



**Department of Electronics and
Electrical Communications Engineering
Faculty of Engineering - Cairo University**

Installing NS-2 on Ubuntu 10.04 & 12.10

for windows users – from the ground up

**Eslam Mostafa
Mahmoud Ayman
Mahmoud Ezz
Mahmoud Mohsen
Mahmoud Rashad
Mostafa Kishk**

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Introduction

This is a screenshot-aided step-by-step tutorial to install Ubuntu 10.04 and Ubuntu 12.10 inside Windows and then NS-2.

This Tutorial is very useful for anyone who wants to try Ubuntu without touching windows. As we'll see later, Ubuntu will be installed inside windows and can be removed from the "Control Panel" like any other installed windows software.

Students who want to use NS-2 may search and find that NS-2 can be installed on windows via "Cygwin". But, believe or not, installing Ubuntu and then NS-2 on it is easier. Also, getting familiar with Ubuntu –or any Linux OS– is very useful for engineers for many reasons that are out of our scope for now.

It's our pleasure to receive feedback or to be asked for any help by email:

gp.team.2013@gmail.com

Why Ubuntu?

Of course, Ubuntu is for free and it's the most famous Linux OS.

A new release of Ubuntu appears every 6 months, but 10.04 is the last version that has the classic simple GUI and it is too enough for our purpose.

But Note that steps of Ubuntu installation here is the same for all the Ubuntu releases.

Requirements

- 1- Internet Connection.

Wired Internet Connection is recommended, as Ubuntu may not identify your Wireless Card.

- 2- A 32-bit Ubuntu 10.04 Desktop ISO.

You can download it form:

<http://releases.ubuntu.com/lucid/ubuntu-10.04.4-desktop-i386.iso>

Or for 12.10

<http://releases.ubuntu.com/quantal/ubuntu-12.10-desktop-i386.iso>

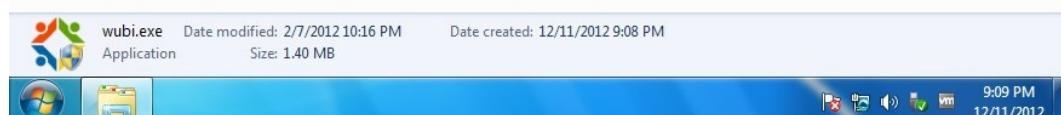
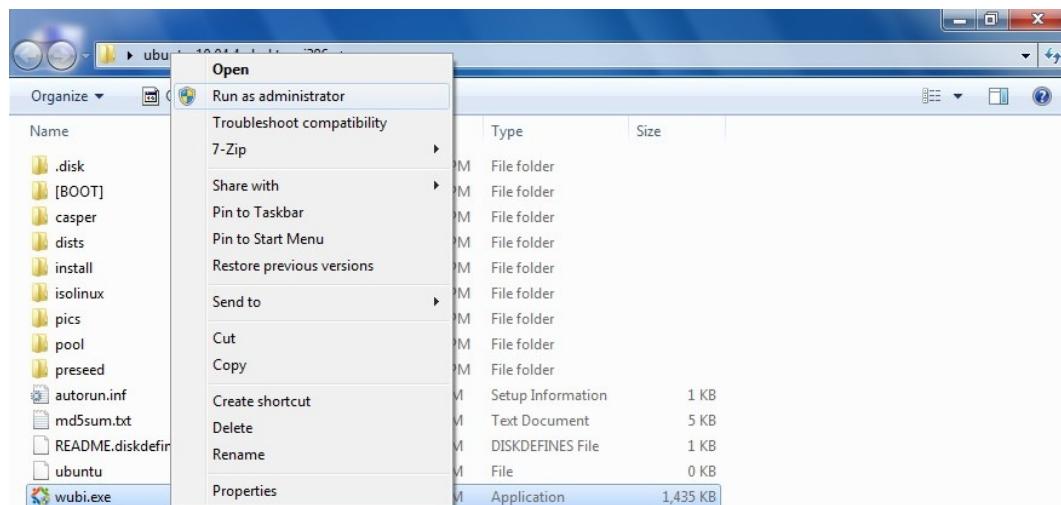
- 3- ISO mounting software. You can download "ISODisk" from:

<http://www.softsea.com/download/ISODisk.html>

- 4- 10GB Free space in your Hard Disk.

Installing Ubuntu

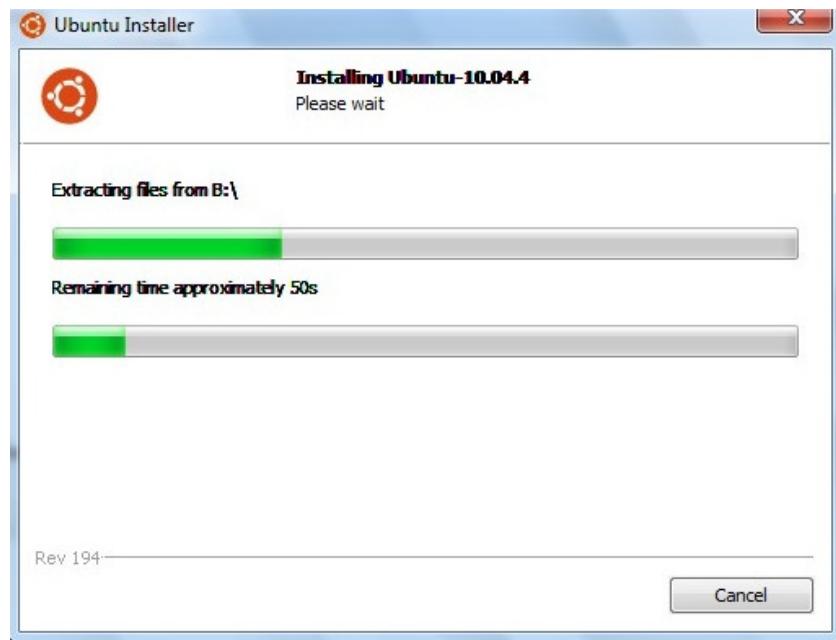
- 1- If you don't have an ISO mounting software, download "ISODisk" and install it, then restart your computer.
- 2- From Start Menu, run "ISODisk". Right Click then choose "run as administrator". Browse for the Ubuntu ISO to mount it in DISK B. Then close it. Go to "My Computer". You should find a Driver called "B" which is a virtual CD-ROM Driver. Double click it.
- 3- Right Click on "wubi" then choose "run as administrator". Choose "install beside windows".



- 4- “Ubuntu Install” windows should appear. Now, it’s recommended that to you disable your internet connection. This will avoid wasting time downloading unimportant updates by the Ubuntu Installer.

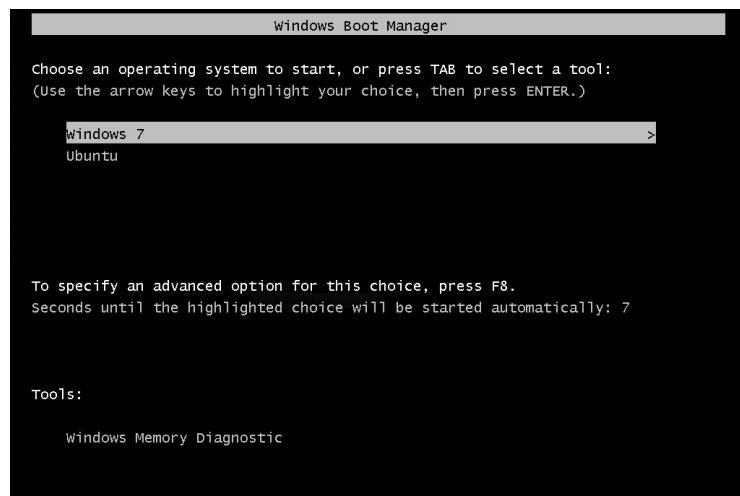


- 5- Choose the installation destination and size (10GB minimum space is recommended). Type your preferred user name and password. **Be careful to make the password short and unforgettable, as you'll be always in need of it.** Then click “install”.

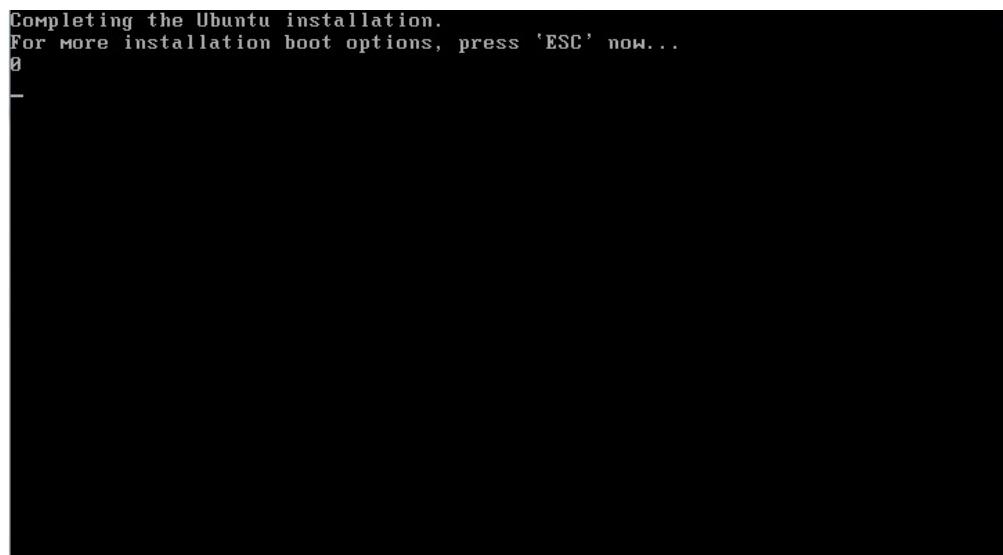


- 6- After Installation, choose “Reboot Now”, and then click “Finish”.
 Note that Ubuntu can open the PDF files. So, put copy this file in any drive except C (or the installation directory) and you then can access it from Ubuntu by clicking the “Places” menu in the upper menu panel.

