

Welcome!

RaspberryPi Workshop

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Pre-Survey: <http://mht.pw/rpi>



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Topics

- What is a RaspberryPi?
- Why should I want one?
- What is Raspbian?
- What is SSH?
- What is FTP?
- What is LAMP?
- Making a LAMP Stack!



What is a Raspberry Pi?

- The Raspberry Pi is a Credit Card sized computer.
- Specifications:
 - 700MHz ARM Broadcom Processor
 - 512MB RAM
 - RCA Video
 - HDMI
 - 10/100 Ethernet
 - 2 USB2.0 Ports
 - 26 GPIO Pins



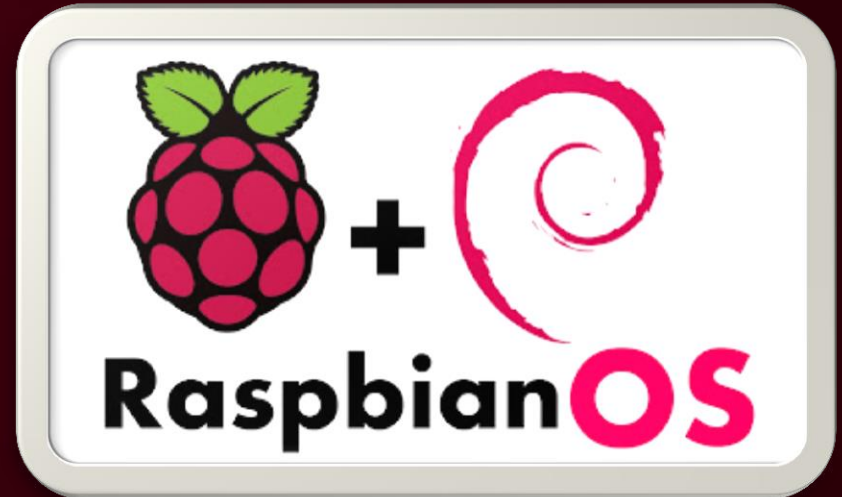
Why should I want one?

- They are great for making projects.
- Some uses
 - File Backup
 - VPN
 - Web Server
 - Database Server
 - Media Center
 - Print Server
 - Home Monitoring
 - The options are seriously endless...




What is Raspbian?

- **Raspbian** – A version of Debian designed for the Raspberry Pi.
- Includes a suite of software on installation.
- The most widely used desktop platform for the RPi.
- Runs ARM packages.
- Can't run regular 32-bit or 64-bit applications.



What is SSH?

- **SSH** – Stands for Secure Shell. Common way to work with machines remotely and through a terminal style interface.
- Most common piece of software is PuTTY.
- Available on ALL Linux distributions
- OpenSSH is the most common SSH server out there!



```
james@volcano ~
login as: james
james@shell's password:
Linux volcano 2.6.22-14-server #1 SMP Sun Oct 14 23:34:23 GMT 2007 i686

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

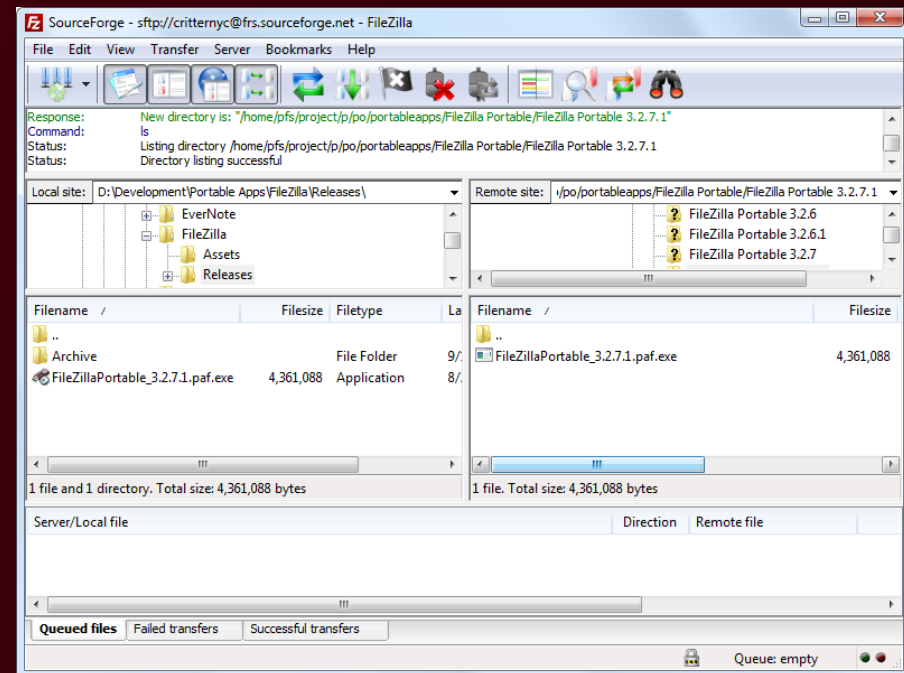
Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

james@volcano:~>
```



