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Installation instructions *BL Banking Web*

Abstract

The following instructions describe the installation and initial setup of *BL Banking Web* on a computer with Windows, Linux, or Mac OS as the operating system.

The description below assumes a Windows installation. With the exception of the paths mentioned in the program, the installation is identical on computers with Linux or Mac OS.

Contents

1 Requirements

The installation of *BL Banking Web* takes about 300 MB of storage space, plus the user data of the program.

BL Banking Web requires a database for its operation. The setup program can create an H2 database during the installation. However, it is recommended to use an external database. MySQL, MariaDB, Oracle DB Server, Microsoft SQL Server and PostgreSQL are supported. An empty database or tablespace must be set up with a user, who has rights to create, delete and change tables and sequences as well as to create, change and delete table entries.

BL Banking Web should be operated as an HTTPS server. An SSL certificate is required for this. The setup program can initially create a self-signed certificate, but this is usually not recognized by all browsers. It makes more sense to use a certificate that was created by a real CA. Free certificates are available from letsencrypt.org, for example. The key can be integrated into *BL Banking Web* in PKCS#12 format.

The Java runtime environment required for *BL Banking Web* is part of the setup program and will be installed automatically.

2 Preparation

Download the setup program for your operating system via the appropriate link and copy it to the target computer in a directory of your choice.

Now start the setup program. A window will open, which shows you the preparation of the wizard. Then a window appears, where you can select the language used during the installation. English and German are available. Regardless of the language selected here, you can switch the language in *BL Banking Web* at any time after the installation.

If you started the setup program under a user account without administrator rights, Windows will now prompt you to enter the administrator's password.

After that the setup wizard is started.

3 Installation

The setup wizard welcomes you with a window, from which you can continue or cancel the installation. If you already had installed *BL Banking Web* before, this window does not appear, but instead the question, whether you want to update the existing installation or reinstall it in another directory. For this see the Figure 11 in the chapter *Update*.

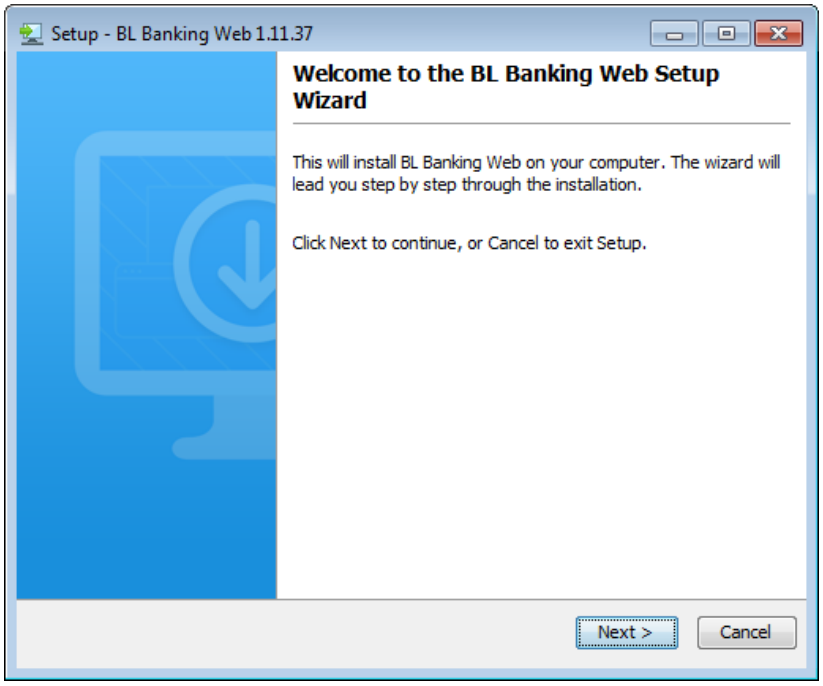

Figure 1: Welcome window of the setup wizard

3.1 Installation directory

In the next window, enter the directory, into which *BL Banking Web* shall be installed, see Figure 2. The default is:

`C:\Program Files\blbankingweb`

You can also enter another directory in the field or click *Browse* and navigate to the desired directory.

3.2 Workspace directory

You will then be asked to enter the directory for the user data, see Figure 3.

