Introduction to GNS3

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Objectives

- Learn about installing, configuring and using GNS3 (Graphical Network Simulator)
- Design real case test scenarios, learning by example

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The Network Simulator

Graphical Network Simulator, GNS3

- Allows to create complex network with GUI
- Emulates CISCO IOS using *dynamips*
- Multiplatform, opensource and allowing VirtualBox and Wireshark integration
- Current version 2.2
- More at www.gns3.com

The Network Simulator

Installation

1. Read instructions for Linux distros (binaries and source) at GNS3 Install instructions
2. Install **dynamips** emulator from binaries according to your distro
3. Get dynamips source code if binaries don't exist for your distro or fixes required on Fedora 26 (Read this)
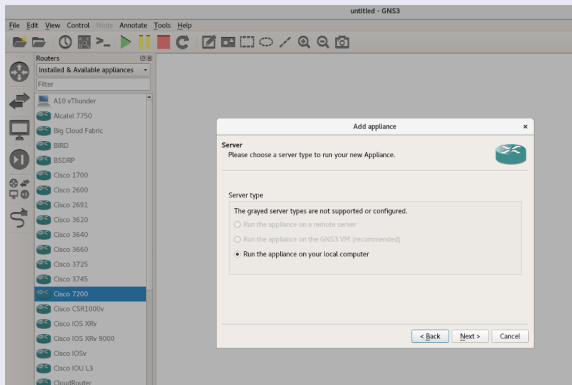
The Network Simulator

Configuration

1. Run GNS3 on localhost
2. Go to `Edit > Preferences > General`. Check if **ubridge** exists on your system. Otherwise, download source code, compile it and install
3. Go to `Edit > Preferences > Dynamips` and check if path is correct
4. Go to `Edit > Preferences > General`. Set paths for Projects and Images
5. Download and extract CISCO 2600 and 7200 images to `$GNS3/Images` from CISCO 2600 and 7200 images
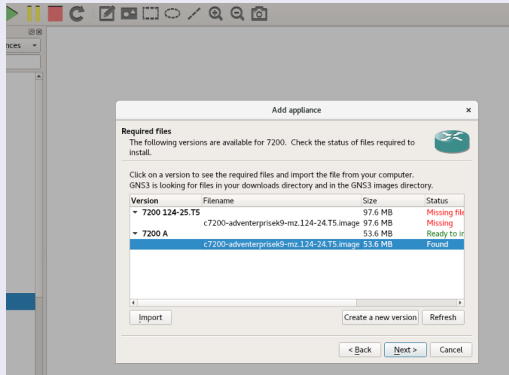
The Network Simulator

Configuration

6. From installed & available appliances, drag and drop Cisco 7200 in a new project canvas
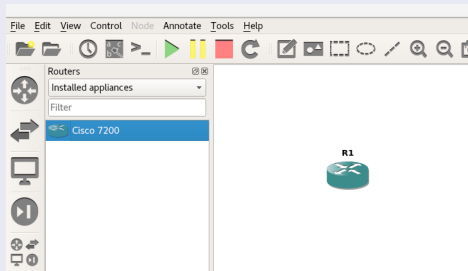
The Network Simulator

Configuration

7. Create a new version and import the new downloaded image

The Network Simulator

Configuration

8 Now, the new router is available in Installed Appliances

The Network Simulator

Configuration

9 If required, as root, include user into wireshark group
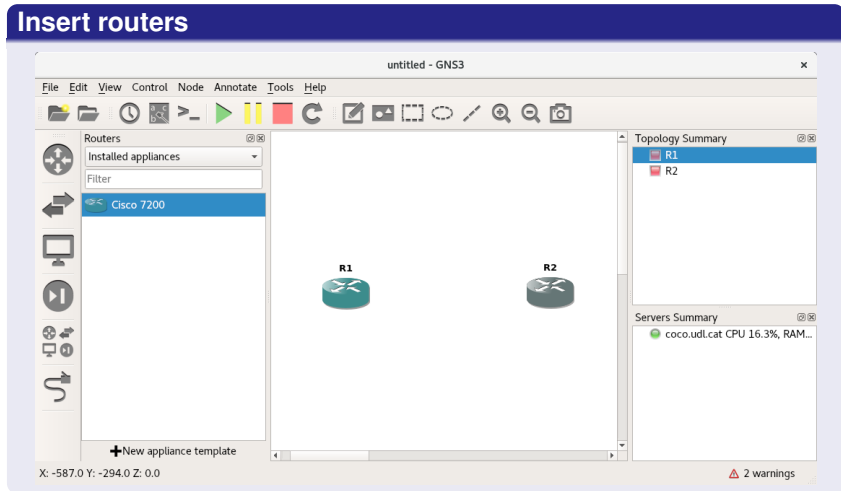
```
% usermod -a -G wireshark  cesar
```