What is FTP?

- **FTP** – Stands for File Transfer Protocol. Used to transfer files from one machine to another.
- This is essential if we need to move files back and forth.
- Available on ALL Linux distributions
- If you have web hosting, you will almost always have FTP access.
- FileZilla is a popular client to reach FTP servers



What is LAMP?

- **LAMP** – Stands for Linux, Apache, MySQL, and PHP. It's generally a software bundle and it's the ideal bundle you would want for any website.
- Another variation is **LNMP**. LNMP uses Nginx instead of Apache.

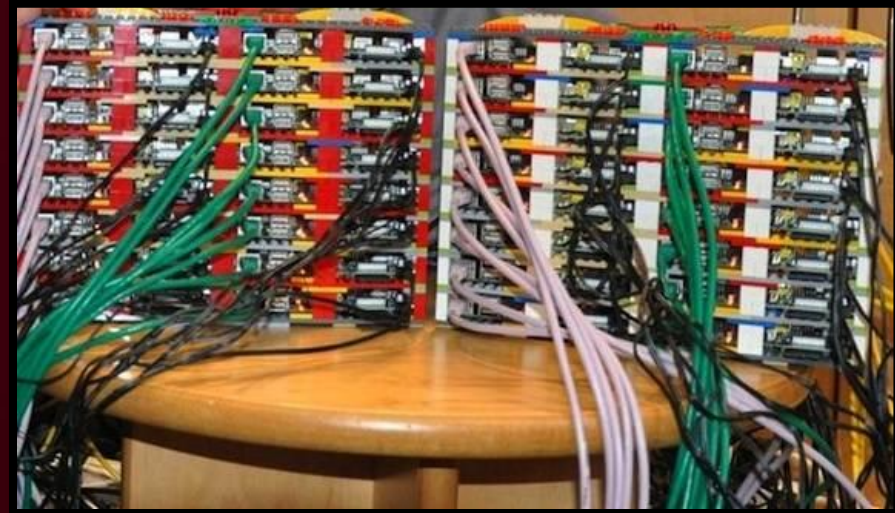


LAMP:



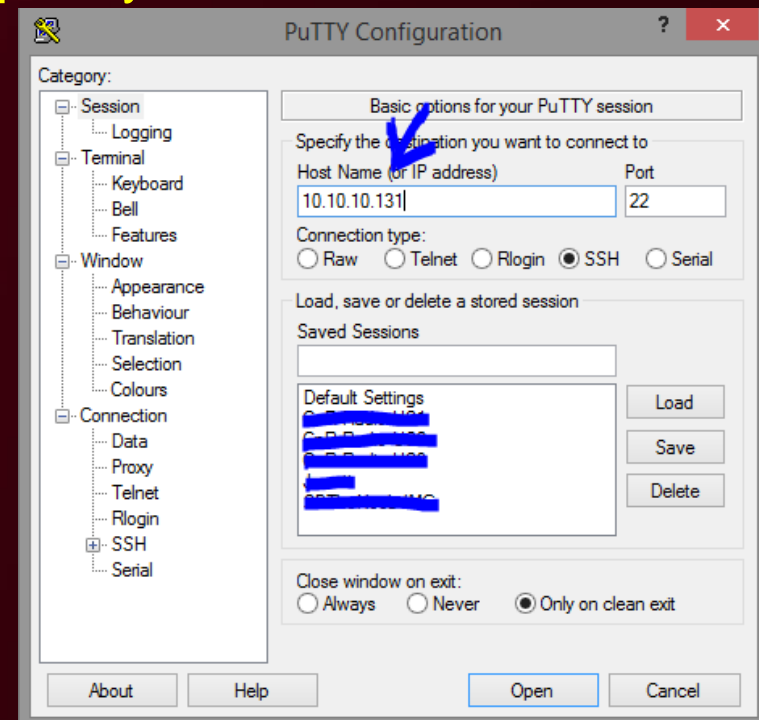
So what do we need for a LAMP stack?

