

SPECCHIO

Administration Guide

Version: 2.2
Date: 31.05.2012
Status: Valid
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File: \SPECCHIO AdminGuide_V2.2.docx
Pages: 23

Classification:
Distribution: SPECCHIO Administrators



History

Version	Date	Author	Remark
1.1b	17.12.2007	A. Hueni	First valid version
1.1b1	09.01.2008	A. Hueni	Changes after ammendments to the software
1.1c	04.06.2008	A. Hueni	
1.1d	28.07.2008	A. Hueni	Added quick setup for single machine setup: Personal Workstation Installation. Info on solving db_connect PHP problems on MacOS (see DB setup)
2.0	25.5.2009	A. Hueni	Changes after V2.0 DB upgrade
2.0	08.09.2009	A. Hueni	Added hint for SQL connection troubleshooting.
2.1	08.09.2010	A. Hueni	Updates for Version 2.1
2.2	31.05.2012	A. Hueni	Updates for Version 2.2 Updates to show installation with new MySQL workbench

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1 Introduction

This guide has been written to support SPECCHIO administrators with the setup and maintenance of a SPECCHIO database.

Namely the following aspects are covered:

- ☐ Prerequisites (hardware, software, administrator skills)
- ☐ Overview over the SPECCHIO system package available from the Remote Sensing Laboratories
- ☐ SPECCHIO user roles
- ☐ Database schema setup
- ☐ Administration tools setup
- ☐ SPECCHIO user account creation
- ☐ SPECCHIO system tables setup

For details about the operation of the SPECCHIO Java client application please refer to the latest issue of the SPECCHIO user guide.

2 Prerequisites

2.1 Hardware and Software

The database must be installed on a machine running a MySQL 5 server. MySQL is available from www.mysql.com. Two basic configurations are possible:

- ☐ Installation on a personal computer: access to the database primarily by the owner of this machine via the server address 'localhost'. Usually, personal computers will have no fix IP and connections by other parties via the network will be hampered by the fact that the IP changes frequently.
- ☐ Installation on a server with a fix IP. Use this setup if several users must access the database.

The SPECCHIO administrator tools are based on dynamic web pages. In order to run these tools a webserver with PHP5 support is needed (e.g. Apache).

2.2 Administrator skills

The SPECCHIO system currently offers only limited administrator software, thus for the operation of the full system the following skills are still needed:

- ☐ Usage of the MySQL Tools 'MySQL Administrator' and 'MySQL Query Browser' or of the new MySQL Workbench.
- ☐ Firewall configuration (if a firewall is installed on the server or on the clients)
- ☐ Webserver setup in order to use the SPECCHIO online admin tools

Note: the installation can be simplified if only a single account on a personal workstation is required (see 5. Personal Workstation Installation).

3 The SPECCHIO system package

You will have received a ZIP archive containing all the needed files to setup your SPECCHIO database:

File name / Folder name	Description
SPECCHIO V2.2.sql	A backup file of the SPECCHIO database.
sdb_admin_creation.sql	A script for the creation of the SPECCHIO database administrator (sdb_admin)
specchio_admin	Folder containing the specchio administrator web pages (specchio admin tools)
Sensor Definitions	Folder containing the sensor definitions of the sensors already preloaded in the schema. Refer to these examples if you need to create your own sensor definition files.

4 SPECCHIO user roles

SPECCHIO is a multiuser system. A number of user roles with well defined characteristics exist:

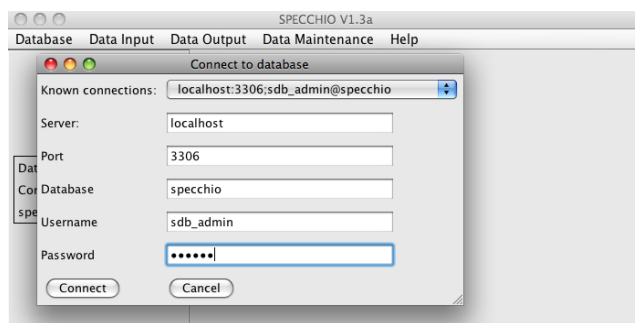
User Role	Name	Description
Root	root	Each MySQL database has a superuser called 'root'. The root account is created automatically during the MySQL database server installation. The password of 'root' is empty by default. It is advisable to define a password for the root user.
SPECCHIO database administrator	sdb_admin	This user, called 'sdb_admin' by default, has limited administrator rights and must be created by the root user. All maintenance of the SPECCHIO schema including user creation is done with the sdb_admin user. If installed on a personal workstation for use by one single user, this account can be used as normal user account (see 5. Personal Workstation Installation).
SPECCHIO user	<freely definable>	This is the normal database user. Normal users can upload, edit and delete their own spectral campaigns and browse/download all existing campaign.
SPECCHIO user with admin rights	<freely definable>	Added rights for the loading of new sensor definitions and calibration data using the SPECCHIO Java application, otherwise identical to the normal SPECCHIO user.

5 Personal Workstation Installation

This section applies to SPECCHIO users who want to install the SPECCHIO system on their personal workstation and only need one user account for their own use. The time consuming installation of the SPECCHIO administration tools can therefore be omitted and the administrator account serves as user account at the same time (you may install the administration tools at a later stage if needed). Perform the following setup steps:

1. MySQL Server and GUI Setup (see 6)
2. Database schema setup (see 7)
3. SPECCHIO database administrator creation (see 9.1). If you want to change the name of the admin user, see 5.1.

When starting the SPECCHIO application, use the administrator name and password to log in:



5.1 Changing the name of the administrator account

By default, the name of the administrator is set to 'sdb_admin'.

