PMOD Installation on Windows Systems

Windows Installation

The installation for all types of PMOD systems starts with the software extraction from the installation DVD. No other installation is required for PMOD network clients. For PMOD standalone systems and PMOD license server systems, the USB protection key drivers must then be installed and the dedicated license file copied to the *system/lcs* folder.

Note that the USB key driver installation requires administrator privileges.

Installation Overview

PMOD supports two licensing schemes: stand-alone and network licenses.

Licensing, Stand-alone License

The PMOD software stand-alone licensing mechanism consists of two components:

1)   a **USB protection key** (WIBU-Box/RU, WIBU-SYSTEMS AG, *http://www.wibu.com*), and

2)   a license file **pstarter.lcs** (in sub-directory *system/lcs* of the PMOD installation).

During PMOD startup the license information encoded in the USB key is read and compared to that in the license file. Only if the two informations match, startup proceeds. Next is a check whether the PMOD version purchased allows running the currently installed version. If all checks are successful, the PMOD ToolBox appears showing the purchased modules, and processing can start. Note that the USB key must remain connected while running PMOD.

Licensing, Network License

The PMOD network licensing scheme consists of a PMOD license server which manages a pool of purchased licenses, and an arbitrary number of PMOD clients which can check out unused licenses from the server. As soon as the PMOD program on a client is closed, the license is returned to the managed server pool. If the PMOD client crashes for some reason, the license is re-collected to the pool after about 15 minutes. On the other hand, if the license server is stopped, the clients show a warning message to the user and allow to continue work for a few minutes. Then, the clients will be stopped, unless the server has been started again.

On the license server PMOD is installed in the same way as for a stand-alone license with the USB key, but the license file turns it into a license server.

On the clients PMOD is also installed in the standard way, *except* that

▶ installation of the drivers for the USB protection key is not required;

▶ no license file is required.

Note the following:

▶ The license server PMOD installation is only intended for server purposes and not for data processing.

▶ The license server must be running and the USB key must be connected at all times.

▶ The license server and the clients must run the same PMOD version.

▶ It is not required that the license server and the clients have the same operating system.

Java Runtime Environment (JRE)

The entire PMOD software has been programmed in Java and therefore requires an appropriate Java Runtime Environment (JRE) to be executed. During PMOD installation, an appropriately configured JRE is extracted into the *java* sub-directory of the PMOD installation. This dedicated JRE will then be used for running PMOD. By this controlled

environment, PMOD will remain unaffected from changes due to automatic upgrade procedures.
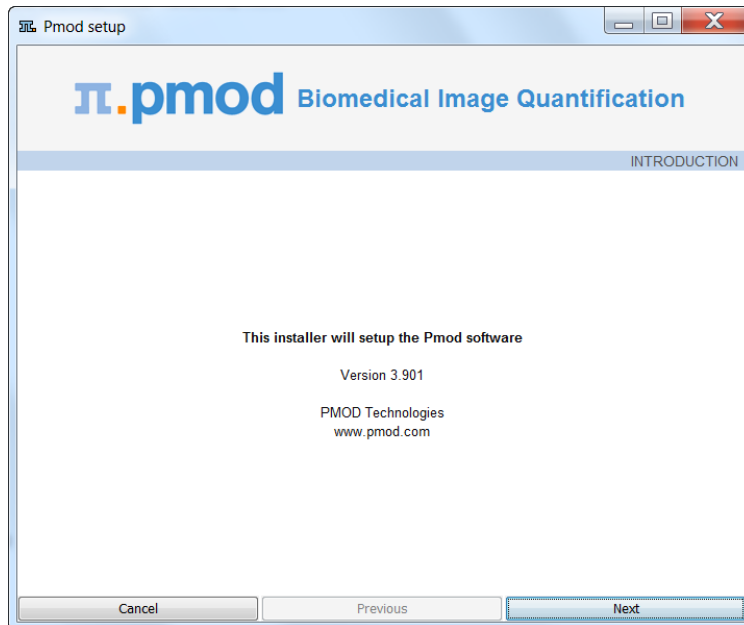
Installation Steps

The installation of the PMOD software consists of the following steps which should be performed in the proposed sequence. They are explained in detail in the following installation sections.

1) Extraction of the PMOD program files, the JRE, and optionally the example data to the *Pmod3.9* directory in a user-defined directory.
   This installation step is required for: **Stand-alone Installation, License Server, Network Clients.**

2) Installation of the USB protection key drivers for reading the information from the WIBU-Box/RU plugged into the USB port. *Please do not connect the PMOD USB protection key before this installation has been completed.*
   This installation step is required for: **Stand-alone Installation, License Server.**

3) Installation of the PMOD license file *pstarter.lcs*. The license file can be downloaded from the **Support** area of the PMOD *website http://www.pmod.com* after the personalized login (please refer to the delivery note of your PMOD package for login information).
   This installation step is required for: **Stand-alone Installation**, **License Server**.

PMOD Software Extraction

The following software extraction procedure must be performed for standalone PMOD installations, for PMOD servers, and also for all PMOD network clients.

Please begin by inserting the PMOD installation DVD. Then start the installer by starting the **RunSetup.bat** in the *Setup/Windows* directory on the DVD by double-clicking. The following installation screen appears

Please use **Next** to proceed and accept the license agreement in the appearing dialog window. After activating **Next** the window for configuring the installation appears.
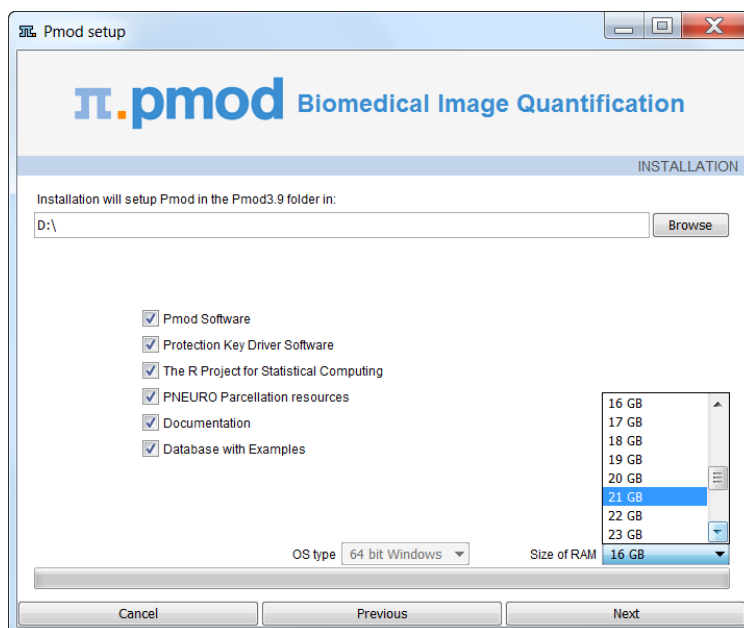
Please perform the following configurations:

Installation Path

Use the **Browse** button to select the parent directory for the installation. There, the installer will create a new directory **Pmod3.9** for the program files and the data. Please make sure that 3.7GB of free space is available for the full package, and 3.4GB without PNEURO.

Packages

It is highly recommended to install the four packages, the **Pmod Software**, the **Protection Key Driver Software**, the **Documentation**, and the **Database with Examples**. The **Database with Examples** requires about 970MB and will show up as database called **Pmod**. This database will allow getting acquainted with the programs because it contains examples for the different types of data analysis. Note, however, that it is recommended establishing an new database externally to PMOD for productive data processing. The **PNEURO Parcellation resources**, should only be enabled, if the PNEURO tool has been licensed, as the required space is 350MB.

## Properties of Operating System and RAM

The operating system of your target computer needs to be 64-Bit. **Size of RAM** can be set to any size. However, if the specified size exceeds the physical RAM, the system will start swapping after RAM space is exhausted and will become very slow. Therefore it is recommended setting **Size of RAM** < physical RAM.

