LucaNet
Simply intelligent.

# LucaNet 23 LTS – Technical Information for LucaNet On-Premises

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# Technical Information for LucaNet On-Premises

If you decide to use LucaNet as an on-premises solution, the LucaNet software is available to you locally. In this way, you can use your own, personalized IT environment and combine it with first-rate financial performance management software (FPM).

### Benefits

Our on-premises solution for FPM offers you:

- The finest in financial intelligence, as you can take advantage of the full functional scope of LucaNet software
- Independence from service providers, because operation of the software and network are in your own hands
- Security, as the security requirements at hand are ensured by LucaNet and yourself

LucaNet as an on-premises solution is:

- Easy to operate
- Simple to administrate
- Easily scalable and modifiable

.... Simply intelligent!

## 1 System architecture

### Overview

As a rule, LucaNet software has a **two-layer architecture** that consists of a server layer and a client layer:

- Both the data storage (the saving and loading of data) and the application logic (the processing mechanisms of the software) are contained in the **server layer**. The server layer is represented by LucaNet.**Financial OLAP Server**.
- The **client layer** comprises the front ends (= the programs running on the client) and is responsible for the data representation, user inputs, and the user interface. Clients are, for example, LucaNet.**Financial Client**, LucaNet.**Web Client**, and the separate LucaNet.**Excel-Add-In** for MS Windows, but also scripts or third-party products.

Apart from its fundamental architecture, LucaNet software consists of numerous components that handle various functions and together form the system architecture at hand:

| Component | Description |
|---|---|
| LucaNet.**Software Manager** | Components for administrating all LucaNet programs<br>LucaNet.**Software Manager** administrates all the LucaNet programs that run on a computer and all the Java versions these programs require. It also launches LucaNet programs. |
| LucaNet.**Financial OLAP Server** | LucaNet server for data storage<br>LucaNet.**Financial OLAP Server** is the server component of LucaNet software. LucaNet.**Financial OLAP Server** is an application server (read: software) that provides a collection of services, including a database and authentication. In addition, the software receives queries from clients and sends back corresponding responses. |
| LucaNet.**Server Administrator** | LucaNet user interface for system administrators, i.e. the administrators of LucaNet.**Financial OLAP Server** |
| LucaNet.**Financial Client** | LucaNet interface for users |

| | |
|---|---|
| LucaNet.**Excel-Add-In** | Add-in for integrating MS Excel into your work with LucaNet<br>LucaNet.**Excel-Add-In** enables interactive access from MS Excel to LucaNet.**Financial OLAP Server** that can be used for data querying and editing from MS Excel.<br>LucaNet offers two variants of LucaNet.**Excel-Add-In**:<br>• An integrated LucaNet.**Excel-Add-In** for MS Windows and macOS that is automatically installed with the LucaNet software<br>• A separate LucaNet.**Excel-Add-In** that can be installed under MS Windows<br>You can read about how the two variants differ from each other in **Integrated vs. separate LucaNet.Excel-Add-In**. |
| LucaNet.**Financial Warehouse** | Data warehouse for storing accounting data from ERP systems<br>LucaNet.**Financial Warehouse** is a standardized relational data model that can be created as a database on any given customer-side database server (e.g. MS SQL, Oracle, DB2, or MySQL*). LucaNet.**Financial Warehouse** is a system-neutral data model that is document-oriented and multi-dimensional. LucaNet.**Financial Warehouse** typically plays a part in the technical implementation of financial intelligence solutions with LucaNet. |
| LucaNet app database | Database for LucaNet apps<br>The LucaNet app database is provided for the use of apps that generate data records that differ in content from the default LucaNet data model and thus also from the LucaNet default table structure, such as the **app Accounting for Leases**. The LucaNet app database is a database of the database server you use. |
| LucaNet.**Web Client** | LucaNet.**Web Client** is a web-based component that, as of LucaNet 22 LTS, allows financial data from LucaNet to be displayed and analyzed in a web browser on a user computer or tablet. |
| LucaNet.**Web Server** | LucaNet.**Web Server** is the server component that hosts LucaNet.**Web Client** and provides the data from LucaNet.**Financial OLAP Server** for display in the web browser. |

*MySQL must be used in combination with a commercial license, as the license-free MySQL version can only be used in combination with open source software.

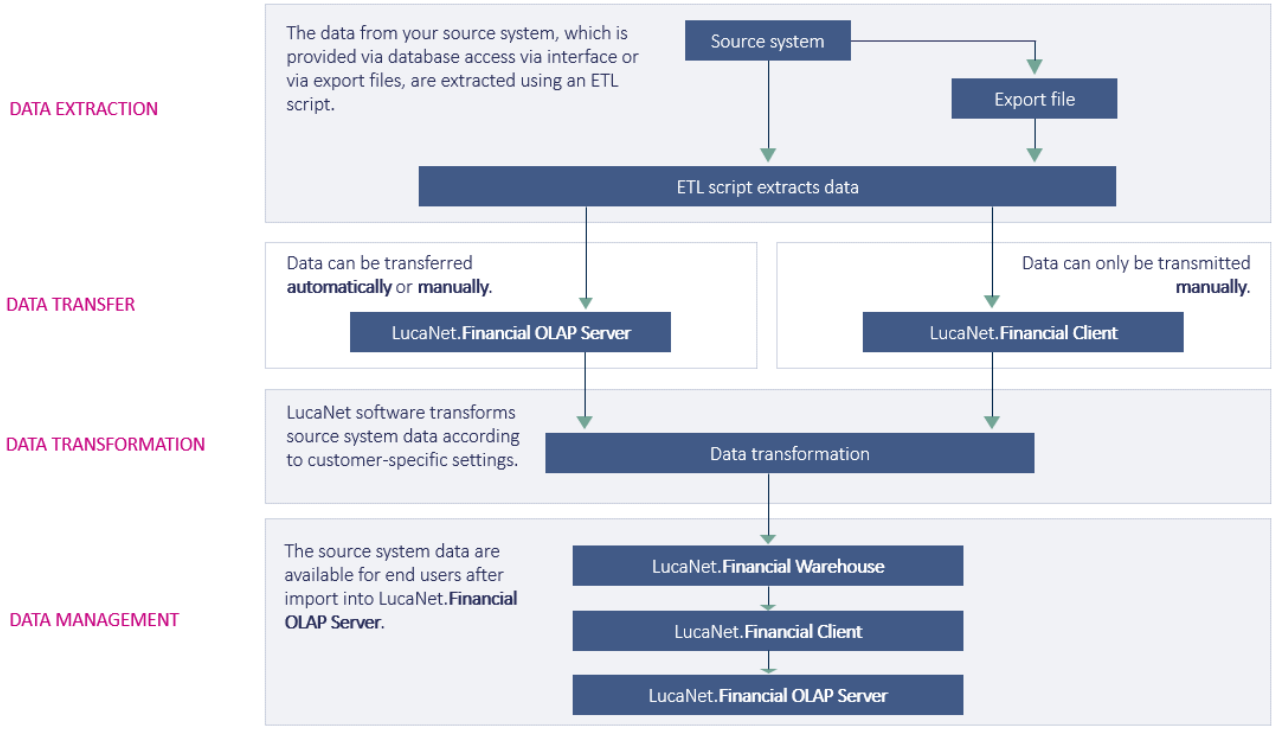
To ensure secure data transmissions among LucaNet components, SSL/TLS is used. As a rule, LucaNet software accesses (ERP) source systems via VPN. HTTP(S) is used for data transmission among the LucaNet components.

