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SISTEMA Cookbook 2

Use of network libraries

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About these instructions

Component libraries can be imported by the SISTEMA software. In previous versions of SISTEMA, these libraries had to be present on a local drive. From Version 1.1.3 onwards, an additional dialog enables libraries to be imported from one or more central server drive(s). SISTEMA thus supports efficient collaboration between multiple SISTEMA users within an enterprise.

The terms database and library are used synonymously in these instructions. They refer to a file with the extension ".slb".

These instructions describe the installation and use of these new functions. The instructions are divided into three sections:

- The first section (setting up a database server) is intended for administrators. It describes, firstly, the installation, setup and administration of a Firebird database server, and secondly, the administration of the SISTEMA libraries on this server.
- The second section (adding network libraries in SISTEMA) describes the use of central databases and their incorporation into SISTEMA. This section is therefore primarily intended for SISTEMA users.
- The final section (instructions on use) describes known issues. This section provides information on the avoidance where possible of conflicts between multiple users working on the same SISTEMA library on a server at the same time.

1 Setting up the database server

1.1 Overview

SISTEMA uses Version 1.5 of Firebird, a free database server program. Comprehensive further information and a download facility are available at http://www.firebirdsql.org/.

Several variants of Firebird are available (SuperServer, ClassicServer and Embedded). Before now, SISTEMA supported only the Embedded variant integrated within the program itself. Version 1.1.3 onwards now also provides support for use of the central server variants, i.e. SuperServer and ClassicServer. Preference should be given to the **SuperServer**variant. This variant was also used in the installation examples described below. Repeat the installation of Firebird for each additional server PC that is to be used for the management of SISTEMA libraries.

1.2 What are the requirements?

Load the current installation kit of the **Firebird 1.5 series**. This can be found on the homepage at http://www.firebirdsql.org, on the **left** under "Downloads → Firebird Released kits". Proceed then with "Download Firebird 1.5.6". There, you will find the file:

- "Firebird-1.5.6.5026-0-Win32.exe“ (Official Windows Setup and Installer For Classic and SuperServer),

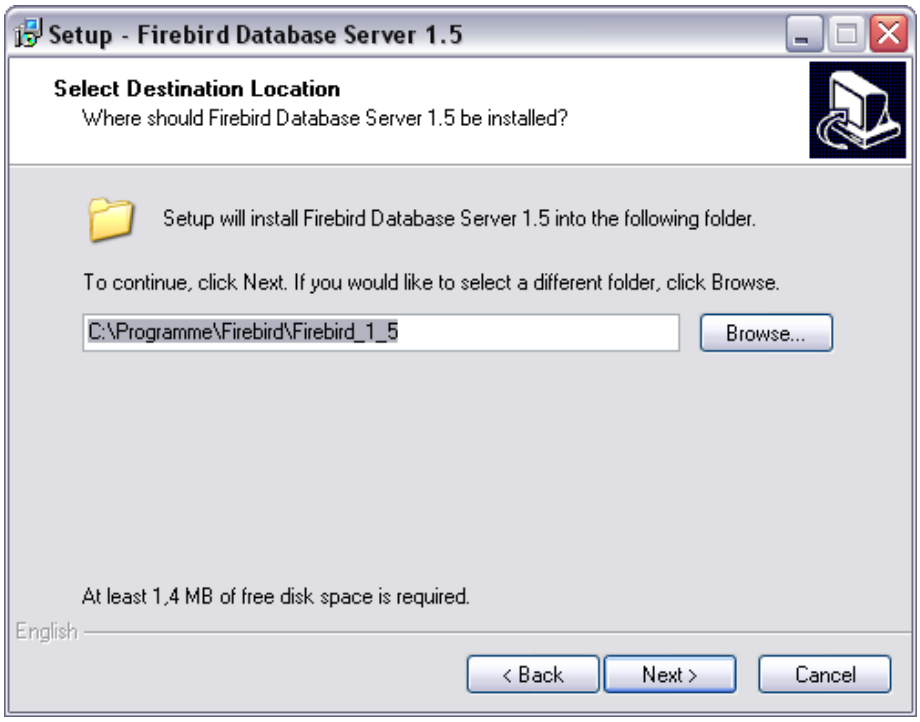
which is used in the installation described below (as at August 2010).

1.3 Installation on the server PC

Administrator permissions are required for the installation described here. They are not required for subsequent administration of the databases. Proceed as follows:

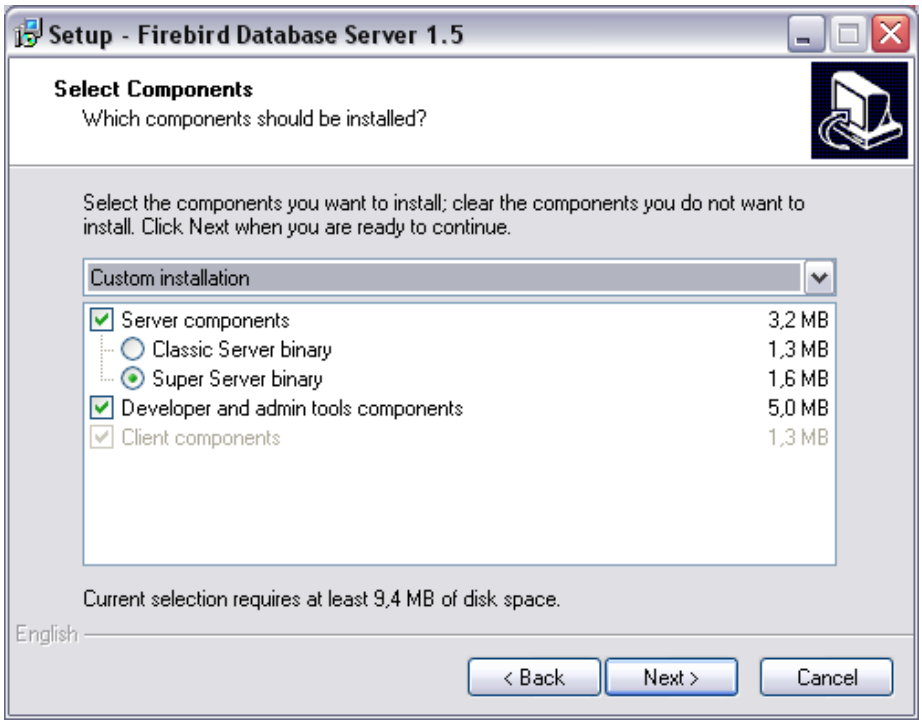
- Download and launch the setup file, "Firebird-1.5.6.5026-0-Win32.exe".
- Any desired destination folder may be selected (Figure 1):

Figure 1:



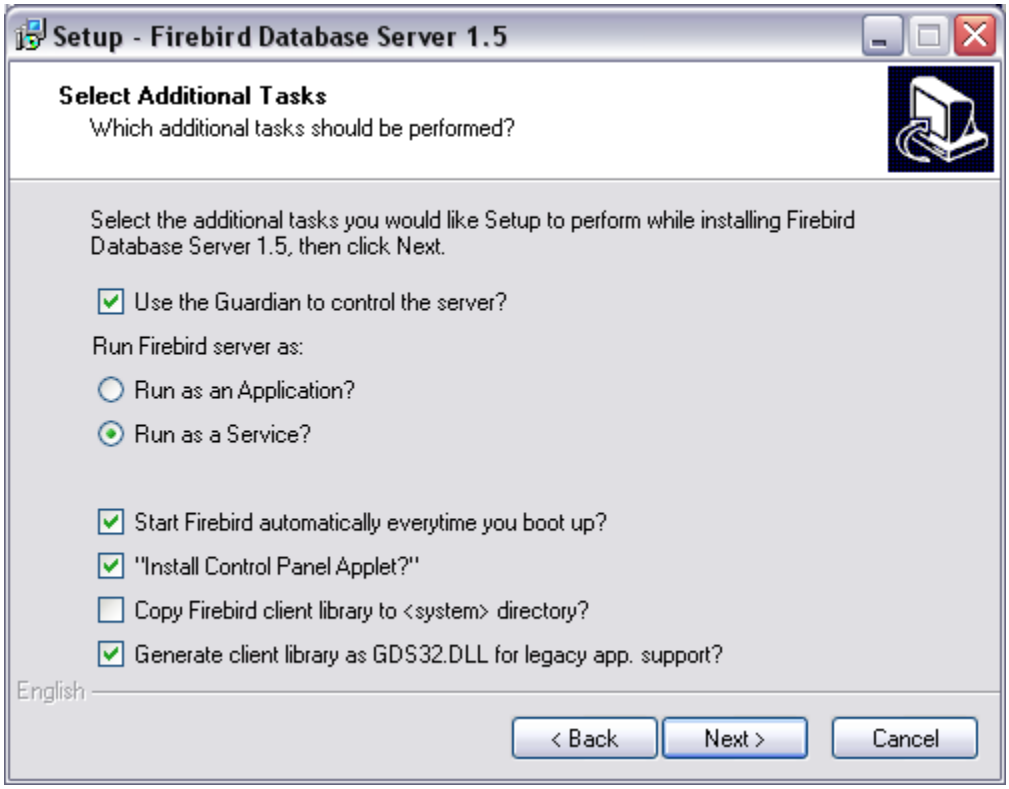
- Select the SuperServer binary files (Figure 2):

