

Trophy DICOM Patient Management System

Installation and Configuration Manual

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1 INTRODUCTION

This document is related to the installation of the Trophy DICOM application and its preliminary database configuration.

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 [1]).

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.

Trophy DICOM is an application running on Microsoft Windows 2000 Operating System and later, up to Windows Seven - 64 bits.

1.1 Revision History

Revision	Date	Author	Description
1.0	2004-11-03	Xavier CARAYOL	Creation
1.1	2004-01-04	Patrick CARDON	Updated installation screen captures
2.0	2004-04-23	Xavier CARAYOL	Added reference to license management
3.0	2005-01-07	Xavier CARAYOL	Updated to software version 6.0.3.0
4.0	2006-07-10	Xavier CARAYOL	Updated to software version 6.0.4.0
4.1	2006-08-04	Yann AMAUGER	Updated installation part.
5.0	2009-02-24	Xavier CARAYOL	Updated to software version 6.1.0.0
5.1	2010-02-17	Xavier CARAYOL	Updated to software version 6.2.0.0
6.0	2011-05-16	Xavier CARAYOL	Updated to software version 6.3.0.0
6.1	2013-05-23	Marc LAURENTIN	Rebranding

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 software installation and system administration on Microsoft Windows based systems.

Knowledge of SQL Server Database Management System configuration and administration would be helpful.

1.3 Applicable Software Version

This document is related to the version 6.3.0.0 and above of Trophy DICOM, unless otherwise explicitly stated.

This Trophy DICOM version is associated with the Trophy imaging application version 6.12.17.0 and above, and shall not be used in conjunction with any other earlier version. Therefore this Trophy DICOM version is compatible with the associated 3D imaging application.

This Trophy DICOM version also provides a new background process named CSDServices for dealing with all dataset transfers in an asynchronous manner: this is particularly useful for large dataset, like 3D volume, transfers. This Trophy DICOM version is associated with CSDServices version 1.1.2.0 and above, unless otherwise stated (refer to 0 for more information about CSDServices).

1.4 Definitions, Terms and Abbreviations

The following symbols and abbreviations are used in this conformance statement:

DICOM	Digital Imaging and Communications in Medicine
MSDE	Former Microsoft Desktop Engine (SQL Server 'light' version) replaced by SQL Server 2005 Express products now.

1.5 References

- [1]. Trophy DICOM Patient Management System - DICOM 3.0 Conformance Statement.
Reference: "04XC001-I Trophy DICOM CS" document
- [2]. Trophy DICOM Patient Management System – User's Manual.
Reference: "04XC004-G Trophy DICOM UM" document
- [3]. Trophy DICOM Patient Management System – DICOM Configuration Manual.
Reference: "05XC002-E Trophy DICOM DC" document
- [4]. Trophy DICOM Patient Management System – Pre-Installation Analysis.
Reference: "08XC005-D Trophy DICOM PA" document
- [5]. CSDServices – User's Manual.
Reference: "09XC003-C CSDServices UM" document

2 PREREQUISITES

2.1 Minimal Configuration

Trophy DICOM is a .NET application. Therefore, the Microsoft .NET Framework is required, in order for Trophy DICOM to be able to execute. This Framework is available on the Installation CD, and is automatically installed if not found on the target system.

Note: Trophy DICOM uses now the Microsoft .NET Framework version 2.0.

Trophy DICOM requires an SQL Server to be accessible in order to install its Patient Database. The SQL Server 2005 Express Database Management System is available on the Installation CD for this purpose, and can be installed along with Trophy DICOM (see section 3.3).

Note: On a system where Trophy DICOM is already installed (basically running under Windows XP) the current MSDE Database Management System is still used and not replaced.

Due to the requirements described above, it is strongly recommended to install Trophy DICOM on a powerful (memory and disk sizes) and up-to-date system running at least Microsoft Windows 2000 Service Pack 3 or later operating system.

The amount of patient data and images being involved by Trophy DICOM being quite large, it is strongly recommended to have a performing network bandwidth (at least 100 MBits), when installing the database in a shared (centralized) configuration (see section 2.2.2.2).

2.1.1 Remarks about Antivirus and Firewall software

It is strongly recommended to turn off both any Antivirus and Firewall functionalities while proceeding to Trophy DICOM installation. Those applications might prevent SQL Server 2005 Express proper installation and configuration.

Note: Integrated Microsoft Windows Firewall functionalities shall be properly configured on certain Microsoft Windows Professional versions.

2.2 Database Considerations

2.2.1 Database Elements

Trophy DICOM requires an SQL Server to be up and running for its Patient Database.

The Patient Database is defined by 3 different elements:

- 1) The database engine itself, i.e. the SQL Server Instance running the Patient Database.
- 2) The actual Patient Database files, under the control of the SQL Server Instance, containing the database tables, and identified by a database name by the SQL Server Instance.
- 3) A file system directory entry used as root directory for the Patient File Repository.

Those 3 elements can be configured on the same physical system, or on separate systems. Nevertheless, for maintenance and performance purpose, it is advised to configure all of them on the same system.

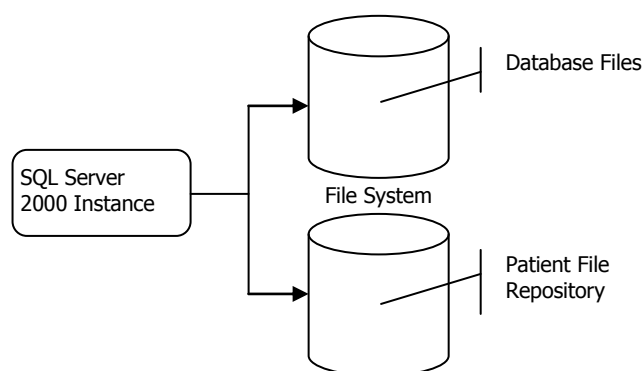


Figure 1: Patient Database Elements

2.2.1.1 Database Engine

SQL Server 2005 Express is a Database Management System. Installing SQL Server 2005 Express means installing the associated programs and files and creating a well identified named instance of the server. This instance is the actual server that an application is accessing.

The default Trophy DICOM SQL Server Instance name is the following:

Table 1: SQL Server Default Instance Name

SQL Server Default Instance Name	TROPHYSERVER
----------------------------------	--------------

Trophy DICOM comes with an installable version of SQL Server, known as SQL Server 2005 Express. This version is a 'light' version of SQL Server, fully operational, and can be used when there are no other specific requirements from the user.

2.2.1.2 Database Files

When SQL Server 2005 Express is installed for the first time on a system, a sample of the Database Files is automatically downloaded from the Installation CD and attached to the SQL Server Instance by the Installation Program. This ensures the user to start with a "blank" operational database.

The Patient Database name associated with the Database Files is:

Table 2: Patient Database Name

Database Name	trophydb
---------------	----------

At the date of this document, for the Trophy DICOM version defined in section 1.3, the following Database Files are defined:

Table 3: Database Files

Primary Data File	trophy.mdf
Journal File	trophy_log.ldf

When attached to a SQL Server Instance, the Database Files are locked and cannot be moved anymore.

It is strongly recommended to verify the Read-Write status of these files and their access permissions, when manually installing and configuring the Patient Database.