The following section describes the standard workflow and topologies for the standard application case for LucaNet software (i.e. transfer of data from a source system using an ETL process).

## 1.1 Workflow for the ETL process

### Overview

The following diagram provides an overview of the ETL process from your source system to LucaNet:




### Requirements for importing data

For the data import from your source system to LucaNet to run smoothly, the following requirements must be met:

- The ETL script must be able to use an interface to access the database in the source system or the data from the source system that is provided via **export files**. It does not matter whether the source system is in a cloud or in a local network.
- It must be ensured that the ETL script can access the data of your source system via one of the LucaNet components (LucaNet.**Financial OLAP Server** or LucaNet.**Financial Client**).

### Finding LucaNet component for data import

To find the right LucaNet component for importing your data:

1. Define whether you want to import the data manually or on a time-controlled basis (i.e. automatically):

| | Advantages | Disadvantages |
|---|---|---|
| Time-controlled (i. e. automatic data import) | • You have to set up a job for data transfer once and then you no longer have to worry about it.<br>• Long processes (i.e. large data imports, using resources from the source system that are usually more available outside of working hours and therefore during peak times). | Your data is only up-to-date immediately after the data import times configured in the job. |
| Manual data import | You have immediate access to the updated data and can continue working. | Depending on the data quantity and number of documents, manual data imports can lead to:<br>• Faults or losses in performance<br>• Long waiting times |

2. Determine which LucaNet component is suitable for transferring your data (see the following subheadings).

### LucaNet.Financial OLAP Server

Data transfer via **Financial OLAP Server** makes sense for you if:

- The data are to be imported both manually and on a time-controlled basis
- Your source system is in a different local network than the rest of the LucaNet components (i.e. LucaNet.**Software Manager**, LucaNet.**Financial Client**, and possibly the separately installed LucaNet.**Excel-Add-In**)
- Connection via VPN is desired

Advantages of LucaNet.**Financial OLAP Server**:

- The data can be imported both manually and on a time-controlled basis.
- LucaNet.**Server Administrator** can be used for job control from any computer that has access to LucaNet.**Financial OLAP Server**.
- LucaNet.**Auto Task Client** can be used for automatic data import.
- The LucaNet software log for data import can be viewed at any time.

For further information on data import via LucaNet.**Financial OLAP Server**, see *ETL process running on LucaNet.Financial OLAP Server* on page *5*.

### LucaNet.Financial Client

Data transfer via LucaNet.**Financial Client** makes sense for you if:

- No direct connection from LucaNet.**Financial OLAP Server** to the source system is possible
- Only manual data import is desired

| Advantages | Disadvantages |
|---|---|
| • The data can be imported at any time as required.<br>• The progress of the data import is displayed. | • The data can **not** be imported automatically.<br>• Manual data imports usually take place during working hours and can impair performance for other users of the LucaNet software for the duration of the data import. |

- The data are up to date.

For further information, see *ETL process running on LucaNet.Financial Client* on page *7*.

### 1.2 ETL process running on LucaNet.Financial OLAP Server

The ETL process is executed in LucaNet.**Financial OLAP Server** in the following cases:

- Data are to be retrieved from the source system via the interface and transferred **automatically** to LucaNet.**Financial Warehouse** (see *System architecture – data access via interface* on page *5*).
- Data from export files created automatically or manually from the source system are to be imported **automatically** into LucaNet.**Financial Warehouse** (see *System architecture – using export files* on page *6*).

#### 1.2.1 System architecture – data access via interface

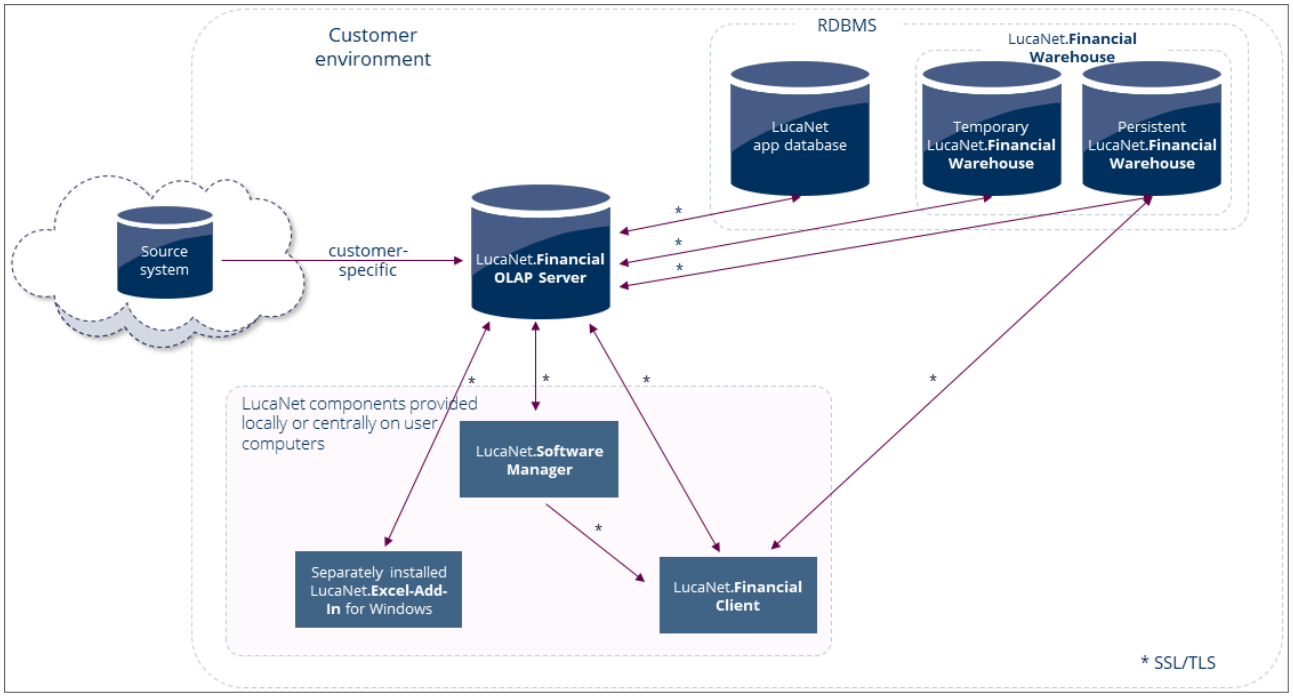
If the (ERP) source system you are using has an interface that makes it possible to access the database or application server, the LucaNet software can access your source system using an ETL script or direct database access, read data automatically, and transfer it to LucaNet.**Financial Warehouse**.

If the source system in the customer environment is in a different local network than the other LucaNet components or if your source system is in a cloud, the ETL process is carried out by LucaNet.**Financial OLAP Server**. The ETL process is usually started automatically at certain times via the job control of LucaNet.**Financial OLAP Server**, but it can alternatively also be started using LucaNet.**Server Administrator**.

If the ETL process is running on LucaNet.**Financial OLAP Server**, the LucaNet server must be able to access the source system either via SSL/TLS or via a VPN.

System architecture

The following figure shows the topology of the LucaNet software when the ETL process is running on LucaNet.**Financial OLAP Server**:




**Notes**:

- If your (ERP) source system is in a cloud, you and your hosting provider must set up a suitable connection between the source system database and LucaNet.**Financial OLAP Server**.
- Connection via SSL/TLS is optional.

### 1.2.2 System architecture – using export files

If your source system does not have an interface for the database or application server, the data from the source system must be extracted using export files and stored (locally) in the customer environment. Whether the source system itself is located in the cloud or in the customer's environment is irrelevant in this case.