Here, *BL Banking Web* stores the files that are created during the operation of the application. In contrast to the program folder selected above, this directory is not write-protected, i.e. users without administrator rights can also access it. This must be taken into consideration if you want to change the default directory. The default is:

`C:\ProgramData\blbankingweb`

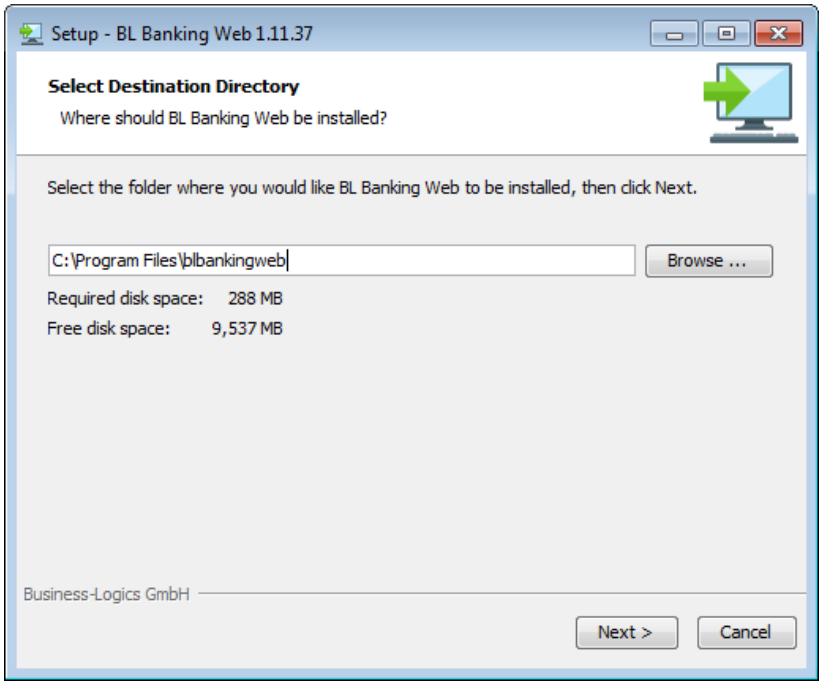

Figure 2: Specifying the installation directory for the program

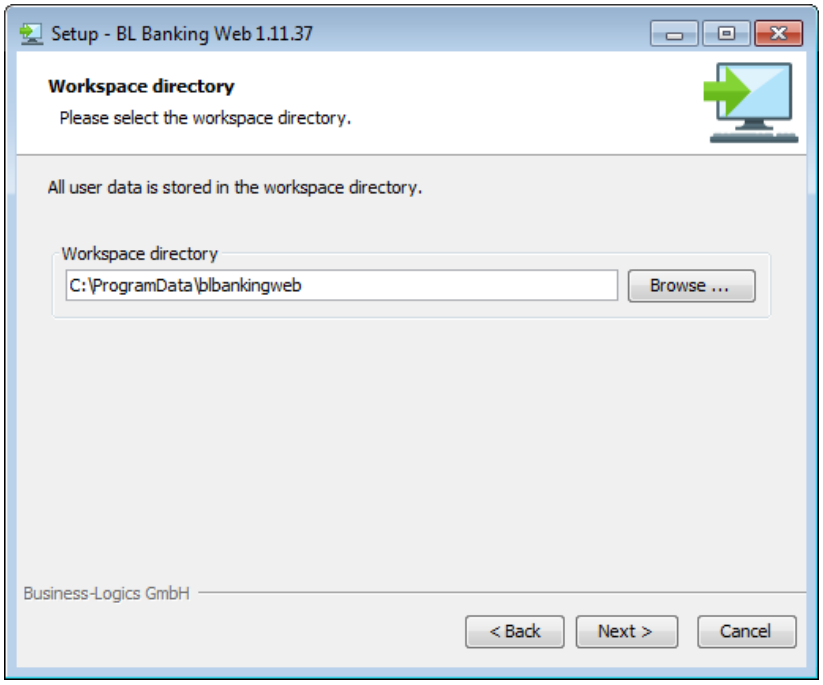

Figure 3: Specifying the workspace directory for the program

3.3 Configure TLS

To set up Transport Layer Security (TLS), enter the port, on which *BL Banking Web* can be reached in the next window, see Figure 4. The default is 443. If this port is already in use on the server, you can change it here, for example to 8443.