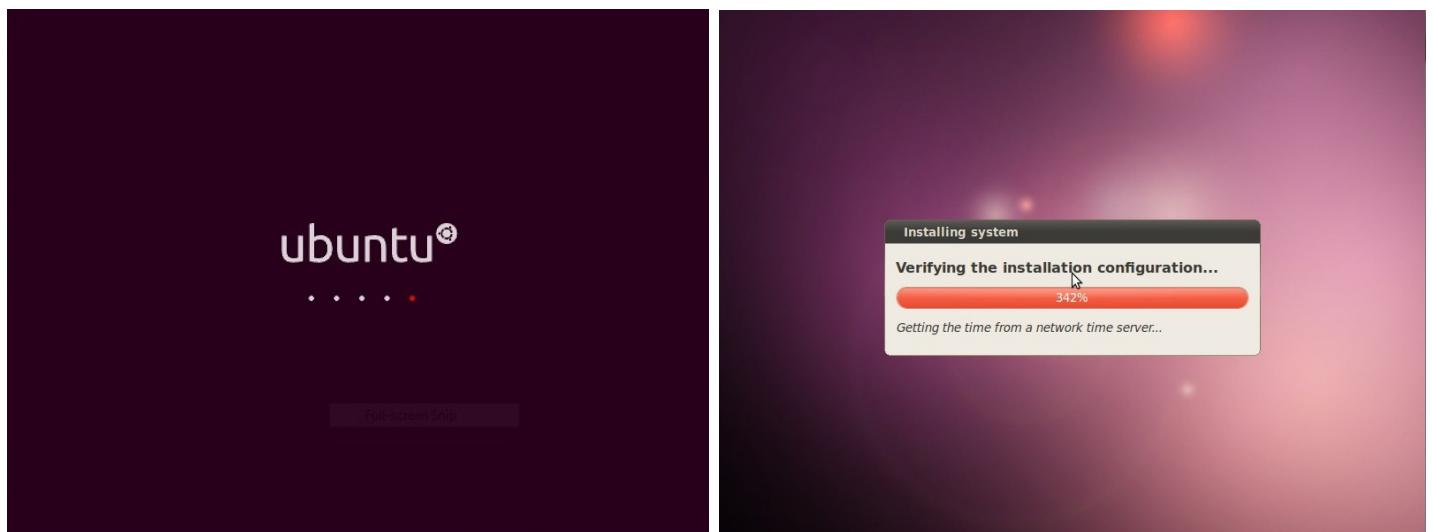
- 7- After Reboot, you should now choose your OS to boot. Simply Press the “Down” Key and OK to choose boot “Ubuntu”.

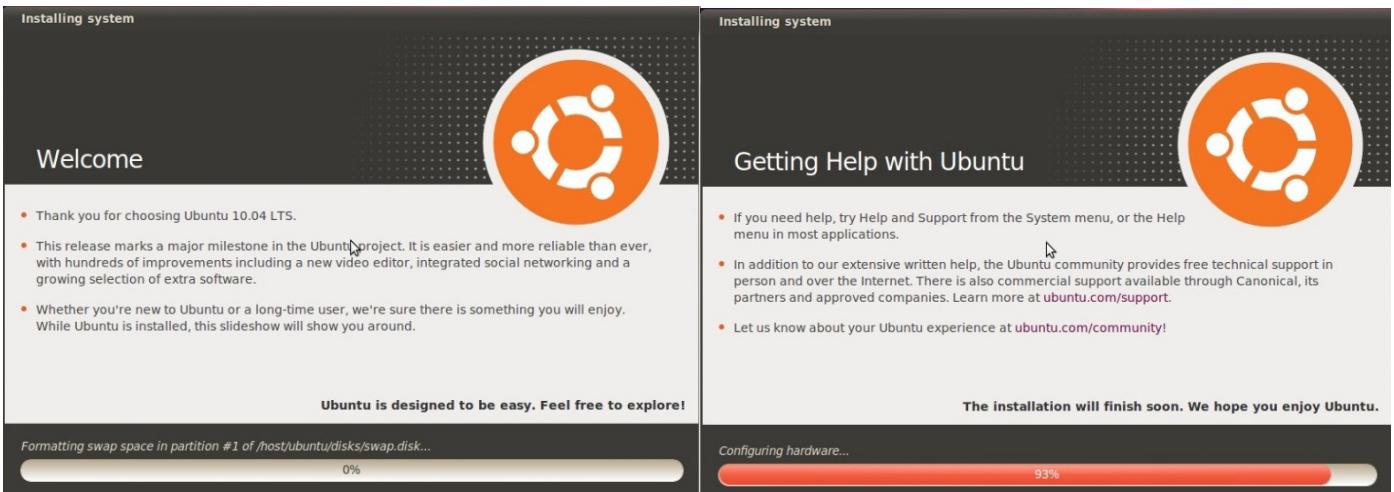


- 8- A message “Ubuntu is completing installation” will appear. **Do not press any key.**

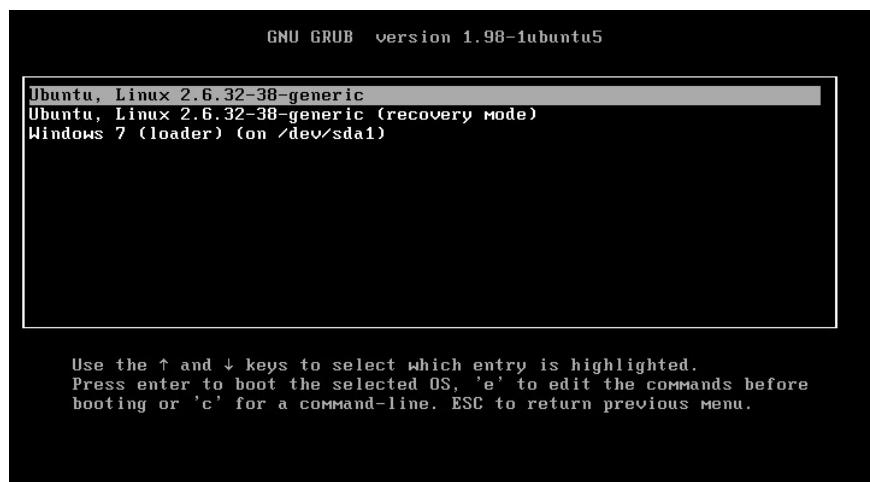


- 9- Ubuntu will complete installation automatically. Just wait.

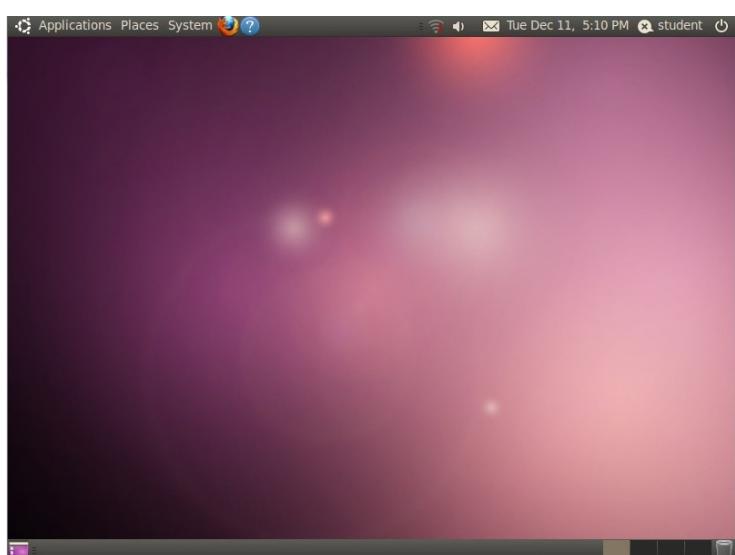




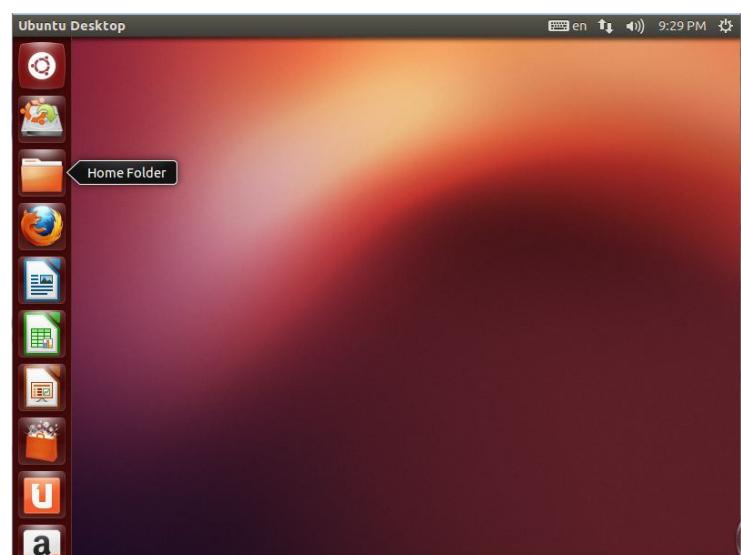
10- Computer will restart. Choose Ubuntu again and then hit the Enter Key to choose “Ubuntu Linux generic”.



