LISTSERV® Maestro 11.0 Installation Manual for Linux®

This document describes the installation of the **Version 11.0** release of LISTSERV® Maestro for Linux®.

WARNING: Upgrade with patience!

Upgrading from LISTSERV Maestro 9.0 or older can take a substantial amount of time, if you have a lot of data in your LISTSERV Maestro instance!
Schedule the upgrade for a time when it does not disrupt your usage of Maestro, even if it should take longer than expected.
Be patient during the first start of LISTSERV Maestro after the upgrade. At this time, the system will convert some of the data into a new format that is necessary to support the new features in this version. Check the log files to see when the startup is finished. Do not be impatient if this takes longer than expected.

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1 Quick Installation Guide

For a complete installation of LISTSERV Maestro 11.0, several components are required that may be installed on one server, or distributed over several servers. The following sub-sections give a quick overview of how to install each of these components when doing a fresh installation of LISTSERV Maestro. For more in depth information, or for information on upgrading an existing LISTSERV Maestro installation, please see the later sections of this document.

1.1 Installing LISTSERV

LISTSERV Maestro 11.0 requires an instance of LISTSERV. For a new installation, **LISTSERV 17.0** or later is recommended[1].

If you already have such a LISTSERV instance installed, you may use it for LISTSERV Maestro.

If you do not have a LISTSERV instance installed, or want to use a freshly installed instance, you can install a new LISTSERV 17.0 directly from the LISTSERV Maestro 11.0 Setup-Suite. The Setup-Suite allows you to either install the LISTSERV instance on a separate server (by performing a "Custom Setup") or together with all other LISTSERV Maestro components on a single server (by performing an "Express Setup"). Please see the Setup-Suite Manual for LISTSERV Maestro for details.

IMPORTANT: The bundled LISTSERV 17.0 requires a version 17.0 License Key (LAK). If you use this bundled LISTSERV to upgrade an existing LISTSERV of a previous version, you must obtain and install a LISTSERV version 17.0 product LAK **prior to upgrading**, or LISTSERV will not start after the upgrade! Note also, that LISTSERV 16.x web interface customizations and branding are **not compatible** with LISTSERV 17.0. Before using the bundled LISTSERV 17.0 to upgrade an existing LISTSERV of a previous version, please back up your LISTSERV installation and read the "LISTSERV 17.0 What's New" document.

If you do not have a LISTSERV instance installed, or want to use a freshly installed instance, install a new LISTSERV 17.0 with the corresponding LISTSERV installation package for Linux (see the LISTSERV installation manual for instructions).

1.2 Installing External Database (optional)

Only necessary if you do **not** want to use the internal database that is deployed together with LISTSERV Maestro 11.0 (an instance of MySQL 8.0.25, see Appendix B for details). In this case, you need an external database that LISTSERV Maestro can use as its system database.

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[1] The minimum supported LISTSERV version is LISTSERV 16.0 with build date "10 Dec 2009".

Supported databases are:

- **Microsoft® SQL Server 2000 or later**

- **MySQL™ 4.1 or later**

- **Oracle® 9i or later[2]**

- **IBM DB2® V8.2 or later**

If you already have an instance of such a database installed, you may use it as the LISTSERV Maestro system database.

If you do not have a database installed, or want to use a freshly installed database, install the database of your choice with the corresponding installation package provided by the database vendor.

Important: If you want to use your own database, see the [Admin Tech Doc 3 – Database Configuration](#) for details about each database, and the specific requirements made by LISTSERV Maestro. Also see [Appendix C](#) for more details.

1.3   Installing LISTSERV Maestro 11.0

LISTSERV Maestro 11.0 itself consists of three components:

- The **Maestro User Interface** component is the actual user interface for mail jobs, tracking data, and subscriber lists.

- The **Maestro Tracker** component is the component that collects the tracking events that are generated by recipients of emails that were sent with the Maestro User Interface component.

- The **Administration Hub** component is a central component that stores registry and account information both for the Maestro User Interface and for Maestro Tracker.

For a complete LISTSERV Maestro 11.0 installation, each of the above components must be installed, and each of them only once. However, the components do not have to be installed on the same server, they can be distributed over several servers.

On each server where you want to install one or several of the components, execute the LISTSERV Maestro installation package:

Log in as a Windows administrator and execute the setup file "`LISTSERVMaestro11.0-N-SetupSuite-x64.exe`"[3] (where "*N*" is the applicable build number). If necessary, select "Custom Setup", then on the Individual Products Setup page click the button for the LISTSERV Maestro product to start the custom setup wizard.

(Alternatively, if you want to make a default installation with all LISTSERV Maestro components together with LISTSERV itself on a single server, you may perform an "Express Setup", which is however not described in this manual but in the "Express Setup" section of the Setup-Suite Manual for LISTSERV Maestro.)

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[2] Starting with version 7.0, LISTSERV Maestro no longer fully supports Oracle 8i as the system database. If you are using Oracle as the system database, please make sure to upgrade it to 9i or later before upgrading LISTSERV Maestro.

Execute the self-extracting setup file "`LISTSERVMaestro11.0-N-linux-x64.bin`"[4] (where "*N*" is the applicable build number).

(If necessary, you may need to perform a `chmod` on the file first, to make it executable.)

During execution, the self-extracting setup will create a temporary folder in the current directory. This folder will automatically be removed once setup completes.

Before you actually perform the installation, please see Appendix D for more details about Linux specific installation issues.

Once started, the Setup wizard will guide you through all the necessary setup steps. During this process, you will be queried for the target folder into which LISTSERV Maestro shall be installed.

