Setting Up The Computer for WOVOdat And Installing WOVOdat database *(last updated: October 16, 2012)*

Getting Started

The WOVOdat is a Linux base SQL of volcanic unrest database. In this tutorial we will describe an example on how to install WOVOdat database into a localhost on an Ubuntu base system.

Note: To be able to install WOVOdat packages, the user should be sys-admin or have sys-admin privileges.

Prerequisite:
Computer running Ubuntu operating system. The latest Ubuntu can be obtained from http://www.ubuntu.com.

The following packages are required:

- Apache2
- Mysql
- Php5
- Php-pear
- Php-db
- Phpmyadmin – The GUI tool to handle the administration of mysql
- GMT

The following packages are optional:

- Openssh-server
- Filezilla --GUI tool to transfer file(s) between computers
- Image Magick

The above packages can be downloaded and installed from the Ubuntu online repository using the Ubuntu apt-get tool or Synaptic Package Manager.

Installation

- **Install Apache2**

```
% sudo apt-get install apache2

% echo "ServerName  localhost" | sudo tee
/etc/apache2/conf.d/fqdn
```

Check the Apache2 installation

- Using web browser go to the URL http://localhost, if you see "It works!", this proves that the Apache works.

- **Install php5**

```
% sudo apt-get install php5
% sudo apt-get install libapache2-mod-php5

% echo "<?php phpinfo(); ?>" | sudo tee
/var/www/test.php
```

Check the PHP 5 installation

- Restart apache2:

```
% sudo /etc/init.d/apache2 restart
```

- Go to the URL http://localhost/test.php, if you can see the description of PHP5 configuration, it proves that PHP5 installation is successful.

- **Install mysql**

```
% sudo apt-get install mysql-server mysql-client mysql-
common
```

Check the mysql installation

- From the terminal:

```
% mysql –u root –p
```

If it prompts you for the password to login, it means that MySQL is successfully installed.

- **Install phpmyadmin**

```
% sudo apt-get install phpmyadmin
% sudo /etc/init.d/apache2 restart
```

Check the phpmyadmin installation

- Go to the URL http://localhost/phpmyadmin, if you can see the phpmyadmin login page, it proves that the phpmyadmin works fine. The user will need to provide the root login of mysql to log into phpmyadmin. Once logged in, the user can create the phpmyadmin user account(s).
(Note: path will be different if you are installing on virtual machine)

If you do not see the phpmyadmin login page, do the following steps and go to the URL http://localhost/phpmyadmin again.

```
%sudo ln -s /etc/phpmyadmin/apache.conf
/etc/apache2/conf.d/phpmyadmin.conf

% sudo /etc/init.d/apache2 restart
```

- **Install php-pear**

```
% sudo apt-get install php-pear
```

- **Install php-db**

```
% sudo apt-get install php-db
```

- **Install openssh-server**

```
% sudo apt-get install openssh-server
```

- **Install filezilla**

```
% sudo apt-get install filezilla
```

- **Install netCDF**

  - Download netCDF from http://www.unidata.ucar.edu/downloads/netcdf/netcdf-4_1_3/index.jsp

  - Uncompress the downloaded file at /home/usrName directory. The **/home/usrName/netcdf-4.1.3** will be created after uncompressing the netcdf-4.1.3.tar.gz.

```
% tar -zxvf netcdf-4.1.3.tar.gz
```

  - Compile and install netCDF. By default, netCDF is installed in /usr/local and it is recommended.

```
% cd /home/username/netcdf-4.1.3

% sudo apt-get install make

% sudo ./configure –disable-netcdf-4

% sudo make check install
```

- **Install GMT**

  - Go to the link http://gmt.soest.hawaii.edu/ and click on the "Download" link that is on left side menu. After that, click on "INSTALL_FORM" is in the middle of the page. Find the "install_gmt.sh" file and download it to your favor directory.