2.2.1.3 Patient File Repository

The Patient File Repository acts as a root directory for all the patient sub-directories. Trophy DICOM maintains a separate directory for each patient. This directory contains then all the files associated with the given patient (images, reports, etc...).

The Patient File Repository is user configurable and shall be specified after the installation at Trophy DICOM first Go (see section 6.1.1.2). This directory must be configured so that any user using Trophy DICOM has full access permissions on it (even over the network when necessary (see section 2.2.2.2)).

The structure of the Patient File Repository is then, for example, the following one, on the file system:

```
X:\...\Patient File Repository Root Directory    \Patient_1
                                                \Patient_2
                                                ...
                                                \Patient_n
```

2.2.1.4 User Authentication

One of the key points when accessing an SQL Server Database Management System is the User Authentication.

User Authentication defines the level of security and privileges the user has on a specific database running on a given SQL Server Instance.

2 modes of User Authentication are available for a database running on a SQL Server Instance, mainly related to the type of the underlying operating system:

- 1) Windows Authentication: on Microsoft Windows NT based system (Windows 2000 and later) only. For such systems, User Authentication is based on the authentication provided by the operating system itself and privileges assigned by the Database Administrator. Microsoft recommends this authentication mode.

Note: In Windows Authentication, any user member of the Microsoft Windows Administrator Group has full privileges by default on SQL Server Instances.

- 2) SQL Server Authentication: on any other supported operating systems or when the SQL Server Instance has not been configured to support Windows Authentication.

Starting with SQL Server 2000, it is possible to install an SQL Server Instance in Mixed Mode. In this mode, both Windows Authentication and SQL Server Authentication are available. If the user does not provide an SQL Server Connection ID (Identifier) when connecting to a database, the Windows Authentication is used. Otherwise the default SQL Server Authentication applies.

In order to simplify the authentication mechanism (and to avoid the user to have to master all the details of the management of a SQL Server) and also to ensure, under any circumstances, proper user access to the Patient Database, Trophy DICOM uses the mixed mode and requires a specific Database User to be configured when installing the SQL Server Instance.

Note: When the Installation Program installs SQL Server 2005 Express on a system, this configuration is automatically performed.

In this mixed mode, if the user does not have administrator rights on the operating system (not member of the Administrator Group), or if the user is not configured into the SQL Server Instance, the default specific user configured during installation is used as SQL Server Connection ID.

The specific Database User expected into the SQL Server Instance is the default SA (System Administrator) Database User with the following password:

Table 4: SA Password For SQL Server Instance

SA Password For SQL Server Instance	sa@trophy
--	-----------

The following authentication mechanism logic applies when connecting the Patient Database:

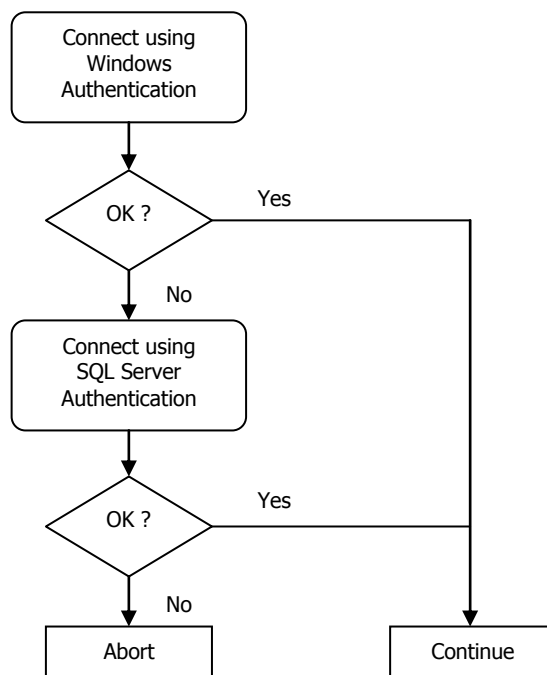


Figure 2: Authentication Mechanism

2.2.2 Database Installation Configurations

Based on the user needs and system configuration, 2 types of database installation can be performed.

2.2.2.1 Standalone Configuration

This situation occurs when installing Trophy DICOM on a standalone system, and when there is no need to share the database between different systems.

It is then strongly recommended to install SQL Server 2005 Express on the target system when prompted by the Installation Program, and to configure the Patient File Repository on this system.

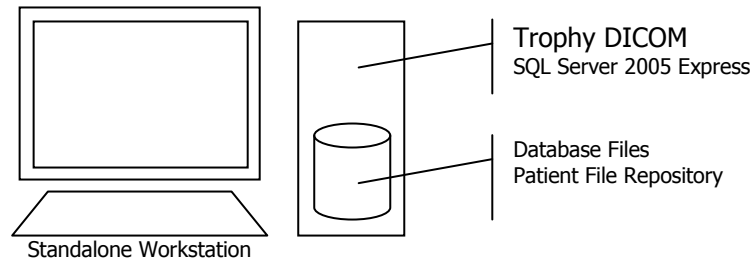


Figure 3: Database Standalone Configuration

2.2.2.2 Shared Configuration

This situation occurs when installing Trophy DICOM on more than 1 system, and sharing the Patient Database between the systems over the network.

In order to ensure the total availability of the Patient Database to all the systems, it is strongly recommended to install the SQL Server 2005 Express on a separate server system along with the Database Files and Patient File Repository.

Note: Trophy DICOM might be installed on this separate system for maintenance and database management purpose.

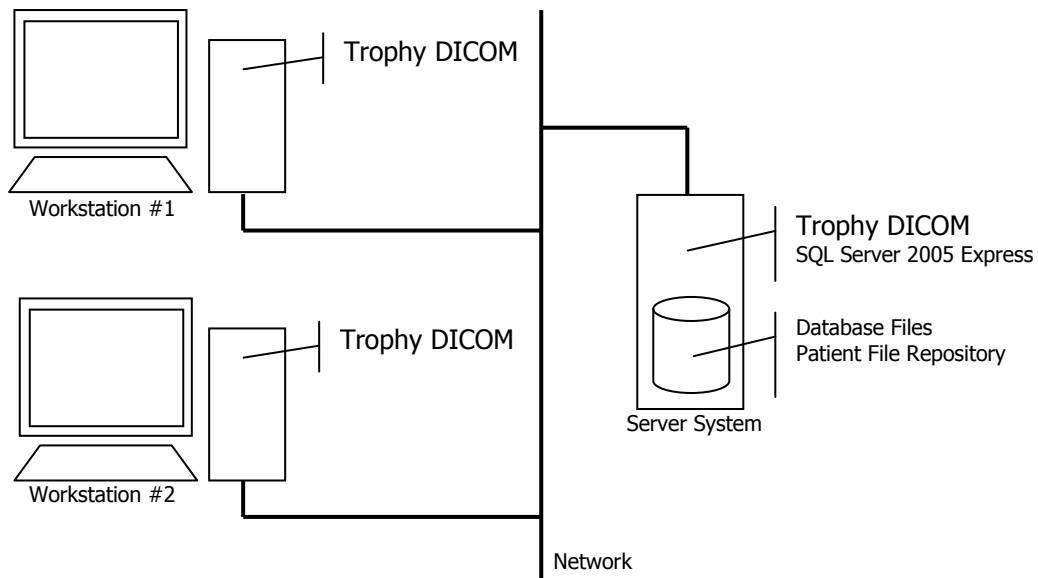


Figure 4: Database Shared Configuration

2.2.3 SQL Server 2005 vs. SQL Server 2005 Express

For situations where a real SQL Server 2005 is used instead of the Express version, it is strongly recommended to the Database Administrator to attach the Patient Database according to the descriptions provided in section 2.2.1.