You will also be asked which kind of setup you want to perform:

- **Standard Setup:** When performing a Standard Setup, all three LISTSERV Maestro components plus the internal MySQL database (but not LISTSERV) will be installed on the current server. Default values will be assumed for most of the configuration settings.

  In addition, if an instance of LISTSERV is already installed on the current server, then the Standard Setup will automatically configure the freshly installed LISTSERV Maestro to use this LISTSERV instance as the default LISTSERV. For this, Setup will also perform any necessary changes to the configuration of the existing LISTSERV.

  If no existing LISTSERV is found, you will be asked to supply the connection information for the default LISTSERV manually.

- **Custom Setup:** When performing a Custom Setup, you will have the choice of which LISTSERV Maestro components you actually want to install on the current server. You will also have to specify more configuration settings than during a Standard Setup.

  If an instance of LISTSERV is already installed on the current server, then during Custom Setup you can choose to either use the existing LISTSERV as the default LISTSERV for the freshly installed LISTSERV Maestro (for which Setup will also perform any necessary changes to the configuration of the existing LISTSERV) or to supply the connection information for the default LISTSERV manually (which you will be asked for in any case if no existing LISTSERV is found).

LISTSERV Maestro 11.0 requires Java 17 to run. For your convenience, the installer comes with an OpenJDK 17 Runtime. If you opt to install and use this OpenJDK Runtime, you also express your agreement with the OpenJDK GPLv2+CE license. If you do not want to install it, you can instead supply your own Java 17 Runtime manually. See Appendix A for more details.

Please read section 6 Prepare LISTSERV Maestro for First Use for further steps you might have to execute after a successful installation.

Note: All settings can be changed at a later time either in the Administration Hub or by editing the corresponding configuration file. Please see for example Admin Tech Doc 1 – Configuration Files and other applicable LMA Admin Tech Docs for details.

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[4] Starting with version 7.3, LISTSERV Maestro is only available for 64-bit operating systems. A version for 32-bit Linux is no longer released.

Note: Setup will query only those settings which it cannot determine automatically, depending on the current configuration of the server and the choices you make in the wizard. Therefore, during different installations you may be queried for different values and generally you will be queried for more values during a Custom Setup than during a Standard Setup.

2 Upgrading an Existing Installation

The installer can be used to upgrade an existing installation of LISTSERV Maestro[5] to the current version 11.0 as well as to apply the bug fixes in a later 11.0 build to an already existing 11.0 installation that has an older build. In both cases:

Log in as a Windows administrator and execute the setup file "`LISTSERVMaestro11.0-N-SetupSuite-x64.exe`"[6] (where "*N*" is the applicable build number) on all hosts to be upgraded.

Once started, the Setup wizard will guide you through all the necessary upgrade steps. It will automatically recognize the existing installation and will give you the option to upgrade it to the current version of LISTSERV Maestro 11.0.

Also, depending on the current installation, the setup wizard may offer the option of an "Express Upgrade" (which will upgrade all installed products) and/or an upgrade via a "Custom Setup", where you can individually select the products to upgrade on the Individual Products Setup page.

On all hosts to be upgraded, log in with the account which is currently configured as the *run-user* (see Appendix D for details) and execute the self-extracting setup file "`LISTSERVMaestro11.0-N-linux-x64.bin`"[7] (where "*N*" is the applicable build number).

(If necessary, you may need to perform a `chmod` on the file first, to make it executable.)

During execution, the self-extracting setup will create a temporary folder in the current directory. This folder will automatically be removed once setup completes.

Before you actually perform the upgrade, please see Appendix D for more details about Linux specific installation issues.

Once started, the setup wizard will guide you through all the necessary upgrade steps. When it queries you for the target folder, supply the name of the folder in which your current LISTSERV Maestro instance is installed. Setup will then recognize the existing installation and will ask you if you want to upgrade it to the current version of LISTSERV Maestro 11.0.

The Setup wizard will upgrade exactly the components that are already installed on this server. Setup will upgrade the installation in the folder where it is currently installed.

Please read the section 6 Prepare LISTSERV Maestro for First Use for further steps you might have to execute after a successful upgrade.

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[5] The LISTSERV Maestro 11.0 installer can only upgrade an existing installation of LISTSERV Maestro 9.0-13 or later. If you should have an older LISTSERV Maestro installation, you first need to upgrade to an intermediate version, before you can upgrade to version 11.0 in a second step. Please contact L-Soft support for help.

[7] Starting with version 7.3, LISTSERV Maestro is only available for 64-bit operating systems. Do not use the 64-bit installation package to upgrade an existing older 32-bit version. See Appendix E on how to upgrade an existing 32-bit installation.

Caution: Upgrading an installation is an invasive process during which files of the current installation are replaced, removed or modified and new files are added. Since any such operation may potentially abort unexpectedly (power outage, computer crash, other error), there is a potential for an unexpected and incomplete termination of the upgrade process that could leave the data in a partially upgraded state, from which no consistent state could be recovered. It is therefore **strongly recommended** that you make a backup copy of the old installation folder before you run the upgrade.

Note: If the upgrade process does indeed fail, then you can attempt to rerun the Setup wizard to reapply the upgrade. If the first upgrade attempt has already proceeded beyond a certain point, then during this second attempt, you will not see the normal upgrade wizard, but instead a version of the wizard that offers a "Repair" option. Select this option to complete the previously aborted upgrade.

3   Modifying or Uninstalling an Existing Installation

This section explains how to modify an existing installation of LISTSERV Maestro 11.0 on a certain server by either adding new components that had previously not been installed on this server, or by removing some of the installed components.

Important: If you modify an existing installation in the course of moving a component from one server to a different server, please do first consult LMA Tech Doc 4 – Moving LISTSERV Maestro about other important steps that need to performed when moving components!

To perform a modify, log in with the account which is currently configured as the *run-user* (see Appendix D for details) and start the Setup wizard by executing the file:

        [Maestro install folder]/setup-data/setup.sh

The Setup wizard will recognize the existing installation and will allow you to add or remove LISTSERV Maestro components.

To completely uninstall LISTSERV Maestro from the server, do not execute the Setup wizard as described above, but instead simply delete the LISTSERV Maestro installation folder.

Also, if you have configured the daemon startup script for LISTSERV Maestro (see Appendix D for details), you will have to delete this script too, otherwise you will get error messages during system startup.

4   Running LISTSERV Maestro

LISTSERV Maestro can be run either as a daemon process or as a console application.

Running as a daemon process has the advantage that LISTSERV Maestro is running silently in the background (it cannot be stopped accidentally by closing the console window), that it will start automatically when the server is booted up, and that it will continue running when the current user logs off. This should be the normal run mode for a production environment.

Running in a console window has the advantage that you can see LISTSERV Maestro's output in the window directly, and not just indirectly by looking at the log files. This run mode is normally used only when trying to diagnose problems with the server.

4.1 Starting LISTSERV Maestro

4.1.1 Starting as Daemon Process

To start LISTSERV Maestro as a daemon process, you must first have installed the corresponding LISTSERV Maestro daemon scripts (please see Appendix D for details).

The correct method to start such a pre-configured daemon process depends on the actual operating system you are running LISTSERV Maestro on. For many Linux variants, the following command, issued by the root user, will start the LISTSERV Maestro daemon process (under the assumption that the daemon script has been installed correctly):

```
/etc/init.d/lsoft-maestro start
```

Note: Even though the daemon is started by the `root` user, LISTSERV Maestro is actually executed under the account of the configured *run-user*, which may be different than the `root` user.

4.1.2 Starting as Console Application

To start LISTSERV Maestro as a console application, you need to be logged in either as the configured *run-user* (see Appendix D for details) or as the `root` user.

Execute the following command:

```
[Maestro install folder]/commands/StartServer.sh
```

This will start LISTSERV Maestro with all output directly visible in the console, using the configured *run-user* as the executing user (even if the command is issued by the `root` user).

Remember that if you start LISTSERV Maestro in a console, then it will automatically stop running when you log out. If you want LISTSERV Maestro to continue running even after you log out, then you must start it as a daemon process.

4.1.3 Checking if LISTSERV Maestro is Running

After starting LISTSERV Maestro, you can send a remote version query to each component to verify that your installation is up and running. Open a compatible browser and type each of the URLs listed below into the address field (where you replace the correct server name in each URL). The result of the query will be displayed in the browser.

- To query LUI: `http://LUISERVER/lui/build`

- To query LUI's "list" context: `http://LUISERVER/list/build`

- To query HUB: `http://HUBSERVER/hub/build`

- To query TRK: `http://TRKSERVER/trk/build`

4.2 Stopping LISTSERV Maestro

To stop LISTSERV Maestro, you need to be logged in either as the configured *run-user* (see Appendix D for details) or as the `root` user.

Execute the following command:

```
[Maestro install folder]/commands/StopServer.sh
```

4.3 Accessing LISTSERV Maestro

To access LISTSERV Maestro, open a web browser and access the URL:

```
http://<YOUR_MAESTRO_USER_INTERFACE_HOST>/lui
```

This URL provides access both to the Maestro User Interface (for normal users and the administrator) and to the Administration Hub (for the administrator only).

In the URL above, you need to replace "`<YOUR_USER_INTERFACE_HOST>`" with the hostname of the server running the Maestro User Interface component (LUI). In addition, if the server uses a different HTTP(S)-port than the standard port "80" (for HTTP) or "443" (for HTTPS), then you need to include this different port with the host name, separated with a colon "`:`", like this: "`http://HOSTNAME:PORT/lui`".

4.3.1 Supported Browsers

Access to the Maestro User Interface and Administration Hub requires a web browser running on the client computer[8].

It is strongly recommended that you use the **latest version**, or at least a relatively recent version, of one of the major browsers: Google Chrome, Firefox, Edge, Safari or Opera (Internet Explorer is not supported). If another browser or an older version of one of these browsers is used, it is possible that some features of LISTSERV Maestro may not work as expected and/or that the application pages may suffer display problems.

5 Preparing LISTSERV Maestro for First Use

The following subsections discuss steps that you need to perform in order to prepare a fresh installation of LISTSERV Maestro for first use. If you have already provided values for certain settings during the installation process, or if you have upgraded an existing installation, some of these steps may not be necessary. Read through the sections anyway, because some steps may deal with new features that were not previously available and therefore must be performed even after an upgrade of an existing installation.

5.1 First Steps with the LISTSERV Maestro Sample Account

LISTSERV Maestro is installed with a pre-defined example account. You can access this account by opening the Maestro User Interface and logging in with the user name "**sample**" (no group name) and the password that you supplied for the sample account during the setup wizard (if you did not supply a password during the setup wizard, then you first have to login with the administrator account – see below – and assign a password to the sample account before you can login with the sample account).

The sample account contains several example newsletters in the list of delivered mail jobs, along with the collected tracking data from these jobs, as well as two pre-defined tracking reports for these jobs. Feel free to browse through the mail jobs and their tracking data and to create some test jobs of your own by using the sample jobs as starting points (by making copies of the sample jobs).

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[8] The client does not necessarily have to use the same operating system as the LISTSERV Maestro server. You may for example use a Linux client to access LISTSERV Maestro on a Windows server or any other combination.

The sample account also contains one example newsletter subscriber list, which you may browse through and experiment with to try out the subscriber warehouse features. (Note, that the subscribers on the sample list are dummy subscribers with addresses that will all bounce back to the sender, should you actually try to deliver a mail job to these subscribers.)

5.2   Additional User Accounts

In addition to the sample account, the setup wizard gives you the option to create your first normal user account. If you use this option, then this account will be ready for your use right after installation.

Over time, you will likely need additional user accounts. To create them, access the Administration Hub with a browser, using the LISTSERV Maestro access URL (see above), and log in with the user name "`admin`" (no group) and the administrator password that you supplied during the setup wizard.

Then select **New → User Account** from the main menu. Next, enter the account name (and, optionally, group) and the password and other account details.

Note: The LISTSERV Maestro login page is used for login both to the Maestro User Interface (LUI) and to the Administration Hub (HUB). Once logged in, you can switch freely between the two by selecting **Switch to LUI** or **Switch to HUB** from the main menu. The configuration steps described below are all performed in the Administration Hub, so after the initial login, you may have to select **Switch to HUB** to reach these settings.

5.3   Configuring the LISTSERV Connection

Depending on your choices in the setup wizard, the default LISTSERV connection may already be configured or not. Especially if you selected the "Custom Setup" option, it is usually not yet configured.

To check, and if necessary configure, the LISTSERV connection details, login to the Administration Hub with the administrator account (user name "`admin`").

The LISTSERV connection settings are necessary to make the Maestro User Interface aware of the LISTSERV instance with which it is supposed to collaborate.

Since this setting can be defined individually for different accounts and groups, you can connect the Maestro User Interface to separate LISTSERV instances (even in parallel), depending on which account is currently logged in. You do so by defining each account's or group's individual LISTSERV connection settings.

If, on the other hand, you have only a single LISTSERV instance that you want to share among all accounts, then it is easiest to configure this LISTSERV instance as the application-wide default and leave the settings of the individual accounts and groups empty.

- To configure the default LISTSERV connection: Select **LUI Settings → Application Default Settings → LISTSERV Connection** from the main menu.

- To override the default connection for a specific account: On the **Accounts and Identities** page, click on the account, then select **Account Settings → LISTSERV Connection** from the main menu.

- To override the default connection for a specific group: On the **Accounts and Identities** page, click on the group, then select **Group Settings → LISTSERV Connection** from the main menu.

Enter information for the following parameters:

- **Host Name:** The host name of the server running the LISTSERV component. This LISTSERV host will be used for the following purposes:

    o Delivery of all mail jobs sent with the account(s) to which this setting applies.

    o Bounce reporting for all jobs sent with the account(s) to which this setting applies (unless a dedicated bounce handling server is defined).

    o Creation and maintenance of all hybrid subscriber lists created with the account(s) to which this setting applies (in case the hybrid subscriber lists feature is used – see section "5.4 Preparing LISTSERV Maestro for Subscriber Lists" for more details).

- **External Host Name:** If the LISTSERV host is known externally with a different host name than the one above, enter this external host name here.

- **TCPGUI Port:** The port number on the LISTSERV host on which the LISTSERV component accepts TCPGUI connections (the standard port is `2306`).

- **Client Address for Email Delivery and Bounce Reporting:** The address you configure here is used by the Maestro User Interface when transferring a mail job to the LISTSERV host configured above and when retrieving bounce information from that LISTSERV host.

    o **Address:** An email address that is known to the LISTSERV host configured above either as a postmaster address or as an address that is listed under the LISTSERV configuration parameter "`DIST_ALLOWED_USERS`" (meaning an address that has the `DISTRIBUTE` right).

    o **Password:** The address' password, as associated with it at the LISTSERV component. Please see the LISTSERV documentation about how to set a personal password for an email address.

- **Client Address for Hybrid Subscriber List Administration:** The address configured here is used by the Maestro User Interface to communicate with the LISTSERV host to perform hybrid list related tasks.

    o **Address:** An email address that is known to the LISTSERV configured above as a postmaster address.

    o **Password:** The address' password, as associated with it at the LISTSERV component.

5.4   Preparing LISTSERV Maestro for Subscriber Lists

The subscriber warehouse of LISTSERV Maestro allows you to store and maintain your subscriber lists (and all subscriber profile values) directly inside of LISTSERV Maestro.

To use subscriber lists, you have to perform the following general steps (or confirm that they have been performed earlier). For each of these steps, see the following sub-sections for details:

1. **Enabling Usage of Subscriber Lists**

    In a freshly installed LISTSERV Maestro, usage of subscriber lists is already enabled by default.

2. **Granting "Data Administrator" Right**

    Even after usage of subscriber lists has been enabled in general, only accounts that are granted the right to **Administer Subscriber Lists and Lookup Tables** are actually allowed to use the feature.

If you want to use **hybrid subscriber lists**, you also have to perform an additional step (or confirm that it has been performed earlier). Again, see the following sub-sections for details about this step:

3. **Connecting LISTSERV to LISTSERV Maestro's System Database**

   If **hybrid subscriber lists** are to be used, then the LISTSERV host configured in the LISTSERV connection settings of the corresponding account/group needs to be connected to the system database of LISTSERV Maestro.

5.4.1 Enabling Usage of Subscriber Lists

If you want to use subscriber lists, confirm that their usage has been enabled in the Administration Hub (this is by default the case in a freshly installed LISTSERV Maestro):

- To enable subscriber lists by default: Select **LUI Settings → Application Default Settings → Subscriber Data Settings** from the menu.

- To override the default setting for a specific non-group account: On the **Accounts and Identities** page, click on the account, then select **Account Settings → Subscriber Data Settings** from the menu.

- To override the default setting for a specific group: On the **Accounts and Identities** page, click on the group, then select **Group Settings → Subscriber Data Settings** from the menu.

The Subscriber Data Settings screen allows you to define if the corresponding user account or group is allowed to create subscriber lists in the first place[9], and if so, if the account or group may also switch subscriber lists into hybrid mode.

5.4.2 Granting Right to Administer Subscriber Lists and Lookup Tables

With the usage of subscriber lists enabled in general (as explained above), you still need to configure which accounts in a group are actually allowed to administer subscriber lists. Normally, this right is not granted to all accounts in a group, but only to some accounts which are supposed to have the special "data administrator" role.

To define this right for a specific account (either an account in a group or a non-group account): On the **Accounts and Identities** page, click on the account, then select **Account Settings → User Rights**. The User Rights screen allows you to grant or revoke the right to **Administer Subscriber Lists and Lookup Tables** for the selected account[10].

Note, that even for a non-group account you need to grant this additional right, if the account is supposed to be allowed to administer its own subscriber lists.

5.4.3 Connecting LISTSERV to LISTSERV Maestro's System Database

This configuration step is necessary, if you want to enable the usage of **hybrid subscriber lists**.

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[9] The applicable right may also be inherited from the default level, if not overridden on the individual account/group level.

[10] If the **Administer Subscriber Lists and Lookup Tables** user right is granted, then the right to **Administer Target Groups** is also always granted by default. Any user who is allowed to administer subscriber lists will always also be allowed to administer target groups.
Also, if this user right is granted but usage of subscriber lists is still disabled (see the previous sub-section), then the account will still not be able to administrate subscriber lists until subscriber lists are enabled as described above.

While standard subscriber lists exist only in LISTSERV Maestro, hybrid subscriber lists are actual LISTSERV lists, which however store their subscriber data in LISTSERV Maestro's system database and which can therefore be administered in the Maestro User Interface.

For this to work, LISTSERV must have access to LISTSERV Maestro's system database. The following describes how to set up this system database access for LISTSERV.

Manual Setup of System Database Access

Access to the LISTSERV Maestro system database must be set up for **every** LISTSERV instance that is configured in the LISTSERV connection settings of any account/group for which the feature to use hybrid subscriber lists is enabled.

In other words, if for an account/group you have enabled the feature to use hybrid subscriber lists, then you **must** configure the LISTSERV instance that this account/group has defined in its LISTSERV connection settings (or inherited from the default settings) to be able to connect to the LISTSERV Maestro system database.

The following instructions describe how to manually configure a LISTSERV instance on a Windows 10 host, so that it is correctly enabled to connect to the LISTSERV Maestro system database. For other Windows operating systems, the procedure is very similar. For LISTSERV on a non-Windows host, please refer to the LISTSERV documentation on how to create a database server name. Use the description below as a guideline and modify it to apply to your operating system.

Create ODBC System DSN

On Windows, LISTSERV's database connection happens by way of ODBC. You must first create a system-wide ODBC data source on the host where the LISTSERV instance is installed. This may or may not be the same host where LISTSERV Maestro or its system database is installed.

For example on Windows 10: Open the start menu and with the menu open, type "ODBC". This starts a search for this term. The search results should show the tool to configure ODBC data sources. Open this tool.[11]

In the tool, select the **System DSN** tab, and then click **[Add...]**. Select the driver appropriate for your LISTSERV Maestro system database (you may have to install it first) and fill out the driver-specific form with the database specific values, using the same values as you supplied for the system database connection in the Administration Hub of LISTSERV Maestro, i.e., the same database host name, port and any additional settings required by the driver. It is however recommended that you do **not** supply the user name and password here in the system-wide DSN (if offered by the driver at all). Instead of supplying these values in the DSN, you will supply them in the LISTSERV configuration (see below). Give the DSN a meaningful name.

Configure Database in SITE.CFG

Now you need to configure this DSN as a database server name in LISTSERV.

To do so, add the following lines to the SITE.CFG file of the LISTSERV instance:

```
ODBC_DSN_SERVERNAME=DSN_NAME
ODBC_UID_SERVERNAME=USERNAME
ODBC_AUTH_SERVERNAME=PASSWORD
```

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[11] On a 64-bit system, if the search result shows two such tools (one for 32 bit and one for 64 bit), you need to use the tool that matches the bit-ness of your LISTSERV instance. If LISTSERV is 32 bit, you need to use the 32 bit tool, if LISTSERV is 64 bit, you need to use the 64 bit tool.

where you replace "SERVERNAME" with the specific server name (see below for details), "DSN_NAME" with the name of your DSN and "USERNAME" and "PASSWORD" with the same database user name and password that you have also supplied for the system database connection in the Administration Hub of LISTSERV Maestro.

The "SERVERNAME": The value for the specific server name to be used in the above configuration is a special value that you can find on the LISTSERV Connection screen in the Maestro Administration Hub:

- Default LISTSERV Connection: Select **LUI Settings → Application Default Settings → LISTSERV Connection** from the menu.

- LISTSERV Connection for a specific account: On the **Accounts and Identities** page, click on the account, then select **Account Settings → LISTSERV Connection** from the menu.

- LISTSERV Connection for a specific group: On the **Accounts and Identities** page, click on the group, then select **Group Settings → LISTSERV Connection** from the menu.

The server name is given as the value labeled **Database Server Name** in the **Hybrid Subscriber Lists Settings** section. This name always starts with "MAESTRODB_", followed by a unique string of characters. For example, "MAESTRODB_dtn7nzn3". So the entry in the SITE.CFG might look like this:

```
ODBC_DSN_MAESTRODB_dtn7nzn3=DSN_NAME
ODBC_UID_MAESTRODB_dtn7nzn3=USERNAME
ODBC_AUTH_MAESTRODB_dtn7nzn3=PASSWORD
```

On your own server, you would replace "dtn7nzn3" with the correct value for your SERVERNAME.[12]

Important: LISTSERV requires that if you add the above settings, then the "default database interface" must also always be defined, even if it is not used. If you do not already have the default database interface defined, you need to do this now. Otherwise, the above configuration of the database server name for Maestro will be ignored by LISTSERV. However, for the default database interface, you may supply dummy values as shown below.

If the default is not already present, add the following lines to the SITE.CFG file of the LISTSERV instance:

```
ODBC_DSN=DUMMY
ODBC_UID=DUMMY
ODBC_AUTH=DUMMY
```

When Using the Internal System Database

LISTSERV Maestro comes with an out-of-the-box version of MySQL as the internal system database. If you use this internal database as the system database and need to connect LISTSERV to it as described above, do this as follows:

- If LISTSERV is installed on the same host as the internal database – that is the host where the Maestro User Interface (LUI) component is installed – then you need an ODBC-driver for MySQL on that host, and when creating the DSN you need to supply the host name

---

[12] It is important to use exactly the same server name as given on the LISTSERV Connection screen of the Administration Hub, using the exact spelling (all letters must be in lowercase, which is also useful to discern between the letter "O" and the digit "zero": The letter is shown in lowercase as "o" while the digit is shown as "0").

"localhost", the port "3306" and the database name "LUI". Also, in the SITE.CFG, supply "luiuser" for the user name and "lui" for the password.

OR

- If LISTSERV is installed on a different host than the internal database, then you need an ODBC-driver for MySQL on that host, and when creating the DSN you need to supply the host name where the internal database is installed (the host where the Maestro User Interface component is installed), the port "3306" and the database name "LUI". Then in the SITE.CFG, supply your DSN's name and a database user name and (secure) password of your choice.

  As a second step, you need to grant the right to access the internal database to this user that you have defined. Do so here:

  On the server where the Maestro User Interface component is installed, start the MySQL client program:

  ```
  [Maestro install folder]/lui/database/bin/mysql –u root
  ```

  Then enter the following command:

  ```
  grant all on lui.* to 'USERNAME'@'LISTSERVHOST' identified by 'PASSWORD';
  ```

  where you replace "USERNAME" with the database user name you have defined (this is your self-defined user name, see above), "LISTSERVHOST" with the name of the host where LISTSERV is running and "PASSWORD" with the database password you have defined (again, your self-defined password, see above).

  Take care to use the same upper/lowercase spelling of the username and password as you have defined them in the SITE.CFG. Also take care to type "lui.*" in lowercase and to use the apostrophe quotes as shown above.

Appendix A: Required Resources

- This manual assumes that you have access to the self-extracting setup file of **LISTSERV Maestro 11.0** (where "*N*" is the applicable build number):

  ```
  LISTSERVMaestro11.0-N-linux-x64.bin
  ```

- LISTSERV Maestro requires a computer running a 64-bit Linux.

- To be able to execute the setup package (and also LISTSERV Maestro itself), you must have the GNU C++ library installed on your system:

  ```
  libstdc++-libc6.1-1.so.2
  ```

- Also you need to have GNU tar installed (see Appendix D).

- LISTSERV Maestro 11.0 requires Java 17 to run. For your convenience, the installer comes with an OpenJDK 17 Runtime. If you opt to install and use this OpenJDK Runtime, you also express your agreement with the OpenJDK GPLv2+CE license.

  But you also have the option to not install the OpenJDK Runtime. In this case, you must instead manually provide a Java Runtime that is compatible with Java 17. You can either use a compatible Java Runtime that is already present on the system, or obtain and install one yourself. With such a Java Runtime present on your system, edit the following file:

  ```
  [Maestro install folder]/commands/UserConfig.sh
  ```

  In this file, look for the "User-Defined Java Runtime" section. Uncomment the "JAVA_HOME=" line (remove the "#") and replace "Java_Runtime_Root_Folder_here" with the folder where your Java Runtime is located.

- All hosts that contain any of the three LISTSERV Maestro components must have a registered DNS host name and the HTTP or HTTPS port (as applicable) on that host must be available to external users from the Internet.

  Therefore, there may not be any other software running that also requires use of the same HTTP(S) port (such as a web server, for example). The three LISTSERV Maestro components themselves may however share one host and the same HTTP(S) port. The standard port for HTTP is "80" and for HTTPS is "443". However, a different port may be configured as the HTTP(S) port during setup or at a later time.

  It is possible to restrict some parts of LISTSERV Maestro (like the main Maestro User Interface and the Administration Hub) so that only allowed users have access. See the Admin Tech Doc 8 – Restricting Access for more details.