If you want to change the name of the administrator to your own name, you may do so by editing the sdb_admin_creation.sql file. Note that the name should contain no spaces or special characters. Note that in this case, you will also need to activate and modify the INSERT statement in the sdb_admin_creation.sql file. An example of an edited creation-file is shown hereafter:

```
CREATE USER 'mr_mueller'@'%' IDENTIFIED BY 'mr_mueller';
UPDATE mysql.user SET Password = OLD_PASSWORD('1234') where User='mr_mueller';

GRANT SELECT, DELETE, INSERT, UPDATE, ALTER, DROP, CREATE, CREATE VIEW, GRANT OPTION ON
specchio.* TO mr_mueller;
GRANT SUPER ON *.* TO mr_mueller;

-- Activate the following line if you choose a different name for sdb_admin (sdb_admin is
-- contained in the supplied schema by default).
INSERT into specchio_user (user, first_name, last_name, email, admin) values ('mr_mueller',
'Joe', 'Mueller', 'jmueller@hypothetical.com', 1);

GRANT INSERT ON mysql.user TO mr_mueller;

UPDATE mysql.user SET Reload_priv='Y', Process_priv='Y', Update_priv='Y', Delete_priv='Y',
Select_priv='Y' where User='mr_mueller';

FLUSH PRIVILEGES;
```

6 MySQL Server and GUI Setup

This is a very rough guide, for detailed information on the server and GUI tools please refer to the information available from MySQL.

- ☐ Download the latest MySQL server installation package from <http://dev.mysql.com/downloads/mysql/5.0.html#downloads>
- ☐ Download the latest GUI tools from <http://dev.mysql.com/downloads/gui-tools/5.0.html>
- ☐ Install the MySQL server
- ☐ Install the MySQL Admin and the Query Browser GUI tools, or the new MySQL Workbench, which replaces the previous GUI tools.

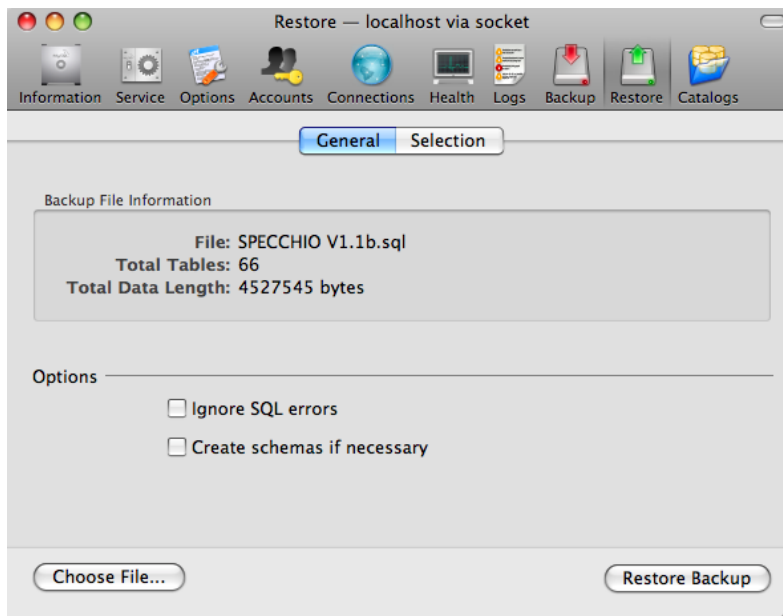
The Root account will be created automatically during the above installation. The password of 'root' is empty by default.

7 Database schema setup

Follow these steps to setup the SPECCHIO database schema. Two installation variations are shown, one for the deprecated MySQL GUI Tools and one for the new Workbench.

7.1 Setup using MySQL GUI Tools (deprecated)

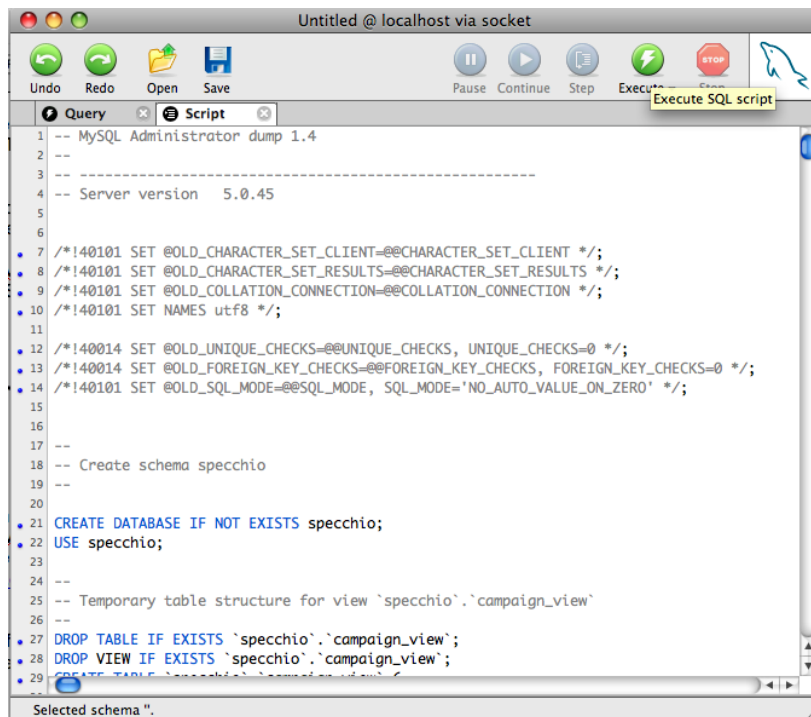
- ☐ Open the MySQL Administrator software (login as root) and choose the 'Restore' tab.



Select the file SPECCHIO V2.2.sql (supplied in the ZIP file) as input. Click 'Restore Backup'. This will create a schema called specchio.