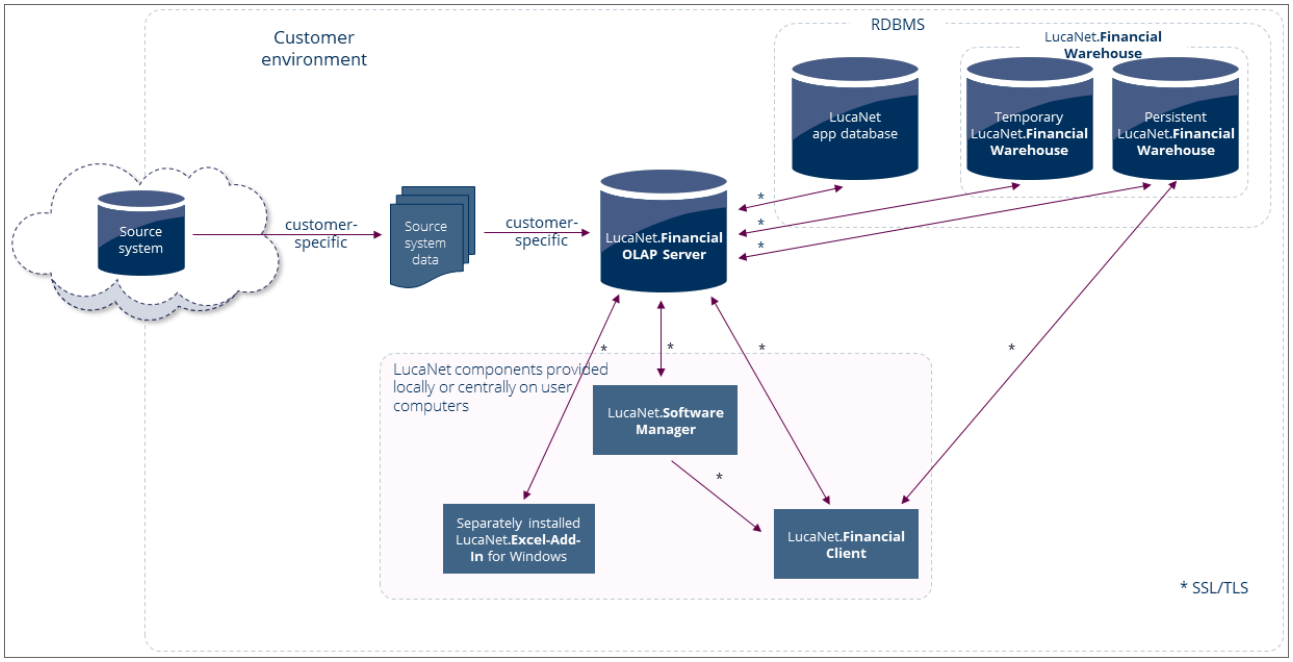
The ETL process is executed by LucaNet.**Financial OLAP Server** if:

- The source system is able to create export files automatically (i.e. on a time-controlled basis) or manually, and store them in the customer environment
- The export files from the ETL process are to be imported automatically (i.e. on a time-controlled basis) into LucaNet.**Financial Warehouse**

LucaNet.**Financial OLAP Server** must be able to access the export files during the ETL process.

Software architecture

The following figure shows the associated topology of the LucaNet software:




**Notes**:

- If your (ERP) source system is in a cloud, you and your hosting provider must set up a suitable connection between the source system database and LucaNet.**Financial OLAP Server**.
- Connection via SSL/TLS is optional.

## 1.3 ETL process running on LucaNet.Financial Client

The ETL process is executed in LucaNet.**Financial Client** in the following cases:

- Data are to be retrieved from the source system via the interface and transferred **manually** to LucaNet.**Financial Warehouse** (see *System architecture – data access via interface* on page *7*).
- Data from export files created automatically or manually from the source system are to be imported **manually** into LucaNet.**Financial Warehouse** (see *System architecture – using export files* on page *8*).

### 1.3.1 System architecture – data access via interface

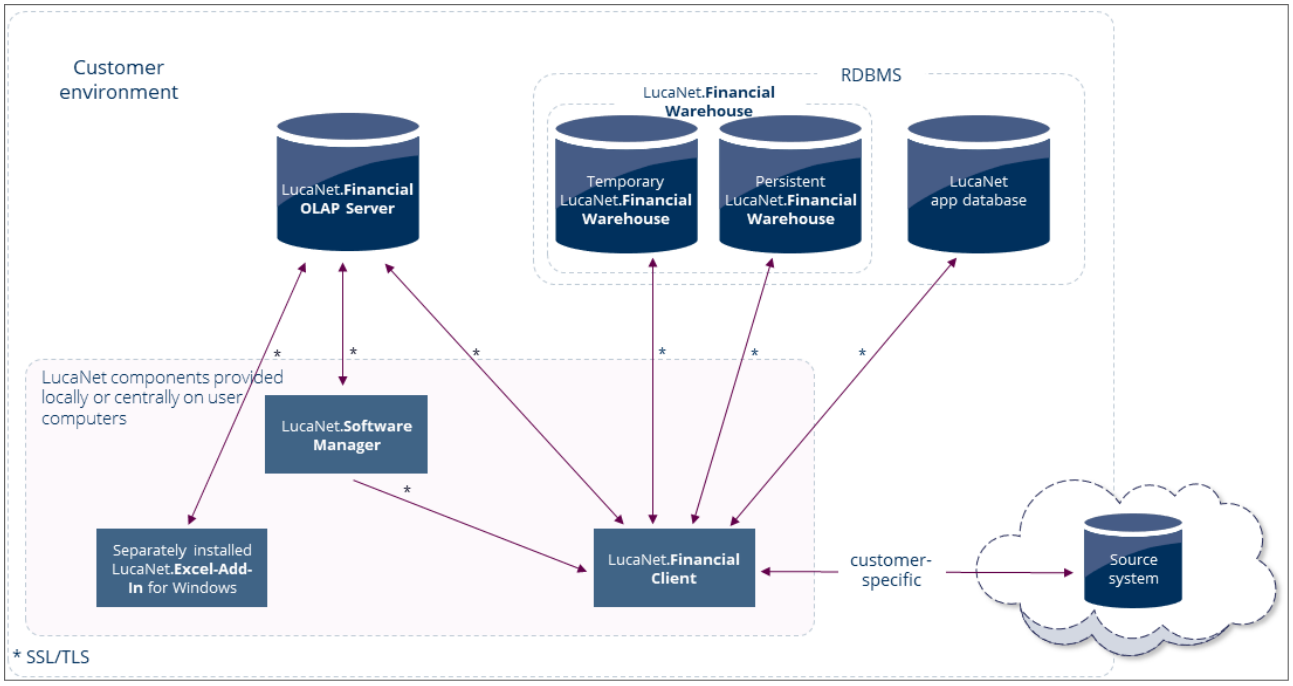
If the (ERP) source system you are using has an interface that makes it possible to access the database of your source system, the LucaNet software can access your source system using an ETL script or direct database access, read out data manually, and transfer it to LucaNet.**Financial Warehouse**.

The ETL process is executed by LucaNet.**Financial Client** if LucaNet.**Financial Client** and the source system are able to communicate directly.

The ETL process is started manually.

Software architecture

The following figure shows the associated topology of the LucaNet software:




**Notes**:

- If your (ERP) source system is in a cloud, you and your hosting provider must set up a suitable connection between the source system database and LucaNet.**Financial OLAP Server**.
- Connection via SSL/TLS is optional.

