Manual for OpenEstate-ImmoTool

OpenEstate.org

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1.1 Acknowledgement

We like to thank all participants in the OpenEstate project and alle Open Source developers. Without your support this project would not have been possible.

1.2 This manual is free of charge

This user manual was created as a part of the OpenEstate project. Its contents (texts and images) are **freely available for personal use**. A commercial distribution requires a written permission by the authors (see "License for the user manual"). Any third party modifications to this manual also have to published under the same license conditions.

> The raw contents of this manual and the scripts used for exporting into different formats (HTML, PDF, ePub, etc.) are published at GitHub[a]. You may use this platform to provide and discuss changes to this manual.

1.3 This manual is incomplete

This user manual documents OpenEstate-ImmoTool and OpenEstate-ImmoServer in its current state of development. Both applications are actively developed. Therefore this manual might not always be up to date. But we are trying our best to add and updates its contents as soon as possible.

1.4 Contributions are welcome

Users and developers are cordially invited to help us with the completion of this manual. Feel free to send us your comments or suggestions for improvements via GitHub[1] or ticket system[2].

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[a]https://github.com/OpenEstate/OpenEstate-Tool-Manual/
[1]https://github.com/OpenEstate/OpenEstate-Tool-Manual/
[2]https://openestate.org/support/tickets

2 Introduction

2.1 About the OpenEstate project...

2.1.1 What is OpenEstate?

The OpenEstate project was initiated by Walter Wagner & Andreas Rudolph[1] with the goal in mind to provide open software solutions for the real estate industry. You can find further information on its website OpenEstate.org[2].

2.1.2 What is OpenEstate-ImmoTool?

OpenEstate-ImmoTool (henceforth referred to as "ImmoTool") is a free software for real estate management targeted at small and medium sized real estate companies.

The software is published under the terms of a Freeware license[3] (see "License for OpenEstate-ImmoTool"). This means basically:

- Everybody may download and use this software without any costs.
- Everybody may help in further development of the software.
- Everybody may extend the software with his own modules (so called addons) and may publish them under a freely chosen license.
- Every registered user may get support and help by the developers about technical issues with the software.
- There are no license fees.

2.1.3 What is OpenEstate-ImmoServer?

OpenEstate-ImmoServer (henceforth referred to as "ImmoTool-Server") provides a HSQL database[4]. This application allows users to work from multiple workspaces on the same database.

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[1] https://openindex.de/
[2] https://openestate.org/
[3] https://en.wikipedia.org/wiki/Freeware
[4] http://hsqldb.org/

The software is published under the terms of an Open Source license[5] (see "License for OpenEstate-ImmoServer"). This means basically:

- Everybody may download and use this software without any costs.
- Everybody may help in further development of the software.
- Everybody may access and modify the provided source code (even for commercial purposes).
- Every registered user may get support and help by the developers about technical issues with the software.
- There are no license fees.

The source code of ImmoTool-Server is published at GitHub[a].

2.2 System requirements

ImmoTool and ImmoTool-Server may be used on all kinds of operating systems as long as they are fairly up to date and Java / OpenJDK is available for it in the required version.

2.2.1 Requirements of ImmoTool

- **Operating system:**
    - Windows (from version 7 onwards; 32bit / 64bit)
    - macOS (from version 10.9 onwards)
    - Linux (x86 aka IA-32 / x86-64 aka amd64)
- **Processor:** 2 GHZ (the more the merrier)
- **RAM:** 512 MB are used by the application at maximum
- **Hard drive space:** approx. 150 MB after installation; more space is required depending on the amount of data
- **Java:** version 11 (already provided in the installation package)
- **Internet access:** not necessary, but helpful

There are no installation packages available for Linux systems on other architectures than **x86** and **x86-64**. But you may still be able to run ImmoTool, if the Linux distribution provides an OpenJDK 11 package for the architecture being used (see "Using Java from the Linux package system").

2.2.2 Requirements of ImmoTool-Server

- **Operating system:**

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[5]https://en.wikipedia.org/wiki/Open-source_model
[a]https://github.com/OpenEstate/OpenEstate-Tool-Server/

- Windows (from version 7 onwards; 32bit / 64bit)
- macOS (from version 10.9 onwards)
- Linux (x86 aka IA-32 / x86-64 aka amd64)
- **Prozessor:** 1 GHZ (the more the merrier)
- **RAM:** 512 MB are used by the application at maximum
- **Hard drive space:** approx. 150 MB after installation; more space is required depending on the amount of data
- **Java:** version 8 at least; version 11 is recommended (already provided in the installation package)
- **Internet access:** not necessary

There are no installation packages available for Linux systems on other architectures than **x86** and **x86-64**. But you may still be able to run ImmoTool-Server, if the Linux distribution provides an OpenJDK 8 package (or newer) for the architecture being used (see "Using Java from the Linux package system").

2.3 Download the applications

2.3.1 Obtain packages from the website

ImmoTool and ImmoTool-Server are available for download at the OpenEstate website[6] in different packages. Older versions of the applications are also available here.

The following packages are provided for both applications:

- For Windows there are **EXE** installers available (32bit / 64bit).
- For macOS there is a **DMG** installation image available.
- For Debian based Linux distributions (e.g. **Debian**, **Ubuntu** or **Linux Mint**) there are different **Debian packages** available (**DEB** installation file).
- For other Linux systems there are different **TAR.GZ** files available.

2.3.2 Obtain packages from the Debian repository

As an alternative for a direct download from the website we provide a Debian repository[7], that may be used for all Debian based Linux distributions (e.g. **Debian**, **Ubuntu** or **Linux Mint**). Using the repository results in a better integration into the package management of the operating system and allows easier installation / updates.

Follow these steps in order to integrate the Debian repository into your operating system:

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[6]https://openestate.org/downloads/
[7]https://debian.openestate.org/

1. Import the PGP key via:

```
wget -qO - \
   "https://debian.openestate.org/conf/debian.gpg.key" | \
   sudo apt-key add -
```

2. Register the repository via:

```
sudo apt-add-repository \
   "deb https://debian.openestate.org/ openestate main"
```

Or alternatively add the following line to the end of the file **/etc/apt/sources.list**:

```
deb https://debian.openestate.org/ openestate main
```

3. Update the package index via:

```
sudo apt update
```

4. Afterwards you can install ImmoTool via:

```
sudo apt install openestate-immotool
```

Or you can install ImmoTool-Server via:

```
sudo apt install openestate-immoserver
```

In case you receive an error message on step 3, you may also need to install the package **"apt-transport-https"** with the following command:

```
sudo apt install apt-transport-https
```

2.4 How ImmoTool can be installed...

You may use ImmoTool in two different ways. Before installing the application you should decide for one of these usage scenarios.

If you want to make yourself familiar with the application, it is recommended to start with a **single-user installation**. Later you may switch to multi-user installation (see "Convert single-user into multi-user installation").

2.4.1 Installing on a single workplace

Using the application on a single workplace (so called **single-user installation**) is the most straightforward installation method. In this case only the ImmoTool has to be installed. The ImmoTool-Server is **not** required for this type of installation.

On the first startup of the application a database is created automatically on the local hard drive, that gathers all processed data.

2.4.1.1 Advantages of single-user installations

- This is the most straightforward installation method. Only ImmoTool has to be installed.
- The database is created automatically on the first startup and the application is usable without any further setup.

2.4.1.2 Disadvantages of single-user installations

- Multiple users can not work on the same database at the same time.
- It is not possible to set permissions for different users. The user always has full access to the database and the application features.

2.4.1.3 Steps for single-user installations

The following steps are required in order to start with a single-user installation:

1. Download ImmoTool.
2. Install ImmoTool.
3. Start ImmoTool.
4. Create a local project on first application startup.

2.4.2 Installing on a multiple workplaces

If multiple employees should be able to work on the same database from their workplace, a so called **multi-user installation** is required. In this case the shared database has to be provided by an external application (ImmoTool-Server).

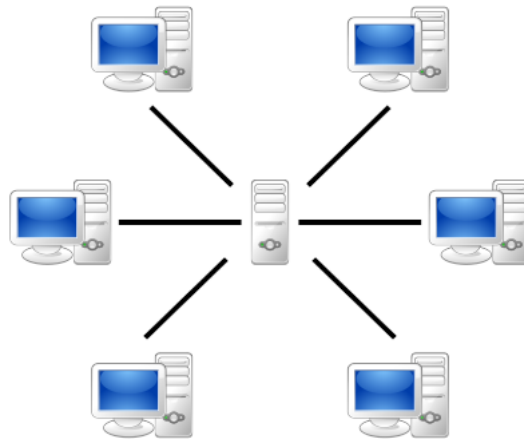The following image illustrates the setup schematically:

Figure 2.1: client-server model

The ImmoTool-Server is placed in the center of the image. The employees workplaces are arranged in a circle around the ImmoTool-Server.

2.4.2.1 Advantages of multi-user installations

- Any number of employees may work at same time on the same database.
- Each employee has its own credentials for database access.
- Each employee may have its own permissions within the database (e.g. accessing certain data or using certain features).
- ImmoTool-Server may be installed in a data center. In this case employees may access the database from different locations. Alternatively the ImmoTool-Server might be made available through a Virtual Private Network[8].

2.4.2.2 Disadvantages of multi-user installations

- The installation procedure is more complicated because the ImmoTool-Server needs to be installed separately. Basic knowledge of networks and server administrations are helpful.
- Software updates are a bit more complicated because all workplaces should use the same ImmoTool version.

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[8]https://en.wikipedia.org/wiki/Virtual_private_network

2.4.2.3 Steps for multi-user installations

A multi-user installation requires multiple steps, that need to be done on multiple computers / workplaces.

The ImmoTool-Server needs to be installed at first on **one** computer in the company network:

1. Download ImmoTool & ImmoTool-Server.
2. Install ImmoTool to the server computer.
3. Install ImmoTool-Server to the server computer.
4. Start ImmoTool-Server.
5. Start AdminTool (provided with the ImmoTool installation) and create a database on the ImmoTool-Server.
6. Start ImmoTool and create a remote project.

> The ImmoTool installation on the server computer may be removed after the initial setup was finished successfully. But in case of problems it might be helpful in the future to have an ImmoTool / AdminTool on the same system as the ImmoTool-Server.

After the basic setup of ImmoTool-Server was completed you may consider setting up further features (e.g. encryption, automatic backups or installing a service).

In the next step you have to install ImmoTool on **each workplace**:

1. Download ImmoTool.
2. Install ImmoTool.
3. Start ImmoTool.
4. Create a remote project on first application startup.

2.5 Installing ImmoTool

2.5.1 Install the application

Download the ImmoTool installation package for your operating system (see "Download the applications").

2.5.1.1 Installation on Windows

On Windows systems you should download the **EXE** installation file. On a 64bit Windows system you should use the corresponding 64bit installer.

Start the downloaded EXE installer with a double click. Afterwards an installation program shows up, that will guide you through the installation process.

Figure 2.2: Installing ImmoTool on Windows

2.5.1.2 Installation on macOS

On macOS systems you should download the **DMG** installation file. Start the downloaded file with a double click in order to show the following installation dialog:

Figure 2.3: Installing ImmoTool on macOS

Click with your mouse on the application symbol of **"OpenEstate-ImmoTool"** and drag it into the **"Applications"** folder. This will copy the application into your **`Applications`** folder. In future you can find the application in your Finder by opening the **`Applications`** folder.

Alternatively you can drop the application symbol somewhere else - e.g. on your desktop or any other location on your hard drive.

2.5.1.3 Installation on Debian, Ubuntu or similar

For Debian based Linux distributions (e.g. **Debian**, **Ubuntu** or **Linux Mint**) there are different **Debian packages** it is recommended to use the Debian repository (see "Obtain packages from the Debian repository"). After the repository was registered in the operating system you may install the **Debian package** with the following commands:

1. Update the package index via:

   sudo apt update

2. Install ImmoTool:

   sudo apt install openestate-immotool

In case you do not like or want to use the repository, you may *alternatively* download the **Debian package** (resp. the **DEB** installation file). Install the package with a double click or via the following command:

sudo dpkg -i openestate-immotool_x.y.z_amd64.deb

(Replace **`x.y.z`** with the version number of the downloaded file.)

> The Debian package installs the application into the **`/opt/OpenEstate-ImmoTool`** directory.

> The Debian package automatically adds start menu entries of the application for each user in the operating system.

2.5.1.4 Installation on Linux

If you do not use a Debian based Linux distribution or do not want to use the repository, you may alternatively download the **TAR.GZ** installation file. Make sure to select the correct installation file for your processor architecture (most commonly used is **x86-64**).

After the file was extracted on your computer you should find a directory called **`OpenEstate-ImmoTool`**. Move this directory to your preferred location on your hard drive (e.g. into the home directory or to **`/opt/OpenEstate-ImmoTool`**).

You may execute the **StartMenuAdd.sh** script within the **bin** folder of the application. This will create the start menu entries of the application for the current user.

2.5.2 Starting ImmoTool

2.5.2.1 Start ImmoTool on Windows

The Windows installer will automatically create a desktop shortcut for the application. Alternatively you can find a folder called **"OpenEstate-ImmoTool"** in the start menu, that contains the shortcuts of the application.

Besides this you may start the application by executing the **ImmoTool.exe** (or **ImmoTool.bat**) file in the **bin** subfolder of the application directory.

2.5.2.2 Start ImmoTool on macOS

Open the application bundle called **"OpenEstate-ImmoTool"** with a double click. This will open a Finder window with the applications provided by ImmoTool.
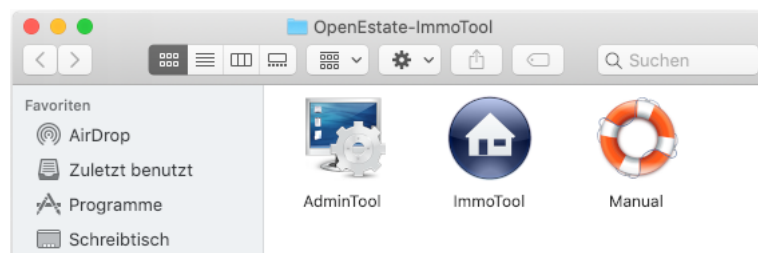

Figure 2.4: Finder window with ImmoTool applications

Provide an English screenshot.

A double click on the **"ImmoTool"** application will start the application.

You may integrate the **"ImmoTool"** application symbol into the Dock for future application starts (see documentation by Apple[a]).

2.5.2.3 Start ImmoTool on Linux

If ImmoTool was installed with the **Debian** package, you will find an entry called **"OpenEstate-ImmoTool"** in your start menu.

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[a]https://support.apple.com/en-us/HT201730

If ImmoTool was installed with the **TAR.GZ** package, you may have to start the **StartMenuAdd.sh** script in the **bin** subfolder of the application directory in order to create the start menu entry for ImmoTool.

Alternatively you may start the application by executing the **ImmoTool.sh** script in the **bin** subfolder of the application directory.

2.5.3 Language selection

If ImmoTool is started for the first time and the language of your operating system is not available in the application, you will have to select your preferred language.

Figure 2.5: Language selection on first application start

This window provide a selection of languages, that the application was translated into.

> ℹ️ ImmoTool may be translated into every language. If you like to help us out with a translation (z.B. new language or fixes in current translations), you can find further information on the OpenEstate website[a].

2.5.4 Create local project

If ImmoTool is started for the first time, the project wizards shows up. You will have to create a local project, that provides the database for the application.

> ℹ️ Within ImmoTool a project is a synonym for a database, that contains all gathered data (real estates, customers, attachments, etc.). In most cases you will only need **one project**, that has to be created once on the first application start. On later startups this project is opened automatically.

> ⚠️ In case you are planning to install a **multi-user installation** (see "Installing on a multiple workplaces"), please follow the advices in chapter "Installing ImmoTool-Server". In this case it is **not necessary** to create a local project.