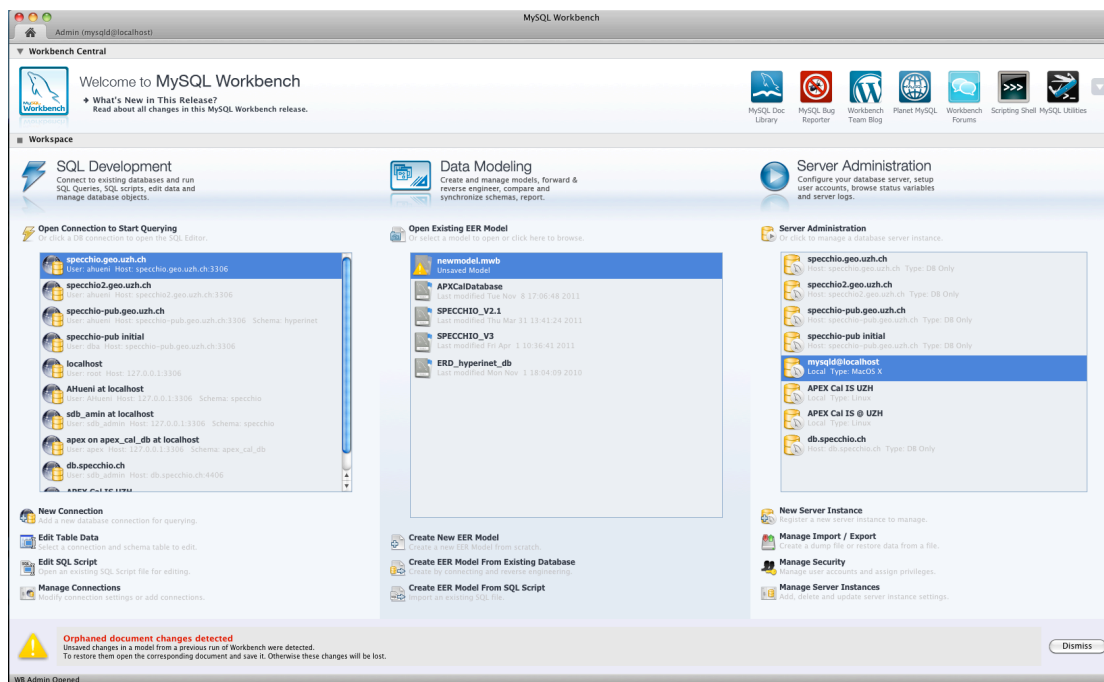
Alternative setup option in case the above restore fails (on some systems the database restore inexplicably fails, e.g. segmentation fault):

- ☐ Start the MySQL Query Browser (login as root)
- ☐ Load the SPECCHIO V2.2.sql file by choosing 'Open Script' from the File menu.
- ☐ Click the 'Execute' button