11- The log-in screen will appear and the user name of the windows will appear. Choose it and enter your password, then click “log in”.



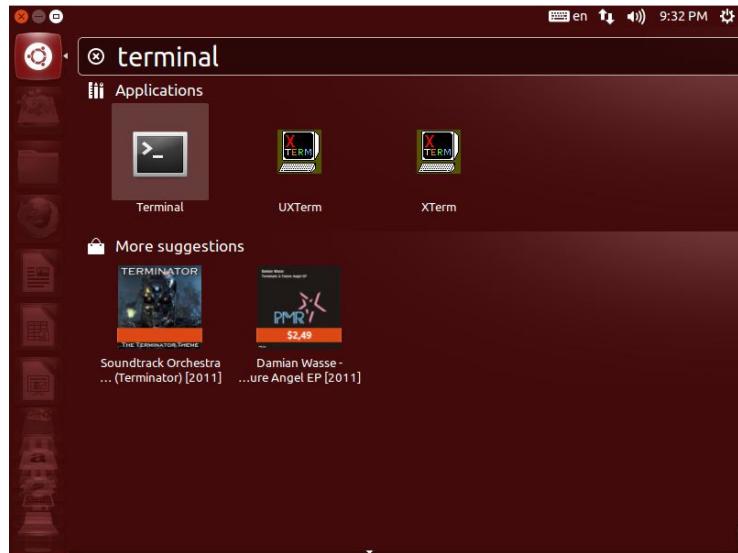
Ubuntu 10.04



Ubuntu 12.10

Installing NS-2 on Ubuntu 12.10

- 1- Click on the up left icon “Dash Home” and Type “terminal” then choose it.



- 2- Type “sudo apt-get update” and hit Enter.

- 3- Type your password and hit Enter.

Note that the password will not appear on screen.

```
student@student: ~
Get:56 http://sd.archive.ubuntu.com quantal-backports/multiverse i386 Packages [14 B]
Get:57 http://sd.archive.ubuntu.com quantal-backports/main Translation-en [14 B]
Get:58 http://sd.archive.ubuntu.com quantal-backports/multiverse Translation-en [14 B]
Get:59 http://sd.archive.ubuntu.com quantal-backports/restricted Translation-en [14 B]
Get:60 http://sd.archive.ubuntu.com quantal-backports/universe Translation-en [1,637 B]
Ign http://sd.archive.ubuntu.com quantal/main Translation-en_US
Ign http://sd.archive.ubuntu.com quantal/multiverse Translation-en_US
Ign http://sd.archive.ubuntu.com quantal/restricted Translation-en_US
Ign http://sd.archive.ubuntu.com quantal/universe Translation-en_US
Ign http://sd.archive.ubuntu.com quantal-updates/main Translation-en_US
Ign http://sd.archive.ubuntu.com quantal-updates/multiverse Translation-en_US
Ign http://sd.archive.ubuntu.com quantal-updates/restricted Translation-en_US
Ign http://sd.archive.ubuntu.com quantal-updates/universe Translation-en_US
Ign http://sd.archive.ubuntu.com quantal-backports/main Translation-en_US
Ign http://sd.archive.ubuntu.com quantal-backports/multiverse Translation-en_US
Ign http://sd.archive.ubuntu.com quantal-backports/restricted Translation-en_US
Ign http://sd.archive.ubuntu.com quantal-backports/universe Translation-en_US
Fetched 18.5 MB in 10min 20s (29.8 kB/s)
Reading package lists... Done
student@student:~$
```

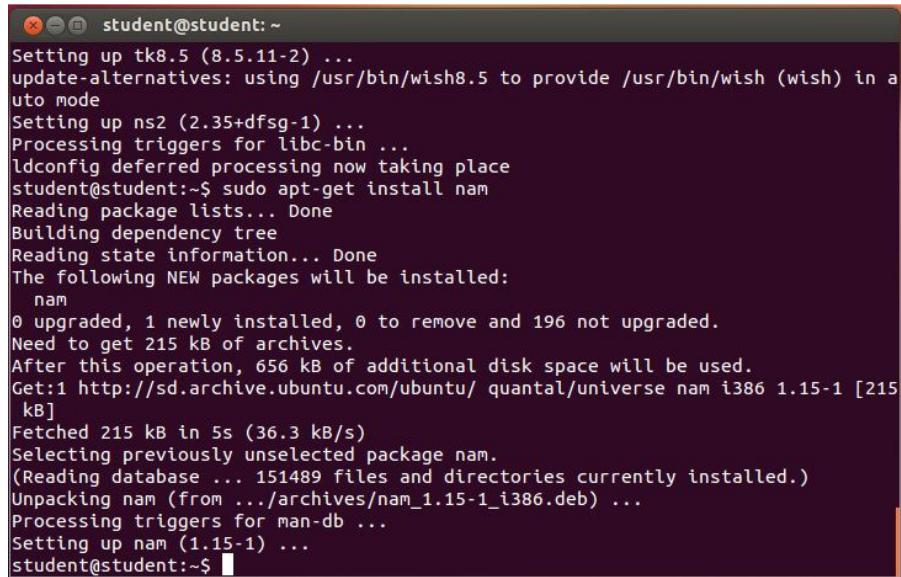
4- Type “sudo apt-get install ns2” and hit Enter.

```
student@student:~$ sudo apt-get install ns2
Get:56 http://sd.archive.ubuntu.com quantal-backports/multiverse i386 Packages [14 B]
Get:57 http://sd.archive.ubuntu.com quantal-backports/main Translation-en [14 B]
Get:58 http://sd.archive.ubuntu.com quantal-backports/multiverse Translation-en [14 B]
Get:59 http://sd.archive.ubuntu.com quantal-backports/restricted Translation-en [14 B]
Get:60 http://sd.archive.ubuntu.com quantal-backports/universe Translation-en [1,637 B]
Ign http://sd.archive.ubuntu.com quantal/main Translation-en_US
Ign http://sd.archive.ubuntu.com quantal/multiverse Translation-en_US
Ign http://sd.archive.ubuntu.com quantal/restricted Translation-en_US
Ign http://sd.archive.ubuntu.com quantal/universe Translation-en_US
Ign http://sd.archive.ubuntu.com quantal-updates/main Translation-en_US
Ign http://sd.archive.ubuntu.com quantal-updates/multiverse Translation-en_US
Ign http://sd.archive.ubuntu.com quantal-updates/restricted Translation-en_US
Ign http://sd.archive.ubuntu.com quantal-updates/universe Translation-en_US
Ign http://sd.archive.ubuntu.com quantal-backports/main Translation-en_US
Ign http://sd.archive.ubuntu.com quantal-backports/multiverse Translation-en_US
Ign http://sd.archive.ubuntu.com quantal-backports/restricted Translation-en_US
Ign http://sd.archive.ubuntu.com quantal-backports/universe Translation-en_US
Fetched 18.5 MB in 10min 20s (29.8 kB/s)
Reading package lists... Done
student@student:~$ sudo apt-get install ns2
```

5- Type “y” and hit Enter. Wait.

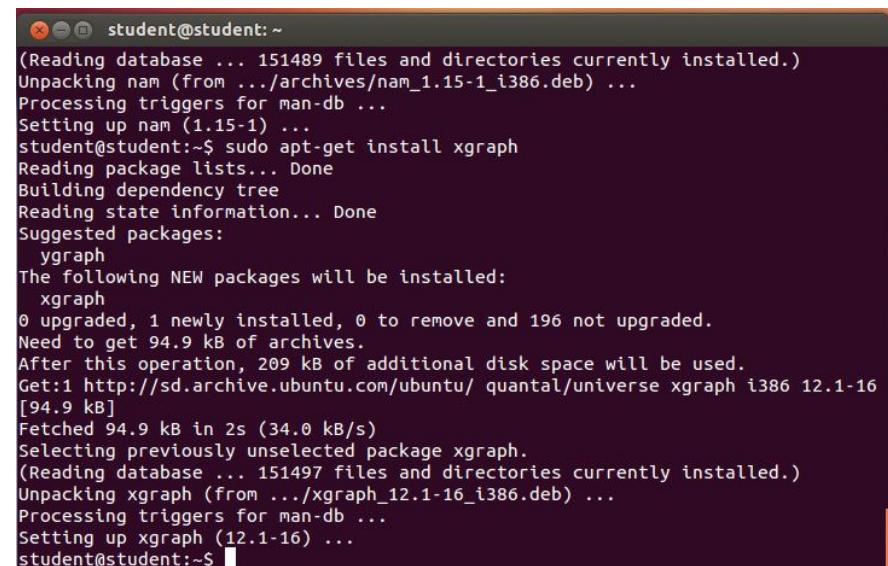
```
student@student:~$ sudo apt-get install ns2
[sudo] password for student:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
  libotcl1 libtclcl1 libxssi1 tcl8.5 tk8.5
Suggested packages:
  gnuplot tcl-tclreadline
The following NEW packages will be installed:
  libotcl1 libtclcl1 libxssi1 ns2 tcl8.5 tk8.5
0 upgraded, 6 newly installed, 0 to remove and 196 not upgraded.
Need to get 7,134 kB of archives.
After this operation, 19.8 MB of additional disk space will be used.
Do you want to continue [Y/n]? ■
```

- 6- Type “sudo apt-get install nam” and hit Enter. Wait.