Installation of the PMOD Environment

The installation is started by the **Install** button. The Pmod3.9 directory is created wherein all PMOD-related files are extracted. At the end of the installation a dialog window is shown. It indicates the command script for starting Pmod3.9. If this is the first PMOD installation, **Close** the window.
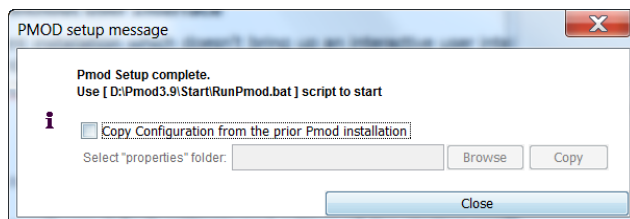
If a prior PMOD version has been used already, it is recommended importing its working environment. To this end, activate **Copy Configuration ...** and select the **properties** folder of your prior PMOD installation with the **Browse** button as illustrated below. Then activate **Copy** to import the setting, and **Close** the window.
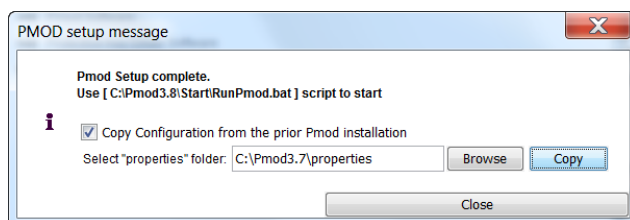
Installation without User Interface

There is a silent installation which doesn't bring up an interactive user interface. It can be started by opening a command window and typing the following commands in. It is assumed that *F* is the mount point of the installation DVD and *D:/tmp* the directory within which PMOD is installed

```
F:
cd pmod
..\java\Windows\jre\bin\java -jar setup.jar -silent D:/tmp
```

The installation will use default settings, and edition of the starting script will be needed to adjust the RAM allocation.

Note: Although no graphical user interface is shown, a graphical subsystem must still be supported as a graphic context is created.

PMOD Stand-alone License Installation

Install USB Key Drivers

All the files required for the driver installation have been extracted during the installation of the PMOD software and stored in the PMOD directory tree. The following two steps must be performed to install the USB protection key hardware drivers.

1) **Driver installation:** The purpose of this step is to install programs for reading the information from the WIBU-Box/RU plugged into the USB port. The driver installer is located in the directory *Pmod3.9/install/hksetup/Windows.*
   Please start the program **WkRuntime.exe** and perform a standard installation procedure.

2) Now the USB key can be connected to any of the free USB ports.

Note: If you experience problems during driver installation, you are recommended to download the most recent drivers for the WIBU-KEY (*WibuKey Runtime https://www.wibu.com/us/downloads-user-software.html*) and try the installation again.

Copy License File

The delivery note that you have received with the PMOD DVD contains account information for logging into the support area of *www.pmod.com (http://www.pmod.com/technologies/support/enter-support.php)*. There you will find a license report, and a button for downloading the license file (pstarter.lcs) for your purchased configuration. Please download pstarter.lcs and copy it to the directory *Pmod3.9/system/lcs.*

If the license file is missing when PMOD is started, the following dialog window is shown.
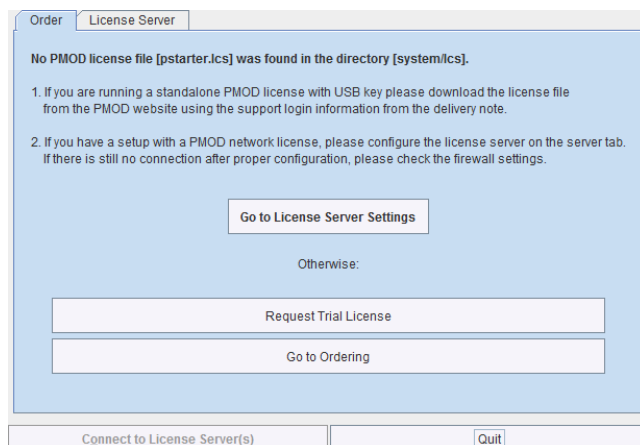
The button **Request Trial License** opens a web browser and points to the location, where the user can fill out a form for requesting a trial license file. The button **Go to ordering** opens a web browser and points to the PMOD ordering form.

The **Go to License Server** panel is only applicable for network licenses. In this case please refer to the next *section* (on page 9).

Important Note: Please do not change pstarter.lcs in any way - a modified license file will not be accepted. Do not open pstarter.lcs in any program, do not rename it, and if you transfer it per FTP, use binary transfer.

Starting PMOD

PMOD can now be started with the command script **RunPmod.bat** in *Pmod3.9/Start.* Example:

```
D:
cd "D:\Pmod3.9"
.\java\jre\bin\java -Xmx16000M -jar pmod.jar
pause
```

Notes:

The starting script has been tailored to the installation directory. Therefore, if the Pmod3.9 directory is moved to a different location, the path needs to be adjusted.

The **-Xmx16000M** option specifies the maximum heap memory (16000 MB) that PMOD can allocate. To process large data sets this number should be increased. Caution: The P3D tool may crash, when the reserved space approaches the physical RAM size.

Create a PMOD Starter Shortcut on your Windows desktop:

1) Start a Windows explorer and drag the file *Pmod3.9/Start/RunPmod.bat* to the Desktop while pressing CTRL+SHIFT simultaneously.

2) Then rename the shortcut to *PMOD*.

3) Change its icon by pressing the right mouse button on the shortcut, select **Properties**, and then in **Change Icon** point to *Pmod3.9/resources/icons/Pmod.ico***.**

PMOD Network License Installation

PMOD License Server Installation

PMOD Software Installation

The computer for the PMOD license server doesn't require a high performance (e.g. 2GB RAM, 20GB free space on HDD, 64-bit OS), but needs to have access to the WIBU key USB dongle and run continually. Therefore, a robust vintage machine is sufficient as a PMOD license server. Preferably, it is dedicated to serving the PMOD license, because the license server is a standard process rather than a Windows service.

When using a Virtual Machine for PMOD license serving, the USB device from the host server needs to be mapped to the selected Virtual Machine. If there are no USB ports in a host server or the mapping is not possible, a Network USB Device Server can be used. USB hubs from Digi Network, *Silex http://www.silexamerica.com/products/connectivity-solutions/device-networking/usb-parallel-connectivity/*, and Belkin have been tested by Wibu-Systems. In such a setup, the WIBU key can be served over the network and mapped to the Virtual Machine. The standard WIBU drivers can be installed and used at the Virtual Machine.

To install the PMOD license server first perform the steps described in the Stand-alone PMOD Installation including copying of the license file and plugging the USB key in.

Starting the License Server

The PMOD license server can then be started by executing the *Pmod3.9/Start/RunLcsSvr.bat* script containing the following lines

```
C:
cd "C:\Pmod3.9"
.\java\jre\bin\java -Xmx2G -jar pmtsvr.jar 5000 -ls
pause
```

The meaning of the command arguments is:
`-Xmx2G`: Size allocated to the license server
`5000`:   IP port over which the license server communicates
`-ls`:   license server only, no data sharing
`-d`:   This option can be added for more verbose output

Note: The script has been tailored to the installation directory. Therefore, if the Pmod3.9 directory is moved to a different location, the path needs to be adjusted. The USB key needs to remain connected at all times during license server operation.

Log Output

The command window will show startup information and log the checking out/in events as illustrated below.

```
C:\Pmod3.9\Start>C:
C:\Pmod3.9\Start>cd "C:\Pmod3.9"
```

```
C:\Pmod3.9>.\java\jre\bin\java -Xmx2G -jar pmtsvr.jar 5000 -ls
Java version: 1.8.0_25
***
 Started on license [9]
***
 License Server [Version 3.901 A  (c) 1996 - 2014 by PMOD
Technologies]
 Verbose: false, Secure: false, Compressed: false
***
 Port: 5000
 Started on: PMOD-CB2/192.168.55.103
 License Server: [ ON ] STANDALONE (Use <Ctrl+C> to stop), Number of
Server Licenses: 3
 Memory Assigned: 1820 MB
--> License Server started [Fri Jul 25 16:43:40 CEST 2014] : on port
5000
 1) 127.0.0.1-192.168.55.103
 Number of free licenses: 2


 1) 127.0.0.1-192.168.55.103
 2) 192.168.55.104-192.168.55.104
 Number of free licenses: 1

===> REMOVE: 192.168.55.104-192.168.55.104, 1406299586017
 1) 127.0.0.1-192.168.55.103
 Number of free licenses: 2

===> REMOVE: 192.168.55.104-192.168.55.104, 1406299586017
 1) 127.0.0.1-192.168.55.103
 2) 192.168.55.104-192.168.55.104
 Number of free licenses: 1


 1) 127.0.0.1-192.168.55.103
 2) 192.168.55.104-192.168.55.104
 3) 127.0.0.1-192.168.55.103
 Number of free licenses: 0
```

At this time clients can't connect any longer, but will see the window illustrated below.
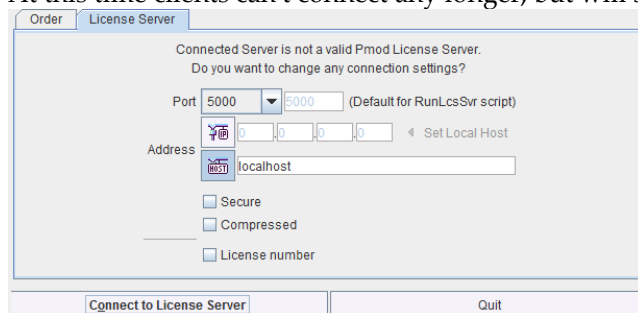
Another client needs to stop
```
===> REMOVE: 192.168.55.104-192.168.55.104, 1406299700154
 1) 127.0.0.1-192.168.55.103
 2) 127.0.0.1-192.168.55.103
 Number of free licenses: 1
```
before connection is possible again and **Connect to License Server** will work.

