# GNS3 LABORATORY CONFIGURATION

This guide is provided to help with the configuration of the gns3 laboratory that we will use in the next lessons
For start the configuration we must install the latest version of GNS3 available at this URL: https://www.gns3.com/software/download
For Linux users you can find the commands to install the latest version of GNS3 at this URL: https://docs.gns3.com/docs/getting-started/installation/linux/

## Configuration of GNS3

For this purpose, we will use 3 appliance, useful for our purposes. In particular we must download the following 3 images:

- Cisco C7200 – http://tfr.org/cisco-ios/7200/c7200-advipservicesk9-mz.124-24.T5.bin
- Cisco C3745 – http://tfr.org/cisco-ios/37xx/3745/c3745-adventerprisek9-mz.124-25.bin
- Ubuntu cloud host – http://cloud-images.ubuntu.com/releases/focal/release/ubuntu-20.04-server-cloudimg-amd64.img
- Raspberry Pi OS Desktop - https://downloads.raspberrypi.org/rpd_x86/images/rpd_x86-2021-01-12/2021-01-11-raspios-buster-i386.iso

### Open Gns3 and create project

1. Run GNS3 as root
2. Create new project

### Internet Configuration

1. Go on the left-bar and select hosts, then drag the appliance “CLOUD” into the hierarchy
2. Do a Right-click on imported appliance
3. Check “show special ethernet interfaces” checkbox
4. Click on refresh
5. Select **virbr0** interface on dropdown
6. Click on Add
7. If present remove your wireless on bottom table net-card clicking on it and then clicking on delete
8. Click on OK
9. Rename “Cloud” into “Internet Access”

### Router Configuration

As router we will use the Cisco C7200 image, that is a Cisco Router. Once we downloaded the image, we must import into GNS3 using its template.

1. Import Image into GNS3 using gns3 templates
    a. Click on host on the left-bar, then click on new template (at the bottom)
    b. Select Install an appliance from the GNS3 server then click on next

    c. Into search-bar write Cisco 7200 then you will see, under the voice Routers, the appliance.
    d. Click on it and click on install
    e. When new popup comes click on next
    f. Click on C7200-adventerprisek9-… voice
    g. Check “allow custom files” checkbox and click on import
    h. Select downloaded image of C7200
    i. Click on C7200-adventerprisek9-… voice and select on next
2. Import appliance into GNS3 hierarchy
3. Interfaces configuration
    a. Right-click on imported appliance and go on “Slots” tab
    b. Replace C7200-IO-FE into dropdown with C7200-IO-2FE
    c. Link interface **FastEthernet 0/0** (of the Router) with **virbr0** (of “Cloud” appliance imported before)
4. Router configuration (with commands)
    a. Start appliance and open terminal
    b. Follow configure_c7200_as_router.txt for configuration of router
5. Router configuration (import configuration file)
    a. As alternative of point 4 we can import directly an existing configuration into Router.
    b. Download C7200 configuration from course website and open it
    c. Copy the content
    d. With appliance stopped right-click on it
    e. Click on open config
    f. Replace the text with the ones copied before
    g. Save and run the appliance

## Switch Configuration

As switch we will use Cisco C3745 image, that is a cisco router but it can work also as switch.

1. Import image into GNS3 using template
    a. Follow point 1 of Router configuration (Importing C3745 image)
2. Import appliance into GNS3 Hierarchy
3. Interfaces configuration
    a. Right-click on imported appliance
    b. Go on “Slots” tab
    c. Remove all adapters from WIC
    d. Remove all adapters but GT96100-FE
    e. Add, as second adapter, NM-16ESW
    f. Link from interface FastEthernet 0/1 (On C7200) to FastEthernet 1/15 (C3745)
    **g. DO NOT USE INTERFACES FASTETHERNET 0/***
        i. These interfaces are configured for routing, for our purposes we will use interfaces FASTETHERNET 1/*, configured for switching
4. Router configuration (with commands)
    a. Start appliance and open terminal
    b. Follow configure_c3745_as_switch.txt for configuration of router

5. Router configuration (import configuration file)
    a. As alternative of point 4 we can import directly an existing configuration into our C3745
    b. Download C3745 configuration from course website and open it
    c. Copy the content
    d. With appliance stopped right-click on it
    e. Click on open config
    f. Replace the text with the ones copied before
    g. Save and run the appliance

**Hosts Configuration**

- Ubuntu Cloud Host
    - For our purposes we will use two hosts, based on Ubuntu-20.04-server-clouding image, after downloaded image follow procedure for appliance importing used for first two imported, selecting Ubuntu Cloud Guest as appliance.
    - When import the image be sure to download also the file ubuntu-cloud-init-data, otherwise the process will not work and you're not be able to import appliance
    - After importing on GNS3 drag three time the host into hierarchy in order to have the three different hosts.
    - Once that we have imported and connected the hosts check if the internet connection is correctly configured.
- Raspberry Pi OS Desktop
    - We will also use this Raspberry Pi image that will be our attacker inside the laboratory.
    - In order to import it on our GNS3 we must at first install VirtualBox.
        - For Windows users you can just download the installer and install it.
        - For LINUX users you can installing using this guide.
    - Once we installed VirtualBox we must create a new VM using the image previously downloaded.
        - As network configuration  chose Generic Driver and as name put eth0
        - Run the new VM and select install, following the procedure.
        - After the installation of the OS close the VM
    - On Gns3 Side go on Edit and Preference (or use keyboard shortcut CTRL + SHIFT + P)
        - Go on Virtualbox VMs and click on New, chose the VM just created and select use as a linked base VM
        - Once new VM is present on GNS3 click on Edit on it, go on network tab and select "**Allow GNS3 to use any configured VirtualBox adapter**"
        - It will create a new template on the gns3 hosts and we can import it on our hierarchy.
        - In order to use a VirtualBox template with the Ubuntu Cloud Desktop host go on preference and on QEMU tab, then deselect both checkboxes for hardware acceleration