PMOD Audit Trail Network License (PATL)

USER MANUAL Version 4.1

PMOD is a software FOR RESEARCH USE ONLY (RUO) and must not be used for diagnosis or treatment of patients.



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1 PMOD Audit Trail Network License

1.1 Purpose

The PMOD ATL version provides an enterprise solution for the application of PMOD in controlled environments with the following features:

- Client-server architecture to separate user administration and data storage from data processing.
- Central data storage in server databases to prevent access from outside of PMOD.
- Central user and data administration from within a privileged account.
- Access list control for databases to restrict access to authorized users.
- Data access exclusively through client-server communication.
- Central user authentication by using the enterprise-wide user administration.
- Central audit trail logging which is transparent to the user.

Note that within the ATL version some of the normal PMOD functionality gets blocked for unprivileged users.

1.2 System Organization

The PMOD ATL version requires a dedicated client-server setup.

Server

At the heart of the setup is a computer system which acts as a protected server ("server"). It

- runs the PMOD license server,
- authenticates the users,
- maintains the user properties,
- hosts the databases containing the data,
- writes the audit trail information into a database.

To prevent unauthorized access and ensure data security, the server should be located in a protected server room ("data center"), and only allow the administrator login.

Clients

The actual data analysis is performed on client machines which have a PMOD software installed. Note that no local PMOD configuration is required.

A user starts PMOD on a client with a script which includes the server address information. Hereby, a sign-on procedure is performed which checks the authorization of the user. If he is known to the PMOD server he can log in and his dedicated configuration is retrieved from the server before he can start working. Thereafter, he can load images from the databases for which he has been authorized. He can process the images and save the results, but he cannot delete objects from the database unless he is authorized. He may add text comments to database objects for clarification purposes. All information logging the user's work is immediately sent to the server and recorded in the audit trail. The user is allowed to change the applications setting in his profiles, which is updated centrally.

The administrator can open the PMOD configuration while working on a client, using the central administration password. Thereafter, he can adjust the system configuration as well as the user configurations and save the changes to the server.

Client-Server Communication

The client-server communication employs PMOD's proprietary transaction server communication protocol using configurable IP ports. The communication can optionally be encrypted and/or compressed. Encryption is recommended for communication across public infrastructure. As it slows communication down, is may not be necessary for communication within an institution. Compression on the other hand can speed up data transmission across slow network connections.

1.3 User Authentication

Authentication ensures that only authorized persons can access data, and that data transformations can unequivocally be attributed to an individual. PMOD distinguishes between a privileged administrator ("PMOD administrator") who installs the software and configures the environment, and the data analysts ("PMOD users") who perform the actual data analysis.

Administrator

The administrator must authorize himself each time he accesses the PMOD configuration. An initial password is provided upon shipment of the program. It can be changed by the administrator and is stored in an encrypted form in the */properties/global.start* file.

After entering the PMOD configuration, the administrator can define PMOD users. For each user he specifies a name, an initial password, his working environment, and adds the user to the access list of the database(s) he is entitled to use. Each PMOD user can also (optionally) be mapped to a user of the underlying operating system ("OS user").

PMOD Users

When a PMOD client is started, PMOD first compares the name of the user logged into the operating system with the list of configured PMOD users. If a PMOD user is found with a matching OS user, login proceeds automatically without requesting a password. In this case authentication is based on the assumption of a correct sign-on to the operating system. Such a configuration is recommended in homogeneous environments like *Active Directory*.

Otherwise, the user has to select his PMOD user name from the list of all configured PMOD users, and log in with his password. The password is initially set by the administrator, but can be changed by the user. The password, is encrypted and saved in */properties/global.start*.

1.4 Data Protection

PMOD provides mechanisms for data protection, which must be combined with the recommended administrative measures as described <u>above</u> **5**^h. If these requirements are fulfilled, data can only be accessed by authorized PMOD users using PMOD's transaction server communication. Regular PMOD users can only read and add data, while delete operations require dedicated privileges.

1.5 Audit Trail

The purpose of the audit trail is to ensure that all data transformations are exactly documented. In PMOD, the audit trail can be recorded in files or in a database. With file-based recording, the system maintains a separate audit trail text file for each PMOD user, which resides on the server machine so as to prevent unauthorized access. Additionally, there is an audit trail text file for system actions. With database recording of the audit trails, all information resides in a single database which supports flexible filtering and data export. We strongly recommend using a database for the audit trail. File based audit trails should only be used in small test environments.

References:

FDA Publication: Part 11, Electronic Records; Electronic Signatures — Scope and Application. Aug. 2003. http://www.cfsan.fda.gov/~dms/guidance.html.

2 Installation

The PMOD ATL version installation includes the following tasks:

- Preparation of a secured server system and a central user authentication environment.
- Installation of the PMOD software on the server.
- Configuration of the server installation: creation of databases, starting of the database server processes, addition of users and definition of their access rights to the databases.
- Setup of the client part of the PMOD software on all clients, or to a common share which is
 accessible to all clients. Note that the clients require no local configuration.

The installation steps should be performed in the exact order as described below.

2.1 System Setup

2.1.1 User Administration System

It is strongly recommended to employ the operating system to ensure authentication for the PMOD ATL users.

In a Windows environment, the Active Directory (AD) can be employed for central user administration. It supports many features for a strict user authentication policy, for instance:

- Request for a password change after first login.
- Request for a password change after 90 days.
- Locking out of a user after 5 failed login attempts.

To employ the AD for a secure PMOD ATL installation, the following setup is proposed:

- All machines running PMOD should belong to the AD.
- There should be a global group "PMOD Group" for the PMOD users.
- The PMOD Group should only contain PMOD users.
- The AD password requirements should reflect the company security policy.
- All PMOD users should be configured as "OS users".

2.1.2 ATL Server System

The PMOD ATL server handles the licenses, the databases and the audit trails. Therefore, the PMOD server installation should reside on a secured server which is not directly accessible by the clients or users. In this way, access to the data is only possible through the PMOD transaction server facility.

2.1.3 ATL Client Systems

A single instance of the PMOD software should be installed on a network share with read/execute permission for the PMOD Group from all clients. In this way, all users can start PMOD using one single PMOD installation. Note that no configuration of this PMOD installation is required, since all configurations are maintained by the server installation.

2.2 PMOD ATL Server Installation and Configuration

Please follow the steps described below in the proposed order to set up the system.

2.2.1 PMOD Software Installation

Perform a standard PMOD installation on the server machine (separate operating system dependent installation document) and copy the license file *pstarter.lcs* into the *Pmod4.1/system/lcs* sub-directory.

2.2.2 Overview Tables

In the following steps, a server and user structure will be configured which can become quite complex. It is recommended to set up a table to keep an overview of the definitions as you proceed.

The tables below represent the structure which is established in the example configuration of this documentation:

Tunbuction Ocree				
	Audit Trail Log & License Server	Import Database	Study Database 1	Study Database 2
DB Name	Audit	Import	Study1	Study2
Port	5201	5202	5203	5204
IP Address	127.0.0.1	127.0.0.1	127.0.0.1	127.0.0.1
Encryption	No	No	No	No
Users (d = delete)		ATL_Manager (d)	ATL_Manager (d) ATL1	ATL_Manager (d) ATL1 ATL2

Transaction Servers

DICOM Server

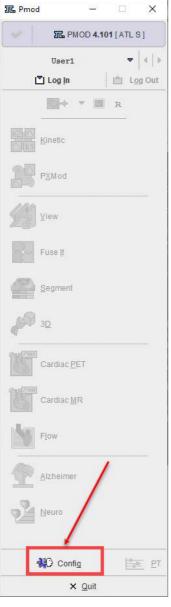
Definition	Value
Application Entity Title	Pmod
Port	5030
IP Address	127.0.0.1
Encryption	Νο
User on USERS tab *)	ATL_Manager
Import Database	Import

*) a user is required to define the saving behavior of the DICOM server.

Empty overview tables are available in the <u>Appendix</u> and can be used during the installation of PMOD ATL software.

2.2.3 Starting PMOD for System Configuration

After the installation, start PMOD using the RunPmod script in the *Pmod4.1/Start* directory. As per default there is a single PMOD user "user 1" configured, automatic sign-on proceeds and prompts for a password. Please **Cancel** this window **ENTER User [user 1] Password:**, and enter the configuration by the **Config** button in the PMOD ToolBox.



The system prompts for the initial administrator password which can be found in the delivery notes. After entering the correct password, the configuration window appears.

IL PMOD Configuration and User Settings
🔉 USERS 🕍 DICOM 🛛 🚛 DATABASE 🖉 FTP Nodes 🖺 On Start 🖓 ATL
Usert 🔻 🖣 🕨 🐐 Add new user 🗢 × Remove user 🧠 Set Password 🗌 Can view Audit log 🗋 Can delete/merge Database records
Login enabled [+] Use OS user name to login User1 E-mail
A User settings are saved when switching the user.
SETTINGS PXMOD models PKIN models READ / WRITE plugins LOADING TOOLS COLOR TABLES MODULES
REPORT DATABASES FTP Nodes APPEARANCE STATS PRESETS
Header Preview:
Institution Address
Logo: logo.gif 🛛 🐵 Placed in [~system/logo/]
Institution Name [Max 8 lines] 🗹 Bold 🗌 Fixed Space 😵 Update Preview 🗄
Institution Address
Printout Image quality: HIGH 🔍 Header date format: yyyy.mm.dd 💌
▲ ▷ OI ■ ? OK Cancel

2.2.4 System Configuration

Select the DATABASE tab. From the initial PMOD installation there will be configured an empty database **PMOD**, an example data sources **Demo** and a database server **DbSvr**. To see the list select the down arrow as indicated in the illustration below.