Multiple Licenses Management

Multiple licenses can be served by a single PMOD installation. In order to use this feature please rename the different license files (*pstarter.lcs*) by appending the license numbers in square brackets (*pstarter[1324].lcs*, *pstarter[427].lcs*, ...) and copy them into the *Pmod3.9/system/lcs* folder. There are two scenarios, a single license server managing multiple licenses simultaneously, or a separate license server for each license.

If the license server script *RunLcsSvr.bat* is started without modification, it will manage all licenses found in the directory. A specific license can then be defined in the *RunPmod.bat* script of the client by the command line option "-lsn[<PORT_NO>.<OPTIONAL_LICENSE_NO>@<IP_ADDRESS>", e.g.:

```
.\java\jre\bin\java -Xmx16G -jar pmod.jar -
lsn[5000.1324@192.168.55.103]
```
- to acquire license 1324
```
.\java\jre\bin\java -Xmx16G -jar pmod.jar -
lsn[5000.427@192.168.55.103]
```
- to acquire license 427

In order to operate a dedicated server for each license please create a separate server script for each license with the "-lic[<pattern>]" option included, e.g.

```
java -Xmx2G -jar pmtsvr.jar 5000 -ls -lic[1324]
java -Xmx2G -jar pmtsvr.jar 5001 -ls -lic[427]
```
A specific license can then be defined in the *RunPmod.bat* script of the client by the command line option "-lsn[<PORT_NO>@<IP_ADDRESS>" e.g.

```
.\java\jre\bin\java -Xmx16G -jar pmod.jar -lsn[5000@192.168.55.103]-
```
to acquire license 1324
```
.\java\jre\bin\java -Xmx16G -jar pmod.jar -lsn[5001@192.168.55.103]-
```
to acquire license 427

The advantage of separate servers is that the processes can be independently started, stopped and monitored.

Emergency Restart

In the case of connection or license management problems the following procedure is recommended for restoring clean license handling:

1) Stop the license server.

2) Delete the contents of the *Pmod3.9/system/lcs/lct/* directory.

3) Start the license server again.

If this procedure is completed within 5 minutes, no shutdown of running PMOD clients is required.

Client Processing on License Server Machine

Although it is not recommended, client processing can be done on the same machine. To do so, a second PMOD installation has to be prepared as follows:

1) Copy Pmod3.9 to Pmod3.9LS. Pmod3.9 will be used for client processing, Pmod3.9LS for license serving.

2) Ensure that the license file (pstarter.lcs) is copied to Pmod3.9LS/system/lcs.

3) Remove the license file from Pmod3.9/system/lcs.

4) Modify Pmod3.9LS/Start/RunLcsSvr.bat to use the new path (Pmod3.9LS). Remove the other .bat files from this Start directory.

5) Remove RunLcsSvr.bat from Pmod3.9/Start.

6) Use Windows Switch User to login as different user (dedicated to run the License Server) e.g.: admin.pmod.

7) Start Pmod3.9LS/Start/RunLcsSvr.bat as admin.pmod user.

8) Switch back to the standard user and run Pmod3.9/Start/RunPmod.bat. Provide the computer name or the local IP to access the license server.

Please note that you need to provide proper read/write privileges:

▸ admin.pmod - RW access to Pmod3.9LS

▸ other Pmod users - RW access to Pmod3.9

▸ all other non-Pmod users - no access to Pmod3.9 nor Pmod3.9LS

In this way the License Server will be running for all users, as long as the computer is not shut down.

PMOD Network Clients Installation and Configuration

PMOD Software Installation

For a PMOD client only the software extraction of the *Stand-Alone PMOD installation* (on page 7) is required. *The license file should not be copied.*

Configuration of the License Server

The PMOD client can then be started by the command script **RunPmod.bat** in the *Pmod3.9/Start* directory. Because no license file is found, the following dialog window is shown.
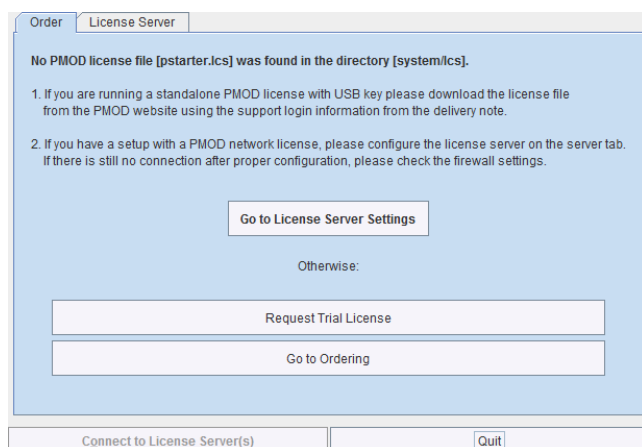
Please select **Go to License Server Settings** to open the **License server** panel illustrated below.
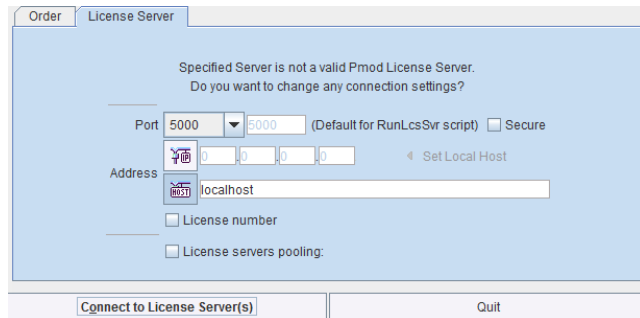
There configure the same **Port** that was configured for the license server (or transaction server), and specify the server **Address** either by entering its IP address, or by entering its host name. If the process employed for license serving uses encryption, please check the appropriate box. If the license server manages several licenses at the same time, enable the **License number** box and enter the number of the license to which you want to connect.

Then activate **Connect to License Server(s)**. If the connection succeeds, the dialog window disappears and PMOD starts up. Otherwise the dialog window
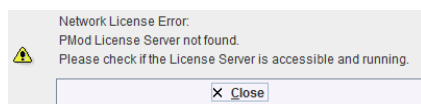
is shown. In this case, please check the configuration of the license server and try again.

Note: The definition is saved in a file `system/lcs/lcserver.ini`. To provoke display of the License Server dialog window, this file may be deleted.

Multiple License Servers

If a customer has multiple license servers, the proper license server can also directly be specified in **RunPmod.bat** as a client command line option "-lsn[<PORT_NO>.<OPTIONAL_LICENSE_NO>@<IP_ADDRESS>", e.g.

```
.\java\jre\bin\java -Xmx16G -jar pmod.jar -
lsn[5000.1324@192.168.55.103]
```

Alternatively muliple license servers can be added in the **License servers pooling** configuration by entering their definition in the upper area and then using the **+** button. Each time the client is started it will connect to the first license server in the list which responds.
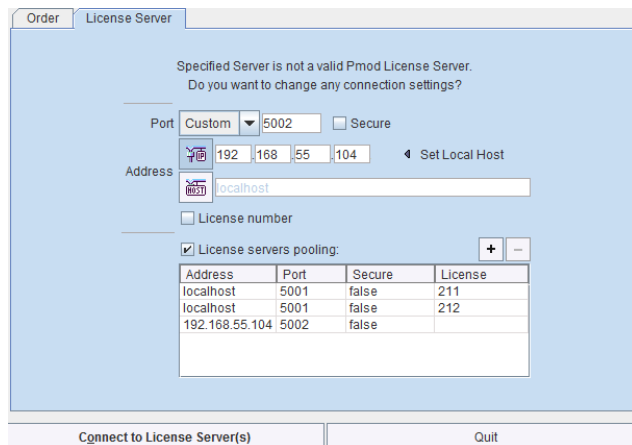
License Server Change and Statistics

The license server setting is available on the **On Start** panel of the Config tool. The **Change License Server** button opens a dialog window for changing the license server address. If a license server handles multiple network licenses, the **License number** field can be used to address a specific license.
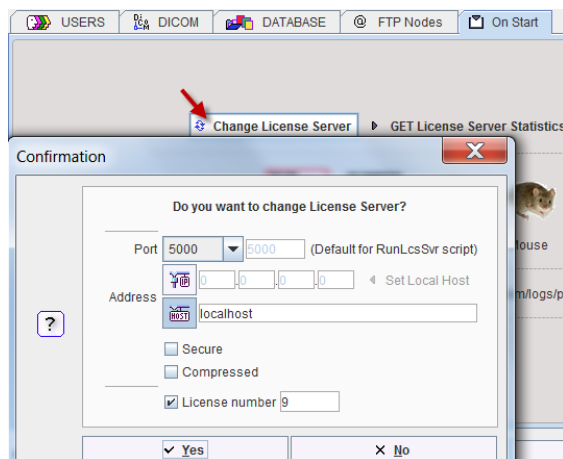
The **GET License Server Statistics** button allows finding out whether there are free licenses left.


Starting and Stopping a PMOD Client

After the license server has been properly configured, PMOD can be started in exactly the same way as with a stand-alone installation. However, for stopping PMOD the main **Quit** button of the ToolBox should always be used. This will initiate a proper shutdown procedure which returns the license to the license server. Otherwise, when simply killing the

client, it will take about 15 minutes until the license server diagnoses loss of connection and reclaims the lost license.

Connection Problems

If at client startup no more licenses are available from the license server because all are in use, the **License Server** connection dialog window is shown again to give the user a chance for connecting to a different license server. In case the connection is repeated with the same server following message is shown.
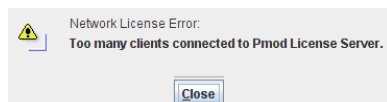
If a connection problem with the license server occurs while working, the **License Server** connection dialog window is shown. If it is not possible to re-establish the connection (for instance by restarting the license server) the following warning is displayed
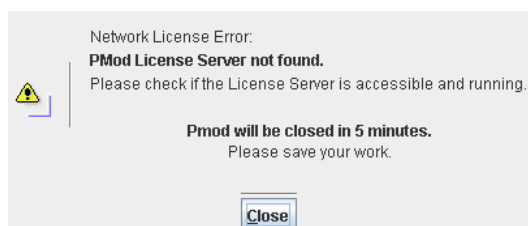
and after five more minutes the PMOD client is finally stopped.

Combination of License and Database Server

Please note that the license server process is based on the transaction server mechanism used for publishing a database. Therefore, if the user is already running a transaction server process on the server system (RunDbSvr.bat, see *Setting up a Transaction Server*), it is *not* necessary to start a dedicated process (RunLcsSvr.bat) just for the license management. The clients can use the same port for requesting a license as for requesting data from the transaction server.

In this context the transaction server option
-noLS: database server only
is relevant. This option should be used when running multiple transaction servers. In this case, only one of the transaction servers should started without -noLS, namely the one used for license serving.

Version Upgrade in a Complex PMOD Environment

Upgrading a standalone installation of PMOD is straightforward. When using absolute paths for the databases the new PMOD version should be immediately functional after copying the properties folder as the last installation step.

In a more complex environment with clients and servers the following rules should be observed:

1) Absolute paths outside the PMOD installation directory should be used for the databases. If this is not the case they should be moved and the paths adjusted in the configuration.

2) The databases should be backed up before the migration.

3) Server and clients should preferably run the same PMOD version. (To some extent, newer server versions can support older client versions, but not reverse.)

4) The PMOD version on the server should be updated first, followed by the clients.

Server Update

Please perform the following tasks sequentially:

1) Stop all PMOD servers in the order DICOM servers (DS), transaction servers (TS), license servers (LS).

2) Install the new PMOD version and import the properties from the old installation.

3) In **Config/DATABASE** switch each database to **Use Direct Connection**, verify it with **Echo DB**, and run **Update & Optimize**. Then switch back to **Use Transaction Server** and generate new starting scripts for the transaction and license servers.

4) In **Config/DICOM/DICOM SERVER** generate new scripts for the DICOM Servers.

5) Save the configuration and exit PMOD.

6) Start the DICOM, transaction and license servers using the new scripts.

7) Start PMOD and verify with the **Config** utility, that the TS and DS are working properly. To this end use **Echo TS** and **C-Echo**.

8) In case of a network license: Exit PMOD and restart the license server (otherwise a license is blocked).

Client Update

1) Install the new PMOD version and import the properties from the old installation. For ATL installations the old properties are not required, as the configuration is centrally stored.

2) Start PMOD, provide the license server details when using a network license, and verify the connections with the transaction and DICOM servers.

Troubleshooting

Error reporting

Internal errors typically leave messages of the form
```
java.lang.NullPointerException
at
pmclass.applications.pmgateway.PMgatewayDefaults.getConvertionSettin
gs(PMgatewayDefaults.java:143)
at
pmclass.applications.pmgateway.PMgatewayFrame.convert(PMgatewayFrame
.java:854)
at
pmclass.applications.pmgateway.PMgatewayFrame.run(PMgatewayFrame.jav
a:911)
at java.lang.Thread.run(Thread.java:484)
```
in the command window or the log file.

To allow PMOD Technologies tracking the problem please report the error using the in-built reporting mechanism as described in the problem reporting section. If this is not possible due to a firewall problem please open the *Support Request https://www.pmod.com/web/?page_id=546* section on the www.pmod.com website and fill the error message together with a description into the problem report form.
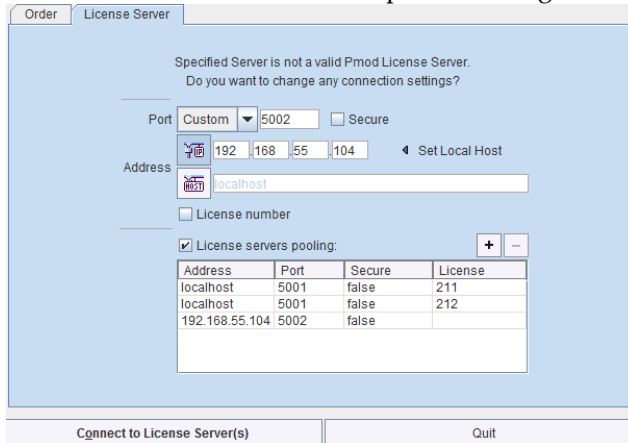
License Errors

Some of the most likely license errors are:

➤ The following error message might appear when restarting PMOD after a crash or after killing the program rather than quitting regularly
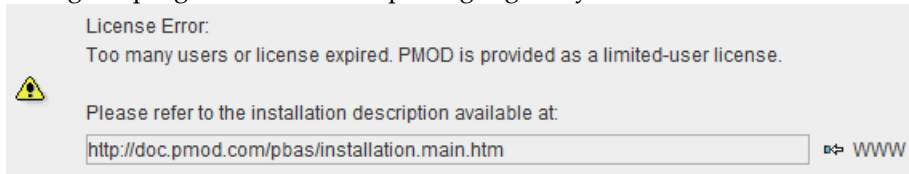
In order to be able to restart without waiting time please remove the folder *Pmod3.9/system/lcs/lct* which contains outdated information.

➤ If the license file has not been copied to the right directory, you will see a message dialog

Please make sure you copy *pstarter.lcs* to *Pmod3.9/system/lcs*.

➤ If the license file has been modified somehow, you will see a message
License Error. Invalid license file (2)
Please try extracting *pstarter.lcs* again from your e-mail without any modifications.

➤ If the USB key cannot be interrogated, because it is not connected or because the driver installation is not up to date, you will see an error message *Hardware license key not accessible*, with additional details. Please make sure that the USB key is connected and the installation was done as described. The driver installation may have to be repeated

Problem Reporting

after an operating system upgrade.

PMOD includes a functionality to directly send a problem report to the support staff of PMOD Technologies. This report can include the log output, screen captures and a problem description entered by the user.

Every PMOD tool contains in the lower left bottom line the functions for creating the report.

The capture button (`Ctrl+Shift+P`) creates a capture of the entire screen (not only the PMOD window) and adds it to a buffer of up to 20 captures. The console button opens the **Console** dialog window illustrated below.
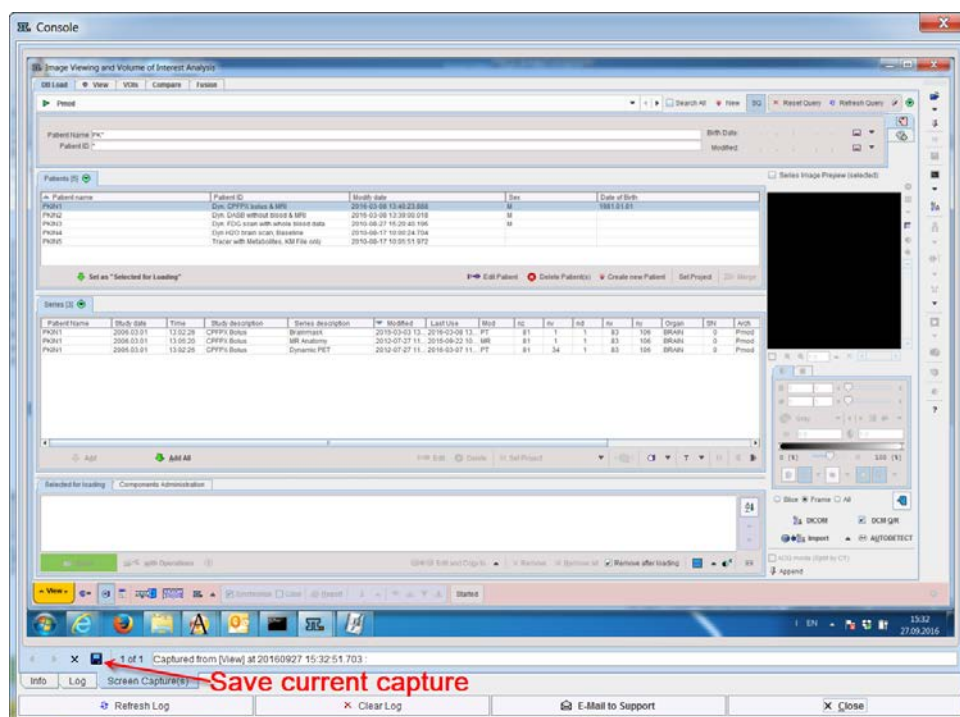
The captures can be inspected on the **Screen Capture(s)** pane with the left/right arrow buttons, and the current one saved in JPEG. The **Log** pane contains the log messages, if the terminal output has been configured to be saved in a file on the **On Start** tab of the **Users Configuration**. Its contents can be updated by the **Refresh Log** button. Once in a while it is recommended to use **Clear Log**, to avoid excessive length of the log file. The **Info** contains some more general information.

To submit a problem description please activate the **E-mail to Support** button. It opens a dialog window,

wherein the user can select the affected **Module**, and confirm whether the **Log Output** and the **Screen Capture(s)** should be included. The problem description should be typed into the text field, and the user's email address into the **Your email** field. Note that multiple addresses can be specified, separated by the colon character (;). use the **Yes** button to submit the report, or **No** to cancel.

Note: Although the standard mailing port is used, corporate firewalls may prevent PMOD from submitting the e-mail. In this case a notification will be shown, and the user needs to

PMOD Server Processes as Windows Services

report the problem either through his support login, or by standard e-mail.

The PMOD software offers various server processes such as

 ‣ DICOM servers for receiving image data over the network;
 ‣ transaction servers for organizing the access to central databases;
 ‣ license servers for managing the processing clients for a network license.

These processes should be running reliably and at all times. The following sections describe, how they can be implemented as Windows Services, improving their manageability and minimizing the administrative overhead. The advantages of such a setup include:

 ‣ no need for open console or terminal sessions;
 ‣ automatic process restart after system restart or a process termination;
 ‣ service events are stored to the Windows log;
 ‣ information about service starting/rebooting can be mailed to the administrator;
 ‣ PMOD Server output can be redirected to a file;
 ‣ user friendly management tool for checking the server state;
 ‣ remote administration via web browser.

Two solutions are described. One is based on the affordable 3rd party software AlwaysUp from Core Technologies Consulting, LLC. Alternatively, there is a free service manager software available at *https://nssm.cc/ https://nssm.cc/* which also works.

This services documentation uses PMOD version 3.6, but everything is similar for other versions.

Environment and Prerequisites

The environment includes following components:

1) *PMOD software http://www.pmod.com* version 3.6

2) *AlwaysUp http://www.coretechnologies.com/products/AlwaysUp/* version 8.8
   price: 49,99 USD, free 30-days test period.

3) *AlwaysUp Web Service*
   http://www.coretechnologies.com/products/AlwaysUp/AlwaysUpWebService/ 8.8
   price: free

4) Microsoft Windows Server 2008 R

Installation using AlwaysUp

Please perform the installations and configurations in the following order:

1) **Windows Server**

2) **PMOD**. All PMOD Servers should be started and tested from the scripts to ensure their proper work. Verification and changes when using **AlwaysUp** is much more complicated.

3) **AlwaysUp**

4) **AlwaysUp Web Service** (optional).

Windows Server Configuration

The **Windows Server** can be set up according to the company policy.

Create a dedicated Windows account (name: **pmod.services**, type: **Local Administrator**) for setting the PMOD services up. As a consequence, the installation and the generated data will only be directly accessible with administrator privileges.

Configure the **Windows firewall** to allow the PMOD Servers (both java.exe and javaw.exe):
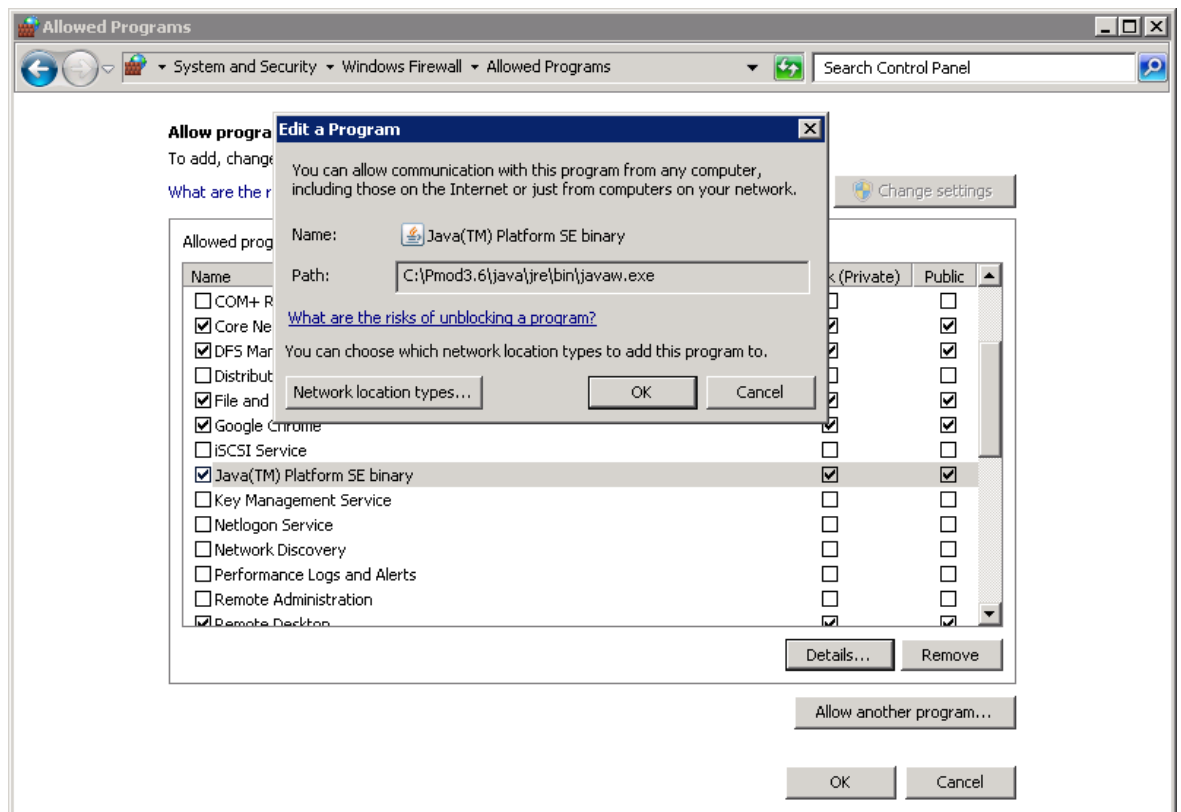
PMOD configuration

As user **pmod.services** perform a PMOD installation. Then configure the environment and the servers:

    ▸ create all required Databases, and generate starting scripts for their Transaction Servers;

    ▸ configure the DICOM Server, and generate a starting script;

    ▸ create the *License Server* (on page 9) starting script;

    ▸ start all servers using these scripts;

    ▸ configure the PMOD users (for ATL installations);

    ▸ perform the PMOD installation on the client machines;

    ▸ test that PMOD clients can communicate with the PMOD Servers.

AlwaysUp Configuration

Install **AlwaysUp**, then perform the configuration described below for each server script. Eventually, the scripts will not be used any more. All processes will be run via **AlwaysUp**.

