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International Centre for Theoretical Physics

United Nations
Educational, Scientific and
Cultural Organization

IAEA
International Atomic Energy Agency

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Second Workshop on Open Source and the Internet for Building Global Scientific Communities with Emphasis on Environmental Monitoring and Distributed Instrumentation

28 November - 16 December, 2011

Rapid Application developments tools

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Canada

Development tools

Second Workshop on Open Source and the Internet for Building Global Scientific Communities

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Razaq Ijaduola

28 November - 16 December 2011

Rapid Application Development

- refers to a type of software development methodology which uses minimal planning in favor of rapid prototyping. The "planning" of software developed using RAD is interleaved with writing the software itself. The lack of extensive pre-planning generally allows software to be written much faster, and makes it easier to change requirements.
- Nowadays, in a broader generic sense the term and its acronym have come to be used to encompasses a variety of techniques aimed at speeding application development, such as the use of different types of software frameworks.

Need for RAD

- Requirements and business rules changes dynamically
- New application requirements emerge everyday.
- have the potential for providing a good framework for faster product development with improved code quality.
- etc

Benefit of RAD

- Promotes strong collaborative atmosphere and dynamic gathering of requirements. Business owner actively participates in prototyping, writing test cases and performing unit testing.
- Encourages using latest MVC(Model View Controller) frameworks.
- This is a way of separating an application into three components: the model, the view and the controller. It allows for clean separation of business logic(the controller), data(the model), and the formatting of data for display and user interraction(the view).
- The model manages the data, usually stored in a database. the model both retreives and inserts data into the database, and enforces any associated business rules.

Benefit of RAD

- The controller maps user input requests to a matching command or action. The action can be a method, which is able to interact with the model, perform required calculations, and pass the result to the view. Action controller is responsible for routing get and post requests to their corresponding action or method.
- The view is reponsible for displaying the data. A view should not contain complex processing logic. A view should only be responsible for formatting and display of the data variabes passed to it from the action. The view is actually the user interface. It could contain links that call other actions. Forms that are used to enter and update data are also displayed by the view. Actions are also able to process data entered into a form and submitted.

Virtualization

- Basically, it's software that allows an entire operating system (the "guest") to run on another OS (the "Host"), whether in a container window, or full-screen, or in what's sometimes called a "seamless" mode, where just one application is run from the "guest"

Virtualization

- Why would you want to run a virtual machine on your computer? Reasons:
- One is used to an operating sytem(OS), but need just an app or two from another OS running in their natural environments — Office or Photoshop in Windows, an arcade game for old time sake.
- There is a need to try out some new software, but would rather not have it affect the production system.
- You're intrigued at the idea of trying out a Linux desktop, but doesn't want to "partition" the hard disk.
- A developer who wants to build and test the software on a different OS.

Virtualization

- VirtualBox
- Vmware
- Qemu

Virtualization

- VMWare's Workstation offers more features and handles multiple virtual machines better.
- VMWare's player is free but limited in features.
- VirtualBox is relatively easy to set up, free to install, and works on all three major operating systems. There is an opensource edition.
- Qemu is both an emulator and a virtualizer

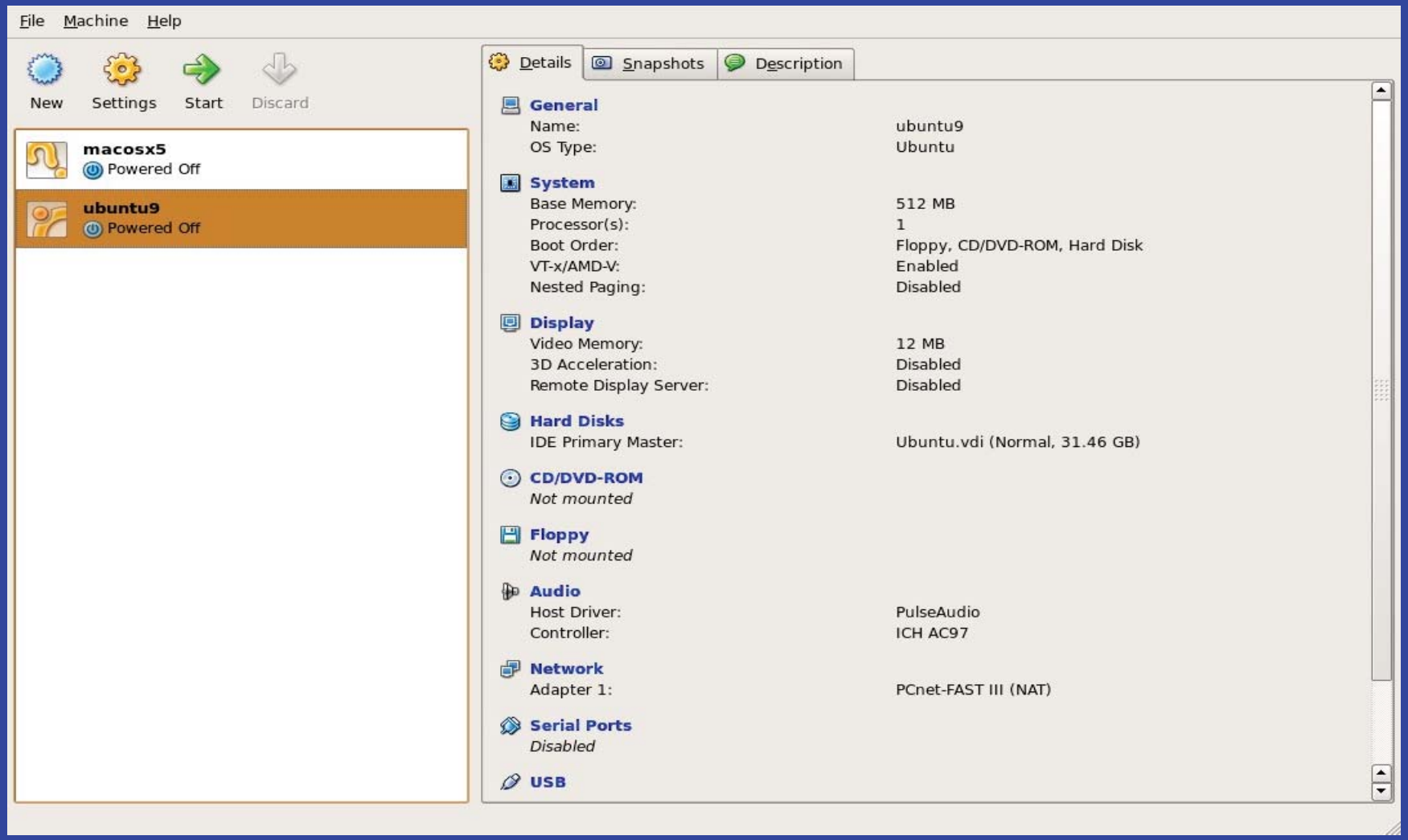
Qemu

- QEMU is a generic and open source machine emulator and virtualizer.
- When used as a machine emulator, QEMU can run OSes and programs made for one machine (e.g. an ARM board) on a different machine (e.g. your own PC). By using dynamic translation, it achieves very good performances.
- When used as a virtualizer, QEMU achieves near native performances by executing the guest code directly on the host CPU. A host driver called the QEMU accelerator (also known as KQEMU) is needed in this case. The virtualizer mode requires that both the host and guest machine use x86 compatible processors.

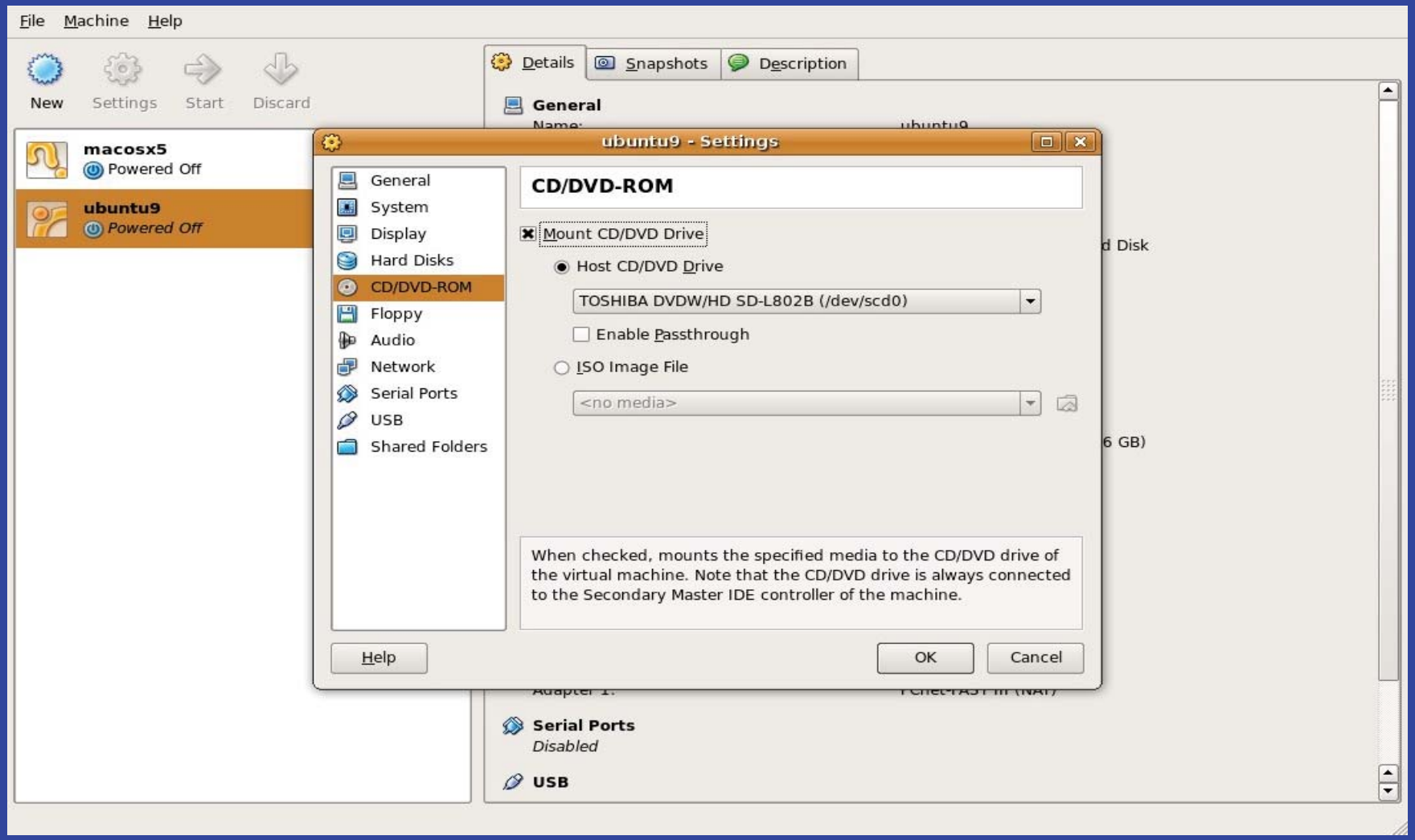
Qemu

- http://www.nongnu.org/qemu/

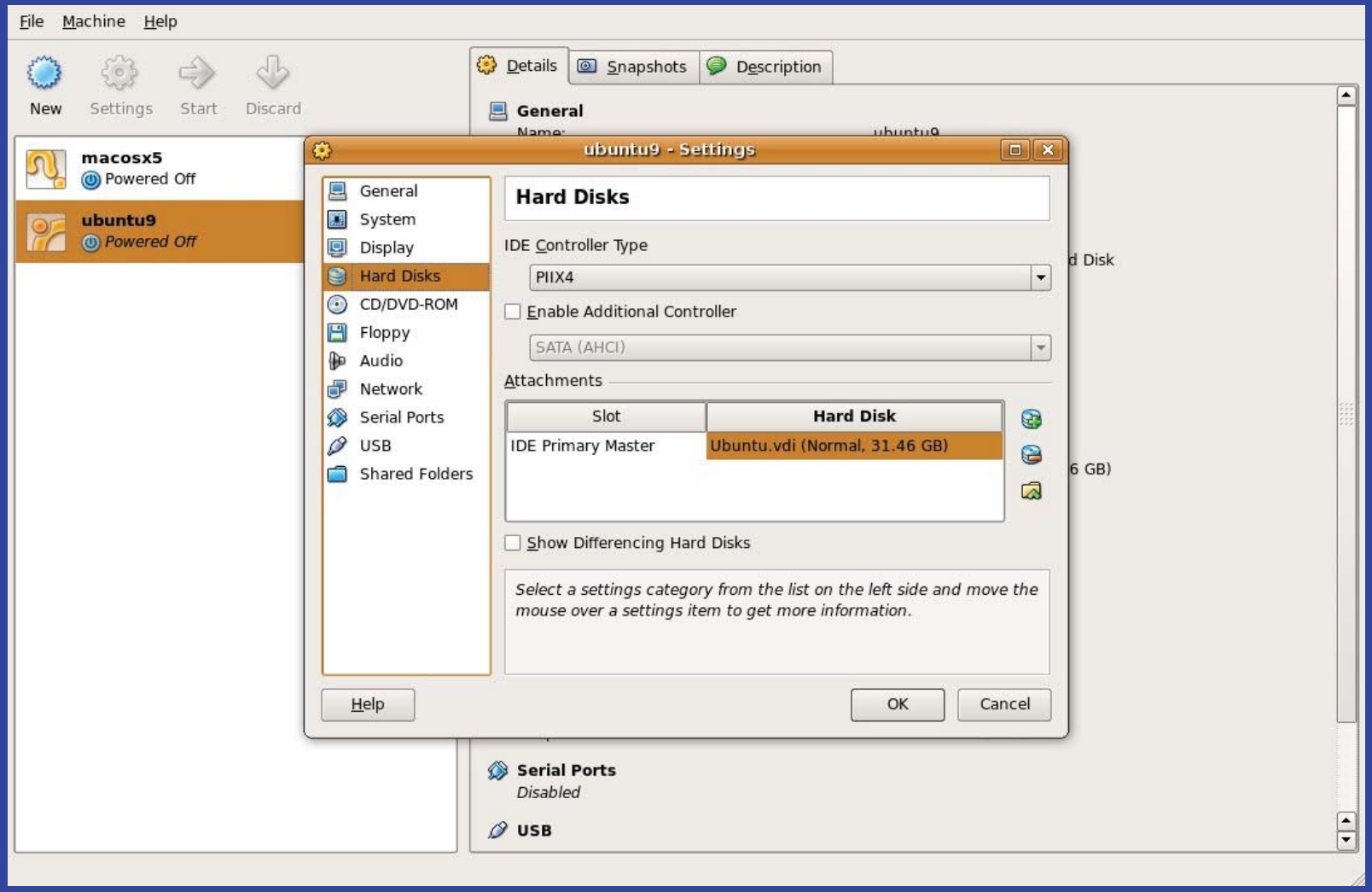
VirtualBox


File
Machine
Help
New
Settings
Start
Discard
macosx5
Powered Off
ubuntu9
Powered Off
Details
Snapshots
Description
General
Name: ubuntu9
OS Type: Ubuntu
System
Base Memory: 512 MB
Processor(s): 1
Boot Order: Floppy, CD/DVD-ROM, Hard Disk
VT-x/AMD-V: Enabled
Nested Paging: Disabled
Display
Video Memory: 12 MB
3D Acceleration: Disabled
Remote Display Server: Disabled
Hard Disks
IDE Primary Master: Ubuntu.vdi (Normal, 31.46 GB)
CD/DVD-ROM
Not mounted
Floppy
Not mounted
Audio
Host Driver: PulseAudio
Controller: ICH AC97
Network
Adapter 1: PCnet-FAST III (NAT)
Serial Ports
Disabled
USB

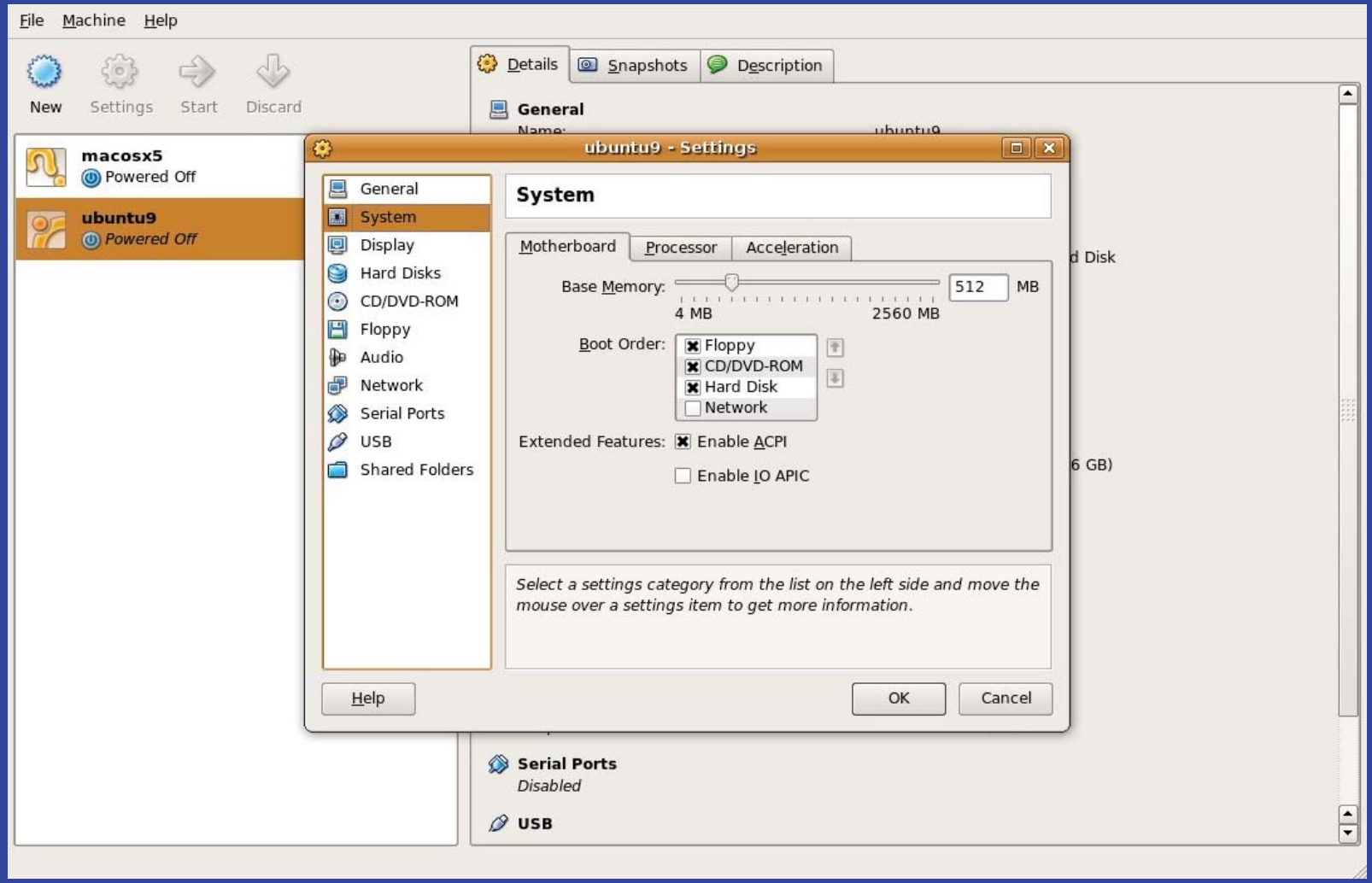
VirtualBox


File Machine Help
New Settings Start Discard
macosx5
Powered Off
ubuntu9
Powered Off
Details Snapshots Description
General
ubuntu9 - Settings
General
System
Display
Hard Disks
CD/DVD-ROM
Floppy
Audio
Network
Serial Ports
USB
Shared Folders
CD/DVD-ROM
Mount CD/DVD Drive
Host CD/DVD Drive
TOSHIBA DVDW/HD SD-L802B (/dev/scd0)
Enable Passthrough
ISO Image File
<no media>
When checked, mounts the specified media to the CD/DVD drive of the virtual machine. Note that the CD/DVD drive is always connected to the Secondary Master IDE controller of the machine.
Help
OK
Cancel
Serial Ports
Disabled
USB

