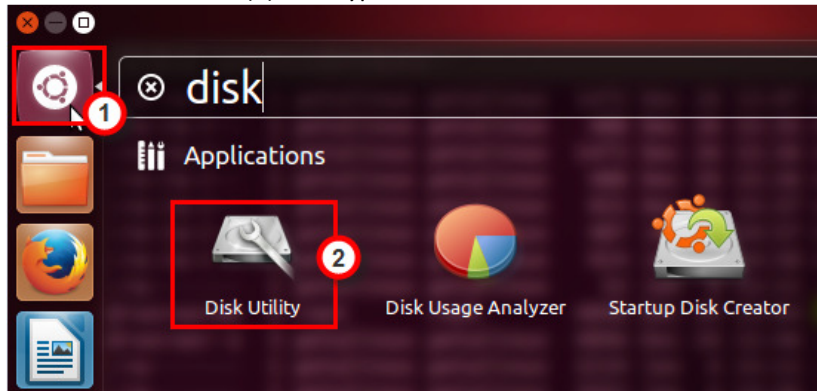


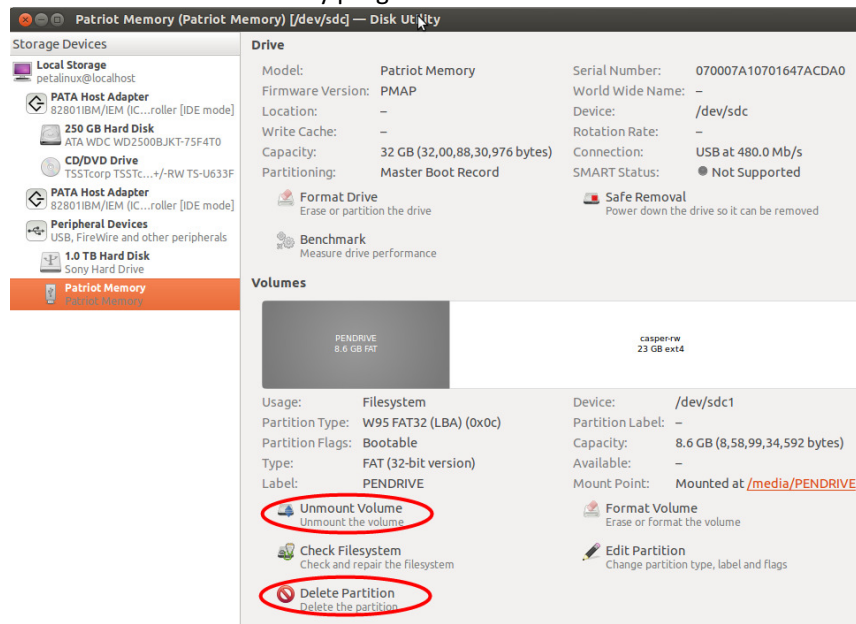
# Procedure to Create and Duplicate Master LiveUSB Stick

## A. Creating a Master LiveUSB stick

1. Formatting USB stick having Linux partition (skip this step if you are using a new USB stick)
  - a. Connect the target USB Stick to the Ubuntu machine.
  - b. Click the **Dash Home (1)**, and type “disk ”