### 1.3.2 System architecture – using export files

If access to the database of the source system is not possible, the data from the source system must be extracted using export files and stored (locally) in the customer environment in such a way that LucaNet.**Financial Client** can access the export files. Whether the source system itself is located in the cloud or in the customer's environment is irrelevant in this case.

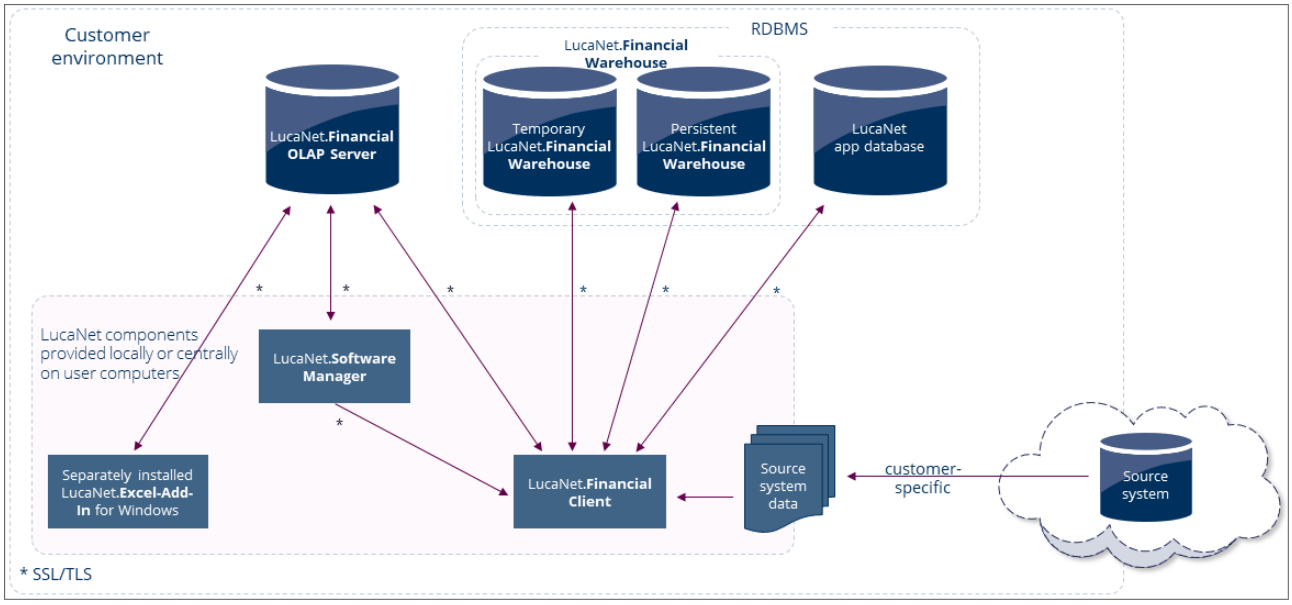
The ETL process is executed by LucaNet.**Financial Client** if:

- The source system is **not** able to create export files automatically, on a time-controlled basis, and/or store them in the customer environment
- The export files from the manually started ETL process are to be imported into LucaNet.**Financial Warehouse**

LucaNet.**Financial Client** must be able to access the export files during the ETL process.

Software architecture

The following figure shows the associated topology of the LucaNet software:




**Notes**:

- If your (ERP) source system is in a cloud, you and your hosting provider must set up a suitable connection between the source system database and LucaNet.**Financial OLAP Server**.
- Connection via SSL/TLS is optional.

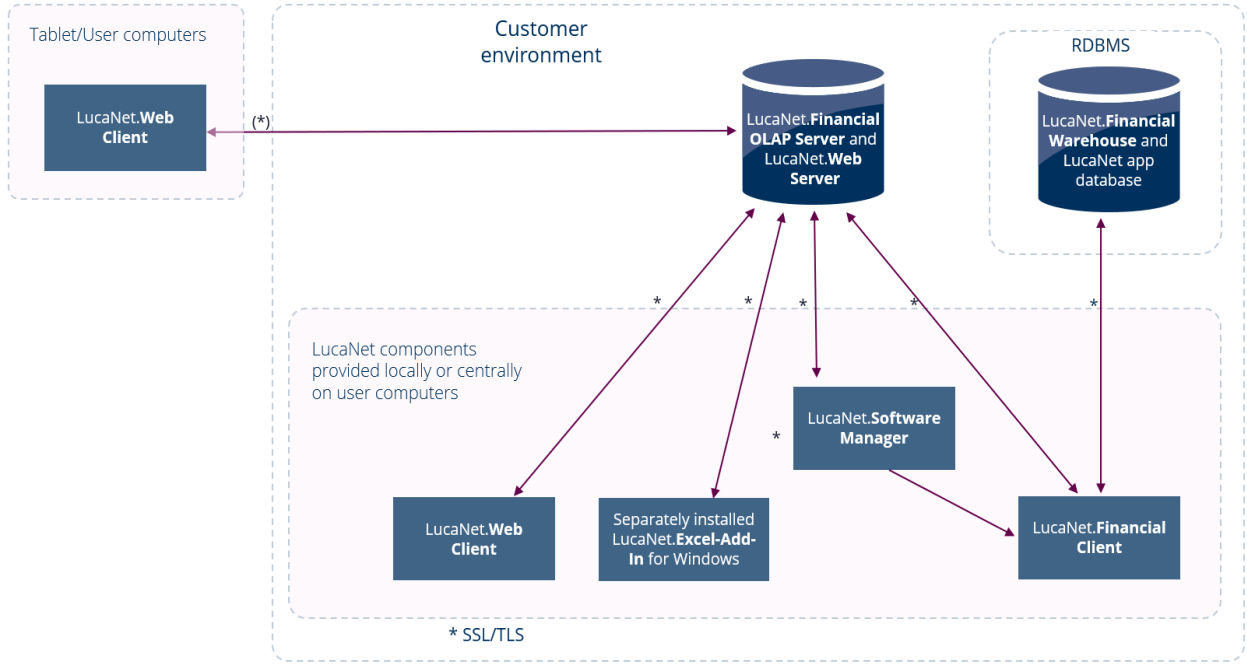
## 1.4 Providing LucaNet clients

Whether the LucaNet client instances are to be available locally on the respective user computers or are to be provided remotely in the network depends on your IT infrastructure. The LucaNet client instances can be easily integrated into all infrastructure variants and can be provided both locally on the user computers and centrally, e.g. via remote desktop access, via Citrix, or via another terminal environment.

In all variants, all components of the client layer (LucaNet.**Software Manager**, LucaNet.**Financial Client**, and, if necessary, the separate LucaNet.**Excel-Add-In** for MS Windows) must be connected via HTTPS (SSL/TLS) to LucaNet.**Financial OLAP Server**.

LucaNet.**Web Client** has read-only access to the data from LucaNet.**Financial OLAP Server** and can be started in a web browser on user computers or tablets. The prerequisite for this is that LucaNet.**Web Server** is installed and running on the server that LucaNet.**Financial OLAP Server** is installed on. For the access of LucaNet.**Web Client** to the data from LucaNet.**Financial OLAP Server** the use of HTTPS can be optionally configured.

### LucaNet On-Premises software architecture




## 2 System requirements

### Overview

The system requirements at hand depend on a variety of factors. Due to the many different potential uses for the software, each customer's organizational characteristics and intended area of application will determine how their system should be designed. In this sense, system requirements are always project requirements as well. The information provided herein should thus be viewed as approximations that need to be adapted to each customer and project. Since customers' needs vary, no universal guidelines can be provided.