Attachment or detachment of the Patient Database can be performed as described in section 7.3.

3 INSTALLATION

The Installation Program requires the user to be part of the Microsoft Windows Administrator Group.

The Installation CD comes with an Auto-run program. If the system is configured not to start automatically such programs, the setup program can be found on the CD root directory under **SetupTrophyDicom.EXE**.

Note: When installing Trophy DICOM from another media or disk, it is mandatory to ensure that the file "license.lic" found on the root of the CD is copied onto the root directory of that media or disk, otherwise the installation won't start.

The Installation Program is an automated process, where user interactions are minimized. As described in section 2.1, the Installation CD includes different components to install if necessary. The regular order for component installation is described in the following table:

Table 1: Component Installation Sequence

Order	Component	Installation Mode
1	Microsoft .NET Framework	Automatic, if not already existing on the target system.
2	Trophy DICOM + CSDServices	
3	SQL Server 2005 Express	Automatic, if not already existing on the target system.

The installation of the Trophy DICOM program itself is required on each system where patient management capabilities or Trophy imaging application is expected.

Note: The Trophy Imaging application is not required for installing Trophy DICOM.

When starting the Installation Program, it might perform automatically a set of controls of the target system to check its configuration.

3.1 Microsoft .NET Framework Installation

The installation program will automatically install the .NET Framework if this component is not installed.

The Installation Program might present the following dialog window, if necessary, when installing this component:

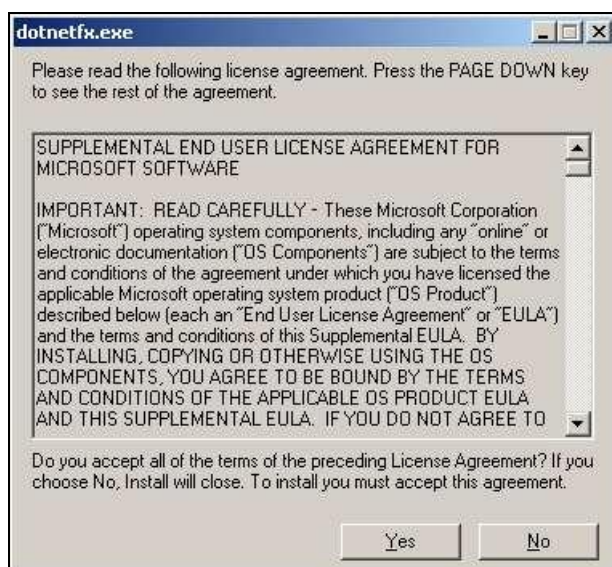


Figure 5: Microsoft .NET Framework Installation

This component is **absolutely required** for Trophy DICOM. The user **shall accept** all the terms of this License Agreement by answering **Yes** to the question, otherwise the Microsoft .NET Framework won't be installed.

Installing this component does not require any other user interactions.

3.2 Trophy DICOM

After or not installing the Microsoft .NET Framework, the Installation Program proceeds with the Trophy DICOM installation itself:

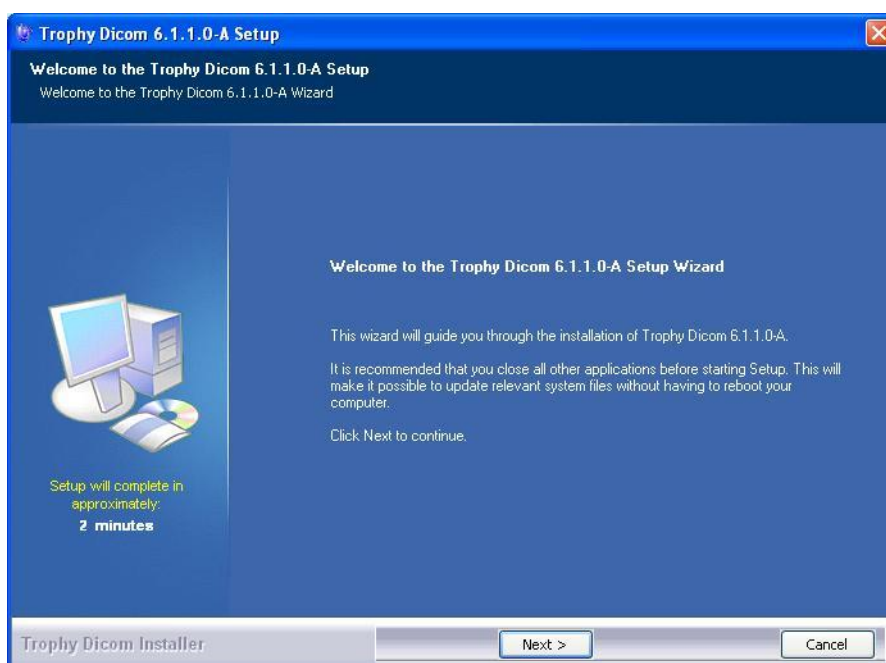


Figure 6: Trophy DICOM Installation Program

The user has then to accept the terms of the Trophy License Agreement:

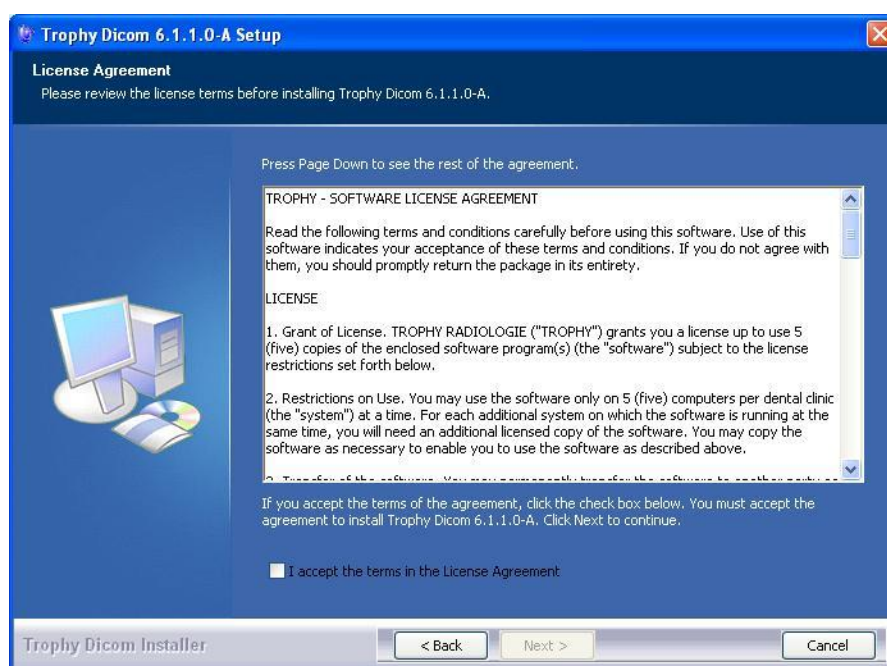


Figure 7: Trophy License Agreement

Note: The "I accept the terms in the License Agreement" checkbox shall be selected in order to activate the "Next" button.

