STEP BY STEP GUIDE ON HOW TO INSTALL NETWORK SIMULATOR (NS2) ON LINUX MACHINE (UBUNTU 8.10)

Prepared by: Eman Alashwali King Abdulaziz University / IS Department 2010

Content:

- I. Install Linux
- II. Install NS2
- III. Set Environmental variables
- IV. Validation
- V. Run the First nam example

I. INSTALL LINUX (UBUNTU 8.10)

- First of all, get the Linux OS image or CD. You can get it for free from Linux website <u>http://www.ubuntu.com/GetUbuntu/download</u>
 Or, if you are looking for old versions, you can find it in: <u>http://mirrors.isu.net.sa/</u>
- 2. If you are a windows user, then you have to download Linux in a separate partition, or use a virtual machine. My advice to you is to use a virtual machine. One of the best virtual machine SW is Vmware. You can buy it or Install trial Vmware Workstaion SW from: http://www.vmware.com/support/product-support/workstation/ There are bunch of alternative Free SW to create Virtual machines, one of them is Virtual Box. You can download it from: http://www.virtualbox.org/wiki/Downloads
- 3. In this manual, I will be using Vmware to create my virtual machine. To create a virtual machine: Open the Vmware workstation -> Click "**New Virtual Machine**"



4. Choose "Typical" and click "Next"



5. Then browse to the directory where you saved the Ubuntu iso image, or choose install it from a dis if you Ubuntu is placed in a CD and click "Next".

A virtual machine is like a physical computer; it needs an operating system. How will you install the guest operating system? tall from: Installer disc: DVD RW Drive (E:) ns cygwin tg
tall from: Installer disc: DVD RW Drive (E:) ns cygwin tg
Installer disc:
DVD RW Drive (E:) ns cygwin tg
DVD RW Drive (E:) ns cygwin tg
) Installer disc image file (iso):
) Installer disc image file (iso):
) Installer disc image file (iso):
y moduler dise indge nie (iso).
C:\Users\e\Downloads\ubuntu-8.10-desktop-i386.iso 🔻 Browse
i) Ubuntu 8.10 detected.
This operating system will use Easy Install. (what's this?)
•
2 I Will Install the operating system later

6. Enter a user name and password to log in to Ubuntu after you install it, and click "Next"

Easy Insta This is u	ll Information used to install Ubuntu.
Personalize Linu	x
Full name:	e
User name:	e
Password:	•••
Confirm:	•••

7. Give your virtual machine a name, and choose its location, and click "Next"

Name the Virtual Machine	
What name would you like to use for this virtual machine?	
irtual machine name	
Ubuntu 2	
ocation	
C:\Users\e\Documents\Virtual Machines\Ubuntu 2	Browse
The default location can be changed at Edit > Preferences.	

8. Choose the size for the hard disk for the virtual machine, I will leave this as default, and then click "Next"

Specify Disk Canacity	
How large do you war	nt this disk to be?
The virtual machine's hard of computer's physical disk. The add applications, files, and	disk is stored as one or more files on the host nese file(s) start small and become larger as you data to your virtual machine.
Maximum <mark>disk s</mark> ize (GB):	8.0
Recommended size for Ubu	ntu: 8 GB
Store virtual disk as a si	ngle file
🖱 Split virtual disk into 2 G	B files
Splitting the disk makes computer.	it easier to move the virtual machine to another
🗟 Pocket ACE size calculat	tor

9. Click "Finish", and the Ubuntu installation will start

Note: You can change the RAM size and many of the virtual machine specifications but this is out of this manual scope. Just keep in mind that you are using your real machine resources like RAM, Processor to run the virtual machine.

Click Finish to o then VMware T	Create the virtual machine and start installing Ubuntu and Fools.		
The virtual machine v	vill be created with the following settings:		
Name:	Ubuntu 2	1	
Location:	C:\Users\e\Documents\Virtual Machines\Ubuntu 2		
Version:	Workstation 6.5		
Operating Syst	Ubuntu		
Hard Disk:	8 GB	ļ	
Memory:	512 MB	3	
•	III •	ĺ	
Customize Hardw	are		
Power on this virt	ual machine after creation		

10. After that, the installation will continue, and after that you finish installing ubuntu

II. INSTALL NS2

- 1. Download the NS2 files from the Internet http://sourceforge.net/projects/nsnam/files/ns-2/2.34/
- 2. Extract the files

Prepared by: Eman Al-Ashwali, 2010. College of Computing & IT / KAU – IS Dept. ©



4. Set the appropriate permissions for the ns-allinone-2.34 to allow executing the files inside it. To do that: Right click the folder -> Properties -> Permissions, and choose the appropriate group with the appropriate file access, then click "Allow executing file as program" and then click "Apply permissions to enclosed files"

Owner:	e	
Folder access:	Create and delete files	
File access:	Read and write	
<u>G</u> roup:	e 🗸	
Folder access:	Create and delete files	
File access:	Read and write	
Others		
Folder access:	Create and delete files	
File access:		
Execute: 🤇	☑ Allow <u>e</u> xecuting file as program	n
SELinux context: Last changed:	unknown unknown	
Apply Permissio	ns to Enclosed Files	

- 5. From the **Accessories** -> **Terminal**
- Type the following command to know in which directory you are: ~\$ pwd