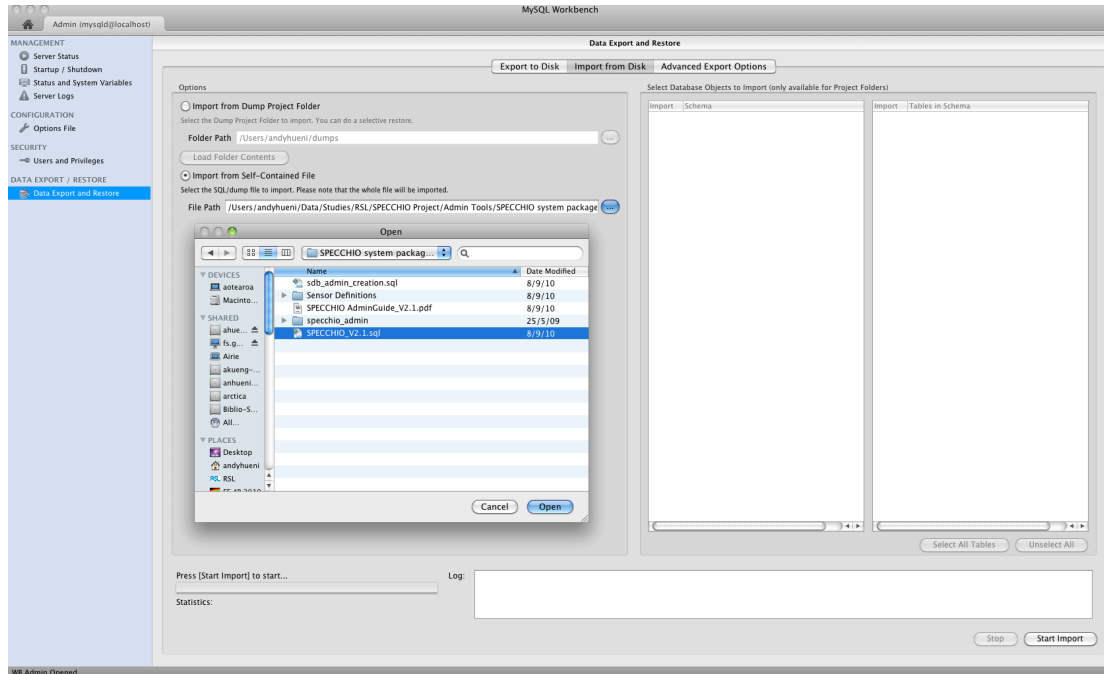


7.2 Setup using MySQL Workbench

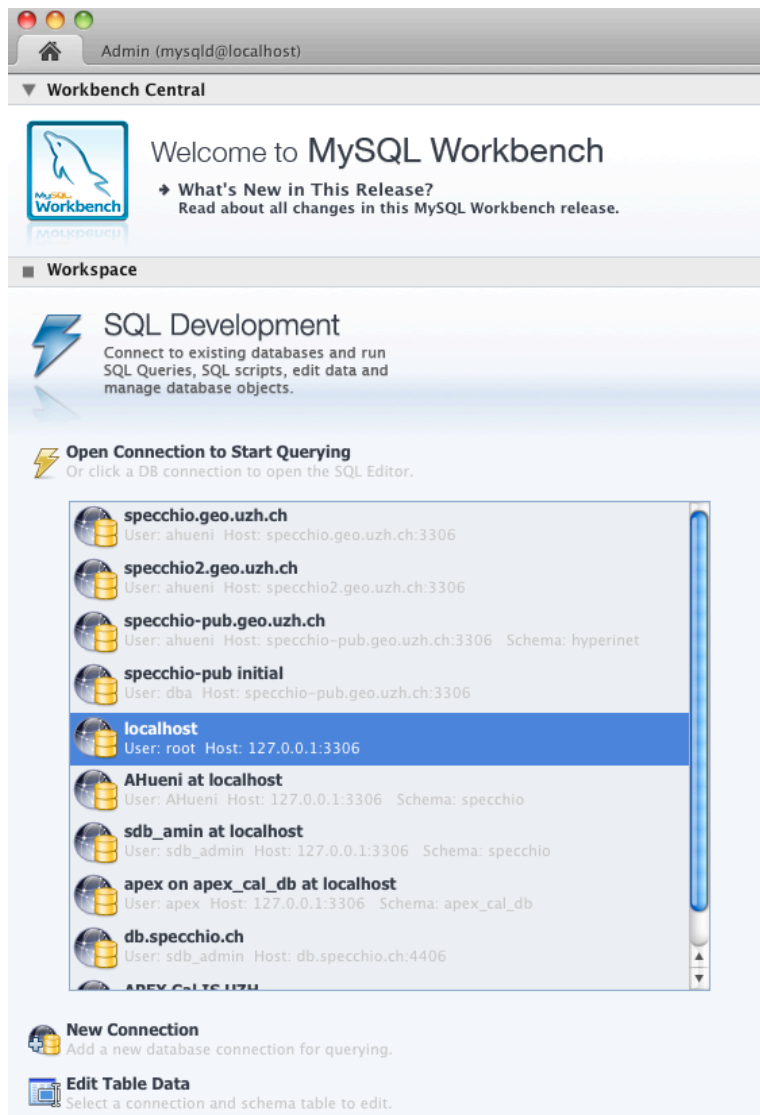
Double click the server instance you want to use for the specchio schema:



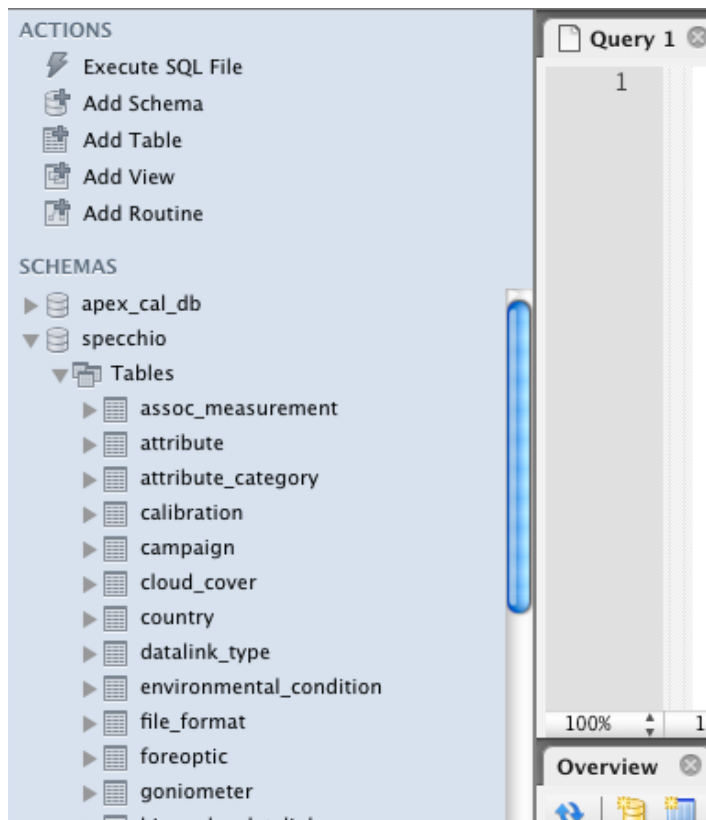
This opens the Admin view: select the 'import from disk' tab, select 'Import from self-contained file' and browse to the file supplied in the SPECCHIO admin package (SPECCHIO_V2.2.sql). Press "Start Import".



To check if the schema was created, move back to the home screen and open the connection to the server you are installing to.



The SPECCHIO schema with the tables similar to shown below should now appear in the schema list.



8 Administration tools

8.1 Setup

The administration tools are based on PHP scripts and are served by a web server. The complexity of the setup of a webserver is operating system dependent. If you use MacOS X, you may refer to the excellent page 'Apache Web Serving with MacOS X' by K. Hemenway (<http://www.oreilly.com/pub/ct/49>). When reconfiguring the web server, e.g. enabling PHP, you may have to restart not only the service but also the machine to make sure that the PHP files are rendered correctly.

- Copy the folder 'specchio_admin' (supplied in the ZIP file) into the document root of your web server. To figure out where your document root resides open a terminal window and type:

```
httpd -V
```

This displays the settings of the web server.
Some line will read like:

```
-D SERVER_CONFIG_FILE="/private/etc/apache2/httpd.conf"
```

I.e. the configuration file is located at the above path.