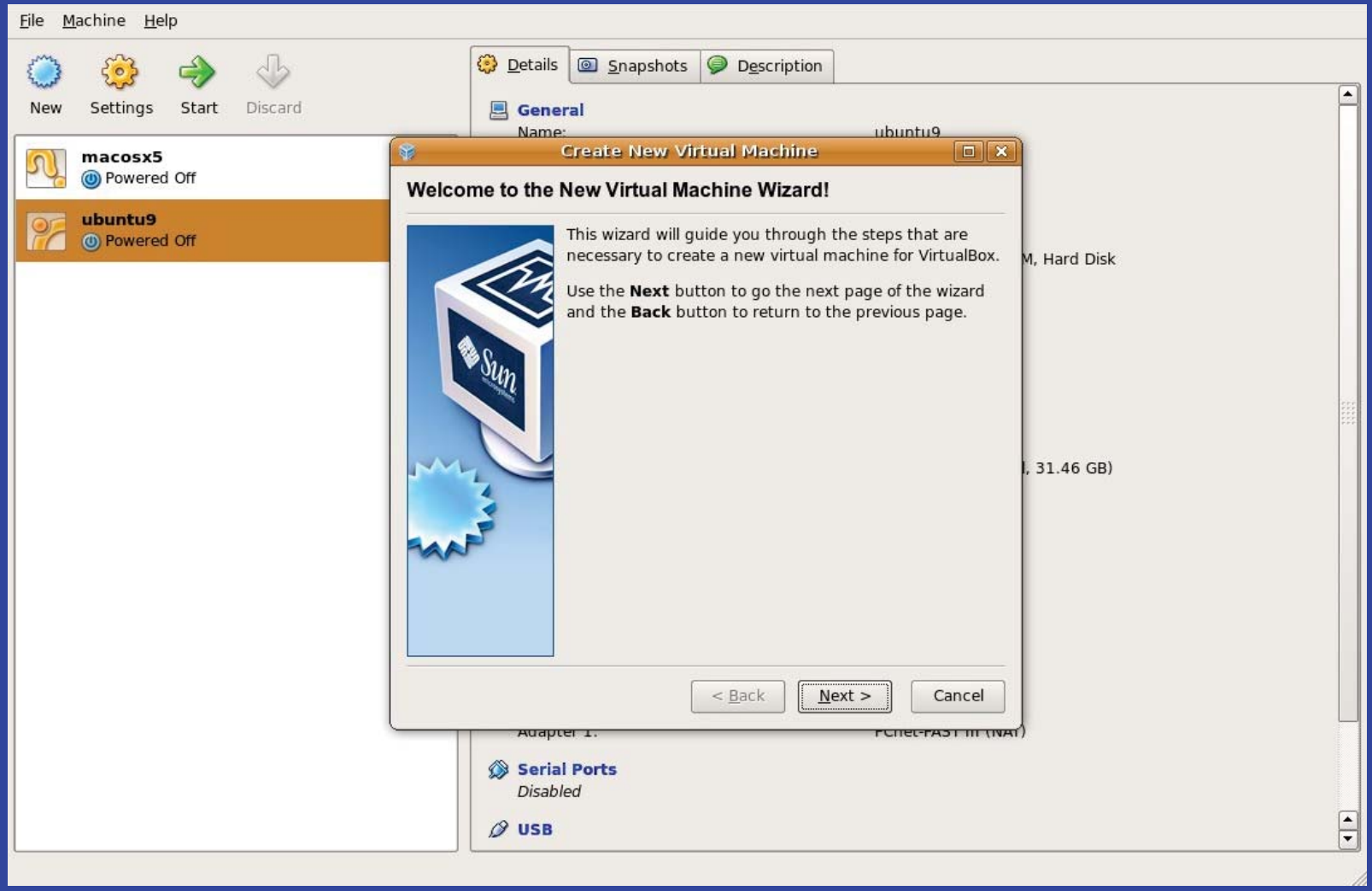
VirtualBox


File Machine Help
New Settings Start Discard
macosx5
Powered Off
ubuntu9
Powered Off
Details Snapshots Description
General
ubuntu9 - Settings
General
System
Display
Hard Disks
CD/DVD-ROM
Floppy
Audio
Network
Serial Ports
USB
Shared Folders
Hard Disks
IDE Controller Type
PIIX4
Enable Additional Controller
SATA (AHCI)
Attachments
Slot
Hard Disk
IDE Primary Master
Ubuntu.vdi (Normal, 31.46 GB)
Show Differencing Hard Disks
Select a settings category from the list on the left side and move the mouse over a settings item to get more information.
Help
OK
Cancel
Serial Ports
Disabled
USB

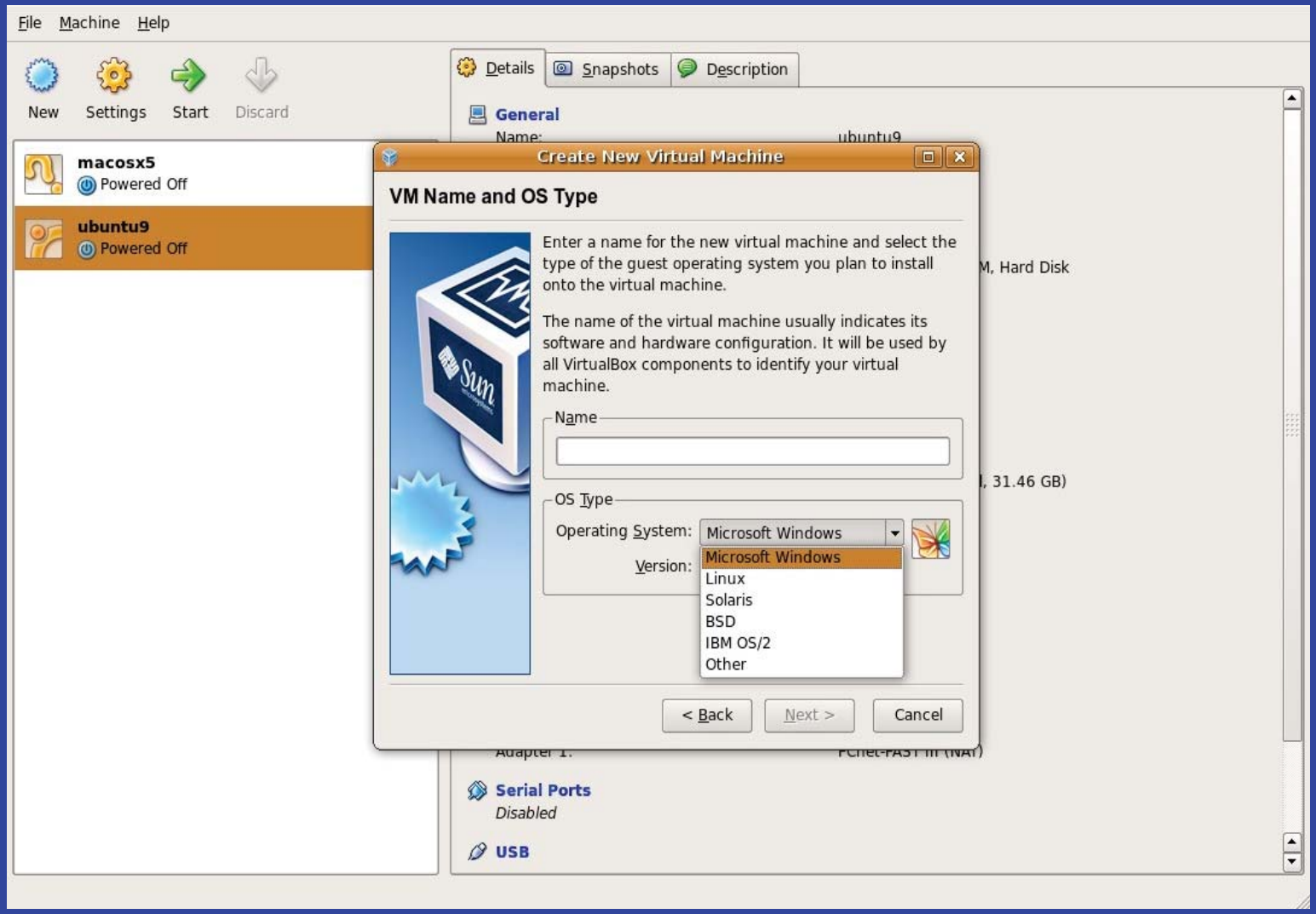
VirtualBox


File Machine Help
New Settings Start Discard
macosx5
Powered Off
ubuntu9
Powered Off
Details Snapshots Description
General
ubuntu9 - Settings
General
System
Display
Hard Disks
CD/DVD-ROM
Floppy
Audio
Network
Serial Ports
USB
Shared Folders
System
Motherboard Processor Acceleration
Base Memory: 512 MB
4 MB 2560 MB
Boot Order: Floppy CD/DVD-ROM Hard Disk Network
Extended Features: Enable ACPI
Enable IO APIC
Select a settings category from the list on the left side and move the mouse over a settings item to get more information.
Help OK Cancel
Serial Ports
Disabled
USB

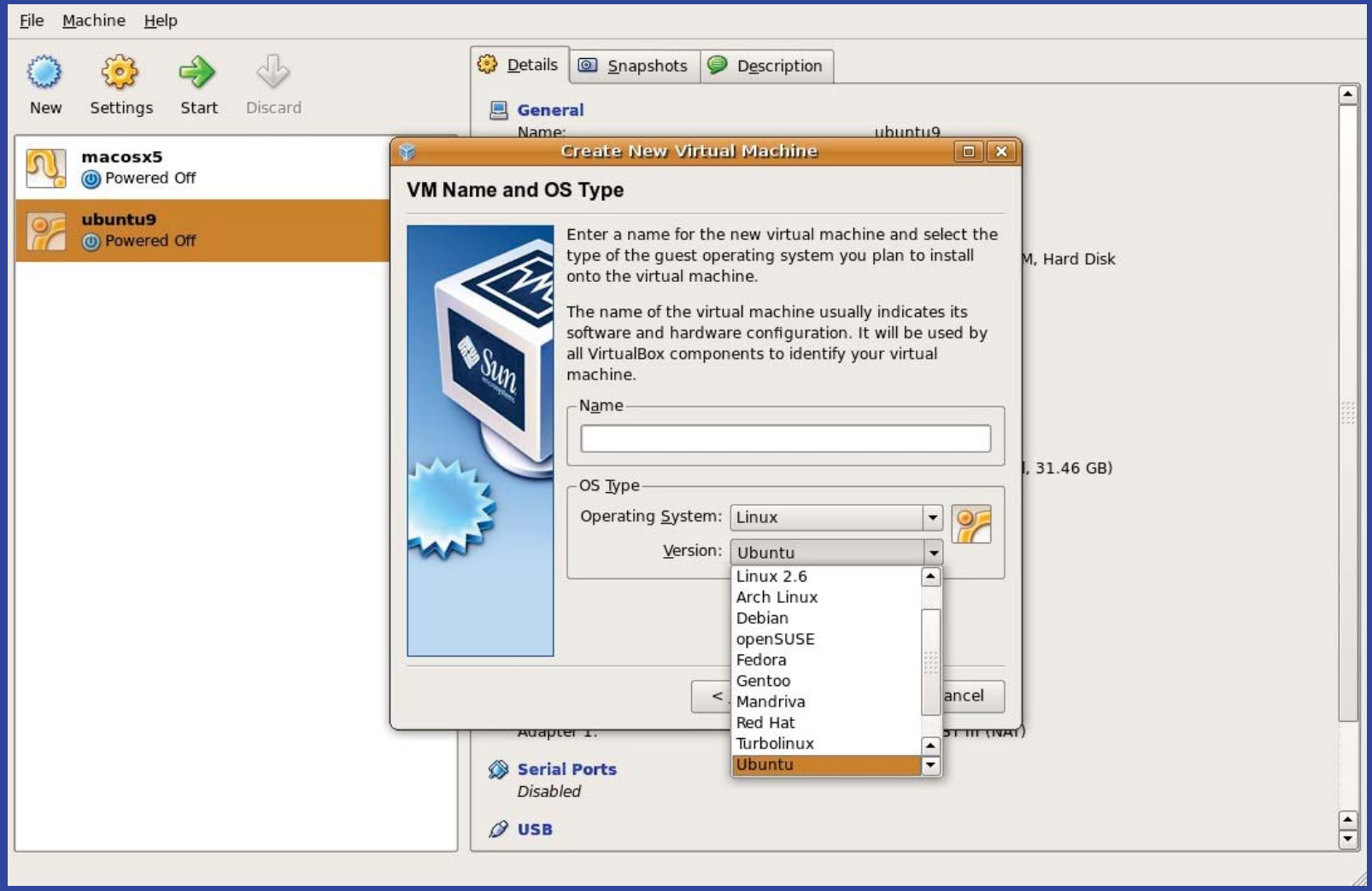
VirtualBox


File
Machine
Help
New
Settings
Start
Discard
macosx5
Powered Off
ubuntu9
Powered Off
Details
Snapshots
Description
General
Name:
ubuntu9
Create New Virtual Machine
Welcome to the New Virtual Machine Wizard!
This wizard will guide you through the steps that are necessary to create a new virtual machine for VirtualBox.
Use the Next button to go the next page of the wizard and the Back button to return to the previous page.
< Back
Next >
Cancel
Serial Ports
Disabled
USB

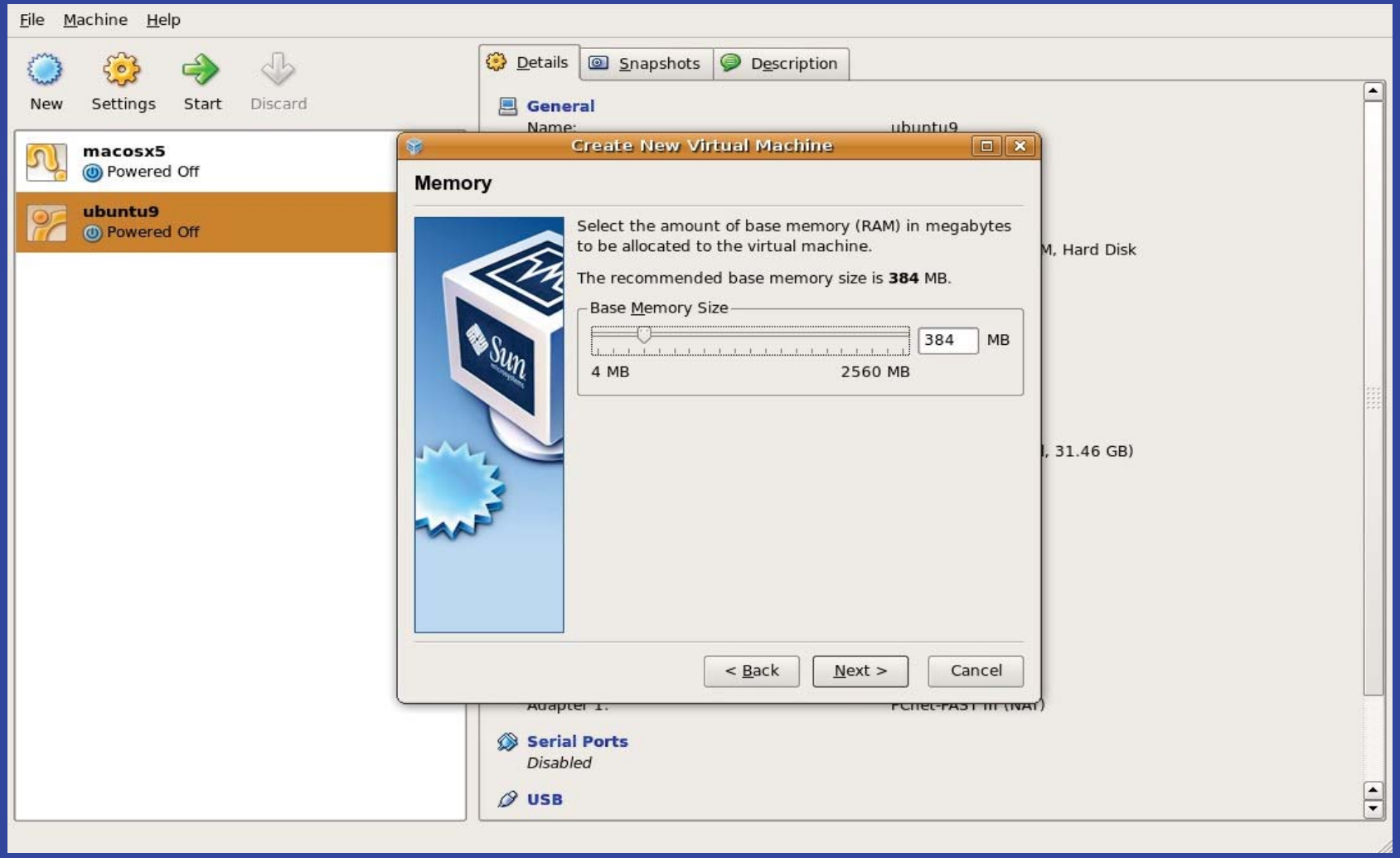
VirtualBox


File Machine Help
New
Settings
Start
Discard
macosx5
Powered Off
ubuntu9
Powered Off
Details
Snapshots
Description
General
Name:
ubuntu9
Create New Virtual Machine
VM Name and OS Type
Enter a name for the new virtual machine and select the type of the guest operating system you plan to install onto the virtual machine.
The name of the virtual machine usually indicates its software and hardware configuration. It will be used by all VirtualBox components to identify your virtual machine.
Name
OS Type
Operating System:
Microsoft Windows
Version:
Microsoft Windows
Linux
Solaris
BSD
IBM OS/2
Other
< Back
Next >
Cancel
Serial Ports
Disabled
USB

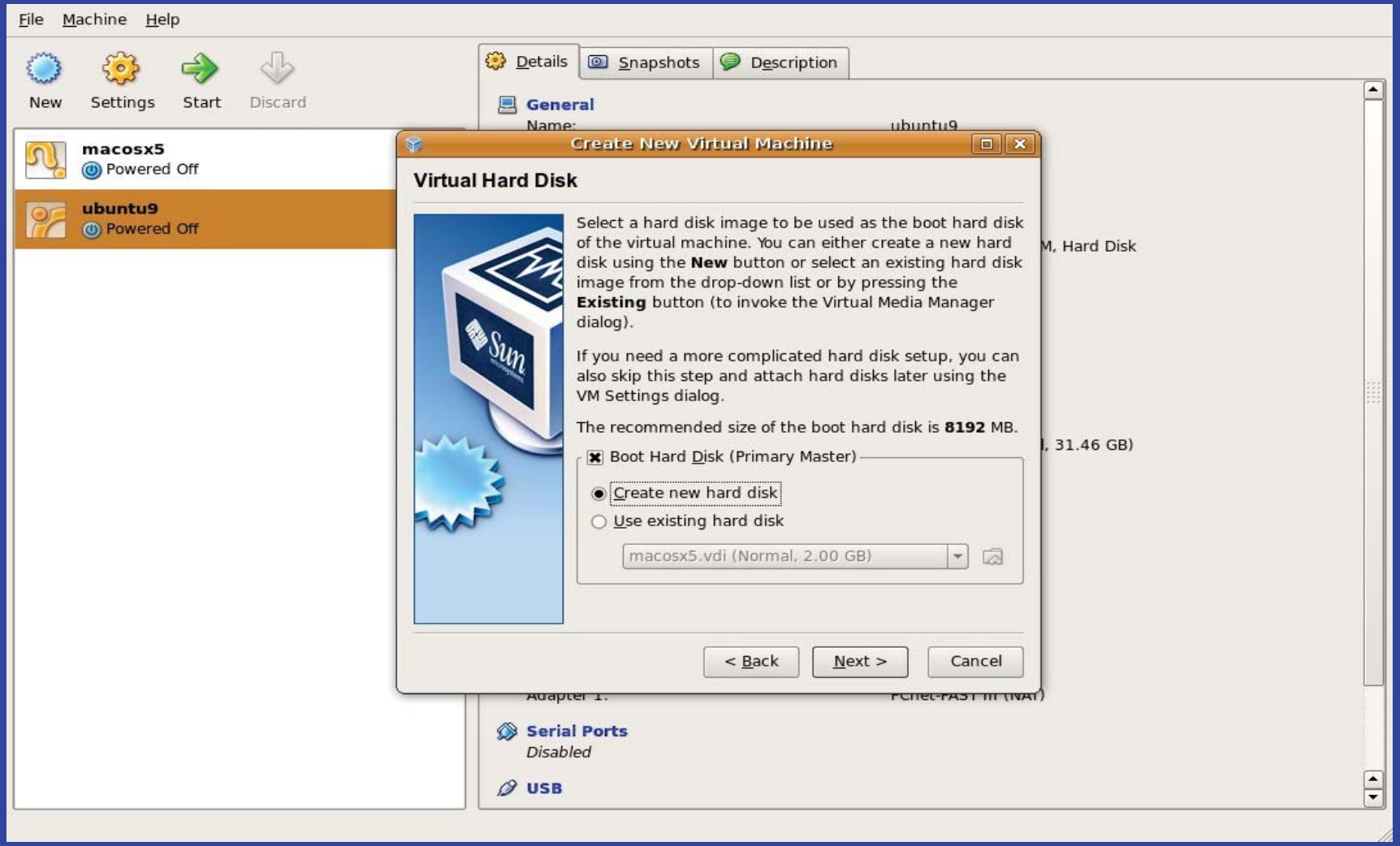
VirtualBox


File Machine Help
New
Settings
Start
Discard
macosx5
Powered Off
ubuntu9
Powered Off
Details
Snapshots
Description
General
Name:
ubuntu9
Create New Virtual Machine
VM Name and OS Type
Enter a name for the new virtual machine and select the type of the guest operating system you plan to install onto the virtual machine.
The name of the virtual machine usually indicates its software and hardware configuration. It will be used by all VirtualBox components to identify your virtual machine.
Name
OS Type
Operating System:
Linux
Version:
Ubuntu
Linux 2.6
Arch Linux
Debian
openSUSE
Fedora
Gentoo
Mandriva
Red Hat
Turbolinux
Ubuntu
Serial Ports
Disabled
USB