- 7. You need to be in the directory where you placed the ns-allinone-2.34 folder
- 8. If you are not in the /home/e , then move to it by using the command *cd*
- Now, supposing you are in the directory /home/e (e can be any other user) type the following command to move inside the ns-allinone-2.34 using the command cd \$ cd ns-allinone-2.34
- 10. Then, type the following command (you will be asked to enter the system password to process. Also, you will be asked if you want to continue, type: y to continue):

\$ sudo apt-get install build-essential autoconf automake libxmu-dev

e@ubuntu: ~/ns-allinone-2.34 💶 🗅	×
<u>F</u> ile <u>E</u> dit <u>V</u> iew <u>T</u> erminal <u>T</u> abs <u>H</u> elp	
autotools-dev cpp-4.3 dpkg-dev g++ g++-4.3 gcc-4.3 gcc-4.3-base libgcc1 libgomp1 libice-dev libpthread-stubs0 libpthread-stubs0-dev libsm-dev libstdc++6 libstdc++6-4.3-dev libx11-6 libx11-dev libxau-dev libxcb-xlib0-dev libxcb1-dev libxdmcp-dev libxext-dev libxi-dev libxmu-headers libxt-dev m4 patch x11proto-core-dev x11proto-input-dev x11proto-kb-dev x11proto-xext-dev xtrans-dev	~
<pre>Suggested packages: autoconf2.13 autobook autoconf-archive gnu-standards autoconf-doc libtool gettext gcc-4.3-locales debian-keyring g++-multilib g++-4.3-multilib gcc-4.3-doc libstdc++6-4.3-dbg gcc-4.3-multilib libmudflap0-4.3-dev</pre>	
libgcc1-dbg libgomp1-dbg libmudflap0-dbg libstdc++6-4.3-doc diff-doc The following NEW packages will be installed: autoconf automake autotools-dev build-essential dpkg-dev g++ g++-4.3	
libice-dev libpthread-stubs0 libpthread-stubs0-dev libsm-dev libstdc++6-4.3-dev libx11-dev libxau-dev libxcb-xlib0-dev libxcb1-dev libxdmcp-dev libxext-dev libxi-dev libxmu-dev libxmu-headers libxt-dev m4 patch x11proto-core-dev x11proto-input-dev x11proto-kb-dev x11proto-xext-dev xtrans-dev	311.
The following packages will be upgraded: cpp-4.3 gcc-4.3 gcc-4.3-base libgcc1 libgomp1 libstdc++6 libx11-6 7 upgraded, 29 newly installed, 0 to remove and 355 not upgraded. Need to get 17.5MB of archives.	
After this operation, 34.3MB of additional disk space will be used. Do you want to continue [Y/n]? y	~

11. Type the following command to install NS2 \$./install

III. SET ENVIRONMENTAL VARIABLES

- Write the following line: gedit ~/.bashrc
- After the previous command, a file will open to you. Add the following lines to the end of the file. Replace "/your/path" by the folder where you placed the extracted *ns-allinone-2.34* (For example, if your Linux user name is *e*, and you placed the *ns-allinone-2.34* in the home directory, you have to change /your/path to /home/e)

LD_LIBRARY_PATH OTCL_LIB=/your/path/ns-allinone-2.34/otcl-1.13 NS2_LIB=/your/path/ns-allinone-2.34/lib X11_LIB=/usr/X11R6/lib USR_LOCAL_LIB=/usr/local/lib export LD_LIBRARY_PATH=\$LD_LIBRARY_PATH:\$OTCL_LIB:\$NS2_LIB:\$X11_LIB:\$USR_LOCAL_LIB

TCL_LIBRARY TCL_LIB=/your/path/ns-allinone-2.34/tcl8.4.18/library USR_LIB=/usr/lib export TCL_LIBRARY=\$TCL_LIB:\$USR_LIB

PATH XGRAPH=/your/path/ns-allinone-2.34/bin:/your/path/ns-allinone-2.34/tcl8.4.18/unix:/your/path/ns-allinone-2.34/tk8.4.18/unix NS=/your/path/ns-allinone-2.34/ns-2.34/ NAM=/your/path/ns-allinone-2.34/nam-1.14/ PATH=\$PATH:\$XGRAPH:\$NS:\$NAM

- 3. Save the file changes after your edit
- Ensure that it immediately takes effect: \$ source ~/.bashrc

Note: the previous step is important; else you cannot successfully run ns-2.

- Now, the installation has been completed. Try: \$ ns
- 6. The "%" symbol appears on the screen. Type "**exit**" to quit.

IV. Validation

- To run the ns validation suite: \$ cd ns-2.34 \$./validate
- 2. The validation will take long time, wait until it finish.

V. RUN YOUR FIRST NAM EXAMPLE

- From the terminal type the following: \$ cd ns-allinone-2.34 \$ cd nam-1.14 \$ cd edu \$ exec nam A2-stop-n-wait-loss.nam
- 2. The following window appears, click the Play button to see the protocol animation

	name	A2-stop-n-v	vait-loss.na	m 🗕 💷	×
<u>F</u> ile	<u>V</u> iews	Analysis	A2-stop-n-v	vait-loss.nam	
•		L > >	0.324000	Step: 2.0ms	Ť
4					
εD					
	Sender				
				_	
	 			13	
	0] Agent:	tcp			
Monitor	cwna_:1.04	10000			
	<u> </u>	nılını	mdn	տաև	
S	top and	Wait with Pack	æt Loss		-
F	end Pac	s at U.1 ket_0			
					12

References :

Dr. Basem Alkazemi pag: http://uqu.edu.sa/page/ar/4519