- If the three LISTSERV Maestro components are not installed on the same server, then their hosts must be interconnected with a network in such a way, that the components can communicate using TCP/IP ports. In addition, the host where the Maestro User Interface component is installed must be interconnected with the LISTSERV host, as well as with the host of any optional database(s).

- Other restrictions may apply to the LISTSERV host, depending on LISTSERV's setup requirements. See the LISTSERV manuals for details.

Appendix B: The Internal MySQL Database

By default, LISTSERV Maestro 11.0 is installed with an instance of MySQL 8.0.25 as the internal system database.[13][14]

Using this internal system database is optional. See [Appendix C](#) for details on how to use an external database instead.

Please see http://www.mysql.com for details about MySQL 8.0.25 and its features to determine if it meets your requirements and expectations for a production database. Reviewing the features will help you decide if you want to use the internal database or if you prefer to install a different external system database.

With LISTSERV Maestro, the internal MySQL database is installed on the same server as the Maestro User Interface component (if installation of MySQL was not deselected during setup). You can find the database binaries, including some selected server and client tools, in the folder

```
[Maestro install folder]/lui/database
```

on that server.

Upgrade Note: LISTSERV Maestro 9.0 (and older) was installed with an internal MySQL database of version 5.5.16. When upgrading such an existing older installation to version 11.0, the internal MySQL database will **not** automatically be upgraded to 8.0.25. Instead, the upgraded LISTSERV Maestro 11.0 will continue to use the internal MySQL 5.5.16 database.

MySQL 5.5.16 is still fully supported and compatible. But if you also want to upgrade the internal database, then please contact L-Soft support for instructions on how to do this.

---

[14] The internal MySQL 8.0.25 database included with LISTSERV Maestro 11.0 is a generic Linux version that relies on certain shared libraries and assumes that these libraries are already present on the system. If MySQL cannot start, it may therefore be necessary to install some missing shared libraries on your Linux system.

Appendix C: Using an External Database

You may decide during setup to not install the internal system database at all, in which case you must install a separate external system database. Information about the supported system database types and the necessary steps to prepare such a database for use as LISTSERV Maestro's system database can be found in Admin Tech Doc 3 – Database Configuration.

LISTSERV Maestro's initial system data is provided in form of backup data that is restored into the system database during the first startup. The data is prepared to be restored into the default internal MySQL system database. Therefore, if you decide to also install the default MySQL database during setup, this initial backup restoration works out-of-the-box.

But if you do not install the internal MySQL database already during initial setup, some manual steps are required to properly restore the initial system data into your own external system database. The initial startup will detect the missing internal database and will halt at a certain point and the Maestro User Interface will not yet accept logins. This is by design. In this state, you need to login via the Administration Hub. To make LISTSERV Maestro connect to your desired external database, execute the following steps:

1. Log into the Administration Hub and select **LUI Settings → System Database Status** from the main menu. This screen will show that there was an error with the database connection. Now click the **Change Connection Settings** link.

2. Select the database plugin that matches your database and JDBC driver configuration (if you do not see the required plugin in this list, you first must provide the JDBC driver jar file provided by your database vendor – please see Admin Tech Doc 3 – Database Configuration).

3. Fill out the connection parameters as required by the plugin. The type and semantics of these parameters depend on the database you want to use. Usually, this are parameters like the host name where the database server is running, the database name, the username and password, and the connection port.

4. Submit your settings with **[Save]**. LISTSERV Maestro now validates your input and checks if the desired target system database is empty. If these checks pass, LISTSERV Maestro then proceed with restoring the initial system data into your database. Once this restoration is complete, LISTSERV Maestro is ready for use.

Regardless of whether you are initially running LISTSERV Maestro with the default MySQL internal system database or an external system database of your choice, you can easily switch to a different external system database (or back to the internal database) at a later time.

Appendix D: Special Linux® Installation Issues

Pre-Installation: Verify that GNU tar is available

The installation of LISTSERV Maestro requires that the GNU version of the tape archival tool `tar` is present on all hosts where LISTSERV Maestro components will be installed. To find out if the currently available `tar` is sufficient to install LISTSERV Maestro, issue the following command:

```
maestro@host:> tar –version
tar (GNU tar) 1.13.19
Copyright 2001 Free Software Foundation, Inc.
This program comes with NO WARRANTY, to the extent permitted by law.
You may redistribute it under the terms of the GNU General Public License;
see the file named COPYING for details.
Written by John Gilmore and Jay Fenlason.
```

If the version output does not contain the text "`GNU tar`" or reports an error, then you need to obtain a compatible version. However, for all supported Linux platforms, the distribution normally contains the GNU version of `tar`, so this should usually not be necessary.

Configuring LISTSERV Maestro for Automatic Startup

To enable LISTSERV Maestro to be started automatically during each system startup (as a daemon process), a daemon startup script must be made available to the `init` process responsible for starting the daemons at system startup.

During the installation, setup has already prepared the daemon startup script[15] for the LISTSERV Maestro server:

```
[Maestro install folder]/commands/lsoft-maestro
```

As the `root` user, copy this file to the location on your system where daemon scripts are usually located.

On a typical Linux, this is usually the folder `/etc/init.d`. In addition, you will typically have to create symbolic links to this file (for startup or shutdown) in the corresponding runlevel folders `/etc/rc?.d`, depending on if you want to start or stop the LISTSERV Maestro daemon in that runlevel.