III. PMOD Configuration and User Settings	×
USERS 🎉 DICOM 🛃 DATABASE @ FTP Nodes 🗂 On Start 🤜 ATL	
Pmod T Edit data source name * Duplicate data source T Edit data source name Pmod 	st
Database Connection jdbc:derby: // 💌 Database Name > / Pmod * 🖓 Create Database	
Database Path D:/Pmod4.1/data/DATABASES	
File Storage Area D:/Pmod4.1/data/DATABASES/Pmod/data 4 🕨 🕞 🕏 🗐 Update & Optimize	
CFD Processor path CFD Processor path ECHO DB	
Image: SQL Backup Properties Image: Save SQL Backup Restore SQL Backup Image: SQL Backup Image: Save SQL Backup Restore SQL Backup Image: SQL Backup Image: Save SQL Backup Restore SQL Backup Image: SQL Backup Image: Save SQL Backup Restore SQL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup Image: SqL Backup	-
Standalone Verbose commands Redirect output License server Save Starting Script	
Database supports FLOAT representation of image objects I use DICOM Study UID to match new images with existing Patient May result in images assigned to different patients User1 User1 Database Administration Database Reports Aggregate Components E Creations	ate Norm
4 ▶ 01 🛐 ? <u>O</u> k <u>C</u> ancel	

It is recommended to remove the **Pmod** and the **DbSvr** data source. To this end select the **PMOD** data source and then activate **Remove data source**. Repeat the procedure for the **DbSvr** data source. Now you are ready to proceed with the configuration.

2.2.4.1 Audit Trail Configuration

The log entries which constitute the audit trail can be saved as files or in a dedicated database. However, the use of an audit trail database is strongly recommended because it offers highly flexible filtering mechanisms for generating audit trail reports. Some users create a new audit trail database for each calendar year as a means to limit the database size.

2.2.4.1.1 Audit Trail Database Creation

Select the DATABASE tab.

PMOD Configuration and User Settings	
🔉 USERS 🕍 DICOM 🚺 DATABASE @ FTP Nodes 🖸 On Start 📾 ATL	
Audit Image:	X Remove data source DB Access List
[🕨] 🖲 Use Direct Connection	
Database Connection jdbc:derby: // 💌 Database Name > / Audit	📽 🚁 Create Database
Database Path D:/Pmod4.1/data/DATABASES	4 Þ 🐨
File Storage Area D:/Pmod4.1/data/DATABASES/Audit/data	🔹 🕨 🐨 🗘 📲 Update & Optimize
CFD Processor path	< ► • • • • • • • • • • • • • • • • • •
[37] O Use Transaction Server Port 5201 70 1 4 Set Local Host Secure Incalhost	Stop
Standalone Verbose commands Redirect output License server	Save Starting Script
Database supports FLOAT representation of image objects A Float objects may b Use DICOM Study UID to match new images with existing Patient A May result in repeat Ser1 Ser1 Image Administration Image Database Administration	e not accesible in some applications ted patient records
	Cancel
	<u>-</u> unor

Perform the following steps for creating the audit trail database.

 Activate Add new data source to create the data source for the audit log. In the message window enter the name of the audit trail database, in the example Audit. A new empty database definition is shown as illustrated below. Per default it assumes a JDBC connection, an embedded Java database using the driver jdbc:derby, and a location of the data in the installation directory.

[🕨] 🖲 Use Direct Conn	ection						
Database Connection	jdbc:derby://	•	Database Name >	/ Audit			∗ ⊠ Create Database
 Database Path 	D:/Pmod4.1/data	/DATABA	SES		• •	•	
File Storage Area	D:/Pmod4.1/data	/DATABA	SES/Audit/data/		• •	۲	韋 🗐 Update & Optimize
CFD Processor path						•	TEST PON ECHO DB

Please refer to the PMOD Base Functionality Guide for the details about databases.

2. After the proper database configuration has been entered, activate **Create Database** to initiate the actual creation of the audit trail database. The successful creation is confirmed in a message window.

2.2.4.1.2 Transaction Server for Audit Trail and Licensing

The audit trail database should be managed by a transaction server process which also acts as a license server. It should not be used to save actual data.

Perform the following steps to define the transaction server and create a script for starting the server as a process.

1. Switch the radio button from Use Direct Connection to Use Transaction Server.

[😫] 🖲 Use Transaction Server
Port 5201 Y面 127 0 0 1 4 Set Local Host m部 HCH ECHO TS
Secure Escalhost Stop
● Standalone 🖉 Verbose commands 🔲 Redirect output 🗹 License server

- 2. Configure the properties of the transaction server. The **Secure** box is for enabling secure communication. This mode should be used if the communication is not confined within the institution. Otherwise it will slow down the communication speed unnecessarily.
- 3. An important property is the IP **Port** for the communication. It must be a unique number not used by any other transaction server or other process. The default port is **5201**.
- 4. Another important property is the **IP address**. It must contain the address of the host in which the servers are running, so typically the system on which the configuration is performed. For this system the IP address can be obtained by activating the **Set Local Host** button. Note that entering "localhost" in the **HOST** area will NOT work!
- 5. Check the box License Server so that the transaction server also manages the licenses. Activate the Save Starting Script button. A dialog window appears which shows the contents of the created script. The script is dependent on the operating system. The example below shows the result for a Windows system.

Confirmat	on	×					
	Do you want to save Transaction Serv	er Starting Script to [~/Start_ATL] folder ?					
?	cd D:\Pmod4.1\ .\java\jre\binjava -Xmx4G -jar pmtsvr.jar 5201 JAVA_DB org.apache.derby.jdbc.EmbeddedDriver jdbc:derby:D:\Pmod4.1/data/DATABASES/Audit D:\Pmod4.1/data/DAT ABASES/Audit/data/						
	Name RunDbSvr_Audit_5201						
	✓ <u>Y</u> es	× <u>N</u> o					

6. Select **Yes** to save the starting script with the specified **Name** in the subdirectory *Start_ATL* of the PMOD installation directory.

Note: Do NOT switch the radio button back to Use JDBC Connection. The transaction server should run at all times so command window should remain open.

2.2.4.2 Study Database Configuration

The PMOD server can host several study databases which can be used in parallel. Initially, a database is created by the administrator in an interactive PMOD session of the server installation. From then on, all accesses to the database are serviced by a transaction server process which needs to be started from a dedicated script.

2.2.4.2.1 Study Database Creation

In **Users Configuration** window go to **DATABASE** tab and perform the following steps for creating the databases which are used for saving the study data. They are the same steps as for the audit trail database.

 Activate Add new data source. In the message window enter the name of the database, in the example Import as this database will be used for data import. A new empty database definition is shown as illustrated below. Per default it assumes a JDBC connection, an embedded Java database using the driver jdbc:derby, and a location of the database information relative to the installation directory.

[🕨] 🖲 Use Direct Conn	ection							
Database Connection	jdbc:derby: //	▼	Database Name >	7	Import			* 🚰 Create Database
 Database Path 	D:/Pmod4.1/data	DAT/	ABASES			_	•	
File Storage Area	D:/Pmod4.1/data	DAT/	ABASES/Import/data/			I	•	🛊 🗐 Update & Optimize
CFD Processor path							e	ECHO DB

Please refer to the PMOD Base Functionality Guide for the details about databases.

- 2. The **File Storage Area** path defines where the actual data are saved. It is recommended to point this path to a fast, protected share which can not be reached by any user directly, and which is covered by a regular backup strategy.
- 3. After the proper database configuration has been done, activate **Create Database** to create the empty tables of database **Import**. The successful creation is confirmed.

In our example the steps 1 to 3 are repeated for creating the **Import** database as well as the two study databases **Study1** and **Study2**.

2.2.4.2.2 Transaction Servers for Study Databases

Each of the study databases must be managed by a transaction server process. Please perform the following steps to define the transaction server and create a starting script for each database (in the example: **Import**, **Study1**, **Study2**).

- 1. Select the **Import** database in the data sources list.
- 2. Switch the radio button from Use JDBC connection to Use Transaction Server.

[95] •	Use Transaction Server
	Port 5202 70 127 0 0 1 4 Set Local Host 📆 🕬 ECHO TS
	Secure Estop
_	
	Standalone Verbose commands Redirect output License server

- 3. Configure the properties of the transaction server. The **Secure** box is for enabling secure communication. This mode should be used, if the communication is not confined within the institution. Otherwise it will slow down the communication speed unnecessarily.
- 4. An important property is the IP **Port** for the communication. It must be a unique number not used by any other transaction server or other process. As the default port of **5201** is already used by the transaction server for the audit trail, use the next free port **5202** for the **Import** server.
- 5. Another important property is the **IP address**. It contain the address of the server system which can be obtained by activating the **Set Local Host** button. Note that entering "localhost" in the **HOST** area will NOT work!
- 6. Activate **Save Starting Script**. A dialog window appears which shows the contents of the created script. The script is dependent on the operating system. The example below is for a Windows system.

Confirmat	on	×				
	Do you want to save Transaction Server Starting Script to [-/Start_ATL] folder ?					
?	cd D:Pmod4.1\ .Javalyre\bin\java -Xmx4G -jar pmtsvr.jar 5202 JAVA_DB org.apache.derby.jdbc.EmbeddedDriver jdbc:derby:D/Pmod4.1/data/DATABASES/Import D/Pmod4.1/data/DA TABASES/Import/data/ -noLS					
	Name RunDbSvr_Import_5202					
	✓ Yes	× <u>N</u> o				

7. Select **Yes** to save the starting script with the specified **Name** in the subdirectory *Start_ATL* of the PMOD installation directory.

Repeat steps 1 to 7 for the **Study1** and the **Study2** databases using port **5203** for **Study1** and port **5204** for **Study2**.

Note: Do *NOT* switch the radio button back to Use JDBC Connection.

2.2.4.2.3 Database Cleanup

From the initial PMOD installation there will be an example data sources configured, **Demo**. To see the list of data sources select the arrow indicated in the illustration below.