Performance can be improved, depending on which of the hardware components are upgraded. The demands on the LucaNet.**Software Manager**, LucaNet.**Financial Client**, LucaNet.**Web Client** and LucaNet.**Server Administrator** LucaNet software components are relatively low in comparison to LucaNet.**Financial OLAP Server**. As a result, LucaNet.**Financial OLAP Server**'s performance is improved when certain hardware components are upgraded. The performance and size of the RAM and the CPU as well as the operating system are the deciding factors for the performance of LucaNet.**Financial OLAP Server**.

### LucaNet.Software Manager

From the very outset, LucaNet.**Software Manager** must be installed onto every computer that LucaNet software is to operate on. LucaNet.**Software Manager** administrates all LucaNet programs on a computer and all Java versions required by LucaNet programs.

### Operating system

It is possible to choose an operating system (Windows, Unix/Linux, macOS) as required. Please note that, as of LucaNet 11 LTS, the entire LucaNet software, i.e. all LucaNet programs including LucaNet.**Software Manager**, is available only as a 64-bit version and can therefore be installed only on 64-bit operating systems. LucaNet.**Web Client** also runs on tablets in Android or iOS.

### RAM

RAM used is actively administrated by LucaNet.**Financial OLAP Server**. LucaNet.**Server Administrator** can be used to analyze the memory requirement for databases.

To optimize work, you must keep an eye on the memory utilization of LucaNet.**Financial OLAP Server**. This is possible by configuring the system so that it sends a warning e-mail as soon as the calculated memory requirements reach a critical level.

RAM consumption of up to 90% by LucaNet.**Financial OLAP Server** is usually not critical. The RAM for LucaNet.**Financial OLAP Server** must be increased only if the RAM consumption is constantly above 90% on a regular basis.

The server reserves 50% of the RAM for the databases that are loaded and 50% for working with the data. That means the available RAM must be at least twice the size of the databases that are being worked with at the same time. If this ratio can be adhered to, there should be no problems during operation.

When LucaNet.**Financial OLAP Server** is operating at critical memory levels, performance can be seriously undermined or the system can become unusable.

LucaNet.**Financial OLAP Server** benefits from additional RAM. Operations, such as mass queries of account values, merging of dimensions, or importing of a backup, for example, can be accelerated with additional RAM.

### Hard drives

Because hard drive accesses are kept to a minimum in LucaNet.**Financial OLAP Server**, the performance of the hard drive is only relevant during database imports, database exports, or when loading a database to the RAM. Modern SSD hard drives are very fast. Because read and write-intensive operations are more of an exception, there are no particular hard drive requirements.

### CPU

The CPU has an influence on the performance of the system. LucaNet.**Financial OLAP Server** benefits from multi-core systems with different operations. If data are called in parallel by the server, the system uses several cores depending on the workload. In most cases, a quad-core system is sufficient. Bigger processor caches and a fast connection between the RAM and the CPU improve system performance.

### Network connection

In our experience, a 1 Gbit connection provides sufficient speed for LucaNet.**Financial OLAP Server**. A 10 Gbit connection is recommended for good performance speed. The network load per client depends heavily on the type of operations performed and the type of network connection used by the client:

- A 1-gigabit network provides sufficient bandwidth for LucaNet.**Financial Client** or LucaNet.**Web Client** within a corporate network.
- For remote connections (for example, VPNs), we recommend a bandwidth with at least 1 Mbit.

- The connection capacity is additionally impacted by the following factors:
  - The quality of the network provider during remote connections
  - Whether or not clients upload a lot of images or large binary files to the database, because this increases network load.

If a remote connection is used, the physical distance between LucaNet.**Financial Client** and LucaNet.**Financial OLAP Server** or between LucaNet.**Web Client** and LucaNet.**Financial OLAP Server** is also a key factor for the performance. If very long distances must be covered (e.g. LucaNet.**Financial OLAP Server** is on a server in Germany, whereas LucaNet.**Financial Client** or LucaNet.**Web Client** is started in Australia), a great deal more time is required to transfer the information. The more information that needs to be transferred (e.g. large data imports), the longer the transfer process will ultimately take.

## 2.1 LucaNet.Software Manager

### Overview

From the very outset, LucaNet.**Software Manager** must be installed onto every computer that the LucaNet software is to operate on. LucaNet.**Software Manager** administrates all the LucaNet programs running on a computer and all the Java versions required by these programs with the exception of LucaNet.**Web Client**.

### Hardware requirements

The minimum hardware requirements of every computer that is to run LucaNet.**Software Manager** are as follows:

| Component | Minimum requirement |
|---|---|
| **CPU** | At least two CPU cores (four CPU cores recommended) |
| **RAM** | At least 512 MB |
| **Internal network connection** | At least a 1 Gbit connection (10 Gbit recommended) |
| **Internet connection** | At least a 16 Mbit connection |
| **Storage/hard drive** | 500 MB or more |

### Operating system

LucaNet.**Software Manager** runs on the following operating systems:

- Microsoft Windows: Windows 7 64-bit or later
- Unix/Linux: all common maintained distributions, especially centOS, Debian (version 7 and later), and SUSE (OH)
- macOS 10.13.5 or later

## 2.2 LucaNet.Financial OLAP Server

### Overview

LucaNet.**Financial OLAP Server** is the server component of the LucaNet software.

The hardware requirements of LucaNet.**Financial OLAP Server** depend on the project and customer in question. The following section includes recommendations on the minimum server hardware configuration necessary to run LucaNet.**Financial OLAP Server**.

In addition to hardware requirements, the type of customer-specific adjustments and maintenance of data stocks are also decisive for system performance. LucaNet.**Financial OLAP Server** uses **in-memory databases**. The

technology used for these databases allows LucaNet.**Financial OLAP Server** to reduce hard drive accesses to a minimum and retain all required data in the RAM. Because the RAM is considerably faster than the hard drive, this significantly improves the system performance.

### General recommendation

As a rule, LucaNet.**Financial OLAP Server** should run in a virtualized environment whenever possible. This makes (temporary) adjustments in system hardware relatively easy when performance issues occur, and it is the standard method prescribed for such situations.

### Hardware requirements

The minimum hardware requirements of a computer that is to run LucaNet.**Financial OLAP Server** are as follows:

| Component | Minimum requirement |
|---|---|
| **CPU** | Four CPU cores or more<br>**Note**: The greater the number of users that will be accessing the LucaNet software simultaneously, the more processors the computer in question should have to run LucaNet.**Financial OLAP Server**. |
| **RAM** | At least 16 GB<br>**Note**: The database will grow over time and require additional RAM. |
| **Internal network connection** | At least a 1 Gbit connection (10 Gbit recommended) |
| **Internet connection** | At least a 16 Mbit connection |
| **Storage/hard drive** | • Basic installation: 1 GB<br>• At least 50 GB; 100 GB recommended for standard operations, plus temporary storage (for imports, for example)<br>• Following configuration, four times the database backup size will be required for ongoing operations! |

### Operating system

LucaNet.**Financial OLAP Server** runs on the following operating systems:

- Microsoft Windows: MS Windows 2012 R2 server operating system (64-bit or later)
  **Note**: LucaNet.**Financial OLAP Server** can be installed as a service or desktop application
- UNIX/Linux: all common maintained distributions, especially centOS, Debian (version 7 and later), and SUSE (OH)
- macOS 10.13.5 or later
  **Notes**:
  - LucaNet.**Financial OLAP Server** can only be installed as a desktop application under macOS 10.13.5 or later.
  - Please note that the LucaNet software does not support various macOS settings such as the display settings **Prefer tabs when opening documents | in full screen** and **Prefer tabs when opening documents | always** for compatibility reasons. However, the LucaNet software can be used under macOS without any restrictions.