- Hardware
 - Raspberry Pi
 - SD Card of at least 4GB or bigger
 - Active Network/Internet Connection
 - Power Adapter
- Software
 - Raspbian
 - Apache
 - MySQL
 - PHP
 - VSFTPD
 - PuTTY on our computer
 - FileZilla (FTP and SFTP)



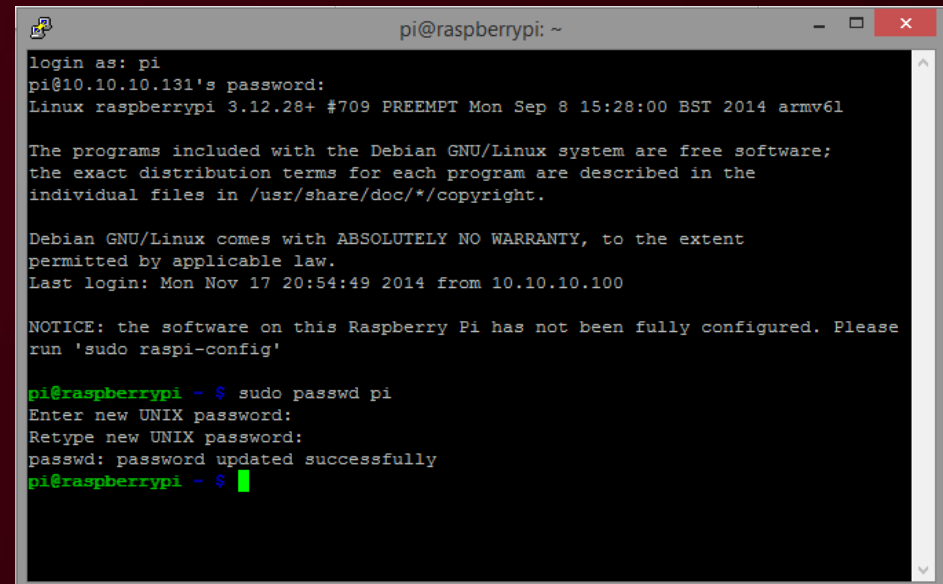
1. SSH into the Raspberry Pi

- We need to SSH into the Raspberry Pi.
- This assumes we know the IP address and that the SSH server is running. By default, it will be running on port 22
- If you need obtain the IP, plug your Raspberry Pi into a TV/Monitor.
- Login with the following credentials:
 - Username: pi
 - Password: raspberry
- Run the command `ifconfig`
- It will return an IP address



2. Update Login Credentials

- If you haven't done so already, we need to modify the login credentials for security reasons.
- Run the following command:
 - `sudo passwd pi`
- The command above will allow you to change the password.
- When you are inserting the password, it will appear blank, but it is actually working.

