# GNS3 LABORATORY CONFIGURATION

This guide is useful to setup the GNS3 laboratory in order to be used during the next lab sessions. We **highly** recommend to use a Linux/UNIX guest system

GNS3 software can be downloaded [here](here)

## GNS3 configuration steps

### Preliminaries

The following images/binaries must be downloaded before starting the configuration

- [Cisco C7200](#) (~41 MB)
- [Cisco C3745](#) (~38 MB)
- [Ubuntu Cloud Host](#) (~580 MB)
- [Ubuntu Cloud Init Data](#) (~128 KB)
- [Raspberry Pi OS Desktop](#) (~3 GB)

### Open Gns3 and create project

1. Run GNS3
2. Create new project

### Internet Configuration

1. Go on the left-bar and select hosts, 🖥 then drag the appliance `CLOUD` into your project
2. Double click on imported appliance
3. Check `show special ethernet interfaces` checkbox
4. Click on refresh
5. Select **virbr0** interface on dropdown
    a. Attention! If `virbr0` doesn't appear in the dropdown menu, you need to install `libvirt` on your machine. On Ubuntu linux system, run the following command: `sudo apt install libvirt0 libvirt-clients libvirt-daemon libvirt-dev`
6. Click on `add`
7. Remove your wireless eth interface from the table (select your wi-fi interface, then click on **delete**)
8. Click on OK
9. Rename `Cloud` into `InternetAccess` (don't use spaces for device name)

## Router Configuration

The **Cisco C7200** image will be used as <u>router</u>. Cisco image must be imported into GNS3 using a personalized template

**Import Cisco 7200 image as template in GNS3**

1. Click on `FILE` → `New template`
2. Select `Install an appliance from the GNS3 server (recommended)` then click on `next`
3. Type `Cisco 7200` into filter search bar
4. Select `Cisco 7200 Dynamips` under the `Routers` tab and click on `install`
5. Select `install the appliance on your local computer` then click on `next`
6. Check `allow custom files` checkbox
   a. If a popup appears, click on `yes`
7. Click on C7200-adventerprisek9-… voice
8. Click on `import` (bottom left corner)
9. Select the previously downloaded image of **Cisco 7200** and press `yes`
10. Click (again) on `C7200-adventerprisek9-`… voice and press `next`
11. <u>Well Done!</u>

**Use the Cisco 7200 appliance on our topology**

From now on, the Cisco 7200 router should appears in the available devices inside the hosts section on the left bar

1. Drag and drop Cisco 7200 device into GNS3 hierarchy
2. Double click on the imported router
   a. Go to the `Slots` tab
   b. Replace `C7200-IO-`**FE** into dropdown with `C7200-IO-`**2FE**
3. Link **FastEthernet0/0** interface of the Cisco 7200 Router with the **virbr0** interface of `Cloud` (**InternetAccess**) appliance imported before
4. Configure the router using a configuration file **(router appliance must be stopped)**
   a. Download <u>Cisco 7200</u> configuration from course website and open it
      i. **Be careful:** File name must be `c7200_startup-config.`**cfg**
   b. Copy its content
   c. Right-click on the router imported in GNS3
   d. Click on `edit config`
   e. click on `ok` if the system asks which config file must be edited
   f. Replace the current configuration with the ones copied before
   g. Click on `Save`

## Switch Configuration
The **Cisco C3745** image will be used as <u>switch</u>

**Import Cisco 3745 image as template in GNS3**
1. Click on `FILE` → `New template`
2. Select `Install an appliance from the GNS3 server (recommended)` then click on `next`
3. Type `Cisco 3745` into filter search bar
4. Select `Cisco 3745 Dynamips` under the `Routers` tab and click on `install`
5. Select `install the appliance on your local computer` then click on `next`
6. Check `allow custom files` checkbox
    a. If a popup appears, click on `yes`
7. Click on `C3745-adventerprisek9-…` voice
8. Click on `import` (bottom left corner)
9. Select the previously downloaded image of **Cisco 3745** and press `yes`
10. Click (again) on `C3745-adventerprisek9-…` voice and press `next`
11. <u>Well Done!</u>