  - Go into that the directory where GMT is downloaded. Execute the following command and accept the given default option.

```
% chmod 755 ./install_gmt.sh
% sudo  ./install_gmt.sh
```

Note:

- **DO NOT** install netCDF through install_gmt.sh because the netCDF installed by install_gmt.sh is pretty old version and we have already installed the netCDF-4.1.3 which is the newer version.
- The **install_gmt.sh** must be executed as super user. In order for the GMT works with WOVOdat, the GMT tool should be installed in **/usr/lib/gmt/bin**

- **Refer to the sample installation below**

```
% sudo ./install_gmt.sh

====>>>> Interactive installation of GMT <<<<====

We first need a questions and answer session to determine how
and where GMT is to be installed.   Then, when all parameters
have been assembled, we will run the installation (unless you
chose -n when starting this script).

This script will install the latest version of GMT 4.5.8.

==> Enter make utility to use [make]: make

If you are behind a firewall you will need to use a passive ftp session.
Only if you have some very old ftp client, you may have to resort to active ftp
(which involves the server connecting back to the client).

==> Do you want passive ftp transmission (y/n) [y]: y
==> Have you installed netcdf (version 3.6 or later)? (y/n) [y]: y
==> Enter directory with netcdf lib and include [/usr/local]: /usr/local

GMT4 offers experimental and optional support for other grid formats
and plotting of geotiffs via GDAL.  To use this option you must already
have the GDAL library and include files installed.

==> Use experimental GDAL grid input in GMT4 (y/n) [y]: n
==> Install GMT version 4.5.8? (y/n) [y]: y
==> Install GSHHS version 2.2.0? (y/n) [y]: y
==> Get the GMT version 4.5.8 archive (38 Mb) via ftp? (y/n) [y]: y
==> Get the GSHHS version 2.2.0 archive (45 Mb) via ftp? (y/n) [y]: y
```

We offer 9 different ftp sites. Choose the one nearest you in order to minimize net traffic and transmission times. The sites are:

1. SOEST, U of Hawaii [GMT Home], Honolulu, Hawaii, USA
2. NOAA, Lab for Satellite Altimetry, Silver Spring, Maryland, USA
3. IRIS, Incorporated Research Institutions for Seismology, Seattle, Washington, USA
4. IAG-USP, Dept of Geophysics, U. of Sao Paulo, BRAZIL
5. Dept of Geosciences, U of Oslo, NORWAY
6. Goodie Domain Service, Vienna U of Techology, AUSTRIA
7. Tokai U, Shimizu, JAPAN
8. School of Geosciences, U of Sydney, AUSTRALIA
9. TENET, Tertiary Education & Research Networks of South Africa, SOUTH AFRICA

==> Enter your choice [1]: 7
You selected site number 7:
7. Tokai U, Shimizu, JAPAN

This anonymous ftp server ftp.scc.u-tokai.ac.jp only accepts connections from computers on the Internet that are registered in the Domain Name System (DNS). If you encounter a problem connecting because your computer is not registered, please either use a different computer that is registered or see your computer systems administrator (or your site DNS coordinator) to register your computer.

GMT can use two different algorithms for Delauney triangulation.

Shewchuk [1996]: Modern and very fast, copyrighted.
Watson [1982] : Older and slower, public domain.

Because of the copyright, GMT uses Watson's routine by default.
However, most will want to use the optional Shewchuk routine.
==> Use optional Shewchuk's triangulation routine (y/n)? [y]: y

The installation will install all GMT components in several subdirectories under one root directory. On most Unix systems this root directory will be something like /usr/local or /sw, under which the installation will add bin, lib, share, etc. Below you are asked to select to location of each of the subdirectories.

==> Directory for GMT4 executables? [/home/wovodat/GMT4.5.8/bin]: **/usr/lib/gmt/bin**
==> Directory for GMT4 linkable libraries? [/usr/lib/gmt/lib]: **/usr/lib/gmt/lib**
==> Directory for GMT4 include files? [/usr/lib/gmt/include]: **/usr/lib/gmt/include**
==> Directory for GMT4 data resources? [/usr/lib/gmt/share]: **/usr/lib/gmt/share**

Unix man pages are usually stored in /usr/man/manX, where X is the relevant man section. Below, you will be asked for the /usr/man part;
the /manX will be appended automatically, so do not answer /usr/man/man1.

==> Directory for GMT4 man pages? [/usr/lib/gmt/man]: **/usr/lib/gmt/man**
==> Directory for GMT4 doc pages? [/usr/lib/gmt/share/doc/gmt]: **/usr/lib/gmt/share/doc/gmt**

At run-time GMT4 will look in the directory /usr/lib/gmt/share to find configuration and data files. That directory may appear with a different name to remote users if a different mount point or a symbolic link is set. GMT4 can use the environment variable $GMT_SHAREDIR to point to the right place. If users see a different location for the shared data files, specify it here. (It will be used only to remind you at the end of the installation to set the enronment variable $GMT_SHAREDIR).