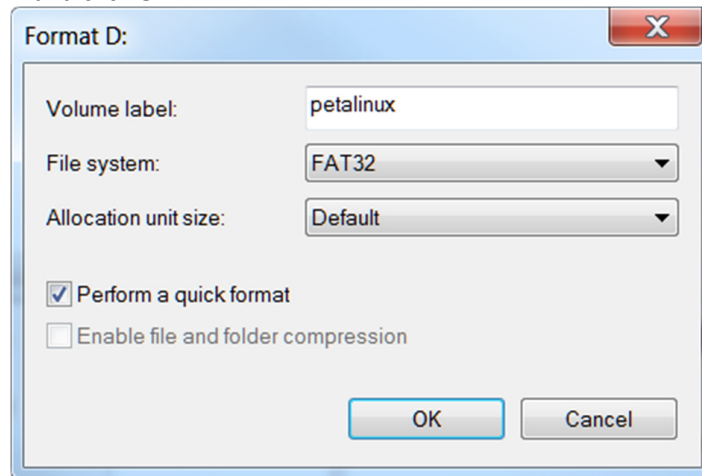


- c. Select the “**Disk Utility**” (2) to format the USB Stick.
  1. Select your USB Device
  2. Unmount the volume(s) of the USB device one by one by selecting each volume
  3. Delete partition(s) of the unmounted volume(s)  
You should only see one volume
  4. Select the volume and click **Create Partition**
  5. Select type as *FAT* and give *petalinux* in the Name field, and click **Create**
  6. Close the Disk Utility program and remove the USB Device



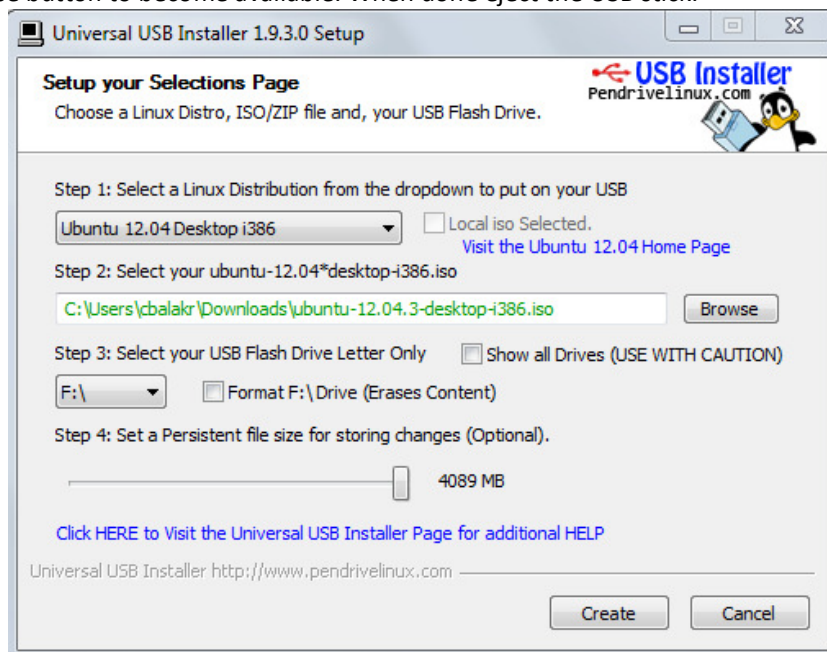
- d. Connect the USB Stick to the windows machine. The Windows OS will prompt for formatting the device. Click Format Disk. In case the OS does not prompt, you can check and format (if necessary) the device using the following method:
  1. My Computer > Manage > Storage > Disk Management

If it shows that the stick is formatted in FAT32, then eject the stick. If not, then right-click on the disk and select Format. Select FAT32 as the format and click **OK**.



2. Use the Universal USB Installer exe to create LiveUSB
  - a. Launch the tool **Universal-USB-Installer-1.9.3.0.exe** (Available in the LiveUSB\_2013.10 folder)
  - b. Step 1: Select **Ubuntu 12.04 Desktop i386**
  - c. Step 2: Select the iso image **ubuntu-12.04.3-desktop-i386.iso** (Download the 32-bit image [Ubuntu-12.04.3-desktop-i386.iso] from the web)
  - d. Step 3: Select your drive (leave the Format option unchecked)
  - e. Step 4: Set the Persistent the full size (about 4089 MB)
  - f. Click **Create**
  - g. Click **YES**

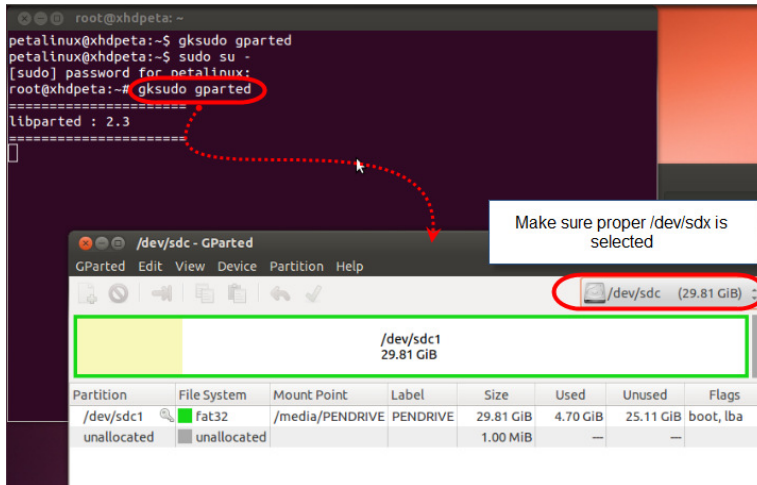
This may take up to 10 minutes. Make sure that the procedure is complete. Wait for the close button to become available. When done eject the USB stick.



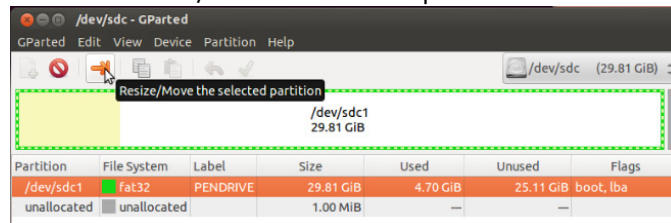
3. Change the persistent

From the above step we can only set a maximum of about 4 GB. We need to increase this size because Xilinx tools require more size for installation

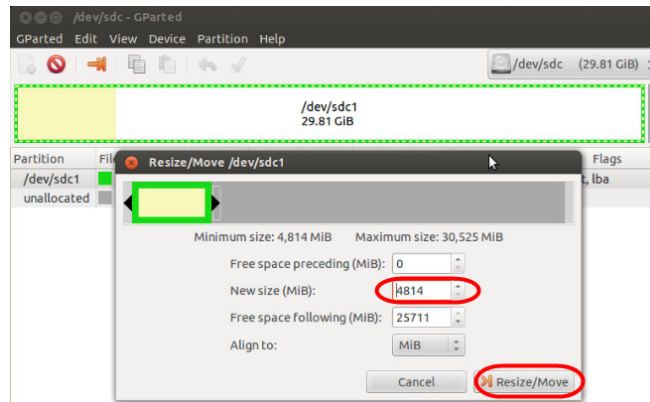
- a. Connect the USB Stick to the Ubuntu machine
- b. Delete the “casper-rw” file in the USB Stick using explorer
- c. Open a Terminal window and run the command  
`gksudo gparted`  
 It may ask for the administrator password. If it does, then enter the password.  
 If gparted is not installed then download and install using  
`sudo apt-get install gparted`



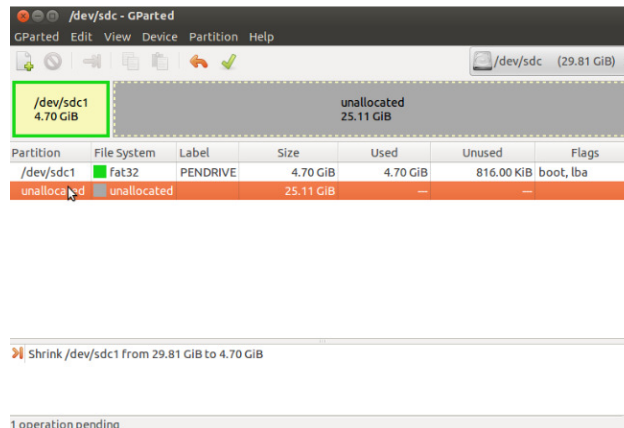
1. Select your device (`/dev/sdc` in this case)
2. Right-click on the selected device and click Unmount
3. Select the Resize/Move the selected partition



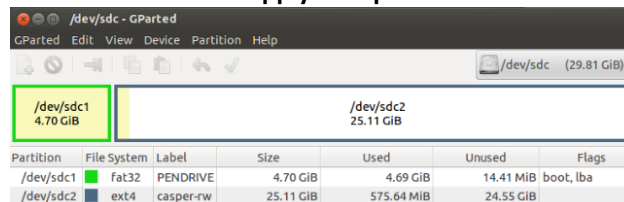
4. Set the New Size as Minimum size (in this case 4814). Click in either *Free Space preceding* or *Free Space following* field to make the **Resize/Move** button visible.



5. Click **Resize/Move** button.
6. Right-click **unallocated** and select **New**



7. Select the File System – **ext4**
8. Label should be **“casper-rw”**
9. Click **Add**
10. Select **Edit > Apply All Operations**



11. Click Close when the operation is completed.
12. Close the GParted application.

4. Boot a system using the created LiveUSB

5. Create a user name – petalinux

- a. Open a terminal window
- b. Become super user by executing the following command  
`sudo su -`
- c. Type the following command to add a new user  
`adduser petalinux`
- d. Set the password as `petalinux`
- e. Hit Enter key to use the default user info (five times), and then “y” to accept
- f. Change the privilege of the new user (petalinux) as root  
`gedit /etc/sudoers`

1. Add the line marked in yellow color as shown below, save the file and close the gedit program.

```
# User privilege specification
root ALL=(ALL:ALL) ALL
# Members of the admin group may gain root privileges
%admin ALL=(ALL) ALL
%petalinux ALL=(ALL)NOPASSWD: ALL
# Allow members of group sudo to execute any command
%sudo ALL=(ALL:ALL) ALL
```

- g. To enable the graphical login, use gedit, make changes, save the file and close gedit  
`gedit /etc/lightdm/lightdm.conf`  
Change the line:  
`autologin-user=ubuntu`  
to

`autologin-user=`

and add the following line at the end of the file to make the login greeter show up:

`greeter-show-manual-login=true`

6. Reboot the system by typing the `reboot` command at the command prompt, and login as `petalinux`
7. Open a terminal window
8. Install Xilinx Vivado 2013.3 and PetaLinux 2013.10 tools (PetaLinux 2013.10 is validated with Vivado 2013.3 so use this version)
  - a. Login as root user using  
`sudo su -`
  - b. Create a folder `pkg` under `/opt` by typing the following commands  
`cd /opt`  
`mkdir pkg`
  - c. Download the Vivado 2013.3 tool from the Xilinx website
  - d. Install Xilinx Vivado 2013.3
    1. Change the permission of the following files using `chmod 755` command
      1. `xsetup`
      2. `<Path_to_xilinx_install>/bin/linux_xsetup`
      3. `<Path_to_xilinx_install>/bin/linux_xsetup` files
    2. Install the Xilinx Vivado tool : `./xsetup` from the install directory  
If the machine is connected on network, you may be presented an option to download 2013.4 version tools. Click **No** as we want to use 2013.3 version tools.
      1. During installation, specify the Destination Directory as `/opt/pkg/Xilinx`
9. Install PetaLinux
  - a. The packages in the figure below are required to run the PetaLinux tool. Follow the instructions given below to install the packages.

Tool/Library	YUM/RPM Package for RHEL/CentOS/Fedora	APT Package for Debian/Ubuntu	RPM Package for SuSE
dos2unix	dos2unix	tofrodos	dos2unix
ip	iproute	iproute	iproute2
gawk	gawk	gawk	gawk
gcc	gcc	gcc	gcc
git	git	git-core	git-core
make	gnutls-devel	make	make
netstat	net-tools	net-tools	net-tools
ncurses	ncurses-devel	ncurses-dev	ncurses-devel
tftp server	tftp-server	tftpd	tftp-server
zlib	zlib-devel	zlib1g-dev	zlib-devel
flex	flex	flex	flex
bison	bison	bison	bison
32bit libs	libstdc++-4.4.6-4.el6.i686 glibc.i686 libgcc.i686	ia32-libs lib32ncursesw5	32-bit runtime environment

Note: 32bit libs installation is not required on a 32-bit machine. Also, some of the packages are already part of the installed Ubuntu version.

