

## **Trophy DICOM Patient Management System CSDServices User's Manual**

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# 1 INTRODUCTION

This document is related to the usage of the Trophy DICOM associated service named CSDServices and provides the user with a description of its functionalities and its user interface.

Trophy DICOM is a patient management system implementing a subset of the DICOM standard in order to achieve patient information and image data exchange with remote systems (see [2]).

Trophy DICOM is actually a front-end application program providing the Trophy Imaging Software (namely Trophy Windows or DIS) with both patient management and DICOM capabilities.

CSDServices is a background process providing Trophy DICOM with asynchronous dataset transfer capabilities. This is particularly useful for large dataset transfers like 3D Volumes acquired with the latest Trophy equipments.

## 1.1 Revision History

Revision	Date	Author	Description
1.0	2009-02-24	Xavier CARAYOL	Initial Version
1.1	2010-02-17	Xavier CARAYOL	Updated for Trophy DICOM 6.2.0.0 version
1.2	2013-05-23	Marc LAURENTIN	Rebranding – Name changed to CSDServices

## 1.2 Audience

This document is provided for advanced users of the Trophy DICOM application and for Trophy Customer Support representatives.

It is assumed that the reader of this document is familiar with the DICOM 3.0 standard and with the terminology and concepts used in the standard.

## 1.3 Applicable Software Version

This document is related to the version 1.1.2.0 and above of CSDServices, unless otherwise explicitly stated.

This CSDServices version is associated with the Trophy DICOM application version 6.2.0.0 and above, and shall not be used in conjunction with any other earlier version.

## 1.4 Definitions, Terms and Abbreviations

The following definitions are used in this conformance statement:

CSDServices	A background process performing asynchronous dataset transfers for Trophy DICOM.
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The following symbols and abbreviations are used in this conformance statement:

AE	Application Entity
DPMS	Dental Patient Management System
DX	Digital X-Ray
FMS	Full Mouth Series
HIS	Hospital Information System

IO	Intra-Oral
DIS	Dental Imaging Software (also known as Trophy Windows)
LUT	Look Up Table
PACS	Picture Archiving and Communication System
Q/R	Query and Retrieve
RIS	Radiology Information System
SC	Secondary Capture
SCP	Service Class Provider (i.e. server in a client-server relationship)
SCU	Service Class User (i.e. client in a client-server relationship)
SOP	Service Object Pair
V&V	Verification & Validation
XML	Extensible Markup Language

## 1.5 References

- [1]. ACR/NEMA Standards Publications, PS 3 - 2009 DICOM Standard

Copies of the DICOM 3.0 standard may be obtained by contacting:

National Electrical Manufacturers Association  
1300 N. 17<sup>th</sup> Street  
Rosslyn, Virginia 22209 USA  
<http://medical.nema.org>

Current standard status may be checked also at:

<http://www.dclunie.com/dicom-status/status.html>

- [2]. Trophy DICOM Patient Management System – DICOM 3.0 Conformance Statement

Reference: "04XC001-I Trophy DICOM CS" document

- [3]. Trophy DICOM Patient Management System – Installation and Configuration Manual

Reference: "04XC002-H Trophy DICOM IM" document

- [4]. Trophy DICOM Patient Management System – DICOM Configuration Manual

Reference: "05XC002-E Trophy DICOM DC" document

- [5]. Trophy DICOM Patient Management System – User's Manual

Reference: "04XC004-G Trophy DICOM UM" document

- [6]. Trophy DICOM Patient Management System – DICOM Connectivity Troubleshooting Guide

Reference: "08XC004-D Trophy DICOM TG" document

## 2 INSTALLING KDSERVICES

CSDServices is part of the Trophy DICOM distribution, and automatically installed along with Trophy DICOM. Its installation is not a separate process.

CSDServices is installed within the Common Files directory of the regular Program Files repository of a Windows based operating system. By default its installation directory is:

**Table 1: CSDServices Installation Directory**

C:\Program Files\Common Files\Trophy\KDServices
---

*Note: This installation location cannot be changed.*

CSDServices creates all its specific DICOM logs files within the "logfiles" sub-directory of its installation directory.