The Installation Program continues by offering to select the Trophy DICOM installation directory:

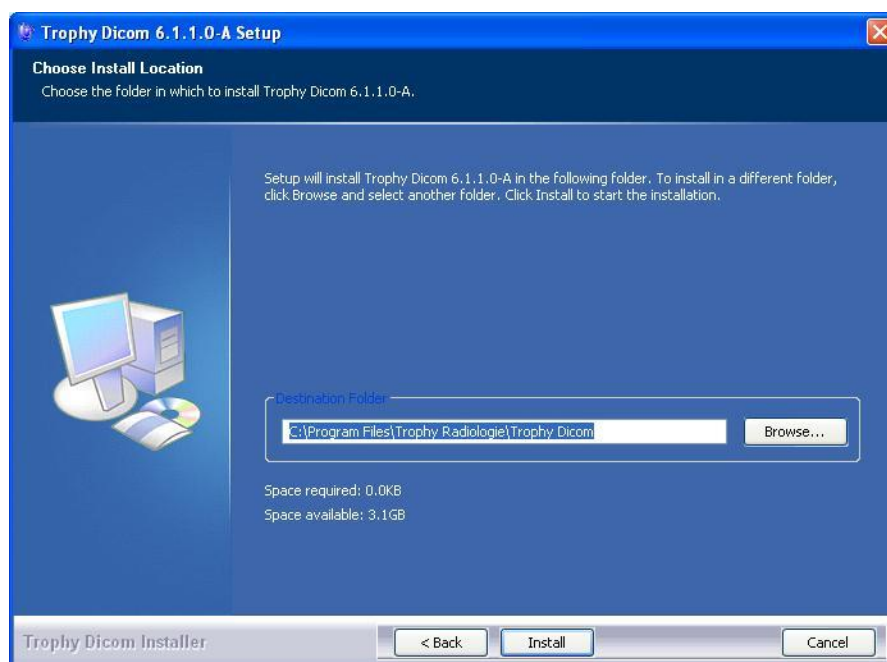


Figure 8: Default Installation Folder

Note: It is recommended to keep such default-selected folder when installing programs on a Microsoft Windows system.

Then the Installation Program will perform the required action as presented in the following picture:

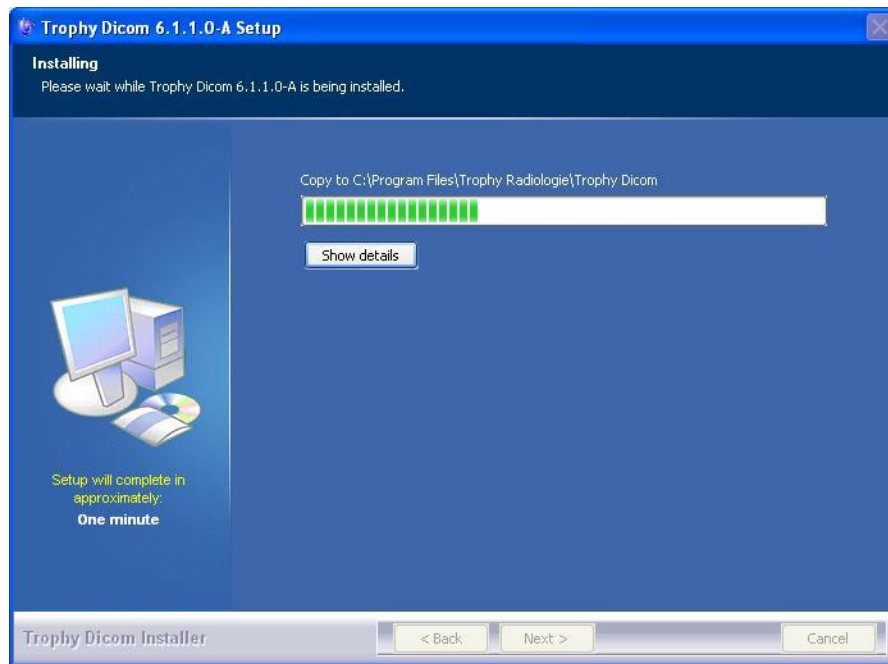


Figure 9: Installation Process

Note: The user may click on the "Show details" button to see what the Installation Program is actually doing.

Note: During this phase the associated CSDServices background process is also installed on the system (refer to 1.3 and [5] for more information about CSDServices).

At that point, the Installation Program will install the Trophy DICOM SQL Server 2005 Express Instance on the target system (refer to section 2.2.2 for a discussion about installing the SQL Server Installation configurations): Go to the section 3.3 for more information about this installation step.

Note: This installation shall be performed only when no other SQL Server exists on the network and only once when installing several Trophy DICOM systems on a network.

Trophy DICOM installation ends with the following dialog window asking to reboot the computer:

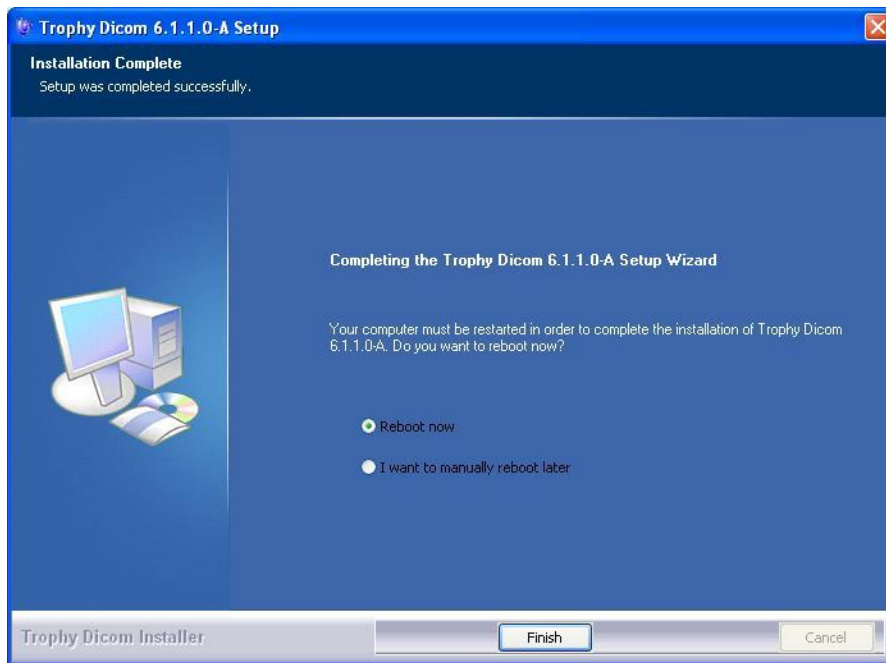


Figure 10: Trophy DICOM Installation Final Message

It is absolutely required to reboot the computer at this point, in order to let the Trophy DICOM installation continue after the reboot: this is mandatory in order to configure the SQL Server 2005 Express instance and attach properly the Trophy DICOM database.

Installation of Trophy DICOM results by placing the following shortcut on the User Desktop:



Figure 11: Trophy DICOM Desktop Shortcut

Associated entries are also created in the Programs option of the main Start menu.

3.2.1 Starting Trophy DICOM For The First Time

When starting Trophy DICOM on a target system, 2 initialization processes are performed:

- 1) Licensing initialization.
- 2) Database initialization.