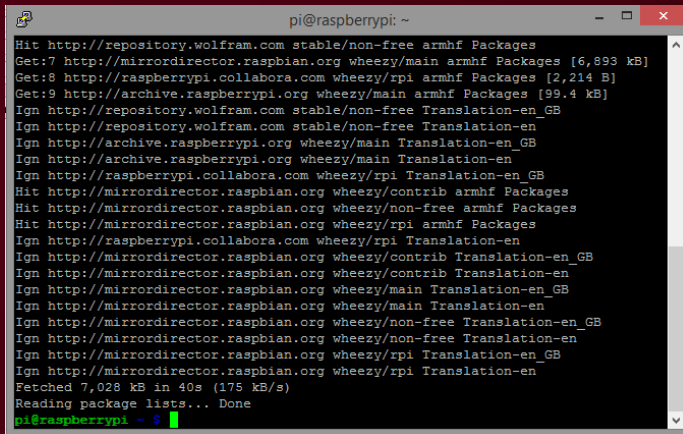


```
pi@raspberrypi: ~  
login as: pi  
pi@10.10.10.131's password:  
Linux raspberrypi 3.12.28+ #709 PREEMPT Mon Sep 8 15:28:00 BST 2014 armv6l  
  
The programs included with the Debian GNU/Linux system are free software;  
the exact distribution terms for each program are described in the  
individual files in /usr/share/doc/*/copyright.  
  
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent  
permitted by applicable law.  
Last login: Mon Nov 17 20:54:49 2014 from 10.10.10.100  
  
NOTICE: the software on this Raspberry Pi has not been fully configured. Please  
run 'sudo raspi-config'  
  
pi@raspberrypi ~$ sudo passwd pi  
Enter new UNIX password:  
Retype new UNIX password:  
passwd: password updated successfully  
pi@raspberrypi ~$
```

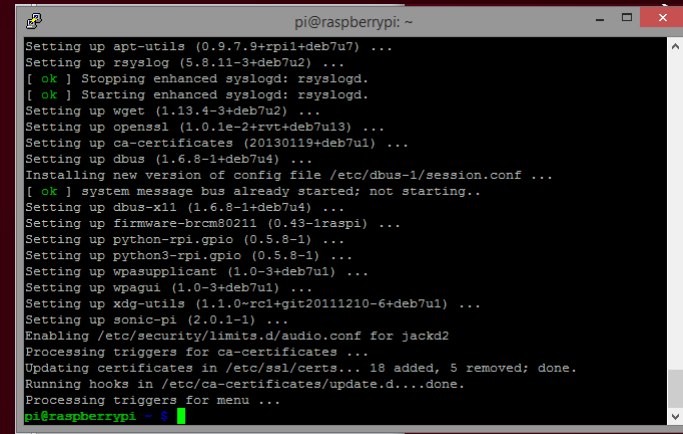


3. Run Updates/Upgrades

- We need to make sure the repositories and packages on the Raspberry Pi are up-to-date.
- Run the following commands:
 - `sudo apt-get update`
 - `sudo apt-get upgrade`
- Follow the prompts and answer Y when necessary.



```
pi@raspberrypi: ~  
Hit http://repository.wolfram.com stable/non-free armhf Packages  
Get:7 http://mirrordirector.raspbian.org wheezy/main armhf Packages [6,893 kB]  
Get:8 http://raspberrypi.collabora.com wheezy/rpi armhf Packages [2,214 B]  
Get:9 http://archive.raspberrypi.org wheezy/main armhf Packages [99.4 kB]  
Ign http://repository.wolfram.com stable/non-free Translation-en_GB  
Ign http://repository.wolfram.com stable/non-free Translation-en  
Ign http://archive.raspberrypi.org wheezy/main Translation-en_GB  
Ign http://archive.raspberrypi.org wheezy/main Translation-en  
Ign http://raspberrypi.collabora.com wheezy/rpi Translation-en_GB  
Hit http://mirrordirector.raspbian.org wheezy/contrib armhf Packages  
Hit http://mirrordirector.raspbian.org wheezy/non-free armhf Packages  
Hit http://mirrordirector.raspbian.org wheezy/rpi armhf Packages  
Ign http://raspberrypi.collabora.com wheezy/rpi Translation-en  
Ign http://mirrordirector.raspbian.org wheezy/contrib Translation-en_GB  
Ign http://mirrordirector.raspbian.org wheezy/contrib Translation-en  
Ign http://mirrordirector.raspbian.org wheezy/main Translation-en_GB  
Ign http://mirrordirector.raspbian.org wheezy/main Translation-en  
Ign http://mirrordirector.raspbian.org wheezy/non-free Translation-en_GB  
Ign http://mirrordirector.raspbian.org wheezy/non-free Translation-en  
Ign http://mirrordirector.raspbian.org wheezy/rpi Translation-en_GB  
Ign http://mirrordirector.raspbian.org wheezy/rpi Translation-en  
Fetched 7,028 kB in 40s (175 kB/s)  
Reading package lists... Done  
pi@raspberrypi ~ $
```