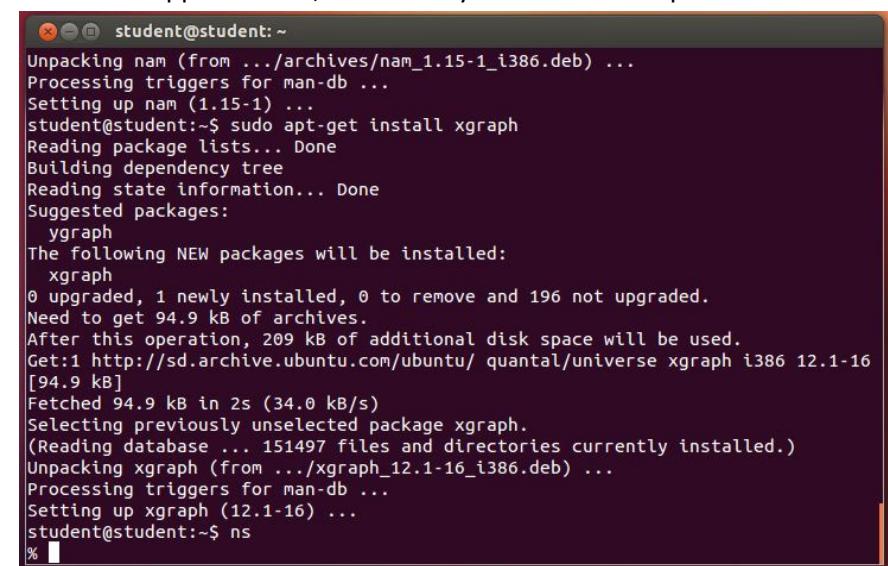
```
student@student:~$ sudo apt-get install nam
Setting up tk8.5 (8.5.11-2) ...
update-alternatives: using /usr/bin/wish8.5 to provide /usr/bin/wish (wish) in auto mode
Setting up ns2 (2.35+dfsg-1) ...
Processing triggers for libc-bin ...
ldconfig deferred processing now taking place
student@student:~$ sudo apt-get install nam
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  nam
0 upgraded, 1 newly installed, 0 to remove and 196 not upgraded.
Need to get 215 kB of archives.
After this operation, 656 kB of additional disk space will be used.
Get:1 http://sd.archive.ubuntu.com/ubuntu/ quantal/universe nam i386 1.15-1 [215 kB]
Fetched 215 kB in 5s (36.3 kB/s)
Selecting previously unselected package nam.
(Reading database ... 151489 files and directories currently installed.)
Unpacking nam (from .../archives/nam_1.15-1_i386.deb) ...
Processing triggers for man-db ...
Setting up nam (1.15-1) ...
student@student:~$
```

- 7- Type “sudo apt-get install xgraph” and hit Enter. Wait.



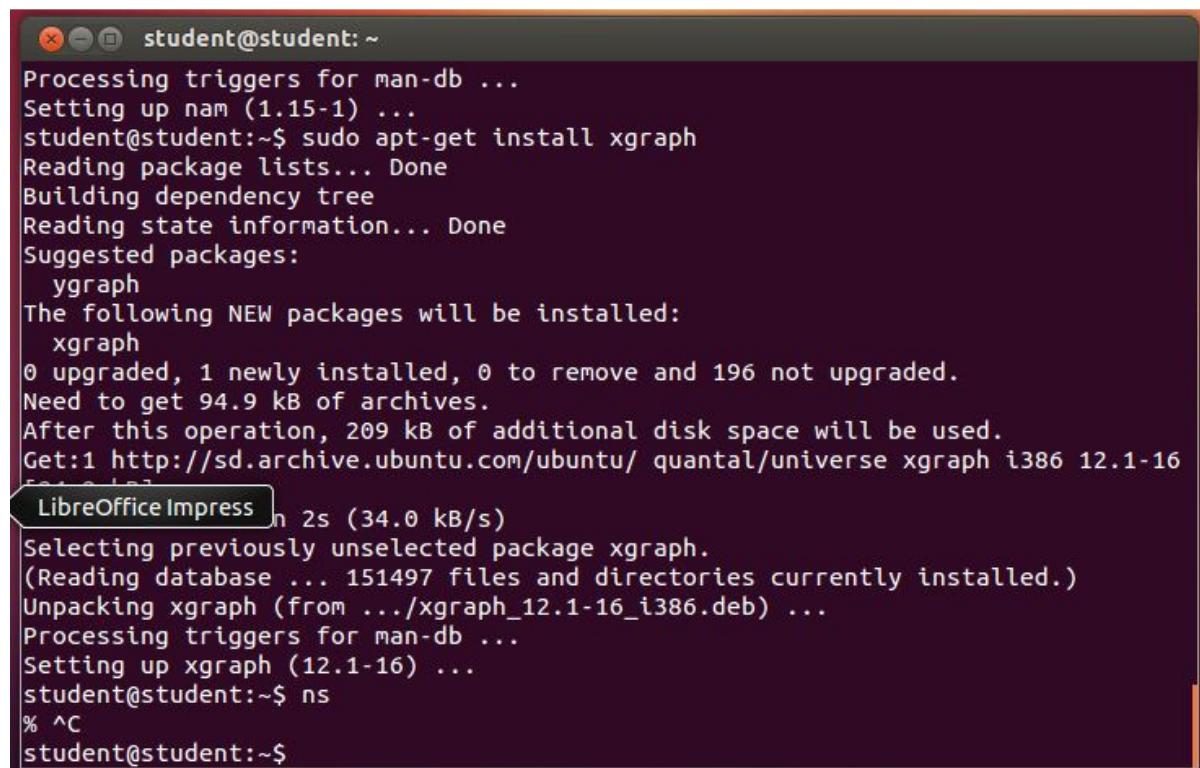
```
student@student:~$ sudo apt-get install xgraph
(Reading database ... 151489 files and directories currently installed.)
Unpacking nam (from .../archives/nam_1.15-1_i386.deb) ...
Processing triggers for man-db ...
Setting up nam (1.15-1) ...
student@student:~$ sudo apt-get install xgraph
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  ygraph
The following NEW packages will be installed:
  xgraph
0 upgraded, 1 newly installed, 0 to remove and 196 not upgraded.
Need to get 94.9 kB of archives.
After this operation, 209 kB of additional disk space will be used.
Get:1 http://sd.archive.ubuntu.com/ubuntu/ quantal/universe xgraph i386 12.1-16 [94.9 kB]
Fetched 94.9 kB in 2s (34.0 kB/s)
Selecting previously unselected package xgraph.
(Reading database ... 151497 files and directories currently installed.)
Unpacking xgraph (from .../xgraph_12.1-16_i386.deb) ...
Processing triggers for man-db ...
Setting up xgraph (12.1-16) ...
student@student:~$
```

- 8- Enter “ns”. A “%” should appear. If not, make sure you did all the steps.