To check the package installed, execute the following command:

```
dpkg -l | grep <package_name>
```

- b. Do the following steps using root access:**

Enable the proxy if required (if you are using proxy, then you need to do this step):

```
export http_proxy=http://proxy:8080
apt-get update
apt-get install tofrodos
apt-get install gawk
apt-get install git-core
apt-get install ncurses-dev
apt-get install zlib1g-dev
apt-get install flex
apt-get install bison
```

**10. Install and run tftp server**

- a. Install the extended Internet daemon**

```
apt-get install xinetd
```

Since tftpd package (tftpd\_0.17-17ubuntu1\_i386.deb) cannot be downloaded from the internet using LiveUSB stick, the package is available in the provided **LiveUSB\_2013.10** directory.

```
dpkg -i tftpd_0.17-17ubuntu1_i386.deb
apt-get install tftpd
```

- b. Create /etc/xinetd.d/tftp file and add the following entry**

```
gedit /etc/xinetd.d/tftp
```

Add the below lines to the file and save it.

```
service tftp
{
protocol          = udp
port              = 69
socket_type       = dgram
wait              = yes
user              = nobody
server            = /usr/sbin/in.tftpd
server_args       = /tftpboot
disable           = no
}
```

- c. Create the folder /tftpboot which was assigned to server\_args.**

```
mkdir /tftpboot
chmod -R 777 /tftpboot
chown -R nobody /tftpboot
```

- d. Restart the xinetd service by typing the following command.**

```
/etc/init.d/xinetd restart
```

**11. Install Serial port**

- a. Install the following packages for serial communication**

```
apt-get install libvte-common
apt-get install libvte9
```

- b. Install the following packages (provided to you in LiveUSB\_2013.10 folder) to install**

**gtkterm:**

```
dpkg -i libvte9_0.28.2-3ubuntu2_i386.deb
dpkg -i gtkterm_0.99.7~rc1-0ubuntu1_i386.deb
```

## 12. Installing the DHCP Server functionality

### a. Install the DHCP server

```
apt-get install dhcp3-server
```

### b. Configuring DHCP server

#### 1. Open the /etc/default/isc-dhcp-server file.

```
gedit /etc/default/isc-dhcp-server
```

#### 2. Edit the file as given below.

Find this line

```
INTERFACES=""
```

REPLACE as shown below

```
INTERFACES="eth0"
```

NOTE: According to your PC id, please change to eth0/eth1...

#### 3. Open the dhcpd.conf file.

```
gedit /etc/dhcp/dhcpd.conf
```

#### 4. Look for the following lines

```
default-lease-time 600;
```

```
max-lease-time 7200;
```

Replace those lines and/or add the following lines shown in the red box:

```
# option definitions common to all supported networks...
option domain-name "example.org";
option domain-name-servers ns1.example.org, ns2.example.org;
```

```
default-lease-time 86400;
max-lease-time 604800;

option subnet-mask 255.255.255.0;
option broadcast-address 192.168.1.255;
option routers 192.168.1.254;
option domain-name-servers 192.168.1.10;

subnet 192.168.1.0 netmask 255.255.255.0 {range
192.168.1.1 192.168.1.200;
}
```