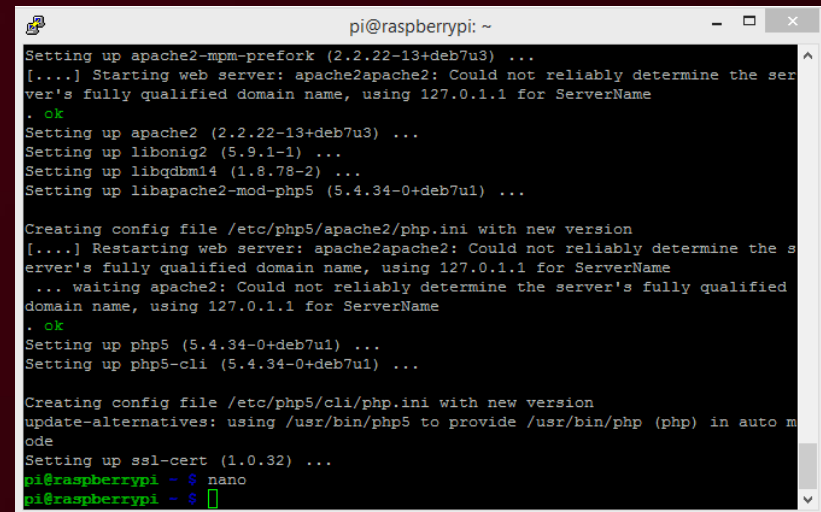


```
pi@raspberrypi: ~  
Setting up apt-utils (0.9.7.9+rp1+deb7u7) ...  
Setting up rsyslog (5.8.11-3+deb7u2) ...  
[ ok ] Stopping enhanced syslogd: rsyslogd.  
[ ok ] Starting enhanced syslogd: rsyslogd.  
Setting up wget (1.13.4-3+deb7u2) ...  
Setting up openssl (1.0.1e-2+rvt+deb7u13) ...  
Setting up ca-certificates (20130119+deb7u1) ...  
Setting up dbus (1.6.8-1+deb7u4) ...  
Installing new version of config file /etc/dbus-1/session.conf ...  
[ ok ] system message bus already started: not starting..  
Setting up dbus-x11 (1.6.8-1+deb7u4) ...  
Setting up firmware-brcm80211 (0.43-1raspi) ...  
Setting up python3-rpi.gpio (0.5.8-1) ...  
Setting up python3-rpi.gpio (0.5.8-1) ...  
Setting up wpasupplicant (1.0-3+deb7u1) ...  
Setting up wpagui (1.0-3+deb7u1) ...  
Setting up xdg-utils (1.1.0-rc1+git20111210-6+deb7u1) ...  
Setting up sonic-pi (2.0.1-1) ...  
Enabling /etc/security/limits.d/audio.conf for jackd2  
Processing triggers for ca-certificates ...  
Updating certificates in /etc/ssl/certs... 18 added, 5 removed; done.  
Running hooks in /etc/ca-certificates/update.d...done.  
Processing triggers for menu ...  
pi@raspberrypi ~ $
```



4. Install Apache2 and PHP5

- We need to install the web server, Apache2. We will also install PHP5 and the necessary library to make it work with Apache2.
- Run the following commands:
 - `sudo apt-get install apache2 php5 libapache2-mod-php5`
- Follow the prompts and answer Y when necessary.
- Once you've done this, open your web browser and browse to `http://IPADDRESS`
- It should display an "It Works!" page!




```
pi@raspberrypi: ~  
Setting up apache2-mpm-prefork (2.2.22-13+deb7u3) ...  
[....] Starting web server: apache2apache2: Could not reliably determine the server's fully qualified domain name, using 127.0.1.1 for ServerName  
. ok  
Setting up apache2 (2.2.22-13+deb7u3) ...  
Setting up libonig2 (5.9.1-1) ...  
Setting up libqdbm14 (1.8.78-2) ...  
Setting up libapache2-mod-php5 (5.4.34-0+deb7u1) ...  
  
Creating config file /etc/php5/apache2/php.ini with new version  
[....] Restarting web server: apache2apache2: Could not reliably determine the server's fully qualified domain name, using 127.0.1.1 for ServerName  
... waiting apache2: Could not reliably determine the server's fully qualified domain name, using 127.0.1.1 for ServerName  
. ok  
Setting up php5 (5.4.34-0+deb7u1) ...  
Setting up php5-cli (5.4.34-0+deb7u1) ...  
  
Creating config file /etc/php5/cli/php.ini with new version  
update-alternatives: using /usr/bin/php5 to provide /usr/bin/php (php) in auto mode  
Setting up ssl-cert (1.0.32) ...  
pi@raspberrypi ~ $ nano  
pi@raspberrypi ~ $
```