死,PMOD Configuration and User Settings	×
🕦 USERS 👫 DICOM 🚺 DATABASE @ FTP Nodes 🖺 On Start 🎮 ATL	
Study2 Image: The Edit data source name Image: Add new data source [Image: The Demo Image: The Demo Image: The Demo	X Remove data source DB Access List
Database Path DJPmod4.1/data/DATABASES	↓ ► · · · · · · · · · · · · · · · · · ·
File Storage Area D/Pmod4.1/data/DATABASES/Study2/data/	
Image: Solid Sector Properties Image: Solid Sector Properties	ere SQL Backup 고마아에 ECHO TS 은 Stop
Standalone Verbose commands Redirect output License server Database supports FLOAT representation of image objects A Float objects Float objects	Save Starting Script
Use DICOM Study UID to match new images with existing Patient 🋕 May result in repea User1 💌 💷 📲 User1 🐨 🖉	ated patient records
4 Þ Ø 🕅 ?	Cancel

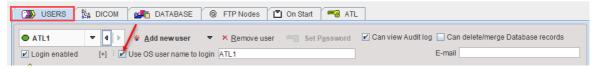
It is recommended to clean up and remove the example data sources. To this end select the **Demo** data source and then activate **Remove data source**. At the end only the relevant data sources should be listed, each with a symbol to indicate that the database is served by a transaction server.



2.2.4.3 User Configuration

PMOD distinguishes between a privileged PMOD administrator who installs the software and configures the environment, and the PMOD users who perform the actual data analysis. The administrator has no user account. He can only open the configuration tool for administrative purposes, but not start any processing tool.

The PMOD users configuration can be performed on the **USERS** tab.



The e-mail specification is mandatory for the Project Tracker. It allows sending information about the assigned tasks to the specified user. Please check the Project tracker section for further details.

2.2.4.3.1 User Creation

User with Data Manager Role

It is recommended to set up one or two PMOD users (with or without OS login) who have rights to all the databases, including deleting permission. In our example we create a local user called **ATL_Manager**.

USERS	🗞 DICOM 🛛 🛃	DATABASE	@ FTP Nodes	🖸 On Start	न ATL			
ATL_Manager	▼ 4 ▶ ※ <u>A</u>d	ld new user 🔻	× <u>R</u> emove us	er . 📼 Set F	assword	Can view Audit I	og 🗹 Can delete/merg	e Database records
✓ Login enabled	[+] Use OS	user name to logi	in ATL_Manager				E-mail	

Please perform as follows:

- 1. Select the Add new user button to create a new user entry.
- 2. Edit the name under which the user will be known to PMOD, ATL_Manager.
- 3. Leave the Use OS user name to login unchecked.
- 4. Define the initial password of the user with the **Set Password** button. The password is encrypted and saved in */properties/global.start*

PMOD Users without OS login

The recommended way for setting up PMOD users is to define users which are authenticated by a password maintained within PMOD. In this case the user definition is done as follows:

- 1. Select the Add new user button to create a new user entry.
- 2. Edit the name under which the user will be known to PMOD, eg to ATL2.
- 3. Leave the **Use OS user name to login** unchecked. This user will have to be authenticated by a password in PMOD.
- 4. Set the initial password of the user with the **Set Password** button. As with the administrator password, it is encrypted and saved in */properties/global.start*

PMOD Users with OS Login

As an alternative it is possible setting up PMOD users identification based on the the operating system user name login. In this case the user definition is done as follows:

- 1. For the first user it is recommended to keep the default **user 1** entry. For the other users please activate the **Add new user** button to create a new user entry.
- 2. Edit the name under which the user will be known to PMOD, eg to **ATL1**. This name will be used in the Audit Log.
- 3. To make this a PMOD user who is identified through his OS login, check the **Use OS user name to login**.
- 4. Enter into the text field to the right the exact name as used by the operating system, in the example **ATL_User1**. Note that the PMOD user name and the OS name are completely independent, but it is recommended to maintain a reasonable agreement between them. As a hint, the OS name of the user who started PMOD is shown in the terminal window.

User with Extended Permission

Per default, PMOD users have very restricted rights. However, deleting may be required sometimes in a controlled manner. Therefore it is possible to assign to dedicated users extended permissions, but still not with full administrator permissions. The following options are available:

- **Can delete/merge Database records**: With this box checked, the user can delete/merge from the databases to which he is entitled.
- Can view Audit log: With this box checked, the user can inspect the current audit log from the PMOD ToolBox. Users which have access to the Audit log can access also the Project Tracker (PT) on the Pmod Toolbox.

2.2.4.4 DICOM Server Configuration

Currently, there are four methods to import DICOM image data into a study database.

- 1. The PMOD user loads images from disk or CD files and saves them to a study database. This has the advantage, that the user will be listed as data creator in the database. However, be aware that the images in the database will not be the original image data, but objects created by PMOD.
- 2. The original images are sent to a PMOD DICOM server, which saves the images to a dedicated database. This has the advantage, that the original image data are saved without any modification. However, the DICOM server will be listed as the data creator, so there is no identification possible who introduced the data.
- 3. Images are dropped into a dedicated directory which is regularly scanned and the data imported into a database. This is a variant of the DICOM server solution and has the same advantages and disadvantages.
- 4. The data are brought into a database by replication from another database. In this case the user who initiates the replication will be listed as the data creator.

Data Import Recommendation

The following organization is recommended:

- 1. The dedicated **Import** database is used as an intermediate data pool from which the data are further distributed to the actual study databases.
- 2. A PMOD DICOM server process is established which is able to receive image data per DICOM network protocol and saves all received images as original data to the **Import** database.
- 3. The dedicated PMOD user **ATL_Manager** is given access rights to the **Import** database and all study databases. This user is in charge of moving the received image data to the appropriate study databases, ending up with the original images.

The sections below describe the configuration of the DICOM Client and of the DICOM server to implement this organization.

2.2.4.4.1 DICOM Client Configuration

To import data into the ATL system, DICOM clients need to be configured which can send the original study data to the PMOD DICOM Server. In such a client, the PMOD DICOM Server has to be appropriately configured.

The configuration should also be done in the ATL Server configuration as illustrated below. In the **NODEs** panel of the **DICOM** panel, enter the **AE Title**, the **Port** number, and the server **IP** address exactly as in the DICOM Server <u>configuration</u> 18. This configuration will allow the easy import of DICOM data data by all PMOD clients as discussed below.

亚 PMOD Configuration and User Settings		×
💮 USERS 🔛 DICOM 🛃 DATABASE	@ FTP Nodes 🎦 On Start 🔫 ATL	
NODEs [C-STORE, Q/R] DICOM SERVER S	PECIAL CASES ADVANCED	
AE Title PMO Port 5030 Secure (TT Compress Ø Do not ser Ø Propose o Ø Use basic Ø Retrieve in Ø Use GET i	D (unique) LS) 127 0 0 1 4 Set Local Host sed 127 0 0 1 4 Set Local Host mod implementation version name one transfer syntax per presentation context	Remove node . C-ECHO ort
4 🕨 🔘 🛐 ?	<u>O</u> K	Cancel

2.2.4.4.2 DICOM Server Definition

To configure the DICOM server please select the **DICOM** panel of the configuration window and select the **DICOM SERVER** tab.

USERS E DICOM	DAT	ABASE @ FTP Nodes	🔄 On Start	ATL 🔤		
NODES [C-STORE, Q/R]	DICOM SER	VER SPECIAL CASES	ADVANCED			
PMOD V () DOMO	Edit server na	ame 🛛 🗢 Duplicate server	♥ × Remov	0 SOLABI	👄 MAI	N (First server)
AE Title PMC	D	Secure (TLS)				
		Do not send implemental		a 🗍 Faran data	ault transfer syntax for all	
Accept in coming connectio	do irom any At	E La Do not send in premeina	CON VECTORS NAM	ie La Force dela	aun elanorer syntax for an	iniconini giconne ci ons
Check Incoming Folder D	/Pmod4.1/data	/di com/in coming			😔 every	seconds
Files stored	Lin (Incoming F	older) are automatically convert	ed according to	configuration		
Notes: Incoming F	older) can't coi	ntain [Final Storage Area].				
 Only DICOM 	I files (without	DICOMDIR) should be stored to	Incoming Fold	erj		
7 Automatic com accine ter	Databas					
] Automatic conversion to:	Databas	e ▼ () <mark>k⊒s⊒ Audit</mark>				
		e 🔻 () - <mark>BiB Andit</mark>	* • •			
Delete temporary DICC	OM files					
Delete temporary DICC	OM files	vrea D/Pmod4 1/data/dicomtm				
	OM files					
Delete temporary DICC Tempo	OM files	vrea D/Pmod4 1/data/dicomtm	p		***	ी र ।
Delete temporary DICC	OM files orary Storage /	srea DyPmod4 1/data/dicomtm [*]	p		12	
Delete temporary DICC Tempo	M files orary Storage / Pipeline	srea DyPmod4 1/data/dicomtm [*]	p		12	<
Delete temporary DICC Tempo	M files orary Storage / Pipeline	srea DyPmod4 1/data/dicomtm [*]	p		12	<
Delete temporary DICC Tempo Execute processing	OM files orary Storage / Pipeline O Script	srea DyPmod4 1/data/dicomtm [*]	p led		12	<
Delete temporary DICC Tempo Execute processing	OM files orary Storage / Pipeline O Script	rea [D/Pmod4 1/dsta/dicom/tm [*] No PROCESSING PIPE select	p led		12	<
Delete temporary DICC Tempo Execute processing	DM files orary Storage / Pipeline O Script x Database	rea [D/Pmod4 1/dsta/dicom/tm [*] No PROCESSING PIPE select	p led	by User. User1	12	<
Delete temporary DICC Tempo Execute processing	DM files orary Storage / Pipeline O Script x Database	vrea DJPmod4 1/data/dicomtm P1 No PROCESSING PIPE select	p led	by User. User1		S & Bave original data

The DICOM server of a particular system is defined by two entities, the:

- Port number on which the server is listening,
- Application Entity Title (AET) which has been given to the server.

Note:

On Linux systems there exist reserved ports which require special permission to allocate. If such a port is defined as the PMOD DICOM server port, the server cannot be started from a user account and issues a message *Permission denied*. Starting as root will normally succeed, but this has the disadvantage that the saved files will all belong to the root. To prevent this situation a higher port number (typically >4000) should be used on Linux, rather than the default DICOM port 104.

Please note that in PMOD ATL example we are using port number 5030 not default 4030.