Figure 2:



- In "Additional Tasks" (Figure 3), the default selection can be accepted. It can be modified later if necessary (see below):

Figure 3:



- Retain the default settings until installation is complete, and complete installation.

Following installation, the server control of the "Firebird 1.5 Server Manager" should be displayed. Launch the server control and check in the dialog (Figure 4) that the service is running (top line to the right of the Firebird logo). If not, click on the top button ("Start"). Use the options below to determine whether this server service is to be launched manually, or automatically when the server PC is booted.

Figure 4:

1.4 Database administration on the server

Once the server has been set up, the SISTEMA libraries that the server is to make available to the SISTEMA users over the network can be placed on the server PC. You can obtain the libraries in the usual way by downloading them from the websites of the product manufacturers. On the IFA's website at

www.dguv.de/ifa, Webcode e92603 (English) and

www.dguv.de/ifa, Webcode d92599 (German)

you can find links to almost all manufacturers offering libraries. After downloading the library files, save them on the server in a suitable folder structure (for example, create a folder for each manufacturer, and within it a sub-folder for each release.)

The libraries can be saved in any desired folder structure, provided the following is observed:

The libraries must always be located on the local hard drive of the PC on which the server is running.

In order for a library to be imported from the server or edited at a later stage, the SISTEMA user requires the following information:

- Server name (IP address or host name of the database server)
- Name of the database (local path\filename of the library)

In the first step, it is sufficient for the user to enter this information for one SISTEMA library in the corresponding "Add SISTEMA Network library" dialog of the SISTEMA library user interface.

For efficient work, the following questions must be answered: how is the SISTEMA user informed as soon as possible which of the many libraries are stored under what names on which server PC? How can he access this information as simply as possible within SISTEMA?

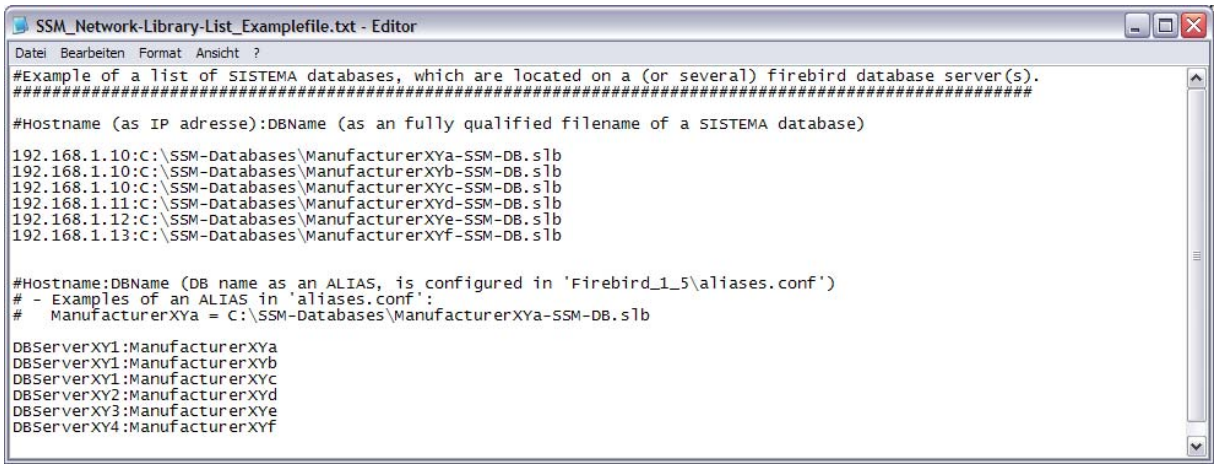
1.4.1 Creating a list of SISTEMA databases