5. Test PHP5

- Create a file in `/var/www/` called `phptest.php`
- You can use `nano`, `vi`, `vim`, or your favorite text editor.
- Run the following command:
 - `sudo nano /var/www/phptest.php`
- Inside this file, put the following line:
 - `<?php phpinfo(); ?>`
- Press `Ctrl+O` to write the file and then press enter.
- Try `http://IP/phptest.php`
- It should display PHP info.

PHP Version 5.4.34-0+deb7u1 

System	Linux raspberrypi 3.12.28+ #709 PREEMPT Mon Sep 8 15:28:00 BST 2014 armv6l
Build Date	Nov 5 2014 13:28:17
Server API	Apache 2.0 Handler
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc/php5/apache2
Loaded Configuration File	/etc/php5/apache2/php.ini
Scan this dir for additional .ini files	/etc/php5/apache2/conf.d
Additional .ini files parsed	/etc/php5/apache2/conf.d/10-pdo.ini
PHP API	20100412
PHP Extension	20100525
Zend Extension	220100525
Zend Extension Build	API220100525.NTS
PHP Extension Build	API20100525.NTS
Debug Build	no
Thread Safety	disabled
Zend Signal Handling	disabled
Zend Memory Manager	enabled
Zend Multibyte Support	provided by mbstring
IPv6 Support	enabled
DTrace Support	disabled
Registered PHP Streams	https, ftps, compress.zlib, compress.bzip2, php, file, glob, data, http, ftp, phar, zip
Registered Stream Socket Transports	tcp, udp, unix, udg, ssl, sslv3, tls
Registered Stream Filters	zlib.*, bzip2.*, convert.iconv.*, string.rot13, string.toupper, string.tolower, string.strip_tags, convert.*, consumed, dechunk

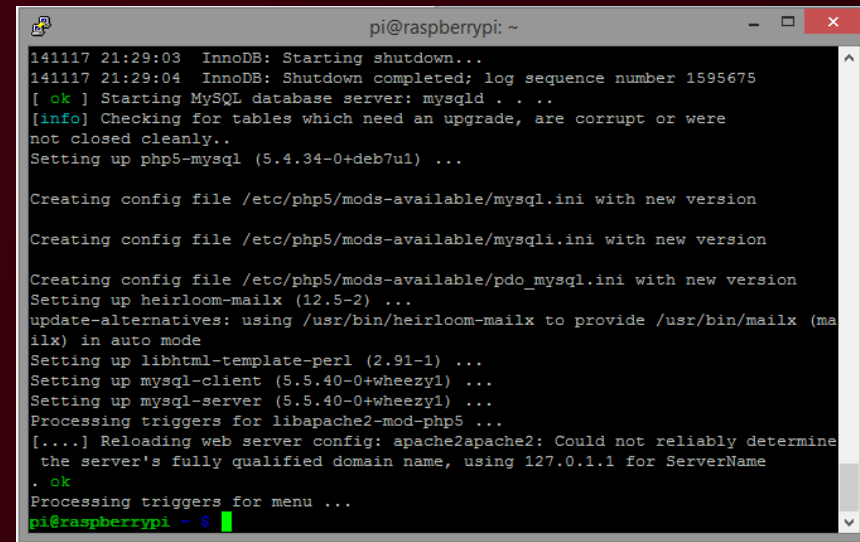
This program makes use of the Zend Scripting Language Engine:
Zend Engine v2.4.0, Copyright (c) 1998-2014 Zend Technologies