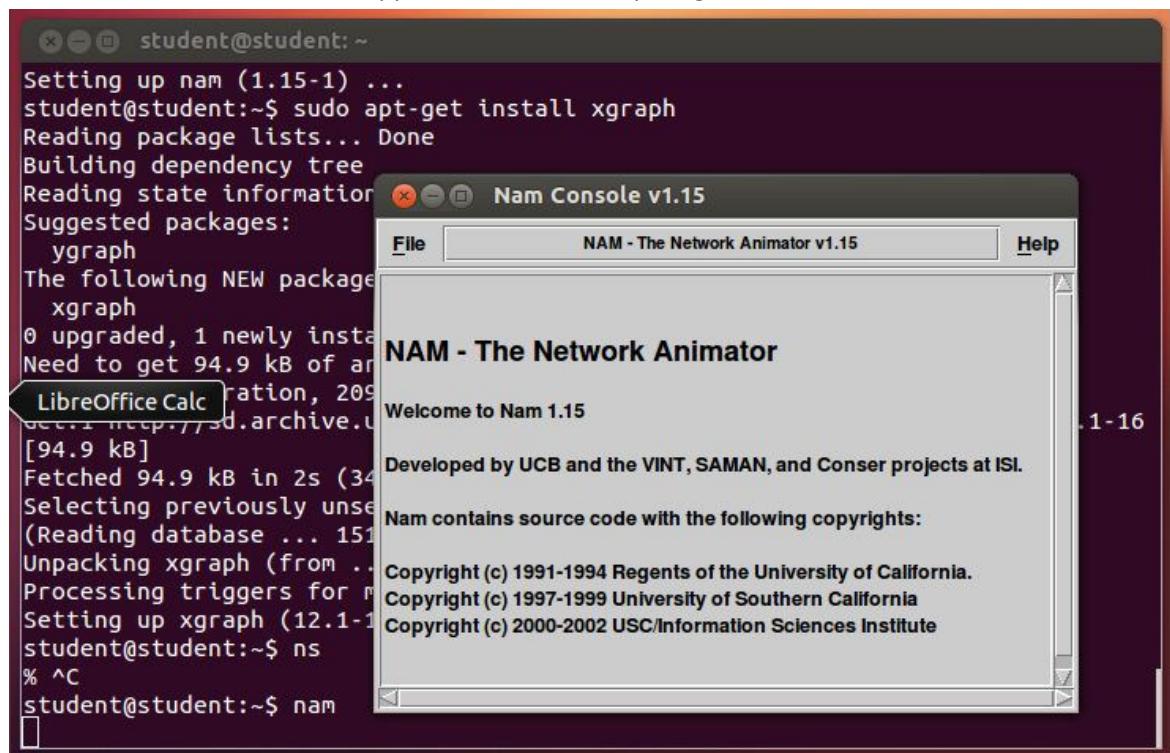
```
student@student:~$ Unpacking nam (from .../archives/nam_1.15-1_i386.deb) ...
Processing triggers for man-db ...
Setting up nam (1.15-1) ...
student@student:~$ sudo apt-get install xgraph
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  ygraph
The following NEW packages will be installed:
  xgraph
0 upgraded, 1 newly installed, 0 to remove and 196 not upgraded.
Need to get 94.9 kB of archives.
After this operation, 209 kB of additional disk space will be used.
Get:1 http://sd.archive.ubuntu.com/ubuntu/ quantal/universe xgraph i386 12.1-16 [94.9 kB]
Fetched 94.9 kB in 2s (34.0 kB/s)
Selecting previously unselected package xgraph.
(Reading database ... 151497 files and directories currently installed.)
Unpacking xgraph (from .../xgraph_12.1-16_i386.deb) ...
Processing triggers for man-db ...
Setting up xgraph (12.1-16) ...
student@student:~$ ns
%
```

9- Press "ctrl+c".



```
student@student: ~
Processing triggers for man-db ...
Setting up nam (1.15-1) ...
student@student:~$ sudo apt-get install xgraph
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  ygraph
The following NEW packages will be installed:
  xgraph
0 upgraded, 1 newly installed, 0 to remove and 196 not upgraded.
Need to get 94.9 kB of archives.
After this operation, 209 kB of additional disk space will be used.
Get:1 http://sd.archive.ubuntu.com/ubuntu/ quantal/universe xgraph i386 12.1-16
[94.9 kB]
LibreOffice Impress in 2s (34.0 kB/s)
Selecting previously unselected package xgraph.
(Reading database ... 151497 files and directories currently installed.)
Unpacking xgraph (from .../xgraph_12.1-16_i386.deb) ...
Processing triggers for man-db ...
Setting up xgraph (12.1-16) ...
student@student:~$ ns
% ^C
student@student:~$
```

10- Enter "nam". A window should appear as shown. Everything is OK now.



```
student@student: ~
Setting up nam (1.15-1) ...
student@student:~$ sudo apt-get install xgraph
Reading package lists... Done
Building dependency tree
Reading state information...
Suggested packages:
  ygraph
The following NEW packages will be installed:
  xgraph
0 upgraded, 1 newly installed, 0 to remove and 196 not upgraded.
Need to get 94.9 kB of archives.
Get:1 http://sd.archive.ubuntu.com/ubuntu/ quantal/universe xgraph i386 12.1-16
[94.9 kB]
Fetched 94.9 kB in 2s (34.0 kB/s)
Selecting previously unselected package xgraph.
(Reading database ... 151497 files and directories currently installed.)
Unpacking xgraph (from .../xgraph_12.1-16_i386.deb) ...
Processing triggers for man-db ...
Setting up xgraph (12.1-16) ...
student@student:~$ ns
% ^C
student@student:~$ nam
```

NAM - The Network Animator
Welcome to Nam 1.15
Developed by UCB and the VINT, SAMAN, and Conser projects at ISI.
Nam contains source code with the following copyrights:
Copyright (c) 1991-1994 Regents of the University of California.
Copyright (c) 1997-1999 University of Southern California
Copyright (c) 2000-2002 USC/Information Sciences Institute

Installing NS-2 on Ubuntu 10.04

- 1- Now, reconnect to the internet. A connection indication should appear.



- 2- Open “FireFox” and google “download ns2 allinone 2.35 sourceforge” and click the “source forge” result. Download the latest version.

The figure consists of three screenshots of Mozilla Firefox browser windows:

- Screenshot 1:** Shows a Google search for "ns2 allinone 2.35". The results page shows various links, with the first link, "The Network Simulator ns-2: Building Ns version 2", highlighted with a red box.
- Screenshot 2:** Shows the SourceForge.net page for "ns-allinone-2.29 at SourceForge.net". The "Download ns-allinone-2.35.tar.gz (59.5 MB)" button is highlighted with a red box.
- Screenshot 3:** Shows the SourceForge.net page for "nsnam - Browse /allinone/ns-allinone-2.29 at SourceForge.net". The same download button is highlighted with a red box.

- 3- Choose “save file”. Wait for download to finish.



- 4- Open “Applications” → “Accessories” → “Terminal”.

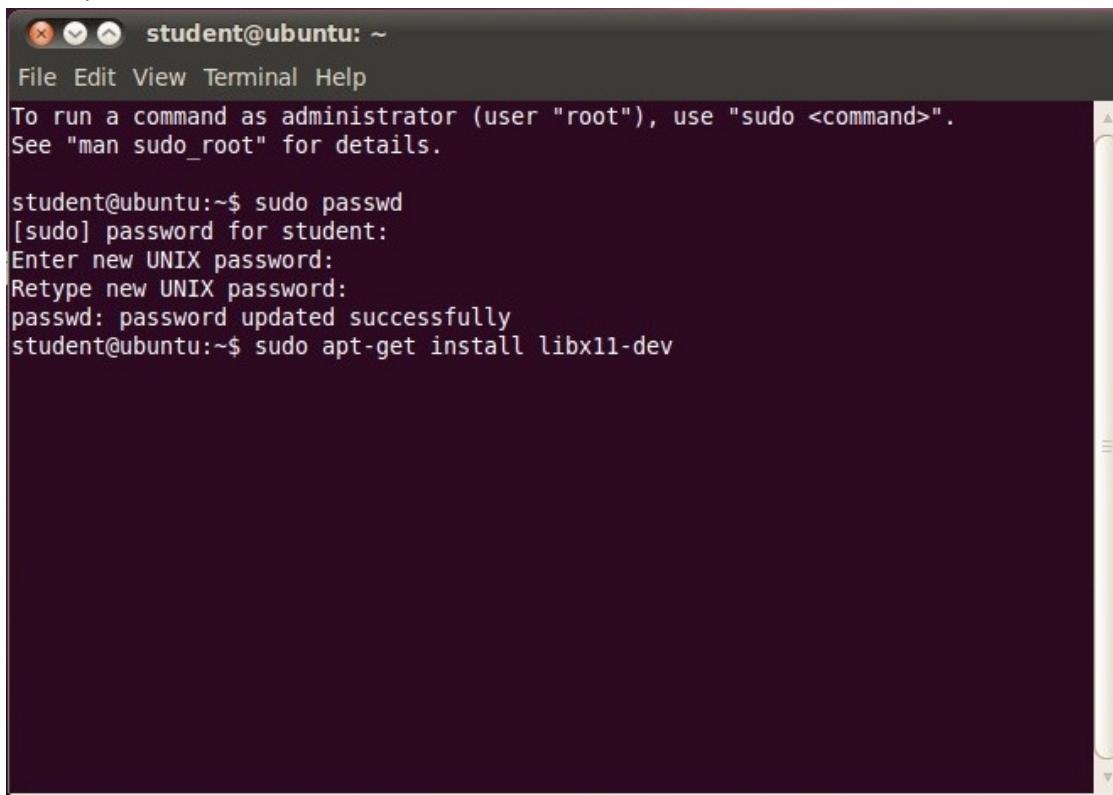


- 5- Type “sudo passwd” then type your password and hit Enter. Repeat 2 Times for “Enter New...” and “Retype ...”

```
student@ubuntu: ~
File Edit View Terminal Help
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

student@ubuntu:~$ sudo passwd
[sudo] password for student:
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
student@ubuntu:~$
```