In order to simplify access to multiple SISTEMA databases on the server, one or more plain-text files each containing a simple list of all known databases maintained in a central location can be made available, likewise in a central location, to the SISTEMA users. There are no restrictions on the names of these plain-text files. The extension "**.txt**" is however used as the default in the SISTEMA dialog.

From SISTEMA Version 1.1.3 onwards, a sample list with the default name "%**USERPROFILE**%\My Documents\SISTEMA\Libraries" is placed in the library folder together with the standard libraries.

This sample file (SSM_Network-Library-List_Examplefile.txt) assists in the creation of one or more user database lists (see Figure 5):

Figure 5:



A line of text beginning with a hash (#) is interpreted as a comment line. All other lines each contain the location of a database (server name:path\name of the database). In the example file shown, the lower block of database names illustrates the use of aliases (see next section).

Such a file provides the SISTEMA user with a list of the available databases which he can import using the SISTEMA library dialog. He is thus saved having to type in the full database file names each time. The location of this database list is not fixed or subject to constraints. The file will normally be stored in an accessible central location. It could however also be sent by e-mail to each SISTEMA user, for example owing to the availability of new libraries following an update, and saved locally on their systems.

1.4.2 Use of aliases

The server administrator essentially has two different ways of indicating the name of a certain database to the SISTEMA user in the database lists described above:

1) As described, by stating the complete path (as seen from the server) of the database file. This could for example be:

   C:\SISTEMA databases\ManufacturerXY\ManufacturerXY-V1_1.SLB.

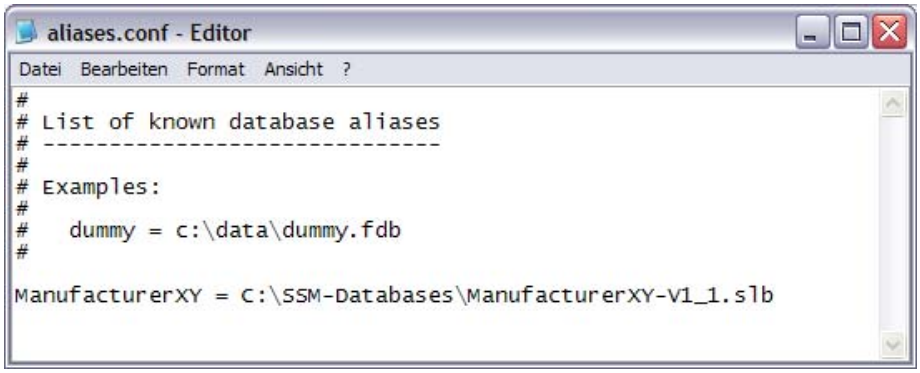
   When a database file is moved, however, each user must be informed in this case of the new path. For this reason, an alternative exists:

2) By using aliases: the server administrator assigns an alias for each complete database name (with path). The SISTEMA user opens a library using this alias. The database server translates the alias into the complete database name, and transfers the library to the SISTEMA user. This "translation table" is generated as follows:

   Using a text editor, open the file "aliases.conf" on the server PC. This file is located in your Firebird installation folder: "C:\Program Files\Firebird\Firebird_1_5\". Figure 6 shows a possible alias entry for the database file named "ManufacturerXY-V1_1.SLB". Each uncommented line contains an alias in the following form:

   Alias name = path\database name

Figure 6:



In contrast to the database list (refer to the preceding section), it is essential that the "aliases.conf" file be placed in the installation folder of the Firebird server. Changing the name "aliases.conf" is also not permissible.