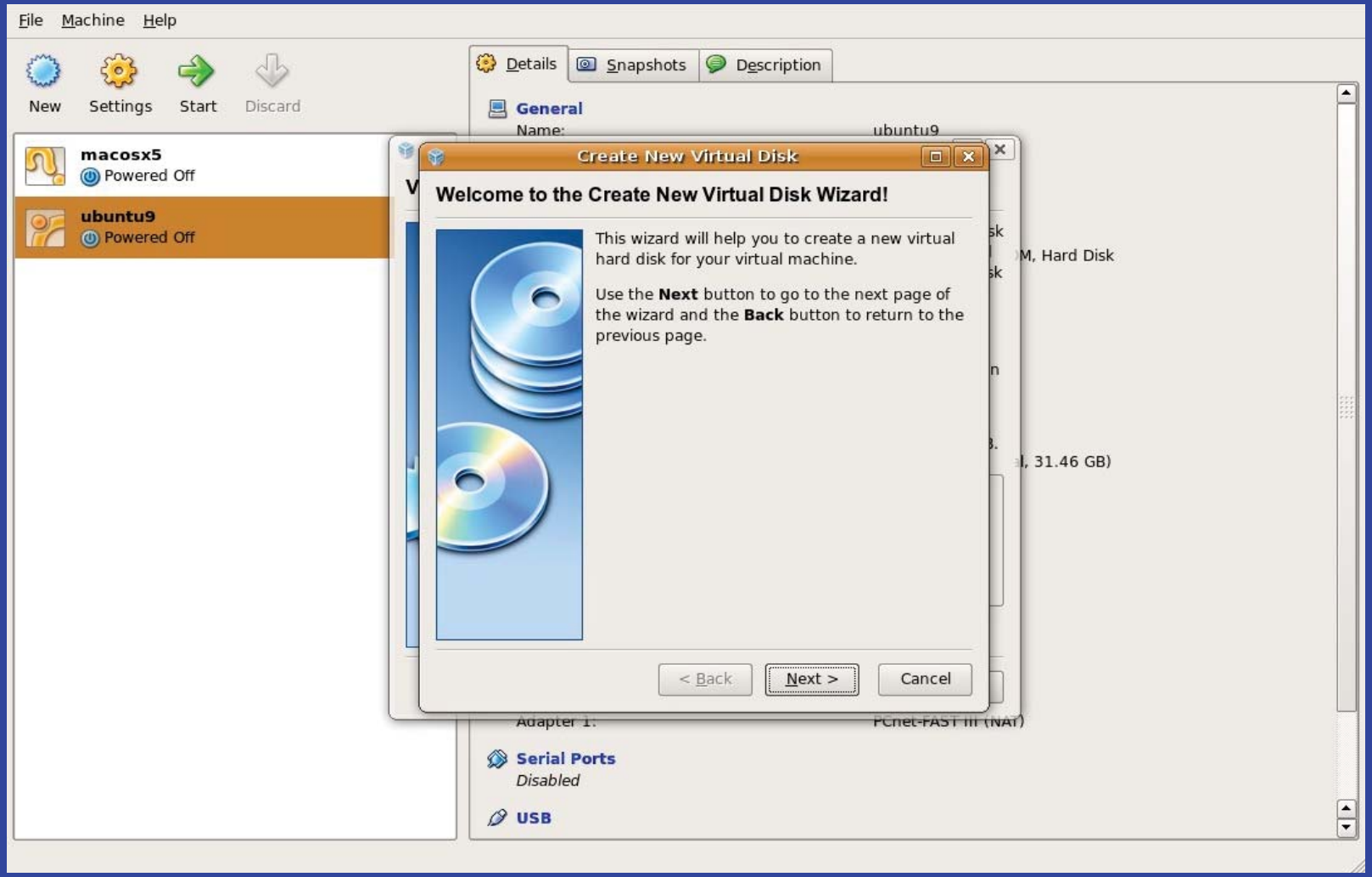
VirtualBox


File Machine Help
New
Settings
Start
Discard
macosx5
Powered Off
ubuntu9
Powered Off
Details
Snapshots
Description
General
Name:
ubuntu9
Create New Virtual Machine
Memory
Select the amount of base memory (RAM) in megabytes to be allocated to the virtual machine.
The recommended base memory size is 384 MB.
Base Memory Size
384
MB
4 MB
2560 MB
< Back
Next >
Cancel
Serial Ports
Disabled
USB

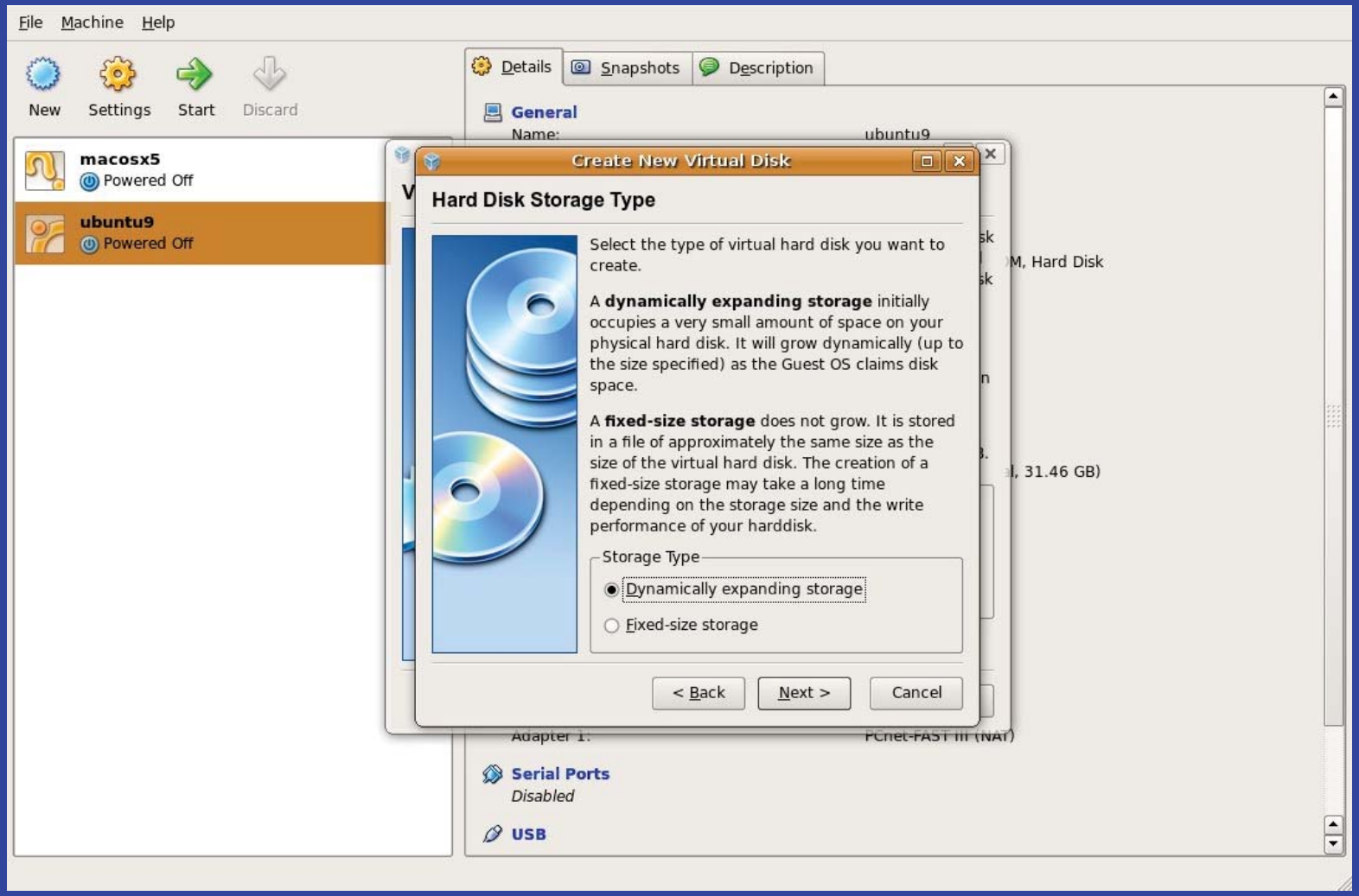
VirtualBox


File Machine Help
New
Settings
Start
Discard
macosx5
Powered Off
ubuntu9
Powered Off
Details
Snapshots
Description
General
Name:
ubuntu9
Create New Virtual Machine
Virtual Hard Disk
Select a hard disk image to be used as the boot hard disk of the virtual machine. You can either create a new hard disk using the New button or select an existing hard disk image from the drop-down list or by pressing the Existing button (to invoke the Virtual Media Manager dialog).
If you need a more complicated hard disk setup, you can also skip this step and attach hard disks later using the VM Settings dialog.
The recommended size of the boot hard disk is 8192 MB.
Boot Hard Disk (Primary Master)
Create new hard disk
Use existing hard disk
macosx5.vdi (Normal, 2.00 GB)
< Back
Next >
Cancel
Serial Ports
Disabled
USB

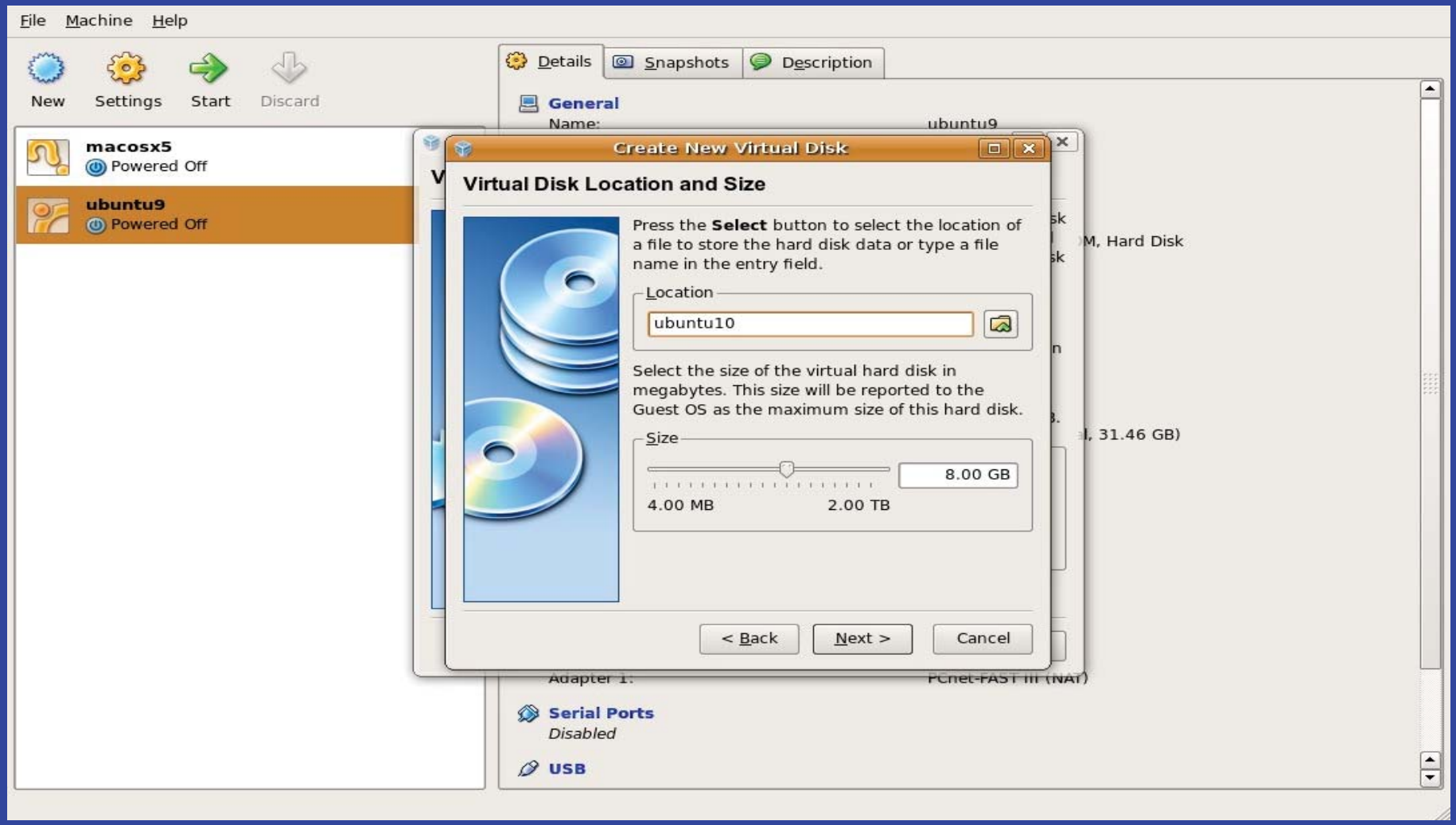
VirtualBox


File Machine Help
New
Settings
Start
Discard
macosx5
Powered Off
ubuntu9
Powered Off
Details
Snapshots
Description
General
Name:
ubuntu9
Create New Virtual Disk
Welcome to the Create New Virtual Disk Wizard!
This wizard will help you to create a new virtual hard disk for your virtual machine.
Use the Next button to go to the next page of the wizard and the Back button to return to the previous page.
< Back
Next >
Cancel
Serial Ports
Disabled
USB

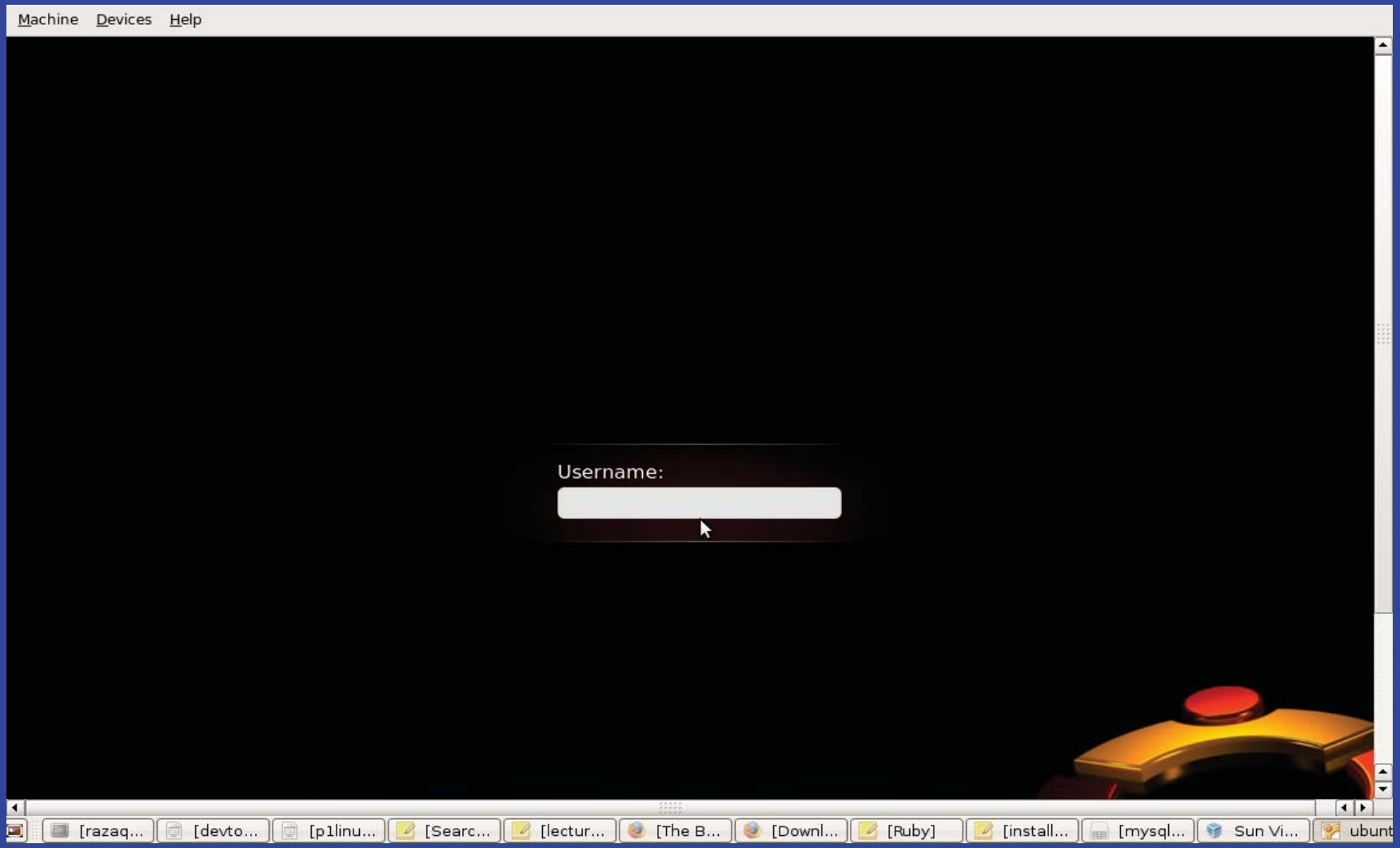
VirtualBox


File Machine Help
New
Settings
Start
Discard
macosx5
Powered Off
ubuntu9
Powered Off
Details
Snapshots
Description
General
Name:
ubuntu9
Create New Virtual Disk
Hard Disk Storage Type
Select the type of virtual hard disk you want to create.
A dynamically expanding storage initially occupies a very small amount of space on your physical hard disk. It will grow dynamically (up to the size specified) as the Guest OS claims disk space.
A fixed-size storage does not grow. It is stored in a file of approximately the same size as the size of the virtual hard disk. The creation of a fixed-size storage may take a long time depending on the storage size and the write performance of your harddisk.
Storage Type
Dynamically expanding storage
Fixed-size storage
< Back
Next >
Cancel
Serial Ports
Disabled
USB

VirtualBox


File Machine Help
New
Settings
Start
Discard
macosx5
Powered Off
ubuntu9
Powered Off
Details
Snapshots
Description
General
Name:
ubuntu9
Create New Virtual Disk
Virtual Disk Location and Size
Press the Select button to select the location of a file to store the hard disk data or type a file name in the entry field.
Location
ubuntu10
Select the size of the virtual hard disk in megabytes. This size will be reported to the Guest OS as the maximum size of this hard disk.
Size
8.00 GB
4.00 MB
2.00 TB
< Back
Next >
Cancel
Serial Ports
Disabled
USB

VirtualBox


Machine
Devices
Help
Username:
[razaq...
[devto...
[p1linu...
[Searc...
[lectur...
[The B...
[Downl...
[Ruby]
[install...
[mysql...
Sun Vi...
ubunt

Web development tools

- XAMPP is an Apache distribution with MySQL and PHP
- Symfony is a full-stack framework, a library of cohesive classes written in PHP
- Django is an open source web application framework, written in Python, which loosely follows the model-view-controller design pattern
- CakePHP is a RAD development framework using the PHP development language.
- Zend framework.
- Yii is a high-performance PHP framework.
- YUI – Yahoo user interface a javascript framework
- Jquery – javascript framework.

