Experiment No:10

Aim: Build a simple network topology and configure it for static routing protocol using GNS3.

Theory:

GNS3 (Graphical Network Simulator) was developed primarily by Jeremy Grossmann.

It is used to emulate, configure, test and troubleshoot virtual and real networks. GNS3 allows us to run a small topology consisting of only a few devices on your laptop, to those that have many devices hosted on multiple servers or even hosted in the cloud (i.e. emulation of complex networks). It basically provides graphical environment.

We may be familiar with VMWare or Virtual PC that are used to emulate various operating systems in a virtual environment. These programs allow you to run operating systems such as Windows XP Professional or Ubuntu Linux in a virtual environment on your computer. GNS3 allows the same type of emulation using Cisco Internetwork Operating Systems. It allows you to run a Cisco IOS (Internetwork Operating System) in a virtual environment on your computer.

GNS3 allows the emulation of Cisco IOSs on your Windows or Linux based computer. Emulation is possible for a long list of router platforms and PIX firewalls. Using an EtherSwitch card in a router, switching platforms may also be emulated to the degree of the card's supported functionality. This means that GNS3 is an invaluable tool for preparing for Cisco certifications such as CCNA and CCNP.

With GNS3 we are running an actual Cisco IOS, so we will see exactly what the IOS produces and will have access to any command or parameter supported by the IOS.

Also, GNS3 will provide around 1,000 packets per second throughput in a virtual environment. A normal router will provide a hundred to a thousand times greater throughput. GNS3 does not take the place of a real router, but is meant to be a tool for learning and testing in a lab environment.

Advantages:

- Free software
- Open Source software
- No monthly or yearly license fees
- No limitation on number of devices supported (only limitation is your hardware: CPU and memory)
- Supports multiple switching options (ESW16 Etherswitch, IOU/IOL Layer 2 images, VIRL IOSvL2):
- Supports all VIRL images (IOSv, IOSvL2, IOS-XRv, CSR1000v, NX-OSv, ASAv)
- Supports multi vendor environments
- Can be run with or without hypervisors
- Supports both free and paid hypervisors (Virtualbox, VMware workstation, VMware player, ESXi, Fusion)
- Downloadable, free, pre-configured and optimized appliances available to simplify deployment

- Native support for Linux without the need for need for additional virtualization software
- Software from multiple vendors freely available
- Large and active community (800,000+ members)

Disadvantages:

- Cisco images need to be supplied by user (download from Cisco.com, or purchase VIRL license, or copy from physical device).
- Not a self-contained package, but requires a local installation of software (GUI).
- GNS3 can be affected by your PC's setup and limitations because of local installation (firewall and security settings, company laptop policies etc).

To Install gns3 in Ubuntu:-

- Before installing, add gns3 repo file by using following command.
  sudo add-apt-repository ppa:gns3/ppa
- Update the repo by using the following command.
  sudo apt-get update
- After the updation is completed, install gns3 as follows.
  sudo apt-get install gns3-gui
- Add debian package for i386
  sudo dpkg --add-architecture i386
- Update the repo again by using the following command.
  sudo apt-get update
- Install gns3 IOS on Unix by using following command.
  sudo apt-get install gns3-iou
- **To Launch the gns3 application**
  Exit from admin mode: **exit**
  Open the GNS3 application in terminal using "gns3" command: **gns3**
- To configure the project settings
  Select networks and switch images.

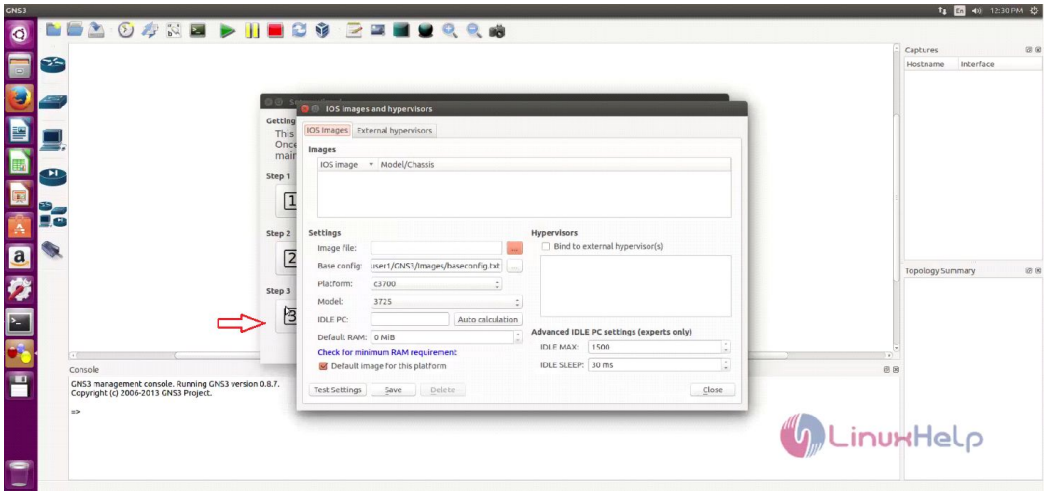


Figure 1: Select image file

- IOS image download link:
  https://protechgurus.com/how-to-add-router-ios-image-in-gns3/

- Browse to the router's image on your server's folder.
- When prompted to copy the image in the default directory you can safely answer NO.
- In the field "IOS image path" you must enter the full path of the chosen image.