2 Adding network libraries in SISTEMA

2.1 Overview

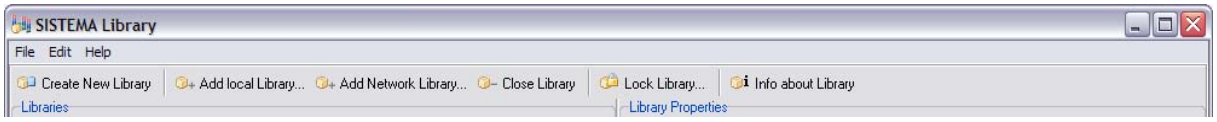
SISTEMA version 1.1.3 also supports network libraries. The required database parameters (name of the database server and name of the database) are provided by your database administrator, generally in the form of a plain-text file containing a list (see Section 1.4, Database administration). Once the server PC, the libraries and the lists have been configured, and provided a network connection exists to the server PC, the SISTEMA user can open these libraries. The two alternatives are described below for entering either a single library or a list of several libraries.

As soon as a library has been added to the SISTEMA library manager, it can be used in the same way as any other library. Please note the additional comments in Chapter 3.

2.2 Loading network libraries

An "Add Network Library..." button has been added to the SISTEMA library manager. Clicking on this button calls up a dialog (Figure 7) in which you can enter the library parameters, check the status of the library, and add it to the list of libraries in SISTEMA.

Figure 7:

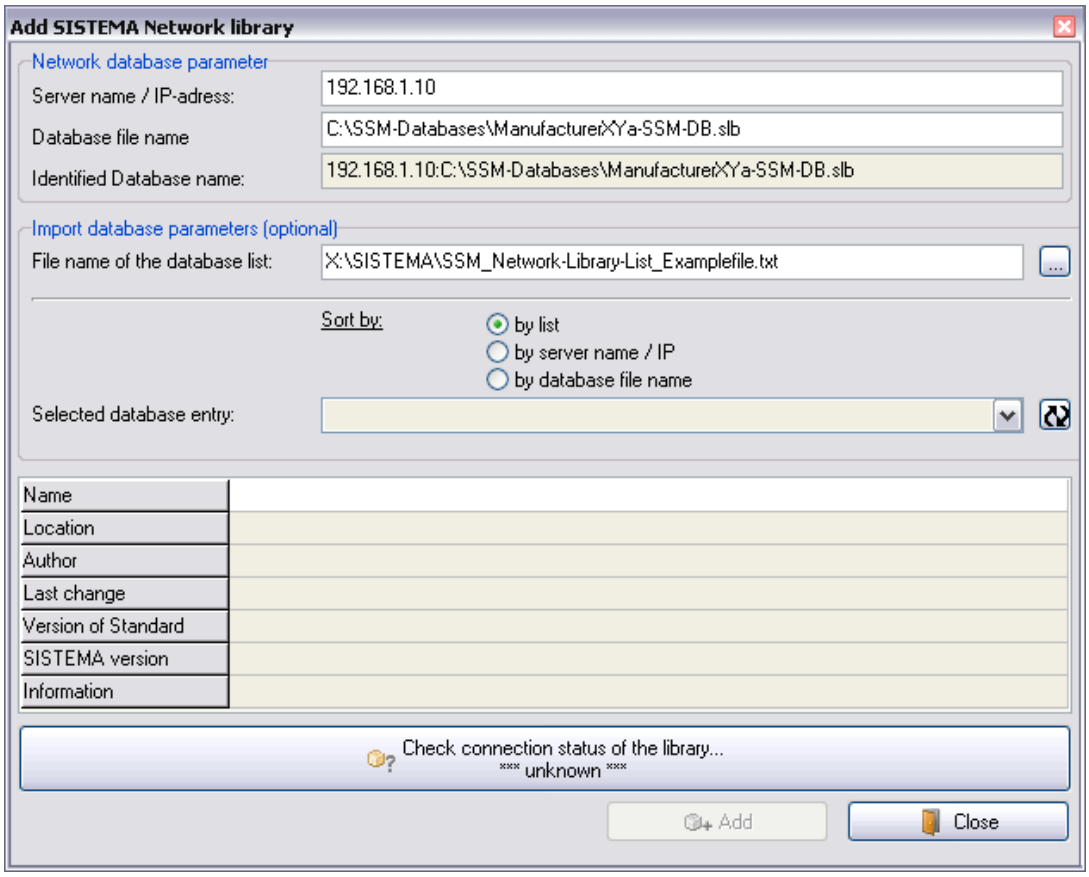


2.2.1 Announcing a single library

The entries for a single library on the server can be entered in the "Server name / IP-adress" and "Database file name" fields in "Network database parameter" at the top of the "Add SISTEMA Network library" dialog. The required full database name is generated automatically as the "Identified Database name" (Figure 8). After entering the parameters, use the "Check connection status of the library" button to test whether creation of a connection to the desired library, and therefore its use, are actually possible.