PMOD Server Script

As an example, the following PMOD ATL Audit Log & License Server script is considered.

```
cd C:\Pmod3.9\
.\java\jre\bin\java -version
.\java\jre\bin\java –Xmx5G -jar pmtsvr.jar 5201 JAVA_DB
org.apache.derby.jdbc.EmbeddedDriver
jdbc:derby:C:/Pmod3.9/data/DATABASES/Audit
C:/Pmod3.9/data/DATABASES/Audit/data/
```
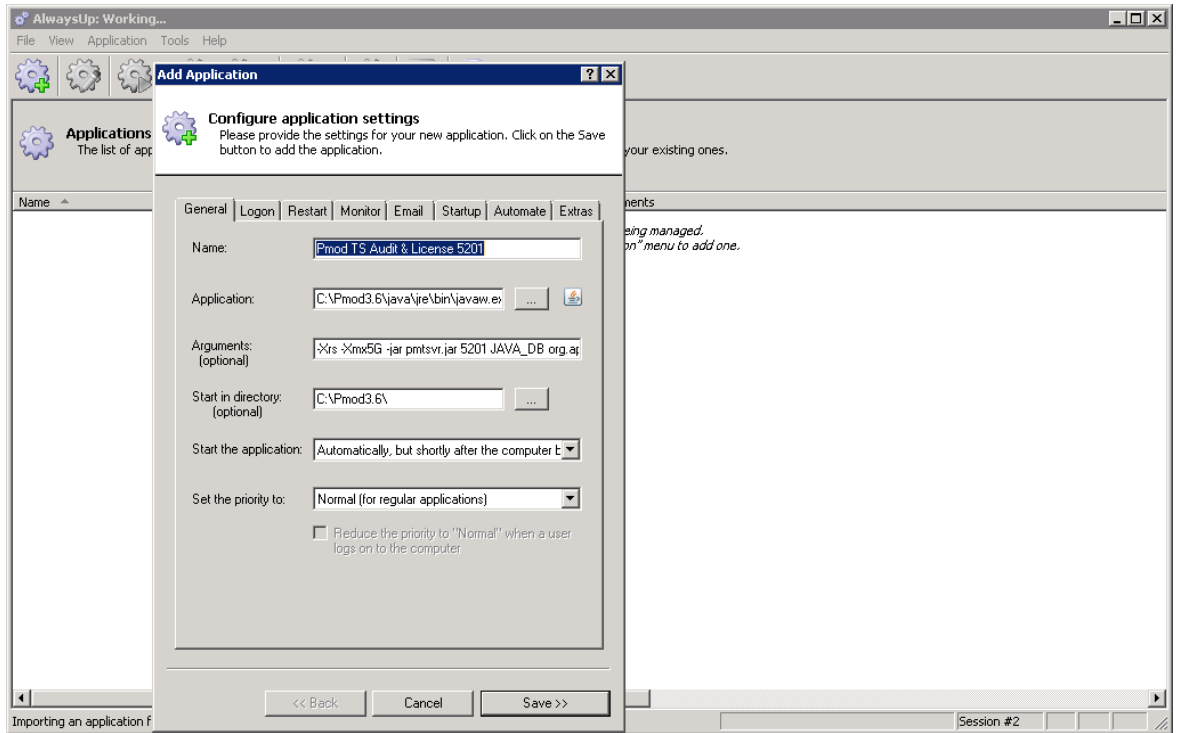
Service Configuration in AlwaysUp

The **AlwaysUp** configuration corresponding to the script above is illustrated below by screen captures. The main elements are:
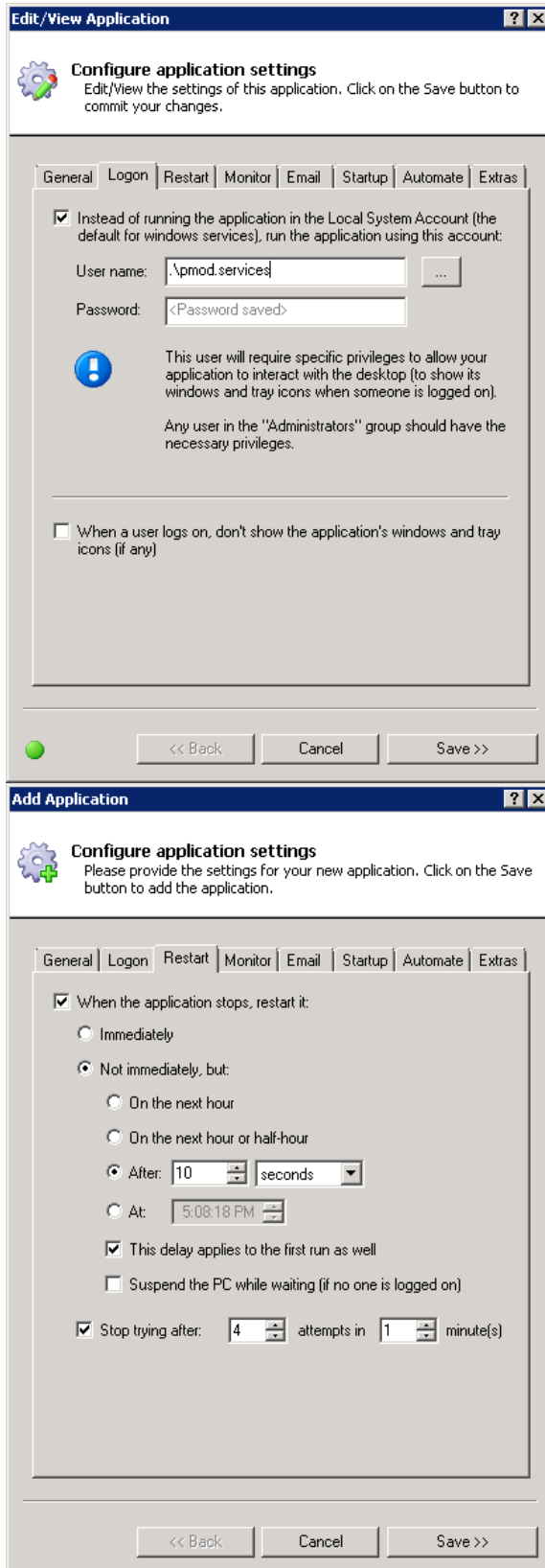
Application: `C:\Pmod3.9\java\jre\bin\javaw.exe`

Arguments: `–Xrs –Xmx5G -jar pmtsvr.jar 5201 JAVA_DB org.apache.derby.jdbc.EmbeddedDriver jdbc:derby:C:/Pmod3.9/data/DATABASES/Audit C:/Pmod3.9/data/DATABASES/Audit/data/`
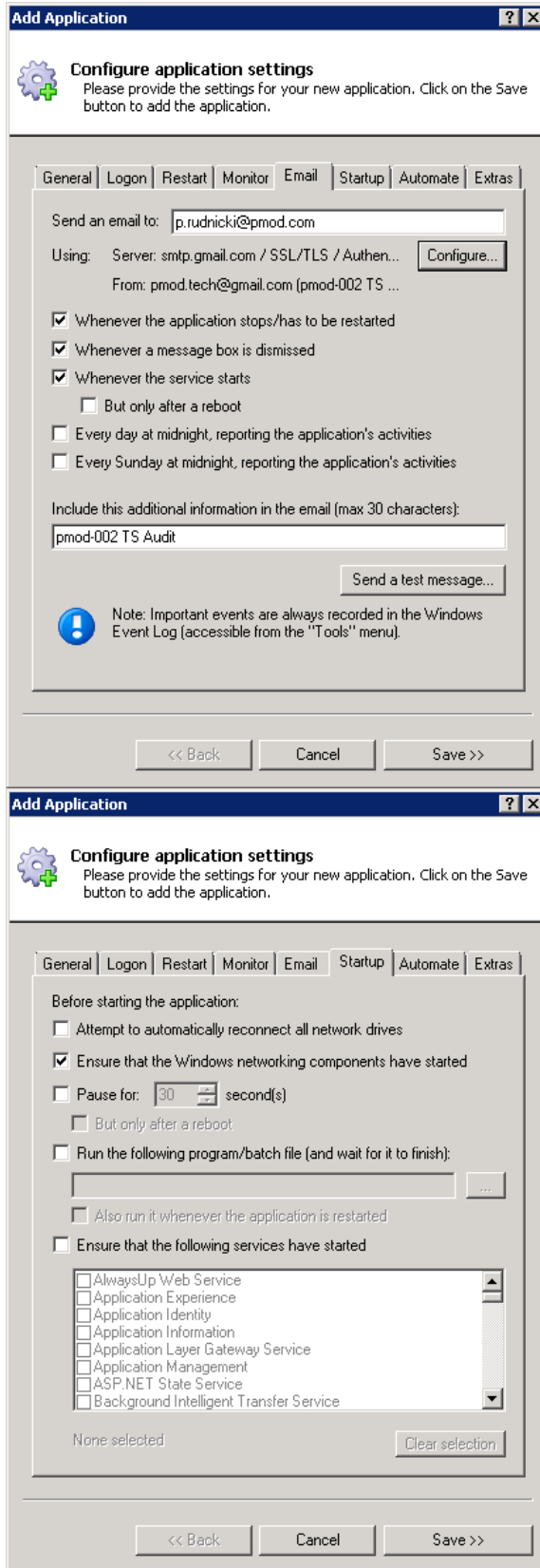
Start in directory: `C:\Pmod3.9\`