==> Enter value of GMT_SHAREDIR selection [/usr/lib/gmt/share]:
/usr/lib/gmt/share

The answer to the following question will modify the GMT4 defaults. (You can always change your mind by editing share/gmt.conf)

==> Do you prefer SI or US default values for GMT4 (s/u) [s]: s

The answer to the following question will modify the GMT4 defaults.
(You can always change your mind later by using gmtset)

PostScript (PS) files may contain commands to set paper size, pick a specific paper tray, or ask for manual feed. Encapsulated PS files (EPS) are not intended for printers (but will print ok) and can be included in other documents. Both formats will preview on most previwers (out-of-date Sun pageview is an exception).

==> Do you prefer PS or EPS as default PostScript output (p/e) [p]: p

Building the GMT4 libraries as shared instead of static will reduce executable sizes considerably. GMT supports shared libraries under Linux, Mac OS X, SunOS, Solaris, IRIX, HPUX, and FreeBSD. Under other systems you may have to manually configure macros and determine what specific options to use with ld.

==> Try to make and use shared libraries? (y/n) [n]: n

If you have more than one C compiler you need to specify which, otherwise just hit return to use the default compiler.

==> Enter name of C compiler (include path if not in search path):

GMT4 can be built as 32-bit or 64-bit. We do not recommend to explicitly choose 32-bit or 64-bit, as the netCDF install is not set up to honor either of these settings. The default is to compile without sending any 32-bit or 64-bit options to the compiler, which generally create 32-bit versions on older systems, and 64-bit versions on newer systems, like OS X Snow Leopard.

==> Explicitly select 32- or 64-bit executables? (y/n) [n]: n
==> Produce universal executables (OS X)? (y/n) [n]: n

GMT4 passes information about previous GMT commands onto later GMT4 commands via a hidden file (.gmtcommands). To avoid that this file is updated by more than one program at the same time (e.g., when connecting two or more GMT4 programs with pipes) we

```
use POSIX advisory file locking on the file.  Apparently, some
versions of the Network File System (NFS) have not implemented
file locking properly.  We know this is the case with Linux
pre-2.4 kernels when mounting NFS disks from a Unix server.
If this is your case you should turn file locking OFF.

==> Use POSIX Advisory File Locking in GMT4 (y/n) [n]: n
==> Want to test GMT4 by running the 30 examples? (y/n) [y]: y
==> Delete all tar files after install? (y/n) [n]: n
==> Enter name of the parameter file that will now be created
[GMT4param.txt]: GMT4param.txt
Session parameters written to file GMT4param.txt
==> Hit return to start the install:
```

- After GMT installation, add the following entries into **/root/.bashrc** if the entries have not been set.

```
export
PATH=/usr/lib/gmt/bin:/usr/lib/gmt/lib:/usr/lib/gmt/include:/usr/lib:$PATH
export GMTHOME=/usr/lib/gmt
export GMTPATH=/usr/lib/gmt/bin
export MANPATH=/usr/lib/gmt/man:/usr/share/man:$MANPATH
```

Check GMT installation

- **From the terminal:**

```
% source .bashrc

%man psxy
```

If GMT is successfully installed , it shows a manual page.

Install WOVOdat Tool

- Download WOVODAT User Interface Tool (wovodat_Tool.tar) from http://wovodat.org/installing/download_installable.php and save it under the directory: /home. This tar file includes:

    - Subdirectory-paths to organize and store script and data files.

    - PHP and HTML scripts for web-based user interface; include WOVOdat ***Documentation, Visualization*** and ***Submit Data*** with all scripts to convert WOVOdat CSV format into WOVOdat XML format, and upload WOVOdat XML to store the data into the database.