When starting Trophy DICOM for the first time on a system, those 2 processes may fail as described in the following sections.

3.2.1.1 Licensing Initialization.

This process is used to control the validity of the Trophy DICOM license on the target system. When starting Trophy DICOM for the first time on a system, the following error dialog windows should appear:



Figure 12: License Management First Go Error Dialog Box

This error message will appear once every day until Trophy DICOM is registered. Refer to 0 for more information on Trophy DICOM Licensing System.

3.2.1.2 Database Initialization

This process is used to control the ability to connect to the Trophy DICOM Patient Database from the target system. When starting Trophy DICOM for the first time on a system, the following error dialog windows should appear:



Figure 13: SQL Server First Go Error Dialog Box

This situation is unfortunately absolutely **normal**, since no default SQL Server Instance is defined yet on the just installed target system. As already stated in section 2.2 Trophy DICOM requires an SQL Server Instance to be defined in order to execute properly. This configuration is the first initialization step to perform on a system after installing Trophy DICOM (see section 6.1), when running Trophy DICOM for the first time.

Note: The SQL Server 2005 Express Instance contains a default empty database required for running Trophy DICOM. Nevertheless, under certain circumstances, it may be required to upgrade this database version, even after a blank new installation: refer to section 6.1 for more details.

3.3 SQL Server 2005 Express

SQL Server 2005 Express Installation is an automated process and does not require user interactions.

This component installation occurs while installing the Trophy DICOM program itself (see section 3.2).

Nevertheless, in order to properly configure the just installed SQL Server Instance and allow the default Patient Database to be attached to that instance, it is necessary to reboot the system. The Trophy DICOM Installation Program performs this operation automatically, and then returns to the Trophy DICOM program installation (see section 3.2).

Therefore, it is strongly recommended to reboot the system if requested by the Trophy DICOM Installation Program.

4 UNINSTALLATION

The Trophy DICOM Installation Program setups all necessary entries in the Microsoft Windows Control Panel ("Add/Remove Programs") configuration tool. Refer to your Microsoft Windows User Manual for more information.

WARNING: Decision to remove SQL Server 2005 Express (or former MSDE) Installation in a Shared Database Configuration (see section 2.2.2.2) is NOT recommended and shall be taken carefully; otherwise this could result in preventing the whole Trophy installed systems from running.

WARNING: Removing specifically the Microsoft .NET Framework on a given system will prevent Trophy DICOM from running on that system.

5 UPGRADE

The Installation CD can be used to upgrade an already existing Trophy DICOM version. In that case, neither the Microsoft .NET Framework nor the MSDE or SQL Server 2005 Express installations are modified.

Upgrading Trophy DICOM does not require any specific configuration. All required extra configuration steps would be performed automatically if applicable, generally when restarting Trophy DICOM for the first time after upgrade.

Upgrading Trophy DICOM shall consist only in replacing the already installed Trophy DICOM software, otherwise explicitly stated. Nevertheless, it might be possible, that a new Trophy DICOM version requires a database upgrade depending on the type of modifications performed.

WARNING: It is strictly recommended to exit all running Trophy DICOM applications prior upgrading one or more systems. This is actually of primary importance in a centralized database architecture, where several Trophy DICOM systems are sharing the same database, especially if a database upgrade is required by the new version of Trophy DICOM.

5.1 Database upgrade

Under certain circumstances, Trophy DICOM upgrade may require a database upgrade first, prior executing the new version of Trophy DICOM on that already existing and configured database. This database upgrade is performed, when necessary, the first time Trophy DICOM is restarted after the upgrade.

In a centralized database architecture, where several Trophy DICOM systems are sharing the same database, all Trophy DICOM systems shall be upgraded to the same version level first, if a database upgrade is required. This is very important in order to keep the database version consistent between applications.

Note: When the associated database revision level is no more compatible with an existing (not upgraded yet) Trophy DICOM system, an error message is displayed the next time Trophy DICOM is started.

When restarting Trophy DICOM for the first time after an upgrade, if a database upgrade requirement is detected, the following warning message is displayed:



Figure 14: Database Upgrade Requirement Warning Message

When accepting the database upgrade the user is required to confirm the operation:



Figure 15: Database Upgrade Requirement Confirmation Message

WARNING: Database upgrade is a non-reversible operation. When a database upgrade is required, the other entire Trophy DICOM systems sharing the same upgraded database shall be upgraded to the same level of revision too.

6 CONFIGURATION

Trophy DICOM configuration process requires the user to be part of the Microsoft Windows Administrator Group.



VERY IMPORTANT: On Windows Vista and Seven, at the Trophy DICOM first-go, the currently logged user must be the real administrator of the system in order to be able to configure the Trophy DICOM database to run with.

*Note: This requirement can be achieved using the **Run-as Administrator***

option of Windows shortcuts.

This configuration process consists in setting up a set of parameters into both keys of the underlying Microsoft Windows Registry Database and resources of the Patient Database.

Most of the common parameters are actually maintained as resources into the Patient Database.

The SQL Server Instance name is the only parameter being required into the Registry Database of the system (see section 6.1.1.1), since it is the main value required for accessing the Patient Database when starting the application.

Other configuration parameters maintained into the Registry Database are mainly user or GUI temporary parameters.

6.1 Database Configuration

The Patient Database configuration step is used mainly to define both the SQL Server Instance and the Patient File Repository (see section 2.2.1 for explanations).

The Patient Database configuration shall be performed only once, whatever the number of system connecting to the Patient Database is.

The Patient Database configuration is available thru the following option of the application Main Menu:

Table 5: Database Configuration Menu Option

Main Menu Option	Tools\Database\Configuration
-------------------------	------------------------------

This option provides the following Database Properties dialog window:

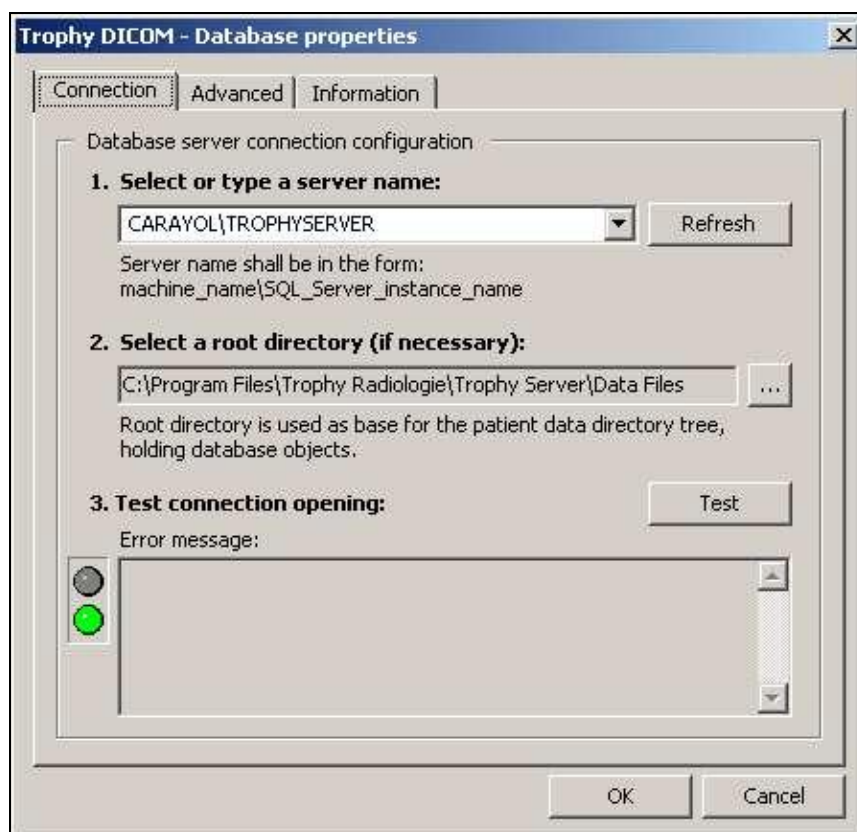


Figure 16: Database Configuration Dialog Window

The "Connection" tab is used to define and test the main configurable item for accessing the Patient Database: The SQL Server Instance name and the Patient File Repository directory.