XAMPP

- Taken from the site:

  XAMPP is an easy to install Apache distribution containing :

  Apache, MySQL, PHP & PEAR, Perl, ProFTPD, phpMyAdmin, OpenSSL, GD, Freetype2, libjpeg, libpng, gdbm, zlib, expat, Sablotron, libxml, Ming, Webalizer, pdf class, ncurses, mod_perl, FreeTDS, gettext, mcrypt, mhash, eAccelerator, SQLite and IMAP C-Client.
- To install and use - just download, extract and start.
- http://www.apachefriends.org/en/xampp.html
- http://www.apachefriends.org/en/xampp-linux.html

XAMPP

XAMPP is a compilation of free software (comparable to a Linux distribution), it's free of charge and it's free to copy under the terms of the GNU General Public License. But it is only the compilation of XAMPP that is published under GPL.

-

XAMPP

- The default configuration is not good from a securtiy point of view and it's not secure enough for a production environment . So it is meant for development only.
- Since LAMPP 0.9.5 one can make it secure by using /opt/lampp/lampp security
- After downloading it can be extracted into /opt as sudo.
- XAMPP is now installed below the /opt/lampp directory.
- To start XAMPP one need to use:

  /opt/lampp/lampp start

XAMPP

The list of missing security in XAMPP:

- The MySQL administrator (root) has no password.
- The MySQL daemon is accessible via network.
- ProFTPD uses the password "lampp" for user "nobody".
- PhpMyAdmin is accessible via network.
- Examples are accessible via network.
- MySQL and Apache running under the same user (nobody).

XAMPP

To fix most of the security weaknesses simply use the following command:

/opt/lampp/lampp security

- Advanced start and stop parameters
  - Parameter Description
  - start Starts XAMPP.
  - stop Stops XAMPP.
  - restart Stops and starts XAMPP.
  - startapache Starts only the Apache.

XAMPP

- startssl Starts the Apache SSL support. This command activates the SSL support permanently, e.g. if you restarts XAMPP in the future SSL will stay activated.
- startmysql Starts only the MySQL database.
- startftp Starts the ProFTPD server. Via FTP you can upload files for your web server (user "nobody", password "lampp"). This command activates the ProFTPD permanently, e.g. if you restarts XAMPP in the future FTP will stay activated.
- stopapache Stops the Apache.
- stopssl Stops the Apache SSL support. This command deactivates the SSL support permanently, e.g. if you restarts XAMPP in the future SSL will stay deactivated.

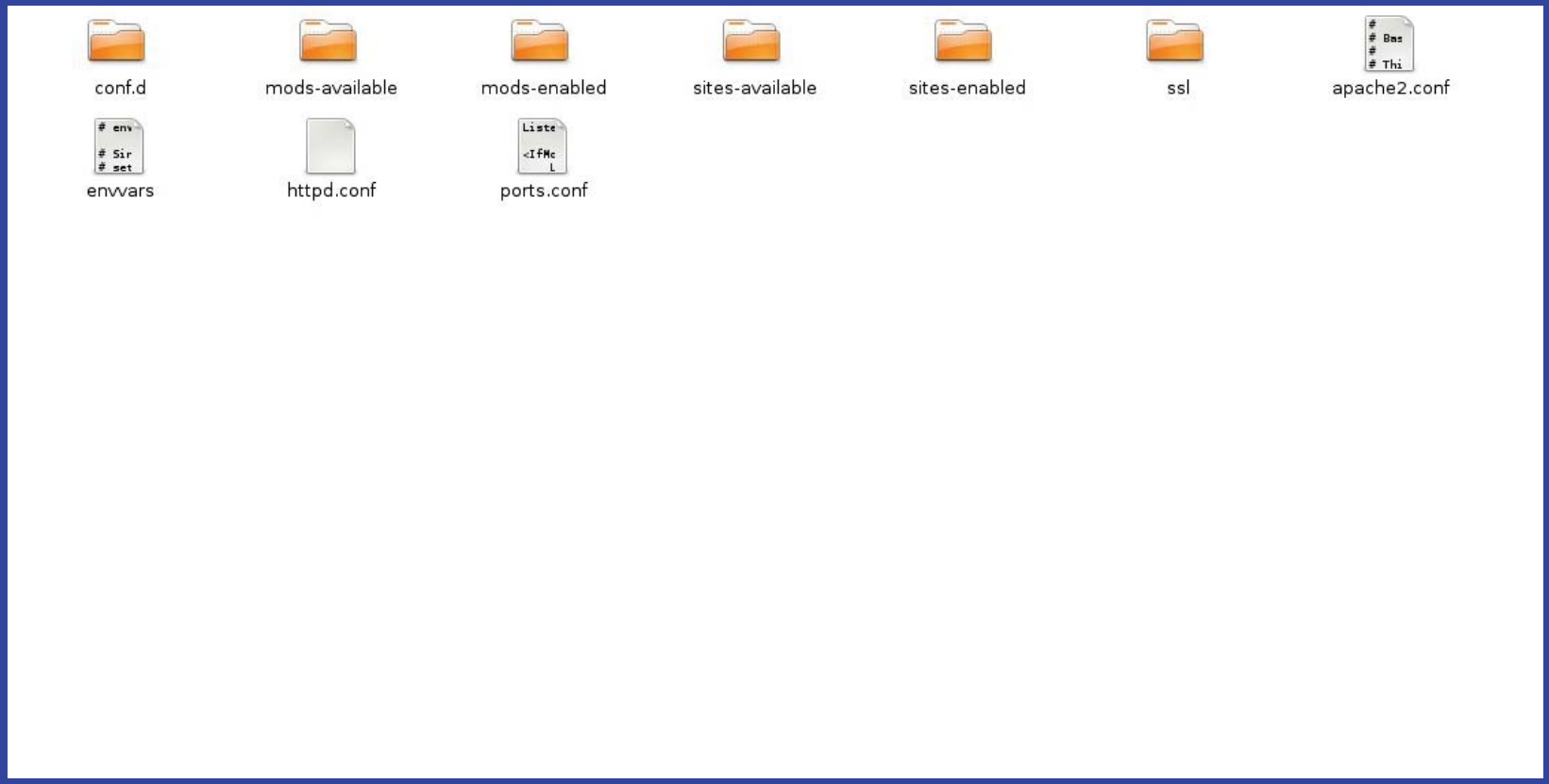
XAMPP

- stopmysql Stops the MySQL database.
- stopftp Stops the ProFTPD server. This command deactivates the ProFTPD permanently, e.g. if you restarts XAMPP in the future FTP will stay deactivated.
- security Starts a small security check programm.
- For example: To start Apache with SSL support simply type in the following command (as root):

  /opt/lampp/lampp startssl
- To uninstall XAMPP just type in this command:

  sudo rm -rf /opt/lampp

Apache

- Apache is the most popular HTTP Server
- 

Apache

- sites-available where all the enabled site configurations area
- httpd.conf apache main configuration file
- ports.conf configuration for the ports
- Sites-enabled links to available sites

Apache

Example ports.conf

```
Listen 80
<IfModule mod_ssl.c>
    Listen 443
</IfModule>
```

Apache

Example

```
NameVirtualHost *
<VirtualHost *>
        ServerAdmin webmaster@localhost
        DocumentRoot /var/www/
        <Directory />
                Options FollowSymLinks
                AllowOverride None
        </Directory>
        <Directory /var/www/>
                Options Indexes FollowSymLinks MultiViews
                AllowOverride None
                Order allow,deny
                allow from all
        </Directory>
```

Apache

```
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
ServerSignature On
    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>
```

Apache

- To enable a site one can use

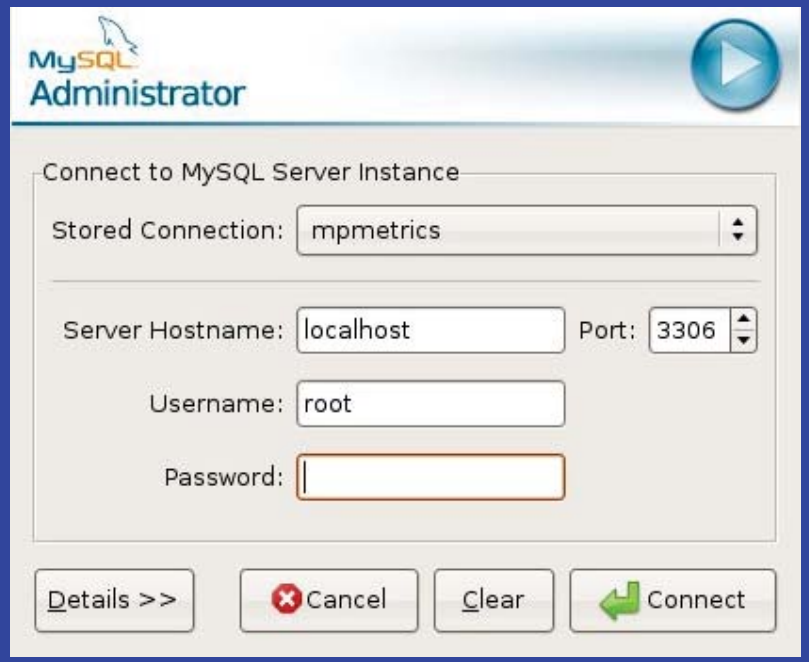
  sudo a2ensite [site]

  where site is the one setup in site-available.

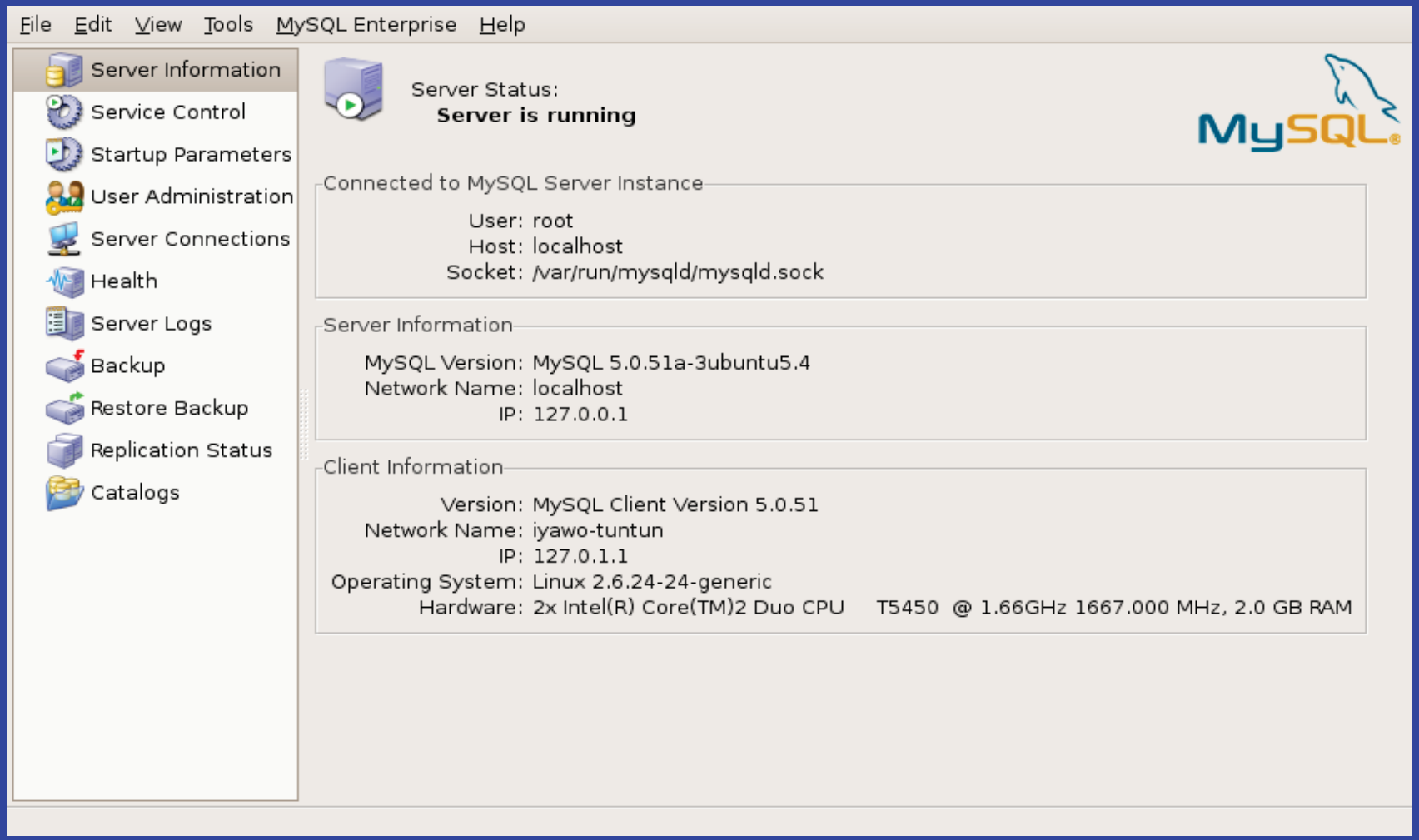
MySQL Administrator

- MySQL is a relational database management system (RDBMS)
- MySQL Administrator is a convinient tool for configuring, starting and stopping a MySQL server, managing users and database connections and a number of other tasks.