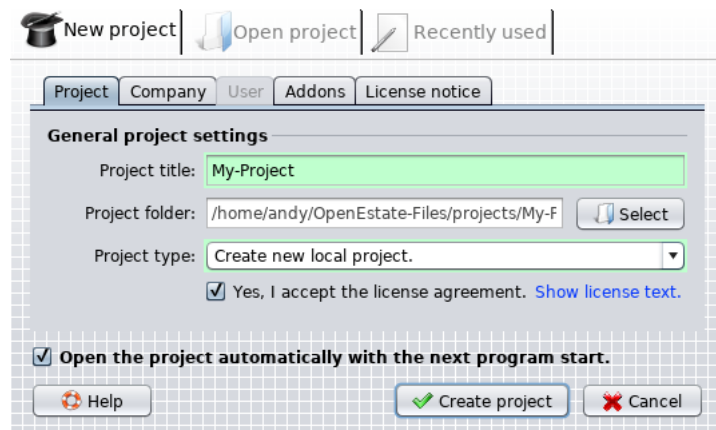[a]https://openestate.org/immotool/translations

Figure 2.6: Create local project on first application start

Enter the following options into the project wizard in order to create a **local project**:

- **Project title:**
  Enter any desired name for the project.

- **Projekt type:**
  Select the option **"Create new local project."**.

- You may open the tab **"Company"** and add some more information about your company.

- You may open the tab **"Addons"** and enable / disable certain extensions in the project.

After the license agreement was accepted you can create the project by clicking on the button **"Create project""**. The newly created project is automatically opened afterwards.

From now on you can work with the application. We wish you a lot of fun and success!

2.6 Installing ImmoTool-Server

The ImmoTool-Server is required, if multiple employees need to work on the same database from their workplace (see "Installing on a multiple workplaces").

If you do **not** want to use ImmoTool in a network with multiple employees, you do **not** need to install ImmoTool-Server. Instead you can install ImmoTool as a **single-user installation** (see "Installing on a single workplace").

2.6.1 Install the application

Download the ImmoTool-Server installation package for your operating system (see "Download the applications").

2.6.1.1 Installation on Windows

On Windows systems you should download the **EXE** installation file. On a 64bit Windows system you should use the corresponding 64bit installer.

Start the downloaded EXE installer with a double click. Afterwards an installation program shows up, that will guide you through the installation process.

Figure 2.7: Installing ImmoTool-Server on Windows

2.6.1.2 Installation on macOS

On macOS systems you should download the **DMG** installation file. Start the downloaded file with a double click in order to show the following installation dialog:

Figure 2.8: Installing ImmoTool-Server on macOS

Click with your mouse on the application symbol of **"OpenEstate-ImmoServer"** and drag it into the **"Applications"** folder. This will copy the application into your `Applications` folder. In future you can find the application in your Finder by opening the `Applications` folder.

Alternatively you can drop the application symbol somewhere else - e.g. on your desktop or any other location on your hard drive.

2.6.1.3 Installation on Debian, Ubuntu or similar

For Debian based Linux distributions (e.g. **Debian**, **Ubuntu** or **Linux Mint**) there are different **Debian packages** it is recommended to use the Debian repository (see "Obtain packages from the Debian repository"). After the repository was registered in the operating system you may install the **Debian package** with the following commands:

1. Update the package index via:

   ```
   sudo apt update
   ```

2. Install ImmoTool-Server:

   ```
   sudo apt install openestate-immoserver
   ```

In case you do not like or want to use the repository, you may *alternatively* download the **Debian package** (resp. the **DEB** installation file). Install the package with a double click or via the following command:

```
sudo dpkg -i openestate-immoserver_x.y.z_amd64.deb
```

(Replace **x.y.z** with the version number of the downloaded file.)

ⓘ   │ The Debian package installs the application into the **/opt/OpenEstate-ImmoServer** directory.

ⓘ   │ The Debian package automatically installs a service in the operating system. The ImmoTool-Server will start automatically as soon as the computer is booted (see "Setup a service for ImmoTool-Server"). Also the Debian package automatically installs a timer for daily backups. In order to make backups work properly, you have to set some configurations (see "Backup a running ImmoTool-Server").

2.6.1.4 Installation on Linux

If you do not use a Debian based Linux distribution or do not want to use the repository, you may alternatively download the **TAR.GZ** installation file. Make sure to select the correct installation file for your processor architecture (most commonly used is **x86-64**).

After the file was extracted on your computer you should find a directory called **OpenEstate-ImmoServer**. Move this directory to your preferred location on your hard drive (e.g. into the home directory or to **/opt/OpenEstate-ImmoServer**).

2.6.2 Starting ImmoTool-Server

For the first installation it is recommended to start ImmoTool-Server manually.

If the application was properly configured an all workplaces can successfully connect to the ImmoTool-Server, you should consider installing a service for ImmoTool-Server. This allows the application to start automatically while the computer is booting (see "Setup a service for ImmoTool-Server").

ⓘ   │ In order to make ImmoTool-Server available over the network you might have to open port **9001** in the firewall for incoming connections.

2.6.2.1 Start ImmoTool-Server on Windows

The Windows installer created a folder called **"OpenEstate-ImmoServer"** in the start menu, that contains the shortcuts of the application. Click on the shortcut **"Start ImmoServer manually"** in the start menu in order to start ImmoTool-Server in foreground.

Besides this you may start the application manually by executing the **Start.exe** (or **Start.bat**) file in the **bin** subfolder of the application directory.

2.6.2.2 Start ImmoTool-Server on macOS

Open the application bundle called **"OpenEstate-ImmoServer"** with a double click. This will open a Finder window with the applications provided by ImmoTool-Server.
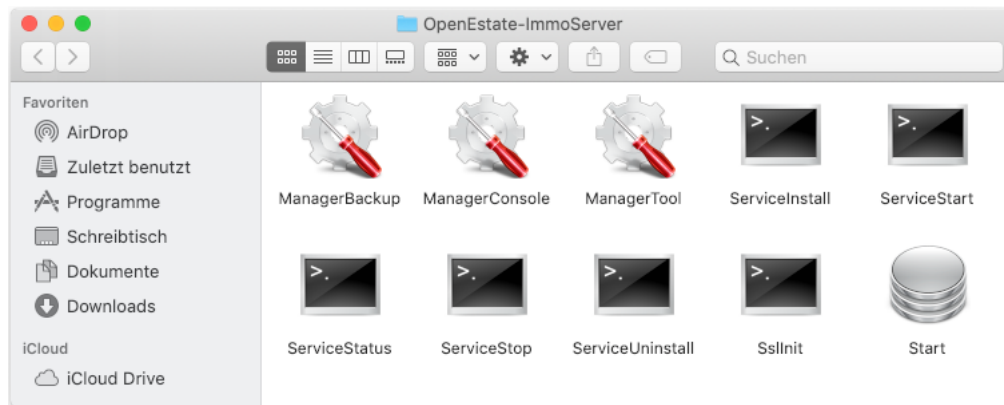

Figure 2.9: Finder window with ImmoTool-Server applications

Provide an English screenshot.

A double click on the **"Start"** application will start ImmoTool-Server manually.

2.6.2.3 Start ImmoTool-Server on Linux

If ImmoTool-Server was installed with the **Debian** package, there is already a service available and ImmoTool-Server was already started. In this case you do not have to do any further steps.

On all Linux systems you can start ImmoTool-Server manually by executing the **Start.sh** script in the **bin** subfolder of the application directory.

2.6.3 Prepare ImmoTool-Server

Before employees can access ImmoTool-Server with ImmoTool you have to install a database. Start **AdminTool** in order to perform the necessary preparations. This application is installed together with the ImmoTool application.

Install ImmoTool on the server computer or any other machine in your network (see "Installing Immo-Tool") and start the AdminTool application (see "AdminTool starten").
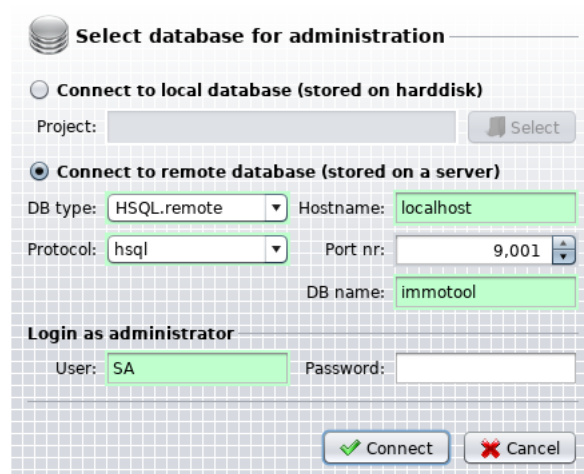
Figure 2.10: Connect to ImmoTool-Server with AdminTool

Select the option **"Connect to remote database (stored on a server)"** in the connection dialog. Afterwards you need to enter the connection settings for ImmoTool-Server:

- **DB type:**

  Select the option **"HSQL.remote"**.

- **Protocol:**

  In normal case you should select the option **"hsql"**. If the ImmoTool-Server was configured for SSL encryption, you have to select the option **"hsqls"** (see "Configure SSL encryption").

- **Hostname:**

  Enter the IP address or hostname of the computer, on which ImmoTool-Server was installed. In case AdminTool was started from the same computer you can keep the hostname **"localhost"** untouched.

- **Port nr:**

  By default the port number is **"9001"**. Only if ImmoTool-Server was configured for another port number, this value has to be changed.

- **DB name:**

  By default the name of the database is **"immotool"**. Only if another database with another name was configured in ImmoTool-Server, this value has to be changed.

- **User:**

  The login name of the database administrator is **"SA"**. In most cases this value has not to be changed.

- **Password:**

If a first connection to the ImmoTool-Server is established, this value can stay empty. After a password was set for the database administrator it has to be entered here.

Click on the button **"Connect"** in order to open a first connection from AdminTool to the ImmoTool-Server.

In the first step the application will detect, that no password was set for the database administrator (**"SA"**). It will ask you for a password. Please take a note of your selected password!

Figure 2.11: Enter an administration password in AdminTool

Afterwards the application will detect, that the database is not installed yet on the ImmoTool-Server. You may disable certain addons. After clicking the button **"Submit"** the application will initialize the database.

Figure 2.12: Install database on ImmoTool-Server

After these steps have been finished you may add further user accounts in the database (see "Manage

user accounts").

After you have finished the configuration you may close AdminTool. From now on employees may access the database via ImmoTool.

2.6.4 Connect to ImmoTool-Server

After the ImmoTool-Server was successfully prepared (see "Prepare ImmoTool-Server") you may access the database via ImmoTool.

Install ImmoTool on **each workplace** (see "Installing ImmoTool"). After ImmoTool was started for the first time (see "Starting ImmoTool") you have to create a **remote project**. Open the project wizard (if it does not start automatically click on **"Main Menu → Project → new project"**).

Figure 2.13: Create a remote project in project wizard

Enter the following settings into the project wizard in order to create a **remote project**:

- **Project title:**
  Enter any desired name for the project.

- **Projekt type:**
  Select the option **"Create new connection to a remote project."**.

- **DB type:**

  Select the option **"HSQL.remote"**.

- **Protocol:**

  In normal case you should select the option **"hsql"**. If the ImmoTool-Server was configured for SSL encryption, you have to select the option **"hsqls"** (see "Configure SSL encryption").

- **Hostname:**

  Enter the IP address or hostname of the computer, on which ImmoTool-Server was installed. In case ImmoTool was started from the same computer you can keep the hostname **"localhost"** untouched.

- **Port nr:**

  By default the port number is **"9001"**. Only if ImmoTool-Server was configured for another port number, this value has to be changed.

- **DB name:**

  By default the name of the database is **"immotool"**. Only if another database with another name was configured in ImmoTool-Server, this value has to be changed.

- **User:**

  Enter the name of the database user. If other users were created via AdminTool, you may enter its login name here. Otherwise you can use the default administrator account **"SA"**.

- **Password:**

  Enter the password of the user provided in the **"User"** field.

Before the project is created, you have to verify the connection settings by clicking the **"Login"** button. If no errors were detected, you can create the project by clicking the **"Create project"** button. The remote project will be created and automatically opened afterwards.

On future application startups you can open the previously created remote project. The user has to enter his login name and password before database access is granted.
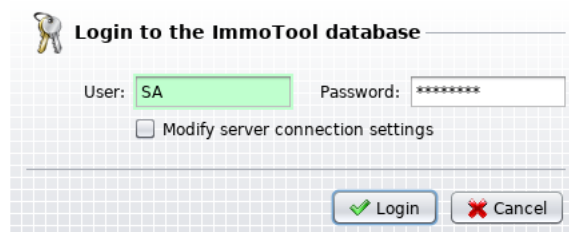

Figure 2.14: Login to a remote project

2.7 Installing Java

ImmoTool and ImmoTool-Server have been written in the Java programming language. In order to use the software a Java runtime environment (so called JRE) is required.

> The provided installation packages of ImmoTool and ImmoTool-Server already contain the required Java runtime environment. In most cases it is **not necessary** to install Java separately.

There are only a few reasons not to use the Java version provided in the installation packages. It might be required, if a Linux system is used, for which no official installation package is available. For these rare cases the documentation below describes the steps to use a custom Java runtime environment.

> Please consider, that OpenEstate can only give limited support for custom / external Java installations. We are trying to maintain compatibility to our best knowledge and belief. But we can not fully rule out possible errors or problems regarding custom Java installations.

By default each application contains a folder called **`jre`**, that contains the provided Java runtime environment. This folder may be replaced with a custom Java installation.

2.7.1 Using Java from a third-party supplier

Many third-party suppliers are providing Java or OpenJDK packages (e.g. AdoptOpenJDK[9], Azul Systems[10], BellSoft[11], JetBrains[12], Red Hat[13], SAP[14] or Oracle[15]). You may use their packages by following these steps:

- Remove the **`jre`** folder from the application directory of ImmoTool / ImmoTool-Server.
- Extract the archive, that you have downloaded from the third-party supplier.
- Rename the extracted folder into **`jre`** and copy it into the application directory of ImmoTool / ImmoTool-Server.

2.7.2 Using Java from the Linux package system

Most Linux distributions also provide Java / OpenJDK through their package system. You may use their packages by following these steps:

- Remove the **`jre`** folder from the application directory of ImmoTool / ImmoTool-Server.

---

[9] https://adoptopenjdk.net/
[10] https://www.azul.com/downloads/zulu/
[11] https://www.bell-sw.com/
[12] https://bintray.com/jetbrains/intellij-jdk
[13] https://github.com/ojdkbuild/ojdkbuild
[14] https://sap.github.io/SapMachine/
[15] https://www.java.com/

- Install the OpenJDK package of your Linux distributions - e.g. via:

  `sudo apt install openjdk-11-jdk`

If the **jre** folder is not present in the application directory, the application will automatically try to use the installed OpenJDK package on startup.

3 General usage notes

Sorry but the usage section of this manual is currently not available in English language. We are working on its completion. But it may take some time due to a lot of other work, that needs to be done. In case of questions about using the application feel free to contact the developers via ticket system[1].

If you like, you may help us out with the translation from German into English. Any kind of help is highly appreciated. Just get in contact with us[a] or open a ticket[b].

---

[1] https://openestate.org/support/tickets
[a] https://openestate.org/contact
[b] https://openestate.org/support/tickets

4 Administrate ImmoTool

4.1 Starting ImmoTool

4.1.1 Start ImmoTool on Windows

The Windows installer will automatically create a desktop shortcut for the application. Alternatively you can find a folder called **"OpenEstate-ImmoTool"** in the start menu, that contains the shortcuts of the application.

Besides this you may start the application by executing the **ImmoTool.exe** (or **ImmoTool.bat**) file in the **bin** subfolder of the application directory.

4.1.2 Start ImmoTool on macOS

Open the application bundle called **"OpenEstate-ImmoTool"** with a double click. This will open a Finder window with the applications provided by ImmoTool.
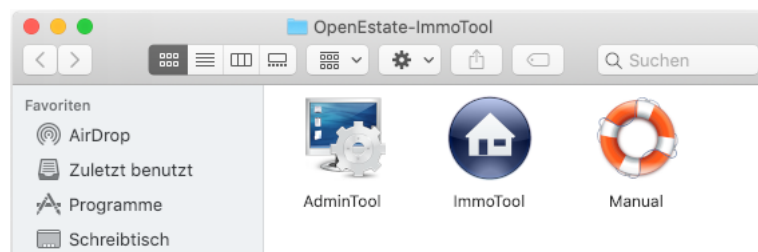

Figure 4.1: Finder window with ImmoTool applications

Provide an English screenshot.

A double click on the **"ImmoTool"** application will start the application.

You may integrate the **"ImmoTool"** application symbol into the Dock for future application starts (see documentation by Apple[a]).

---
[a]https://support.apple.com/en-us/HT201730

Besides this you may start the application by executing the **`ImmoTool.sh`** file in the **`bin`** subfolder of the application directory.