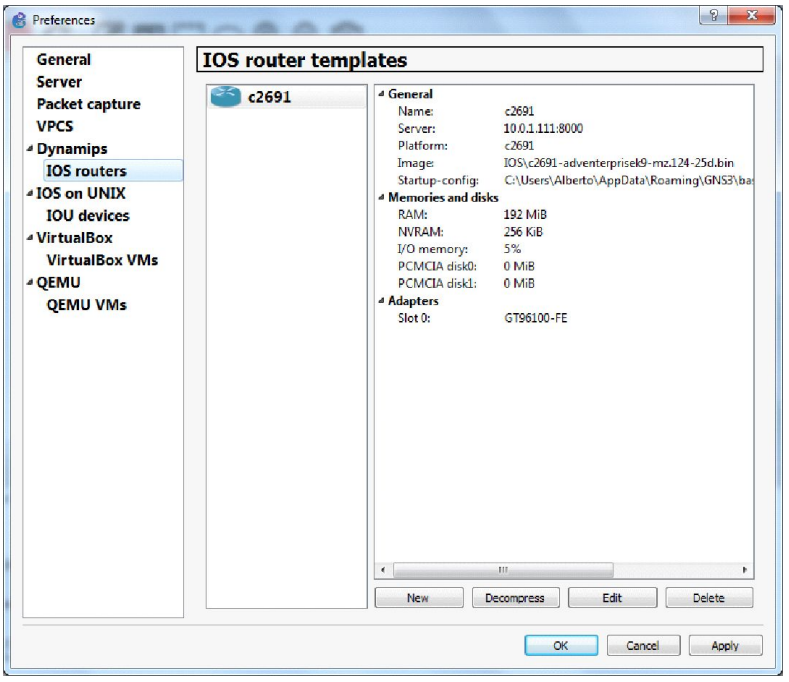
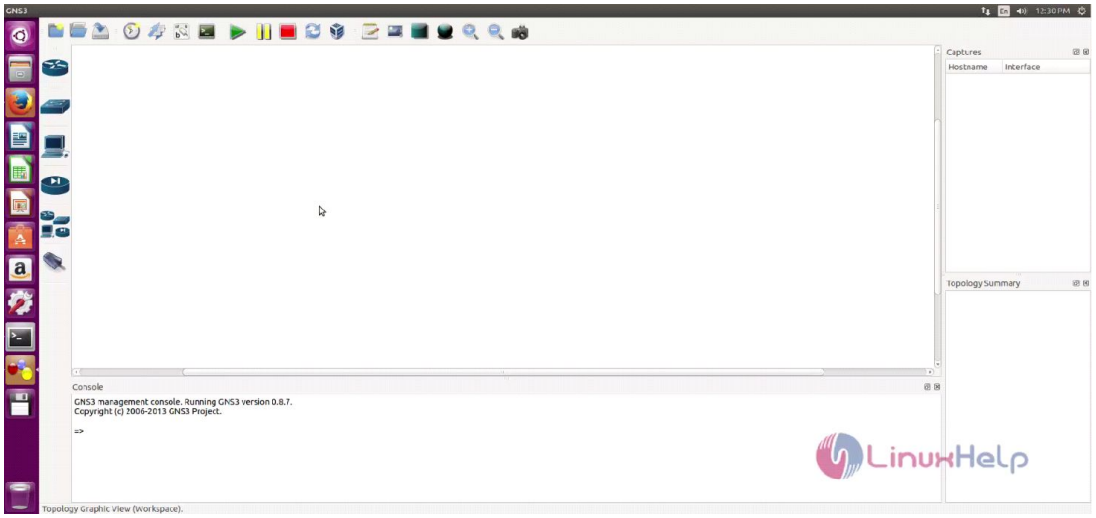


Figure 2: GNS3 preferences

- 

- After that click OK and “close”. Now the gns3 project wizard is ready to use.

Figure 3: GNS3 project wizard first look

Conclusion : Hence we successfully studied the program Build a simple network topology and configure it for static routing protocol using GNS3.

DATE: GRADE:

SIGN: