# Purpose

This document summarizes Raspberry Pi setup as development platform. It will cover external module building and loading, file share setup on RPI.

# Development Setup

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| Hardware | Raspberry Pi 1 Model B |
| Software | Raspberry linux based distribution image from raspberry official site :https://www.raspberrypi.org/downloads/ |

# Building kernel loadable modules

## Getting kernel headers

Raspberry Pi distribution image doesn’t come with linux headers included which are prerequisite to kernel loadable module building. Thus user need to retrieve headers of linux kernel distribution package is based on.

There are several ways to find out and retrieve kernel version, easiest of them include using rpi-source

Script. Script searches for matching kernel distribution from github and install in on raspberry pi machine.

Follow steps here: <https://github.com/notro/rpi-source/wiki>

Please note though rpi-source deprecated but still work well in many cases.

Other than rpi-source, user may refer to this link to fetch matching source code to binary image <http://www.raspberrypi.org/forums/viewtopic.php?f=66&t=82811&p=726802#p726802>.

## Building for Raspberry Pi

Once you have kernel tarball do the following steps:

* Untar linux source code on to pi and create symbolic link
* sudo ln -s /home/pi/src/linux /lib/modules/`uname -r`/build  
  sudo ln -s /home/pi/src/linux /lib/modules/`uname -r`/source
* cd linux
* make clean
* make bcmrpi\_defconfig
* make modules\_prepare
* zcat /proc/config.gz > .config
* cp ../firmware/extra/modules.symvers ./modules.symvers

Now your raspberry is ready for compilation.

## Setting up samba share of home directory on RPI

Follow instructions here: <http://elinux.org/R-Pi_NAS>

## Troubleshooting

* Having issues with gcc version using rpi-source?

Raspberry Pi kernel distribution package Debian Wheezy comes with gcc version 4.3.3 however most of the kernels are built with version 4.8.8 or higher. If you see issues while building on rpi of gcc-version you can follow instructions at https://github.com/notro/rpi-source/wiki. There are two links to update and install gcc to 4.8, please use jessie version. As non-jessie mode will install gcc-4.8.2 and that version shows issues compiling downloaded kernel. I used Jessie mode and it installed version 4.8.4 for me. When I executed rpi-source after installing this, it executed modules\_prepare command successfully. Much of the information on this link was helpful <http://www.embedded.com/electronics-blogs/open-mike/4437876/Getting-Started-with-Embedded-Linux---Part-Nine-Self-hosted-development>

* Booting RPI with another kernel version:

Booting raspberry with 3.18.9+ version works. If you follow cross compiler instruction here to compile source code <http://www.raspberrypi.org/documentation/linux/kernel/building.md> and copy kernel image on boot sector of sdcard , you can boot through that kernel. However if you build some module on that kernel version and simply copy it on Pi it fails to load.

Also, modules\_install command on cross compiler fails with message “arm-linux-gnueabi-gcc:Command not found”. Booting with another kernel needs some exercise and will be tried later

Download toolchain: git clone https://github.com/raspberrypi/tools

Firmware: git clone <https://github.com/raspberrypi/firmware>

However this will pull latest on branch. You will need to know commit-id of the one matching to your kernel image and check out that. Please refer to this link to get some help: <http://www.raspberrypi.org/forums/viewtopic.php?f=66&t=82811&p=726802#p726802>