4.1.3 Start ImmoTool on Linux

If ImmoTool was installed with the **Debian** package, you will find an entry called **"OpenEstate-ImmoTool"** in your start menu.

If ImmoTool was installed with the **TAR.GZ** package, you may have to start the **`StartMenuAdd.sh`** script in the **`bin`** subfolder of the application directory in order to create the start menu entry for ImmoTool.

Alternatively you may start the application by executing the **`ImmoTool.sh`** script in the **`bin`** subfolder of the application directory.

4.1.4 Start parameters of ImmoTool

You may customize the application startup via **`ImmoTool.exe`** / **`ImmoTool.bat`** / **`ImmoTool.sh`** with the following parameters:

- **-help**
  Shows a summary of available command line arguments.

- **-noProject**
  Starts the application without automatically opening a project. Instead the *project wizard* is shown.

- **-project <PROJECT>**
  Automatically opens the project located in the **`<PROJECT>`** folder on startup.

- **-projectLogin <USER>**
  If the project specified by the **`-project`** parameter is a multi-user project, the program will automatically login as user **`<USER>`**.

- **-projectPass <PASSWORD>**
  If the project specified by the **`-project`** parameter is a multi-user project, the program will automatically login with the password **`<PASSWORD>`**.

Add link to the project wizard in the usage section.

4.2 Directories of ImmoTool

ImmoTool operates on different directories on the hard drive.

4.2.1 Application directory of ImmoTool

The application directory contains the installed files necessary to run ImmoTool.

- On Windows systems the path **C:\Programme\OpenEstate-ImmoTool** is used by default. But during the installation process the user might select another location.

- On macOS systems it depends, where the application bundle was copied to during the installation. By default the application bundle should be located at **/Applications/OpenEstate-ImmoTool.app**. The application directory itself is located inside the application bundle in the **Contents/Resources** subfolder.

- If the **Debian** package (or Debian repository) was used on Debian, Ubuntu, Linux Mint or similar for installation, the application is located at **/opt/OpenEstate-ImmoTool**.

- If the **TAR.GZ** package was used on Linux for installation, it depends where the extracted folder was moved to.

The application directory contains a **bin** subfolder with several scripts and applications for ImmoTool.

ImmoTool does **not** write any files / data into to the application directory. It only reads from this directory.

It is recommended to make sure, that regular users of the operating system only have read access to the application directory. Administrators might set appropriate permissions to this directory in order to avoid accidental modifications.

4.2.2 Data directory of ImmoTool

If a user starts ImmoTool for the first time, the program will automatically create a folder called **OpenEstate-Files** in his home directory. This folder contains data and settings for ImmoTool **exclusively** for this user.

This folder is used by ImmoTool to write certain data during its runtime (e.g. protocols or temporary files).

4.2.3 Project directory of ImmoTool

If a project is created within ImmoTool, the user can choose the location of the project directory for himself. By default the application stores the project directory into the **projects** subfolder of the data directory.

> 🛈 Each project created with ImmoTool is stored in its own / separate directory. This makes it easier to backup / move / replace a project by modifying the project folder.

> 🛈 It is theoretically possible, that multiple users share the same project directory (e.g. by using a shared folder). But local projects (resp. single-user-installations) can never be opened by multiple users at the same time.

> ⚠ You **should not** open a project directory from an unstable location (e.g. network drive or cloud drive). Network failures may corrupt the database. If you want to go this path nevertheless, keep in mind to backup the project as often as possible.

4.2.4 Plugin directory of ImmoTool

The plugin directory contains the extensions (addons) as ZIP files loaded by ImmoTool. There are two locations, where addons can be stored:

1. In the application directory there is a **plugins** subfolder. The administrator of the operating system may place addons here, that are available for all users of the operating system.

2. In the data directory of each user there is also a **plugins** subfolder. The user may place addons here, that are only available for himself.

While ImmoTool is starting both directories are synchronized. If both folders contain the same addon in different versions, the application will load the newer version.

> ⚠ On macOS the plugin directory inside the application directory (within the **"OpenEstate-ImmoTool"** application bundle) should not be modified. Otherwise the signature of the application bundle might get invalid and Gatekeeper[a] might reject starting up the application. Therefore you should always place addons into the **plugins** subfolder of the data directory on macOS.

4.3 Updating ImmoTool

Once per day the application searches for available updates on startup. The following information is shown, in case that updates are available:
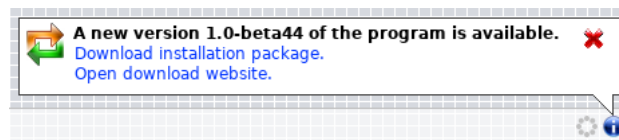
---

[a]https://support.apple.com/en-us/HT202491

Figure 4.2: Information about available updates

Click on **"Download installation package."** in order to open the web browser and download the installation package for the currently used operating system.

Click on **"Open download website."** in order to open the download page[1] for the new application version.

Download the installation package for your operating system and start the installation process (see "Installing ImmoTool"). Thereby keep the following notices for your operating system in mind.

Always close the ImmoTool application before starting the update process.

If ImmoTool is installed on multiple workplaces (see "Installing on a multiple workplaces"), you should update the application on **all workplaces**. Different versions of ImmoTool might not work in a multi-user installation.

4.3.1 Update on Windows

The **EXE** installer automatically detects, where the application was installed beforehand and will update the files accordingly.

4.3.2 Update on macOS

Move the application symbol of **"OpenEstate-ImmoTool"** to the same location, where ImmoTool was installed beforehand. The operating system will show the following question:
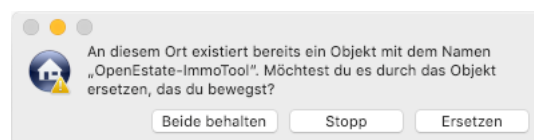

Figure 4.3: Question about overwriting on macOS

Provide an English screenshot.

Answer this question in the dialog window by clicking on **"Replace"**.

---
[1]https://openestate.org/downloads/openestate-immotool

4.3.3 Update on Debian, Ubuntu or similar

If the Debian repository was configured in your operating system (see "Obtain packages from the Debian repository"), you do **not** have to download the updated version from the OpenEstate website. Instead you can execute the following commands:

```
sudo apt update
sudo apt install openestate-immotool
```

If you do **not** use the Debian repository but installed the program from the **Debian** package, you can download the **DEB** installation package. Install the downloaded package with a double click or via the following command:

```
sudo dpkg -i openestate-immotool_x.y.z_amd64.deb
```

(Replace **x.y.z** with the version number of the downloaded file.)

4.3.4 Update on Linux

1. Find out the path, where ImmoTool was installed beforehand.
2. Download the **TAR.GZ** installation package for your Linux system and extract the file on your computer.
3. Rename the folder, you have determined in step 1 - e.g. **OpenEstate-ImmoTool-OLD**.
4. Create a new / empty folder with the name, you have determined in step 1 - e.g. **OpenEstate-ImmoTool**.
5. Copy the files, that were extracted in step 2 into the newly created / empty folder.

After you have been able to properly start the application in the updated version you might remove the temporary folder created in step 3.

4.3.5 Important advices for certain versions

This section contains advices about updates to certain application versions.

4.3.5.1 Update from version 1.0-beta to 1.x

ImmoTool 1.0.0 introduced some major changes, that should be considered during an update from version 1.0-beta.

New installation routine for Windows & macOS

A **new installation routine** was implemented for **Windows** and **macOS** systems (EXE and DMG installation packages). The new installation packages are not compatible with the old update procedure. Please make sure, that you **do not overwrite** the previous ImmoTool version while installing the update. Therefore we are recommending the following approach:

- Find out, in which folder ImmoTool 1.0-beta is currently installed on your hard drive.

  – If the application is located on Windows systems at **`C:\Programme\OpenEstate-ImmoTool`**, you should rename this folder - e.g. in **`C:\Programme\OpenEstate-ImmoTool-OLD`**.

  – On macOS systems there should not be a problem with the naming of the folder. But nevertheless you should figure out, where the application is located.

- On Windows you should remove of the application (from the Desktop or start menu). On macOS you might remove the application from the Dock.

- Start the installation procedure (see "Installing ImmoTool").

- If the application was successfully installed and started, you can remove the installation folder of ImmoTool 1.0-beta.

Future updates of ImmoTool 1.x do not require these steps and should work flawlessly.

Java can be removed

Since version 1.0.0 Java is bundled together with the ImmoTool application. Therefore you can **remove Java from your operating system** as long as you do not need it for other applications.

- On Windows you can open the system control panel and open the section for software removal. You should find an entry for **"Oracle Java"**, that can be removed.

- On macOS you can follow these steps in order to remove **"Oracle Java"**:

  1. Click on the **"Finder"** icon located in your dock.

  2. Click on **"Go"** in the Finder menu.

  3. Click on **"Utilities"**.

  4. Double-click on the **"Terminal"** icon.

  5. In the Terminal window copy and paste the commands below:

     ```
     sudo rm -fr /Library/Internet\ Plug-Ins/JavaAppletPlugin.plugin
     sudo rm -fr /Library/PreferencePanes/JavaControlPanel.prefPane
     sudo rm -fr ~/Library/Application\ Support/Oracle/Java
     ```

(quoted from the official instructions by Oracle[2])

- On Linux you might remove **"OpenJDK"** via the package system of your distribution. Or if **"Oracle Java"** was installed, you might remove its installation folder manually.

4.3.5.2 Update from version 0.9.x to 1.x

For a migration from ImmoTool 0.9.x to 1.x the same advices apply as for the migration from 1.0-beta to 1.x. But in this case the project is not migrated automatically. Therefore you also need to follow the instructions to migrate an old project into ImmoTool 1.x.

---

[2]https://www.java.com/en/download/help/mac_uninstall_java.xml

5 Administrate ImmoTool-Server

5.1 Starting ImmoTool-Server

The easiest way to start ImmoTool-Server is a manual startup **in foreground**.

If the application was properly configured an all workplaces can successfully connect to the ImmoTool-Server, you should consider installing a service for ImmoTool-Server. This allows the application to start automatically **in background** while the computer is booting (see "Setup a service for ImmoTool-Server").

5.1.1 Start ImmoTool-Server on Windows

The Windows installer created a folder called **"OpenEstate-ImmoTool"** in the start menu, that contains the shortcuts of the application. Click on the shortcut **"Start ImmoServer manually"** in the start menu in order to start ImmoTool-Server in foreground.

Besides this you may start the application manually by executing the **Start.exe** (or **Start.bat**) file in the **bin** subfolder of the application directory.

If ImmoTool-Server was started for the first time, the operating system may ask to allow incoming connections for ImmoTool-Server. You should answer this question by clicking the **"Allow access"** button.

Figure 5.1: Grant access in the Windows firewall

Provide an English screenshot.

5.1.2 Start ImmoTool-Server on macOS

Open the application bundle called **"OpenEstate-ImmoServer"** with a double click. This will open a Finder window with the applications provided by ImmoTool-Server.
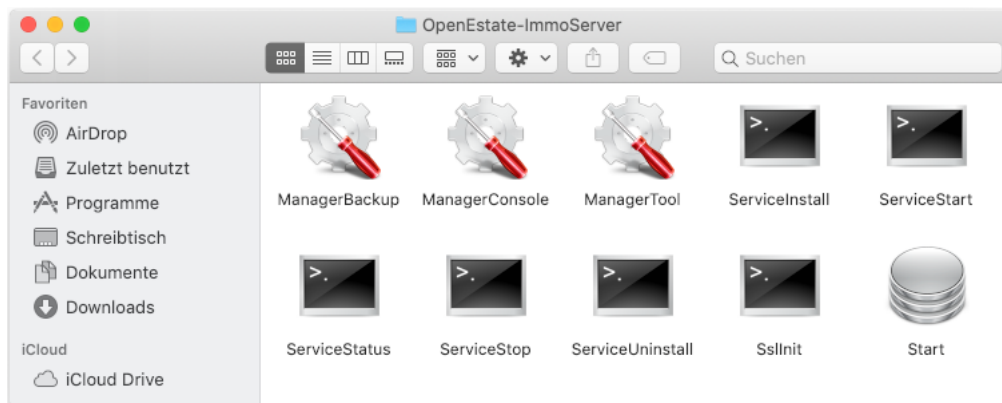

Figure 5.2: Finder window with ImmoTool-Server applications

Provide an English screenshot.

A double click on the **"Start"** application will start ImmoTool-Server manually.

If ImmoTool-Server was started for the first time, the operating system may ask to allow incoming connections for ImmoTool-Server. You should answer this question by clicking the **"Allow"** button.
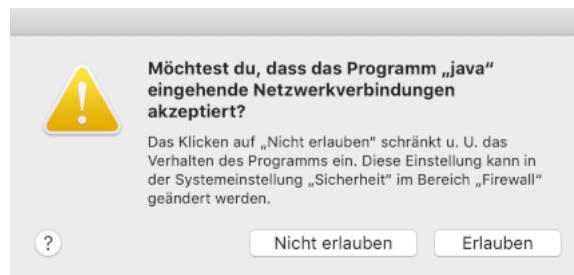
Figure 5.3: Grant access in the macOS firewall

Provide an English screenshot.

5.1.3 Start ImmoTool-Server on Linux

If ImmoTool-Server was installed with the **Debian** package, there is already a service available and ImmoTool-Server was already started. In this case you do not have to do any further steps.

On all Linux systems you can start ImmoTool-Server manually by executing the **Start.sh** script in the **bin** subfolder of the application directory.

5.2 Directories of ImmoTool-Server

ImmoTool-Server operates on different directories on the hard drive.

5.2.1 Application directory of ImmoTool-Server

The application directory contains the installed files necessary to run ImmoTool-Server.

- On Windows systems the path **C:\Programme\OpenEstate-ImmoServer** is used by default. But during the installation process the user might select another location.

- On macOS systems it depends, where the application bundle was copied to during the installation. By default the application bundle should be located at **/Applications/OpenEstate-ImmoServer.app**. The application directory itself is located inside the application bundle in the **Contents/Resources** subfolder.

- If the **Debian** package (or Debian repository) was used on Debian, Ubuntu, Linux Mint or similar for installation, the application directory is located at **/opt/OpenEstate-ImmoServer**.

- If the **TAR.GZ** package was used on Linux for installation, it depends where the extracted folder was moved to.

The application directory contains a **bin** subfolder with several scripts and applications for ImmoTool-Server.

ImmoTool-Server does **not** write any files / data into to the application directory. It only reads from this directory.

It is recommended to make sure, that regular users of the operating system only have read access to the application directory. Administrators might set appropriate permissions to this directory in order to avoid accidental modifications.

5.2.2 Data directory of ImmoTool-Server

All data, that is created and written by ImmoTool-Server, is stored in the data directory (e.g. databases, backups, log files).

- If the **Debian** package (or Debian repository) was used on Debian, Ubuntu, Linux Mint or similar for installation, the data directory is located at **/var/lib/OpenEstate-ImmoServer**.

- For all other types of installation (Windows, macOS, Linux via **TAR.GZ** package) the data directory is located at the subfolder **OpenEstate-Files** of the home directory by the user, who executed the application.

5.2.3 Protocol directory of ImmoTool-Server

The protocol directory contains log files with messages created during the execution of ImmoTool-Server.

- If the **Debian** package (or Debian repository) was used on Debian, Ubuntu, Linux Mint or similar for installation, the protocol directory is located at **/var/log/OpenEstate-ImmoServer**.

- For all other types of installation (Windows, macOS, Linux via **TAR.GZ** package) the protocol directory is located in the subfolder **logs** of the data directory.

5.2.4 Configuration directory of ImmoTool-Server

ImmoTool-Server uses the configuration directory to load its configurations.

- On Windows systems the **etc** subfolder of the application directory is used as configuration directory.

- On macOS systems the application creates an **etc** subfolder in the data directory of the executing user on the first startup. The program copies its default configuration files into this folder.

- If the **Debian** package (or Debian repository) was used on Debian, Ubuntu, Linux Mint or similar for installation, the configuration directory is located at **/etc/OpenEstate-ImmoServer**.

- If the **TAR.GZ** package was used for installation on Linux, the **etc** subfolder of the application directory is used as configuration directory.

ℹ The chapter "Configure ImmoTool-Server" contains further information about how to configure ImmoTool-Server for your personal needs.

5.2.5 Configure directories of ImmoTool-Server

It is possible to change the location of the directories used by Immotool-Server.