**WARNING: Trophy DICOM cannot be installed on a Windows system without CSDServices, and requires CSDServices to be running in order to provide the user with DICOM Store functionality.**

### 2.1 Configuring CSDServices

CSDServices does not require any specific configuration for running after its installation.

Trophy DICOM, when submitting transfer requests, provides any DICOM specific parameters, necessary to establish a communication to a remote DICOM server, to CSDServices.

CSDServices does not maintain any database configuration of remote DICOM servers and relies on Trophy DICOM to get such information.

CSDServices expects to retrieve, within a specific directory on the system, transfer requests as XML files. By default, this directory is:

**Table 2: CSDServices Request Directory**

C:\Documents and Settings\All Users\Application Data\↵ → TW\KDServices\Requests
--

*Note: This location cannot be changed.*

For more information about CSDServices configurable options, refer to section 3.3.

### 2.2 Uninstalling CSDServices

CSDServices may be uninstalled using the regular Windows "Add/Remove programs" application. It appears in the list under "**CSDServices (remove only)**".

Running the "Uninstall.exe" program located into its installation directory may also uninstall CSDServices.



**WARNING: It is strongly NOT recommended to uninstall CSDServices, since this is the only mechanism used now by Trophy DICOM for sending any type of images to remote systems by DICOM.**

## 3 RUNNING CSDSERVICES

### 3.1 Starting CSDServices

There is no need to explicitly launch CSDServices. CSDServices is automatically started every time a user logs into the Windows system.

*Note: For that purpose, an entry is added to the startup folder for all users of the Windows system during its installation.*

Trophy DICOM when launched also restarts CSDServices, if necessary.

When installed and running, CSDServices appears in the Windows System Tray as a Carestream icon:



**Figure 1: CSDServices System Tray Icon**

This icon state changes depending on the CSDServices state, as described in the following:

**Table 3: CSDServices System Tray Icon States**

	CSDServices is in an idle state, ready to process transfer requests.
	CSDServices is in a running state, checking for or processing transfer requests.
	CSDServices is in a suspended state: its management console window is open; it does not process any transfer request.

*Note: When in idle state, CSDServices periodically spools its request directory for new transfer requests. Therefore its icon may appear as blinking (from idle to running state).*

### 3.2 Managing CSDServices

CSDServices may be considered as a spooler for transfer requests made by Trophy DICOM. In order to provide the user with the ability to control and check the state of previously submitted request, CSDServices offers a transfer management console.

Within that console, the user can then suspend/resume, check, cancel any submitted transfer request and perform also some general maintenance operations and basic option configurations.

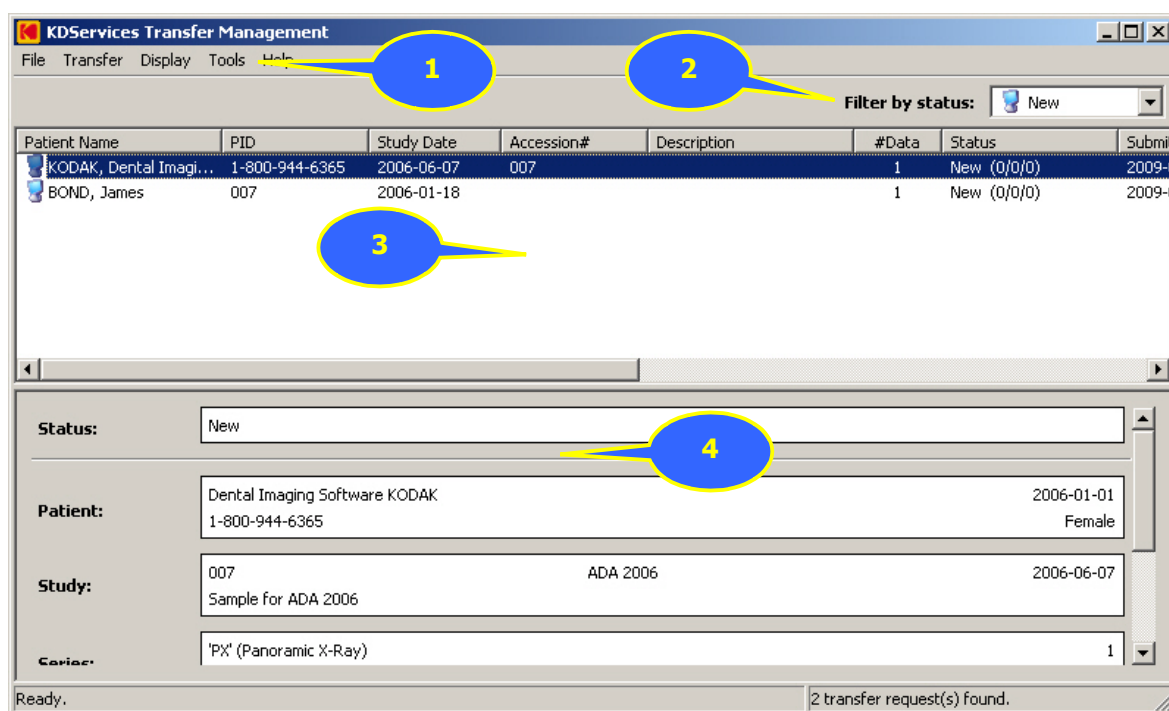
CSDServices Transfer Management console is accessible thru the popup menu available when right-clicking on its System Tray icon:



**Figure 2: CSDServices Popup Menu**

When selecting the "Open" option, the CSDServices Transfer Management console window is displayed, as shown in the following picture:

*Note: Double-clicking on the System Tray icon provides the same action.*



**Figure 3: CSDServices Transfer Management Console**



**WARNING:** As described above, when the Transfer Management console is displayed, CSDServices is in a suspended state.

This dialog window consists of 4 main components as described in the following table:

**Table 4: Console Components**

#	Component	Description	Context Sensitive
1	Main Menu	Provides access to all common functionalities and some transfer management specific commands.	Yes
2	Filter	Provides the ability to filter existing transfer requests based on their processing status.	No
3	Transfer Request List	Provides the list of existing transfer requests matching selected filter. <i>Note: this list is multi-selectable.</i>	No
4	Transfer Request Status	Provides information related to the selected transfer request item of the Transfer Request List	Yes

### 3.2.1 Main Menu Component

The Main Menu options and sub-options are described in the following table:

**Table 5: Main Menu Options**



Option	Sub-option	Shortcut	Description
File	Hide		Hide the CSDServices Transfer Management console, resuming CSDServices from its suspended state, ready to process any new transfer request.
Transfer	Suspend	CTRL-Z	Suspend the currently selected transfer request(s). <i>Note: available only for pending (new) transfer requests.</i>
	Resume	CTRL-R	Resume the currently selected transfer request(s). <i>Note: available only for suspended transfer requests.</i>
	Retry		Retry (restart) the currently selected transfer request(s). <i>Note: available only for completed (successfully or not) transfer requests.</i>
	Cancel / Remove...		Definitely cancel pending transfer requests or remove completed transfer requests.
	Properties		Show the content of the XML file associated with the selected transfer request. <i>Note: available when only one request is selected.</i>
Display	Show Details	F2	Display or hide the Transfer Request Status component.
	Refresh	F5	Refresh the content of the Transfer Request List. <i>Note: currently selected filter still apply.</i>
Tools	Purge History...		Provides the user with the ability to remove definitely all transfer requests that are not in a pending state (i.e. new, not processed yet). <i>Note: an automatic purge mechanism exists within CSDServices and duration for keeping history can be configured thru the Options menu.</i>
	DICOM Logs...		Provides access to the directory where DICOM logs are created. <i>Note: The DICOM logs are accessible directly from within Trophy DICOM (refer to [4]).</i> <i>Note: The DICOM logs are simple text files that can be open using Windows Notepad program.</i> <i>Note: Trophy DICOM regularly purges the DICOM logs (refer to [4]).</i>
	Options...		Open the CSDServices option configuration window as described in section 3.3 below.
Help	About...		Display the About dialog window. <i>Note: also available thru the System Tray popup menu.</i>

*Note: A context-menu providing the Transfer menu sub-options is also available when right-clicking on select transfer requests.*




### 3.2.2 Filter Component

CSDServices provides the user with the ability to filter the submitted transfer requests displayed in the Transfer Request List, based on their status as described in the following table:

**Table 6: Filter Options**

Value	Description
 New	List pending (non processed yet) transfer requests only.
 Suspended	List suspended transfer requests only.