The "Advanced" tab is used to configure both the Database Disconnection Mode and the Manual Patient Data Directory Selection option.

The "Information" tab is used to review some current database version information.

6.1.1 SQL Server Instance and Patient File Repository

6.1.1.1 SQL Server Instance Configuration

The SQL Server Instance of the Patient Database shall be specified in this dialog window. This instance name shall be in the form:

Table 6: SQL Server Instance Name Form

SQL Server Instance Name Form	<i>System name</i> \TROPHYSERVER
--------------------------------------	----------------------------------

"System_name" being the name of the system holding the instance (on the network, if applicable).

The "Refresh" button might be used to retrieve list of all SQL Server Instances available on the network.

When performing this configuration for the first time, this instance name is defaulted to the Trophy DICOM SQL Server Instance name installed on the system if applicable.

The selected SQL Server Instance name is saved into the Registry Database under the following key:

Table 7: SQL Server Instance Name Registry Key

SQL Server Instance Name Registry Key	HKLM\SOFTWARE\Classes\TROPHY\TrophyServer\DefaultServer\InstanceName
--	--

Note: The HKLM location of this Registry Key ensures single configuration step for all users using the target system.

The "Test" button might be used for testing the connection to the selected SQL Server Instance. A Red-Green icon provides visual information about the current connection status.

Note: To avoid errors while testing the connection, it is suggested to define the Patient File Repository too.

6.1.1.1.1 Considerations when configuring a newly installed database

WARNING: When installing Trophy DICOM for the first time, a database upgrade may be required just when configuring the newly installed database. This is due to the fact that the SQL Server 2005 Express installation creates a basic blank database for Trophy DICOM. Refer to section 5.1 for more information about this database upgrade process.

6.1.1.2 Patient File Repository Configuration

The Patient File Repository directory shall be specified in this dialog window. This is done by selecting a directory entry via the "..." button. This button displays the regular Microsoft Windows Folder Selection dialog box.

This directory entry can be a shared directory entry over the network.

When performing this configuration for the first time, this directory is defaulted to the former Trophy Windows 5 "Database Path" if already installed on the system.

The "Test" button must be used for testing the accessibility (existence and user access permissions) of the selected directory.

The Patient File Repository parameter is saved into the Patient Database resource table, in order to be unique for a given Database Instance.

6.1.1.2.1 Considerations when Upgrading from Trophy Windows 5

WARNING: It is strongly recommended to setup the Patient File Repository directory the same as the former "Database Path" of Trophy Windows 5 in order to ensure proper database upgrade (see section 6.2)

6.1.2 Advanced Configuration

Advanced configuration is accessible when selecting the "Advanced" tab of the Database properties dialog window:

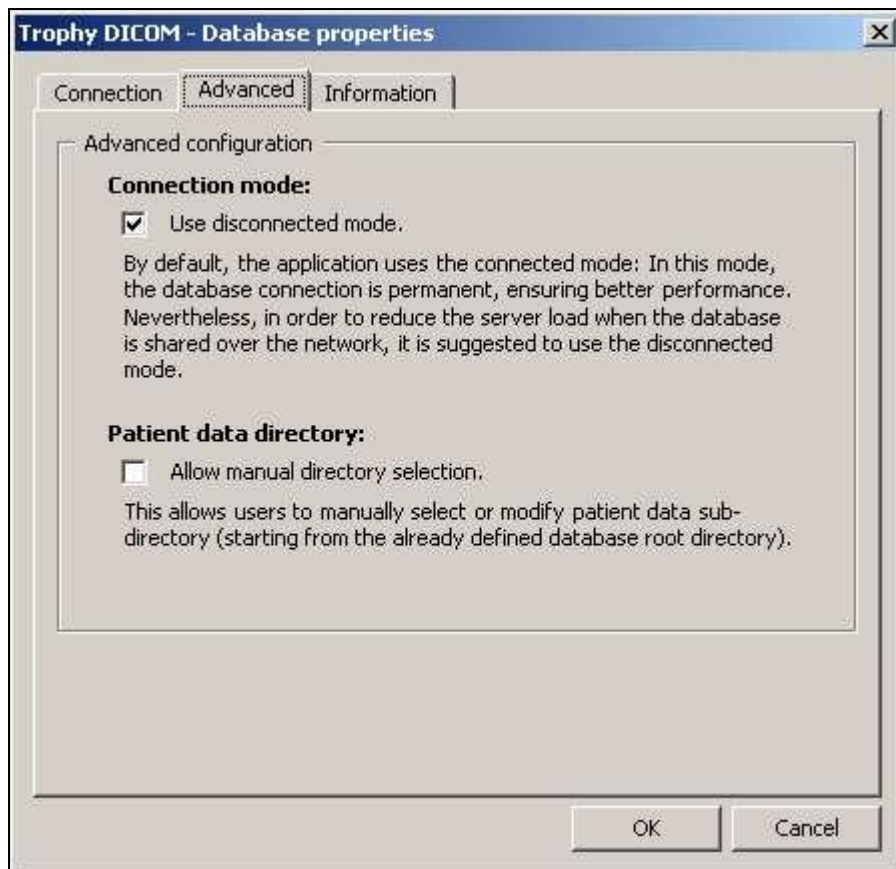


Figure 17: Database Advanced Configuration Dialog Window

6.1.2.1 Connection Mode

By default, when installing Trophy DICOM, connection to the SQL Server Instance is maintained "opened" as long as Trophy DICOM is used.

This situation might produce bad database performance if SQL Server 2005 Express is used as the Database Management System as described in section 2.2.3.

In order to reduce the load of the Database Management System, the .NET Framework ADO.NET SQL Server .NET Data Provider gives the ability to enable a Disconnected Mode. In this mode, actual connection to the Database Management System is performed only when required, i.e. at each database access. This solution obviously has a bad side effect: opening a connection to the Database Management System is a time consuming process. Performing such extra connection step for each database access can result in overall application performance decrease.

Note: In order to minimize the Disconnect Mode side effect, the SQL Server Data Provider implements internally a connection pooling mechanism.

Current Connection mode and state are visible in the bottom status bar of Trophy DICOM as described in the following figures:

- 3) Database Connection Error Indicator:
This situation might appear if the SQL Server Instance is not defined or when a fatal error is detected.