ℹ The user of the operating system, who starts ImmoTool-Server, needs write permission on the protocol and data directory. For the configuration directory only read access is required.

5.2.5.1 Configure directories on Linux & macOS

On Linux and macOS systems you can create a file at **/etc/default/OpenEstate-ImmoServer** with the following contents:

```
# path to configuration directory
SERVER_ETC_DIR="/etc/OpenEstate-ImmoServer"

# path to protocol directory
SERVER_LOG_DIR="/var/log/OpenEstate-ImmoServer"

# path to data directory
SERVER_VAR_DIR="/var/lib/OpenEstate-ImmoServer"
```

Enter the desired path of the directories behind the variables and restart ImmoTool-Server afterwards.

5.2.5.2 Configure directories on Windows

On Windows it depends, how the individual applications provided by ImmoTool-Server are started.

- If **EXE** files are used, you can edit the identically named **l4j.ini** with a text editor. Change the following lines in these files:

```
# path to configuration directory
-Dopenestate.server.etcDir=D:\OpenEstate-ImmoServer\etc
```

```
# path to protocol directory
-Dopenestate.server.logDir=D:\OpenEstate-ImmoServer\logs

# path to data directory
-Dopenestate.server.varDir=D:\OpenEstate-ImmoServer
```

- If **BAT** files are used, you can edit these files with a text editor. You can change the following lines:

```
:: path to configuration directory
set "SERVER_ETC_DIR=D:\OpenEstate-ImmoServer\etc"

:: path to protocol directory
set "SERVER_LOG_DIR=D:\OpenEstate-ImmoServer\logs"

:: path to data directory
set "SERVER_VAR_DIR=D:\OpenEstate-ImmoServer"
```

- If a service was installed on Windows, you can edit the path to the directories in the service management application (siehe "Manage service on Windows").
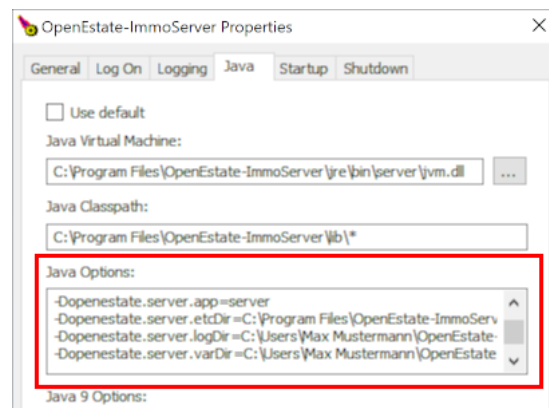

Figure 5.4: Change directories in service management application

Open the tab **"Java"** in the service management application and update the values in the **"Java Options"** text field according to your requirements:

- Enter the path of the configuration directory behind **-Dopenestate.server.etcDir=**.
- Enter the path of the protocol directory behind **-Dopenestate.server.logDir=**.
- Enter the path of the data directory behind **-Dopenestate.server.varDir=**.

5.3 Configure ImmoTool-Server

The configuration directory of ImmoTool-Server contains several files to customize the default behaviour of the application.

ⓘ In most use cases the provided default configuration is sufficient. You should only change the configuration, if it is really necessary.

5.3.1 Configure databases

The configuration directory of ImmoTool-Server contains a file called **`server.properties`**. With this file the databases provided by ImmoTool-Server can be configured.

By default ImmoTool-Server provides exactly one database with the name **"immotool"**. When necessary you may provide more databases with ImmoTool-Server by editing the **`server.properties`** file. You can find further information about this configuration file in the HSQLDB documentation[1].

For example to register a second database called **"immotool2"** in ImmoTool-Server, you can follow these steps:

1. Stop ImmoTool-Server, if it is currently running.

2. Open the **`server.properties`** file with a text editor and add the following lines to the end of the file:

```
# database #1
server.database.1=file:${openestate.server.varDir}/data/immotool2/db
server.dbname.1=immotool2
```

   This registers a second database called **"immotool2"**. Its data is stored in the data directory in the **`data/immotool2`** subfolder.

3. Save the modified **`server.properties`** file and restart ImmoTool-Server.

4. Start AdminTool and create a connection to the newly created database (see "Prepare ImmoTool-Server"). Enter the database name **"immotool2"** in the connection dialog window in order to connect to the newly created database.

5. After the database was prepared with AdminTool it can be accessed with ImmoTool (see "Connect to ImmoTool-Server"). Enter the database name **"immotool2"** in the project wizard (or login) window in order to connect to the newly created database.

In general ImmoTool-Server can provide an **arbitrary number of databases** in the **`server.properties`** file with freely choosable name. For each database you need to increment the counter - e.g.:

---

[1]http://hsqldb.org/doc/2.0/guide/listeners-chapt.html#lsc_server_props

```
# database #0
server.database.0=file:${openestate.server.varDir}/data/immotool/db
server.dbname.0=immotool

# database #1
server.database.1=file:${openestate.server.varDir}/data/mydb/db
server.dbname.1=mydb

# database #2
server.database.2=file:${openestate.server.varDir}/data/anotherdb/db
server.dbname.2=anotherdb
```

The character string **${openestate.server.varDir}** is automatically replaced with the con-figured path of the data directory.

5.3.2 Configure protocols

The configuration directory of ImmoTool-Server contains a file called **logback.xml**. With this file the logging behaviour of ImmoTool-Server can be configured.

By default the application stores its protocols into the protocol directory. In most cases it is not necessary to make any changes to this file. But you can find further information about customization in the documentation of Logback[2].

The character string **${openestate.server.logDir}** in the **logback.xml** file is automati-cally replaced with the configured path of the protocol directory.

The character string **${openestate.server.app}** in the **logback.xml** file is automatically replaced with the name of the executing application. This allows every application to use a separate log file.

5.3.3 Configure manager applications

ImmoTool-Server provides some helper applications to cover some administrative tasks (so called "manager applications"). These application are connecting themselves to the databases provided by the ImmoTool-Server in order to do their work (e.g. "Backup a running ImmoTool-Server").

The manager applications need to open a connection to the provided database and login with admin-istrative permissions. Therefore it is necessary to tell these application with which credentials to login.

---

[2]https://logback.qos.ch/documentation.html

The required login credentials have to be placed in the **manager.conf** file within the configuration directory.

For each database, that is provided by ImmoTool-Server, you need to add the following lines into the **manager.conf** file:

```
urlid immotool
url jdbc:hsqldb:hsql://localhost:9001/immotool
username SA
password test1234
```

- The value after **urlid** is a unique name for the database connection. To simplify matters you should use the database name here.

- The value after **url** is the database address used for the connection.

  - If the manager applications are executed from the same system as the ImmoTool-Server, you can use the **"localhost"** address. Otherwise you should enter the IP address or hostname. If ImmoTool-Server was configured for SSL encryption, you have to use the hostname specified in the SSL certificate.

  - After the **"localhost"** (separated by a colon) address follows the configured port number. In most cases you can keep the number **"9001"** untouched.

  - After the port number **"9001"** (separated by a forward slash) you have to set the name of the configured database (as it is configured as **server.dbname** in the **server.properties** file).

  - If the ImmoTool-Server was configured for SSL encryption, you need to replace **hsql://** with **hsqls://**.

- The value after **username** contains the login name of the database administrator. By default each database has an administrator account called **"SA"**. In most cases you do not need to change this value.

- The value after **password** is the password for the user specified by **username**. Enter the password of the administrator here, that was chosen during the server preparation with AdminTool (see "Prepare ImmoTool-Server").

For the three example databases described in the "Configure databases" chapter, you would have to put the following lines into the **manager.conf** file:

```
urlid immotool
url jdbc:hsqldb:hsql://localhost:9001/immotool
username SA
password test1234
```

```
urlid mydb
url jdbc:hsqldb:hsql://localhost:9001/mydb
username SA
password test2345

urlid anotherdb
url jdbc:hsqldb:hsql://localhost:9001/anotherdb
username SA
password test3456
```

(Replace the password accordingly.)

You can find furter information about this configuration file in the HSQLDB documentation[3].

> The **manager.conf** contains sensitive information. Only the users of the operating system, who are allowed to use the manager applications, should be able to read this file.

5.3.4 Configure SSL encryption

If ImmoTool-Server was installed outside of the local network or if connections from the internet are allowed, it is recommended to use encrypted communication between ImmoTool and ImmoTool-Server.

In other cases it also might make sense to use encryption because it improves security and integrity during data transfers. But keep in mind, that encryption will slow down the connection speed a bit and will increase the amount of computation time.

> ImmoTool-Server does **not** allow to use encrypted and unencrypted at the same time. You need to decide which way you want to go and have to configure **all** ImmoTool installations in your network accordingly (see "Use SSL encryption in ImmoTool").

5.3.4.1 Create SSL certificate

In order to provide SSL encryption you need to create a SSL certificate in the first step. The certificate ensures the trustworthiness of ImmoTool-Server towards the client applications.

ImmoTool-Server provides an application for easily creating a SSL certificate.

- On Windows systems you can select the following start menu entry **"OpenEstate-ImmoServer → Management → Create SSL certificate"** to start the application.

---

[3]http://hsqldb.org/doc/2.0/util-guide/sqltool-chapt.html#sqltool_auth-sect

- On macOS systems you can open the application bundle **"OpenEstate-ImmoServer"** and start the **"SslInit"** application.

- Alternatively you can open the **bin** subfolder of the application directory. From there you can start the application via **SslInit.exe** / **SslInit.bat** / **SslInit.sh**.

After the application was started a terminal window will show up with the following output:

```
--------------------------------------------------------------------
Generate RSA key pair and certificate for SSL encryption.
--------------------------------------------------------------------

Enter the ip-address / hostname of this server: 192.168.178.123
Enter the password to access the keystore:
Enter the password to access the keystore again: 
```

Figure 5.5: Configure the SSL certificate

1. Enter the **IP address** (or hostname), that is used for connection to the ImmoTool-Server. The SSL certificate is created exactly for this address. All applications, that are connecting to ImmoTool-Server, will have to use the provided address.

2. In the next step you have to enter a **keystore password**, that is used to protect the certificate from external modification. Note down the chosen password because it is needed afterwards.

After these settings were entered the application will create a **ssl** subfolder in the configuration directory. All created files are stored into this folder. The following summary is shown after the program finished its job:

```
-------------------------------------------------------------------------
Creating files for SSL encryption...
-------------------------------------------------------------------------

Writing private key to '/opt/OpenEstate-ImmoServer/etc/ssl/private.key'.
Writing public key to '/opt/OpenEstate-ImmoServer/etc/ssl/public.key'.
Writing certificate to '/opt/OpenEstate-ImmoServer/etc/ssl/private.crt'.
Writing keystore to '/opt/OpenEstate-ImmoServer/etc/ssl/keystore.jks'.

-------------------------------------------------------------------------
SSL encryption was successfully prepared!
-------------------------------------------------------------------------

Follow these steps in order to enable SSL encryption.

(1) Open the following configuration file with a text editor:

/opt/OpenEstate-ImmoServer/etc/server.properties

(2) Change the following values in the configuration file:

server.tls=true
system.javax.net.ssl.keyStorePassword=test1234

(3) Restart OpenEstate-ImmoServer.

-------------------------------------------------------------------------

Press ENTER to exit this application.
█
```

Figure 5.6: Summary about the SSL certificate

The **ssl** subfolder in the configuration directory contains sensitive information. Only the users of the operating system, who are allowed to start ImmoTool-Server, should be able to read this file.

As an alternative to the application you can create the SSL certificate manually with the following commands:

```
keytool -genkey \
  -alias OpenEstate-ImmoServer \
  -keyalg RSA -validity 999 \
  -keystore keystore.jks \
  -storetype JKS

keytool -export \
  -alias OpenEstate-ImmoServer \
  -keystore keystore.jks \
  -rfc -file private.crt
```

The **`keytool`** application is located in the **`bin`** subfolder of the Java runtime environment. The files created by the **`keytool`** applications have to be placed into the **`ssl`** subfolder of the configuration directory.

5.3.4.2 Enable SSL encryption

In the next step SSL encryption has to be enabled in the ImmoTool-Server. Edit the **`server.properties`** file in the configuration directory with a text editor. The following lines need to be changed:

```
# TLS/SSL (secure) sockets
server.tls=true
system.javax.net.ssl.keyStore=${openestate.server.etcDir}/ssl/keystore.jks
system.javax.net.ssl.keyStorePassword=test1234
```

- The value after **`server.tls`** has to be set to **`true`** in order to enable SSL encryption.

- The value after **`system.javax.net.ssl.keyStore`** contains the path to the previously created keystore file (**`keystore.jks`**). In most cases you do **not** need to change this value.

- The value after **`system.javax.net.ssl.keyStorePassword`** is the keystore password, that was chosen during the creation of the SSL certificate.

Restart ImmoTool-Server in order to make the changes take effect.

The character string **`${openestate.server.etcDir}`** is automatically replaced with the configured path of the configuration directory.

5.3.4.3 Use SSL encryption in ImmoTool

If a new remote project is created in ImmoTool, you need to select the protocol **"hsqls"** in the *project wizard* dialog.

Add link to the project wizard in the usage section.

Figure 5.7: Enable SSL encryption in the project wizard

If an existing remote project is opened, you might also enable SSL encryption. Click on the **"Modify server connection settings."** checkbox and select the protocol **"hsqls"**. This setting is stored permanently for the project and does not have to be set again.

Figure 5.8: Enable SSL encryption during login

5.3.4.4 Use SSL encryption in AdminTool

If a connection is established with AdminTool, you need to select the protocol **"hsqls"** in the connection dialog.

Figure 5.9: Enable SSL encryption in AdminTool

5.3.4.5 Use SSL encryption in manager applications

The manager application are configured with the **manager.conf** file in the configuration directory.

Modify this file with a text editor and update the value behind **url** for all configured databases.

- Instead of **hsql://** you need to use **hsqls://**.
- Replace **localhost** with the hostname, that was chosen while creating the SSL certificate.

The three example databases from the "Configure manager applications" chapter would have to be changed like this:

```
urlid immotool
url jdbc:hsqldb:hsqls://192.168.178.123:9001/immotool
username SA
password test1234

urlid mydb
url jdbc:hsqldb:hsqls://192.168.178.123:9001/mydb
username SA
password test2345

urlid anotherdb
url jdbc:hsqldb:hsqls://192.168.178.123:9001/anotherdb
username SA
password test3456
```

5.4 Setup a service for ImmoTool-Server

For the everyday operations it is useful to integrate ImmoTool-Server as a service into the operating system. This allows ImmoTool-Server to start **automatically** in background while the system is booting. The administrator can control the service from the outside (start / stop / restart).

5.4.1 Setup service on Windows

In order to install and control the service for ImmoTool-Server on Windows systems the Open Source software commons-daemon[4] provided by the Apache Software Foundation[5] is used. The applications in the **bin\service** subfolder of the application directory are provided by the "commons-daemon" project.

5.4.1.1 Install service on Windows

The service for ImmoTool-Server can be registered in the operating system in the following ways:

- Open the start menu and select the shortcut **"OpenEstate-ImmoServer → Service → Install ImmoServer service"**.

- Open the **bin** subfolder in the application directory and start the **ServiceInstall.bat** script with a double click.

Because services can only be registered by an administrator the operating system might ask for administrative permissions.

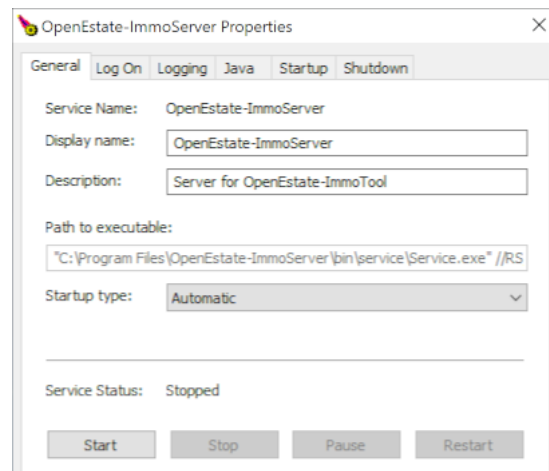After the service was successfully installed a dialog window will show up, which allows further configuration.

