NST32031-Practical for Wireless Network
Department of ICT
Faculty of Technology
South Eastern University of Sri Lanka
Lab Sheet – 01

Title: Getting started with Ns3 installation

Prerequisites:

- Linux basics
- Networking basic knowledge
- Basics of programming

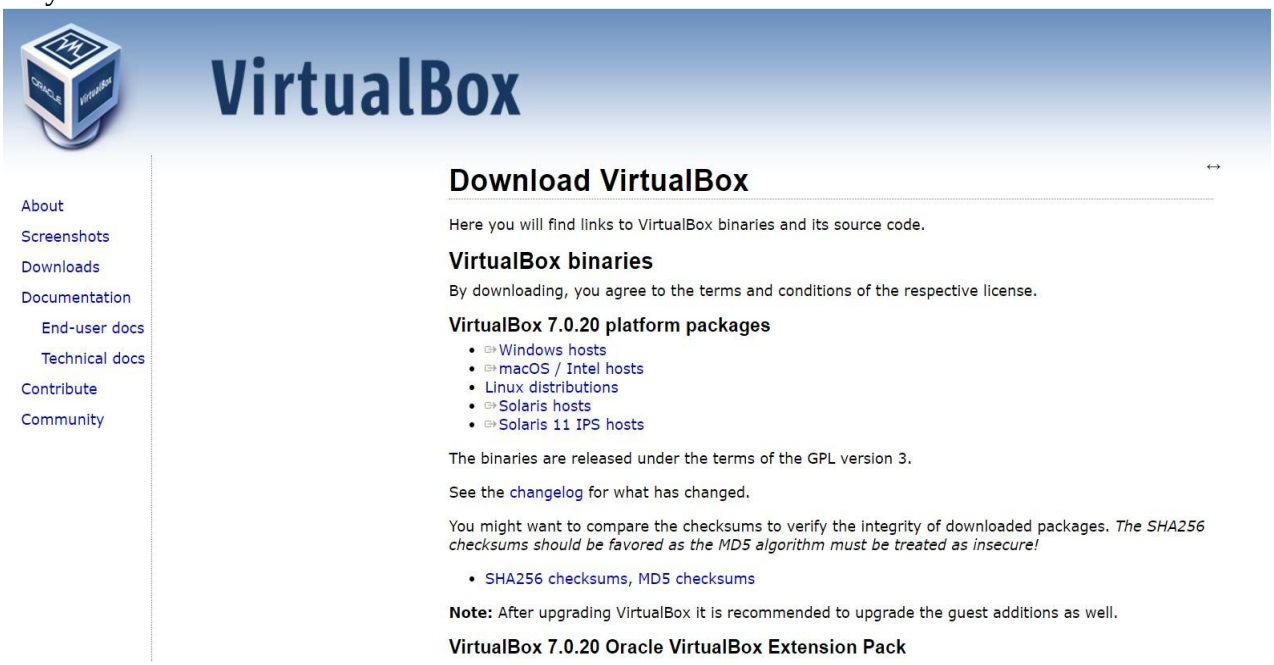
Prerequisites tools:

- Python
- C++ compiler
- Linux environment setup
- VMware /Virtual box/ Fusion (mac)
- IDE (Eclipse)

Official website: https://www.nsnam.org

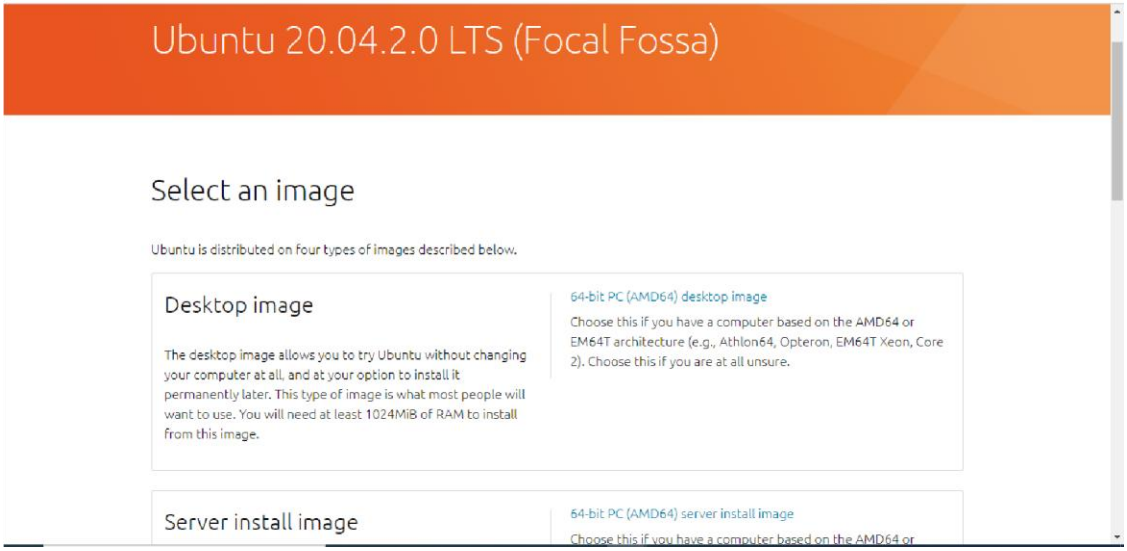
Setup the environment

1. **VM installation - https://www.virtualbox.org/ Latest version 7.0.20;**
   Double click on the .exe file and install it into your local machine. Instead of VMware, you can use the virtual box as well.