Besides the basic server information there is an additional check relevant for the DICOM server operation: Accept incoming connections from any AE. If it is checked, any association request will be accepted, so images will be received from any system, otherwise only from known systems. Note that as long as the sending node is not configured, it will not be able to retrieve images from the PMOD DICOM server.

DICOM Server Saving Definition

There is still one configuration missing for the DICOM server, namely what he has to do with the received data. This can be done as follows in the same panel as above. Make sure that for Database access by user **ATL_Manager** user is selected from the list. Then select on the **SETTINGS** tab the DICOM panel as illustrated below.

Make sure that the **Automatic conversion** box is checked, the format is set to **Database**, and the **Import** database is selected. With this configuration the original DICOM data will be added to the **Import** database.

C PMOD Configuration and User Settings					×	
🕦 USERS 🔛 DICOM	TABASE @ FTP Nodes	🖸 On Start	TTL ATL			
NODEs [C-STORE, Q/R] DICOM SER	VER SPECIAL CASEs	ADVANCED				
Notes: • [Incoming Folder] can't co	Secure (TLS) Do not send implement dicom/incoming older] are automatically conv	itation version nam	e 🗌 Force default trans	 MAIN (First fer syntax for all incomi every 60 		
✓ Delete temporary DICOM files	e ▼ 4 ▶ <mark>G⊐B Impo</mark> Area D./Pmod4.1/data/dicom					
	[*]					
Execute processing	No PROCESSING PIPE sel	ected	A		Save original data	
Answer Server Query from: Database Standalone: Verbose commands Redirect output Database access by User: ATL_Manager ATL_MAN						
		Ok			Cancel	
		<u>v</u> r			Ganool	

The **Answer Server Queryfrom** box can be deactivated to disallow remote querying. In the example above querying will be allowed to the **Import** database.

Script for DICOM Server

The **Save Starting Script** button serves for generating a starting script for the DICOM server with the defined configuration and definition. It shows a dialog window where all the above settings and definitions are summarized. The script content is shown, and can be saved in the *Start_ATL* folder within the *Pmod4.1* directory by the **Yes** button under a given **Name**.

Confirmat	ion	\times			
?	Do you want to save DICOM Server Starting Script to [~/Start_ATL] folder ?				
	cd D:/Pmod4.1\ .\javaljre\bin\java -Xmx2G -jar pdcmsvr.jar -port[5030] -aet[PMOD] -std -tmpsa[D:/Pmod4.1/data/dicom/tmp/] -deltmp -conv[database@Import] -ansQuery[Database@Imp ort] -userName[ATL_Manager]				
	Name RunDcmSvr_5030_PMOD				
	✓ Yes × №o				

The **-std** flag indicates the standard communication port, while **-tls** would be used for specifying the secure port.

2.2.4.4.3 Advanced DICOM Server Options

Support for Secure DICOM

Standard DICOM communication is not secure, and therefore is not recommended over public networks. To overcome this problem, a DICOM supplement has been finalized which allows

implementing secure connections. PMOD supports one of the proposed variants called BASIC TLS SECURE TRANSPORT CONNECTION PROFILE. Of the three optional features (entity authentication, encryption, integrity check) encryption is implemented in the current release. As a consequence, the data transferred can only be interpreted by the target DICOM server with which the communication has been established.

The PMOD server may be configured to accept secure and insecure connections at the same time on two different ports. One port is designated for standard TCP/IP connection and the other for secure TLS connections. To enable secure DICOM, enable the **Secure (TLS)** checkbox, define a port number, and the AET.

DICOM Import from Directory

Normally the DICOM server is receiving data over the network from DICOM clients. However, it is also possible to have the DICOM server scan a directory and treat found DICOM series in the same way as if they had arrived by the network. This functionality can be configured by the **Check Incoming Folder** box. If it is checked, the directory to be scanned can be entered as well as a scanning interval **every ... seconds**. This import feature can be used to add DICOM images to a PMOD database. Note that after processing the images by the DICOM server they are removed from the incoming folder.

2.2.4.4.4 Client Script Generation

The clients will use a script to start PMOD wherein the license server must pe properly specified. The client script can be generated with the **Save Client Starting Script** button on the **ATL** tab. It opens a dialog window as illustrated below.

Confirmati	on S	<
?	Do you want to save Client Starting Script to [-/Start_CLT] folder ? Memory and License Server configuration: Memory 16G Port 5201 Address 127 0 0 1 4 Set Local Host Secure 8G Command 16G Cd D:Pmo 64C Java Jirelbhar Secure Fision Java Jirelbhar Name RunPmodClient	
	✓ Yes X №o	

The transaction server **Port** and **Address** should already correspond to the ones configured for the Audit trail license server. In addition, the amount of RAM to be used by the client is available for configuration under the **Memory** selection. Note that the allocated memory cannot be bigger than the physical RAM available on the client system.

It is however recommended to make sure the correct properties of the license server are configured:

- 1. Address: It must contain the address of the server system, which can be obtained by activating the Set Local Host button. Note that entering "localhost" in the HOST area will NOT work!
- 2. **Port:** It must contain the port number of the transaction server which was configured as the license server 12, in the example **5201**.
- 3. Transfer syntax: The Secure box must be configured exactly as for the license server.
- 4. Memory configuration: must be lower than the physical RAM available on the client system.
- 5. Select **Yes** to save the starting script with the specified **Name** in the subdirectory *Start_CLT* of the PMOD installation directory.

A confirmation message is shown which reminds the user that some information in the script may be edited once the client system is configured.

2.2.4.5 Administrator Password Change

The administrator password should be changed. This can be done on the **ATL** tab using the **Change Pmod's Admin Password** button. Upon exit the new password is stored in an encrypted form in the */properties/global.start* file.

If there is a need to reset the administrator password to the initial one, please remove the line starting with ADMIN_PSWD in *global.start*.

2.2.5 Starting of the Servers

At this point of the configuration the transaction servers and the DICOM server can be started. Please close the PMOD **Users configuration** window with **Ok**, and stop PMOD by selecting **Quit** from the ToolBox.

Start the transaction servers using the scripts which can be found in the *Pmod4.1/Start_ATL* subdirectory. This can be done by double-clicking the script files, or by opening a command window per server and entering the complete name of the script.

- 1. **RunDbSvr_Audit_5201**: Starts the transaction server for the **Audit** database and license server functionality.
- 2. **RunDbSvr_Import_5202:** Starts the transaction server for the **Import** database to which the DICOM server will save.
- RunDbSvr_Study1_5203, RunDbSvr_Study2_5204, etc: Start the transaction servers for the databases configured for studies 1 and 2. Similarly, start the transaction server for all other study databases.

Note: Per default the output of the transaction servers is shown in the respective terminal windows. To redirect the output to a file please add the -o argument to the end of the command in the starting script.

Then start the DICOM server double-clicking the script **RunDcmSvr_5030_PMOD** which was saved in the *Start_ATL* directory.

Important Note: After the initial server configuration and starting of the transaction and dicom servers the *RunPmodClient.bat* script should be used both for normal work and administrative tasks. Please remember that before using the server script *RunPmod.bat* in the *Start* directory all clients should be switched off (single user environment). All transaction and dicom servers should be restarted after any administrative changes on server.

2.2.6 Database Access Rights

To define database access for the users, please start the PMOD using the *RunPmodClient.bat* in the *Pmod4.1/Start_CTL* sub-directory, and enter the **Config** menu with the administrator password.

Enabling Database Access for a User

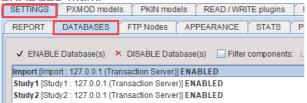
The administrator has to explicitly configure all databases to which a PMOD user has access. This is done on the **USERS** panel:

- 1. Select the user, in our example the **ATL_Manager**.
- 2. Select the **DATABASES** tab in the **SETTINGS** panel.

- IL PMOD Configurat × 🕦 USERS 📓 DIC 🚧 🛃 DATABASE 🔞 FTP Nodes 🖾 On Start 📼 ATL 🗢 ATL_Manager 💐 4 🕨 🐐 Add new user 📼 🗙 Remove user 🧠 Set Password 🗹 Can view Audit log 🖌 Can delete/merge Database records ✓ Login enabled [+] Use OS user name to login ATL_Manag E-mail A User settings are saved when switching the user. SETTINGS PXMOD models PKIN models READ / WRITE plugins LOADING TOOLS COLOR TABLES MODULES REPORT DATABASES FTP Nodes APPEARANCE STATS PRESETS ✓ ENABLE Database(s) × DISABLE Database(s) ☐ Filter components: Last Year ▼ Select: × ₿₽ Audit [Audit : 127.0.0.1 (Transaction Server)] Import [Import : 127.0.0.1 (Transaction Server)] Study1 [Study1: 127.0.0.1 (Transaction Server)] Study2 [Study2 : 127.0.0.1 (Transaction Server)] Select All Ok Cancel + Add new × <u>R</u>emove ± set default 4 🕨 🖸 🔣 ? Ok Cancel
- 3. Activate the Add new button to see the list of currently configured databases:

Select the relevant study databases and close with Ok.

4. As a result, the databases to which the user has access are shown in the list with the **ENABLED** mark.



For the user ATL1 enable the Study1 and Study2 databases, and for ATL2 only Study2.

Database Access List

For each database, a user access list is maintained. This list is synchronized with the configuration described above, but provides some more detail.

To see and edit the database access lists select the top **DATABASE** tab of the configuration then the **DB Access List** button near the data source creation/removal. It shows a dialog window as illustrated below.