 Success	List completed with success transfer requests only.
 Warning	List completed but with warning transfer requests only.
 Error	List completed but failed transfer requests only.
All	List all transfer request (no filter applied).

### 3.2.3 Transfer Request List Component

The Transfer Request List component display to the user basic information about transfer requests that may help identifying a specific transfer request, as described in the following table:

**Table 7: Transfer Request List Columns**

Column	Description
Patient Name	The patient's name of the image(s) included into the transfer request.
Patient ID	The patient's ID of the image(s) included into the transfer request.
Study Date	The study date of the image(s) included into the transfer request.
Accession#	The study accession number of the image(s) included into the transfer request.
Description	The study description of the image(s) included into the transfer request.
#Data	The number of images actually part of the transfer request.
Status	The status of the transfer request, with in parenthesis the number of success, warnings and errors respectively for all images part of the transfer request.
Submitted	The date and time of submission of the initial transfer request.
Destination	The destination DICOM server for the transfer request.
Owner	The name of the Windows user that submitted the transfer request.
Request	The file name of the XML file containing the transfer request.

By default, transfer request are sorted by submission date in this list.

*Note: Sorting is available by clicking on the different column headers.*

Context menu is available in the Transfer Request List component when right clicking on selected item(s) in the list. Menu options available are obviously based on the selected items.

*Note: hitting the F5 key may refresh the content of the Transfer Request List component.*

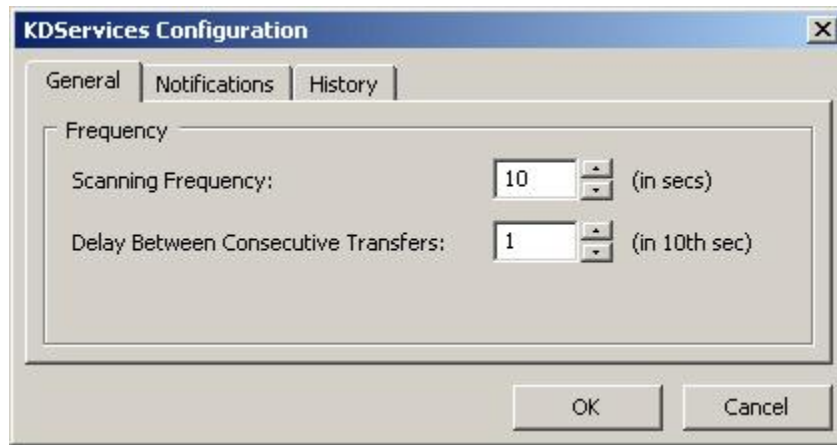
### 3.2.4 Transfer Request Status Component

The Transfer Request Status component provides the user with more information (when available) concerning the currently selected transfer request in the Transfer Request List component.

Note: hitting the F2 key may hide The Transfer Request Status Component.

## 3.3 Configuring CSDServices Options

CSDServices provides the user with the ability to configure some options thru its configuration dialog window, as shown in the following picture:



**Figure 4: CSDServices Option Configuration Dialog Window**

The options along with their default values are described in the following table:

Tab	Option	Description	Default
General	Scanning Frequency	Frequency used by CSDServices for scanning request directory for new transfer requests. Expressed in seconds.	3
	Delay Between Consecutive Transfers	New scanning frequency after a transfer request has been detected. Expressed in 10 <sup>th</sup> of seconds. <i>Note: allows speeding up transfer request processing when several transfer requests are posted together.</i>	1
Notifications	Display Notifications	Shall a notification balloon be displayed on the bottom right corner of the screen, after each transfer request processing? This balloon provides a general status of the transfer. <i>Note: If selected (clicked) this balloon does not disappear by itself and must be closed using its red close button.</i>	Unchecked
	Duration	Duration for the balloon to stay visible. Expressed in seconds.	5
	Beep	Shall a beep be produced each time the balloon is displayed?	Unchecked
History	Keep history for	Number of weeks all completed (successfully or not) transfer requests shall be kept in the history. Expressed in weeks.	1

### 3.4 Processing Transfer Requests

In order to process new transfer requests, CSDServices regularly scan its request directory for new transfer request XML files that Trophy DICOM is putting, each time the user requires some images to be sent to some remote DICOM servers.