2. **Download Ubuntu iso (Latest version 24.04 LTS - not server version) -** https://ubuntu.com/download/desktop

Install desktop image



3. **Setup VMware /virtual box – Ubuntu environment establishment**
    a. For virtual box refer to this article to install - https://brb.nci.nih.gov/seqtools/installUbuntu.html
    b. For VMware refer to the below article – https://theholmesoffice.com/installing-ubuntu-in-vmware-player-on-windows/

NS3 Prerequisites - follow below steps one by one

(refer https://www.nsnam.org/wiki/Installation#Ubuntu.2FDebian.2FMint)

Introduction of NS3

Network simulator is tool used for simulating the real-world network on one computer by writing scripts in c++ or python. which is a discrete event network simulator for Internet. NS3 helps to create various virtual nodes (i.e., computers in real life) and with the help of various Helper classes it allows us to install devices, internet stacks, application, etc.

NS3 Gives us Some Special Features

- **Tracing of the nodes**
- **NetAnim**
- **Pcap File**
- **Gnuplot**

4. **Go to your Ubuntu environment – open Ubuntu terminal**
    a. Command ‘ls’ – to check available files in the system
    b. Change your directory to desktop
        ✓ Type: cd Desktop/

5. **Type below the command to update and upgrade your systems and repositories.**
    a. sudo apt-get update
    b. sudo apt-get upgrade
    c. sudo apt install build-essential autoconf automake libxmu-dev

6. **sudo apt-get install g++ python3**
    a. minimal requirements for C++ users

7. **sudo apt-get install g++ python3 python3-dev pkg-config sqlite3**
    a. minimal requirements for Python API users

8. **sudo apt-get install python3-setuptools git**

9. **sudo apt-get install qt5-default mercurial**
    a. Netanim animator: qt5 development tools are needed for Netanim animator

10. **sudo apt-get install gir1.2-goocanvas-2.0 python3-gi python3-gi-cairo python3-pygraphviz python3-gi python3-gi-cairo python3-pygraphviz gir1.2-gtk-3.0 ipython ipython3**
    a. If ipython doesn't install in this way, follow below commands;
        i. **sudo apt install python3-pip**
        ii. **pip3 install ipython**

11. **sudo apt-get install openmpi-bin openmpi-common openmpi-doc libopenmpi-dev**

12. **sudo apt-get install autoconf cvs bzr unrar**

13. **sudo apt-get install gdb valgrind**

14. **sudo apt-get install uncrustify**

15. **sudo apt-get install doxygen graphviz imagemagick**

16. **sudo apt-get install texlive texlive-extra-utils texlive-latex-extra texlive-font-utils= dvipng latexmk**
    a. Doxygen and related inline documentation:

17. **sudo apt-get install python3-sphinx dia**

18. **sudo apt-get install gsl-bin libgsl-dev libgsl23 libgslcblas0**

19. **sudo apt-get install tcpdump**

20. **sudo apt-get install sqlite sqlite3 libsqlite3-dev**

21. **sudo apt-get install libxml2 libxml2-dev**

22. **sudo apt-get install cmake libc6-dev libc6-dev-i386 libclang-6.0-dev llvm-6.0-dev= automake python3-pip python3 -m pip install --user cxxfilt**

23. **sudo apt-get install libgtk-3-dev**

24. **sudo apt-get install vtun lxc uml-utilities**

25. **sudo apt-get install libxml2 libxml2-dev**

sudo apt install g++ python3 cmake ninja-build git gir1.2-goocanvas-2.0 python3-gi python3-gi-cairo python3-pygraphviz gir1.2-gtk-3.0 ipython3 tcpdump wireshark sqlite sqlite3 libsqlite3-dev qtbase5-dev qtchooser qt5-qmake qtbase5-dev-tools openmpi-bin openmpi-common openmpi-doc libopenmpi-dev doxygen graphviz imagemagick python3-sphinx dia imagemagick texlive dvipng latexmk texlive-extrautils texlive-latex-extra texlive-font-utils libeigen3-dev gsl-bin libgsl-dev libgslcblas0 libxml2 libxml2dev libgtk-3-dev lxc-utils lxc-templates vtun uml-utilities ebtables bridge-utils libxml2 libxml2-dev libboost-all-dev

Downloading and installing ns3;

(refer https://www.nsnam.org/wiki/Installation#Installation)

1. **Method 01: Downloading ns-3 Using a Tarball**
    1. **cd**
    2. **mkdir tarballs**
    3. **cd tarballs**
    4. **wget https://www.nsnam.org/release/ns-allinone-3.43.tar.bz2**
    5. **tar xjf ns-allinone-3.43.tar.bz2**
    6. **cd ns-allinone-3.43**
    7. **./build.py –enable-examples –enable-tests**

2. **Manual installation**
    1. **download the ns3 package from https://www.nsnam.org**
    2. **cd ns-allinone-3.43/**
    3. **./build.py –enable-examples –enable-tests**

3. **Downloading ns-3 Using Git**
    1. **cd**
    2. **mkdir repos**
    3. **cd repos**
    4. **git clone https://gitlab.com/nsnam/ns-3allinone.git**
    5. **./download.py -n ns-3.43**
    6. **cd ns-allinone-3.43/**
    7. **./build.py**