Installation

PMOD Configuration and User Settings	
🎲 USERS 🕍 DICOM 🛃 DATABASE @ FTP Nodes 🗂 On Start 🎮 ATL	
Image: Study 2 Image: T Edit data source name Image: Duplicate data source [Image: Image: Study 2 Image: Study 2 Image: Study 2 Image: Study 2 Image: Study 2 Image: Study 2 Image: Study 2 Image: Study 2 Image: Study 2 Image: Study 2 Image: Study 2 Image: Study 2 Image: Study 2 Image: Study 2 Image: Study 2 Image: Study 2	 X Remove data source DB Access List
[🕨] 🔿 Use Direct Connection	
Database Connection jdbc:derby: // S Database Name > / Study2	* Create Database
Database Path D:/Pmod4.1/data/DATABASES	4 > @
File Storage Area D:/Pmod4.1/data/DATABASES/Study2/data/	👍 🗼 👝 🕴 🚛 Update & Optimize
CFD Processor path	
ि 🖓 😯 SQL Backup Properties 🛛 🖶 Save SQL Backup 💲 Restore	SQL Backup
Port 5204 译通 127 0 0 1 4 Set Local Host mm	Stop
Standalone Verbose commands Redirect output License server	Save Starting Script
Database supports FLOAT representation of image objects Ise DICOM Study UID to match new images with existing Patient May result in repeate	e not accesible in some applications ed patient records
ATL2 💌 4 🕨 👬 Database Administration 🛈 🏛 Database Reports 👔	Aggregate Components [] Create Norm
▶ 01 2 ?	Cancel

The **DB** Access UID contains the name of the PMOD user. The **Computer** column shows the systems from which the user can access the database. If the "*" is shown, user access from all client systems are allowed. It can be restricted by replacing * by a computer host name. A value of **0** in the **Enabled** column indicates that the user has no database access, whereas **1** indicates enabled access. The **Description** is a convenience field which can be edited by the administrator for commenting purposes. **First login** and **Last login** give some information about the activity of the user.

现。Database Access List Management							
Database permission:	s [3]:						
DB Access UID	Computer (* = any)	Enabled	Description	First login	Last login		
ATL_Manager	*	1		2019-11-01 12:52:40.306	2019-11-01 12:52:40.396		
ATL2	*	1		2019-11-01 12:53:33.773	2019-11-01 12:53:36.113		
ATL1	*	1		2019-11-01 12:53:26.251	2019-11-01 12:53:31.204		
I≈⊜ <u>E</u> d	it	😣 Delete		₩ Get / <u>F</u> ilter	× <u>C</u> lose		

The **Edit** button serves for editing the selected access list entry as illustrated below. For instance, by removing the **Enabled** check, the user **ATL2** can be blocked from the selected database.

IL Edit	×
Database permissions:	
DB Access UID ATL2	
Computer (* = any) *	
Enabled 🗾	
Description	
First login 2019-11-01 12:53:33.773	
Last login 2019-11-01 12:53:36.113	
<u>S</u> ave	X <u>C</u> ancel

2.2.7 Audit Trail Configuration

The last step for the audit log configuration is the assignment, where the audit log output is saved. Select the **ATL** tab of the **Users** configuration window opened.

配 PMOD Configuration and User Settings X							
USERS Addit Log to Files Addit Log to Database: Save Client Starting Script							
↓ OI Image: Concel							

To use the database for the audit log select **Audit Log to Database**, and chose the prepared **Audit** entry from the list of currently available databases. As an alternative, with the **Audit Log to Files** configuration, the log information will be saved in to user-specific text files.

At this point only PMOD (not the transaction servers and DICOM server) should be restarted after closing the **Users configuration** window with **Ok** and quitting the ToolBox.

2.3 Client Installation

The clients will run PMOD locally. In contrast to a standard PMOD installation, they will not use the local properties, but retrieve the dedicated properties of the user at login.

If all the clients are homogeneous, i.e. using the same operating system, it is recommended setup a single PMOD client installation on a share which can be reached by all clients and is mounted in the same manner so that they can use the same starting script.

If all the clients are not homogeneous, they require an individual setup because of the differing Java environment.

Homogeneous Client Environment

Please proceed with the client configuration as described below. For the explanation it is assumed that the installation is performed on the common share *P*:*ATL-Client*.

In a first step install PMOD with a suitable Java environment.

- 1. On a PMOD Client system, start a PMOD installation from CD.
- 2. Point the installation directory to P:\ATL-Client.
- 3. Enable only the item PMOD Software, and disable all other items.
- 4. Complete the installation without importing properties.
- 5. Remove all scripts in the Pmod4.1/Start directory

Note: Do NOT copy the license file to the client installation.

In a second step tailor the client starting script.

- 1. Copy the client starter script *RunPmodClient.bat* from the *Start_CLT* directory on the server to the *P:/ATL-Client/Pmod4.1/Start* directory.
- 2. Then edit P:/ATL-Client/Pmod4.1/Start /RunPmodClient.bat. The part which has to be edited is the path of the installation as it will be seen from the client systems. Also, the maximal allocated memory may be increased from 16000MB for example to 20GB (-Xmx20000M or Xmx20G) for a system with 24GB pf physical RAM available. cd P:\ATL-Client\Pmod4.1\ .\java\jre\bin\java -version .\java\jre\bin\java -Xmx20000M -jar pmod.jar -LSC[52010127.0.0.1]

Now the client script can be tested. After a certain time, the PMOD toolbox should appear.

Heterogeneous Client Environment

If the client systems have differing operating systems, a common installation is not possible. In this case a local installation per client should be performed and configured as described above. The only difference is that the common share path *P*:*ATL-Client* is replaced by a local directory.

3 Maintenance Operations

3.1 Stopping/Starting of the Servers

Server Stopping

To ensure proper shutdown each server should be stopped with Ctrl+C signal (closing terminal can break onging operations). For instance, the DICOM server will continue until the last image of a data transfer has been received.

If for maintenance reasons the servers have to be stopped the following order is recommended:

- 1. Stopping the DICOM server and waiting for its termination, so that received images can yet be announced to the database.
- 2. Stopping the study database transaction servers using Ctrl+C.
- 3. Stopping the audit trail and license server.

Server Starting

After maintenance it is recommended to start the servers with the scripts in the *Start_ATL* folder in the following order:

- 1. Start the audit trail and license server.
- 2. Start the study database transaction servers.
- 3. Start the DICOM server.

3.2 Audit Trail Inspection

The audit trail can either be inspected from the ToolBox, or from the **ATL** tab of the **Config** Window.

距 PMOD Configuration and	User Settings	×
USERS 🔛 DICOM	DATABASE @ FTP Nodes On	Start Carl
न्द्र <u>ू</u> Ch <u>a</u> nge F	Pmod's Admin Password 🛛 🗹 Allow remot	e administration
Audit Log to Files	Audit Log to Database: 🔒 🔒 Audit	
Select a	and view log database: 🎕 Audit 🤜 📗	íli -
	Save Client Starting Script	
4 🕨 🔘 🔣 ?	<u>O</u> k	Cancel

In both cases there is a selection to switch between different Audit trail databases. For instance, an institution could use annual Audit databases. For each year it would create a new database, and then switch logging to this new database. With the switch above, the administrator can inspect the current Audit database, but also the old ones.

The advantage of the **Config** window is that an **Audit Log Statistics** is available for the selected Audit database:

®t Audit マ 📶	翆 Audit Log St	tatistics $ imes$
starting Script	🔺 Name	Value
Adding Conpt	Audit Log cDBID len	59
	Audit Log details len	601
	Audit Log records	321
	Clos	e

Audit Log

Activating the **Select and view log** button opens the **Audit Trail Log** as illustrated below.