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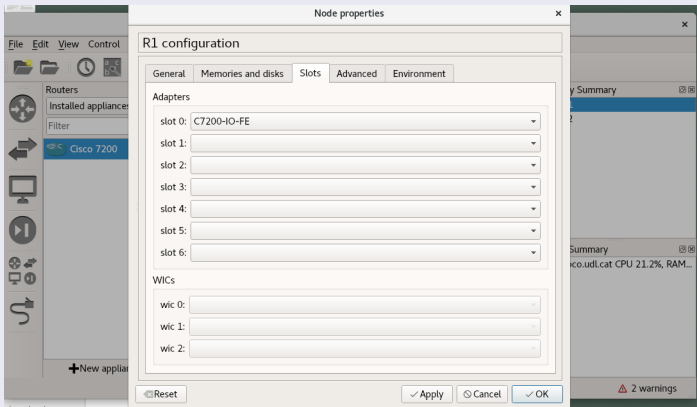**4 GNS3 important files**

5 CISCO IOS basic commands

A simple example

Insert routers

A simple example

Configure slots and interfaces

Right click on router. Select configure. Choose slot/0 and 1 port
FastEthernet

A simple example

Add a FastEthernet link
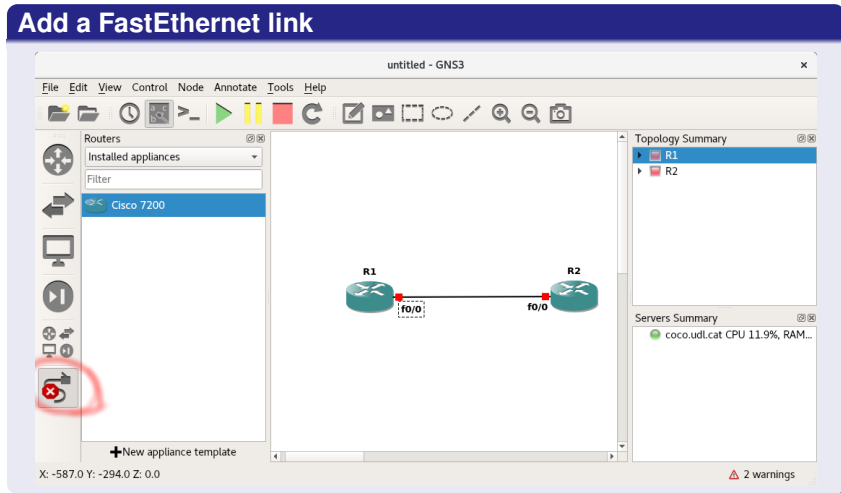
A simple example

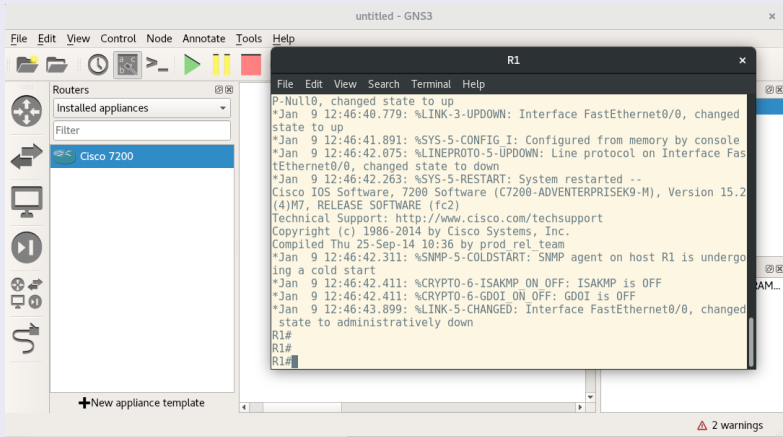## Start nodes
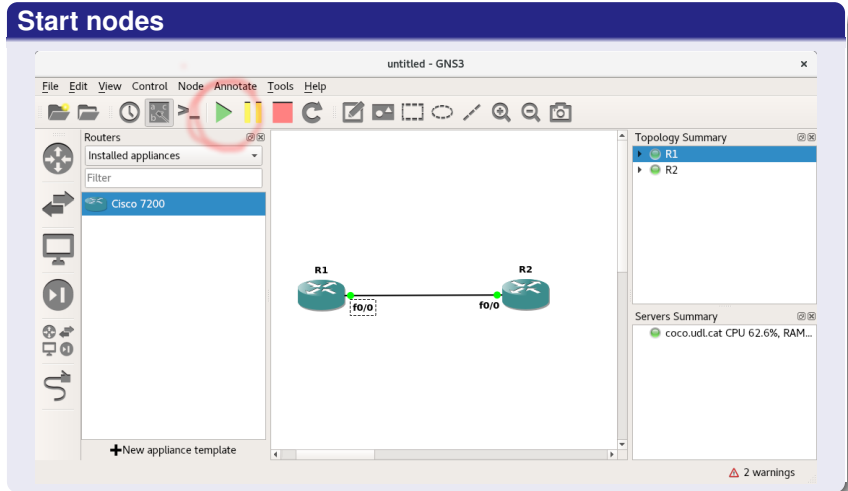
A simple example