Figure 18: Database Connection Status Indicator - Error

- 4) Disconnected Mode Indicator:

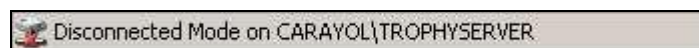


Figure 19: Database Connection Status Indicator - Disconnected Mode

- 5) Permanent Connection Mode Indicator:

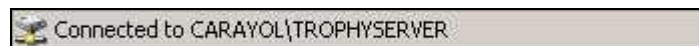


Figure 20: Database Connection Status Indicator - Permanent Connection Mode

It is suggested to enable the Disconnected Mode only when really required. This mode might only be used in a Shared Database Configuration mode when SQL Server 2005 Express is used as Database Management System. This mode shall not be used in a Standalone Database Configuration mode (see section 2.2.2).

6.1.2.2 Patient Data Directory Selection

Under certain circumstances, it might be necessary to be able to manually select the Patient Data Directory as a sub-directory of the Patient File Repository.

When normally creating a new Patient into the Patient Database, the associated Patient Data Directory is automatically created by the application. When enabling this option, the user has the ability to manually enter this parameter (see 0 for Patient Creation).

Note: Manual Patient Data Directory Selection requires the selected directory to already exist as a sub-directory of the Patient File Repository root directory.

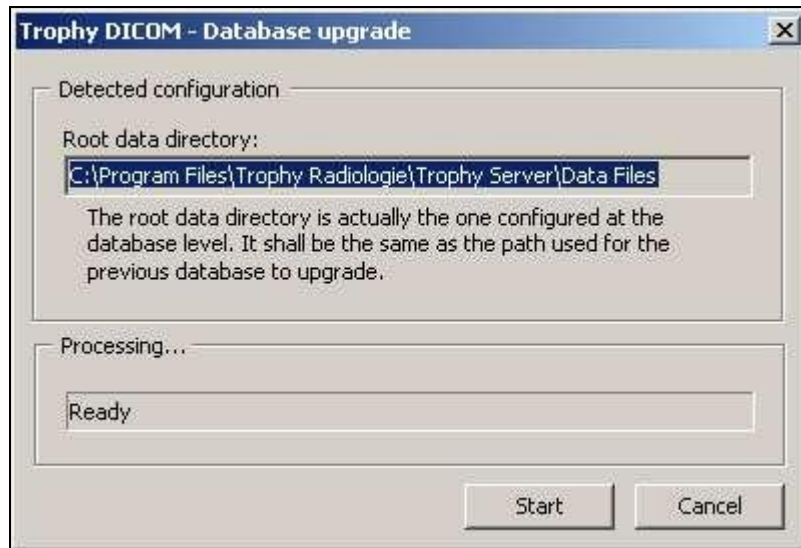
6.2 Upgrading from Trophy Windows 5

If Trophy DICOM is installed to upgrade a Trophy Windows Imaging application version 5 configuration, a conversion utility is available thru the following option of the application Main Menu.

Table 8: Database Upgrade Menu Option

Main Menu Option	Tools\Database\Upgrade
-------------------------	------------------------

This utility provides with the following dialog window:

**Figure 21: Database Upgrade Dialog Window**

The "Root Data Directory" field is automatically filled with the current Patient File Repository directory as defined in section 6.1.1.

In order to properly upgrade the database, this directory path shall be exactly the "Database Path" defined in the "Preferences" of the former Trophy Windows 5 version. If the Patient File Repository is not located in the same directory, it is possible either to change that directory or to move the former "Database Path" data to that directory.

The "Start" button initiates the upgrade process. This process is based on the decoding of the "FILEDATA.TXT" file located in each patient sub-directory.

This process decodes for each patient sub-directory found the associated "FILEDATA.TXT" file, and creates or not a new patient entry into the Patient Database.

Patient matching is performed on the "NUMERO" field (or "PATIENTID" field if present) in order to prevent duplication of patient entries into the Patient Database.

7 TROUBLESHOOTING

This section provides some information on how to troubleshoot both SQL Server Database Management System and Patient Database installations.

The need to install SQL Server 2005 Express is based on the user requirements and system configuration. Refer to section 2.2.2, to check whether or not SQL Server 2005 Express is required on a particular system.

7.1 Testing SQL Server 2005 Express Installation

SQL Server 2005 Express comes with a Computer Management snap-in accessible from the Manage option of the "My Computer" icon on the desktop. This snap-in is then located under the "Services and Applications/SQL Server Configuration Manager" entry.

Note: It is strongly required to be member of the Microsoft Windows Administrator Group in order to be able to execute properly this snap-in.

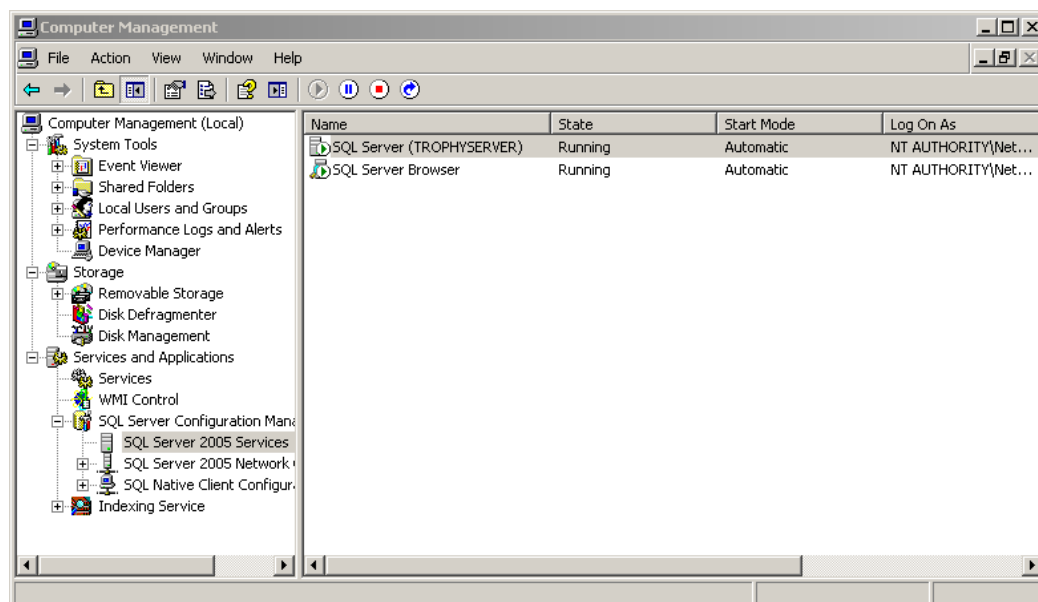


Figure 22: SQL Server Manager Snap-in

It is strongly recommended to select "Automatic" for the "Start Mode" option of the properties dialog window (accessible on a right-click TROPHYSERVER SQL Server) in order to ensure that the SQL Server Instance is started at each system boot.



Figure 23: SQL Server Manager Snap-in Property Window

7.1.1 Trophy DICOM Internal SQL Server Manager

An equivalent SQL Server Manager utility is available directly from within Trophy DICOM thru the following Main Menu option:

Table 9: SQL Server Manager Menu Option

Main Menu Option	Tools\Database\SQL Server
-------------------------	---------------------------

This option provides the following dialog window:



Figure 24: SQL Server Internal Manager

This dialog window provides information status of the current SQL Server Instance as described in the following table:

SQL Server Instance Status	Description	Possible Actions
SQLDMOSvc_Running	The SQL Server Instance is running. Access to the Patient Database is possible.	Pause / Stop
SQLDMOSvc_Paused	The SQL Server Instance is paused. Access to the Patient Database is not possible.	Start / Stop
SQLDMOSvc_Stopped	The SQL Server Instance is stopper. Access to the Patient Database is not possible.	Start

WARNING: It is mandatory to check again the Patient Database Connection after (re) starting the SQL Server Instance using this internal SQL Server Instance Manager dialog window (see section 6.1).