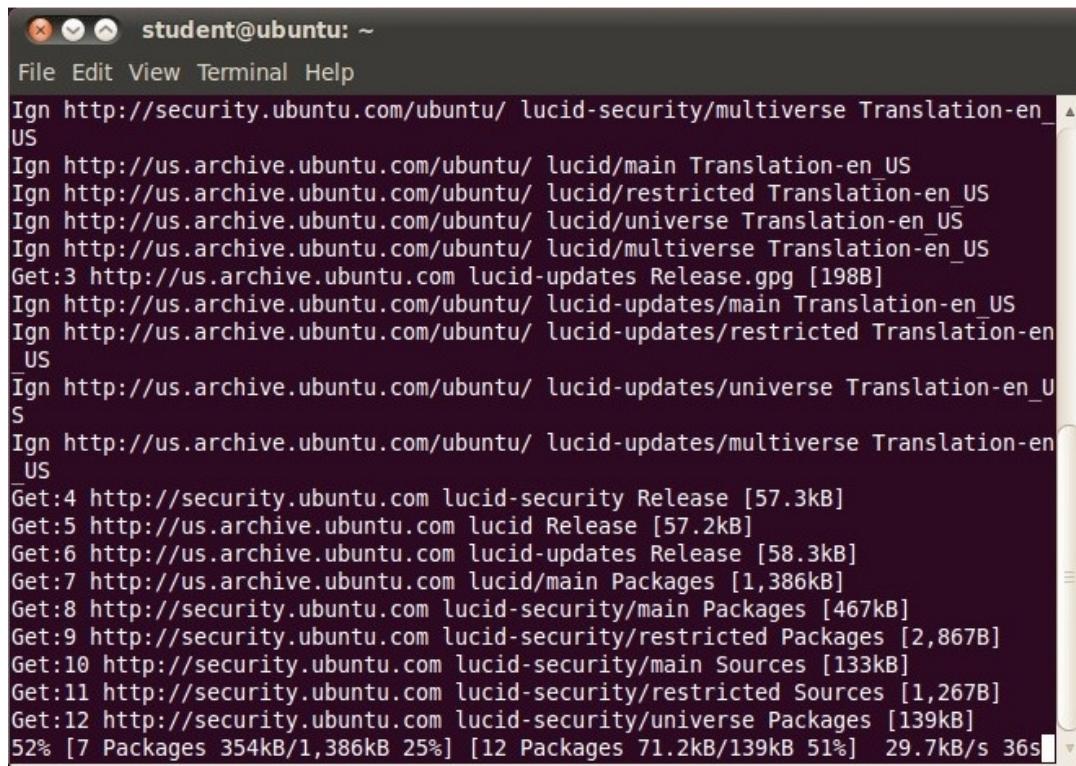
- 6- Type “sudo apt-get update” and wait for the update to be completed.
- 7- Type “sudo apt-get install libx11-dev”. You can use the mouse right click to copy and paste, but don’t use the keyboard shortcut “ctrl+v” in the terminal window.



```
student@ubuntu: ~
File Edit View Terminal Help
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

student@ubuntu:~$ sudo passwd
[sudo] password for student:
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
student@ubuntu:~$ sudo apt-get install libx11-dev
```

- 8- Type “y” then hit Enter. Wait.



```
student@ubuntu: ~
File Edit View Terminal Help
Ign http://security.ubuntu.com/ubuntu/ lucid-security/multiverse Translation-en_US
Ign http://us.archive.ubuntu.com/ubuntu/ lucid/main Translation-en_US
Ign http://us.archive.ubuntu.com/ubuntu/ lucid/restricted Translation-en_US
Ign http://us.archive.ubuntu.com/ubuntu/ lucid/universe Translation-en_US
Ign http://us.archive.ubuntu.com/ubuntu/ lucid/multiverse Translation-en_US
Get:3 http://us.archive.ubuntu.com lucid-updates Release.gpg [198B]
Ign http://us.archive.ubuntu.com/ubuntu/ lucid-updates/main Translation-en_US
Ign http://us.archive.ubuntu.com/ubuntu/ lucid-updates/restricted Translation-en_US
Ign http://us.archive.ubuntu.com/ubuntu/ lucid-updates/universe Translation-en_US
Ign http://us.archive.ubuntu.com/ubuntu/ lucid-updates/multiverse Translation-en_US
Get:4 http://security.ubuntu.com lucid-security Release [57.3kB]
Get:5 http://us.archive.ubuntu.com lucid Release [57.2kB]
Get:6 http://us.archive.ubuntu.com lucid-updates Release [58.3kB]
Get:7 http://us.archive.ubuntu.com lucid/main Packages [1,386kB]
Get:8 http://security.ubuntu.com lucid-security/main Packages [467kB]
Get:9 http://security.ubuntu.com lucid-security/restricted Packages [2,867kB]
Get:10 http://security.ubuntu.com lucid-security/main Sources [133kB]
Get:11 http://security.ubuntu.com lucid-security/restricted Sources [1,267kB]
Get:12 http://security.ubuntu.com lucid-security/universe Packages [139kB]
52% [7 Packages 354kB/1,386kB 25%] [12 Packages 71.2kB/139kB 51%] 29.7kB/s 36s
```

```

student@ubuntu: ~
File Edit View Terminal Help
Get:10 http://security.ubuntu.com lucid-security/main Sources [133kB]
Get:11 http://security.ubuntu.com lucid-security/restricted Sources [1,267B]
Get:12 http://security.ubuntu.com lucid-security/universe Packages [139kB]
Get:13 http://security.ubuntu.com lucid-security/universe Sources [42.9kB]
Get:14 http://security.ubuntu.com lucid-security/multiverse Packages [5,353B]
Get:15 http://security.ubuntu.com lucid-security/multiverse Sources [2,350B]
Get:16 http://us.archive.ubuntu.com lucid/restricted Packages [6,208B]
Get:17 http://us.archive.ubuntu.com lucid/main Sources [659kB]
Get:18 http://us.archive.ubuntu.com lucid/restricted Sources [3,775B]
Get:19 http://us.archive.ubuntu.com lucid/universe Packages [5,448kB]
Get:20 http://us.archive.ubuntu.com lucid/universe Sources [3,165kB]
Get:21 http://us.archive.ubuntu.com lucid/multiverse Packages [180kB]
Get:22 http://us.archive.ubuntu.com lucid/multiverse Sources [119kB]
Get:23 http://us.archive.ubuntu.com lucid-updates/main Packages [664kB]
Get:24 http://us.archive.ubuntu.com lucid-updates/restricted Packages [4,630B]
Get:25 http://us.archive.ubuntu.com lucid-updates/main Sources [233kB]
Get:26 http://us.archive.ubuntu.com lucid-updates/restricted Sources [2,196B]
Get:27 http://us.archive.ubuntu.com lucid-updates/universe Packages [285kB]
Get:28 http://us.archive.ubuntu.com lucid-updates/universe Sources [105kB]
Get:29 http://us.archive.ubuntu.com lucid-updates/multiverse Packages [11.5kB]
Get:30 http://us.archive.ubuntu.com lucid-updates/multiverse Sources [5,827B]
Fetched 13.2MB in 5min 28s (40.3kB/s)
Reading package lists... Done
student@ubuntu:~$
```

- 9- Type “sudo apt-get install libxt-dev” and hit Enter. Type your password and hit Enter. Note that the password will not be shown. Type “y” and hit Enter. Wait.
- 10- Type “sudo apt-get install build-essential g++” and hit Enter. Type “y” and hit Enter. Wait.
- 11- Type “sudo apt-get install build-essential autoconf automake libxmu-dev” and hit Enter. Wait.
- 12- Type “sudo apt-get install libx11-dev libxmu-dev libxmu-headers libxt-dev libtool” and hit Enter. Wait.
- 13- Type “sudo apt-get install dpkg-dev g++ libc6-dev make” and hit Enter. Wait.
- 14- Type “sudo apt-get install xorg-dev g++ xgraph” and hit Enter. Wait.
- 15- Type “sudo apt-get install build-essential autoconf automake libxmu-dev gcc-4.3” and hit Enter. Wait.
- 16- Enter the command “cd /home/student/Downloads”. Terminal should change the directory as shown.

```

student@ubuntu: ~/Downloads
File Edit View Terminal Help
0 upgraded, 3 newly installed, 0 to remove and 198 not upgraded.
Need to get 577kB of archives.
After this operation, 1,704kB of additional disk space will be used.
Do you want to continue [Y/n]? y
Get:1 http://us.archive.ubuntu.com/ubuntu/ lucid/main libice-dev 2:1.0.6-1 [60.0
kB]
Get:2 http://us.archive.ubuntu.com/ubuntu/ lucid/main libsm-dev 2:1.1.1-1 [26.6k
B]
Get:3 http://us.archive.ubuntu.com/ubuntu/ lucid/main libxt-dev 1:1.0.7-1 [491kB
]
Fetched 577kB in 7s (77.9kB/s)
Selecting previously deselected package libice-dev.
(Reading database ... 123953 files and directories currently installed.)
Unpacking libice-dev (from .../libice-dev 2%3a1.0.6-1_i386.deb) ...
Selecting previously deselected package libsm-dev.
Unpacking libsm-dev (from .../libsm-dev 2%3a1.1.1-1_i386.deb) ...
Selecting previously deselected package libxt-dev.
Unpacking libxt-dev (from .../libxt-dev_1%3a1.0.7-1_i386.deb) ...
Processing triggers for man-db ...
Setting up libice-dev (2:1.0.6-1) ...
Setting up libsm-dev (2:1.1.1-1) ...
Setting up libxt-dev (1:1.0.7-1) ...
student@ubuntu:~$ cd /home/student/Downloads
student@ubuntu:~/Downloads$
```

Note that “student” here is the user name you entered while installation in the windows environment.