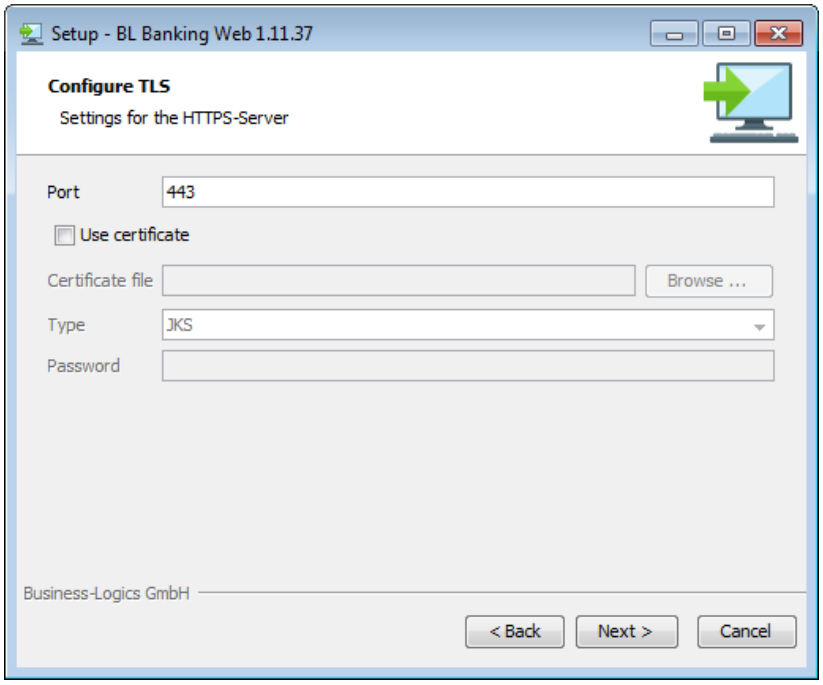

Figure 4: TLS configuration of the program

If you do not tick the checkbox below, a self-signed certificate will be created. However, this certificate is not recognized by most browsers. It is therefore recommended that you use your own certificate here. To do this, tick the checkbox, click *Browse* and navigate to the certificate file. This path is not changed by the setup wizard, i.e. the certificate remains in this location. Below, select the format of the file. JKS and PKCS12 are supported. In most cases, the format PKCS12 or PKCS#12 is used for an externally issued certificate.

Finally, enter the password, with which the certificate is protected.

You can also change the certificate subsequently. For this, see the section 3.8.1.

If you want to use a certificate from *Let's Encrypt*, it is a good choice to deploy an Apache web server. A description of this can be found in the section 3.8.3.

3.4 Configure proxy

If you are using a proxy, through which the users or the program access the network, set the checkbox here and enter the address and port of the proxy server below.

If the proxy requires authentication, also set the second checkbox and enter the user name and password of the proxy server below, see Figure 5.

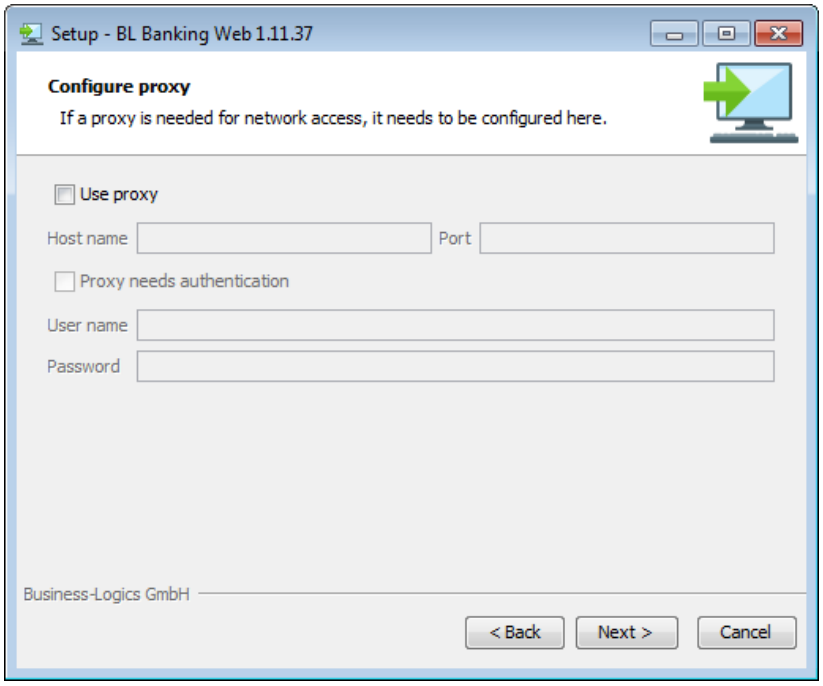

Figure 5: Proxy configuration

3.5 Start menu

In the next step you can specify, whether the setup wizard should create an entry in the Windows Start menu, see Figure 6. The checkbox is already set and the name of the folder is preset with *BL Banking Web*.

It is recommended that you create the start menu folder. You will then find the following entries in it:

- Uninstallation program – Wizard for the uninstallation
- Web browser with the address of *BL Banking Web*
- Update check – Wizard for the update