Note: Due to SQL Server internal mechanism (connection pooling that creates "zombie" pools when the SQL Server shuts down) it might be necessary to actually "Test" twice the connection in that case: The first "Test" might raise a SQL Exception, which shall be discarded.

7.2 Testing Patient Database Installation

WARNING: Only advanced user shall execute the commands described in this section.

The proper installation of the Patient Database into the SQL Server Instance can be tested manually using the **OSQL** utility provided with SQL Server 2005 Express, in a command prompt window:

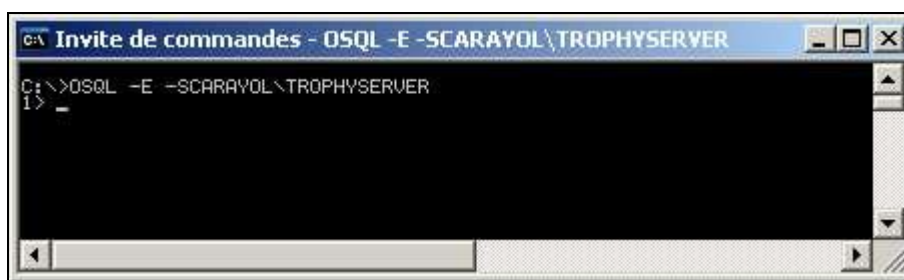


Figure 25: OSQL Utility

*Note: The **-E** and **-S** shall be in capital letters.*

This utility is located by default under:

C:\Program Files\Microsoft SQL Server\90\Tools\Binn\osql.exe

Note: It is strongly required to be member of the Microsoft Windows Administrator Group in order to be able to execute properly this command.

The command arguments are:

Table 10: OSQL Utility Arguments

Argument	Description
-E	Use Trusted Connection, i.e. Windows Authentication
-Ssystem_name\TROPHYSERVER	Specifies the SQL Server Named Instance to connect to: "system_name" is the name of the system holding the instance.

A successful connection to the SQL Server Instance changes the DOC prompt to "1> _", meaning that the OSQL utility is ready for command.

*Note: Each OSQL interactive command sequence shall be launched using the interactive command **go**. The OSQL interactive **exit** command can be used any time to leave the OSQL utility.*

In order to check the proper installation of the Patient Database, the **sp_helpdb** OSQL interactive command might be used as described below:

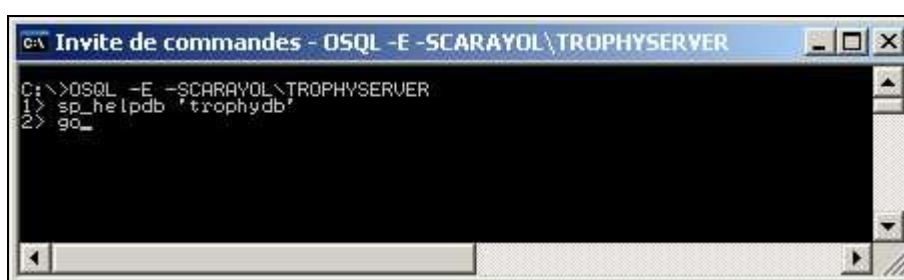


Figure 26: Patient Database Installation Control Command

*Note: "simple tick" characters (['']) shall surround the **trophydb** database name.*

The command arguments are:

Table 11: OSQL sp_helpdb Command Arguments

Argument	Description
'trophydb'	The name of the database to attach

The execution of this OSQL interactive command shall give information about the attached Patient Database. Among other things it is suggested to check the ONLINE status and READ_WRITE updateability of the associated Database Files:

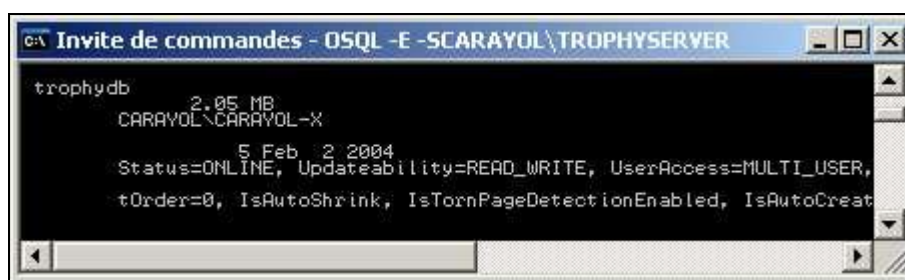


Figure 27: Patient Database Control Results

Note: READ_WRITE updateability of the associated Database Files can be used to check and troubleshoot user accessibility of those files.

7.3 Attaching and Detaching Manually the Patient Database

WARNING: Only advanced user shall execute the commands described in this section.

If the Patient Database is not attached to the SQL Server Instance, the **sp_attach_db** OSQL interactive command might be used as described below:



Figure 28: Patient Database Manual Attachment

*Note: "simple tick" characters ([,]) shall surround both **trophydb** database name and file paths.*

The command arguments are:

Table 12: OSQL sp_attach_db Command Arguments

Argument	Description
'trophydb'	The name of the database to attach
N'C:\Database_File_Directory\trophy.mdf'	The Primary Data file path
N'C:\Database_File_Directory\trophy_log.ldf'	The Journal file path

Note: "comma" character ([,]) separate arguments. "Database_File_Directory" is the directory name where Database Files are located.

In order to detach Patient Database, the **sp_detach_db** OSQL interactive command might be used as described below:



Figure 29: Patient Database Manual Detachment

Patient Database Detachment and Attachment might be necessary and when moving the Database Files is required, since SQL Server locks access to those files.

7.4 Backing up the Patient Database files

As stated above, when an SQL Server 2005 Express instance is running, all attached database files are locked, preventing them from being properly backed up when just copying them thru the Windows Explorer.

So the main problem for backing up the database file is to stop the SQL Server 2005 Express instance. Different solutions exist for that:

- 1) Using the SQL Server manager program described in section 7.1 (or its equivalent tool available from within Trophy DICOM).
- 2) Using the Windows Service Manager console available thru the Computer Management console or by running the "services.msc" application, in order to stop the MSSQL\$TROPHYSERVER Windows NT service.
- 3) Using the Microsoft SQL Server Management Studio Express, that can be freely downloaded from the Microsoft Web site:
<http://www.microsoft.com/downloads/en/details.aspx?FamilyID=c243a5ae-4bd1-4e3d-94b8-5a0f62bf7796>
- 4) Using the NET STOP/START command line.

Obviously proper administrator rights are required in order to perform each of these options.

This last solution is useful to automate the Patient Database files back up thru batch file. In that case the following command shall be used:

To stop the SQL Server Instance	C:>NET STOP MSSQL\$TROPHYSERVER
To start the SQL Server Instance	C:>NET START MSSQL\$TROPHYSERVER

Figure 30: Backing up Database Files using NET command