Only once the "Check connection status of the library" test has been passed is the "Add" button enabled (Figure 8). Clicking on the "Add" button causes this entry to be added to the list of libraries in the SISTEMA library manager.

Figure 8:



2.2.2 Announcing a list of libraries

You can also have an entry made automatically. This is possible in the middle of the dialog under "Import database parameters (optional)", which enables you to import a list of library names (Figure 8). The list required for this purpose should be supplied to you by your database administrator in the form of a plain-text file. Two locations are essentially possible for this file: either locally on your user PC, or on a central drive accessible to all SISTEMA users (refer also to Section 1.4.1). The location and the name of this file are not fixed or subject to constraints.

To the right of the "File name of the database list" field, a button with three dots can be clicked which causes this plain-text file containing the list of library names to be read in via the file manager.

Once this file has been imported, an entry (i.e. a library) can be selected ("Selected database entry"). The database parameters of this library then appear in the associated "Server name / IP-adress" and "Database file name" fields at the top of the dialog. The entries in the plain-text file can be listed according to three sort criteria ("Sort by:"): list order, server name/IP address, or file name of the database.

The availability of the database must now be checked (click on "Check connection status of the library..."). If the database is available, clicking on "Add" adds it to the list of libraries in SISTEMA. Libraries from this list can be added only one at a time. If several libraries are to be added from the list in the file, the procedure (select entry, check connection status, add) must be repeated each time.

3 Instructions on use

3.1 General

When a library is loaded from the server, it is placed in full in the RAM of your local PC. Any changes made to the library by other users working on it on the server at the same time are not detected by the current SISTEMA version (1.1.3), and you will not be informed of any such changes.

Should you make changes of your own to a library, they are not saved in the library file on the server until you click on the "Set changes'" button of the SISTEMA library manager.

Another user may have been working on the same library at the same time. Should you wish to call up the latest version of a library from the server, you must currently first load a different library from the list of libraries into your own cache. Only then can you load the desired library. Switching between two libraries in this way is required in order for the content to be fully updated in your local RAM.

3.2 Problematic scenarios

Known scenarios for the server interface of SISTEMA Version 1.1.3 which may cause issues are:

3.2.1 Changing entries

User A and User B load the same SISTEMA library, "192.168.1.200:Test-DB".

- User B makes changes to this library.
- User A makes changes in the same sub-system, block or element as B.
- User B accepts his changes (causing the library on the server PC to be written to), after which A accepts his own changes.

The last changes to be accepted (in this case, those made by A) are written to the library on the server PC, thereby overwriting the changes previously made by B. The last to write, wins (as it were) – almost always. The problem here is that a user working on a library does not receive any notification of changes being made by other users at the same time to the library concerned.

3.2.2 Deleting entries

User A and User B load the same SISTEMA library, "192.168.1.200:Test-DB".

- User B deletes, for example, the "Switch 1" element.
- User A makes various changes to the "Switch 1" element.
- Both users accept their changes (in this case, it is irrelevant who does so first).

Since User B has deleted the element, changes made by User A no longer have any effect (even should A have saved his changes later). Deleting an object trumps edits: once a library object has been deleted, no further changes to it can be saved. Once again, the problem is that User A is not informed of the fact that User B has deleted "Switch 1".

3.3 Collaboration between multiple users

In view of the potential for conflict described above, libraries should be used through a network interface on a read-only basis if possible. It is however counter-productive for the library files to be made write-protected, since this makes a database connection impossible.

The solution is therefore the SISTEMA write protection feature. This feature can also be used in the library dialog for libraries created by users themselves (the "Lock library" action). The majority of manufacturers' libraries are also write-protected in this way.

Should changes nevertheless be necessary, organizational measures must be taken to ensure that multiple users do not make changes to the same library at the same time. Changes can for example be made by a user to the non-write-protected copy of the library saved locally. The modified library can then be protected by SISTEMA and copied to the server.