---

[4]https://commons.apache.org/daemon/
[5]https://apache.org/

Figure 5.10: Manage the service on Windows

For example you might change the path of the application directories in the **"Java"** tab (see "Directories of ImmoTool-Server"):
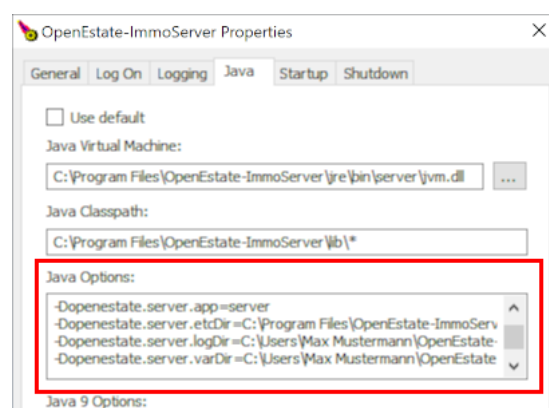

Figure 5.11: Change directories in service management application

After settings were changed click on the **"Submit"** button. You can close the dialog window afterwards or start the service in the **"General"** tab by clicking the **"Start"** button.

If ImmoTool-Server was started for the first time, the operating system may ask to allow incoming connections for ImmoTool-Server. You should answer this question by clicking the **"Allow access"** button.
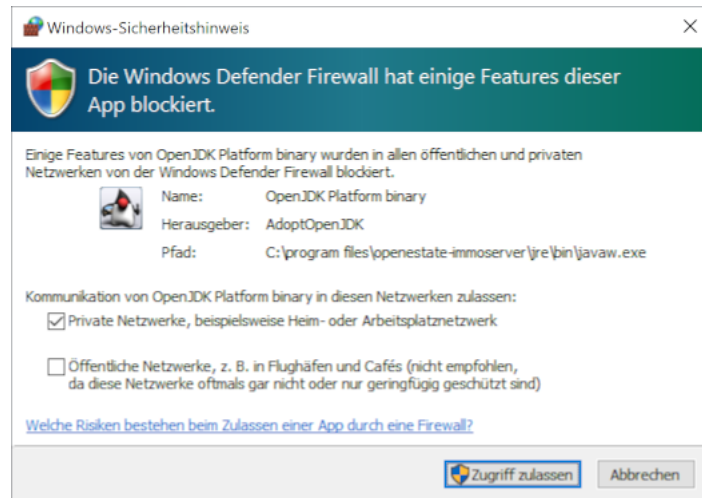
Figure 5.12: Grant access in the Windows firewall

5.4.1.2 Uninstall service on Windows

The service for ImmoTool-Server can be removed from the operating system in the following ways:

- Open the start menu and select the shortcut **"OpenEstate-ImmoServer → Service → Uninstall ImmoServer service"**.

- Open the **bin** subfolder in the application directory and start the **ServiceUninstall.bat** script with a double click.

A command line window will show up, which removes the service from the operating system. You will see a success or error message in this window after the application was finished.

ℹ | If ImmoTool-Server is regularly uninstalled, a previously registered service is automatically removed.

5.4.1.3 Manage service on Windows

ImmoTool-Server provides an application for management / configuration of the service. You may start the application in one of the following ways:

- Open the start menu and select the shortcut **"OpenEstate-ImmoServer → Service → Manage ImmoServer service"**.

- Open the **bin\service** subfolder in the application directory and start the **OpenEstate-ImmoServer.exe** application with a double click.

This application provided by the Apache Software Foundation allows modification of the service. Also the service can be started / stopped from this application.

Alternatively you might use the service management provided by the Windows operating system.

1. Press the **"Windows key"** together with the letter **"R"** to open a window for command execution. Alternatively you can open the command prompt.

2. Enter the command `services.msc` and press the **"ENTER"** key.

The service management window provided by the Windows operating system will show up:
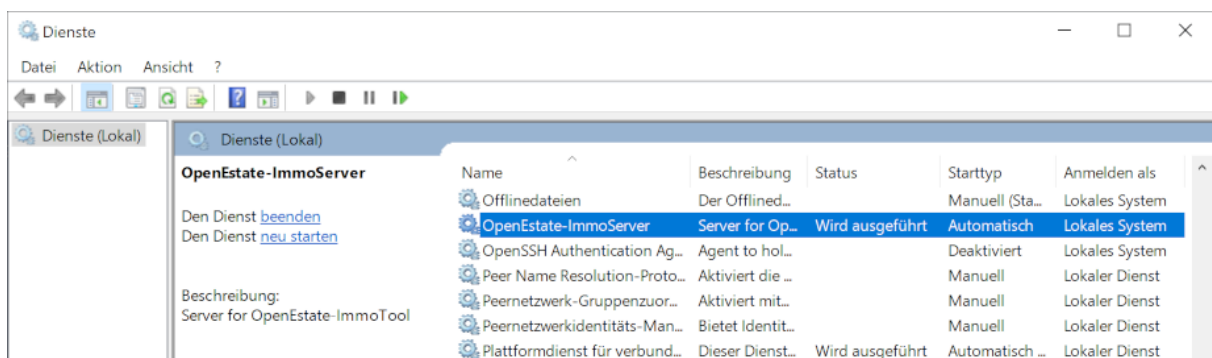

Figure 5.13: Windows service management

You might start / stop the service in this window or edit certain settings with a double click.

Provide an English screenshot.

5.4.1.4 Start service on Windows

After the service was installed (see "Install service on Windows") you might start the service manually in of these ways:

- Open the start menu and select the shortcut **"OpenEstate-ImmoServer → Service → Start ImmoServer service"**.

- Open the **bin** subfolder in the application directory and start the **ServiceStart.bat** script with a double click.

- Open the provided service management application and click the **"Start"** button (see "Manage service on Windows").

- Open the service dialog of the Windows operating system, select the service **"OpenEstate-ImmoServer"** and click on the top left at **"Start the service"** button (see "Manage service on Windows").

Figure out the correct naming in the Windows service dialog.

By default the service will **start automatically** while the Windows system is booting. Therefore in most cases it is not possible to start the service manually.

5.4.1.5 Stop service on Windows

After the service was installed (see "Install service on Windows") you might stop the service manually in of these ways:

- Open the start menu and select the shortcut **"OpenEstate-ImmoServer → Service → Stop ImmoServer service"**.

- Open the **bin** subfolder in the application directory and start the **ServiceStop.bat** script with a double click.

- Open the provided service management application and click the **"Stop"** button (see "Manage service on Windows").

- Open the service dialog of the Windows operating system, select the service **"OpenEstate-ImmoServer"** and click on the top left at **"Stop the service"** button (see "Manage service on Windows").

Figure out the correct naming in the Windows service dialog.

5.4.2 Setup service on macOS

On macOS the service is controlled with the launchd[6] application, which is part of the operating system. The service is registered by creating a file **org.openestate.tool.server.service.plist** in the **/Library/LaunchDaemons** directory.

You might modify the created service file by yourself in order to make individual adjustments (see tutorial for launchd[a]). But in most cases this should not be necessary.

5.4.2.1 Install service on macOS

Open the application bundle **"OpenEstate-ImmoServer"** and start the **"ServiceInstall"** application. A terminal window will show up, which will guide you through the installation of the service.

---

[6]https://en.wikipedia.org/wiki/Launchd
[a]http://www.launchd.info/

```
./ServiceInstall.sh
Which user should execute the service [default is root]: openestate
Which group should execute the service [default is openestate]: openestate
Do you want to install a timer for automatic daily backups (yes/no)? [default is yes]: yes▯
```

Figure 5.14: Installing the service on macOS

The application requires administrative permissions. While the application is running you might get asked for an administrator password.

You can select the following options during the installation of the service:

- You can enter the user name, that executes ImmoTool-Server.

- You can enter the group name, that executes ImmoTool-Server.

- You might enable a timer for daily automatic backups (see "Automatic backup on macOS"). In order to make these backups work properly you also have to configure the manager applications properly (siehe "Configure manager applications").

The service file **org.openestate.tool.server.service.plist** is created in the directory **/Library/LaunchDaemons** after all questions have been answered.

```
--------------------------------------------------------------------
The service was successfully registered as a launchd daemon at:

/Library/LaunchDaemons/org.openestate.tool.server.service.plist

The service will start automatically with the next system boot.
--------------------------------------------------------------------
You can start the service manually via:

sudo launchctl start org.openestate.tool.server.service
--------------------------------------------------------------------
You can stop the service manually via:

sudo launchctl stop org.openestate.tool.server.service
--------------------------------------------------------------------
You can check the service status via:

sudo launchctl list org.openestate.tool.server.service
--------------------------------------------------------------------
IMPORTANT NOTICE:

Daily automatic backups were enabled. Please make sure, that the
connection settings for the databases to backup are properly set in:

/Applications/OpenEstate-ImmoServer.app/Contents/MacOS/OpenEstate-Immo

Otherwise automatic backups will fail!
See https://manual.openestate.org for more information.
--------------------------------------------------------------------
```

Figure 5.15: Summary after the service was installed on macOS

Beim ersten Start des ImmoTool-Servers werden Sie vom Betriebssystem eventuell gefragt, ob einge-hende Verbindungen akzeptiert werden sollen. Diese Frage sollte mit **"Erlauben"** beantwortet werden.

Figure 5.16: Grant access in the macOS firewall

5.4.2.2 Uninstall service on macOS

Open the application bundle **"OpenEstate-ImmoServer"** and start the **"ServiceUninstall"** applica-tion. A terminal window will show up, which will remove the service from the operating system.

The application requires administrative permissions. While the application is running you might get asked for an administrator password.

5.4.2.3 Start service on macOS

After the service was installed (see "Install service on macOS") you might start the service manually in of these ways:

- Open the application bundle **"OpenEstate-ImmoServer"** and start the **"ServiceStart"** application.

- Open the Terminal and execute the following command:

  ```
  sudo launchctl start org.openestate.tool.server.service
  ```

> By default the service will **start automatically** while the macOS system is booting. Therefore in most cases it is not possible to start the service manually.

5.4.2.4 Stop service on macOS

After the service was installed (see "Install service on macOS") you might stop the service manually in of these ways:

- Open the application bundle **"OpenEstate-ImmoServer"** and start the **"ServiceStop"** application.

- Open the Terminal and execute the following command:

  ```
  sudo launchctl stop org.openestate.tool.server.service
  ```

5.4.3 Setup service on Linux

On Linux the service is controlled with the systemd[7] application, which is part of the operating system. The service is registered by creating a file called **openestate-immoserver.service** in the **/etc/systemd/system** directory.

> Most Linux distributions are using "systemd". To be on the safe side you should check, if you operating system also uses this software, before the service is installed.

> You might modify the created service file by yourself in order to make individual adjustments (see manual of launchd[a]). But in most cases this should not be necessary.

---

[7]https://en.wikipedia.org/wiki/Systemd
[a]https://www.freedesktop.org/software/systemd/man/systemd.service.html

5.4.3.1 Install service on Linux

If ImmoTool-Server was installed with the **Debian** package, the service is already installed. In this case **no further steps are necessary** to install the service.

If ImmoTool-Server was installed with the **TAR.GZ** package, open the **bin** subfolder of the application directory and start the **ServiceInstall.sh** script.

```
./ServiceInstall.sh
Which user should execute the service [default is root]: openestate
Which group should execute the service [default is openestate]: openestate
Do you want to install a timer for automatic daily backups (yes/no)? [default is yes]: yes
```

Figure 5.17: Installing the service on Linux

The application requires administrative permissions. While the application is running you might get asked for an administrator password.

You can select the following options during the installation of the service:

- You can enter the user name, that executes ImmoTool-Server.

- You can enter the group name, that executes ImmoTool-Server.

- You might enable a timer for daily automatic backups (see "Automatic backup on Linux"). In order to make these backups work properly you also have to configure the manager applications properly (siehe "Configure manager applications").

If all questions have been answered, the service file **openestate-immoserver.service** is created in the **/etc/systemd/system** directory.

```
  ------------------------------------------------------------------
  The service was successfully registered as a systemd unit at:

  /etc/systemd/system/openestate-immoserver.service

  The service will start automatically with the next system boot.
  ------------------------------------------------------------------
  You can start the service manually via:

  sudo systemctl start openestate-immoserver
  ------------------------------------------------------------------
  You can stop the service manually via:

  sudo systemctl stop openestate-immoserver
  ------------------------------------------------------------------
  You can check the service status via:

  sudo systemctl status openestate-immoserver
  ------------------------------------------------------------------
  IMPORTANT NOTICE:

  Daily automatic backups were enabled. Please make sure, that the
  connection settings for the databases to backup are properly set in:

  /opt/OpenEstate-ImmoServer/etc/manager.conf

  Otherwise automatic backups will fail!
  See https://manual.openestate.org for more information.
  ------------------------------------------------------------------
```

Figure 5.18: Summary after the service was installed on Linux

5.4.3.2 Uninstall service on Linux

Open the **bin** subfolder in the application directory and start the **ServiceUninstall.sh** script.

The application requires administrative permissions. While the application is running you might get asked for an administrator password.

5.4.3.3 Start service on Linux

After the service was installed (see "Install service on Linux") you might start the service manually in of these ways:

- Open the **bin** subfolder of the application directory and start the **ServiceStart.sh** script.

- Open the console and execute the following command:

  ```
  sudo systemctl start openestate-immoserver
  ```

Standardmäßig wird der Dienst unter Linux **automatisch gestartet** sobald der Rechner hochgefahren wird. Daher ist es in der Regel nicht nötig den Dienst von Hand zu starten.

5.4.3.4 Stop service on Linux

After the service was installed (see "Install service on Linux") you might stop the service manually in of these ways:

- Open the **bin** subfolder of the application directory and start the **ServiceStop.sh** script.

- Open the console and execute the following command:

    sudo systemctl stop openestate-immoserver

5.5 Updating ImmoTool-Server

ImmoTool-Server is updated much more rarely compared to ImmoTool. In contradiction to ImmoTool the ImmoTool-Server does **not check for updates automatically**. Therefore you should visit the OpenEstate website[8] regularly or subscribe to the RSS feed[9] in order to get notifications about updates.

Download the installation package for your operating system and start the installation process (see "Installing ImmoTool-Server"). Thereby keep the following notices for your operating system in mind.

Always close the ImmoTool-Server application before starting the update process.

In order to avoid a data loss in case of an error, it is recommended to backup the data directory before starting the update procedure.

5.5.1 Update on Windows

The **EXE** installer automatically detects, where the application was installed beforehand and will update the files accordingly.

If you made custom modifications to the configuration directory, you should backup all files in this directory before installing the update. Afterwards you can copy the modified files back.

---

[8] https://openestate.org/
[9] https://openestate.org/news/feed/en/rss/

5.5.2 Update on macOS

Move the application symbol of **"OpenEstate-ImmoServer"** to the same location, where ImmoTool-Server was installed beforehand. The operating system will show the following question:
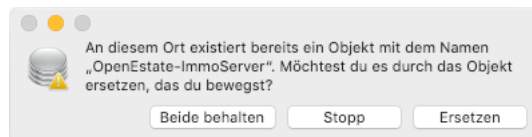
Figure 5.19: Question about overwriting on macOS

Provide an English screenshot.

Answer this question in the dialog window by clicking on **"Replace"**.

5.5.3 Update on Debian, Ubuntu or similar

If the Debian repository was configured in your operating system (see "Obtain packages from the Debian repository"), you do **not** have to download the updated version from the OpenEstate website. Instead you can execute the following commands:

```
sudo apt update
sudo apt install openestate-immoserver
```

If you do **not** use the Debian repository but installed the program from the **Debian** package, you can download the **DEB** installation package. Install the downloaded package with a double click or via the following command:

```
sudo dpkg -i openestate-immoserver_x.y.z_amd64.deb
```

(Replace **x.y.z** with the version number of the downloaded file.)

If you made custom modifications to the configuration directory, you should backup all files in this directory before installing the update. Afterwards you can copy the modified files back.

5.5.4 Update on Linux

1. Find out the path, where ImmoTool-Server was installed beforehand.
2. Download the **TAR.GZ** installation package for your Linux system and extract the file on your computer.
3. Rename the folder, you have determined in step 1 - e.g. **OpenEstate-ImmoServer-OLD**.

4. Create a new / empty folder with the name, you have determined in step 1 - e.g. **OpenEstate-ImmoServer**.

5. Copy the files, that were extracted in step 2 into the newly created / empty folder.

After you have been able to properly start the application in the updated version you might remove the temporary folder created in step 3.

⚠ If you made custom modifications to the configuration directory, you should backup all files in this directory before installing the update. Afterwards you can copy the modified files back.