Powered By 



6. Install MySQL

- We need to install our database server to complete the LAMP stack.
- Run the following command:
 - `sudo apt-get install mysql-server mysql-client php5-mysql`
- Follow the prompts and answer Y when necessary.
- One of the prompts will ask for a root password.
- Set the password to something you'll remember.



```
pi@raspberrypi: ~
141117 21:29:03 InnoDB: Starting shutdown...
141117 21:29:04 InnoDB: Shutdown completed; log sequence number 1595675
[ ok ] Starting MySQL database server: mysqld . . .
[info] Checking for tables which need an upgrade, are corrupt or were
not closed cleanly..
Setting up php5-mysql (5.4.34-0+deb7u1) ...

Creating config file /etc/php5/mods-available/mysql.ini with new version

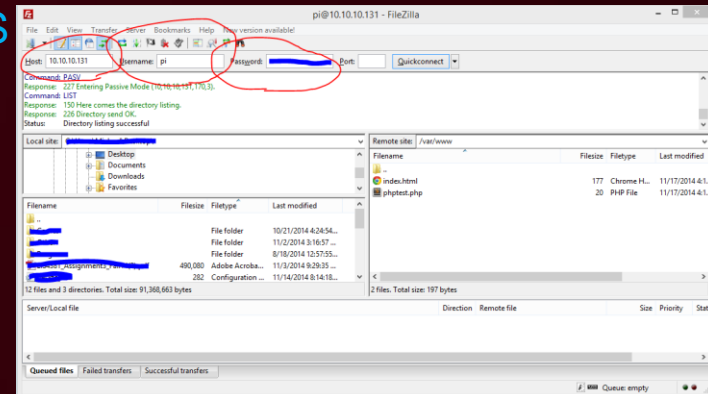
Creating config file /etc/php5/mods-available/mysqli.ini with new version

Creating config file /etc/php5/mods-available/pdo_mysql.ini with new version
Setting up heirloom-mailx (12.5-2) ...
update-alternatives: using /usr/bin/heirloom-mailx to provide /usr/bin/mailx (ma
ilx) in auto mode
Setting up libhtml-template-perl (2.91-1) ...
Setting up mysql-client (5.5.40-0+wheezy1) ...
Setting up mysql-server (5.5.40-0+wheezy1) ...
Processing triggers for libapache2-mod-php5 ...
[....] Reloading web server config: apache2apache2: Could not reliably determine
the server's fully qualified domain name, using 127.0.1.1 for ServerName
. ok
Processing triggers for menu ...
pi@raspberrypi ~ $
```



7. Install VSFTPD (Optional)

- You could develop everything from the Pi or use SFTP for file transfers. It makes more sense to use FTP though in terms of practicality.
- Run the following commands:
 - `sudo chown -R pi /var/www`
 - `sudo apt-get install vsftpd`
 - `sudo nano /etc/vsftpd.conf`
- Make the following modifications within vsftpd.conf using nano:
 - Change `anonymous_enable=YES` to `anonymous_enable=NO`
 - Uncomment `local_enable=YES`
 - Uncomment `write_enable=YES`
 - At the bottom of the file add `force_dot_files=YES`
- Then run the following command:
 - `sudo service vsftpd restart`
- FTP to your server using your pi login and FileZilla!



Some things to consider

- Permissions must be set properly
 - Files should have 644 permissions
 - Directories should have 755 permissions
- This setup is not very secure and is primarily designed for a live testing environment within your own home and to be blocked off from outside access.
- If you are interested in hosting your own website with your own servers, look into using a VPS.
- Again, this is not secure enough for a production environment.

0	---
1	--x
2	-wx
3	-wx
4	r--
5	r-x
6	rw-
7	rwx



Some things to consider

- Adjust your root password to secure your pi.
 - Run the following commands:
 - `sudo passwd root`
 - `sudo usermod -L root`
- If we have time left over, we will perform a WordPress installation.
 - <https://www.digitalocean.com/community/tutorials/how-to-install-wordpress-on-ubuntu-12-04>
 - Do this within the `/var/www/` directory



Questions?



Final Survey: <http://mht.pw/rpipost>

Feel free to ask any questions you may have now!



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<http://mht.pw/LIN>