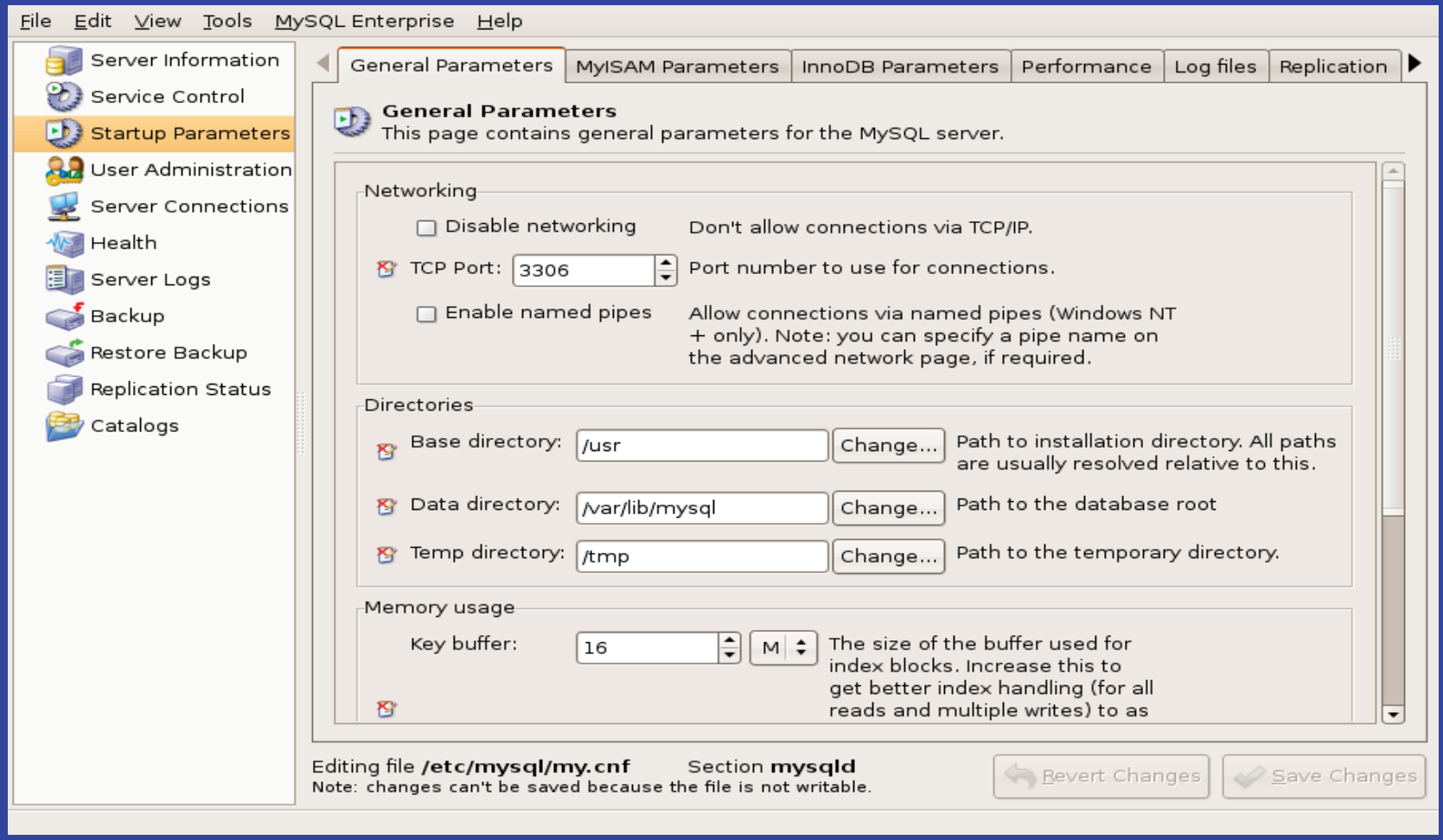
MySQL Administrator



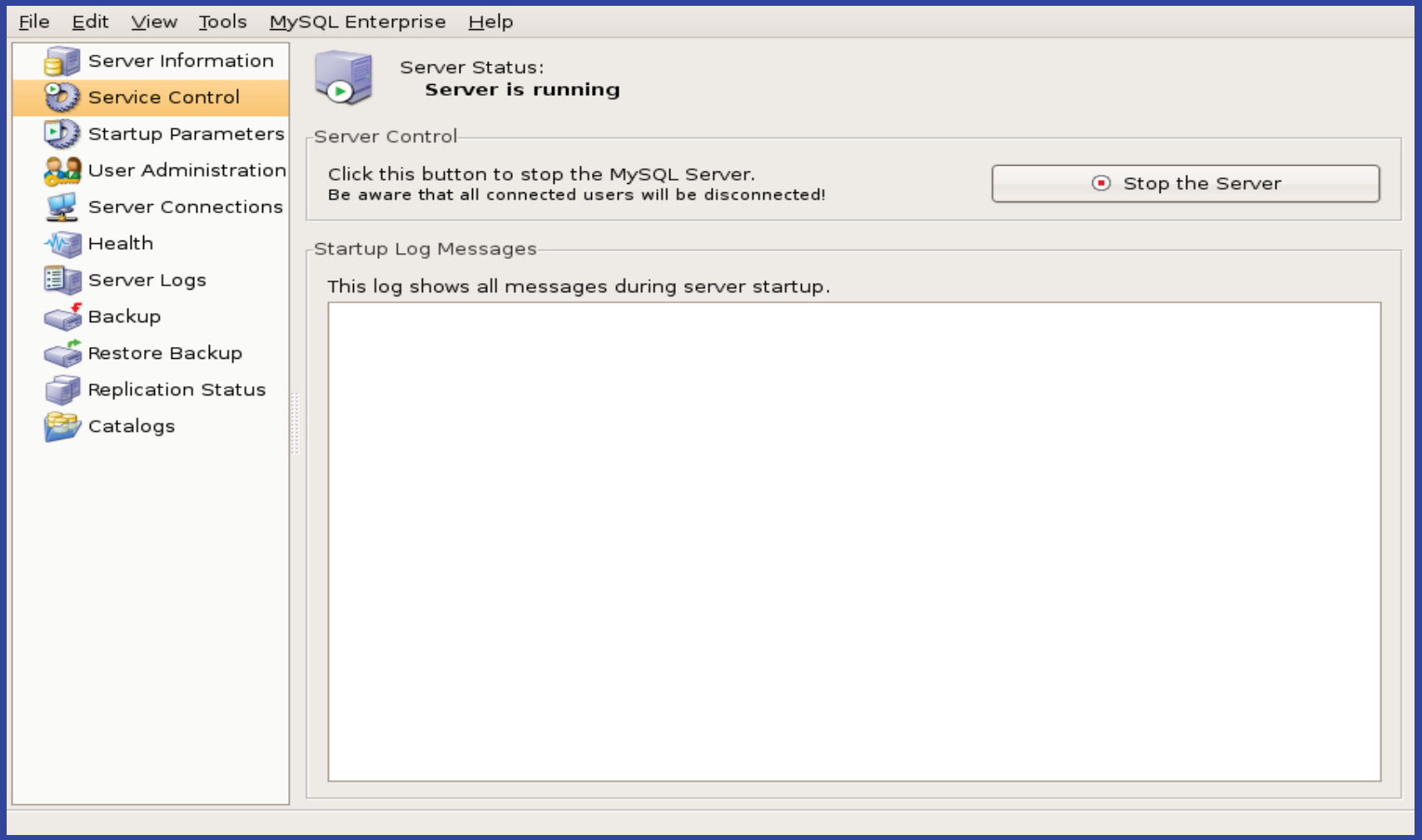
MySQL Administrator



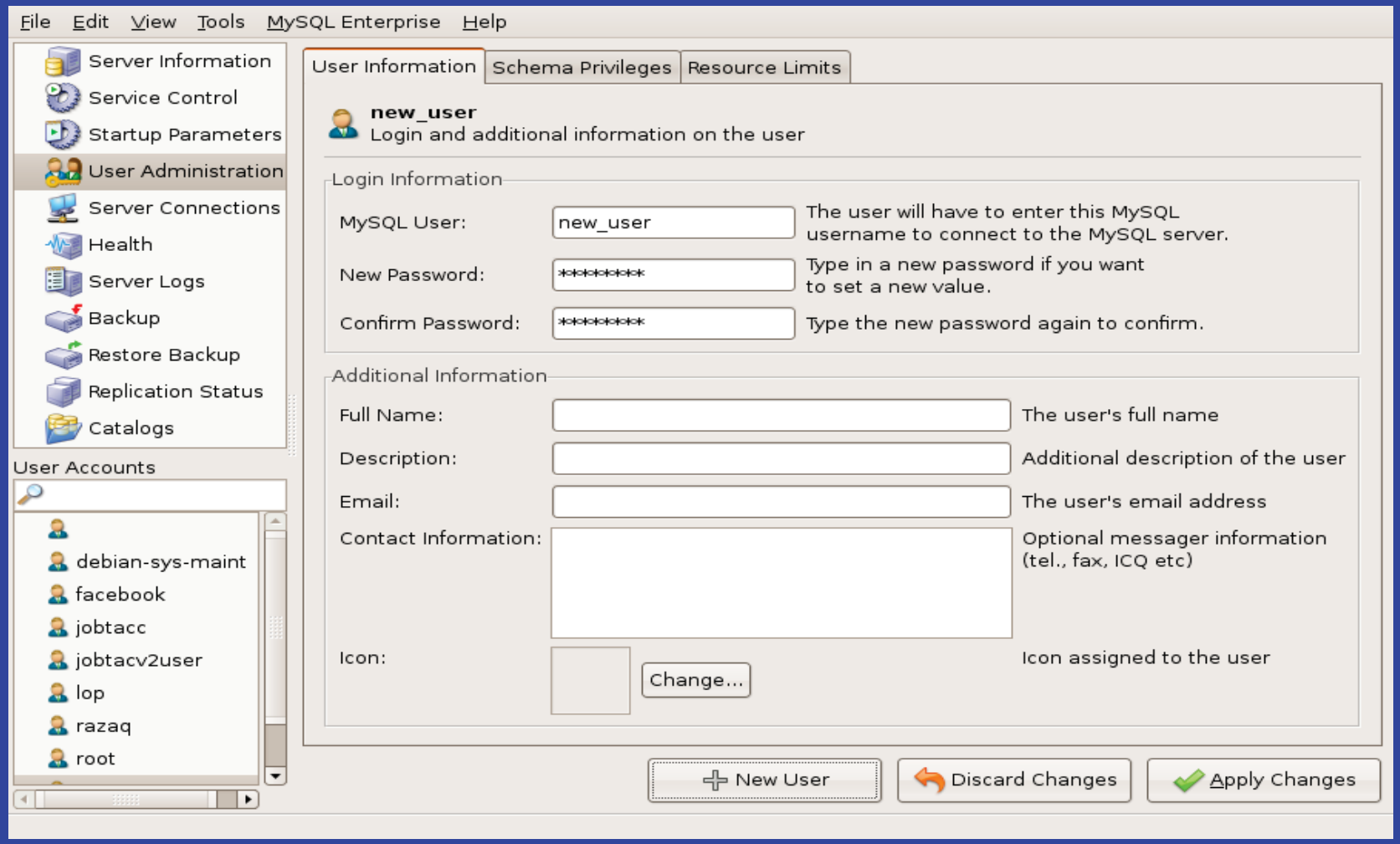
MySQL Administrator



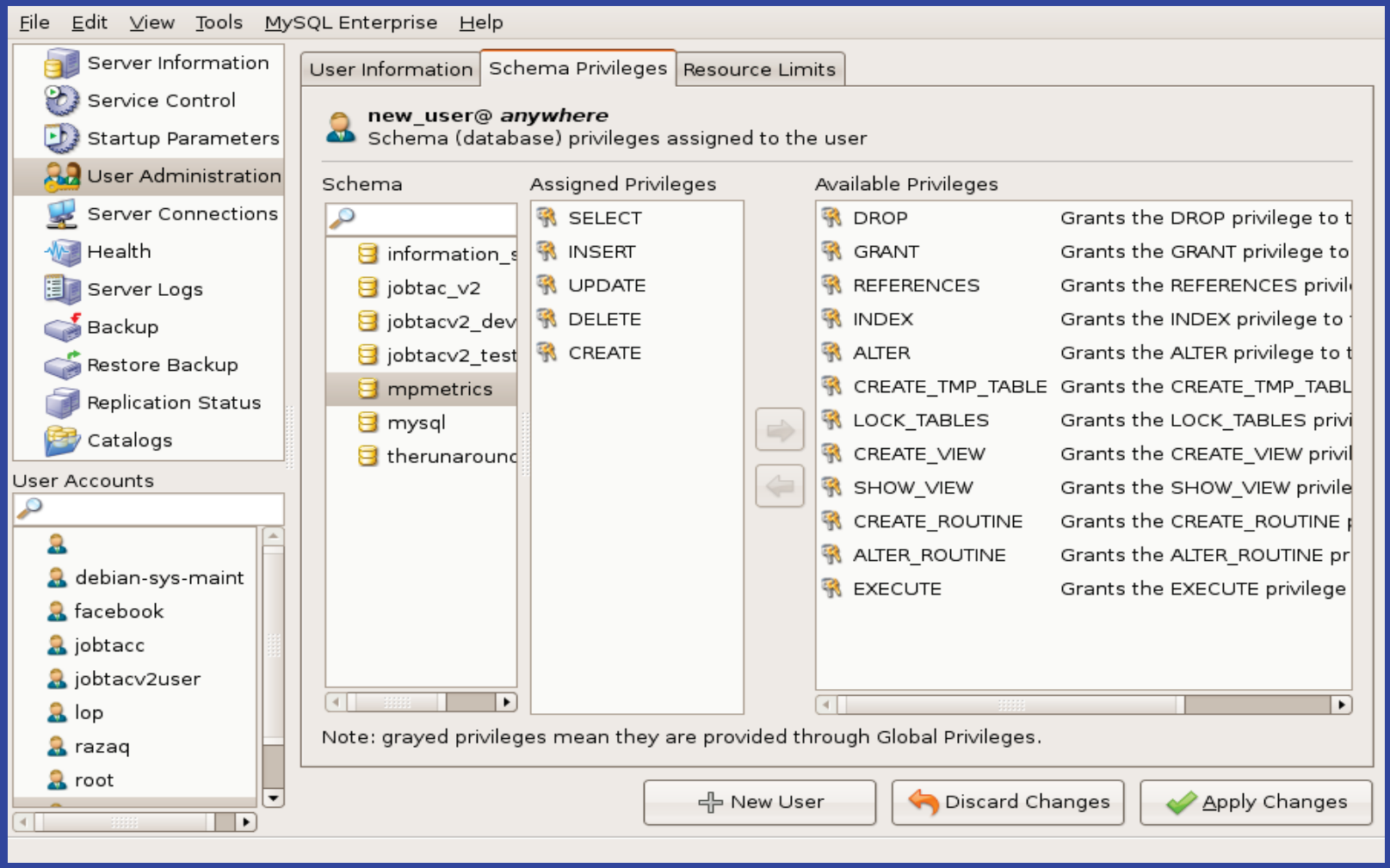
MySQL Administrator



MySQL Administrator



MySQL Administrator

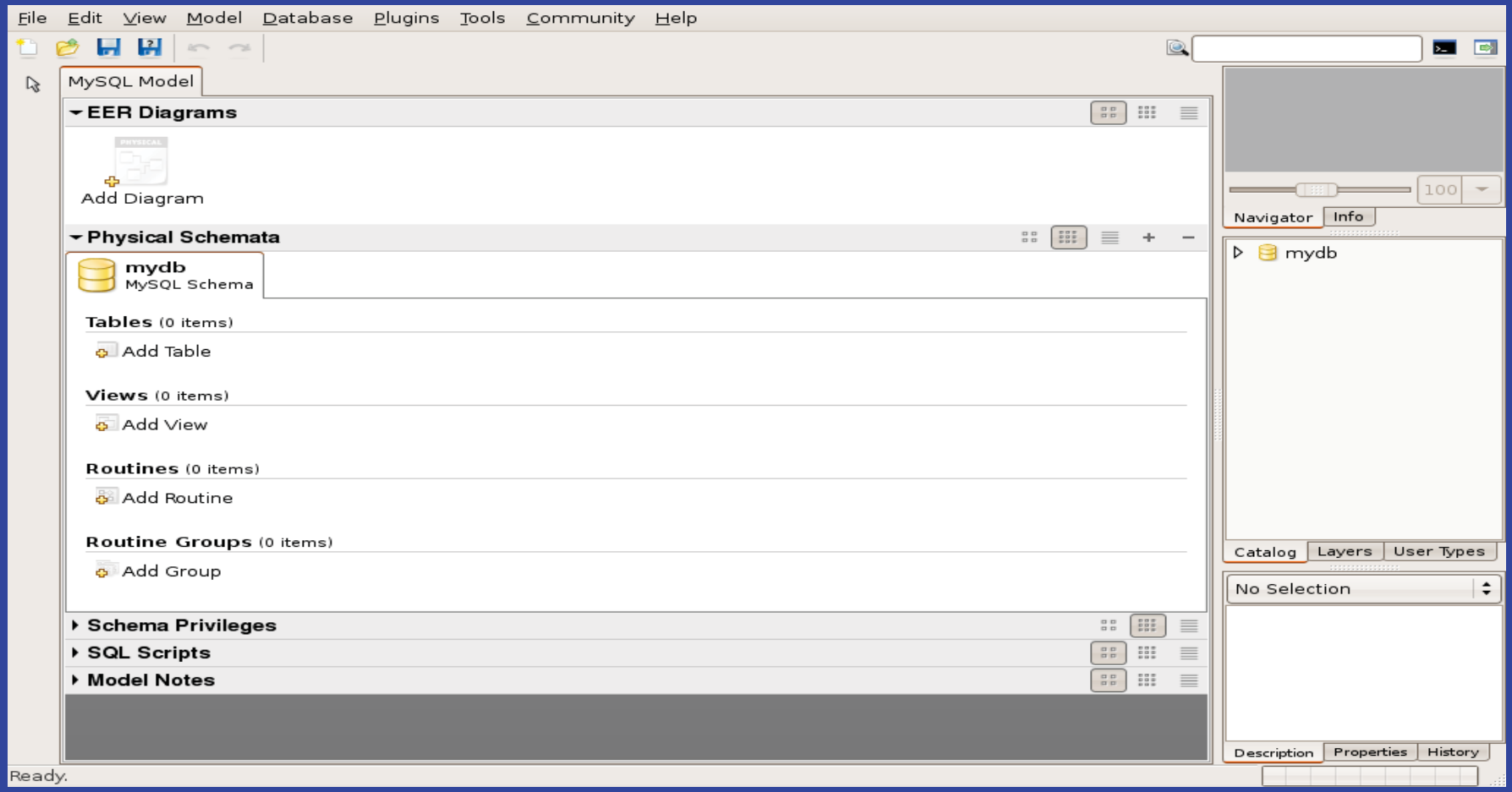


MySQL workbench

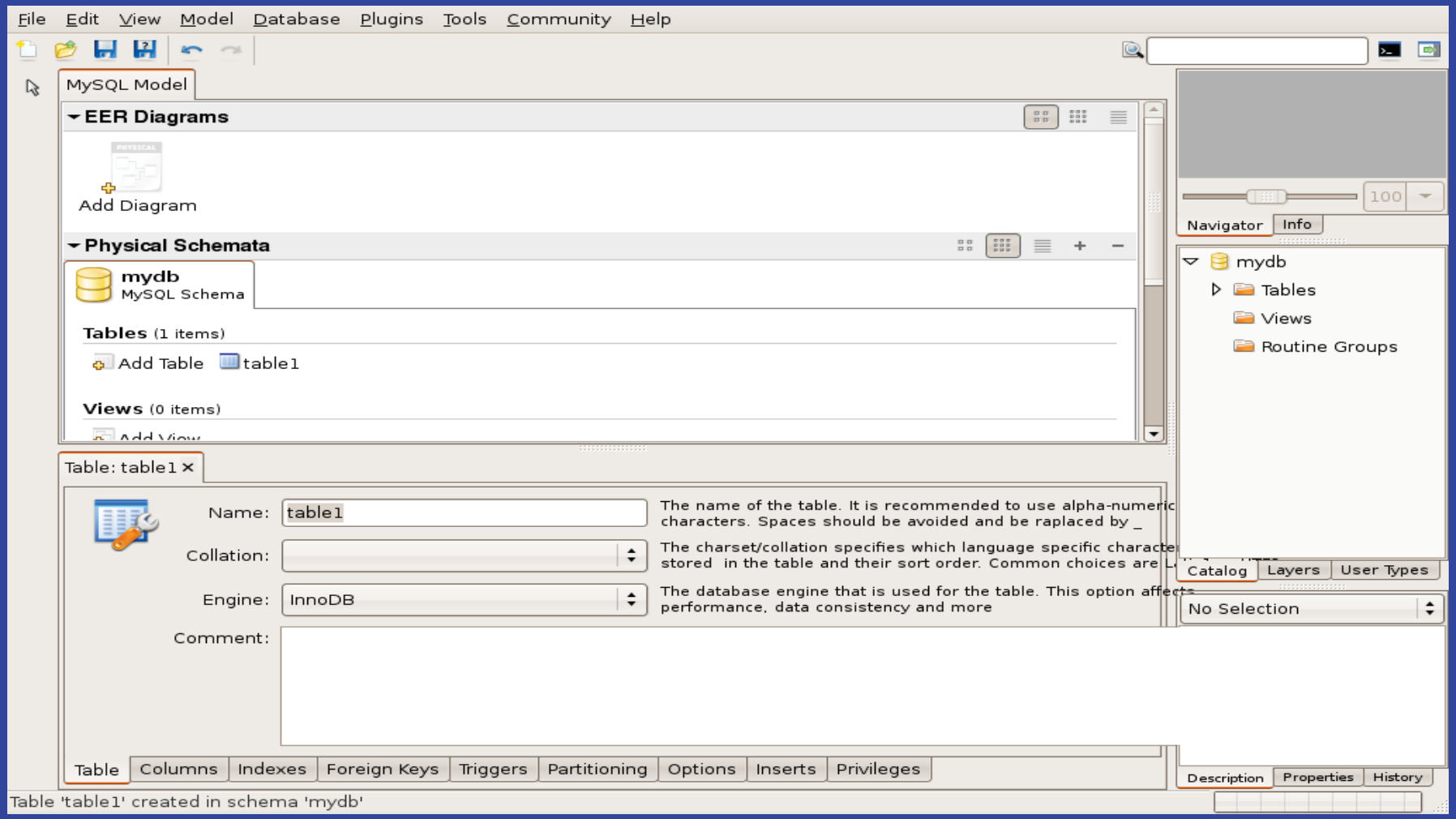
- MySQL Workbench is a visual database design application that can be used to efficiently design, manage and document database schemata.

- It is available as both, open source and commercial editions. The Community (OSS) Edition is available GNU General Public License.
- http://dev.mysql.com/downloads/workbench/5.2.html