5.5.5 Important advices for certain versions

This section contains advices about updates to certain application versions.

5.5.5.1 Update from version 1.0-beta to 1.x

ImmoTool-Server 1.0.0 introduced some major changes, that should be considered during an update from version 1.0-beta.

New directories

In contrast to the 1.0-beta version ImmoTool-Server does not save the databases in the application directory anymore. Before the old application directory is removed, you **absolutely should backup the contents of the var/data subfolder** from the old application directory.

After the new version of ImmoTool-Server was installed, start the application for the first time and shutdown the application afterwards immediately. This will create the new data directory. Open this directory and copy the previously saved contents of the **var/data** subfolder into the newly created **data** subfolder of the data directory.

You should find an already existing **data** subfolder. Remove or rename this folder before copying files into it.

Future updates of ImmoTool-Server 1.x do not require these steps and should work flawlessly.

New mechanism for services

Installation of services have been completely reworked with ImmoTool-Server 1.0.0. If you are using a service for the previous version, you should **remove the service from the operating system before starting the update**. In order to remove the service execute the **ServiceUninstall.bat** or **ServiceUninstall.sh** script in the **bin** directory of the old ImmoTool-Server installation.

After the new version of ImmoTool-Server was installed you can reinstall its service (see "Setup a service for ImmoTool-Server").

Future updates of ImmoTool-Server 1.x do not require these steps and should work flawlessly.

New installation routine for Windows & macOS

A **new installation routine** was implemented for **Windows** and **macOS** systems (EXE and DMG installation packages). The new installation packages are not compatible with the old update procedure. Please make sure, that you **do not overwrite** the previous ImmoTool-Server version while installing the update. Therefore we are recommending the following approach:

- Find out, in which folder ImmoTool-Server 1.0-beta is currently installed on your hard drive.

    – If the application is located on Windows systems at `C:\Programme\OpenEstate-ImmoServer`, you should rename this folder - e.g. in `C:\Programme\OpenEstate-ImmoServer-OLD`.

    – On macOS systems there should not be a problem with the naming of the folder. But nevertheless you should figure out, where the application is located.

- On Windows you should remove of the application (from the Desktop or start menu). On macOS you might remove the application from the Dock.

- Start the installation procedure (see "Installing ImmoTool-Server").

- If the application was successfully updated and the database was copied (see "New directories"), you can remove the installation folder of ImmoTool-Server 1.0-beta.

Future updates of ImmoTool-Server 1.x do not require these steps and should work flawlessly.

Java can be removed

Since version 1.0.0 Java is bundled together with the ImmoTool-Server application. Therefore you can **remove Java from your operating system** as long as you do not need it for other applications.

- On Windows you can open the system control panel and open the section for software removal. You should find an entry for **"Oracle Java"**, that can be removed.

- On macOS you can follow these steps in order to remove **"Oracle Java"**:

    1. Click on the **"Finder"** icon located in your dock.

    2. Click on **"Go"** in the Finder menu.

    3. Click on **"Utilities"**.

4. Double-click on the **"Terminal"** icon.

5. In the Terminal window copy and paste the commands below:

```
sudo rm -fr /Library/Internet\ Plug-Ins/JavaAppletPlugin.plugin
sudo rm -fr /Library/PreferencePanes/JavaControlPanel.prefPane
sudo rm -fr ~/Library/Application\ Support/Oracle/Java
```

(quoted from the official instructions by Oracle[10])

- On Linux you might remove **"OpenJDK"** via the package system of your distribution. Or if **"Oracle Java"** was installed, you might remove its installation folder manually.

5.6 Reset the password of a database user

This chapter describes different approaches how to reset the password of a database user.

5.6.1 Reset the password via AdminTool

If the password of a database user got lost, the administrator can login to AdminTool and assign a new password for the user in the user management (see "Manage user accounts").

As long as a password of at least one database user with administrative permissions is known this procedure can be used to reset the password of all users (even of other administrators).

5.6.2 Reset the password without administrator access

If the password of the database administrator is not known anymore, you can follow these steps in order to reset the password:

1. Stop ImmoTool-Server, if it is currently running.

2. Open the **db.script** file from the database directory in a text editor. By default the database directory is placed in the **data/immotool** subfolder of the data directory.

   Create a backup of the **db.script** file before making any changes. Possible mistakes might lead to a defective database.

3. Search in the **db.script** file for a line starting with:

```
CREATE USER SA PASSWORD DIGEST
```

---

[10]https://www.java.com/en/download/help/mac_uninstall_java.xml

Replace the line with the following line:

```
CREATE USER SA PASSWORD DIGEST '16d7a4fca7442dda3ad93c9a726597e4'
```

4. Save the modified **db.script** file and restart ImmoTool-Server.

5. The password of the database administrator **SA** was changed to **test1234**. From now on you can use this password to login to the database via AdminTool / ImmoTool.

For security reasons you should connect to the database with AdminTool and enter a new secret password for the **"SA"** user (see "Manage user accounts").

6 Further notes about administration

6.1 AdminTool

AdminTool is a **helper application for administrators** to manage ImmoTool databases. In most cases the application is used in conjunction with multi-user installations - e.g.

- to prepare a new database to make it usable for ImmoTool,
- to manage user accounts in the database,
- to set permissions for database users or
- to execute commands on the database.

6.1.1 Starting AdminTool

AdminTool is installed together with the ImmoTool application (see "Installing ImmoTool").

6.1.1.1 Start AdminTool on Windows

You can find a folder called **"OpenEstate-ImmoTool"** in the start menu, that contains a shortcut to start AdminTool.

Besides this you may start the application by executing the **AdminTool.exe** (or **ImmoTool.bat**) file in the **bin** subfolder of the application directory.

6.1.1.2 Start AdminTool on macOS

Open the application bundle called **"OpenEstate-ImmoTool"** with a double click. This will open a Finder window with the applications provided by ImmoTool.
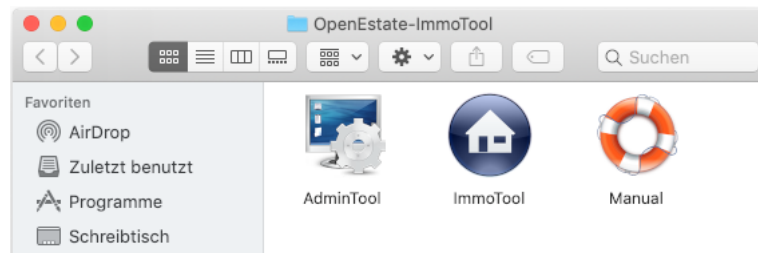
Figure 6.1: Finder window with ImmoTool applications

Provide an English screenshot.

A double click on the **"AdminTool"** application will start the application.

You may integrate the **"AdminTool"** application symbol into the Dock for future application starts (see documentation by Apple[a]).

Besides this you may start the application by executing the **AdminTool.sh** file in the **bin** subfolder of the application directory.

6.1.1.3 Start AdminTool on Linux

If ImmoTool was installed with the **Debian** package, you will find an entry called **"OpenEstate-AdminTool"** in your start menu.

If ImmoTool was installed with the **TAR.GZ** package, you may have to start the **StartMenuAdd.sh** script in the **bin** subfolder of the application directory in order to create the start menu entry for AdminTool.

Alternatively you may start the application by executing the **AdminTool.sh** script in the **bin** subfolder of the application directory.

6.1.2 Connecting with a database

If AdminTool was started, you will see the following dialog window. You need to enter the connection settings for the database into this window.

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[a]https://support.apple.com/en-us/HT201730
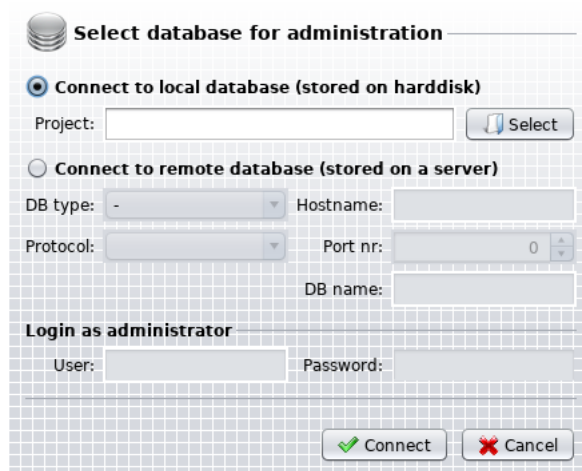
Figure 6.2: Connecting with a database via AdminTool

There are two possible ways to connect with a database via AdminTool.

6.1.2.1 Connect via project folder

You may connect to a database of a previously created project (single-user or multi-user). In this case you need to select the project directory on the hard drive by clicking the button **"Select"**.
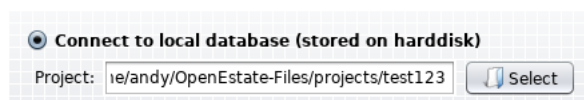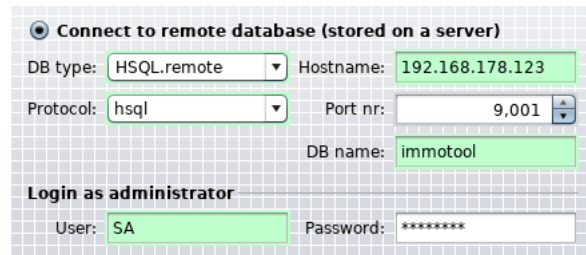
Figure 6.3: Connect to database via project folder

In this case AdminTool will use the connection settings provided by the selected project.

If the folder of a remote project (multi-user installation) was selected, you will also have to enter the login credentials of the database administrator into the **"User"** and **"Password"** field. In most cases the user name of the database administrator is **"SA"**.

6.1.2.2 Connect via explicit configuration

You may also connect to a database by explicitly entering the connection settings.

Figure 6.4: Connect to database via explicit configuration

The following settings can be entered:

- **DB type:**

  Select the option **"HSQL.remote"**.

- **Protocol:**

  In normal case you should select the option **"hsql"**. If the ImmoTool-Server was configured for SSL encryption, you have to select the option **"hsqls"** (see "Configure SSL encryption").

- **Hostname:**

  Enter the IP address or hostname of the computer, on which ImmoTool-Server was installed. In case AdminTool was started from the same computer you can keep the hostname **"localhost"** untouched.

- **Port nr:**

  By default the port number is **"9001"**. Only if ImmoTool-Server was configured for another port number, this value has to be changed.

- **DB name:**

  By default the name of the database is **"immotool"**. Only if another database with another name was configured in ImmoTool-Server, this value has to be changed.

- **User:**

  The login name of the database administrator is **"SA"**. In most cases this value has not to be changed.

- **Password:**

  If a first connection to the ImmoTool-Server is established, this value can stay empty. After a password was set for the database administrator it has to be entered here.

6.1.3 Toolbar

AdminTool shows a toolbar on top with the following button.
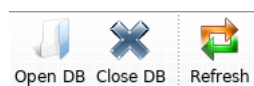
Figure 6.5: Toolbar of AdminTool

- **Open DB:**
  Open a new connection to a database. A currently opened database connection will be closed.

- **Close DB:**
  Close the connection to the current database.

- **Refresh:**
  Reload all tabs shown in the AdminTool.

6.1.4 Edit company data

After a database connection was established you can find the **"Agency"** tab, which shows the currently used company data / logo. You may edit these settings within this tab.

Figure 6.6: Edit company data

- Click within the tab on the **"Refresh"** button in order to reload all company data from the database.
- Click within the tab on the **"Submit"** button in order to save modified company data to the database.
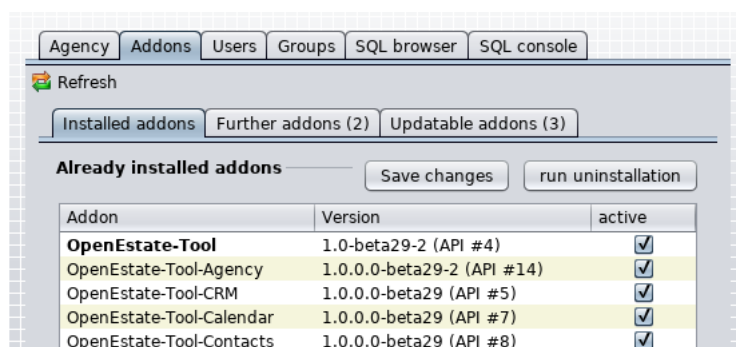
6.1.5 Manage addons

After a database connection was established you can find the **"Addons"** tab, which shows information about currently used addons.

- Click within the tab on the **"Refresh"** button in order to reload addon information from the database.

6.1.5.1 Manage installed addons

The tab **"Installed addons"** shows a tabular view of addons, that are currently installed in the project database.

Figure 6.7: Table of currently installed addons

Enable / Disable addons

An addon has to be enabled by the administration in order to make it available for database users within the project.

You may enable or disable an addon by clicking into the **"active"** table column. After clicking the **"Save changes"** button the settings are saved into the database.

Uninstall addons
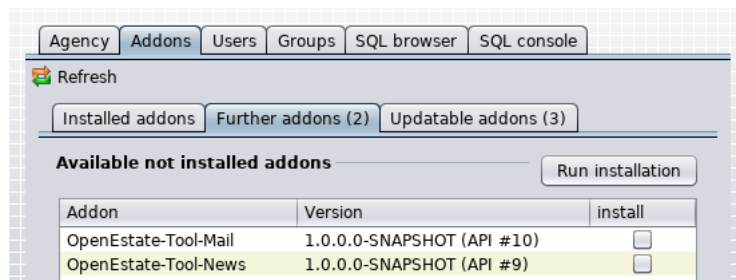
Select the addon to uninstall from the table by selecting its table row. Afterwards click on the **"Run uninstallation"** button in order to remove the selected addon from the database completely.

Uninstalling an addon from the database means, that all of its previously stored data is being removed from the database.

6.1.5.2 Install further addons

An addon can be available in the ImmoTool plugin directory, but it might not installed into the database yet. Those addons are shown in the table within the **"Further addons"** tab.
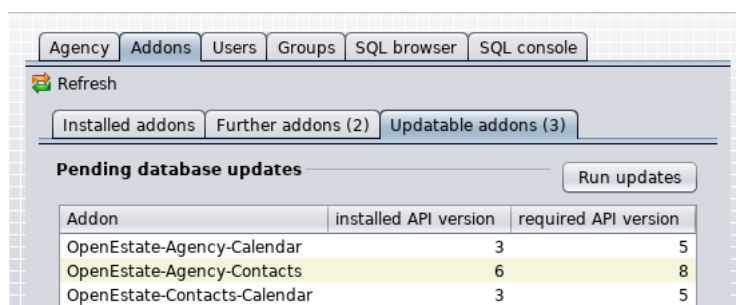

Figure 6.8: Table of further addons

You may install those addon by clicking into the **"Install"** table column. After clicking the **"Run installation"** button the addons are installed into the database.

6.1.5.3 Update addons

The tab **"Updatable addons"** shows a tabular view of addons and extensions, that are already installed into the database but need to be updated because a newer version is available on the hard drive.

Figure 6.9: Table of updatable addons

In order to install an available update select the corresponding table rows and click on the **"Run updates"** button.

An addon or extension is only usable within ImmoTool, of the installed API version is equal to the required API version by the addon on the hard drive.

6.1.6 Manage user accounts

After a database connection was established you can find the **"Users"** tab, which provides user manage-ment. On multi-user installations you configure any number of users, that may work on the database at the same time.
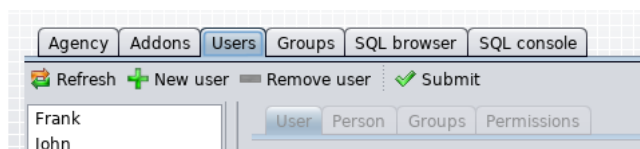

Figure 6.10: Manage user accounts

On the left side of the tab there is a list of user accounts, that are currently registered in the database. Click on one of these accounts in order to manage their settings.

On the right side of the tab the information about the currently selected user account is shown.

The following action buttons are available on the top of the tab:

- Click on the **"Refresh"** button in order to reload user information from the database.
- Click on the **"New user"** button in order to create a new user account.
- Click on the **"Remove user"** button in order to remove the selected user account.
- Click on the **"Submit"** button in order to permanently save all previously made modifications.

After any modification you need to click the **"Submit"** button. Otherwise these changes are not stored into the database.