Display the config file and search for document root, e.g. by using grep:

```
cat /private/etc/apache2/httpd.conf | grep "DocumentRoot"

# DocumentRoot: The directory out of which you will serve your
# DocumentRoot "/Library/WebServer/Documents"
DocumentRoot "/Users/andyhueni/Data/PHP"
# This should be changed to whatever you set DocumentRoot to.
# access content that does not live under the DocumentRoot.
```

There are two places where this document root is defined/used:

```
#
# DocumentRoot: The directory out of which you will serve your
# documents. By default, all requests are taken from this directory, but
# symbolic links and aliases may be used to point to other locations.
#
# DocumentRoot "/Library/WebServer/Documents"
DocumentRoot "/Users/andyhueni/Data/PHP"

#
# This should be changed to whatever you set DocumentRoot to.
#
# <Directory "/Library/WebServer/Documents">
<Directory "/Users/andyhueni/Data/PHP">
```

You can either use the default location or edit the path of the document root to point to some new location on your file system. In any case, the folder `specchio_admin` should be below this document root path. E.g.:

```
/Users/andyhueni/Data/PHP/specchio_web/specchio_admin
```

- Edit the file `config.php` (contained in the `specchio_admin` folder) and change the following (indicated in green in the script below):
 - Server address: address of the web server where the online admin PHP scripts are installed
 - Server directory: the location where the online admin PHP scripts are contained. This path is relative to the document root path of web server
 - Admin email: your own email address. You will get emails when you create a new database user.
Note: the scripts use the PHP mail function. This relies on the SMTP server being accessible without any authentication, otherwise sending mails will not work.
 - Database server: address of the database server
 - Database: schema name of the database you are working on. If you want to administrate more than one database, the current solution is

to copy the whole 'if(\$host == 1){ }' statement, increase the number and use the **environment switch** to choose your working database.

```
<?php
/*
 * Created on 4/10/2007
 * ahueni
 */

$host = 1; // environment switch
$site_title = "SPECCHIO Database Administrator Tools";

if($host == 1)
{
    // web server settings
    $server_address = "localhost";
    $server_directory = "/specchio_web/specchio_admin";

    // mail settings
    $admin_email = "ahueni@geo.uzh.ch";

    // db server settings
    $port = 3306;
    $db_server = "localhost";
    $database="specchio"; // default database (master database)

    // schemas
    $schemas = array("specchio");
}

$common_folder = $_SERVER['DOCUMENT_ROOT'] . "$server_directory/common";
$common_folder_http = "http://$server_address$server_directory/common";

?>
```

8.2 PHP Connection Problems

On MacOS X, the following error may appear when trying to connect to your local MySQL database using PHP:

```
Warning: mysql_connect(): Can't connect to local MySQL server through socket
'/var/mysql/mysql.sock'
```

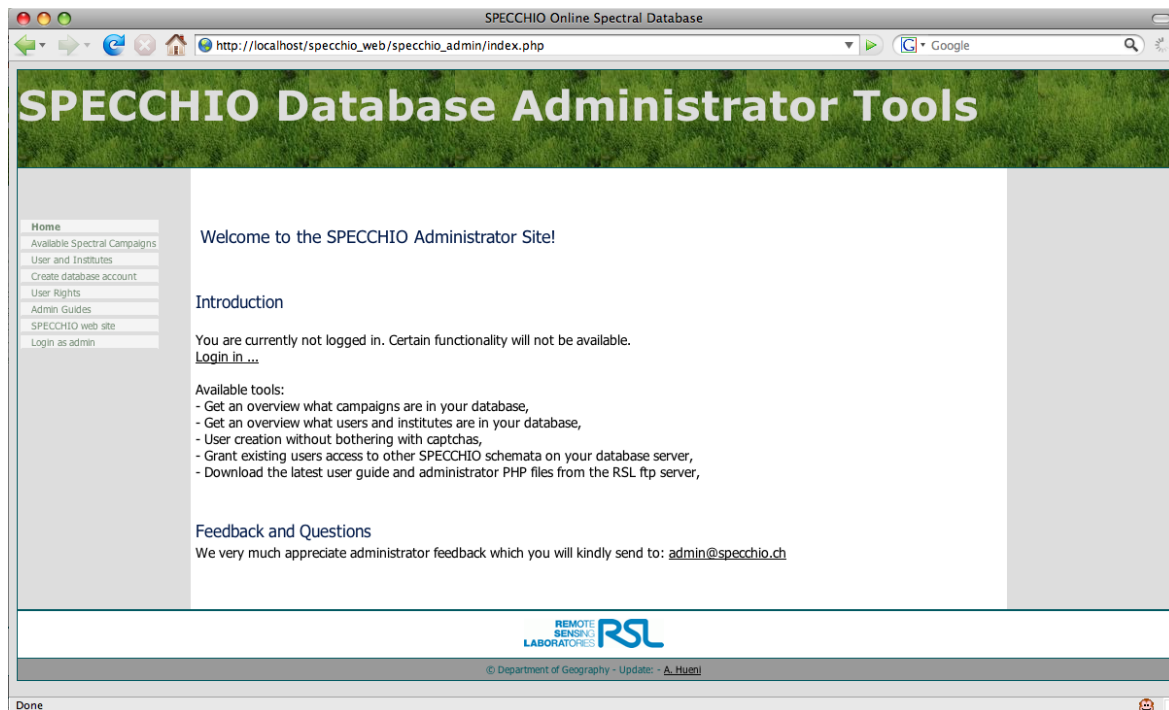
This error is due to /etc/php.ini(.default) looking for mysql.sock in the wrong place. This can be fixed by making a symbolic link from the right place to the socket. Enter the two following commands in a terminal window:

```
sudo mkdir /var/mysql
sudo ln -s /private/tmp/mysql.sock /var/mysql/mysql.sock
```

8.3 Usage

Open the administration tools by entering the respective URL in your browser, e.g. with a local installation: http://localhost/specchio_web/specchio_admin/index.php

This should bring up the main page:



The admin user name and password are stored in cookies in your browser and deleted after 24 hours. The page will indicate if you are logged in or not (line below the introduction and also an entry in the main menu). To login click the menu entry 'Login as admin'. (Note: an admin user must be created first as described in 9.1.)

Available tools:

- Get an overview what campaigns are in your database,
- Get an overview what users and institutes are in your database,
- User creation without bothering with captchas,
- Grant existing users access to other SPECCHIO schemata on your database server,
- Download the latest user guide and administrator PHP files from the RSL ftp server.