$\begin{array}{c} 2019-11.01 10.01 10.27\\ 2019-11.01 10.05 10.29\\ 2019-11.01 10.05 10.39\\ 2019-11.01 10.05 10.39\\ 2019-11.01 10.00 17.09\\$	User ATL1 ATL1 ATL1 ATL1 ATL1 ATL1 ATL1 ATL1	Modula PXWCO PXWCO PXWCO PXWCO PXWCO PXWCO PXWCO	Level MAGE COMPONENT COMPONENT BERGES	Operation SAVE SAVE	Subject name PKIN2	TSubject (D		1000000			
$\begin{array}{c} 2019 + 101 + 100 + 100 27\\ 2019 + 101 + 100 + 100 + 100 + 100 \\ 2019 + 101 + 100 + 100 + 100 + 100 \\ 2019 + 101 + 100 + 100 + 100 + 100 \\ 2019 + 100 + 100 + 100 + 100 + 100 \\ 2019 + 100 + 100 + 100 + 100 + 100 \\ 2019 + 100 + 100 + 100 + 100 + 100 \\ 2019 + 100 + 100 + 100 + 100 + 100 \\ 2019 + 100 + 100 + 100 + 100 + 100 \\ 2019 + 100 + 100 + 100 + 100 + 100 \\ 2019 + 100 + 100 + 100 + 100 + 100 \\ 2019 + 100 + 100 + 100 \\ 2019 + 100 $	ATL1 ATL1 ATL1 ATL1 ATL1 ATL1 ATL1 ATL1	PXW00 PXW00 PXW00 PXW00 PXW00 PXW00 PXW00	MAGE COMPONENT COMPONENT BERIES	S4VE		Thingetto					
	ATL1 ATL1 ATL1 ATL1 ATL1 ATL1 ATL1	PXW00 PXW00 PXW00 PXW00 PXW00 PXW00	COMPONENT COMPONENT BERIES		DATES		Comptex DEID	Details			
2013-10-11 10.02 10.046 2013-10-11 10.01 00.052 2013-10-11 10.01 00.057 2013-10-11 10.01 00.057 2013-10-11 10.01 00.057 2013-10-11 10.01 00.05 2013-10-11 10.01 00.05 2013-10-11 10.01 07.84 2013-10-11 07.84 2013-10-100-100-100-100-	ATL1 ATL1 ATL1 ATL1 ATL1 ATL1	PXWOO PXWOO PXWOO PXWOO	COMPONENT BERIES	SAVE		Dyn. DASB with	<2160/16tudy2>	SAVED as Database PKIN2 DAB	8 SERT BPnd_Logan > D	mamic DASB PET <2/16/0//Study2>	
2014-10-10 10000 452 2014-10-10 10000 474 2014-10-10 10000 474 2014-10-10 1000 474 201	ATL1 ATL1 ATL1 ATL1	PXMCO PXMCO PXMCO	BERIES		PKIN2	Dyn. DASB with	<2/16/30/98tudy2>	[WAGEHISTORY] MAGE_HISTOP	Y - Saved to Database feld	Mr. DYN_DASE_WITHOUT_BLOODMRb20191101/1099	
$\begin{array}{c} 2019 + 10.1 \\ 10.019 + 10.019 \\ 2019 + 10.1 \\ 10.019 + 10.019 \\ 10.019 + 10.019 \\ 10.010 \\ 10.019 \\ 10.0$	ATL1 ATL1 ATL1	PXMOD PXMOD		BAVE	PKIN2	Dyn. DASB with	<2/9/29/18tudy2>	IMAGEHISTORY] MAGE HISTOP	If = Saved to Database fold	Nr DVN DASB WITHOUT BLOOD MRI/20191101/1099	
2014-5-161 150204 193- 2014-5-161 150204 193- 2014-5-161 15020 1946 2014-5-161 15020 1946 2014-5-161 15020 1946 2014-5-161 15020 2014 2014-5-161 2014 2014-	ATL1 ATL1	PXMOD		LIPDATE	PKIN2	Dyn. DASB with	<2/16/07/Study 2×	Total image objects in series = 1, is	nage objects already in DB	= 0. objects updated = 0, new objects added = 1	
2014-1-01 10 2019 140 2014-1-01 10 2019 2014 2014-1-01 10 2018 2014 2014-1-01 10 2018 2014 2014-1-01 10 2017 2014 2014-1-01 10 2014 2014-1	ATL1		SERIES	CREATE	PKIN2	Dyn, DASB with	<2/16/07/Study 2>	and the second se			
$\begin{array}{c} 2019 + 1 - 0.11 \\ 8019 $			MAGE	SAVE	PKN2	Dvn. DASB with	<2/15/0//Study2x	SAVED as Database PKINUI DAS	ESERT I BPng SRTM21-1	Swame DASS PET <215/07/Study2+	
2013-10-11 10.0010-235 2013-10-11 10.0017-36 2013-10-11 10.0017-36 2013-10-11 10.0017-36 2013-10-11 10.0017-31 2013-10-11 10.0017-31 2013-10-11 10.0017-31 2013-10-11 10.0017-30 2013-10-11 10.0017-30 2013-10-10017-30 2013-10-10-10017-30 2013-10-10017-30 2013-10-1000-50 2013-1000-50 2013	ATL1	EXMOD	COMPONENT	SAVE	PKIN2	Din DASB with	<2/15/27/1/81/0/2>	IMAGEHISTORYUMAGE HISTOR	Y = Saved to Detabase fold	Mr DYN DASE WITHOUT BLOOD MRI20191101/1098	
$\begin{aligned} & 2019-11.01 \ (150.000 \ box) \\ & 2019-11.01 \ (150.007 \ 5b) \\ & 2019-11.01 \ (150.007 \ 5b) \\ & 2019-11.01 \ (150.007 \ 5b) \\ & 2019-11.01 \ (150.006 \ 4b) \\ & 2019-11.01 \ (150.006 \$		PXMOD	COMPONENT	BAVE	PKIN2		<2/9/26/7/Study 2>			NC DYN DASB WTHOUT BLOOD MRs20191101/1098	
2019-11-01 15:0208.043 2019-11-01 15:0207.586 2019-11-01 15:0207.586 2019-11-01 15:0207.595 2019-11-01 15:0208.712 2019-11-01 15:02.446.687 2019-11-01 15:02.12:026 2019-11-01 15:02.12:026 2019-11-01 15:02.12:026 2019-11-01 15:02.12:026 2019-11-01 15:02.10.157 2019-11-01 15:02.10.157 2019-11-01 15:02.10.157 2019-11-01 15:02.686 2019-11-01 15:02.686 2019-11-01 14:59.20.085 2019-11-01 14:59.20.085	ATL1	PXMOD	BERIES	LIPDATE	PKIN2	Dyn DaSB with	*2/15/0/*/Study2*	Total image objects in series = 1 is	nane objects already in DR	= 0. objects updated = 0, new objects added = 1	
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2019-11-01 15:0207.96 2019-11-01 15:0208.715 2019-11-01 15:0208.712 2019-11-01 15:0208.425 2019-11-01 15:0208.425 2019-11-01 15:0212.208 2019-11-01 15:0212.208 2019-11-01 15:0212.208 2019-11-01 15:0212.208 2019-11-01 15:0216.201 2019-11-01 15:0216.201 2019-11-01 15:0216.201 2019-11-01 15:0216.201 2019-11-01 14:9210.2085 2019-11-01 14:9210.2085	ATL1	PXMOD	MAGE	SAVE	PKIN2		<2/14/0//Study 2>	SAVED as Dofeness PKIN2 (DAR	R SERT LEPAS SETM IN D	mamic DASB PET <2/14/0/VStudy2>	
2019-11-01 15:02/07 315 2019-11-01 15:02/06-712 2019-11-01 15:02/06-415 2019-11-01 15:02/44-607 2019-11-01 15:02 12:206 2019-11-01 15:02 12:206 2019-11-01 15:02 12:006 2019-11-01 15:02 12:006 2019-11-01 15:02 12:006 2019-11-01 15:02 10:05:064 2019-11-01 15:02/06:504 2019-11-01 15:02/06:504 2019-11-01 15:02/06:504 2019-11-01 14:92 10:085	ATL 1	PXMOD	COMPONENT	SAVE	PKIN2		<2/14/24/18/10/2>			MICDYN DASB WITHOUT BLOOD MRI20191101/1098	
2019-11-01 15:00.106-712 2019-11-01 15:00.106-415 2019-11-01 15:00.214.6407 2019-11-01 15:00.112.206 2019-11-01 15:00.210.015 2019-11-01 15:00.210.015 2019-11-01 15:00.213.107 2019-11-01 15:00.25:004 2019-11-01 15:00.25:004 2019-11-01 15:00.25:004 2019-11-01 14:50.25:009 2019-11-01 14:50.25:009 2019-11-01 14:50.25:009	ATL1	PXMOD	COMPONENT	BAVE	PKIN2		<2/9/23//Study 2>			NF DYN DASB WITHOUT BLOOD MRV20191101/1098	
2019-11-01 15:0306-845 2019-11-01 15:02 45:04 2019-11-01 15:02 12:206 2019-11-01 15:02 12:206 2019-11-01 15:02 12:026 2019-11-01 15:02 10:15 2019-11-01 15:01 45:04 2019-11-01 15:00 45:06 2019-11-01 15:00 45:06 2019-11-01 15:00 45:06 2019-11-01 14:59:16:206 2019-11-01 14:59:16:206 201	ATL1	PXMOD	RERIES	UPDATE	PKIN2		<2/14/0/7/Study 2>			= 0. objects updated = 0, new objects added = 1	
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2019-11.01 15:02 12:008 2019-11.01 15:02 10:15 2019-11.01 15:01 26:03 2019-11.01 15:01 26:287 2019-11.01 15:01 26:04 2019-11.01 15:00 26:716 2019-11.01 14:50 26:209 2019-11.01 14:59:28:285 2019-11.01 14:59:28:24	ATL1	PXMOD	COMPONENT	LOAD	PKIN2		<2/9/20/25tudy2>	[VOI] TH_x2prime = Loaded	Canadate Mater Diffi_D		
2019-11.01 15.02.10 15 2019-11.01 15.01 48.287 2019-11.01 15.01 48.287 2019-11.01 15.01 35.187 2019-11.01 15.00 36.716 2019-11.01 15.00 36.716 2019-11.01 45.93.6.290 2019-11.01 45.93.68.24	ATL1	PXMOD	MAGE	LOAD	PKIN2		<2/13/16/18/40/2>	LOADED			
2019-11-01 15:01 48:287 2019-11-01 15:01 33:187 2019-11-01 15:00 5:084 2019-11-01 15:00 46:718 2019-11-01 15:00 46:718 2019-11-01 14:59:30:085 2019-11-01 14:59:30:085	ATL1	PXMOD	COMPONENT	LOAD	PKIN2		<29/19/18/18/19/2>	IVOII CB ref = Loaded			
2019-11-01 15:01:33:187 2019-11-01 15:00:05:084 2019-11-01 15:00:05:084 2019-11-01 15:00:06:715 2019-11-01 14:59:36:290 2019-11-01 14:59:30:085 2019-11-01 14:59:18:624	ATL1	PXMOD	COMPONENT	SAVE	PKIN2		<2/9/20/7/Study 2×	(VOI TH K2prime - Saved to Database folder: DYN DASB WITHOUT BLOOD WRI20191101/109081502201800.ml			
2019-11-01 15:00:05:084 2019-11-01 15:00:04:715 2019-11-01 14:59:36:200 2019-11-01 14:59:30:885 2019-11-01 14:59:30:885	ATL1	PXMOD	COMPONENT	BAVE	PKIN2		<29/19/19/18/ud/2>			OUT BLOOD MRI20191101/108230369139200.voi	
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	ATL1	PXMOD	MAGE	SAVE	PKIN2	Des Danse	<213/0/98tudy2>			ET IAver Volumes/Maski <2/13/0//Study2>	
2019-11-01 14:59:18:597	ATL1	PXMOD	COMPONENT	SAVE	PKIN2		<213/18//Study2>			ar DYN DASB WITHOUT BLOOD WRV20191101/1075	
	ATL1	PXMOD	COMPONENT	BAVE	PKIN2		<2/9/17//8tudy2>			Nr DYN DASB WTHOUT BLOOD MRI20191101/1075	
	ATL1	PXMOD	BERIES	LIPDATE	PKIN2 PKIN2					ar: DVNDASB_WTHOUT_BLOODNHa201911011075 = 0. objects updated = 0. new objects added = 1	
			SERIES	ORFATE	PKIN2 PKIN2		<2/13/07/Study2> <2/13/07/Study2>	rotarimage objects in sense = 1, i	hage objects aready in LIB	» 0, objects updated = 0, new objects added = 1	
	ATL1	PXMOD			PKIN2	Dyn. DASE with		10000			
	ATL1	PXMOD	MAGE	LOAD			resourceatemplatesinormaliza.	LOADED			
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	ATL1	PXMOD	MAGE	LOAD	PKIN2	Dyn. DASB with	<2/9/9/19th(d)/2>	LOADED			
	ATL1	PXMOD	APPLICATION	SETTINGS				CLOSED			
	ATL1	PXMOD	APPLICATION	SETTINGS	10172.02	10110304-511	316-15-14-15-15-15-15-15-15-15-15-15-15-15-15-15-	STARTED			
	ATL1	PXMOD	COMPONENT	SAVE	PKIN1		<1/5/15/18tudy2>	[VOI] TargetVt3CM = Saved to Dat	abase tokter: DYNCPEPs	BOLUSMR(20101101/105210215858400.voi	
	ATL1	PXMOD	MAGE	SAVE	PKIN1		<1/12/0/P/Study2>	SAVED as Database PKIN1 CPF	of image History (Letter)	Crop [Aver Volumes][Mask] <1/12/0/75tudy2>	
	ATL1	PXMOD	COMPONENT	SAVE	PKIN1		<1/12/14/18/u0/2>	[WAGEHISTORY] MAGE_HISTOR	T Image History (A4)	DVN_CPFFX_BOLU8NRI/20191101/105788428635	
	ATL1	PXMOD	COMPONENT	BAVE	PKIN1		<1/5/13/1/Study2>	[MAGEHISTORY] MAGE_HISTOR		DVN_CPFPX_BOLU8NRI/20191101/105785740071	
	ATL1	PXMOD	BERIES	LIPDATE	PKIN1		<1/12/0/98tudy2>	Total image objects in series - 1,	Print Report (Letter)	D. objects updated = 0, new objects added = 1	
	ATL1	PXMOD	SERIES	CREATE	PKIN1	Dyn. CPFPX bo.	<1/12/0/15tud/2>		Print Report (A4)		
10140 44 04 AA CC CT COD	ATT 4	BANKOO.	## 1/0 F	1045	1 -100077	1	rand and all widefanish a writin a	(A)DED	car y survised out (see)		
T Get/Fft				t Refresh	1	-	Export	Ter Image History Getteri	6	X Close	