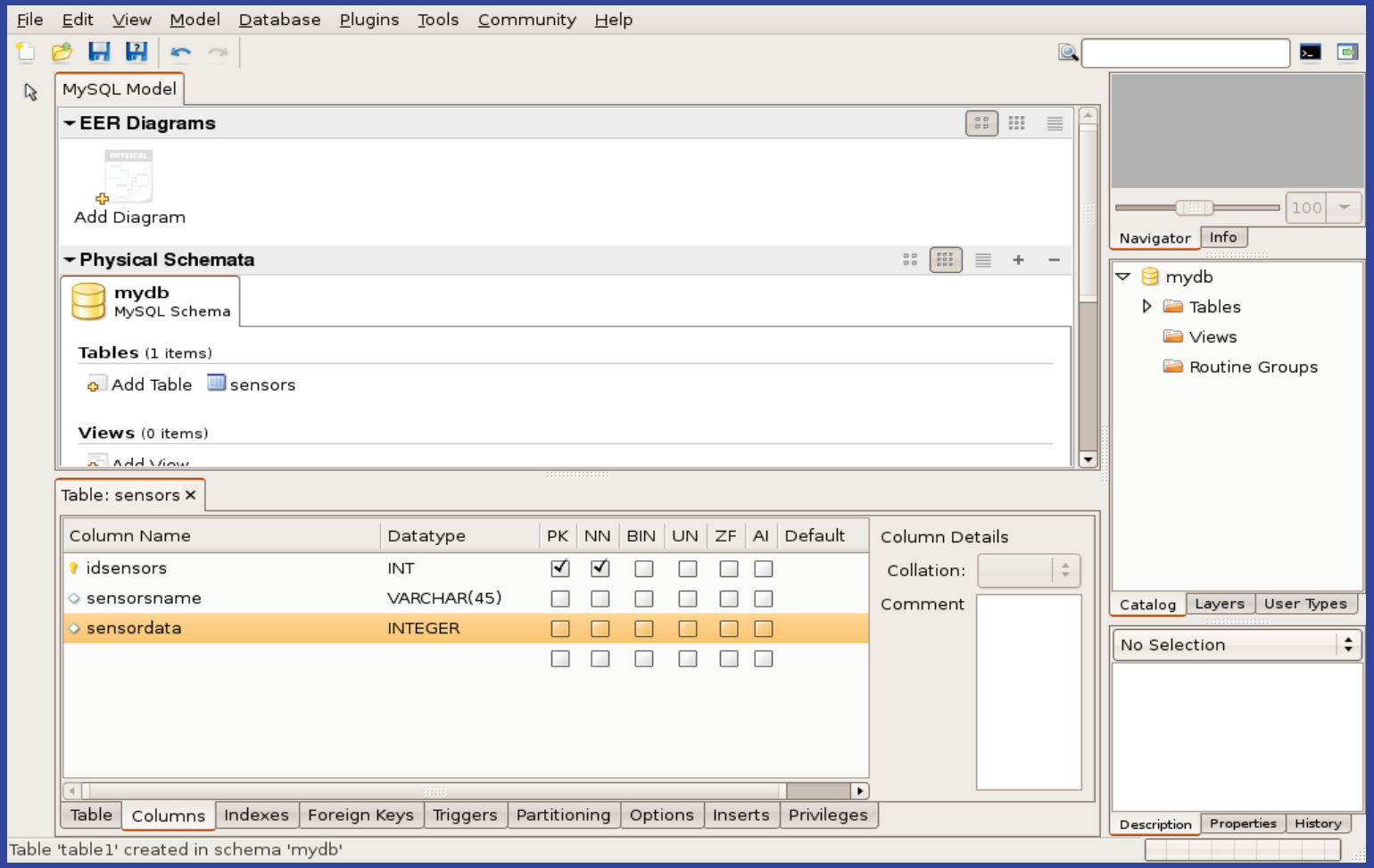
MySQL workbench



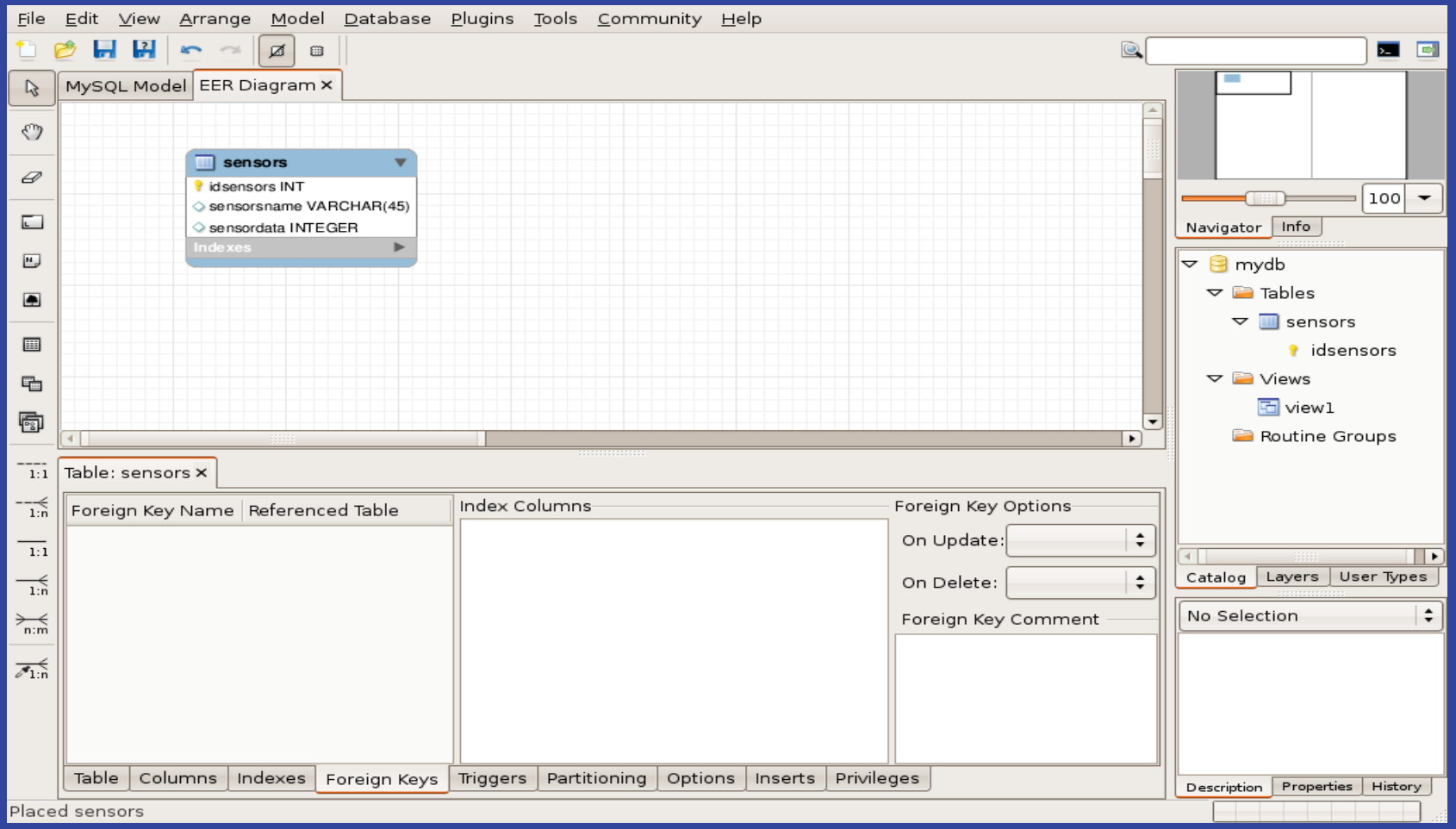
MySQL workbench -Table



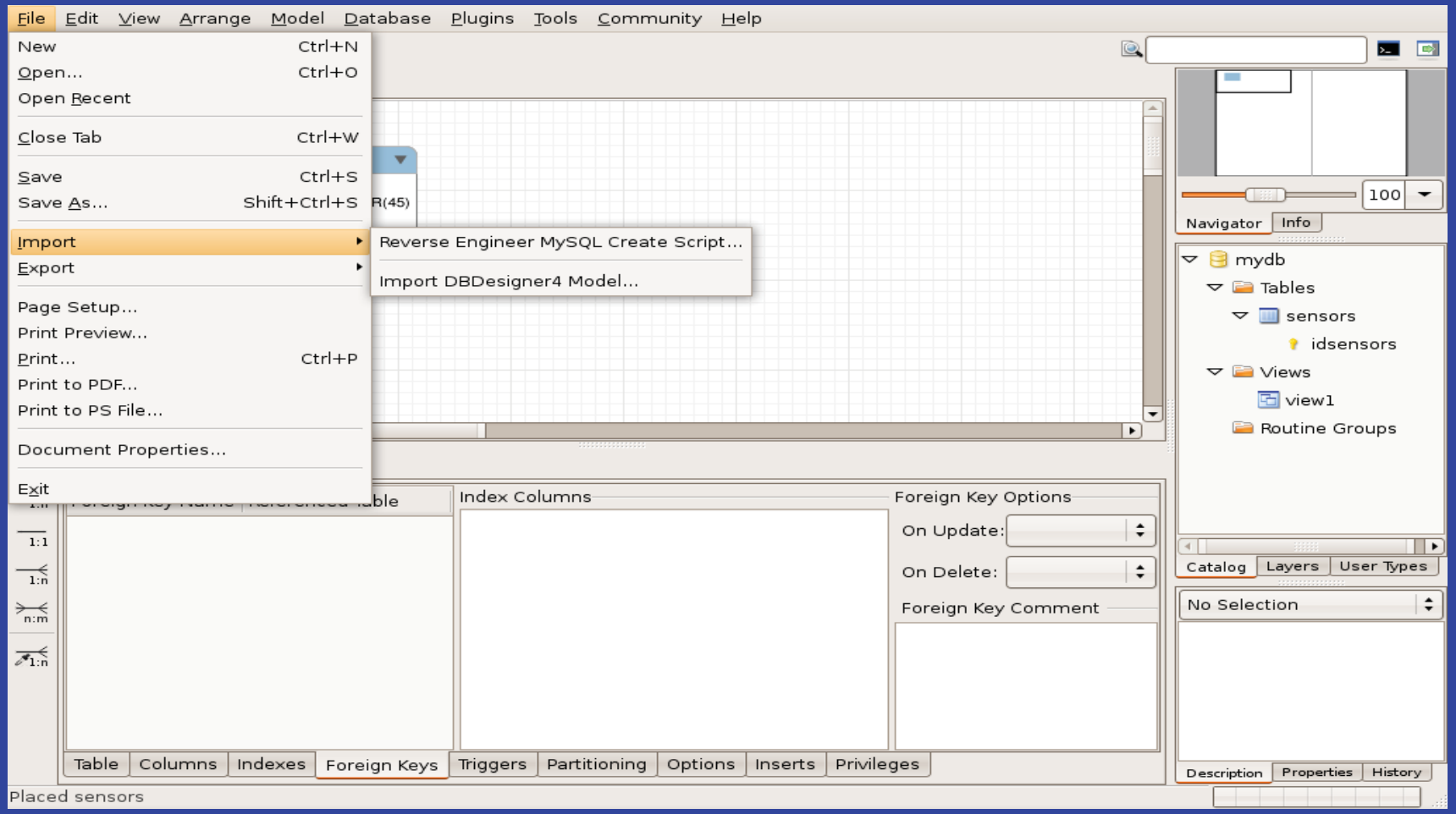
MySQL workbench -Table



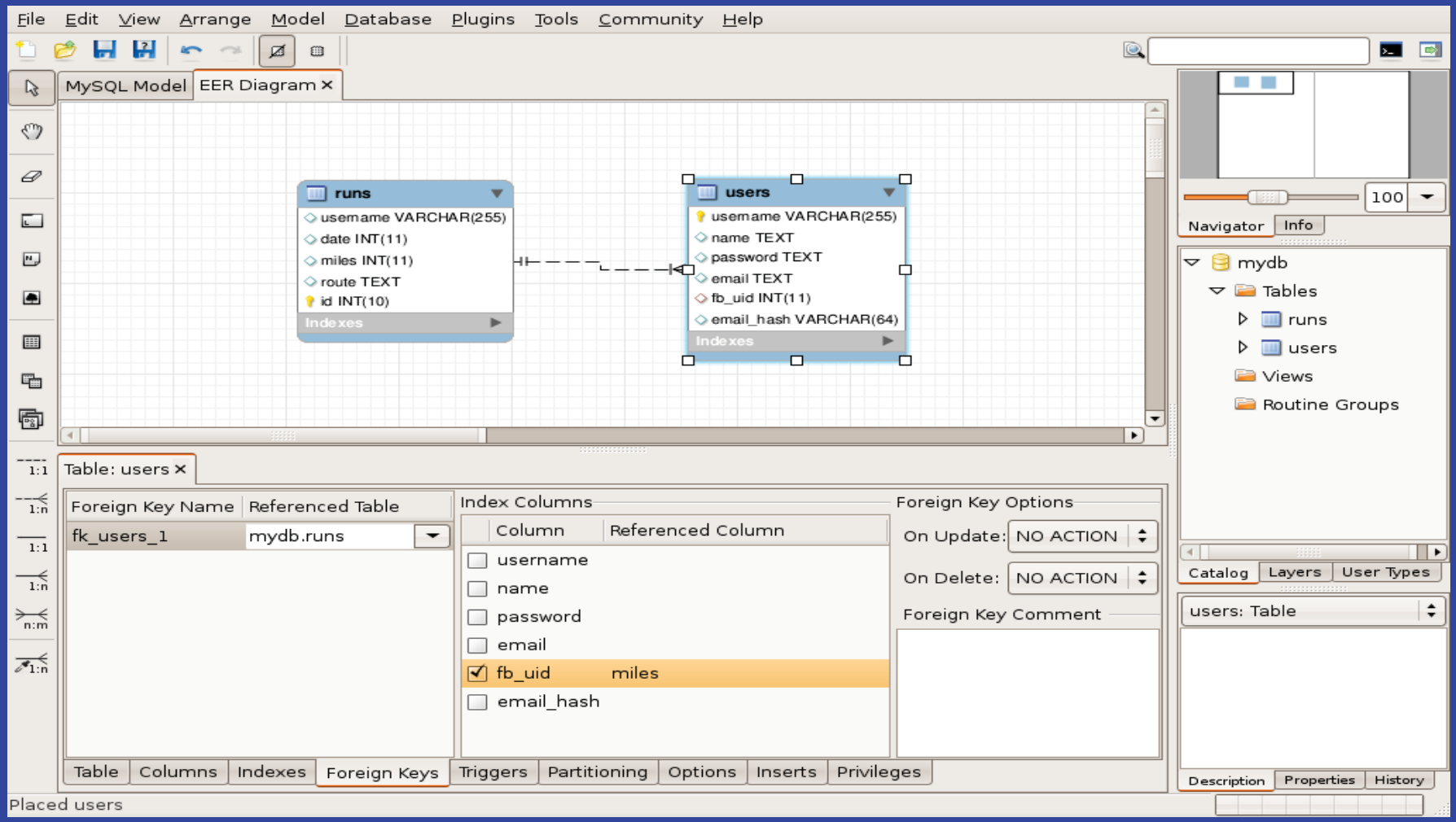
MySQL workbench – EER diag



MySQL workbench - import



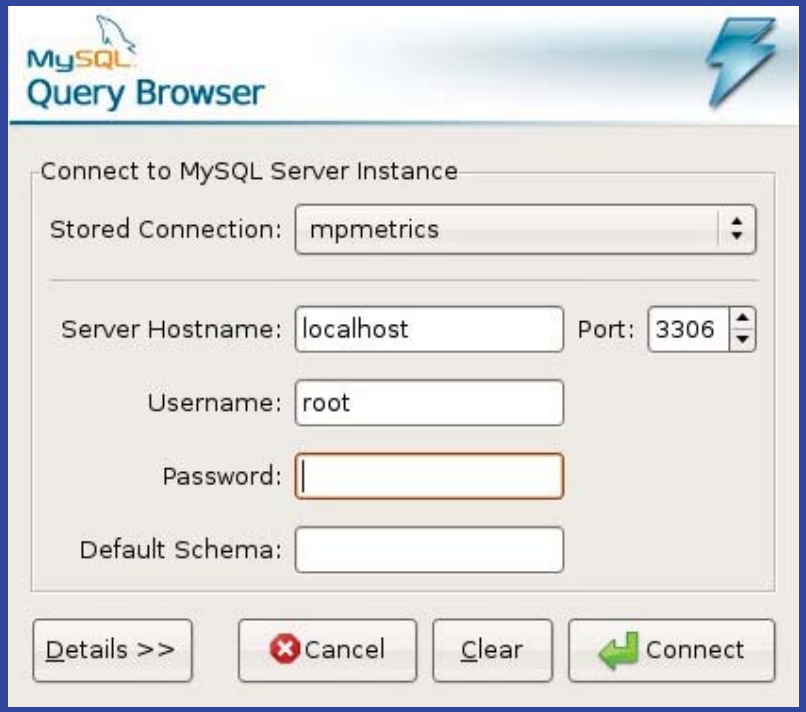
MySQL workbench – foreignkey



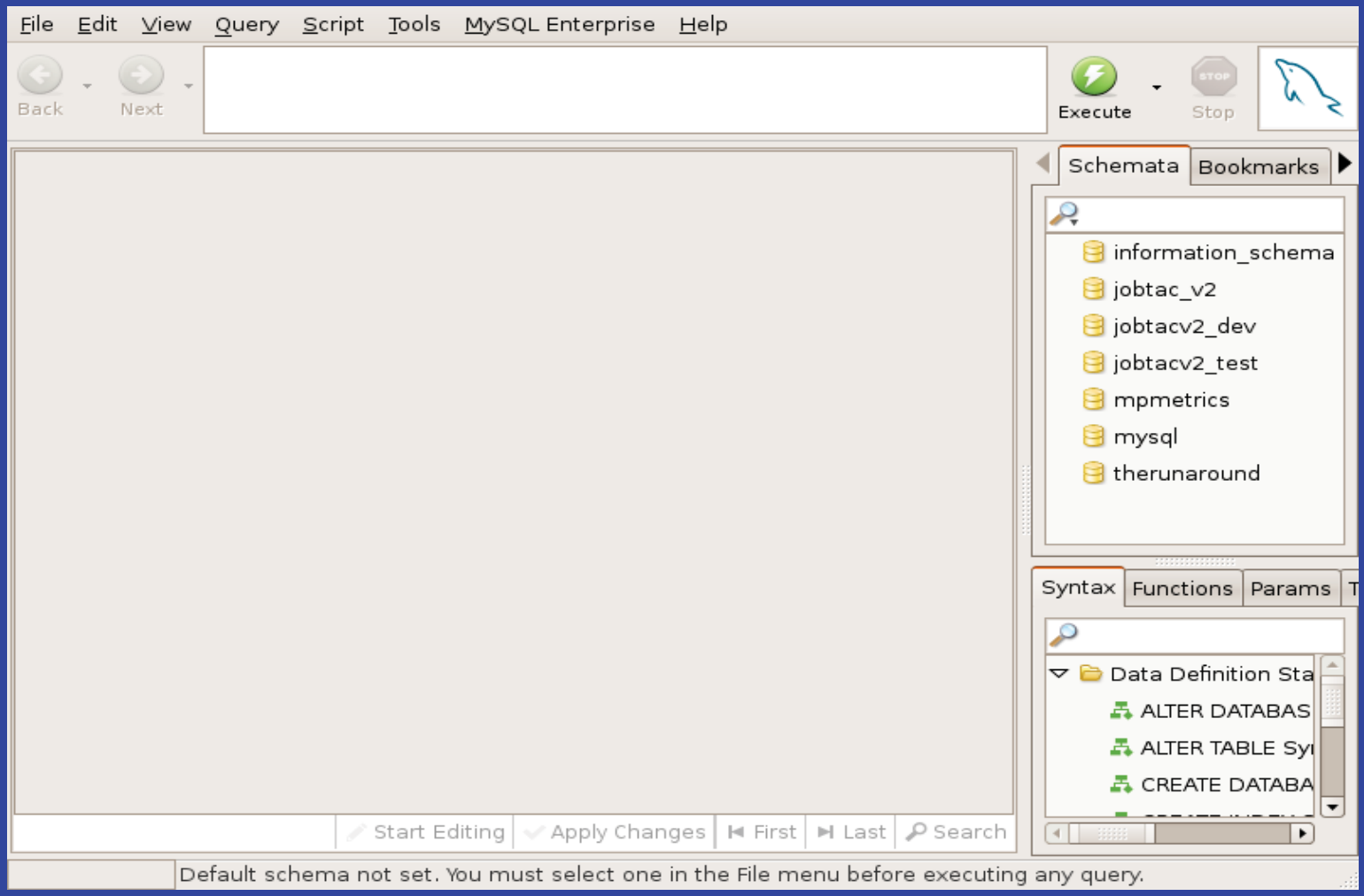
MySQL Query Browser

Used in querying and analyzing data stored within a MySQL database.