6.1.6.1 General user data

If a user account was selected for modification, its general data is shown on the right side in the **"User"** tab.

Figure 6.11: General data of an user account

- **Login name for the user:**
  This name is used by the user in order to login at the database. The chosen name has to be unique within the database / project.

- **Password for the user:**
  This password is used by the user in order to login at the database. Enable the checkbox **"Change password"** to change a previously saved password afterwards.

- **User is enabled:**
  This checkbox has to be selected, in order to allow the user to login at the database. If this checkbox is enabled, the user will automatically become a member of the **"IMMOTOOL"** group.

- **User has administrator privileges:**
  Enable this option in order to grant all permissions in the database to the user. An administrator can access all data, may add other user accounts, may install addons, etc. It is not necessary to assign any permissions to an administrator because he owns all permissions by default.

- **Notes for the user:**
  You may enter some internal notes about the user account into this text field.

- **Effective permissions:**
  This table shows the effective permissions of the user. This includes permissions, that have been directly assigned to him or that he has gotten by his group memberships.

⚠️ If the database of a single-user installation is managed in AdminTool, you should not change the password of the **"SA"** user. In this particular case the password should always be empty.

6.1.6.2 Personal user data

If a user account was selected for modification, its personal data is shown on the right side in the **"Person"** tab.

Figure 6.12: Personal data of an user account

🛈 ❘ The user might change his personal data via ImmoTool by himself, if he has the required permissions.

6.1.6.3 User memberships

If a user account was selected for modification, its group memberships are shown on the right side in the **"Groups"** tab.

Figure 6.13: Group memberships of an user account

The table shows the groups, that are currently available in the database. By clicking on the checkbox in the **"assigned"** column you might assign one or more groups to the user.

🛈 ❘ The user gains all permissions, that have been assigned to the groups of his memberships.

🛈 ❘ The user automatically becomes a member of the **"IMMOTOOL"** group, if his account was activated in the **"User"** tab.

6.1.6.4 User permissions

If a user account was selected for modification, its permissions are shown on the right side in the **"Permissions"** tab.
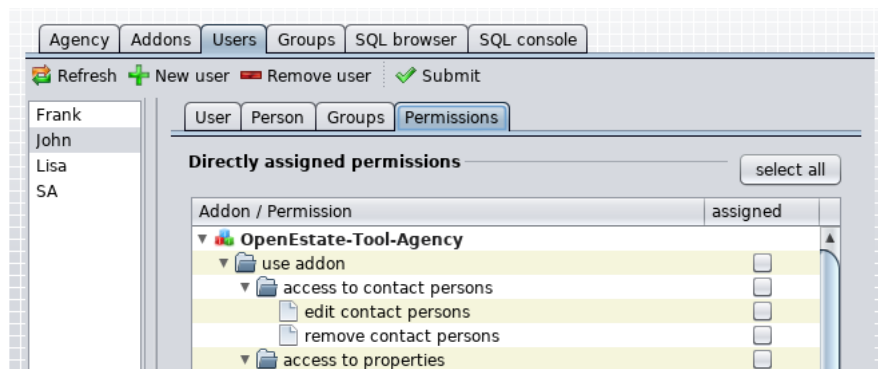

Figure 6.14: Permissions of an user account

The table shows the permissions, which are defined by installed addons. By clicking on the checkbox in the **"assigned"** column you might assign one or more permissions to the user.

Instead of explicitly assigning permissions to a certain user, its often a better way to use user groups. In this case the permissions only have to be set once for the group. Each user, who becomes a member of the group, will automatically gain these permissions.

6.1.7 Manage user groups

After a database connection was established you can find the **"Groups"** tab, which provides group management.

Generally you can combine multiple users into multiple groups. By becoming a member of a group a user will automatically gain all permissions, that were assigned to the group.
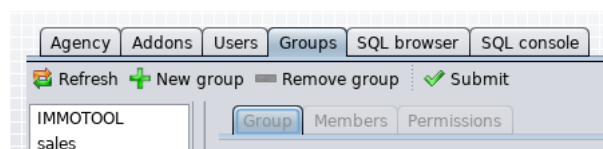

Figure 6.15: Manage user groups

On the left side of the tab there is a list of groups, that are currently registered in the database. Click on one of these groups in order to manage their settings.

On the right side of the tab the information about the currently selected user group is shown.

The following action buttons are available on the top of the tab:

- Click on the **"Refresh"** button in order to reload group information from the database.
- Click on the **"New group"** button in order to create a new user group.
- Click on the **"Remove group"** button in order to remove the selected user group.
- Click on the **"Submit"** button in order to permanently save all previously made modifications.

> After any modification you need to click the **"Submit"** button. Otherwise these changes are not stored into the database.

6.1.7.1 General group data

If a user group was selected for modification, its general data is shown on the right side in the **"Group"** tab.

Figure 6.16: General data of an user group

- **Name of the group:**
  Enter a proper name, that describes the user group. The chosen name has to be unique within the database / project.

- **Notes for the group:**
  You may enter some internal notes about the user group into this text field.

6.1.7.2 Assign user accounts

If a user group was selected for modification, its group members are shown on the right side in the **"Members"** tab.
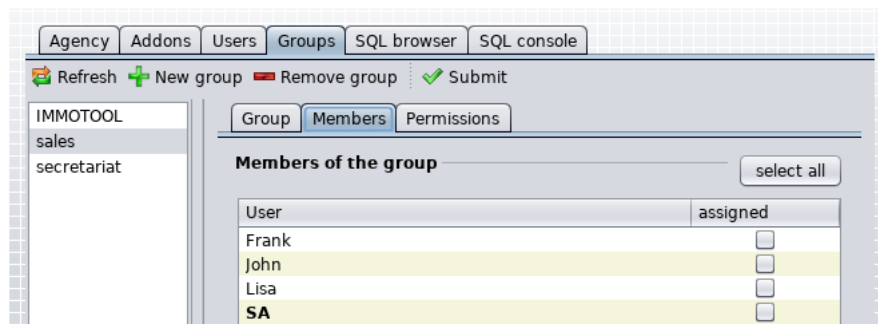
Figure 6.17: Members of an user group

The table shows the user accounts, that are currently available in the database. By clicking on the checkbox in the **"assigned"** column you might assign one or more users to the group.

6.1.7.3 Group permissions

If a user group was selected for modification, its permissions are shown on the right side in the **"Permissions"** tab.
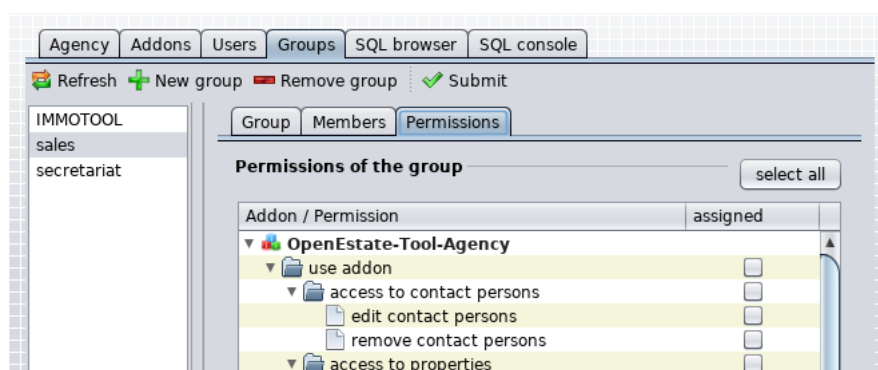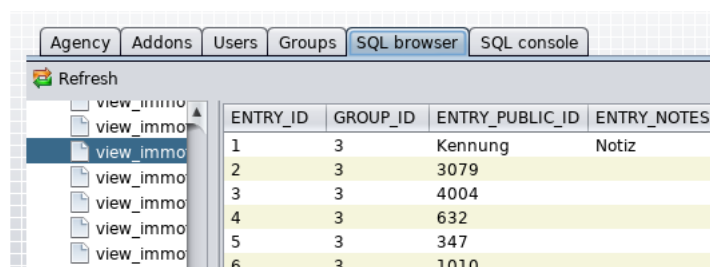
Figure 6.18: Permissions of an user group

The table shows the permissions, which are defined by installed addons. By clicking on the checkbox in the **"assigned"** column you might assign one or more permissions to the group.

6.1.8 Browse database contents

After a database connection was established you can find the **"SQL browser"** tab, which provides read access to the raw database contents (tables, views and stored procedures).
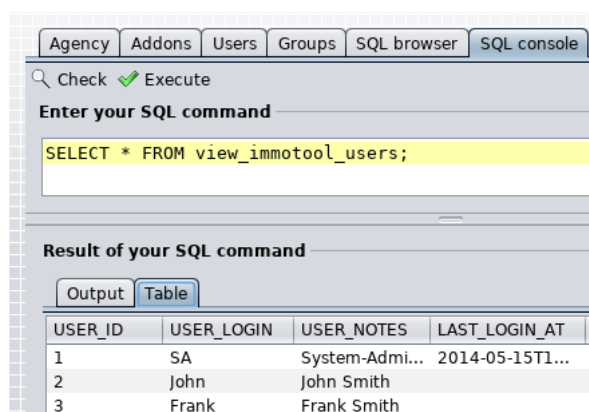
Figure 6.19: Browse database contents

This tab does not provide any special functionality. It might only be helpful for a database review.

6.1.9 Execute SQL commands

After a database connection was established you can find the **"SQL console"** tab, which allows the execution of SQL commands on the database.

Figure 6.20: Execute SQL commands via AdminTool

⚠️ | Use this feature with caution. Any wrong SQL command might damage your database.

ℹ️ | You can find a summary of supported SQL commands in the documentation of the HSQL database[a].

6.2 Backup & restore databases

For everyday usage it is **highly recommended** to find and implement a strategy for regular backups. This chapter describes different approaches about how to backup the databases of ImmoTool and

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[a]http://www.hsqldb.org/doc/2.0/guide/sql-ind.html

ImmoTool-Server.

Please consider, that you have to follow different approaches for single-user installations and multi-user installations (see "How ImmoTool can be installed…").

⚠ | Do not simply rely on the backup features of your operating system. Practice has shown, that for example restore points on Windows led to corrupt databases.

ℹ | In order to avoid a possible data loss, you should implement a backup strategy as soon as ImmoTool is used productively.

💡 | It is recommended to test the procedure of backup and restore beforehand. Take notes of the required steps. In case of a system failure you can rely on your notes and previously made experiences, which finally reduces a possible downtime.

💡 | In order to ensure the best possible failure safety you should save the database backups to an external location. For example use an external hard drive or send the backup files to an external server (e.g. your webspace or cloud provider).

6.2.1 Backup single-user installations

On **single-user installations** the database is managed by the Immotool itself (see "Installing on a single workplace"). Therefore in most cases the backup should be executed from the same system, on which ImmoTool is installed.

6.2.1.1 Copy project folder

The easiest way of backing up a **single-user installation** is copying the project directory. Find out where your project directory is located and copy this folder accordingly.

ℹ | By default ImmoTool creates a separate directory for each project in the `OpenEstate-Files/projects` subfolder of the user's home directory.

⚠ | You should only copy the project directory, if ImmoTool is not running or the project is currently not opened.

6.2.1.2 Manual backup via ImmoTool

After the local project was opened in ImmoTool you can click in the main menu at **"Extras → Database → Backup"** in order to create a database backup manually. A dialog window is shown, where you can select the save location of the backup file.

6.2.1.3 Automatic backup via ImmoTool

As an alternative to a manual backup you can configure automatic backups for local projects (single-user installations). In this case the application will automatically create backups in certain situations.

After the local project was opened in ImmoTool you can click in the main menu at **"Extras → Settings"** in order to open the settings dialog window. After selecting the form **"Database"** you will see the following view:
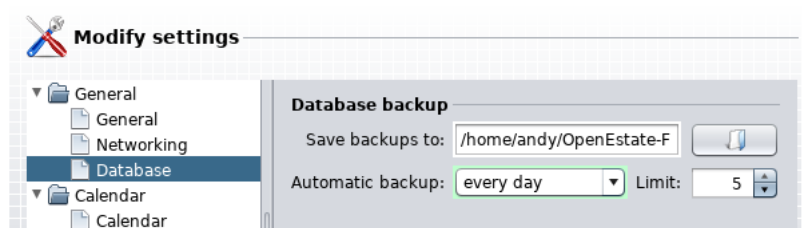

Figure 6.21: Configure automatic backups

You can choose a target folder, where automatic backups are saved at. Besides this you may choose, in which case an automatic should be created (e.g. while the project is opened).

The number selected as **"Limit"** determines, how many backups are kept in the selected target directory. For example if more than five backups are stored in the target directory, the oldest backups are automatically removed. The defined limit will not be exceeded.

You might select an external hard drive or a network drive as backup location. This makes sure, that the backups are not lost in case of a hardware failure on your local system.

6.2.1.4 Restoring a backup

If the project directory was copied (see "Copy project folder"), you can simple copy the folder back to its original location. Afterwards the project can be opened again with ImmoTool. Further steps for restoring the backup are **not** necessary in this case.

Backups created within ImmoTool have been stored as **TAR.GZ** archives (see "Manual backup via ImmoTool" and "Automatic backup via ImmoTool"). In order to restore these archives you can follow these steps:

1. Close ImmoTool, if it is currently running.
2. Extract the TAR.GZ archive, that contains the database backup.
3. Open the project directory in your file browser (Explorer / Finder).
4. Rename the **data** subfolder - e.g. to **data-old**.

5. Create a new / empty **data** subfolder.
6. Copy the files extracted from step 2 into the newly created **data** folder.
7. Start ImmoTool and open the project.

If the restored project was successfully opened, you might remove the folder **data-old** created in step 4.

> 💡 If you do not know where the project is located or do not have a project available anymore, you might create a new / empty local project first and afterwards follow the steps above.

6.2.2 Backup multi-user installations

On **multi-user installations** the database is managed by Immotool-Server (see "Installing on a multiple workplaces"). Therefore in most cases the backup should be executed from the same system, on which ImmoTool-Server is installed.

6.2.2.1 Backup an inactive ImmoTool-Server

If ImmoTool-Server is not running (or was temporarily stopped), you can copy its data directory. By default this directory contains the files of all managed databases.

> ⚠️ It is not recommended to copy the data directory while ImmoTool-Server is running. This may lead to a faulty backup, that can not be restored easily.

6.2.2.2 Backup a running ImmoTool-Server

You can create backups of ImmoTool-Server while the application is running. For this use case the helper application **"ManagerBackup"** is provided.

- On Windows you can open start menu and select the shortcut **"OpenEstate-ImmoServer → Management → Create database backup"**.
- On macOS you can open the application bundle **"OpenEstate-ImmoServer"** and start the **"ManagerBackup"** application.
- Alternatively you can start the **ManagerBackup.exe** / **ManagerBackup.bat** / **Manager-Backup.sh** file in the **bin** subfolder of the application directory.

The **ManagerBackup** application needs to connect with the databases to backup. Therefore the application needs to login with an administrative account for all databases to backup.

Open the **manager.conf** file in the configuration directory with a text editor. For each database to backup you need to provide these lines:

```
urlid immotool
url jdbc:hsqldb:hsql://localhost:9001/immotool
username SA
password
```

After the **password** value you need to enter the password of the database administrator (**SA**) separated by space - e.g. **password test1234** (see "Configure manager applications").

By default the **ManagerBackup** application creates a backup for all databases specified in the **manager.conf** file. By default the application stores the backup into the **backups** subfolder of the data directory.

> Before automating the backup process you should test, if the **ManagerBackup** is properly configured and works as expected.

Automatic backup on Windows

The Windows operating system provides a dialog window for task scheduling, which can be used for automatic execution of the **ManagerBackup** application at freely chosen times.

Open the Windows Task Scheduler[1] application:

1. Press the **"Windows key"** together with the letter **"R"** to open a window for command execution. Alternatively you can open the command prompt.