- 17- Enter “sudo tar -xzf ns-allinone-2.34.tar.gz”.
- 18- Enter “cd ./ns-allinone-2.35”.
- 19- Enter “sudo ./install” and wait until it finishes (it may take time).

```

student@ubuntu: ~/Downloads/ns-allinone-2.35
File Edit View Terminal Help
student@ubuntu:~/Downloads$ tar -xzf ns-allinone-2.35.tar.gz
student@ubuntu:~/Downloads$ cd ./ns-allinone-2.35/
student@ubuntu:~/Downloads/ns-allinone-2.35$ sudo ./install
=====
* Testing for Darwin (OS X) environment
=====
* Testing for Cygwin environment
=====
Cygwin not detected, proceeding with regular install.
=====
* Testing for FreeBSD environment
=====
FreeBSD not detected
=====
* Build XGraph-12.2
=====
configure: error: expected an absolute directory name for --prefix: ..
make all-am
make[1]: Entering directory `/home/student/Downloads/ns-allinone-2.35/xgraph-12.2'
gcc -DHAVE_CONFIG_H -I. -g -MT xgraph.o -MD -MP -MF .deps/xgraph.Tpo -c -o xgraph.o xgraph.c

```



```

student@ubuntu: ~/Downloads/ns-allinone-2.35
File Edit View Terminal Help
(1) You MUST put /home/student/Downloads/ns-allinone-2.35/otcl-1.14, /home/student/Downloads/ns-allinone-2.35/lib,
    into your LD_LIBRARY_PATH environment variable.
    If it complains about X libraries, add path to your X libraries
    into LD_LIBRARY_PATH.
    If you are using csh, you can set it like:
        setenv LD_LIBRARY_PATH <paths>
    If you are using sh, you can set it like:
        export LD_LIBRARY_PATH=<paths>

(2) You MUST put /home/student/Downloads/ns-allinone-2.35/tcl8.5.10/library into
    your TCL_LIBRARY environmental
    variable. Otherwise ns/nam will complain during startup.

After these steps, you can now run the ns validation suite with
cd ns-2.35; ./validate

For trouble shooting, please first read ns problems page
http://www.isi.edu/nsnam/ns/ns-problems.html. Also search the ns mailing list archive
for related posts.

student@ubuntu:~/Downloads/ns-allinone-2.35$ 

```

20- Enter “cd /home/student”.

- 21- Enter “gedit .bashrc”. A text windows should appear.

```

.bashrc (~) - gedit
File Edit View Search Tools Documents Help
Open Save Undo | 
.bashrc ✘
# ~/.bashrc: executed by bash(1) for non-login shells.
# see /usr/share/doc/bash/examples/startup-files (in the package bash-doc)
# for examples

# If not running interactively, don't do anything
[ -z "$PS1" ] && return

# don't put duplicate lines in the history. See bash(1) for more options
# ... or force ignoreups and ignorespace
HISTCONTROL=ignoredups:ignorespace

# append to the history file, don't overwrite it
shopt -s histappend

# for setting history length see HISTSIZE and HISTFILESIZE in bash(1)
HISTSIZE=1000
HISTFILESIZE=2000

# check the window size after each command and, if necessary,
# update the values of LINES and COLUMNS.
shopt -s checkwinsize

# make less more friendly for non-text input files, see lesspipe(1)

```

- 22- Scroll to the end of the file.

```

*.bashrc (~) - gedit
File Edit View Search Tools Documents Help
Open Save Undo | 
*.bashrc ✘
alias egrep='egrep --color=auto'
fi

# some more ls aliases
alias ll='ls -alF'
alias la='ls -A'
alias l='ls -CF'

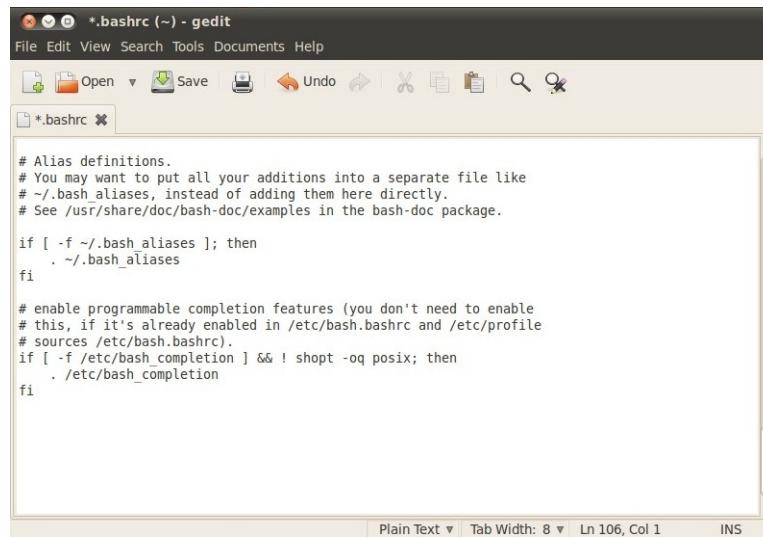
# Alias definitions.
# You may want to put all your additions into a separate file like
# ~/.bash_aliases, instead of adding them here directly.
# See /usr/share/doc/bash-doc/examples in the bash-doc package.

if [ -f ~/.bash_aliases ]; then
. ~/.bash_aliases
fi

# enable programmable completion features (you don't need to enable
# this, if it's already enabled in /etc/bash.bashrc and /etc/profile
# sources /etc/bash.bashrc).
if [ -f /etc/bash_completion ] && ! shopt -oq posix; then
. /etc/bash_completion
fi| 

```

23- Hit Enter 5 times.



The screenshot shows a Gedit text editor window titled ".bashrc (~) - gedit". The file contains the following code:

```
# Alias definitions.
# You may want to put all your additions into a separate file like
# ~/.bash_aliases, instead of adding them here directly.
# See /usr/share/doc/bash-doc/examples in the bash-doc package.

if [ -f ~/.bash_aliases ]; then
    . ~/.bash_aliases
fi

# enable programmable completion features (you don't need to enable
# this, if it's already enabled in /etc/bash.bashrc and /etc/profile
# sources /etc/bash.bashrc).
if [ -f /etc/bash_completion ] && ! shopt -oq posix; then
    . /etc/bash_completion
fi
```

At the bottom of the window, there are status bars for "Plain Text", "Tab Width: 8", "Ln 106, Col 1", and "INS".

24- Open this PDF and take the following text copy and then paste it there. Then, click save and close it.
Remember to replace “student” with the user name you’ve entered during installation in the windows environment.

```
#LD_LIBRARY_PATH
OTCL_LIB=/home/student/Downloads/ns-allinone-2.35/otcl-1.14
NS2_LIB=/home/student/Downloads/ns-allinone-2.35/lib
X11_LIB=/home/X11R6/lib
USR_LOCAL_LIB=/home/student/Downloads/local/lib
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:$OTCL_LIB:$NS2_LIB:$X11_LIB:$USR_LOCAL_LIB
#TCL_LIBRARY
TCL_LIB=/home/student/Downloads/ns-allinone-2.35/tcl8.5.10/library
USR_LIB=/home/lib
export TCL_LIBRARY=$TCL_LIB:$USR_LIB
#PATH
XGRAPH=/home/student/Downloads/ns-allinone-2.35/bin:/home/student/Downloads/ns-allinone-2.35/tcl8.5.10/unix:/home/student/Downloads/ns-allinone-2.35/tk8.5.10/unix
NS=/home/student/Downloads/ns-allinone-2.35/ns-2.35/
NAM=/home/student/Downloads/ns-allinone-2.35/nam-1.15/
PATH=$PATH:$XGRAPH:$NS:$NAM
```

The image shows two side-by-side gedit text editors. Both windows have the title ".bashrc (~) - gedit". The left window contains the following code:

```
#LD_LIBRARY_PATH
OTCL_LIB=/home/student/Downloads/ns-allinone-2.35/otcl-1.14
NS2_LIB=/home/student/Downloads/ns-allinone-2.35/lib
X11_LIB=/home/X11R6/lib
USR_LOCAL_LIB=/home/student/Downloads/local/lib
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:$OTCL_LIB:$NS2_LIB:$X11_LIB:$USR_LOCAL_LIB
#TCL_LIBRARY
TCL_LIB=/home/student/Downloads/ns-allinone-2.35/tcl8.5.10/library
USR_LIB=/home/lib
export TCL_LIBRARY=$TCL_LIB:$USR_LIB
```

The right window contains the following code:

```
#TCL_LIBRARY
TCL_LIB=/home/student/Downloads/ns-allinone-2.35/tcl8.5.10/library
USR_LIB=/home/lib
export TCL_LIBRARY=$TCL_LIB:$USR_LIB
#PATH
XGRAPH=/home/student/Downloads/ns-allinone-2.35/bin:/home/student/Downloads/ns-allinone-2.35/tcl8.5.10/unix:/home/student/Downloads/ns-allinone-2.35/tk8.5.10/unix
NS=/home/student/Downloads/ns-allinone-2.35/ns-2.35/
NAM=/home/student/Downloads/ns-allinone-2.35/nam-1.15/
PATH=$PATH:$XGRAPH:$NS:$NAM
```