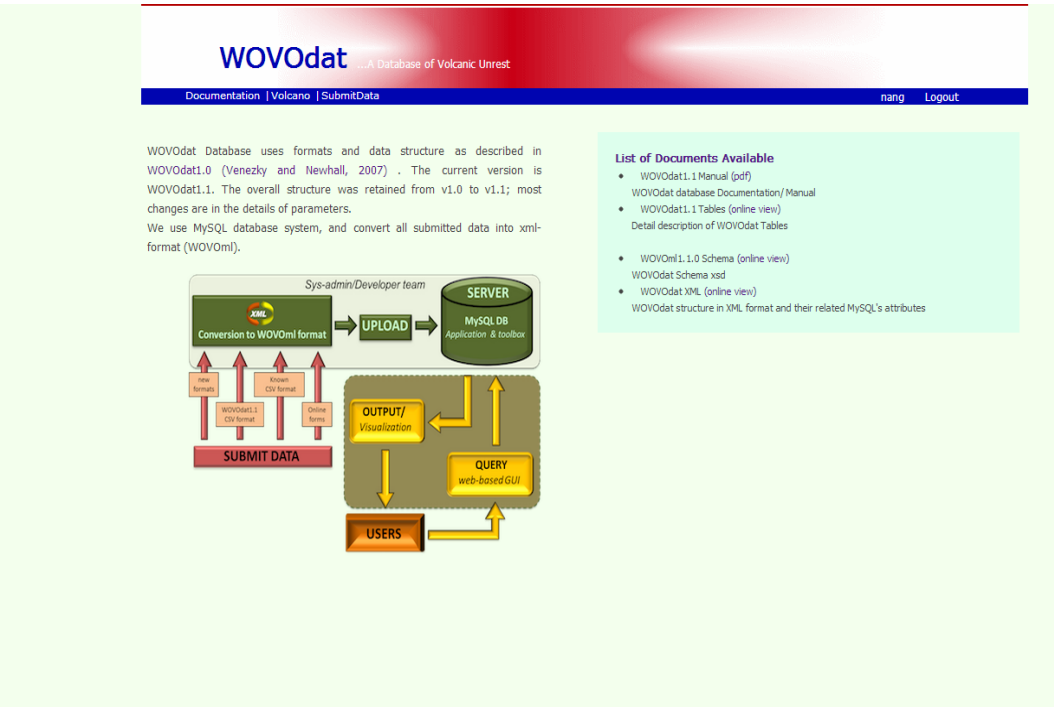

Figure 1. WOVOdat ***Documentation*** webpage

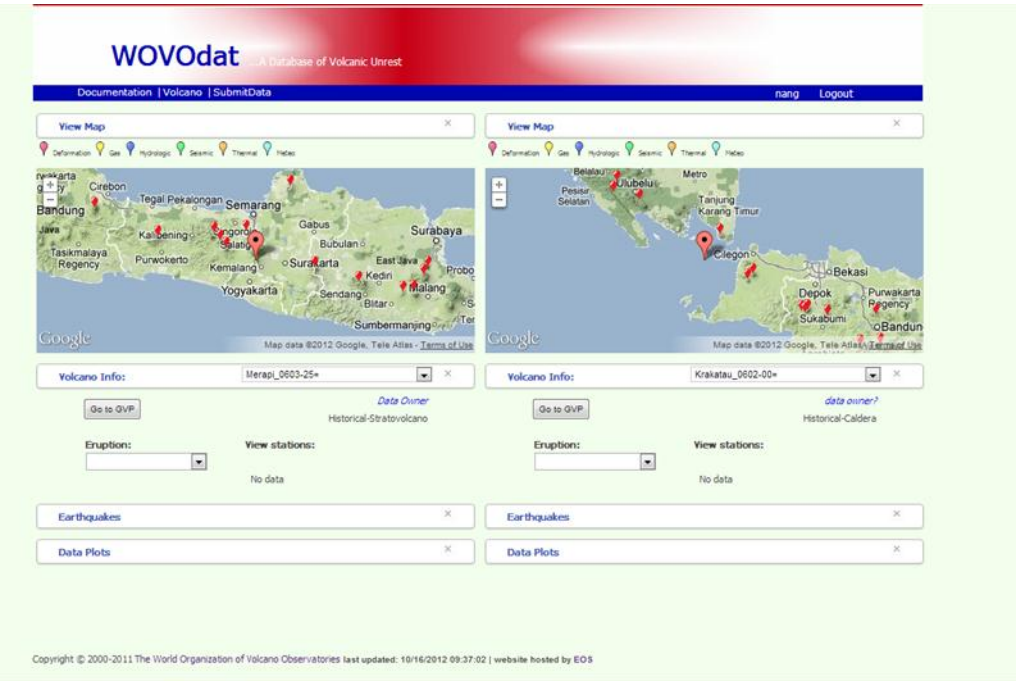

Figure 2. WOVOdat ***Visualization*** webpage

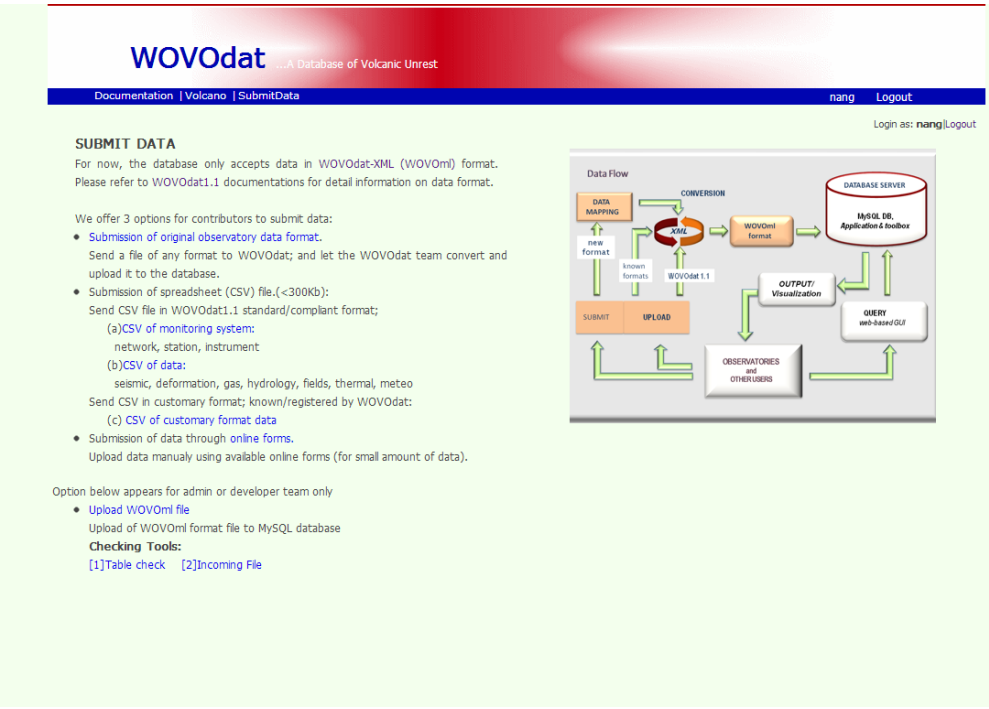

Figure 3. WOVOdat ***Submit Data*** webpage

- Uncompress the tar file under directory: /home. The whole package of scripts will therefore store under: /home/wovodat

Install WOVOdat Database

❶ Download WOVOdat database template (wovodat.sql) file from http://wovodat.org/installing/download_installable.php and save it into your favorite directory.

❷ Use web browser to go to this link http://localhost/phpmyadmin to import a database and create a new account.

❸ Log in page will appear in the web browser, as shown in Figure 3. Type in MySQL username and password.