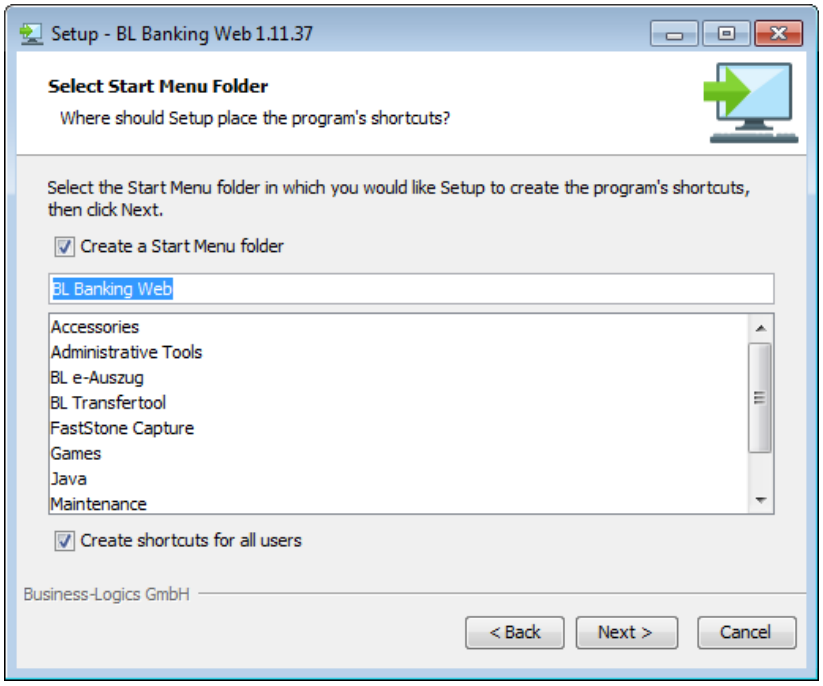

Figure 6: Settings for the start menu of the program

3.6 Installation progress

After these entries were made, *BL Banking Web* will be installed. The progress is shown in the wizard, see Figure 7.

3.7 Completing

The last window of the wizard shows you that the installation is complete, see Figure 8.

As part of the installation, the wizard has set up a service on the computer, which ensures that *BL Banking Web* is started automatically when the computer has to be rebooted.

Click *Finish* to exit the setup wizard.

3.8 Configuration

Certain settings cannot be made with the setup program, but must be carried out in configuration files.