9 SPECCHIO user account creation and administration

9.1 SPECCHIO database administrator creation

9.1.1 Using the MySQL Query Browser (deprecated)

- ☐ Start the MySQL Query Browser (login as root)
- ☐ Make the specchio schema the default schema for this session
- ☐ Load the script file `sdb_admin_creation.sql` (supplied in the ZIP file)

- ☐ Set another password by editing the create user line:

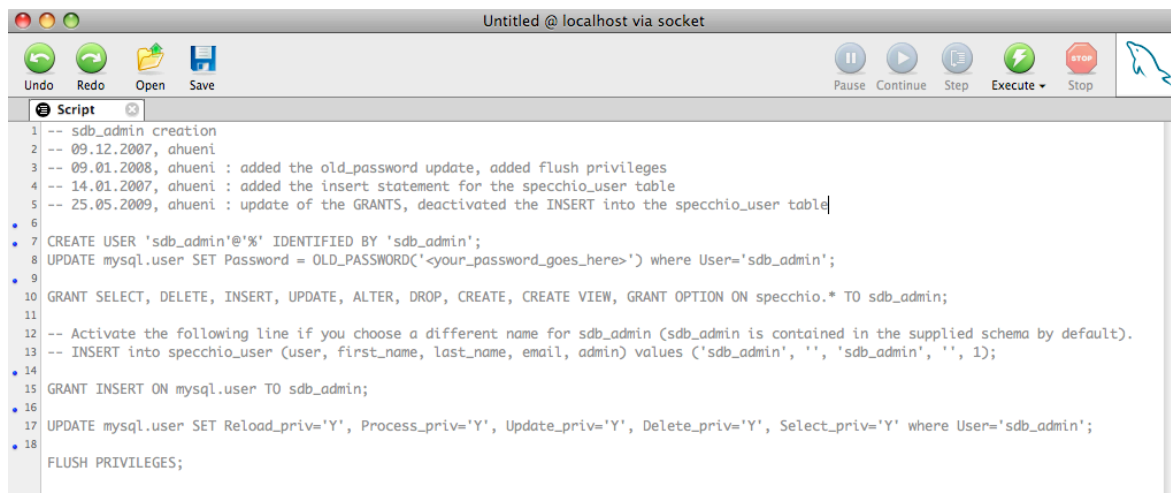
```
UPDATE mysql.user SET Password = OLD_PASSWORD('<your_password_goes_here>')  
where User='sdb_admin';
```

e.g. to set the password to 'abc' the line should read:

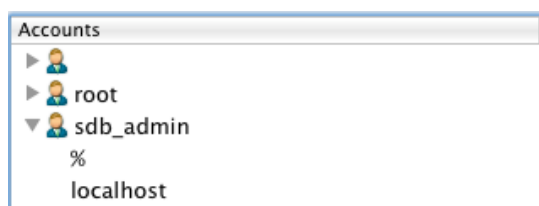
```
UPDATE mysql.user SET Password = OLD_PASSWORD('abc') where User='sdb_admin';
```

Note: on some database server versions this update may fail. If so, use the MySQL Administrator software to set the password to some new value if required.

- ☐ Run the script by clicking the 'Execute' button in the GUI



Depending on your database server version, the connection from the localhost will not work automatically. To add the localhost to the sdb_admin user, open the MySQL Administrator and click the 'add host' button:



9.1.2 Using the MySQL Workbench

Create sdb_admin user:

Open the file sdb_admin_creation.sql (part of the installation package) and edit a bit by removing the second line (UPDATE mysql.user SET Password =

OLD_PASSWORD('<your_password_goes_here>') where User='sdb_admin');). Alternatively, enter a different password for sdb_admin in the single quotes after the identified keyword.

```
CREATE USER 'sdb_admin'@'%' IDENTIFIED BY 'sdb_admin'
```

```
-- Added TRIGGER for MySQL 5.1.6
```

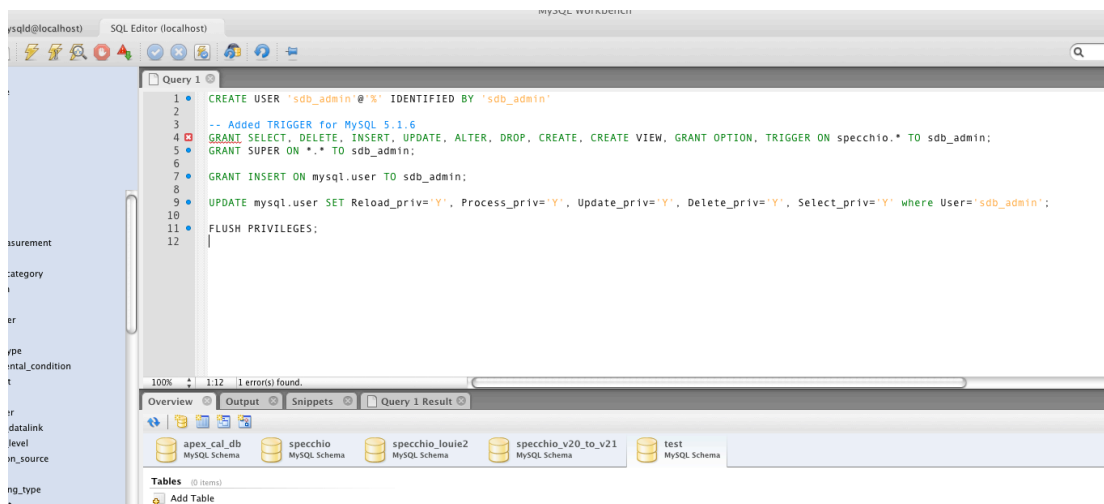
```
GRANT SELECT, DELETE, INSERT, UPDATE, ALTER, DROP, CREATE, CREATE VIEW,  
GRANT OPTION, TRIGGER ON specchio.* TO sdb_admin;  
GRANT SUPER ON *.* TO sdb_admin;
```

```
GRANT INSERT ON mysql.user TO sdb_admin;
```

```
UPDATE mysql.user SET Reload_priv='Y', Process_priv='Y', Up-  
date_priv='Y', Delete_priv='Y', Select_priv='Y' where User='sdb_admin';
```

```
FLUSH PRIVILEGES;
```