## 13. Install NFS

### a. Get nsf-kernel-server by executing the following command

```
apt-get install nfs-kernel-server
```

### b. Open the file /etc/exports

```
gedit /etc/exports
```

### c. Add the following lines shown in the red box.

```
exports ✖
# /etc/exports: the access control list for filesystems which may be exported
# to NFS clients. See exports(5).
#
# Example for NFSv2 and NFSv3:
# /srv/homes hostname1(rw,sync,no_subtree_check) hostname2(ro,sync,no_subtree_check)
#
# Example for NFSv4:
# /srv/nfs4 gss/krb5i(rw,sync,fsid=0,crossmnt,no_subtree_check)
# /srv/nfs4/homes gss/krb5i(rw,sync,no_subtree_check)
/home/petalinux 192.168.*.*(rw,sync,no_root_squash,no_subtree_check)
```

## 14. Fix missing gmake by typing the following command:

```
ln -s /usr/bin/make /usr/bin/gmake
```

verify by typing the following command

```
which make
```

this should show /usr/bin/make

## 15. Set BASH as default shell

Change the directory to /bin and enter the following commands:

```
mv sh sh_ori
```

```
ln -s /bin/bash sh
```

## 16. Installing the drivers

Change the directory to

```
/opt/pkg/Xilinx/Vivado/2013.3/data/xicom/cable_drivers/lin/digilent/digilent.adept.runtime_2.14.3-i686
```

Enter the command given below.

```
./install.sh
```

Hit Enter several times when prompted to install various components in the default directories

## 17. Install PetaLinux 2013.10

- a. Download the PetaLinux 2013.10 tools from the Xilinx website
- b. Change the permission (chmod 755) of *petalinux-v2013.10-final-installer.run*  

```
chmod 755 petalinux-v2013.10-final-installer.run
```
- c. Run the following command to install PetaLinux in /opt/pkg directory.  

```
./petalinux-v2013.10-final-installer.run /opt/pkg
```
- d. Download the **Avnet-Digilent-ZedBoard-v2013.10-final.bsp** from the Xilinx website.
- e. Copy the BSP **Avnet-Digilent-ZedBoard-v2013.10-final.bsp** to **/opt/pkg**.

## 18. Copy the License file for Vivado and PetaLinux tools

- a. Launch the Vivado tool.
- b. Select Help > Manage License.
- c. Select Manage Licenses tab and select Load License
- d. Provide the path to the license file.

**NOTE: If you have separate license files for Vivado and PetaLinux tools. Have different files name (for e.g., Xilinx\_Vivado.lic and Xilinx\_PetaLinux.lic) and load the license file.**

## 19. Setup Static IP for LiveUSB

- a. Since the labs uses a direct connection between the board and the host PC, the host PC needs to be configured with the static IP. Edit the interfaces file.

```
gedit /home/petalinux/interfaces
```

- b. Add the below lines:

```
auto lo
iface lo inet loopback

auto eth0
iface eth0 inet static
address 192.168.1.1
netmask 255.255.255.0
broadcast 192.168.1.255
gateway 192.168.1.1
```

## 20. Setup Terminal window and other environments

- a. Every time a new Terminal window is opened and during the login certain environment need to be setup. The above created file needs to be copied to the /etc/network/interfaces and network has to be restarted using the steps below ever.

```
gedit /home/petalinux/.bashrc
```