**Note**: LucaNet cannot guarantee that its software will offer 100% functionality in older operating system versions of Microsoft Windows, Unix/Linux and macOS. LucaNet will test future versions of operating systems in a timely manner in order to approve their use with LucaNet software.

#### Necessary permissions under MS Windows

LucaNet.**Financial OLAP Server** can be launched under Microsoft Windows either as an application or as a service. By default, the Windows service runs under the user **Local system account**. If this is changed, the new user name entered must have the following permissions:

- Start LucaNet Windows service
- Write permissions to the LucaNet directories. Default directories under MS Windows are:
  - C:\Program Files\LucaNet\Youniverse\
  - C:\ProgramData\LucaNet\Youniverse\LNWEB

#### Installation prerequisite

From the very outset, LucaNet.**Software Manager** must be installed onto every computer that LucaNet.**Financial OLAP Server** is to operate on.

### 2.3 LucaNet.Server Administrator

#### Overview

LucaNet.**Server Administrator** is the LucaNet user interface for the administration of LucaNet.**Financial OLAP Server**.

LucaNet.**Server Administrator** can be run without difficulty on a typical, modern desktop computer or laptop.

#### Hardware requirements

The minimum hardware requirements of every computer that is to run LucaNet.**Server Administrator** are as follows:

| Component | Minimum requirement |
|---|---|
| **CPU** | At least two CPU cores (four CPU cores recommended) |
| **RAM** | At least 512 MB |
| **Internal network connection** | At least a 1 Gbit connection (10 Gbit recommended) |
| **Internet connection** | At least a 16 Mbit connection |
| **Storage/hard drive** | 500 MB or more |

#### Operating system

LucaNet.**Server Administrator** runs on the following operating systems:

- Microsoft Windows: Windows 7 64-bit or later
- Unix/Linux: all common maintained distributions, especially centOS, Debian (version 7 and later), and SUSE (OH)
- macOS 10.13.5 or later
  **Note**: Please note that the LucaNet software does not support various macOS settings such as the display settings **Prefer tabs when opening documents | in full screen** and **Prefer tabs when opening documents | always** for compatibility reasons. However, the LucaNet software can be used under macOS without any restrictions.

#### Installation prerequisite

From the very outset, LucaNet.**Software Manager** must be installed onto every computer that LucaNet.**Server Administrator** is to operate on.

### 2.4 LucaNet.Financial Client

#### Overview

LucaNet.**Financial Client** is the user interface for end users of the LucaNet software.

LucaNet.**Financial Client** can be run without difficulty on a typical, modern desktop computer or laptop.

#### Hardware requirements

The minimum hardware requirements of every computer that is to run LucaNet.**Financial Client** are as follows:

| Component | Minimum requirement |
|---|---|
| **CPU** | At least two CPU cores (four CPU cores recommended) |
| **RAM** | At least 1 GB (in addition to the RAM required for the operating system and other programs)<br>**Notes**: If you have a complex LucaNet installation, i.e. you are using, for example, LucaNet.**Group Report** and/or other LucaNet scripts and apps, we recommend a configuration with 4 GB RAM (in addition to the RAM required for the operating system and other programs) |
| **Internal network connection** | At least a 1 Gbit connection (10 Gbit recommended) |
| **Internet connection** | At least a 16 Mbit connection |
| **Storage/hard drive** | 500 MB or more |

#### Operating system

LucaNet.**Financial Client** runs on the following operating systems:

- Microsoft Windows: all currently supported operating system versions
- Unix/Linux: all common maintained distributions, especially centOS, Debian (version 7 and later), and SUSE (OH)
  **Note**: When running Linux, system behaviour depends on distribution and the desktop environment used. Therefore, LucaNet cannot guarantee correct operation of LucaNet.**Financial Client** under Linux.
- macOS 10.13.5 or later
  **Note**: Please note that the LucaNet software does not support various macOS settings, such as the display settings
  - **Prefer tabs when opening documents | In full screen**
  - **Prefer tabs when opening documents | Always**
  - **System settings | Dock & Menu Bar | Show recent applications in Dock**

  for reasons of compatibility. However, the LucaNet software can be used without restrictions in macOS.

#### Installation prerequisite

From the very outset, LucaNet.**Software Manager** must be installed onto every computer that LucaNet.**Financial Client** is to operate on.

### 2.5 LucaNet.Excel-Add-In

#### Overview

LucaNet.**Excel-Add-In** is used for the excel integration of the LucaNet software.

There are two variants of LucaNet.**Excel-Add-In** available:

- An **integrated** LucaNet.**Excel-Add-In** that is automatically installed with the LucaNet software
- A **separate** LucaNet.**Excel-Add-In** that can be installed under MS Windows

You can read about how the two variants differ from each other in **Integrated vs. separate LucaNet.Excel-Add-In**.

#### Technical prerequisites

| | | **Integrated** LucaNet.**Excel-Add-In** | **Separate** LucaNet.**Excel-Add-In** |
|---|---|---|---|
| **Windows** | MS Excel 2013 | x | x |
| | MS Excel 2016 | x | x |
| | MS Excel 2019 | x | x |
| **macOS** | MS Excel for macOS 2016 | x | |
| | MS Excel for macOS 2019 | x | |

### 2.6 LucaNet.Web Client

#### Overview

LucaNet.**Web Client** is a web-based component that allows financial data from LucaNet to be displayed and analyzed without having to download or install anything. LucaNet.**Web Server** is the LucaNet server component that hosts LucaNet.**Web Client**.

LucaNet.**Web Client** can be easily used in a web browser on a modern desktop PC or notebook and on tablets.

#### Requirements

The following requirements apply to the use of LucaNet.**Web Client**:

- **LucaNet 22 LTS** or higher on the server computer on which LucaNet.**Financial OLAP Server** is installed.
- LucaNet.**Web Server** must be running on the server computer on which LucaNet.**Financial OLAP Server** is installed.

**Notes**:

- LucaNet.**Web Server** can be started from LucaNet.**Software Manager**.
- Optionally, the communication between LucaNet.**Web Client** and LucaNet.**Financial OLAP Server** via **HTTPS** can be activated in LucaNet.**Server Administrator**. In this case, a valid SSL certificate must be integrated in LucaNet.**Server Administrator**.

#### Using LucaNet.Web Client in macOS

LucaNet.**Web Client** can be used in macOS only if LucaNet.**Financial OLAP Server** is running in Linux or MS Windows. The reason for this is that the server component LucaNet.**Web Server**, which reads the data from LucaNet.**Financial OLAP Server** to display in the web browser, can only be installed as a service. Under macOS, however, installation as a service is not possible.

If LucaNet.**Financial OLAP Server** is installed in Linux or MS Windows, a web browser is sufficient to display financial data from LucaNet in macOS or iOS. No special software must be installed on the (client) user computers for this purpose.

#### Supported browsers

LucaNet.**Web Client** runs in the following browsers on user computers, Android tablets, or Apple iPads:

- Google Chrome
- Microsoft Edge
- Apple Safari
- Mozilla Firefox

**Notes**:

- LucaNet supports only the latest versions of the specified browsers.
- Furthermore, LucaNet.**Web Client** also runs in other browsers. However, LucaNet guarantees support only for the listed browsers.