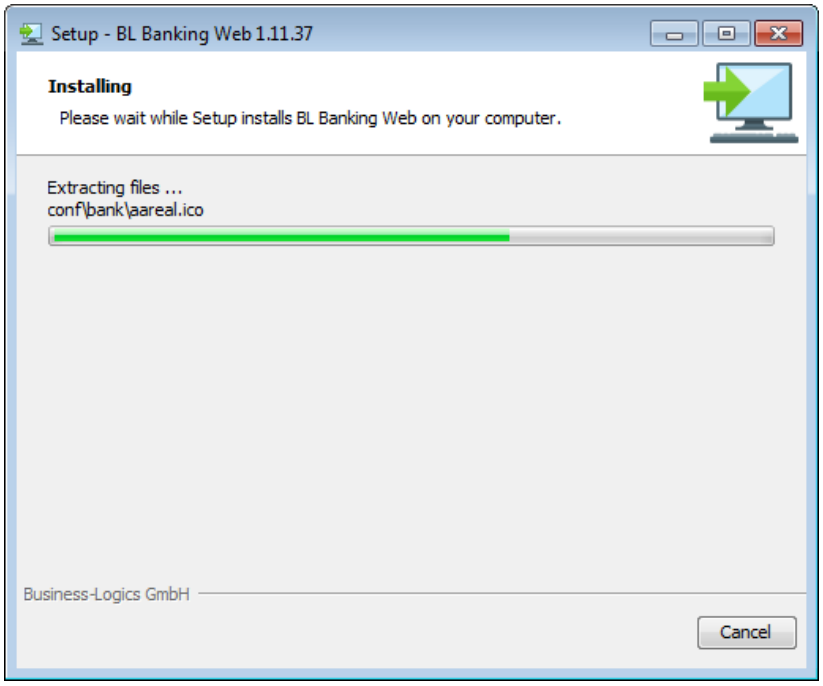

Figure 7: Installation of *BL Banking Web* with progress display

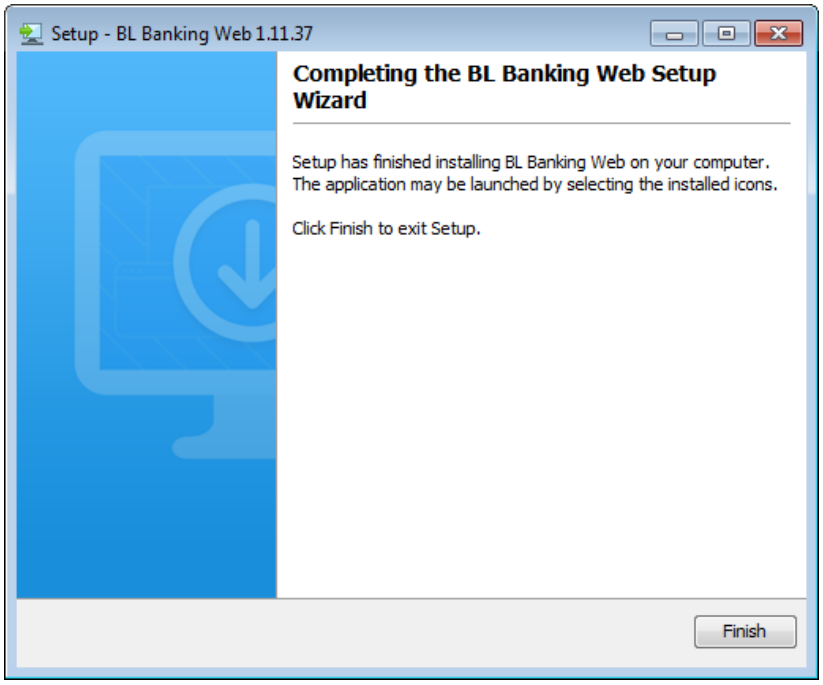

Figure 8: End of the setup wizard

3.8.1 Configure certificate subsequently

If you want to subsequently use another certificate, you must enter it in the `config.ini` file. This is located in the directory `C:\Program Files\blbankingweb` or the folder you specified during installation, see section 3.1. With the parameter `sslKeystorePath` you specify the path and file name of your certificate, with `sslKeystoreType` the format (JKS or PKCS12) and with `sslKeystorePassphrase` the password in plain text. The `config.ini` could then look like this:

```
workspace=C\:\\ProgramData\\blbankingweb
sslKeystorePath=C\:\\Program Files\\blbankingweb\\conf\\mycertificate.jks
sslKeystoreType=JKS
sslKeystorePassphrase=mypassword
```

After that, restart the server, e.g. by stopping and restarting the service under Windows. Then the password is stored encrypted with the parameter `sslKeystorePassphrase.enc`.

3.8.2 Configure WebSockets for web server

BL Banking Web uses WebSockets to communicate with the browser in both directions. If the application is operated behind an upstream web server (e.g. proxy server or load balancer), this must also support WebSockets. In addition, the name of the web server must be entered in the file `production.conf`. This is located in the subdirectory `conf` under the folder you specified during the installation, see section 3.1.

The parameter `bl.websocket.host` is used to specify the host name. This should be the host name of the web server from the perspective of the user. With `bl.websocket.secure` you determine whether TLS should be used for the WebSockets. The values `true` and `false` are possible. The following example shows the syntax, whereby `server.address` is the address, under which users can reach the application.

```
bl.websocket.host=server.address
bl.websocket.secure=true
```

3.8.3 Configure Apache web server

In many cases it makes sense to operate a web server that accepts user requests and forwards them to *BL Banking Web*. For example, if you want to use a certificate from *Let's Encrypt*, it is a good choice to deploy an *Apache* web server, as it can be configured to renew the certificate automatically.

As with the WebSockets described in section 3.8.2, the name of the web server must be entered in the file `production.conf`. Furthermore, *BL Banking Web* is set to unencrypted operation there, i.e. with `http`.

In the following example, it is assumed that the Apache web server is installed on the same computer as *BL Banking Web* and can be reached by users at `https://server.address:9000/blbankingweb`. The Apache web server then runs under the address `server.address` and the port 9000, which you can choose at will. If the application shall be called up with `https://server.address:9000`, the instruction `play.http.context` will be omitted.

```
http.address=127.0.0.1
http.port=9000
play.http.context="/blbankingweb"
bl.websocket.host=server.address
bl.websocket.secure=true
```

On the Apache web server, the modules `mod_proxy`, `mod_proxy_http` and `mod_proxy_wstunnel` must be installed or activated, respectively. The forwarding to *BL Banking Web* is specified in the Apache configuration file. The values for `http.port` and `play.http.context` are taken over from the file `production.conf`.

```
ProxyPass "/blbankingweb/ws" "ws://localhost:9000/blbankingweb/ws"
ProxyPass "/blbankingweb" "http://localhost:9000/blbankingweb"
ProxyPassReverse "/blbankingweb" "http://localhost:9000/blbankingweb"
```

Depending on the operating system and the Apache program package, the configuration is entered in different files, e.g. under Windows in `conf\httpd.conf`.

4 First-time setup

After the installation, *BL Banking Web* must be configured for the first time. To do so, you need a license for the application from Business-Logics, and the access data for the EBICS connection from your bank. Moreover, your bank must set up an EBICS access for you, which must be in the state *not initialized*.

To start the setup, call up the application in a web browser. If you are on the computer, where the application is installed, select the appropriate folder from the start menu and then click on *BL Banking Web*. Instead, you can also start a web browser and enter the address `https://localhost/setup` there.

You can also perform the configuration from a remote computer. In that case, enter the IP address or the name of the server instead of `localhost` in the browser.

After the application has started, click on *Display help* in the upper right corner and follow the instructions to continue the setup.

5 Update

With the help of a provided program you can check whether an update is available for *BL Banking Web*. If this is the case, you can perform the update immediately.