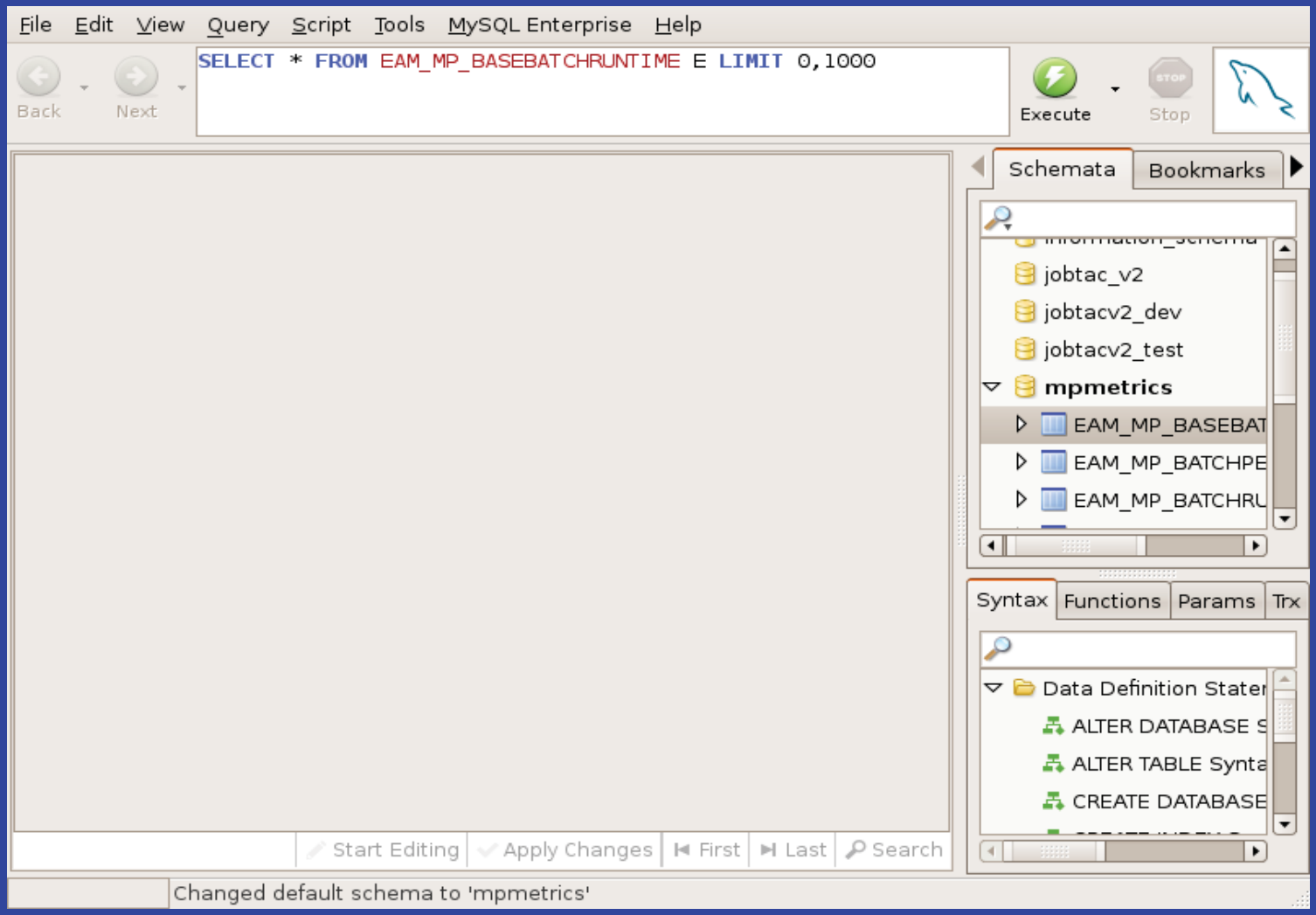
MySQL Query Browser



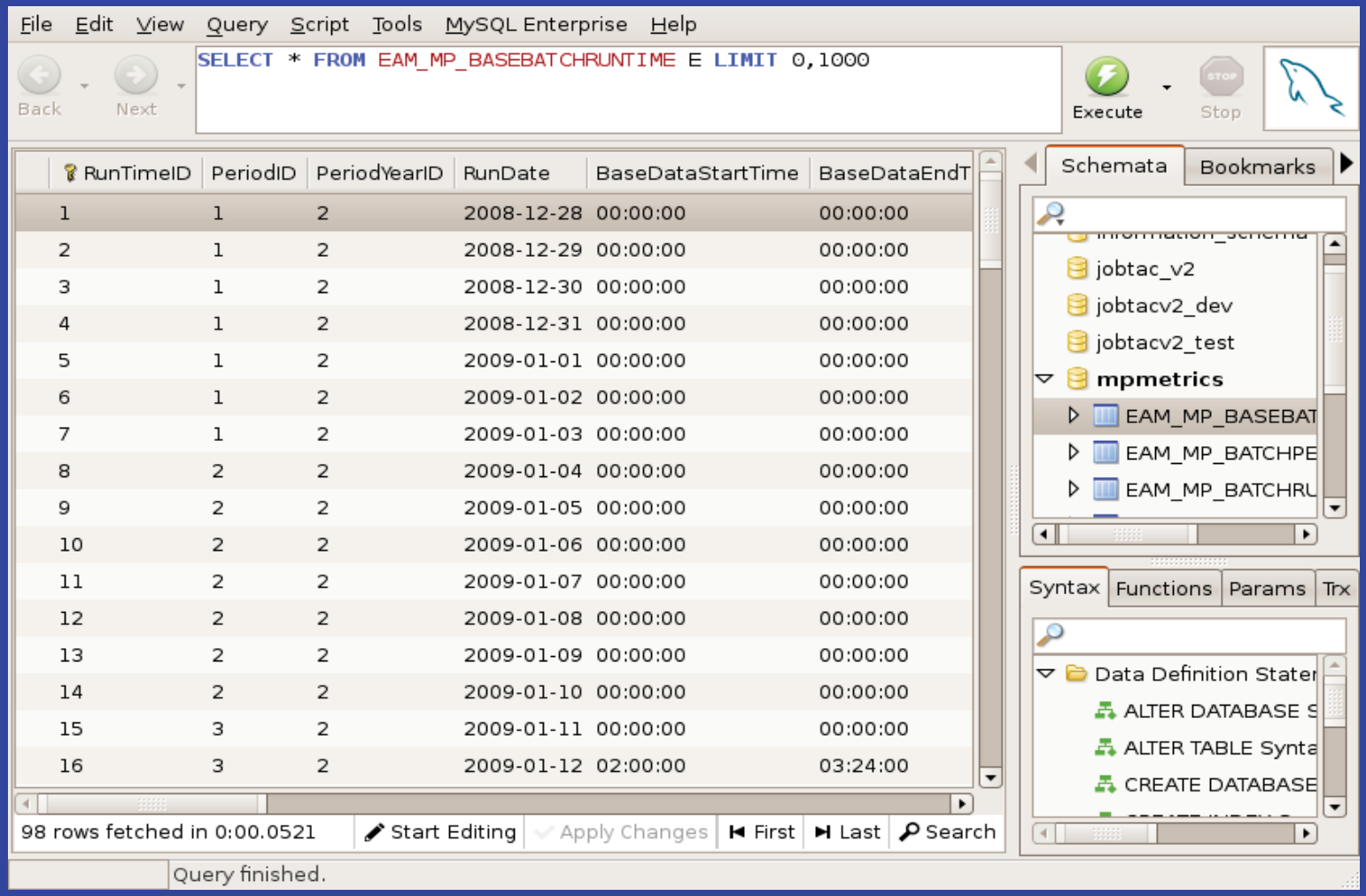
MySQL Query Browser



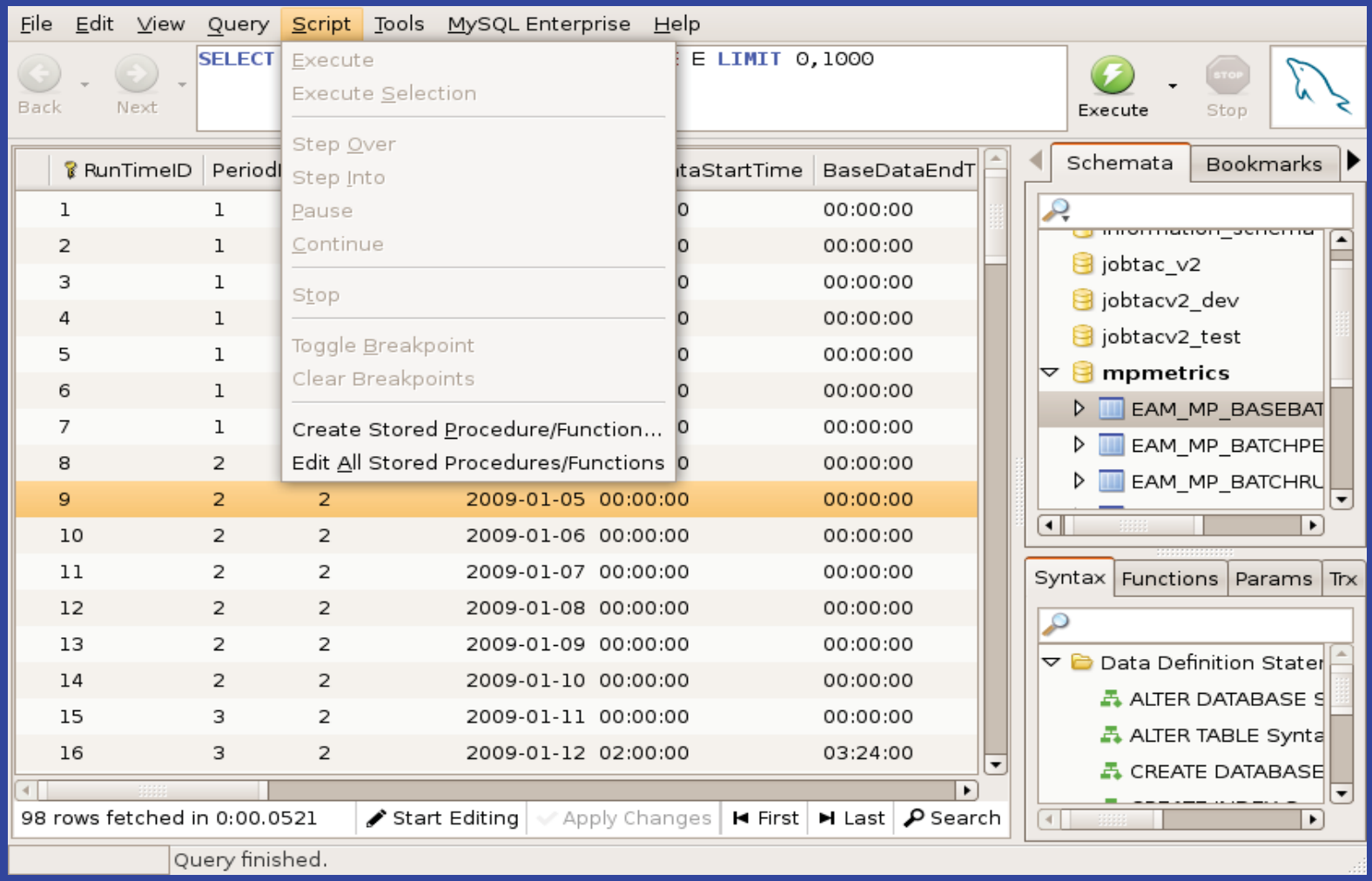
MySQL Query Browser



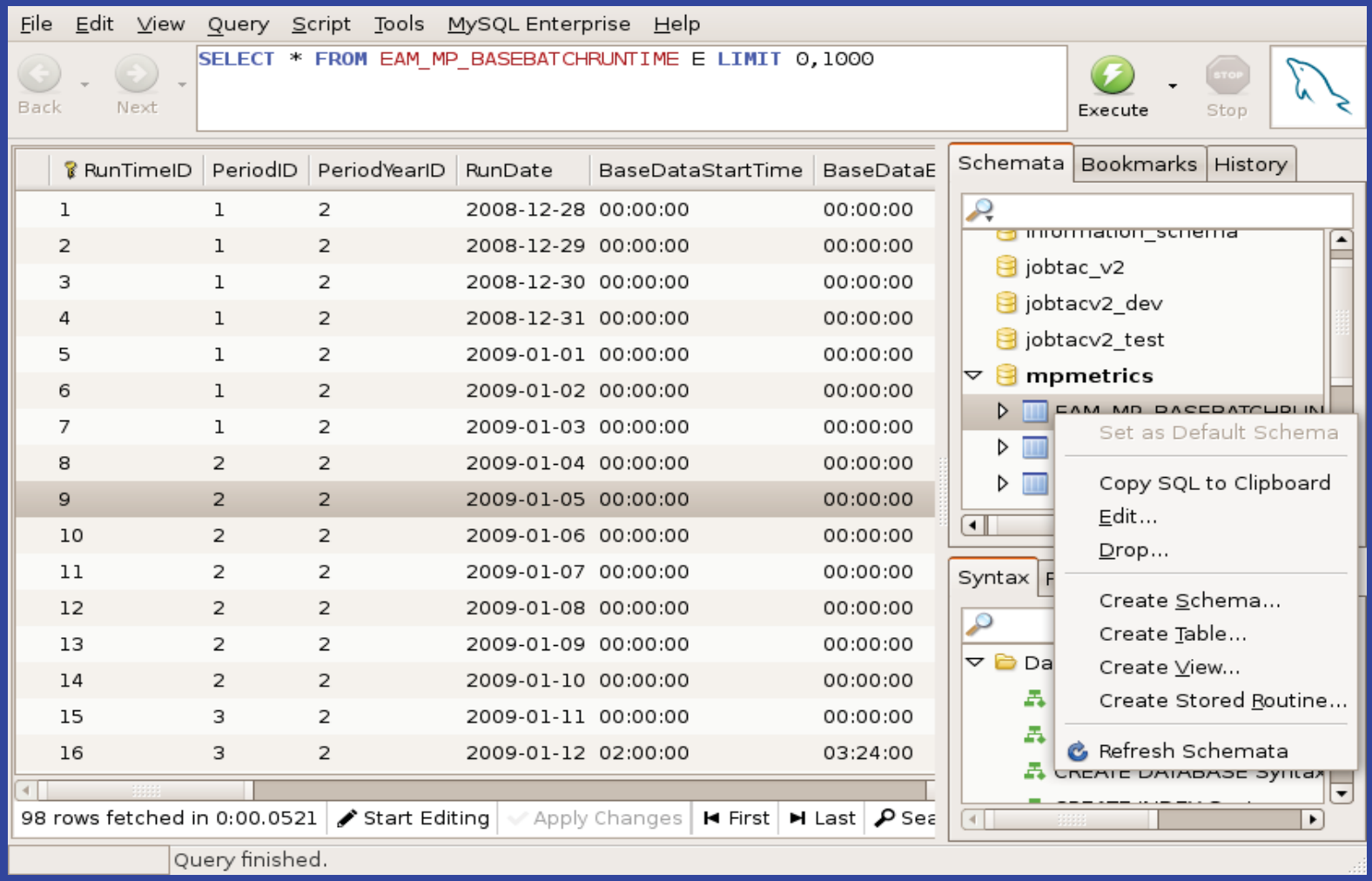
MySQL Query Browser



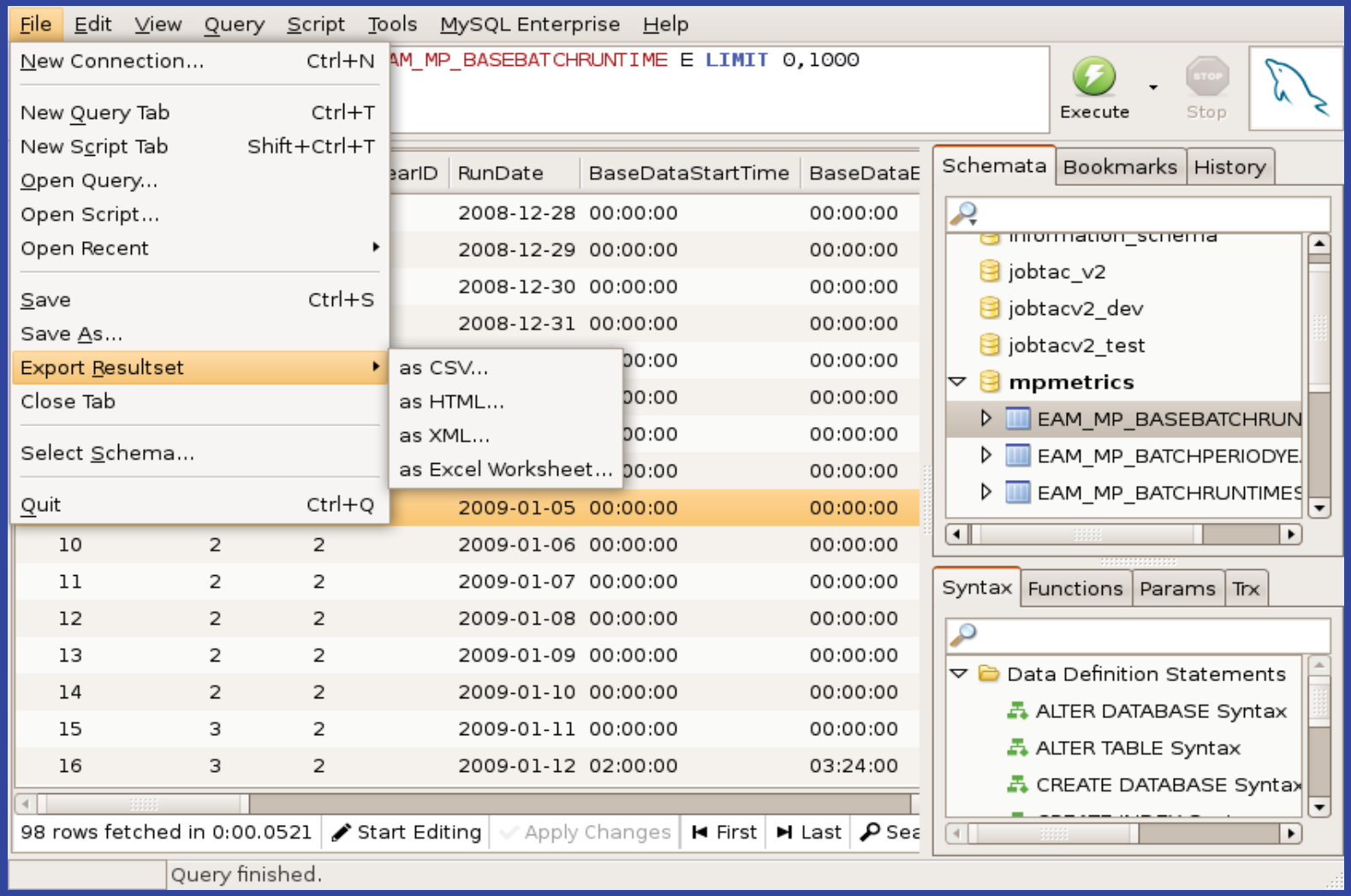
MySQL Query Browser



MySQL Query Browser



MySQL Query Browser



PhpMyAdmin

http://www.phpmyadmin.net/home_page/index.php

- written in PHP to handle the administration of MySQL with a web interface.

Features – taken from the site

- Intuitive web interface
- Support for most MySQL features:
  - browse and drop databases, tables, views, fields and indexes
  - create, copy, drop, rename and alter databases, tables, fields and indexes
  - maintenance server, databases and tables, with proposals on server configuration

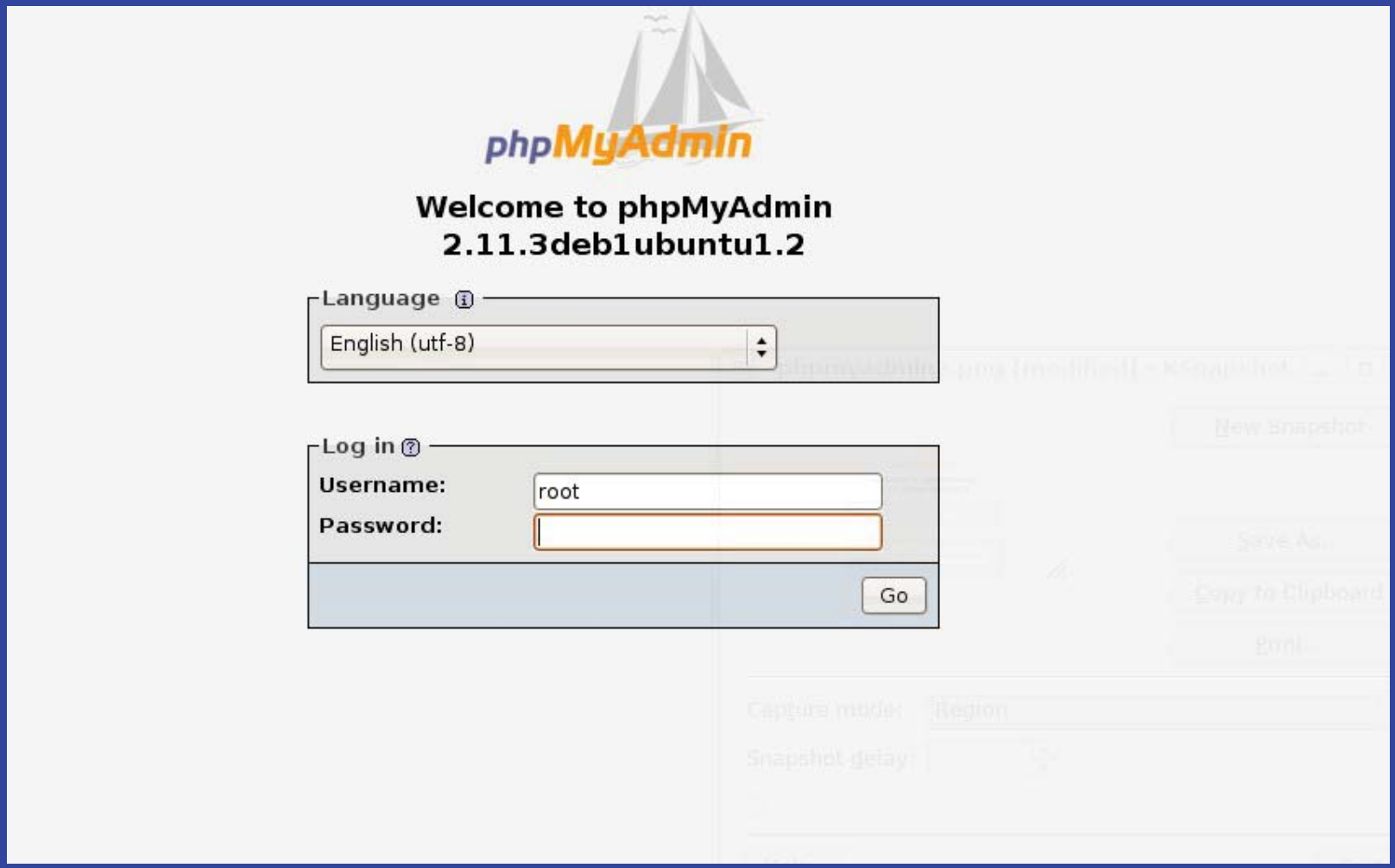
PhpMyAdmin

  - execute, edit and bookmark any SQL-statement, even batch-queries
  - manage MySQL users and privileges
  - manage stored procedures and triggers
- Import data from CSV and SQL
- Export data to various formats: CSV, SQL, XML, PDF, ISO/IEC 26300 - OpenDocument Text and Spreadsheet, Word, Excel, LATEX and others