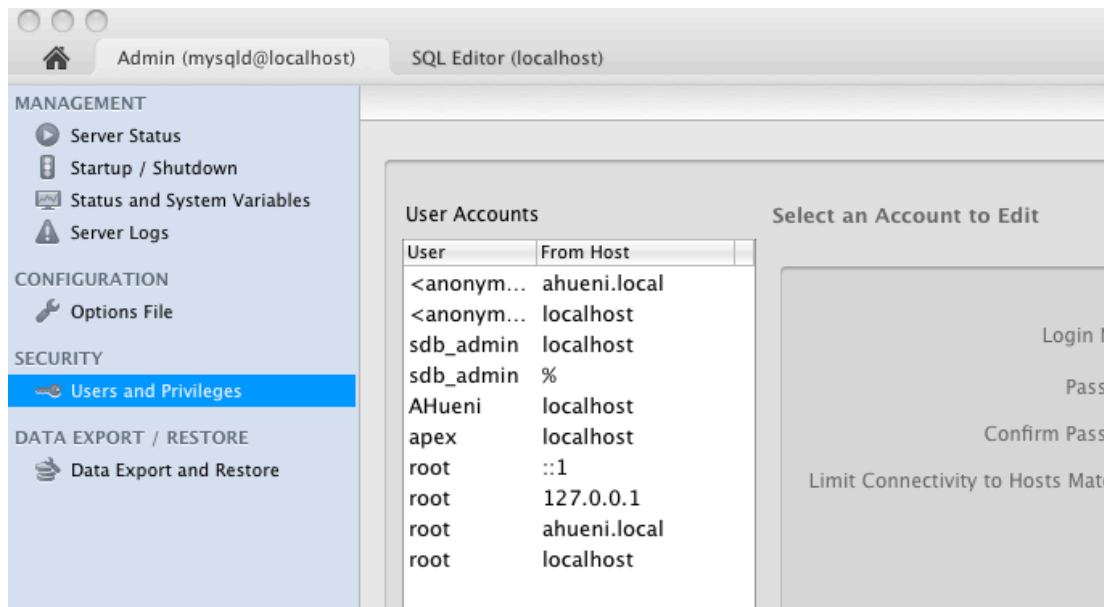
Copy the above statements into the query field in the GUI tool:



Press the execute button:

This should create the sdb_admin user.

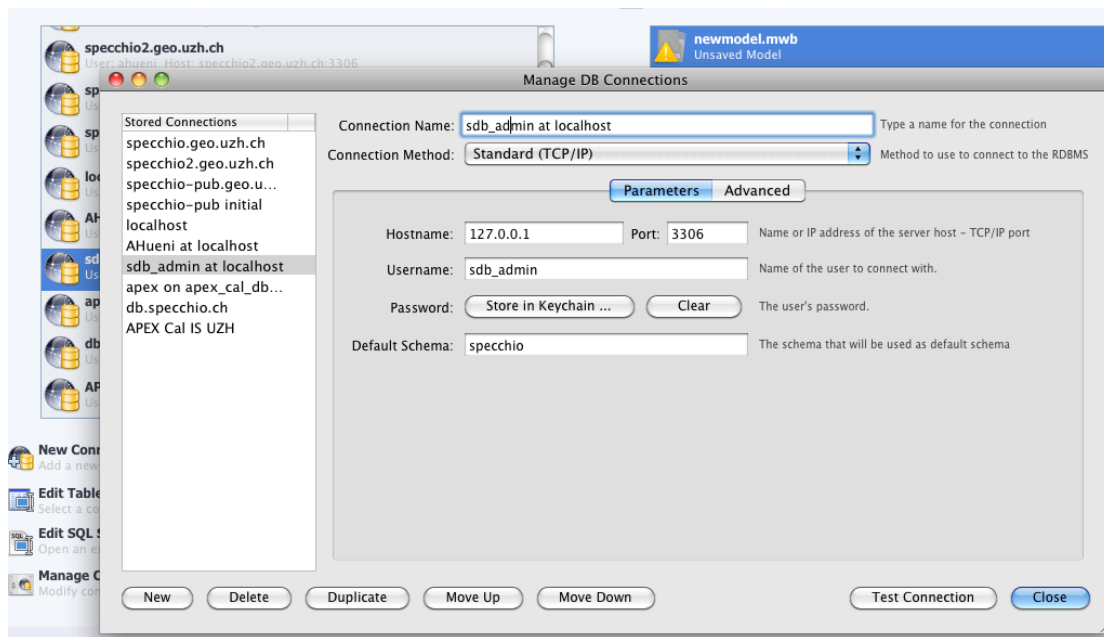
To check this, go back to the admin tab and select “users and privileges” tab:



sdb_admin should show up. Note that by default, sdb_admin is configured to connect from other machines to the server, but not from the server to the server. If you are working on the same machine where the server runs, you need to reconfigure by adding another user account entry for the same user name but with the host set to 'localhost':



To check if you can connect to the specchio schema with the sdb_admin user, either open an SQL editor and specify the connection details to use the sdb_admin:



Or alternatively, open the SPECCHIO Java application and try to login to specchio using the sdb_admin credentials.