At the end of the file add the following lines:

```
# copy the static IP information to /etc/network/interaces
sudo cp /home/petalinux/interfaces /etc/network/interfaces
sudo /etc/init.d/network-manager stop
```



```

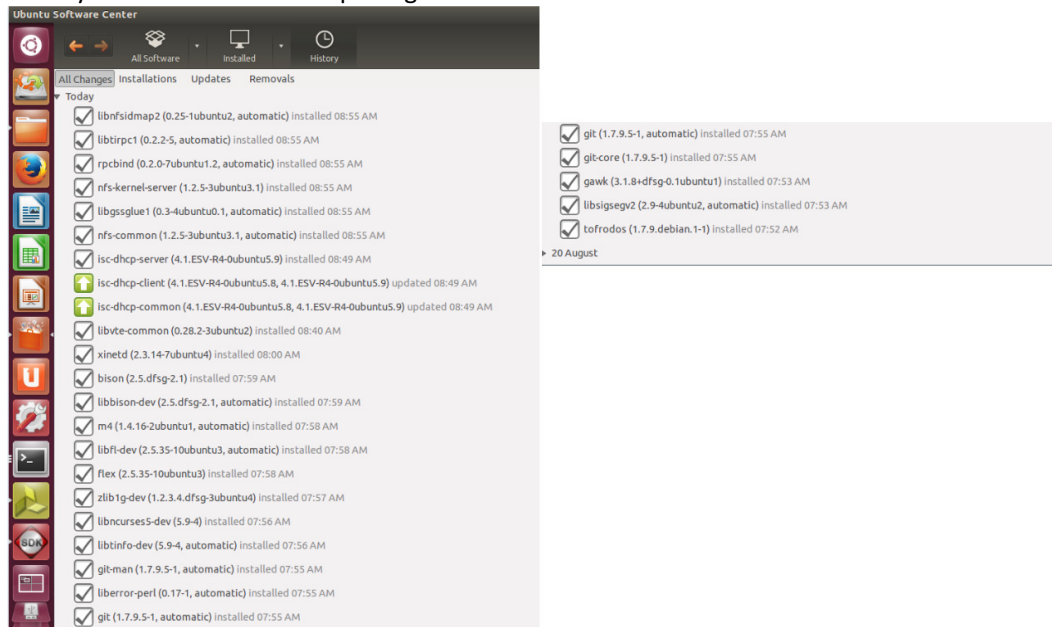
sudo /etc/init.d/networking restart
clear
# source the tools settings
source /opt/pkg/Xilinx/Vivado/2013.3/settings32.sh
source /opt/pkg/petalinux-v2013.10-final/settings.sh

```

- b. Change the ownership of /opt/pkg directory by executing the following command:  
`chown -R petalinux:petalinux /opt/pkg`
- c. Setup the serial port
  1. Set the baud rate as 115200 and port as ttyACM0 by updating the /home/petalinux/.gtktermrc file. However .gtktermrc file will be generated only after launching the serial port terminal. Hence type the following command.  
`gtkterm`
  2. Open the .gtktermrc file using the command  
`gedit /home/petalinux/.gtktermrc`  
Update the following data:  
`port = /dev/ttyACM0`  
`speed = 115200`
- d. Copy the provided lab files into /home/petalinux directory.

21. Restart the LiveUSB

22. To confirm the required packages, you can check the Ubuntu Software Centre and click the History to check the installed packages. It should be similar to the one below.



## **B. Steps for Duplicating the LiveUSB stick**

Note: Your existing Master LiveUSB and the new USB stick to be duplicated should be the same type and same size.

1. Before duplicating, make the changes to the master LiveUSB stick clearing any stale configuration lines (like eth0, eth1,...) if any, found in **/etc/udev/rules.d/70-persistent-net.rules** and propagating that change forward to the LiveUSB

2. Boot a desktop Ubuntu system
3. Insert the master LiveUSB stick in to the USB port.
4. Wait for about 30 seconds and then execute the following command in a terminal window  
`dmesg | tail`  
You should see something like `/dev/sdc1` or `/dev/sdc2` or some other letter `/dev/sdxy`. This indicates that the inserted USB stick (source) is mounted on `/dev/sdc` or `/dev/sdxy`
5. Insert the destination USB stick
6. Again, wait for 30 seconds and then execute the `dmesg` command and observe where it got mounted. For our example, let us say it got mounted on `/dev/sdd`
7. Type the following command to duplicate the Master LiveUSB stick.  
`$ sudo dd if=<Master_LiveUSB_device_name> of=<New_USB_Stick> bs=4096 conv=notrunc,noerror`

i.e., in this case

```
[host]$ sudo dd if=/dev/sdc of=/dev/sdd bs=4096 conv=notrunc,noerror
```

**This will take approximately 30 minutes to duplicate the LiveUSB data.**