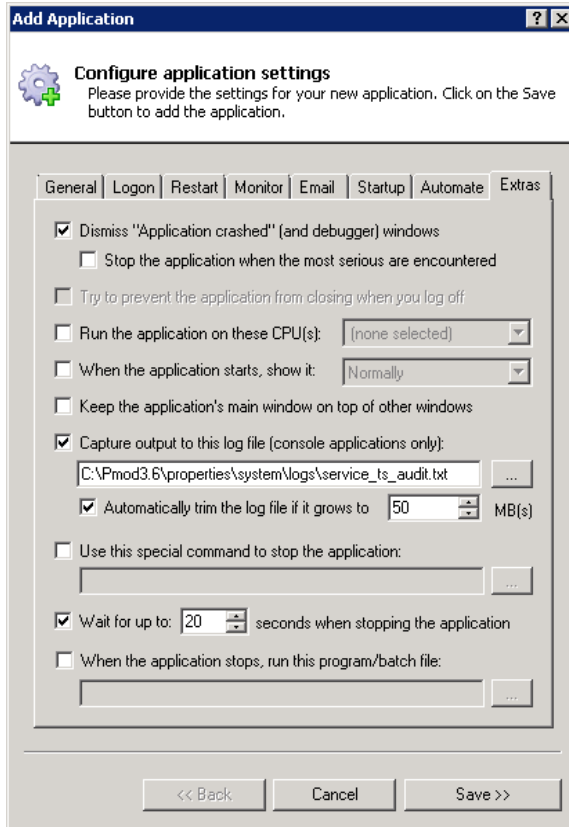Note that `javaw.exe` instead of `java.exe` is used, and the `–Xrs` arguments have to be added.

The other options are documented by the screen captures.

Configuration Screenshots

Edit/View Application

Configure application settings
Edit/View the settings of this application. Click on the Save button to commit your changes.

General | Logon | Restart | Monitor | Email | Startup | Automate | Extras

☑ Instead of running the application in the Local System Account (the default for windows services), run the application using this account:

User name: .\pmod.services

Password: <Password saved>

ⓘ This user will require specific privileges to allow your application to interact with the desktop (to show its windows and tray icons when someone is logged on).

Any user in the "Administrators" group should have the necessary privileges.

☐ When a user logs on, don't show the application's windows and tray icons (if any)

<< Back   Cancel   Save >>

Add Application

Configure application settings
Please provide the settings for your new application. Click on the Save button to add the application.

General | Logon | Restart | Monitor | Email | Startup | Automate | Extras

☑ When the application stops, restart it:

  ○ Immediately

  ⦿ Not immediately, but:

    ○ On the next hour

    ○ On the next hour or half-hour

    ⦿ After: 10   seconds

    ○ At: 5:08:18 PM

    ☑ This delay applies to the first run as well

    ☐ Suspend the PC while waiting (if no one is logged on)

☑ Stop trying after: 4   attempts in   1   minute(s)

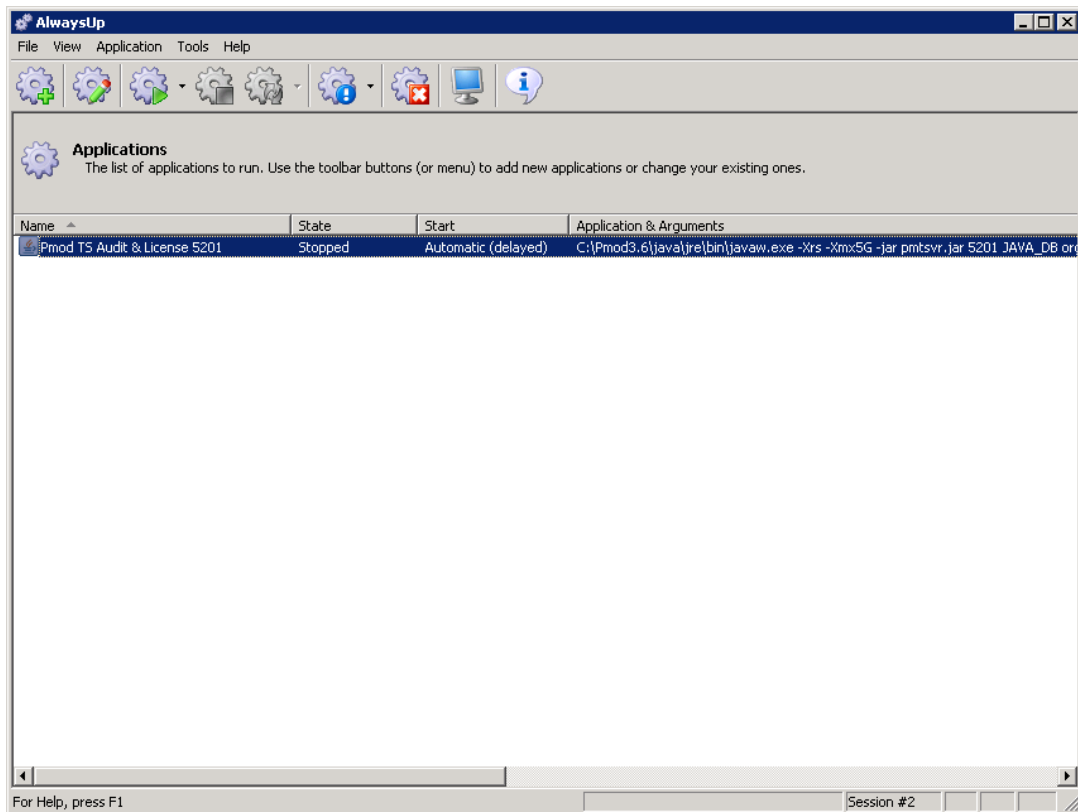<< Back   Cancel   Save >>

After closing, the added service should be available and ready to start.

Automatic emails should be configured only for most important servers (like Audit Log, License Server, main production server) to avoid multiple emails after each **Windows Server** reboot.

AlwaysUp Web Service configuration (optional)

The **AlwaysUp Web Service** allows controlling the services via a web browser. After installation, the following configuration has to be performed:

⯈ **Password** to access the services

⯈ IP **Port** (default is 8585)
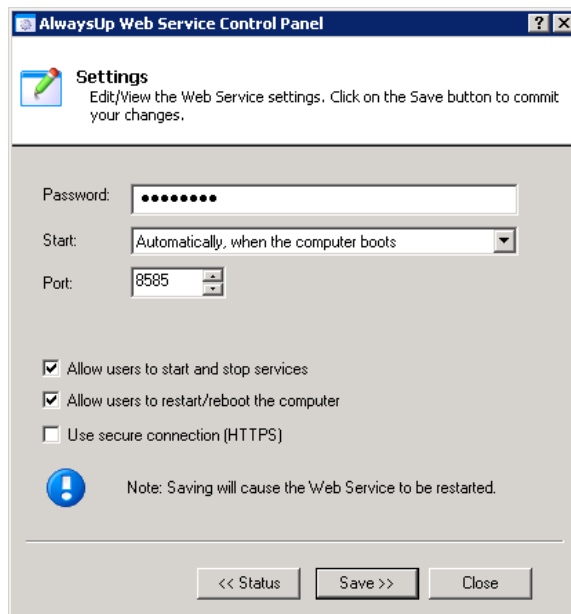
Furthermore, the **Windows Firewall** should be *configured* (on page 22) to allow network traffic to the **AlwaysUp Web Service**.