❹ Press on 'Go' button to log in.

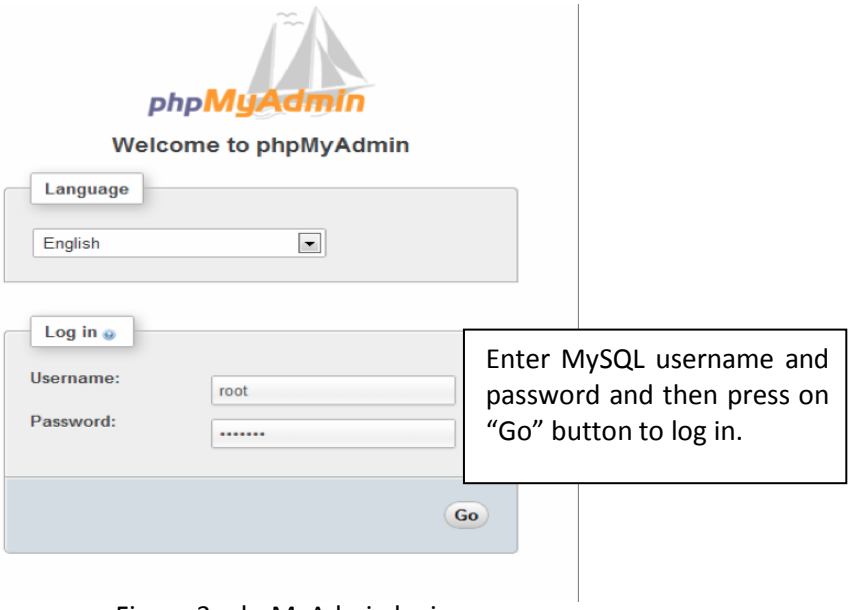

Figure 3. phpMyAdmin login page

Creating the new database and the new account using phpmyadmin

Default Database Name:	wovodatdb Default
Username:	wovodatuser
Default Password:	wovodatpassword

Note: if you want to change default database name, username and password, edit the following files:

- /home/wovodat/public_html/WOVOdat/PEAR/php/MYDB.php
- /home/wovodat/public_html/WOVOdat//PEAR/php/include/db_connect.php
- /home/wovodat/public_html/WOVOdat/PEAR/php/include/db_connect_view.php

How to import wovodat database (see Figure 4)

❶ Click on “Import” button that is at the top right frame to import “wovodat.sql” file.