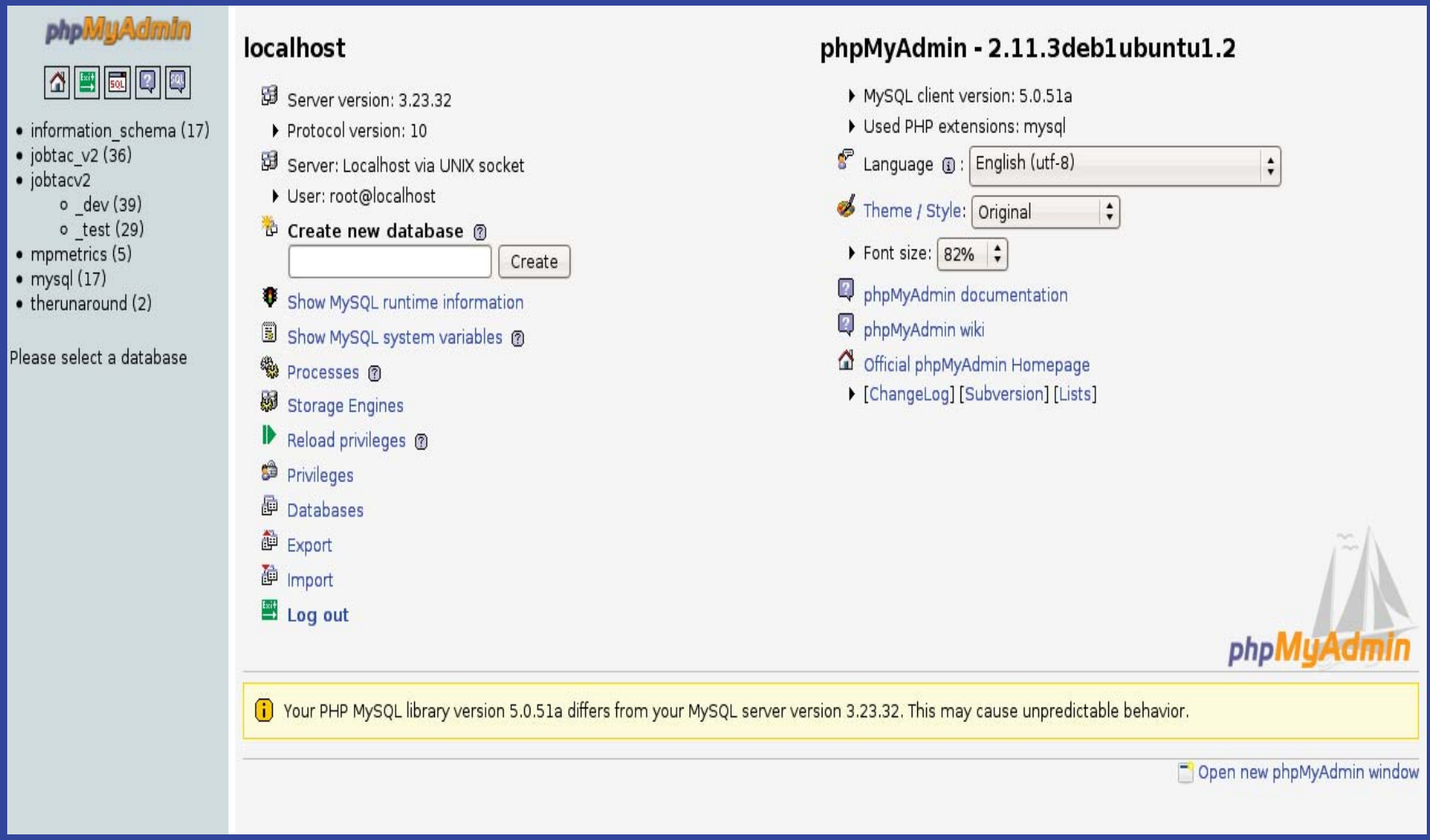
PhpMyAdmin

- Administering multiple servers
- Creating PDF graphics of your database layout
- Creating complex queries using Query-by-example (QBE)
- Searching globally in a database or a subset of it
- Transforming stored data into any format using a set of predefined functions, like displaying BLOB-data as image or download-link
- And much more...

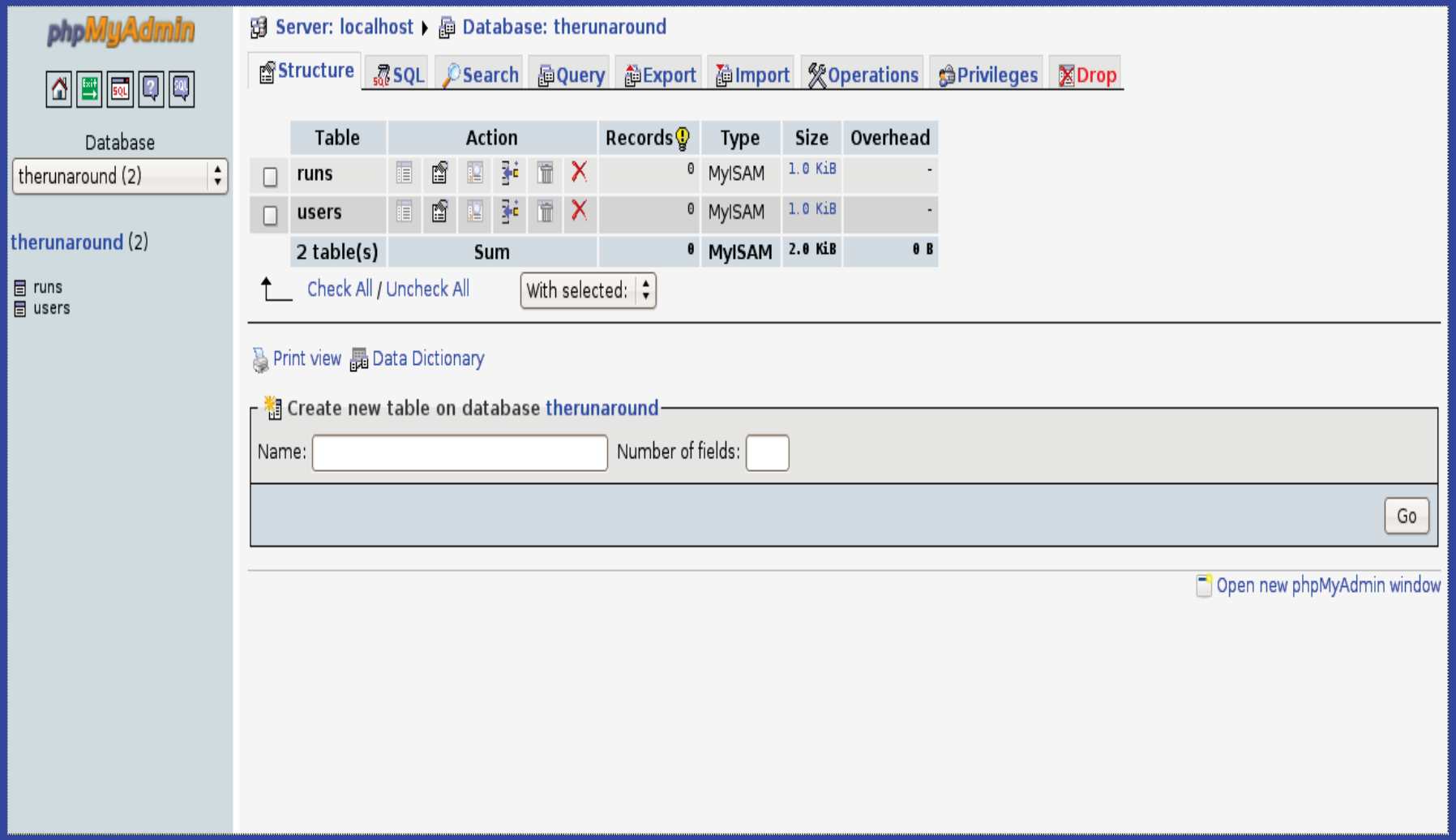
PhpMyAdmin - login



PhpMyAdmin - home



PhpMyAdmin - Structure



Symfony

Symfony is a web application framework for PHP projects.

Quoting the site

"The symfony framework is a full-stack MVC framework that helps you develop websites faster"

- Developers can apply agile development principles (such as DRY, KISS or the XP philosophy) and focus on applicative logic.

Symfony

Prerequisite

- need Unix or Windows with a web server and PHP installed.

At a Glance

- Compatible with as many environments as possible.
- Easy to install and configure
- Simple to learn
- Enterprise ready

Symfony

Project layout for 1.x.x, 2.0 structure is different

Directory	Description
apps/	Hosts all project applications
cache/	The files cached by the framework
config/	The project configuration files
lib/	The project libraries and classes
log/	The framework log files
plugins/	The installed plugins
test/	The unit and functional test files
web/	The web root directory (see below)

Symfony

- Generating the project is as simple as:

  symfony generate:project PROJECT_NAME

Other tools

- Subversion is an open source version control system
- Git - is a free & open source, distributed version control system. Every Git clone is a full-fledged repository with complete history and full revision tracking capabilities, not dependent on network access or a central server.
- Adobe Air - The Adobe® AIR™ runtime lets developers use proven web technologies to build rich Internet applications that run outside the browser on multiple operating systems.
- Google gears
  - Let web applications interact naturally with your desktop
  - Store data locally in a fully-searchable database
  - Run JavaScript in the background to improve performance

Other tools

- Android development

  developer.android.com/sdk/installing.html
- Nintendo DS development

  devkitpro.org/wiki/Getting_Started/devkitARM
  - eclipse plugin

  NDS-Managerbuilder - dev.snipah.com/nds/updater

PHP

- PHP stands for PHP: Hypertext Preprocessor
- is a server-side scripting language, like ASP
- scripts are executed on the server
- is a powerful tool for making dynamic and interactive Web pages.
- supports many databases (MySQL, Informix, Oracle, Sybase, Solid, PostgreSQL, Generic ODBC, etc.)
- is an open source software
- is free to download and use
- PHP-enabled web pages are treated just like regular HTML pages and you can create and edit them the same way you normally create regular HTML pages.

php

- PHP files can contain text, HTML tags and scripts
- PHP files are returned to the browser as plain HTML
- PHP files have a file extension of ".php", ".php3", or ".phtml"
- http://www.php.net/downloads.php
- Php is a server side script, PHP code is executed on the server, and the plain HTML result is sent to the browser.
-

PHP

- A PHP scripting block always starts with <?php and ends with ?>. The block of code can be placed anywhere in the document.

  <?php

  ?>

- A PHP file normally contains HTML tags, just like an HTML file, and some PHP scripting code.

php

- Example

```
<html>
 <head>
  <title>PHP Test</title>
 </head>
 <body>
 <?php echo '<p>Hello World</p>'; ?>
 </body>
</html>
```

- A popular code is <?php phpinfo(); ?>

PHP

- Each line of code in PHP must end with a semicolon ;. The semicolon is a separator and is used to distinguish one set of instructions from another.
- There are two basic statements to output text with PHP: echo and print.
- Comments in PHP
  - In PHP, // is used to make a single-line comment or /* and */ to make a large comment block.

PHP

- Example

```
<?php
//This is a comment
/*
This is
a comment
block
*/
?>
```

PHP Variables

- Variables are used for storing values, like text strings, numbers or arrays.
- When a variable is declared, it can be used over and over again in your script.
- All variables in PHP start with a $ sign symbol.
- The correct way of declaring a variable in PHP:

```
$variable_name = value;
```

```
<?php
$txt="This is a text";
$number=44;
?>
```

PHP Variable

- PHP is a Loosely Typed Language
- In PHP, a variable does not need to be declared before adding a value to it.
- you do not have to tell PHP which data type the variable is. PHP automatically converts the variable to the correct data type, depending on its value.
- In a strongly typed programming language, you have to declare (define) the type and name of the variable before using it.
- In PHP, the variable is declared automatically when you use it.

PHP Variable

- Naming Rules for Variables
- A variable name must start with a letter or an underscore "_"
- A variable name can only contain alpha-numeric characters and underscores (a-z, A-Z, 0-9, and _)
- A variable name should not contain spaces. If a variable name is more than one word, it should be separated with an underscore ($part_number), or with camel case capitalization ($partNumber)

PHP String

- A string variable is used to store and manipulate text.

```
<?php
$txt="I am a string";
echo $txt;
?>
```

- The output of the code above will be:

  I am a string

- The Concatenation Operator
- There is only one string operator in PHP.
- The concatenation operator (.) is used to join two string values together.

PHP String

- To join two string variables together, use the concatenation operator:

```
<?php
$txt1="Hello World!";
$txt2="What a nice day!";
echo $txt1 . " " . $txt2;
?>
```

- The output of the code above will be:

Hello World! What a nice day!

PHP String functions

- The strlen() function
- The strlen() function is used to return the length of a string.
- Example

```
<?php
echo strlen("Hello world!");
?>
```

- The output of the code above will be:

```
12
```

PHP String functions

- The strpos() function
- The strpos() function is used to search for a character/text within a string.
- If a match is found, this function will return the character position of the first match. If no match is found, it will return FALSE.
- Let's see if we can find the string "world" in our string:

```
<?php
echo strpos("Hello world!","world");
?>
```

- The output of the code above will be:

```
6
```

PHP

- http://www.w3schools.com/php/php_ref_string.asp

PHP Operators

- Arithmetic Operators

Operator	Description	Example	Result
+	Addition	x=2 x+2	4
-	Subtraction	x=2 5-x	3
*	Multiplication	x=4 x*5	20
/	Division	15/5 5/2	3 2.5
%	Modulus (division remainder)	5%2 10%8 10%2	1 2 0
++	Increment	x=5 x++	x=6
--	Decrement	x=5 x--	x=4

PHP Operators

- Assignment Operators

Operator	Example	Is The Same As
=	x=y	x=y
+=	x+=y	x=x+y
-=	x-=y	x=x-y
*=	x*=y	x=x*y
/=	x/=y	x=x/y
.=	x.=y	x=x.y
%=	x%=y	x=x%y

PHP Operators

- Comparison Operators

Operator	Description	Example
==	is equal to	5==8 returns false
!=	is not equal	5!=8 returns true
<>	is not equal	5<>8 returns true
>	is greater than	5>8 returns false
<	is less than	5<8 returns true
>=	is greater than or equal to	5>=8 returns false
<=	is less than or equal to	5<=8 returns true

PHP Operators

- Logical Operators

Operator	Description	Example
&&	and	x=6 y=3 (x < 10 && y > 1) returns true
||	or	x=6 y=3 (x==5 || y==5) returns false
!	not	x=6 y=3 !(x==y) returns true

PHP

- Conditional Statements
- The if Statement
- Use the if statement to execute some code only if a specified condition is true.
- Syntax

```
if (condition) {
code to be executed if condition is true;
}
```

PHP

- The following example will output "Have a nice weekend!" if the current day is Friday:

```
<html>
<body>
<?php
$d=date("D");
if ($d=="Fri") echo "Have a nice weekend!";
?>
</body>
</html>
```

if..else

```
if (condition){
  code to be executed if condition is true;
}
Else
{
  code to be executed if condition is false;
}
```

if..else

- Example

  The following example will output "Have a nice weekend!" if the current day is Friday, otherwise it will output "Have a nice day!":

```
<html>
<body>
<?php
$d=date("D");
if ($d=="Fri"){
  echo "Have a nice weekend!";
}else{
 echo "Have a nice day!";
}
?>
</body>
</html>
```

if..elseif..else

```
if (condition){
  code to be executed if condition is true;
}elseif (condition){
  code to be executed if condition is true;
}else{
  code to be executed if condition is false;
}
```

PHP

- While it's easy to get carried away mixing your logic and presentation together since it's so easy to do, you're better off using PHP within HTML only to fill in values, or include other source files.

PHP

- PHP Arrays
- A variable is a storage area holding a number or text. The problem is, a variable will hold only one value.
- An array is a special variable, which can store multiple values in one single variable.
- Each element in the array has its own index so that it can be easily accessed.
- In PHP, there are three kind of arrays:
- Numeric array - An array with a numeric index
- Associative array - An array where each ID key is associated with a value
- Multidimensional array - An array containing one or more arrays

PHP

- Numeric Arrays
- A numeric array stores each array element with a numeric index.

  $animals = array(“cat”,”tiger”,”lion”);
- OR

  $animals[0] = “cat”;

  $animals[1] = “tiger”;

  $animals[2] = “lion”;

  <?php

  echo $animals[0].” and “.$animals[1].” belongs to cat family”;

  ?>
- The output will be

  Cat and tiger belongs to cat family

PHP

- Associative Arrays
- An associative array, each ID key is associated with a value.
- When storing data about specific named values, a numerical array is not always the best way to do it.
- With associative arrays we can use the values as keys and assign values to them.
- Example

```
$player_number = array("joe"=>5, "john"=>76, "michael"=>54);
```

PHP

- Multidimensional Arrays
- In a multidimensional array, each element in the main array can also be an array. And each element in the sub-array can be an array, and so on.

PHP for Loop

- The for Loop

```
for (init; condition; increment)
  {
  code to be executed;
  }
```

- Parameters:
- init: Mostly used to set a counter (but can be any code to be executed once at the beginning of the loop)
- condition: Evaluated for each loop iteration. If it evaluates to TRUE, the loop continues. If it evaluates to FALSE, the loop ends.
- increment: Mostly used to increment a counter (but can be any code to be executed at the end of the loop)

PHP for Loop

```
<html>
<body>
<?php
for ($i=1; $i<=5; $i++)
  {
  echo "The number is " . $i . "<br />";
  }
?>
</body>
</html>
```

PHP for Loop

- Output:

  The number is 1

  The number is 2

  The number is 3

  The number is 4

  The number is 5

PHP foreach Loop

- The foreach loop is used to loop through arrays.

```
foreach ($array as $value)
  {
  code to be executed;
  }
```

- For every loop iteration, the value of the current array element is assigned to $value (and the array pointer is moved by one) - so on the next loop iteration, you'll be looking at the next array value.

PHP foreach Loop

```
<html>
<body>
<?php
$x=array("one","two","three");
foreach ($x as $value)
  {
  echo $value . "<br />";
 }
?>
</body>
</html>
```

PHP foreach Loop

- Output

  one

  two

  three

PHP Forms and User Input

- The PHP $_GET and $_POST variables are used to retrieve information from forms, like user input.

```
<html>
<body>
<form action="welcome.php" method="post">
Name: <input type="text" name="fname" />
Age: <input type="text" name="age" />
<input type="submit" />
</form>
</body>
</html>
```

PHP Forms and User Input

- When a user fills out the form above and click on the submit button, the form data is sent to a PHP file, called "welcome.php":

  "welcome.php" looks like this:

  ```
  <html>
  <body>
  Welcome <?php echo $_POST["fname"]; ?>!<br />
  You are <?php echo $_POST["age"]; ?> years old.
  </body>
  </html>
  ```

- output

  Welcome John!

  You are 28 years old.

PHP $_GET

- The $_GET Variable
- The predefined global $_GET variable is used to collect values in a form with method="get"
- When the user clicks the "Submit" button, the URL sent to the server could look something like this:
- http://www.ictp.it/welcome.php?fname=Peter&age=37

PHP $_POST

- The $_POST Variable
- The predefined $_POST variable is used to collect values from a form sent with method="post".
- Information sent from a form with the POST method is invisible to others and has no limits on the amount of information to send.

PHP $_REQUEST

- PHP $_REQUEST Variable
- The predefined $_REQUEST variable contains the contents of both $_GET, $_POST, and $_COOKIE.
- The $_REQUEST variable can be used to collect form data sent with both the GET and POST methods.
- Example

  Welcome <?php echo $_REQUEST["fname"]; ?>!

  You are <?php echo $_REQUEST["age"]; ?> years old.

Resources

- http://en.wikipedia.org/wiki/Rapid_application_development
- http://www.symfony-project.org/
- http://subversion.tigris.org/
- http://git-scm.com/
- http://www.w3schools.com/php/default.asp
- http://www.php.net/