Services Administration

Configuration Backup/Restore

AlwaysUp supports exporting/importing of the services configuration (without stored passwords). It is highly recommended saving a working configuration as a backup. This can also be useful during reconfiguration or migration to a new server.
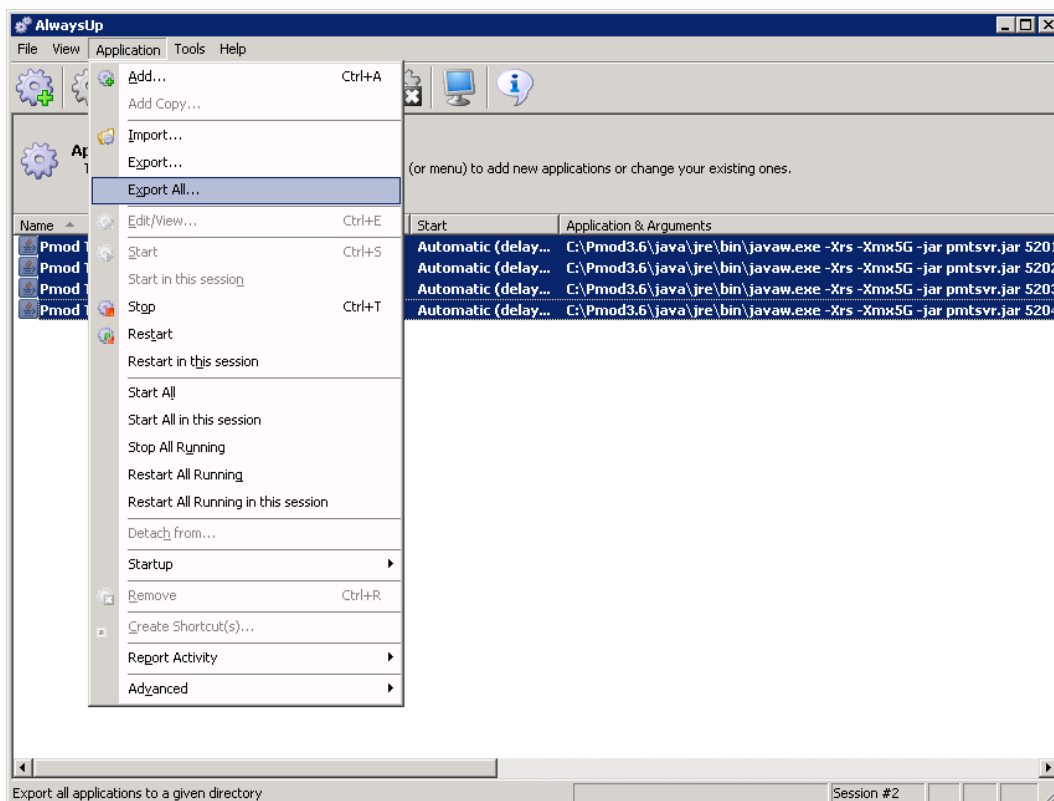
Server Starting/Stopping

In the **AlwaysUp** interface, the servers can be selected and started/stopped/restarted with one mouse click.
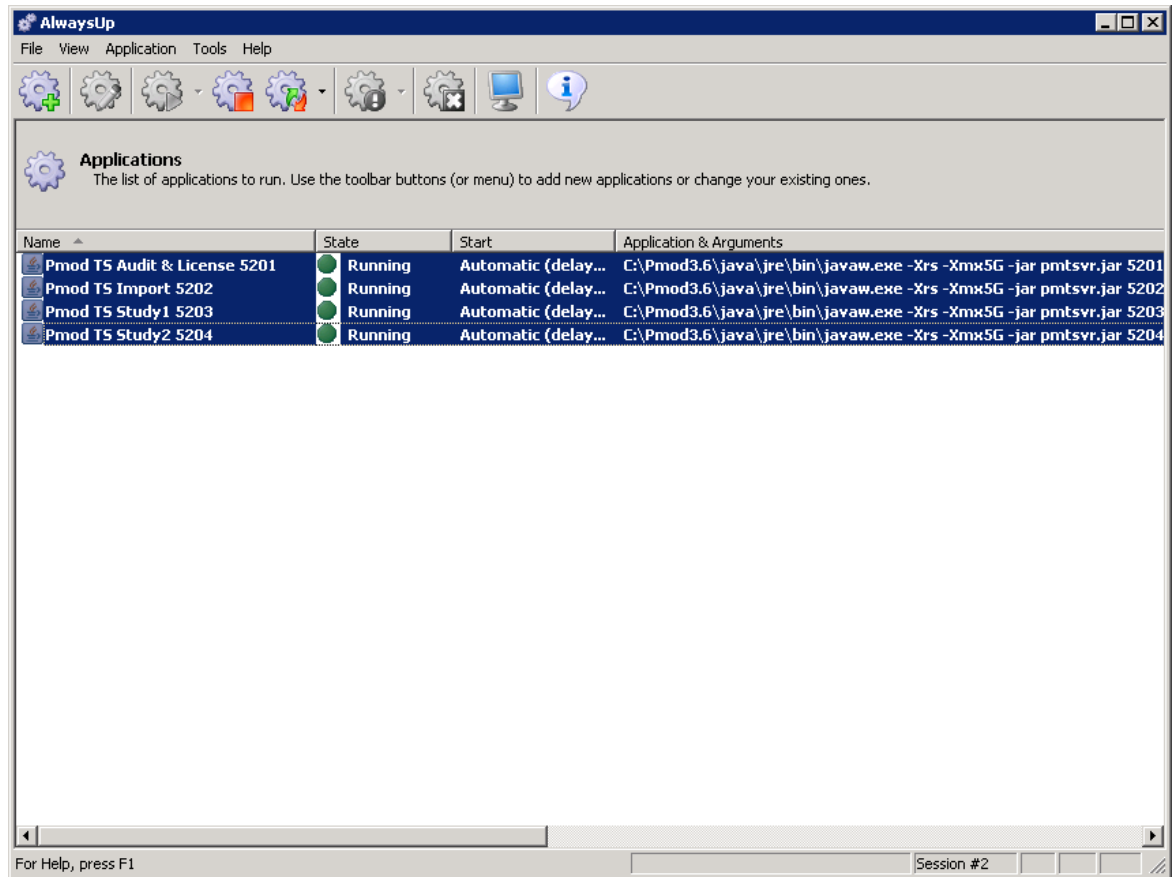
Access to Console Output

If the console output has been redirected to a file, it can easily be inspected using standard text viewers.

Management using AlwaysUp Web Service

Web management is useful for remote administration of the services. It shows the following interface.
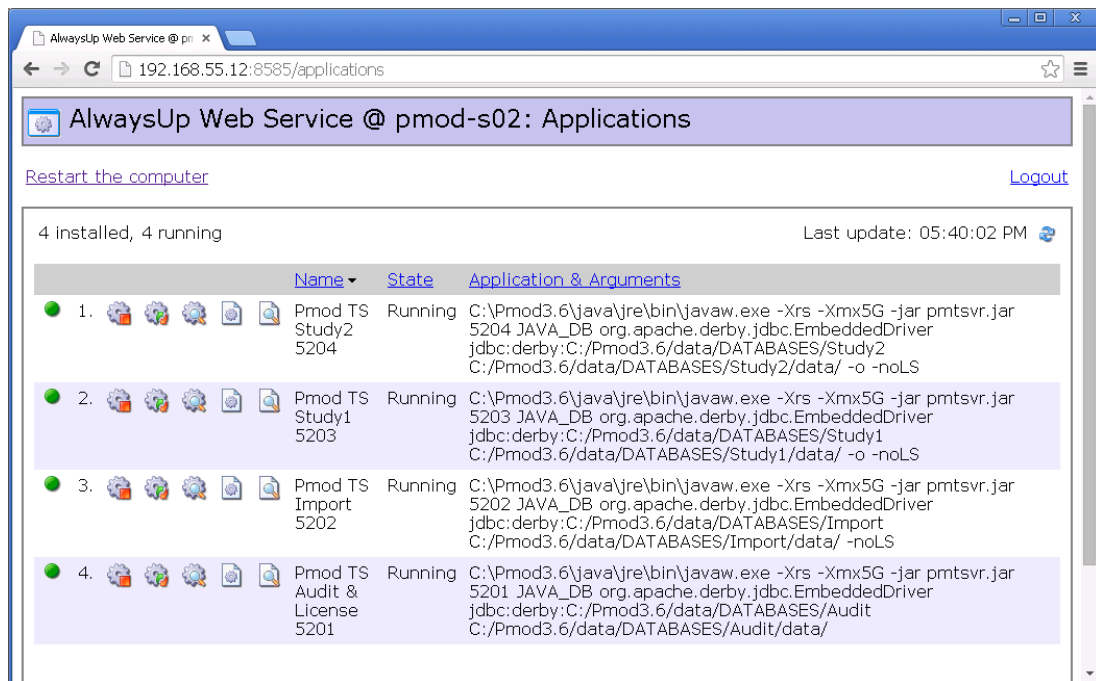
It offers:

❱ service start/stop/restart,

❱ service configuration overview, service report (daily usage, memory usage, events),

Summary

	Tuesday 10/21/14	Monday 10/20/14	Sunday 10/19/14	Saturday 10/18/14	Friday 10/17/14	Thursday 10/16/14	Wednesday 10/15/14
Number of times run	1	0	0	0	1	1	1
Number of restarts	0	0	0	0	0	0	0
Memory: Average / Peak	78.0 / 80.0 MB	78.0 / 80.0 MB	78.0 / 80.0 MB	78.0 / 80.0 MB	77.2 / 80.0 MB	72.8 / 80.0 MB	72.0 / 80.0 MB
CPU: Average / Peak	0 / 1 %	0 / 0 %	0 / 0 %	0 / 1 %	0 / 12 %	0 / 9 %	0 / 10 %
Time running	17.0 hours	24.0 hours	24.0 hours	24.0 hours	23.9 hours	23.8 hours	23.9 hours
Availability	71 %	100 %	100 %	100 %	100 %	99 %	100 %

❱ quick output view,

❱ **Windows Server** restart (this option can be disabled).

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