❷ Click on “Browse” button to locate and choose “wovodat.sql” file from your computer and select ‘utf8’ for the character set.

❸ Click on “Go” button to import it.

❹ Now “wovodatdb” database has been installed on your system.

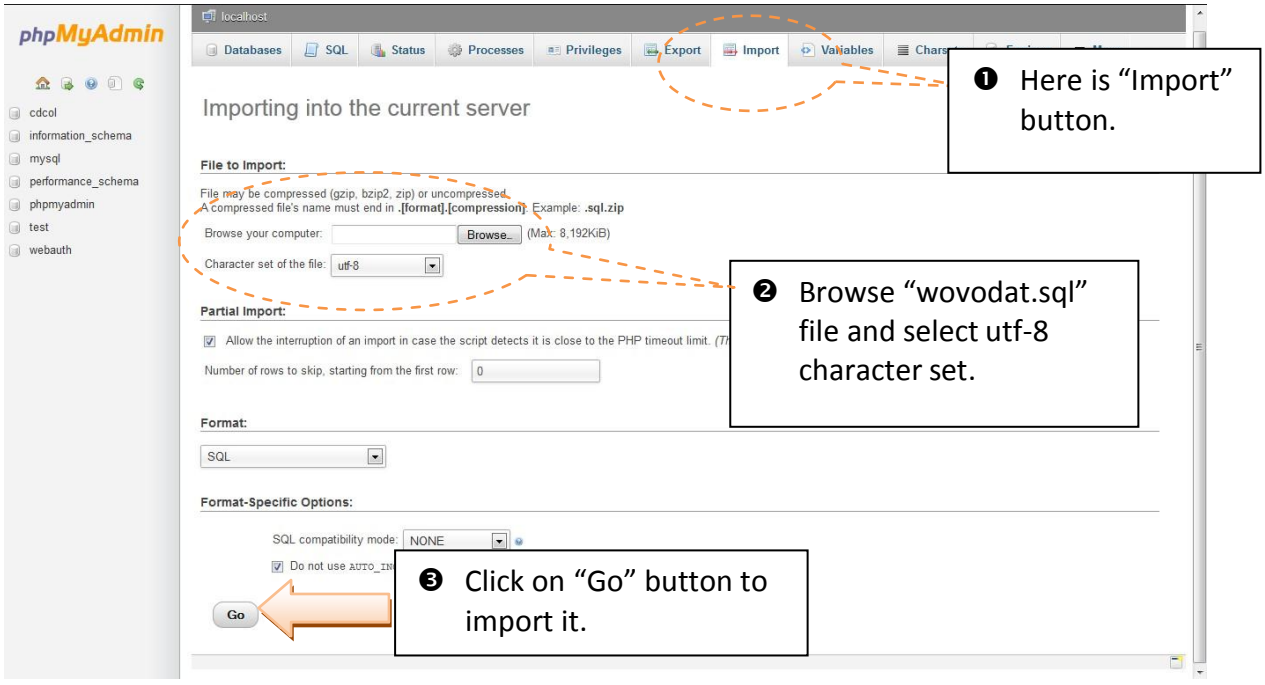

Figure 4. Importing a database into the current server using phpMyAdmin GUI

How to create a new account

Setting up new user account (see Figure 5)

❶ Click on Privileges menu that is at the left hand side panel.

❷ Click on “Add a new User” link near bottom left of Privileges page.