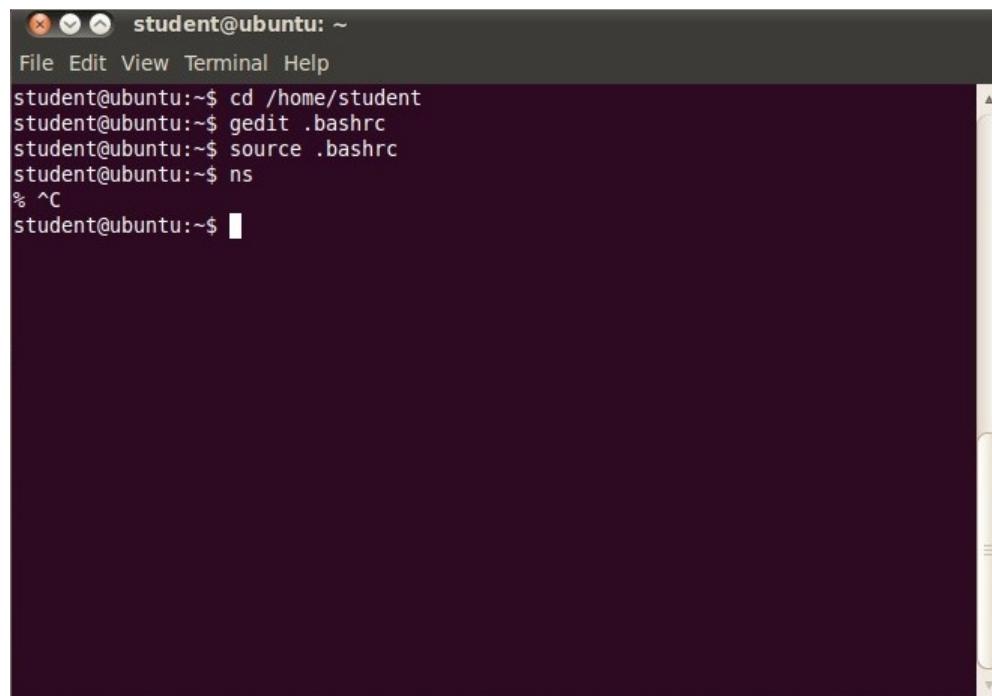
25- Enter “source .bashrc”

The terminal window shows several "GConf Error" messages, each indicating a failed connection to a configuration server due to TCP/IP networking issues or stale NFS locks. At the bottom of the window, the command "root@ubuntu:~# source .bashrc" is entered and executed.

26- Enter “ns”. A “%” should appear. If not, make sure you did all the steps.

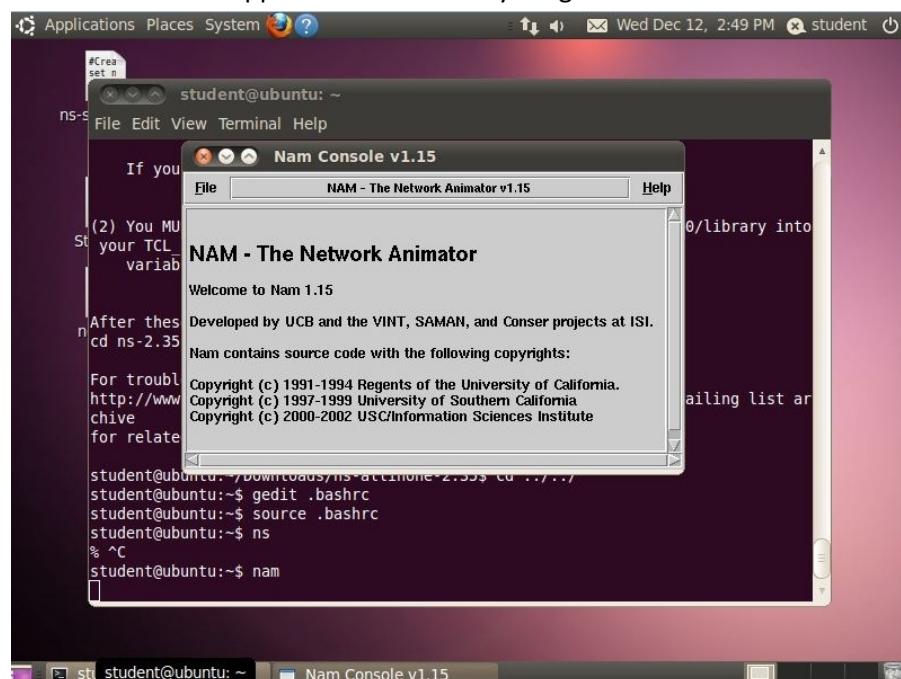
The terminal window shows the user navigating to the directory "/home/student", opening ".bashrc" in gedit, and then running "source .bashrc". Finally, the command "ns" is entered, resulting in a prompt "%".

27- Press "ctrl+c".



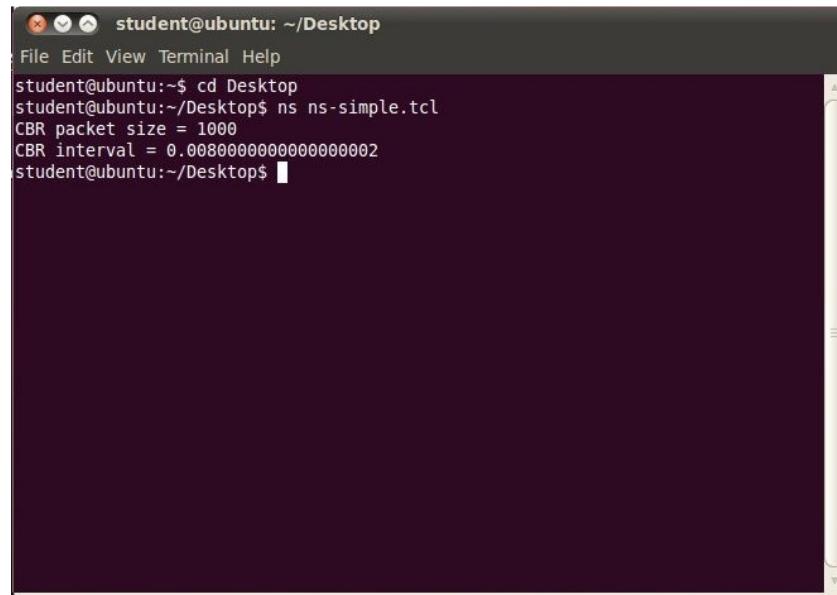
```
student@ubuntu: ~
File Edit View Terminal Help
student@ubuntu:~$ cd /home/student
student@ubuntu:~$ gedit .bashrc
student@ubuntu:~$ source .bashrc
student@ubuntu:~$ ns
% ^C
student@ubuntu:~$
```

28- Enter "nam". A window should appear as shown. Everything is OK now.



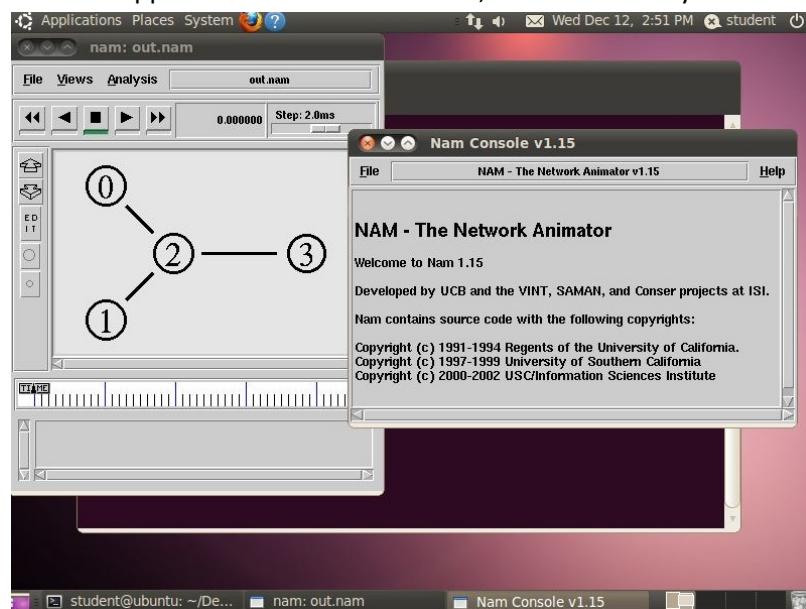
The First NS-2 Run

- 1- Download the file “ns-simple.tcl” from: <http://nile.wpi.edu/NS/Example/ns-simple.tcl>
- 2- Open “places” → “Downloads”, then copy the file to the desktop.
- 3- Open the terminal from “Applications” → “Accessories”.
- 4- Type “cd Desktop”. Hit Enter.
- 5- Type “ns ns-simple.tcl” and hit Enter.



A screenshot of a terminal window titled "student@ubuntu: ~/Desktop". The window shows the command "ns ns-simple.tcl" being run. The output indicates a CBR packet size of 1000 and a CBR interval of 0.008000000000000002. The terminal window has a dark background and light-colored text.

- 6- The nam windows should appear as shown below. If not, make sure that you've done all the steps.



7- You can now click the “play” icon and watch the packets moving from node to another.