The actual steps to install the daemon script on your system may differ for your Linux distribution, see your distribution's documentation for more details.[16]

Console Based Installation ("Headless")

The normal LISTSERV Maestro setup wizard is a GUI based application which requires a graphical environment to run. If such a graphical environment is not available (for example if you are installing remotely via telnet, or if the server does not have a graphics environment installed), you may also execute the setup wizard in a purely text based console mode.

---

[15] As is the convention for daemon scripts, if this script is executed with the parameter `start`, it will start the LISTSERV Maestro server, if it is executed with `stop` it will stop the server.

[16] Some Linux distributions also have a (GUI-)tool for this.

To start the setup in this console mode, execute the self-extracting setup file with the additional parameter "`-headless`", as follows (where "*N*" is the applicable build number):

```
LISTSERVMaestro11.0-N-linux-x64.bin -headless
```

Understanding the LISTSERV Maestro "Run-User"

The *run-user* is the account under which the LISTSERV Maestro server is actually run (no matter if started in console mode or as a daemon process).

After a fresh installation, the initially configured *run-user* is always the `root` user.

Security Note: For security reasons it is usually considered good practice not to run a server application under the `root` user account, if possible. Therefore, you might want to change the *run-user* to a different account after the initial installation (however, you have to keep the run-user constraint in mind).

The currently configured *run-user* can be found in the file

```
[Maestro install folder]/commands/UserConfig.sh
```

In this file, look for an entry similar to "`RUN_USER=username`", where "`username`" defines the current *run-user*.

LISTSERV Maestro "Run-User" Constraint

For security reasons imposed by the operating system, non-root users are not allowed to open servers on the so called "privileged ports", which are ports in the range of "1023" and below.

Therefore, the choice for the *run-user* is constrained by the following:

- If the HTTP-port is a privileged port ("1023" and below, including the defaults of "80" for HTTP and "443" for HTTPS), you **must** specify the `root` user as the *run-user*.

- If the HTTP-port is a non-privileged port ("1024" and above), you can specify any user account as the *run-user* (preferably not the `root` user).

How to Change the LISTSERV Maestro "Run-User"

To change the LISTSERV Maestro *run-user*, do the following:

- Shut down LISTSERV Maestro.

- Edit the following file:

  ```
  [Maestro install folder]/commands/UserConfig.sh
  ```

  The file contains an entry similar to:

  ```
  RUN_USER=username
  ```

  where `username` is the name of the current *run-user*. Replace this name with the user account name you want to define as the new *run-user* instead.

- If the new *run-user* is **not** the `root` user, then you also need to do the following:

  - Make sure that you do not violate the run-user constraint, i.e. it might be necessary that you also change the HTTP-port to a non-privileged port if the new *run-user* is not the `root` user.

o Set file ownership of the LISTSERV Maestro installation folder and all files in it to the new *run-user* (this is not necessary if the `root` user is used as the new *run-user*), by executing a recursive `chown` command on the installation folder (as the `root` user):

```
chown -R username:groupname installfolder
```

where *username* is the name of the new *run-user,* *groupname* is the name of group the files shall belong to (the group is optional and can be left out, in which case you would leave out the colon ":" too) and *installfolder* is the name of the folder where LISTSERV Maestro is installed.

Appendix E: Upgrading an Existing 32 Bit Installation

Starting with version 7.3, LISTSERV Maestro is only released as a 64-bit version. This means that if you have an existing 32-bit installation of LISTSERV Maestro, then you cannot upgrade it directly with the LISTSERV Maestro 11.0 installer.

Note: The latest version that is still available in a 32-bit variant is LISTSERV Maestro 7.2-2. If desired, and if your current installation is even older, you can first upgrade to 7.2-2 to have at least the most recent version for 32-bit, before proceeding with the steps described below.

If your existing 32-bit installation is on a 32-bit Linux, then you cannot upgrade it at all. To upgrade to LISTSERV Maestro 7.3 or later, you will have to move the whole LISTSERV Maestro installation to a new server with one of the supported 64-bit operating systems. See Admin Tech Doc 4 – Moving LISTSERV Maestro for details.

If your existing 32-bit installation is on a 64-bit Linux, then you can transfer the existing installation to a new 64-bit installation on the same server:

- Trigger a backup in LISTSERV Maestro.

- Wait until the backup has completed successfully.

- Immediately after backup completion, shut down LISTSERV Maestro (on all servers where a LISTSERV Maestro component is installed – the following also applies to each server that has a LISTSERV Maestro component installed).

- Rename the existing (old) LISTSERV Maestro installation folder to a new name.

- Install a fresh LISTSERV Maestro instance using the 11.0 installer. Install it into the folder with exactly the same path and name as the previous installation folder (i.e. the name of the folder in the step above, *before* you renamed it).

- Restore the backup of above into this new LISTSERV Maestro instance. See Admin Tech Doc 2 – Backups for more details. Remember that you need to restore the backup of all three components. To locate the backup files, you may have to look into the renamed old installation folder (this depends on the backup location you have configured).

- Transfer all special configuration settings, for example in "commands/UserConfig.sh" and in "conf/tomcat.ini", from the renamed old installation folder. Remember to also transfer all necessary SSL certificates (if any) and, if you want, transfer the accumulated log files. Also transfer any additional web content that you added to the webapps folder (if any, see Admin Tech Doc 12 for details).

- Restart LISTSERV Maestro on all servers. This restart also completes the backup restoration by restoring the data in the system database. Be patient for this step to finish.

- Once you have verified that LISTSERV Maestro is running properly again (now in a 64-bit version) and no data has been lost, you can delete the renamed old installation folder.