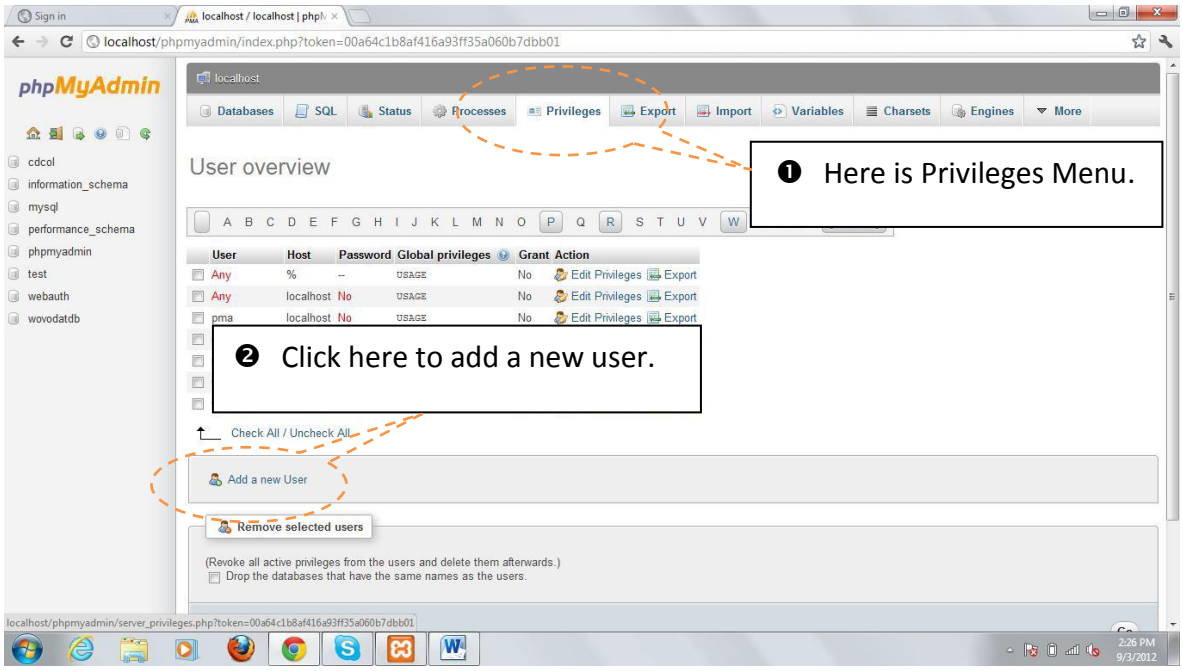

Figure 5. Create new account using phpMyAdmin GUI

Create login information and setting up privilege (see Figure 6)

- ❸ Choose the field category from the left hand side drop down box and then move the cursor to the right hand side and type fill in the fields.
- ❹ Click on 'none' radio button under "Database for user" section.
- ❺ Click on "Check All" beside Global Privileges to give all permissions for the "wovodatuser".
- ❻ There is no change under "Resource Limits" section.
- ❼ The last step is to click on "Create user" button to create the "wovodatuser" user account.