**Use the Cisco 7200 appliance on our topology**
1. Drag and drop Cisco 7200 device into GNS3 hierarchy
2. Double click on the imported router
3. Go to the `Slots` tab
    a. Remove all adapters from WIC
    b. Remove the adapter on **slot 3**
    c. Replace adapter on **slot 2** with **NM-16ESW**
4. Link **FastEthernet0/1** interface of **Cisco 7200** to **FastEthernet1/15** interface of **Cisco 3745**
    a. **DO NOT USE INTERFACES FASTETHERNET 0/*.** These interfaces are configured for routing. For our purposes we will use interfaces FASTETHERNET 1/* which have been configured for switching
5. Configure the router/switch using a configuration file **(router/switch appliance must be stopped)**
    a. Download <u>Cisco 3745</u> configuration from course website and open it
        i. **Be careful:** File name must be `c3745_startup-config.`**cfg**
    b. Copy its content
    c. Right-click on the router imported in GNS3
    d. Click on `edit config`
    e. click on `ok` if the system asks which config file must be edited
    f. Replace the current configuration with the ones copied before
    g. Click on `Save`

## Hosts Configuration

**Ubuntu Cloud Host**
- For our purposes we will use 3 hosts, based on `Ubuntu-20.04-server-clouding`
- Create a new template as we did for `Cisco 7200` **router and** `Cisco 3745` **switch**
  - Click on `FILE` → `New template`
  - Select `Install an appliance from the GNS3 server (recommended)` then click on `next`
  - Type **Ubuntu Cloud Guest** into filter search bar
  - Select `Ubuntu Cloud Guest` under the `Guests` tab and click on `install`
  - Select `install the appliance on your local computer` then click on `next`
  - Check `allow custom files` checkbox
    - If a popup appears, click on `yes`
  - Click on **ubuntu-cloud-init-data.iso** under `Ubuntu Cloud Guest version 20.04 (LTS)` voice
  - Click on `import` (bottom left corner)
  - Select the previously downloaded **ubuntu-cloud-init-data.iso** and press `yes`
  - Click on **ubuntu-20.04-server**… under `Ubuntu Cloud Guest version 20.04 (LTS)` voice
  - Click on `import` (bottom left corner)
  - Select the previously downloaded **ubuntu 20.04 image** and press `yes`
  - Click (again) on **ubuntu-20.04-server**… under `Ubuntu Cloud Guest version 20.04 (LTS)` voice and press `next`
  - <u>Well Done!</u>

- After that the import is complete, drag and drop 3 times the image into your GNS3 project

**Raspberry Pi OS Desktop**
A Raspberry Pi image will be used as attacker inside our laboratory sessions

**Import the image**

- Install VirtualBox
  - Windows users can download the installer [here](#)
  - LINUX users you can installing using this [guide](#). On Ubuntu 22.04 LTS, you can just execute the following command: `sudo apt install virtualbox`
- Create a new Virtual Machine
  - Start VirtualBox
  - Click on `NEW`
  - **Name:** `Raspbian`
  - **Type:** `Linux`
  - **Version:** `Debian (32-bit)`
  - Press on `create`
  - **File size:** `25 GB`
  - Right click on the new Raspbian machine

- Go to `settings` → `storage`
- Click on `Add optical drive`
- Select the previously downloaded image (**2021-01-11-raspios… .iso**)
- Go to `network`
  - Attached to: **Not Attached**
- Press `OK`
- Double click on the machine to run
  - If a popup appears (**select startup disk**…), press `Run`
- Follow the instruction!

**Import the new Raspbian host in GNS3**
- Start GNS3
- Go to **Edit** → **Preference** (or use keyboard shortcut **CTRL + SHIFT + P**)
- Go to `VirtualBox VMs` and click on `New`
- Chose the `Raspbian VM` and check **use as a linked base VM (experimental)**
- Press **Finish**
- Click on **Edit**
- Go to **Network** tab and click on **Allow GNS3 to use any configured VirtualBox adapter**
- Click on **OK**
- Go to **QEMU** tab
- **Deselect** both checkboxes for **hardware acceleration**