### 2.7 LucaNet.Financial Warehouse

LucaNet.**Financial Warehouse** is a standardized relational data model independent of the ERP system used for storing accounting data that can be created as a database on any given database server (e.g. MS SQL, Oracle, DB2, or MySQL*). LucaNet.**Financial Warehouse** is a system-neutral data model that is document-oriented and multi-dimensional. The data model is optimized for use with any financial intelligence or business intelligence applications with LucaNet.

Using **ETL processes**, any ERP systems can be mirrored in LucaNet.**Financial Warehouse** at the document level in a prepared format and are then available in a standardized format for any other evaluations and schedules. ETL stands for **Extract**, **Transform** and **Load**, i.e. the processing of data by reading data from a source system, restructuring data and loading data to a target system.

*MySQL must be used in combination with a commercial license, as the license-free MySQL version can only be used in combination with open source software.

#### 2.7.1 SQL databases

##### Overview

To use LucaNet.**Financial Warehouse**, two relational databases are required. We recommend using an MS SQL server. While it is also possible to use relational database systems such as MySQL* or Oracle, this should be discussed in advance with a LucaNet consultant or the LucaNet technical support department.

**Caution**: When choosing the database system, make sure that you consider the expected data quantity!

*MySQL must be used in combination with a commercial license, as the license-free MySQL version can only be

used in combination with open source software.

#### Database requirements

The following database requirements must be met:

- The databases have a name. These names can be freely selected. Suitable names are, for example **LNFWH** and **LNFWHTemp.**
- At least one database user (user and password) with read and write access to the databases is set up.

Further preparation of the databases is not necessary. Creation of tables and further preparations are performed by LucaNet.**Consulting**.

#### Disk storage

The database size (hard drive memory) depends on the quantity of the data to be processed: The number of companies, number of accounts and the number of postings. The following approximate values apply for an MS SQL server:

| Memory requirement | Any ERP system | SAP Business Suite |
|---|---|---|
| Posting entries | 1.5 KB per posting entry | 4 KB per posting entry |
| 100,000 | 150 MB | 400 MB |
| 1,000,000 | 1.5 GB | 4 GB |
| 10,000,000 | 15 GB | 40 GB |
| 100,000,000 | 150 GB | 400 GB |

The values indicate the maximum memory workload during script runtime. After completion of the ETL process, the storage space can be optimized with SQL server functions. The required storage space then amounts to just a part of the values specified above. However, it must be possible to ensure at all times that the database files can temporarily grow to the specified size.

**Note**: Remember that there must also be sufficient disk memory for the operating system and the installation of the software!

### 2.7.2 Selecting the database server

#### Overview

LucaNet does not require any specific database server for LucaNet.**Financial Warehouse**. Each customer must decide which database system it will use. LucaNet recommends the following:

- If the database server is only going to be used for LucaNet.**Financial Warehouse** and/or LucaNet, then we recommend **Microsoft SQL Server Express** for small to medium data quantities. This database server can be downloaded (no license fees required) from the Microsoft website.
- For higher memory requirements, a full-featured database system (**Microsoft SQL Server Standard Edition** or later, or **Oracle Database**) must be used.

For the respective system requirements and any limitations that may apply, please refer to the following chart:

**Microsoft SQL Server 2016**

| Edition | System requirements | Restrictions |
|---|---|---|
| Microsoft SQL Server (Standard Edition) | **Software**<br>• .NET Framework<br>• Microsoft Windows 8/Microsoft Windows Server 12 and later<br>**Hardware**<br>• Min. 6 GB hard drive memory<br>• Min. 1 GB RAM<br>• Min. x64 processor running at 1.54 GHz (2.0 GHz recommended) | No restrictions |
| Microsoft SQL Server Express Edition | **Software**<br>• .NET Framework<br>• Microsoft Windows 8 and later<br>**Hardware**<br>• Min. 512 MB RAM (1 GB recommended)<br>• Min. 6 GB hard drive memory<br>• Min. x64 processor running at 1.54 GHz (2.0 GHz recommended) | • Max. one CPU usable<br>• Cannot use more than one processor core (MS SQL Server 2008 R2 Express) or four processor cores (Express versions 2012, 2014, and 2016)<br>• Max. 1 GB RAM usable<br>• Max. 10 GB database size<br>• Restricted range of functions in Microsoft SQL Server |

**Oracle Database 11.1**

| Edition | System requirements | Restrictions |
|---|---|---|
| Oracle Database (Enterprise Edition) | **Software**<br>• Windows Server 2003 or later<br>• Windows Vista and later<br>**Hardware**<br>• Min. 1 GB RAM<br>• Min. 5 GB hard disk memory<br>• Min. 550 MHz processor | No restrictions |
| Oracle Database (Express Edition, XE) | **Software**<br>• Microsoft Windows Server 2008 or later | • Max. one CPU usable<br>• Max. 1 GB RAM usable<br>• Max. 4 GB database size (user data) |

| | | |
|---|---|---|
| | • Microsoft Windows 7 and later<br>**Hardware**<br>• Min. 1.5 GB hard drive memory<br>• Min. 512 MB RAM | • Some database functions unavailable |

**MySQL* (4.x)**

| System requirements | Restrictions |
|---|---|
| **Software**<br>• Windows XP and later<br>• Microsoft Windows Server 2003 or later<br>• Linux (various distributions, incl. Ubuntu, CentOS, Debian)<br>• macOS 10.13.5 or later<br>**Hardware**<br>• Min. two processor cores<br>• Min. 2 GB RAM<br>• 500-800 MB RAM (depending on operating system)<br>**Note**: Oracle no longer specifies hardware and software requirements for newer versions of MySQL*, as these requirements depend in particular on the intended use of MySQL*. | If **more than one million postings** have to be processed per fiscal year, **MySQL* must not** be used due to performance problems when using LucaNet.**Financial Warehouse**. In case that more than one million postings have to be processed, we recommend you to use Microsoft SQL server. |

*MySQL must be used in combination with a commercial license, as the license-free MySQL version can only be used in combination with open source software.

**Notes**

- The database systems cited herein have undergone comprehensive testing. When using other database systems, LucaNet cannot ensure that the LucaNet ETL scripts will work without errors.
- The system requirements and limitations vary a great deal based on the operating system and processor type at hand, as well as on the installed components of the database system in use. If necessary, inquire with the respective manufacturer about the system requirements for your hardware and software configuration.
- The specific usage parameters at hand (the amount of data to be processed, the number of documents, etc.) are another key factor. If necessary, discuss the database server that suits your particular needs with your LucaNet consultant.

**Caution**

- The system requirements and limitations correspond to the manufacturer specifications issued in October 2018.
- The system requirements and limitations of older versions of the database management systems covered may deviate from the specifications in this document.

### 2.7.3 Network architecture

The LucaNet software, the ERP system and the database server can be on any of the servers in a company network. This makes it possible to host the ERP system on a local installation of LucaNet, for example. The database server containing LucaNet.**Financial Warehouse** can be installed on a third server.

We recommend installing the database software for LucaNet.**Financial Warehouse** and the LucaNet server on the same computer. This can achieve an acceleration of ETL processes by a factor of three.

**Note**: In situations where it is not possible to install LucaNet.**Financial OLAP Server** and LucaNet.**Financial Warehouse** on the same computer, we recommend installing the two software components on the same network.

## 3 Security concept

The LucaNet software has a comprehensive security concept that includes both the protection of your data in the LucaNet software and the mapping of your individual security policies using a comprehensive authorization concept.

### 3.1 Access protection in the software

#### Data Transfer

A choice between no encryption or SSL encryption (TLS 1.2 or higher) can be made when transferring between LucaNet.**Financial OLAP Server** and the client applications.

#### Password encryption

The PBKDF2 procedure is used to authenticate users for all software components (that is, servers and all clients).

#### Administration of LucaNet.Financial OLAP Server

LucaNet.**Financial OLAP Server** is administrated by means of the application LucaNet.**Server Administrator**.

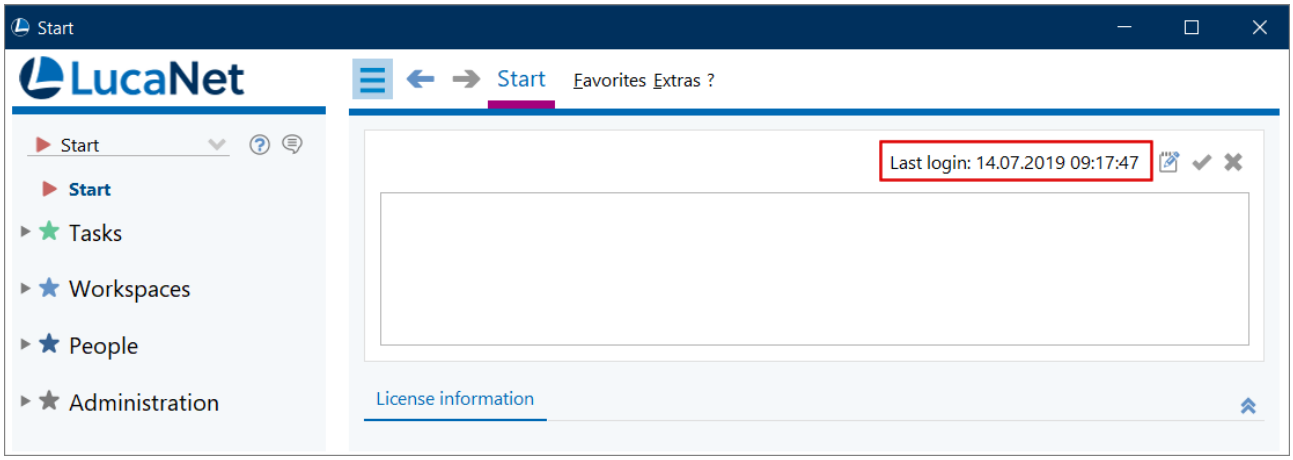
Administrative tasks such as creating, backing up, and deleting databases take place in LucaNet.**Server Administrator**. Furthermore, access to it can be used to manage software updates, carry out regular backups, and view server log files.

Permission to access LucaNet.**Server Administrator** does **not** include any access rights to view the contents of the managed databases, with the exception of the following statistical data:

- Number and names of created users
- Number and names of created reporting entities
- Number and names of created data levels
- Number of cost centers

## Database access

Every database user must identify themselves with a user name and a PBKDF2-encrypted password. Each login operation is recorded with a time stamp. The most recent access attempt is displayed to users on the start-up screen as in the following example:




To increase password security, policies can be defined as to their length, complexity, and how often they must be changed.

To grant LucaNet employees temporary access to a database for support purposes, users of type LucaNet.**Certified Professional** that do not require a license can be created and configured in every database:

- To satisfy audit requirements, users of type LucaNet.**Certified Professional** should always have the full names of the accessing user in the form *FirstnameLastname* as user names in line with LucaNet's naming conventions. The user John Smith Doe would have the user name JohnSmithDoe, for example.
- A user of type LucaNet.**Certified Professional** has the exact access permissions it was granted during configuration. Due to audit requirements (security policies), a customer may object to users of type LucaNet.**Certified Professional** being granted full write and read permissions across the board. In such cases, individual arrangements can be made as to the access permissions these support users should have.
- All actions performed by users of type LucaNet.**Certified Professional** are registered in the change log, which makes it possible to determine what tasks the users in a given database have carried out at any time.
- If continued access to a database is (temporarily) no longer required for a user of this kind, the user can be blocked for the relevant period (or permanently).

## Access to LucaNet.Financial Warehouse

After initial setup, the authorization for access to LucaNet.**Financial Warehouse** can be restricted by assigning a customer-specific password so that only the customer has access to LucaNet.**Financial Warehouse**. From this moment, LucaNet can access LucaNet.**Financial Warehouse** only upon customer request.

## 3.2 Data backup concept

### Overview

LucaNet.**Financial OLAP Server** uses an in-memory database for providing data for the application. Because the RAM is volatile, several fallback levels are implemented in order to guarantee safety against breakdowns and thus the availability of the data. The following fallback levels are implemented:

- **import**
  Backups can be used to store the entire LucaNet database on a separate drive so that the latest data can be accessed even in the event of a server failure. Data backups consist of XML-based raw data that are zipped and encrypted and stored in LNARC format, i.e. in a LucaNet-specific archive format. Each backup contains the current state of the database in encrypted form and all binary files.
- **Snapshots**
  Snapshots are backup copies of the main memory. Each snapshot is a binary file that is comprised technically of a one-to-one copy of the object-oriented data model at a particular point in time. Snapshots can be interpreted only by LucaNet.**Financial OLAP Server** for which they were created.
- **Transaction log**
  The transaction log is always based on a snapshot and contains all of the changes that have been executed since the creation of the snapshot on the database in the context of writing transactions.

### Creating backups

To prevent data loss, automated or manual backups of the managed databases can be created in LucaNet. **Financial OLAP Server**. You can create a backup of your database(s) at any time. The database state at the time of the backup is saved as an LNARC file and stored in the file system.

You can store the database either through LucaNet.**Server Administrator** or in the currently used database directly in LucaNet.**Financial Client**.

As a rule, data backups are created automatically overnight in LucaNet, using the so-called job control. The job control contains the job **Perform backup**, which is used to automatically create data backups. We recommend saving this backup to a network drive located on a server that is also part of your backup strategy.

### Encryption of backups

All backups are password-protected and encrypted using the **AES** algorithm. By default, the password of a backup is the license number. Alternatively, it is possible to assign individual passwords for the data backup(s) by using the option **Encrypt backup with individual password**.

Decoding and using a backup is impossible without knowing the password of the backup.

### Importing backups

Data backups can be imported at any time. The original database at the time of the backup will be restored by the LucaNet software as part of this process. Backups can be imported into higher releases of the LucaNet software or in other LucaNet.**Financial OLAP Servers**. Should the worst-case scenario occur and an import into the existing LucaNet.**Financial OLAP Server** is no longer possible, the LucaNet software can be reinstalled and the data backup can be imported into the new LucaNet server.

Please note that when using a backup, the changes made in the source database since the last backup will be lost.

### Data recovery based on snapshots (recovery concept)

LucaNet.**Financial OLAP Server** always stores all of the changes made as a snapshot and in the transaction log on the hard drive parallel to on-going work.

If the computer crashes during operation, the server will reconstruct the changes from the hard drive at the time of the next start-up and restores the data up to the last storage time prior to the crash. Recovery of the data in the RAM from the files on the hard drive is called **loading the database**.

Because the transaction log is written asynchronously in the background (possibly with a time delay of a few milliseconds), at most the last change, which could not be logged completely in the transaction log, could get lost.

### Recovery based on VM images

We also recommend that the image of the VM on which LucaNet.**Financial OLAP Server** is installed to be stored at the shortest intervals possible. In this way, a fallback level is created that enables the recovery of LucaNet.**Financial OLAP Server** without having to reinstall it. When creating VM images, it is not necessary to back up the entire RAM of the VM.