Each relevant event generates one or more entries in the Audit log. For instance, when the VOI statistics are saved the system saves the VOI definitions also and logs this action. Similar, the transformation is saved when matched image is saved. The details of a log entry can be seen by double-clicking. The example below illustrates the entry of a data set which was created by setting all pixel values below zero by zero.

T View	Х
Audit Trail Log:	
Operation time	2019-11-01 15:08:31.851
Computer	c[pmod-if3.PMT.local]i[b78d454b-6bf8-48a7-a38c-1c991dfaaeb5]
User	ATL2
Module	PVIEW
Level	IMAGE
Operation	SAVE
Data source	Study2
Subject name	PKIN1
Subject ID	Dyn. CPFPX bolus & MRI
Series DBID	21
Complex DBID	<1/21/0/*/Study2>
	SAVED as Database PKIN1 CPFPX Bolus Dynamic PET Orig Crop [Aver Volumes] [Replace] <1/21/0/*/Study2>
Details	
	·
	× <u>C</u> lose

Audit Trail Report

The first task for creating a meaningful audit trail report is defining an appropriate filter so that only relevant information will be listed. The filtering criteria can be changed with the **Get/Filter** button.

After setting the filter as in the example below, only the operations of user **ATL2** in the **Study2** database will be shown in the list.

The Filter		×
Operation time	2019.10.2:2019.11.1	~
Computer		
User	ATL2	
Module		
Level		
Operation		
Data source	Study2	
Subject name		
Subject ID		
Series DBID		
Details		
✓ <u>S</u> elect	× Clea <u>r</u> × <u>C</u> ance	el

Once the list has been filtered, it can be printed as a report with the **Print Report** button, either with the **A4** or the **Letter** format. For reasons of performance, the maximum number of print pages is restricted to 100.

Image History

When an **IMAGE** (Level) **SAVE** (Operation) event is selected in the list, the **Image History** button becomes active. It can be selected to show the entire history of this saved data set, for example:

No	Operation	Date	Tool	User
1	=> USED BY	2019.11.01 14:56:18	PXMOD	ATL1
2	=> LOAD	2019.11.01 15:07:54	PVIEW	ATL2
3	PROCESS	2019.11.01 15:07:59	PVIEW	ATL2
4	REPLACE	2019.11.01 15:08:14	PVIEW	ATL2
5	=> SAVE	2019.11.01 15:08:31	PVIEW	ATL2
Details Re	place Values if < 0.0 by value = 0.0,	All volumes, All slices		

The detail information of an operation can be seen in the **Details** area after clicking at an operation. The **Print** button allows printing the history as a report wherein the operation details are listed.

3.3 Annual Maintenance

It is recommended to create a new, dedicated database and switch audit trail log to it each year.

4 Data Processing

From the data processing point of view there are only a few differences to the normal operation of PMOD, which are explained below. Therefore, the user is referred to the standard User Guides for the explanations of the PMOD functionality.

4.1 Starting the PMOD Client

On a client system PMOD is started for data processing by the script *RunPmodClient* as described in the <u>Client Installation</u> 25 section.

When a PMOD client is started, the name of the current user is retrieved from the AD and one of the following actions happens:

- 1. If the name of the user logged into the operating system is found in the PMOD user list as an OS user name, PMOD starts automatically. In this case, no logout is possible, just exit of PMOD.
- 2. If the AD user name is not found in the PMOD user list as an OS user name, the user has to select among the users without OS association. Then he has to enter the correct password and activate **Accept Password**.

記 ENTER User [ATL_Manager]	Password:		X
Password •••••			
Accept Password <enter></enter>	Change password	×	Cancel

The Change password button in window can be employed for changing the user password.

3. If there are no user names without OS association in PMOD, only the **Config** tool can be opened by the administrator. In this case all PMOD tools remain disabled.

The PMOD ToolBox looks similar to a standard PMOD installation. There is an indication **[ATL C]** which alerts the user that he is working in an ATL environment.

፲፲ Pmoo	- b		×
~	冠 PMOD 4.101	[ATL	C]
	ATL_Manager		
	Log <u>I</u> n	ÊL	og Out
	**	R	
<mark>⊡k1</mark>	<u>K</u> inetic		
	PXMod		
	View		
	Fuse It		
2	<u>S</u> egment		
	3 <u>D</u>		
V PET	Cardiac <u>P</u> ET		
	Cardiac <u>M</u> R		
Y	Flow		
<u>ج</u>	<u>A</u> lzheimer		
Ż	<u>N</u> euro		
NO Co	onfi <u>a</u> <u>P</u> T	€ A <u>I</u>	udit 🔻
	× <u>Q</u> uit		

There is also a button Audit, which serves for starting the inspection of the Audit log. This button is only active if the user has been assigned a corresponding right in the setup 16.

The **Config** button allows starting the configuration of the PMOD ATL Server installation. It will always require the administrator password, independent of the user who is logged in.

Note that login to PMOD is disabled if logging to the audit trail database is not possible. In this case only the the configuration tool can be opened by the PMOD administrator.

4.2 Data Processing

Data processing with an ATL client is exactly the same as with a standard PMOD instance except for the following differences:

- 1. A user will not see all available databases, just the ones for which he has been authorized.
- 2. A user can not delete from database, unless he has been assigned this privilege.
- 3. All loading and saving operations in all PMOD tools are logged to the Audit Trail.

- 4. When image data are loaded from a database, the ImageHistory of these images are loaded as well. New data processing steps are appended to this ImageHistory, so that there is a full data processing record in the ImageHistory.
- 5. When image data are saved, the complete ImageHistory is automatically saved. Both operations are recorded in the Audit Trail, so that the data transformations can be easily tracked and reported.
- 6. When VOI statistics is performed and the result saved, the VOIs are automatically saved.

4.3 DICOM Data Import

If DICOM data are available on a disk (flash disk, DVD, hard disk), they can easily be sent to the DICOM server, which will add them to the **Import** database.

Start the PMOD image viewing tool (PVIEW), and on the DB Load page activate the **DICOM** button. A **Select DICOM Series** window appears. Use the **Change Folder** button to browse the file system to the directory where the data resides. If the data is organized as DICOM part 10 offline files, there will be a DICOMDIR file at the root of the directory tree which contains the image access information. Please **Select** this directory and the image series on the device will be listed as in the illustration below.

R Select DICOM Series						
Series (22) 💿						Image Preview:
D:/00-data/DIC OM				C. M.		
A Name	Birth date	T C-Store original files - select node				×
PFUS1	- 10 DF	Study Name			Image Preview:	
PFUS1		D/J00-data/DICOM/PKIN2(S8)/IMAGE/IMAGE 1	ADAED/201 Image/0.0		I mage Preview.	
PFUS1	1	Dro-uatarbroomin Kinz(30)/kiKGEmin(30_1)	_auapuzo ilinagen.u		1	
PFUS1	000000000					
PFUS2	1937.06.2					
PFUS2	1937.06.2					-
PFUS3						T
PFUS4						ENN .
PFUS4						÷ 🛃
PFUS4						-
PFUS4						- Marca
PKIN1	1981.01.0					- 1466
PKIN1	1981 01 0		Message	×		
PKIN1	1981.01.0		Message	A 4		
PKIN1	1981.01.0					
PKIN1	1981 01.0		DIC OM Verification s	uccopeful	(m	
PKIN1	1981.01.0		Diction Vermenuon a	arce sarut	Teach Turn	
PKIN1	1981.01.0		Address = 127.0.0.1		at trac	
PKIN2	1001.01.0		Poit = 5030			
PKIN2			AETItle = PMOD		2 1 1 1 K 2	
1 (0.10)			ALTINE - PWOD			0
1					Gray - 4 5	
14 41 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	File: D:/00-t		× <u>C</u> lose		m 0.0 0 10	
Institution: Study Descrip	tion DASB SERT					<u> </u>
🕹 Add		Select FRAME. Sele. [1 of	Saled Street III Sale		0 [8] ×	100 [4]
		and the second se		the second second second	D	
Selected for leading [1]		C-STORE Nodes				
production (provide 1.4	91		and the second	Contraction of the local division of the loc	A CONTRACTOR OF A CONTRACTOR	S6.3577
Name	Birth date	PMOD T [PMOD	= 127.0.0.1:5030]	min Hol	🔾 Slice @ Frame 🔾 All	4
PKIN2	10 2					and the second se
1000						× 31 [%]
		Send			× ⊆ancel	
						• # • 0 4 •
						🔾 Slice 🖲 Frame 🔾 All 🛛 🧣
				-	111	and the second second second
		20	Di con la c		• • • • • • • • • • • • • • • • • • •	ACQ mode (Split by CT)
🔂 Open		률 🥌 with Operations 🕥	있Ą C-Store 있는 Q	uegynketneve X	Remove XI Remove all	× Cancel

Select the image series you want to import in the list, and use the **Add** button to bring them to the **Selected for loading** area. Use the **C-Store** button to initiate sending of the images to the DICOM server running on the ATL server machine. A dialog window appears for selecting the sending target which should equal the proper node.