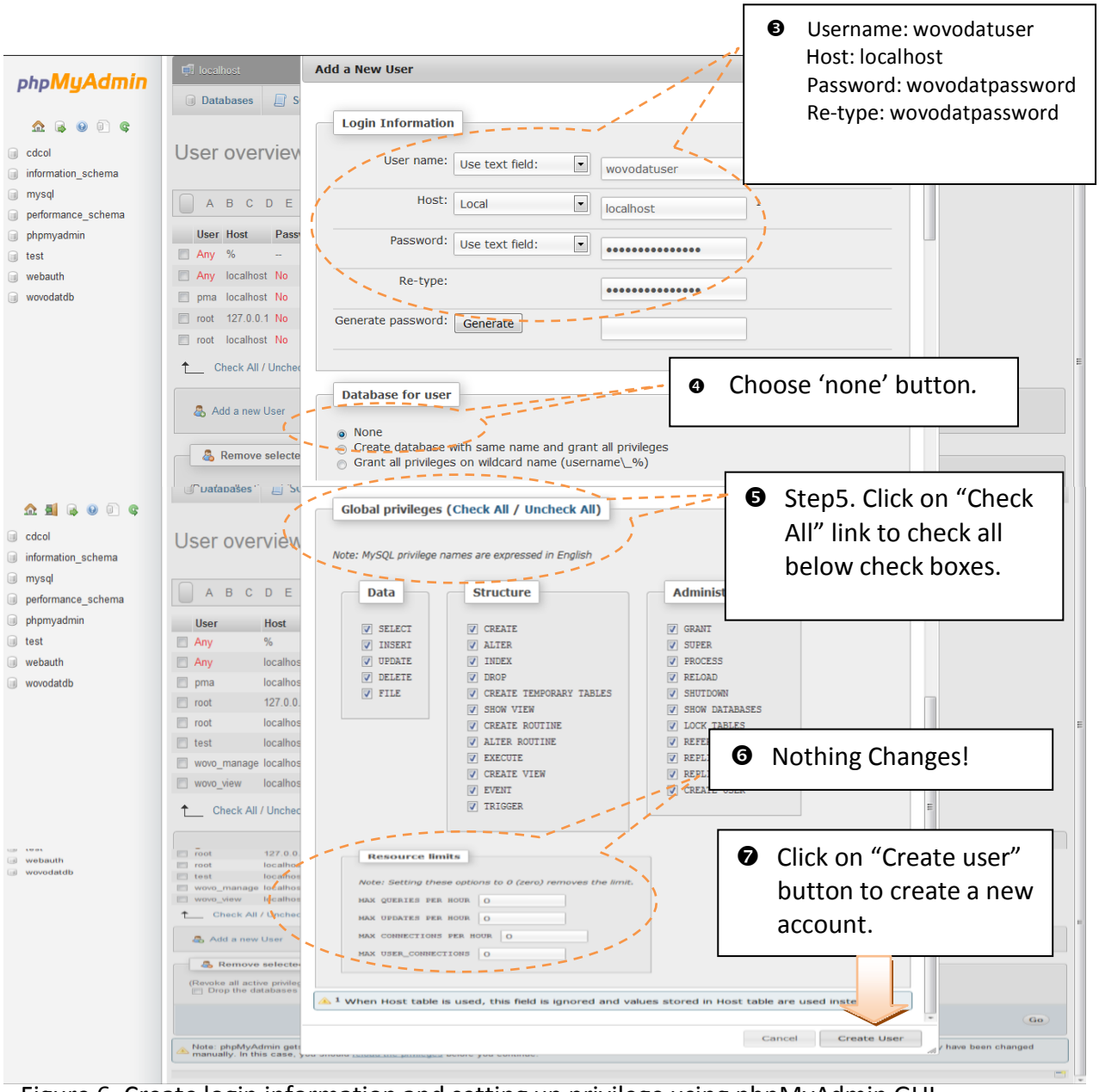

Figure 6. Create login information and setting up privilege using phpMyAdmin GUI

Configuration

After finish with the installation, the next step is to configure Apache2 and PHP5 for the WOVOdat website and the database.

- Configure the default site to **/home/wovodat/public_html/WOVOdat/**
  Edit *default* file using *vi* or other editor:

```
% sudo vi /etc/apache2/sites-available/default
      ⇨ Replace the path /var/www with
         /home/wovodat/public_html/WOVOdat/
```

- Refer to the sample default file below:

```
<VirtualHost *:80>
        ServerAdmin webmaster@localhost
        DocumentRoot /home /wovodat/public_html/WOVOdat
        <Directory />
                Options FollowSymLinks
                AllowOverride None
        </Directory>

       <Directory /home/wovodat/public_html/WOVOdat >
                Options Indexes FollowSymLinks MultiViews
                AllowOverride None
                Order allow,deny
                allow from all
        </Directory>

        <Directory /home/wovodat/public_html/WOVOdat/output>
                Options Indexes FollowSymLinks MultiViews
                AllowOverride None
                Order allow,deny
                allow from all
        </Directory>

        ScriptAlias  /cgi-bin/  /usr/lib/cgi-bin/
        <Directory  "/usr/lib/cgi-bin">
                AllowOverride None
                Options +ExecCGI -MultiViews +SymLinksIfOwnerMatch
                Order allow,deny
                Allow from all
        </Directory>

        ErrorLog /var/log/apache2/error.log

        # Possible values include: debug, info, notice, warn, error, crit,
        # alert, emerg.
        LogLevel warn

        CustomLog /var/log/apache2/access.log combined

       Alias /doc/ "/usr/share/doc/"
       <Directory "/usr/share/doc/">
            Options Indexes MultiViews FollowSymLinks
            AllowOverride None
            Order deny,allow
            Deny from all
            Allow from 127.0.0.0/255.0.0.0 ::1/128
        </Directory>
</VirtualHost>
```

- Change the mode of the "*/home/wovodat/*"

```
% sudo chmod 755 /home/wovodat -R
```

- Change the owner of the */home/wovodat/incoming* to "www-data".

```
% sudo chown -R www-data:root /home/wovodat/incoming
/home/wovodat/region /home/wovodat/public_html/WOVOdat/output

% sudo chown www-data:root /home/wovodat/login_history.txt
```

- Edit the *php.ini* to include */home/wovodat/PEAR*

```
% sudo vi /etc/php5/apache2filter/php.ini
 ⇨ Modify the include_path entry as following:
include_path = ".:/home/wovodat/PEAR:/usr/share/php"
```

- Restart Apache2

```
% sudo /etc/init.d/apache2 restart
```

- Using the web-browser and type in "http://localhost". The website should appear in your web browser.

For any inquiries and comments please contact WOVOdat developer team:
http://www.wovodat.org/populate/contact_us_form.php