2. Enter the command **taskschd.msc** and press the **"ENTER"** key.

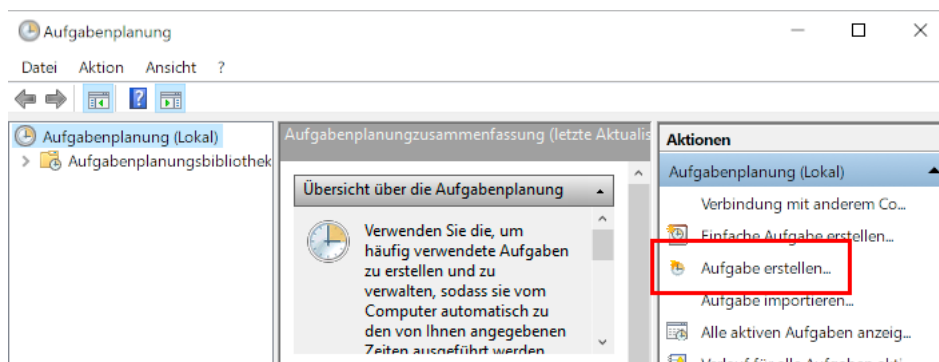Click on the right side in the **"Actions"** section on the **"Create task"** link.

Figure 6.22: Create task for automatic backup

A new dialog window shows up, which allows the creation of the backup task.

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[1]https://en.wikipedia.org/wiki/Windows_Task_Scheduler
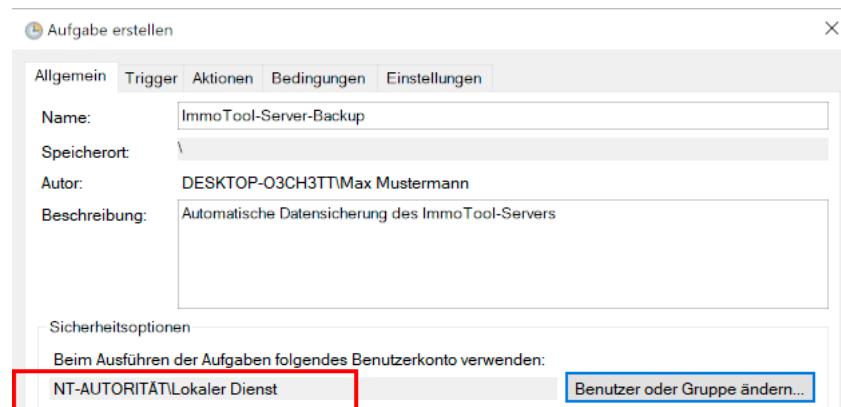
Figure 6.23: General settings for the task

Open the tab **"General"** and enter a suitable name and description for the task. Besides this you should click on the **"Change User or Group"** button and select the **"Local Service"** user.
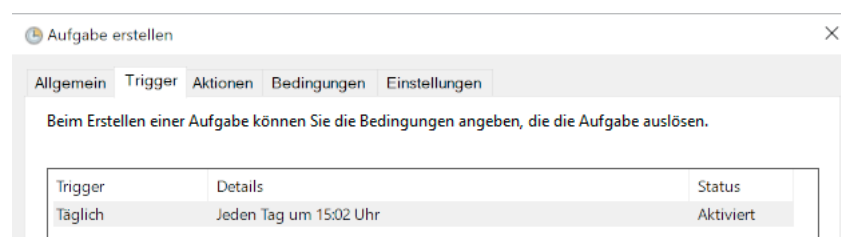
Figure 6.24: Zeit der Ausführung wählen

Open the tab **"Triggers"** in order to configure the execution time of automated backups.
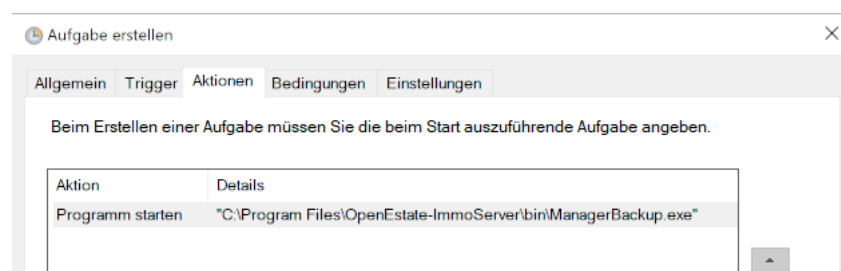
Figure 6.25: Auszuführendes Programm wählen

Open the tab **"Actions"** and select the **`ManagerBackup.exe`** application from the **`bin`** subfolder of the application directory.

You may change further settings in this dialog window. After you have completed the configuration, click on the **"OK"** button in order to register the task in the operating system.

Provide English screenshots.

Automatic backup on macOS

While installing a service for ImmoTool-Server on macOS you can enable daily automatic backups (see "Setup service on macOS").

If automated backups were enabled while installing the service, the script creates a file **org.openestate.tool.server.backup.plist** in the **/Library/LaunchDaemons** directory. This file tells the operating system to automatically execute **ManagerBackup** once in a day.

You are not forced to use the provided mechanism for automated backups. You might also create your own cronjob (or agent for launchd), that executes the **ManagerBackup** application.

Automatic backup on Linux

If ImmoTool-Server was installed with the **Debian** package, a timer for daily automated backups is already installed.

Alternatively a timer can be registered, while a service for ImmoTool-Server on Linux is installed (see "Setup service on Linux").

The files **openestate-immoserver-backup.timer** and **openestate-immoserver-backup.service** in the **/etc/systemd** folder are used to trigger automatic execution of the **ManagerBackup** application.

You are not forced to use the provided mechanism for automated backups. You might also create your own cronjob (or timer for systemd), that executes the **ManagerBackup** application.

Parameters for ManagerBackup

The **ManagerBackup** can be controlled by the following command line parameters:

- **-help**
  Shows a summary of available command line arguments.

- **-conf <file>**
  You may specify a custom path to the **manager.conf** configuration file.

- **-id <urlid>**
  Only the database with identifier **<urlid>** from the **manager.conf** file should be backed up. Otherwise all configured database are backed up.

- **-dir <path>**

  You may specify a directory at **<path>**, where backups are stored.

- **-limit <number>**

  You may set the maximal number **<number>** of backups to keep for each database. Older backups are automatically removed, if the limit is exceeded.

- **-delay <seconds>**

  You may delay the execution of the backup for **<seconds>** seconds.

- **-wait**

  After the backup was successfully executed the applications waits for the user to press the **"ENTER"** key.

- **-dump**

  Create a database dump instead of copying the database files.

6.2.2.3 Restoring a server backup

A database backup is a copy of the database files. You can restore these files quite easily by following these steps:

1. Stop ImmoTool-Server, if it is currently running.

2. If the backup is created as **ZIP** or **TAR.GZ** archive, extract these files accordingly.

3. Rename the database directory and create a new / empty database directory with the same name.

4. Copy the database files **db.data**, **db.lobs**, **db.properties** & **db.script** into the database directory (see "Data directory of ImmoTool-Server").

5. Start ImmoTool-Server in order to make the restored databases available.

If the restored project was successfully opened, you might remove the renamed database directory created in step 3.

6.3 Convert single-user into multi-user installation

A single-user installation can be migrated to a multi-user installation. Therefore the database has to be copied to the ImmoTool-Server and slightly modified.

1. Install ImmoTool-Server, if it is not installed yet (see "Installing ImmoTool-Server").

2. Stop ImmoTool-Server, if it is currently running.

3. Open the data directory of the ImmoTool-Server and create a folder **data/immotool**, if it does not already exist. If the directory does already exist, remove all contained files and subfolders.

4. Open the directory of the local project. There you should find a **data** folder. This directory contains the database files: **immotool.data**, **immotool.lobs**, **immotool.properties** and **immotool.script**.

5. Copy the database files located in step 4 into the directory created in step 3. Rename these files to **db.data**, **db.lobs**, **db.properties** and **db.script**.

6. Start ImmoTool-Server and connect to the copied database with AdminTool. Use the username **"SA"** and an **empty password**. On the first connection with AdminTool you will be asked to enter a password for the **"SA"** user.

From now on the database is available for ImmoTool and AdminTool as a remote project. To finally access the database with ImmoTool you need to create a remote project (see "Connect to ImmoTool-Server").

If the migration was successfully completed and ImmoTool properly connects to ImmoTool-Server, you might remove the old directory of the local project.

6.4 Convert multi-user into single-user installation

A multi-user installation can be migrated to a single-user installation. Therefore the database has to be copied into a local project and slightly modified.

1. Start ImmoTool and create a new / empty local project (see "Create local project"). Into this project the database will be transferred in the next steps.

2. Close ImmoTool after the new / empty local project was created and opened for the first time.

3. Stop ImmoTool-Server, if it is currently running.

4. Open the directory of the local project created in step 1. The **data** subfolder should contain these files: **immotool.data**, **immotool.lobs**, **immotool.properties** and **immotool.script**. Remove all files and subfolders from the **data** subfolder.

5. Open the database directory of the ImmoTool-Server. By default you find this directory in the **data/immotool** subfolder of the data directory. You should find these files in this folder: **db.data**, **db.lobs**, **db.properties** and **db.script**. Copy these files into the **data** subfolder of the previously created project (see step 4). Rename the copied files to **immotool.data**, **immotool.lobs**, **immotool.properties** and **immotool.script**.

6. Edit the **`immotool.script`** file from the **data** folder of the local project in a text editor.

> Copy a backup of the **`immotool.script`** file before making any changes. A mistake while editing may lead to a faulty database.

7. Seach in the **`immotool.script`** file for a line starting with:

CREATE USER SA PASSWORD DIGEST

Replace this line with:

CREATE USER SA PASSWORD DIGEST 'd41d8cd98f00b204e9800998ecf8427e'

8. Save the modified **`immotool.script`** file.

From now on you can open the local project with ImmoTool. All data from ImmoTool-Server is available in the local project.

In case you don't need ImmoTool-Server anymore, you might uninstall ImmoTool-Server after the migration was successfully finished.

6.5 Migrate an old project from ImmoTool 0.9.x

ImmoTool 0.9.x is already very old. It is not developed any further and can not be supported by OpenEstate anymore. Therefore it is **heavily recommended** to migrate the application to the latest 1.x version. This chapter describes the required steps for migration.

> You should **not** overwrite old ImmoTool 0.9.x installation. ImmoTool 1.x has to be installed separately. In case of problems during the migration you can continue using the old version until the problem was solved.

6.5.1 Export project from ImmoTool 0.9.x

In the first step you need to open ImmoTool 0.9.x and create a backup of the project database.

1. Make sure, that the latest available old version is used (at least **0.9.15** or **1.0-beta10f**). Therefore click in the main menu at **"Extras → Updates"**.
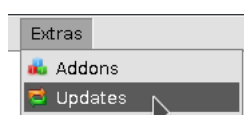

Figure 6.26: Update the old ImmoTool version

Alternatively you might download version 0.9.33 (the latest 0.9.x Version) from the OpenEstate website[2].

2. Open the project to migrate in the old ImmoTool installation and create a database backup by clicking in the main menu at **"Extras → DB type → Sicherung für Version 1.x"**. (The translation in the application is incorrect here.)
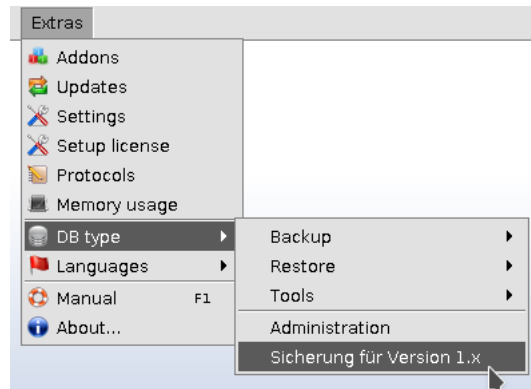
Figure 6.27: Create a backup for ImmoTool 1.x

This will create a ZIP archive with the contents of the project database. You will need this ZIP archive in the following steps.

The next steps depend on how you want to use ImmoTool 1.x in the future (as single-user installation or multi-user installation).

6.5.2 Migrate into a single-user installation

If ImmoTool 1.x should be used as **single-user installation**, install the latest version of ImmoTool 1.x next to your old ImmoTool installation (see "Installing ImmoTool").

Do **not** overwrite the old ImmoTool installation! Both versions should be installed **next to each other**.

If ImmoTool 1.x is started for the first time, the *project wizard* shows up. Create a new project and select the previously created ZIP file.

Add link to the project wizard in the usage section.

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[2]https://openestate.org/downloads/openestate-immotool/0.9.33

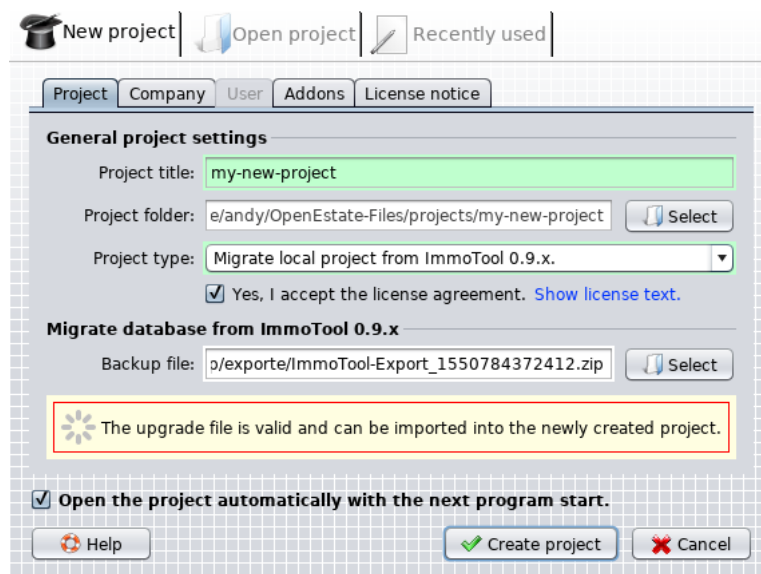**Figure 6.28:** Datensicherung via Projektassistent importieren

Select as **"Project type"** the option **"Migrate local project from ImmoTool 0.9.x"**. Below you can find a form, where the previously created ZIP file can be selected by clicking the **"Select"** button. The application will validate the ZIP file and automatically load the company information.

You might check and fix the company information and addon. Afterwards click on the **"Create project"** button. While the project is created the data from the ZIP file is automatically imported into the database.

After the migration was successfully finished you might remove the old installation of ImmoTool 0.9.x.

6.5.3 Migrate into a multi-user installation

If ImmoTool 1.x should be used as **multi-user installation**, install the latest version of ImmoTool 1.x next to your old ImmoTool installation (see "Installing ImmoTool") and ImmoTool-Server (see "Installing ImmoTool-Server").

Do **not** overwrite the old ImmoTool installation! Both versions should be installed **next to each other**.

After ImmoTool-Server was installed you can import the database backup with AdminTool into ImmoTool-Server. The previously created ZIP file can be imported via AdminTool in one of these ways:

- If ImmoTool-Server is connected **for the first time**, you will see a window on which the previously created ZIP file can be selected.
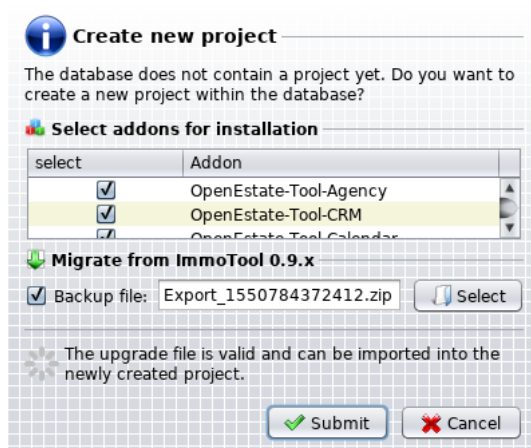
Figure 6.29: Import ZIP file while creating the database

- If the database was already created with AdminTool, you can import the ZIP file **afterwards** by clicking in the main menu to **"Extras → Migration from ImmoTool 0.9.x"**.
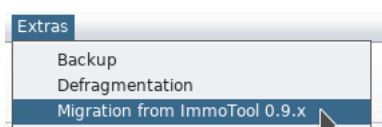
Figure 6.30: Import ZIP file after the database was created

After the contents of the ZIP file were imported the database is ready for use. Start ImmoTool 1.x and create a remote project in order to connect to the database (see "Connect to ImmoTool-Server").

After the migration was successfully finished you might remove the old installation of ImmoTool 0.9.x.

7 Appendix

7.1 Support & Assistance

Each user, that has been registered on the OpenEstate website[1], may receive free technical support for ImmoTool, ImmoTool-Server and other OpenEstate projects. This includes assistance with

- installation of the applications,
- setup of the applications,
- updates of the applications and
- error analysis in the the applications.

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as from 25.05.2018

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