C-STORE Nodes	1	1		
External Node 🗢	PMOD -		[PMOD = 127.0.0.1:5030]	TEST

Start sending the images with the **Send** button. After the acknowledgment of a successful transfer has appeared the images are available in the **Import** database.

4.4 Data Migration

The **ATL_Manager** will be in charge for moving the data from the **Import** database to the target study database, in the example below **Study2**. This task can be done in two ways. Note that all of these actions will be documented in the Audit log.

Moving Data in the Config Window (requires Administrator Password)

Start the **Config** utility and select the **DATABASE** tab. Make sure that the correct user **ATL_Manager** is selected, and activate the **Database Administration** button.

📆 PMOD Configuration and User Settings	×
🞲 USERS 🕅 DICOM 🚺 DATABASE @ FTP Nodes 🖺 On Start 🖓 ATL	
Image: Study2 Image: Study2<	 X Remove data source DB Access List
[🕨] 🔿 Use Direct Connection	
Database Connection jdbc.derby: // 😒 Database Name > / Study2	* 💴 Create Database
Database Path D/Pmod4.1/data/DATABASES	4 1
File Storage Area D:/Pmod4.1/data/DATABASES/Study2/data/	4 🕨 🌐 🛊 🚮 Update & Optimize
CFD Processor path	↓ ► · · · · · · · · · · · · · · · · · ·
C1 Y SQL Backup Properties Save SQL Backup & Restore [S==B] Use Transaction Server Port 5204 Y 127 0 1 4 Set Local Host Image: Compared and the set Local Host Secure Image: Compared and the set Local Host Image: Compared and the set Local Host Image: Compared and the set Local Host	re SOL Backup איז ECHO TS Stop
Standalone Verbose commands Redirect output License server	Save Starting Script
Database supports FLOAT representation of image objects In Detabase supports FLOAT representation of image objects In Use DICOM Study UID to match new images with existing Patient And May result in repea	e not accesible in some applications ited patient records
ATL_Manager 🗧 4 🕨 👬 Database Administration 🛈 🏛 Database Reports	Aggregate Components 🛛 Create Norm
	Cancel

In the appearing **Database Administration** make sure that the **Import** database is selected. If it is not selected, activate the **Components Administration** tab, switch the database to **Import**, and the select the **Selected for:/replication/..** tab.

Then select the subjects to move to the **Study2** database, and activate **Set as "Selected for Loading"**. This brings all related images to the **Selected for:/replication/**.. tab.

R+B Import Subject Name Subject ID			1							ALC: NO	2003030000		Refresh Querv
Subjects (9) 🐨			1							* (* ja	Search All	× Reset Query	a remean unery
Subject (0) 🐨													
Subjects [9] 🕤										Bi	rth Diate:		
Subjects [9] 🕤										1.52	an beauty		
											lodified:		
Law Street of Concession, Name												🛄 Image Prøylew (1	selected "Beries")
Subject name		Su	bject ID	Modify date		Sex	Date	of Birth					
~[IMAGE HISTORY]			AGE HISTORY	2019-11-01 14:17:	38.094	1 220	0.00						
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PKIN2		Dyn	n DASB without blood & MRI	2019-11-01 14 173	29.98	M							
PKIN3			n. FDG scan with whole bloo-		29.263	м							
PKIN4			n H20 brein scan. Baseline	2019-11-01 14-17:	28.685								
PFUS4			and SPM Contrasts for 3 So										
PFUS3		Dyn	n FDG for Motion Correction	2019-11-01 14:17:	23.609	M							
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PKIN1	2005.03.01	13:02:26	CPFPX Bolus	A1 > Dynamic PET Orig C			81	1	1	83	100		
PKIN1	2006.03.01	13:02:28	CPFPX Bolus	Vt_ma1 > Dynamic PET_		4. 2019-11-01 14 PT	81	1	1	83	100		
PKIN1	2006.03.01	13.02.26	CPFPX Bolus	Dynamic PET Orig Crop		4. 2019-11-01 14. PT	1	1	2754	83	105		
PKIN1	2006.03.01	13:02:26	CPFPX Bolus	Vt perpend > Dynamic P.		4. 2019-11-01 14. PT	81	1	1	83	105		
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PKIN1	2006.03.01	13:02:26	CPFPX Bolus	A1 > Dynamic PET Orig C			81	1	1	83		Cray	
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PKIN2	2006.03.21	15:15:09	DASB SERT	NR Anatomy		4. 2019-11-01 14:. MR	124	1	1	137			
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PKIN4	2006.03.15	10.38.10	H2O perfusion reserve	H20 Baseline	2019-11-01 1	4. 2019-11-01 14 PT	32	18	1	60		Slice @ Frame	CAIL
			r			8					к		
GIOG Repar						Remove all Remove					4 11	₩ <u>C</u> h	eck DB integrity

In order to remove the data after being copied switch **Replicate to** to **Move to**.

Subject Name	Study date	Time	Study description	Series
PKIN1	2006.03.01	13:02:26	CPFPX Bolus	Dynamic
PKIN1	2006.03.01	13:05:20	CPFPX Bolus	MR Anat
PKIN1	2006.03.01	13:02:26	CPFPX Bolus	A1 > Dyr
PKIN1	2006.03.01	13:02:26	CPEPX Bolus	Vt_ma11
PKIN1	2006.03.01	13 🗆 🎯 🕸	Copy to empty databa	ase (Whole)
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PKIN1	2006.03.01	13	Replicate to	
PKIN2	2006.03.21	15 🗆 😂 🕏	😂 Edit and Copy to	
PKIN2	2006.03.21	1 🗆 📾 🕏	Move to	
PKIN3	2006.03.10	1	-	
PKIN4	2006.03.15	10 🗆 😂 🕏	Export DICOM	
		🗆 😂 🌢	🔚 Export anonymized D	NOOI
4		🗆 📴	C-Store	

A dialog window appears for the specification of the target database. Make sure that the right **Move to** database is selected, and then migrate the data with the **Move data** button.

🕰 Datal	base [Import] Move					×
Move	ata Study2	▼	4		127.0.0.1 (Transaction Server)	
Delete empty moved Patients Deleck if data files are successfully moved Derwrite existing series						
Move data					Cancel	

Replicating Data in the Viewing Tool

Data replication can also be done directly in the viewing tool PVIEW. The only requirements are that the user has access rights to both databases and that he is allowed to delete in the **Import** database.

1. On the **DB Load** page select the **Import** database

- 2. Select the subject(s) to move to the **Study1** database.
- 3. Activate Set as "Selected for Loading" to prepare the images for replication.
- 4. Activate the **Replicate** button.
- 5. In the appearing **Database Replication** window select the target database **Replicate to Study1** and **Start Replication**. The replication is confirmed.
- 6. To clean up remove the data from the **Import** database by the **Delete subject(s)** button.

	VOIs Co	mpare Fusion							-		-		-
Import								1	 Is 	earch All	SQ	× Reset Query 🗢 Retresh Query	9 6
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Subject ID *										Modif	le dr		-
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bjects (4) 👻												Image Preview (selected "Series")	
Subject name		SubjectID		Modify date		Sex	Date of Br	th:					10
J81		Multimodality		2019-11-01 14:17:21 40		M							
US2		Cardiac PET		2019-11-01 14:17:22:33		М	1937.06.24	1					
US3 US4			Motion Correction	2019-11-01 14 17:23:60		M							F
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5 Licenses Control

The license usage is available for inspection on the **Users Configuration** window, on the **On start** tab:

T PMOD Configuration and User Settings		×
🔅 USERS 👫 DICOM	DATABASE 🛛 @ FTP Nodes 🚺 On Start 🛛 🗝 ATL	
	Change License Server Get License Server Statistic	cs
	Redirect the Console information output to file: [~Pmod/system/logs/	/pmsys.log]
	Communication with www.pmod.com (software update check, online do	numentation)
	Look & Feel: Cross Platform 🗢 🍕 🕨	
4 🕨 🛈 🔣 ?	Qk	Cancel

The activation of the **GET License Server Statistics** opens a dialog window similar to the one shown below:

Confirmat	ion		×				
	Do you want to clean up selected licenses?						
	Number of free licenses: 1						
	LIST O	F USED LICENSES:					
6	No. IP Last use						
?	1 10.106.0.119 Fri Nov 01 14:31:19 CET 2019						
	2	10.106.0.132	Fri Nov 01 14:32:12 CET 2019				
		/					
	✓ Yes X No						

This dialog window allows disconnecting one or all of the clients currently connected. To do so, in the **LIST OF USED LICENSES**, select the entrie(s) based on the **IP** information and activate the **Yes** button. The selected clients are disconnected from the license server. A confirmation window will display a successful operation.

Note: The client is only removed from license pool, not killed instantly. So it can reconnect to license server in few minutes if there are still spare licenses.

6 Appendix

Transaction Servers

	Audit Trail Log & License Server	Import Database	Study Database 1	Study Database 2
DB Name				
Port				
IP Address				
Encryption				
Users (d = delete)				

DICOM Server

Definition	Value
Application Entity Title	
Port	
IP Address	
Encryption	
User on USERS tab *)	
Import Database	

*) a user is required to define the saving behavior of the DICOM server.

7 PMOD Copyright Notice

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