As stated in section 2.1, CSDServices is build to check into a specific location on the system. That location is fixed and known also by Trophy DICOM.

Under that request directory, CSDServices uses 2 sub-directories, named "Performed" and "Trashcan", for moving respectively, completed (successfully or not) or suspended transfer requests, and rejected ones.

*Note: a transfer request is rejected when its XML file is not properly formatted.*

*Note: when resuming a suspended transfer request, or retrying one, CSDServices Transfer Management Console simply move back the associated XML file within the CSDServices request directory, updating its included status information.*

The following picture shows the content of an example of a transfer request XML file:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<!-- DICOM Store Request -->
- <trophy type="dicomstore" version="1.0">
- <transfer>
  <string key="guid" value="4a763b22-9c32-41ec-8b47-0ae0c567f6ea" />
  <string key="userid" value="PB10241" />
  <string key="hostname" value="MARL5895" />
  <datetime key="submissiondate" year="2009" month="03" day="19" hour="09" minute="17" second="43" />
  <string key="status" value="Error" />
  <string key="code" value="2" />
  <string key="message" value="Association error (wrong server configuration or server not
    accessible)" />
  <datetime key="lastattemptdate" year="2009" month="03" day="19" hour="09" minute="18"
    second="06" />
  <number key="count" value="1" />
</transfer>
- <patient>
  <name key="name" family="KODAK" given="Dental Imaging Software" middle="" suffix="" prefix="" />
  <string key="id" value="1-800-944-6365" />
  <date key="birthdate" year="2006" month="01" day="01" />
  <string key="sex" value="F" meaning="Female" />
</patient>
- <study>
  <datetime key="date" year="2009" month="02" day="11" hour="10" minute="15" second="13" />
  <string key="id" value="" />
  <string key="accessionnumber" value="" />
  <string key="description" value="" />
</study>
- <series>
  <string key="modality" value="DX" meaning="Digital Radiography" />
  <number key="number" value="1" />
  <string key="description" value="" />
</series>
<equipment />
- <instances>
  - <instance status="New">
    <string key="uid" value="1.2.250.1.90.3.873279385.1234343717.645" />
    <string key="class" value="1.2.840.10008.5.1.4.1.1.1.1" />
    <string key="syntax" value="1.2.840.10008.1.2.1" />
    <string key="file" value="C:\DATA\USERS\PB10241\Kodak\Ma Base de Donnees\Patient_121
      \T20.dx" />
  </instance>
</instances>
- <dicomserver version="1.0">
  <string key="guid" value="cbc72485-dc47-4e0e-b1b6-3e2e2671b03d" />
  <string key="username" value="PacsOne PACS Server" />
  <string key="description" value="" />
  <boolean key="enabled" value="true" />
  <string key="callingaetitle" value="KODAKSCU" />
  <string key="calledaetitle" value="PACSONE" />
  <string key="calledhostname" value="marl5895" />
  <number key="calledportnumber" value="30000" />
  <boolean key="verificationsupported" value="true" />
  <boolean key="verificationrequired" value="true" />
  <boolean key="storagesupported" value="true" />
  <boolean key="verbosetracing" value="true" />
  <boolean key="debugtracing" value="true" />
</dicomserver>
</trophy>
```

**Figure 5: Transfer Request XML File**

As visible in this picture, each transfer request XML file contains various general information about the transfer request and its processing status, along with some patient, study, series, equipment, and image (instance) information (helpful for CSDServices that does not have to decode the associated image file in that case to get such information) and also information about the remote DICOM server destination of that transfer.

This last point is particularly important, because this means that the final destination DICOM parameter information is included within each transfer request, and modifying just such information within Trophy DICOM won't have any impact on all already submitted transfer request handled by CSDServices.



**WARNING: Changing DICOM server parameters within Trophy DICOM does NOT have any impact on all already submitted transfer request for that server within CSDServices.**

**The user has to resend her images when modifications are performed on a DICOM server within Trophy DICOM.**