If you have created an entry in the step Start menu during the installation, you can call up the menu item *Update Check* from there. Otherwise you can start the program `UpdateCheck.exe` directly via the file manager. This is located under the installation directory, which you created in the step Installation directory, hence by default in `C:\Program Files\blbankingweb\bin`.

Then, the first page of a wizard will appear, where you can click *Next*. After that, it will check whether an update is available. If this is the case, you can select in the next window the directory, where the setup program will be downloaded, see Figure 9. To do so, click the *Browse* button, whereupon the file manager opens, with which you can navigate to the desired directory.

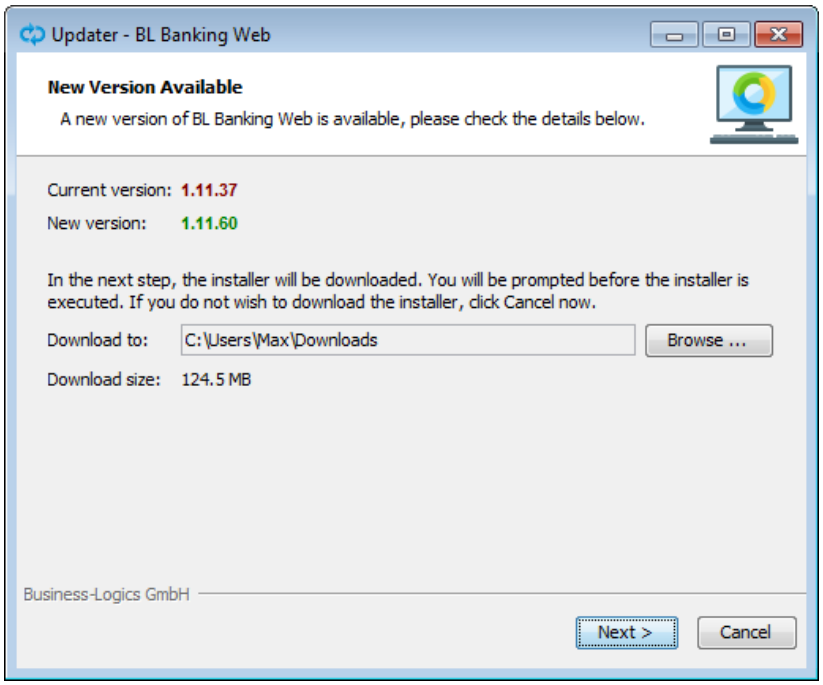

Figure 9: Update available

In the next window you can follow the progress of the download. When this is complete, you can choose to install the update immediately or later, as shown in Figure 10.

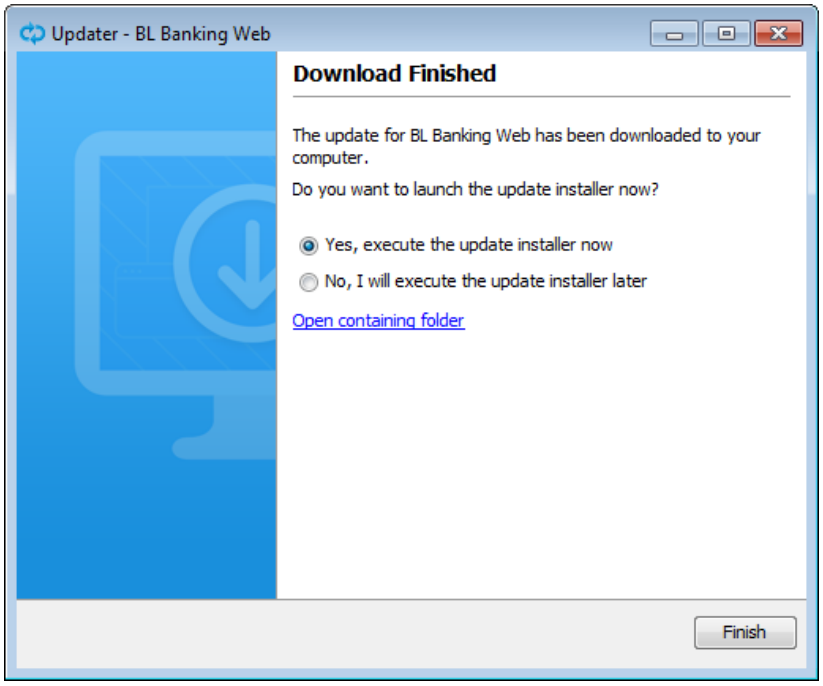

Figure 10: Download completed

The rest of the procedure is the same as for the installation and is described in section 2. However, in any case the window appears here, where you can choose whether you want to update the existing installation or install to another directory. See Figure 11 for this. Be sure to leave the setting *Yes* here. By hovering the mouse over the green question mark, you can make sure that this is really the directory of your existing installation.

After clicking *Next*, the update is performed. The progress and the completion are shown each in a window.

6 Migration

If you want to move an existing installation of *BL Banking Web* to another computer, proceed as follows. With this procedure, you can also migrate to a computer with a different operating system, for example, from Windows to Linux.

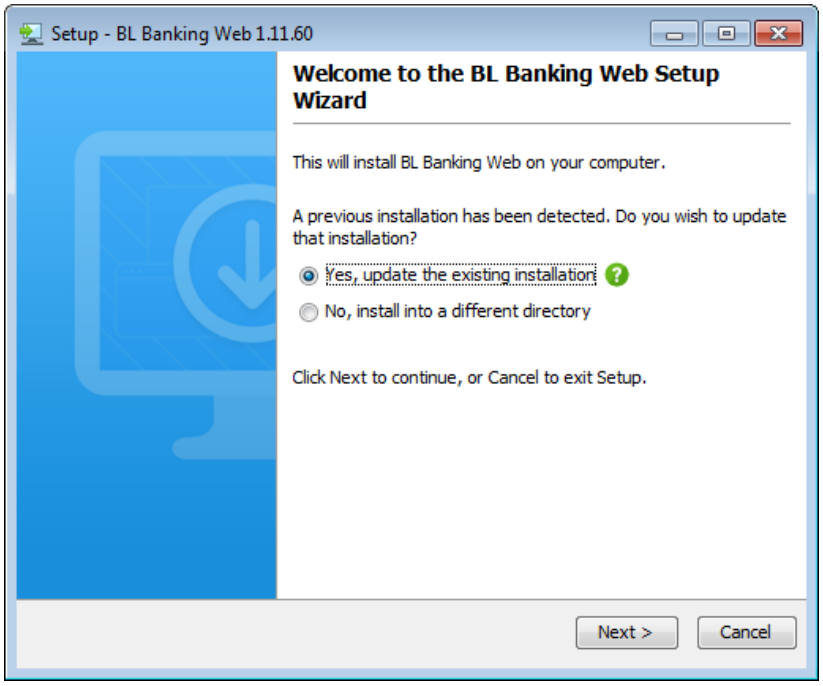

Figure 11: Begin of the update

If you are using an external database and also want to move this to a new server, first perform a database migration with the *existing* installation. You can find a description of this in the online manual.

Download the latest setup program and execute it on the new computer. See the chapter 3 for this.

If necessary, modify the configuration file `config.ini` with regard to the paths to the workspace directory and certificate or copy the file from the old installation. See also the section 3.8.1 for this. The following is an example of a modified `config.ini` with a relative and absolute path.

```
workspace=workspace
sslKeystorePath=/opt/blbankingweb/conf/mycertificate.jks
...
```

If you had modified other configuration files in the old installation, check whether these changes were retained after the setup program was run. For an example, see the section 3.8.2.

Finally, copy the workspace directory and the certificate to the new computer. The migration is then complete.

7 Configure a cluster

BL Banking Web can also be operated in a cluster, which means, software runs on several systems and the requests are distributed between the systems. distributed between the systems. Figure 12 shows the structure and the various components of the installation. components of the installation.

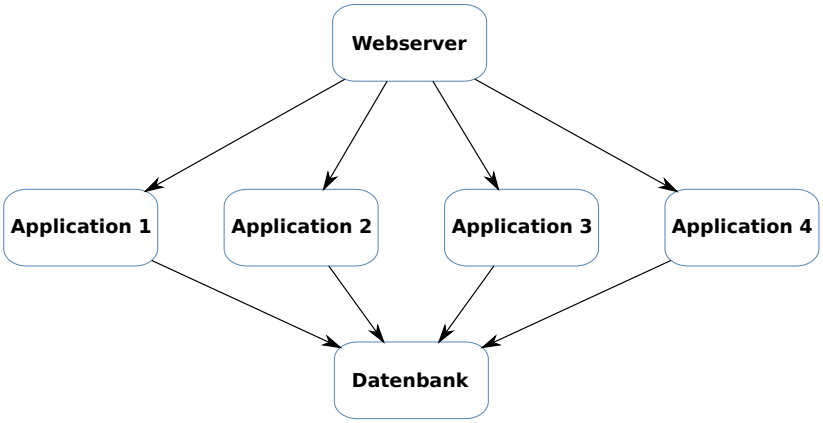

Figure 12: Architecture of a *BL Banking Web* Cluster

The starting point is a functioning *BL Banking Web* installation with a web server connected in front of it, here the use of an Apache web server is described as an example. In the illustration, these are the components *web server* as well as *Application 1* and *Database*.

In this example, the *Application 1* server can be reached from the *web server* via `http://192.168.1.1:9000` and the server can also be reached from the other servers via this URL. In this example, the *Application 2* server can be reached via `http://192.168.1.2:9000` and the other servers can be reached accordingly.

The production.conf of the server contains the following entries:

```
https.port=disabled
http.address=192.168.1.1
http.port=9000
bl.websocket.host=server.address
bl.websocket.secure=true
```

And in the Apache web server, the forwarding is configured as follows:

```
ProxyPass "/ws" "ws://192.168.1.1:9000/ws"
ProxyPass "/" "http://192.168.1.1:9000/"
ProxyPassReverse "/" "http://192.168.1.1:9000/"
```

The steps for adding the other servers are described below. to be added.

7.1 Activation of the cluster

Starting with a functioning installation with a web server, an application server and a database server, the configuration on the application server must first be adjusted so that the cluster function is activated.

To do this, the following entry is added to the *config.ini* of the application server:

```
node_url=http://192.168.1.1:9000
```

Afterwards, the service is restarted once. In the database, this node is now entered as *primary node*. This means that the things that are to be executed only once (such as fetch schedules) are always executed on this node.

You can check the activation of the cluster after the restart with the following SQL statement:

```
select id, base_url, primary_node from cluster_node;
```

```
 id |         base_url         | primary_node
----+--------------------------+--------------
  1 | http://192.168.1.1:9000 | t
(1 row)
```

In addition, for all files of the `workspace` directory in the database, an entry is created that these files can be found on this node. This can be checked with the following SQL statement:

```
select count(*) from workspace_file_cluster_node where cluster_node_id=1;
```

```
 count
-------
    79
(1 row)
```

This lists 79 files in the `workspace` directory. This number may of course be different on your system.

In addition, you want the web socket requests generated by node 1 to come back to node 1. Therefore, we change the entry `bl.websocket.host` in *production.conf* and add an id for node 1 here. `bl.websocket.host=server.address` then becomes `bl.websocket.host=server.address/node1`. We want to achieve here that the previous websocket URL `https://server.address/ws`, depending on the node, is now either

- `https://server.address/node1/ws`

  or

- `https://server.address/node2/ws`

Finally, the redirection must be changed on the Apache web server. The new entries should look like this:

```
1   Header add Set-Cookie "ROUTEID=.%{BALANCER_WORKER_ROUTE}e; path=/" env=BALANCER_ROUTE_CHANGED
2   <Proxy "balancer://blbankingweb">
3       BalancerMember "http://192.168.1.1:9001" route=1
4       BalancerMember "http://192.168.1.2:9002" route=2
5       ProxySet stickysession=ROUTEID
6   </Proxy>
7   ProxyPass /node1/ws ws://192.168.1.1:9000/ws
8   ProxyPass /node2/ws ws://192.168.1.2:9000/ws
9   ProxyPass / "balancer://blbankingweb"
```

Here a `stickysession` cookie is set (lines 1 and 5) when a client has been sent to a node once. Subsequent requests from the same client will then always go to the same node.

Lines 4 and 8

- `BalancerMember "http://192.168.1.2:9002" route=2`

  und

- `ProxyPass /node2/ws ws://192.168.1.2:9000/ws`

do not need to be added until the second node is set up. These are the lines that must also be added for each additional node.

7.2 Building another node

To add another node to this cluster, the following steps are performed:

1. first the same version of the software is installed on the *Application 2* server.

2. on *Application 2* the *config.ini* is also created and a local *workspace* directory is referenced there. The *node_url* for this node is also entered in the *config.ini*. The *config.ini* should now have the following entries, for example:

   ```
   workspace=workspace
   node_url=http://192.168.1.2:9000
   ```

3. also, the *jdbc.properties* file of *Application 1* is copied to the `workspace` directory of *Application 2* so that the same database is accessed.

4. the files from the `workspace` directory do not have to be copied between the nodes. Each node gets the files it needs from the other nodes.

5. the entries in `production.conf` differ only in the values of

   - `bl.websocket.host=server.address/node2`

     und

   - `http.address=192.168.1.2`.

   It is important that the entry `play.http.secret.key` is identical on all nodes.

6. Finally, in the Apache web server, these lines

   - `BalancerMember "http://192.168.1.2:9002" route=2`

     und

   - `ProxyPass /node2/ws ws://192.168.1.2:9000/ws`

   must be added for this server.

7.3 Database distribution

Since the database plays a central role in the architecture, the performance of the entire application can be increased in a cluster by providing a local *read-only* copy of the database with database replication. All read operations can then be performed by the local copy of the database and only the write operations are forwarded to the central *Replication Server*.

How to set up a replication for the database is not described here (please inform yourself how this is possible for your database type), but only how to use a local *read-only* database to increase the performance of the system.

To use a *read-only* database, create a file called *jdbc.readonly.properties* in the `workspace` directory in addition to the *jdbc.properties* file. This file contains the same parameters as the file *jdbc.properties*, but indicates that the database should only be used for read access in cluster mode.

8 Change log

You can find the change history on the *BL Banking* website under the following address: www.blbanking.de/changeweb.html