9.2 SPECCHIO user creation

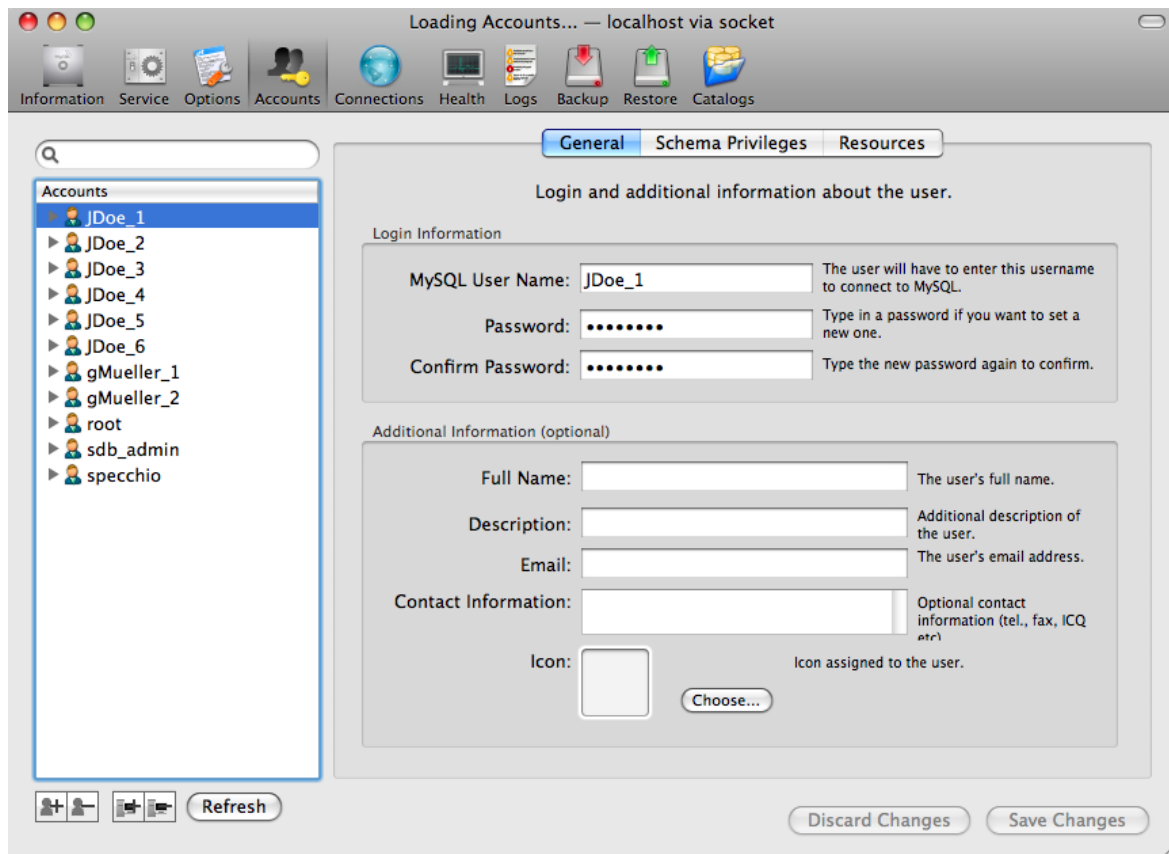
Use the online database administration tools to create new users in the database. Users will get their username and password sent to the email that is provided during user creation.

- Home
- Available Spectral Campaigns
- User and Institutes
- Create database account**
- User Rights
- Admin Guides
- SPECCHIO web site
- Logout sdb_admin

Note: Please do not use any special characters (e.g. umlauts) in your first or last name. Special characters currently still pose problems during database connections on some platforms/operating systems.

First name *:	<input type="text"/>
Last name *:	<input type="text"/>
Title :	<input style="border: 1px solid black;" type="text" value="Dr."/>
Institute name: (Select existing or register new one.)	<input style="border: 1px solid black;" type="text" value="none"/> Register new institute
Email *:	<input type="text"/>
WWW:	<input type="text"/>
<input type="button" value="Create account"/>	<input type="button" value="Reset form"/>

Note: the scripts use the PHP mail function. This relies on the SMTP server being accessible without any authentication, otherwise sending mails will not work. Should this be the case, the MySQL Administrator Tool can be used to figure out the user name and reset the password to some new value:



10 SPECCHIO system tables setup

Some system tables must be filled by the administrator in order to have the system operate at its best:

- ☐ Sensors: plotting is not possible if the sensors are not defined. Some sensors are already pre-loaded in the supplied database.
- ☐ Instruments: automatic linking of measurements to specific instruments is only possible if the instrument numbers are correct. See the SPECCHIO user guide on instructions how to define new instruments.
- ☐ Instrumentation configurations: the current system allows the loading of calibration data for instruments (wavelength calibration) and reference panels (reflective properties correction). See the SPECCHIO user guide for details.

10.1 Sensors

The following sensors are pre-loaded:

name	description
ASD FSFR	ASD Fieldspec FR
GER 3700	GER 3700
MFR-7	MFR-7 Rotating Shadowband Radiometer
Beckman UV-5240	Beckman UV-5240
USGS Beckman UV-5240	Beckman UV-5240
SVC HR 2024	

For loading other sensor please refer to the SPECCHIO User Guide, section 'Definition of new Sensor'.

Loading of new sensors is only possible by the SPECCHIO database administrator.

10.2 Instruments

The following instruments are preloaded:

owner	serial_number	name
INR Massey University	6421	INR ASD
RSL	1002	RSL GER 3700
RSL	16006	RSL ASD FS3 1
RSL	16007	RSL ASD FS3 2
FGI	6213	FGI ASD

Some of these instruments are used in the tutorials.

To add your own instruments use the function provided in the SPECCHIO Java application. For more information please see the SPECCHIO user guide.

11 Troubleshooting

This section just contains lists of useful hints that may help to resolve some issues. They are all based on installation experiences under different operating systems.

Problem	Solution
sdb_admin cannot connect to the MySQL server on localhost.	Add localhost to the machines that this user can connect from. Logically, this makes no sense, as all machines (%) are already included in the list of possible machines. Seems to work anyway ...
Database connection problem with sdb_admin: class java.sql.SQLException 1045	Upgrade the password using the Workbench: SET PASSWORD FOR 'sdb_admin'@'%'=PASSWORD('sdb_admin');

12 References