Open console for router configuration

Right click on router. Select console

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GNS3 important files

Topology

- Saved at
  `$GNS3/Projects/ProjectName/ProjectName.gns3`
- Links and nodes detailed. JSON Notation

GNS3 important files

ProjectName.net (Link info)

```
"topology": {
      "computes": [],
      "drawings": [],
      "links": [
            {
                 "filters": {},
                 "link_id": "0e2bf692-5e3b-4e65-8423-b5b445fafe73",
                 "nodes": [
                       {
                            "adapter_number": 0,
                            "label": {
                                 "rotation": 0,
                                 "style": "font-family: TypeWriter;font-size: 10.0;font-weight: bold;fill: #000000;fi
                                 "text": "f0/0",
                                 "x": 72,
                                 "y": 26
                            },
                            "node_id": "6fe1d4bf-758c-4340-8d6e-fedfbab48763",
                            "port_number": 0
                       },
                       {
                            "adapter_number": 0,
                            "label": {
                                 "rotation": 0,
                                 "style": "font-family: TypeWriter;font-size: 10.0;font-weight: bold;fill: #000000;fi
                                 "text": "f0/0",
                                 "x": -6,
                                 "y": 17
                            },
                            "node_id": "e6ebfc40-e454-43e3-98b1-6a378f57deef",
                            "port_number": 0
                       }
                 ],
                 "suspend": false
```

GNS3 important files

ProjectName.net (Node info)

```
"nodes": [
    {
        "compute_id": "local",
        "console": 5000,
        "console_type": "telnet",
        "first_port_name": null,
        "height": 45,
        "label": {
            "rotation": 0,
            "style": "font-family: TypeWriter;font-size: 10.0;font-weight: bold;fill: #000000;fill-opaci
            "text": "R1",
            "x": 19,
            "y": -25
        },
        "name": "R1",
        "node_id": "6fe1d4bf-758c-4340-8d6e-fedfbab48763",
        "node_type": "dynamips",
        "port_name_format": "Ethernet{0}",
        "port_segment_size": 0,
        "properties": {
            "auto_delete_disks": true,
            "aux": null,
            "clock_divisor": 4,
            "disk0": 0,
            "disk1": 0,
            "dynamips_id": 1,
            "exec_area": 64,
            "idlemax": 500,
            "idlepc": "0x606df838",
            "idlesleep": 30,
            "image": "c7200-adventerprisek9-mz.124-24.T5.image",
            "image_md5sum": "1fe8d7d82cb8261a7487d543f172b985",
            "iomem": 5,
            "mac_addr": "ca01.1805.0000",
```
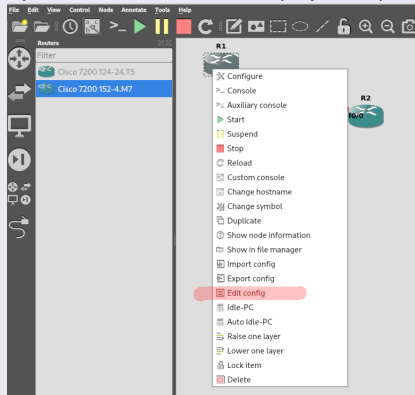
GNS3 important files

Router Configurations

- Saved at
  `$GNS3/Projects/ProjectName/project-files/`
  `/dynamips/NodeID/configs/iX_startup-config.cfg`

  - Where **NodeID** corresponds to `node_id` as in topology file
  - and **X** is the assigned number by GNS3 (Right click and `Show node information:  Server ID`)

GNS3 important files

Router Configurations

- Configuration may be edited from GUI when project stoped

Contents

CISCO IOS basic commands

- Cisco IOS Configuration Fundamentals Configuration Guide, Release 15.OS
- IP Addressing Configuration Guide Library, Cisco IOS Release 15M&T
- Self-completion commands (tab) and help (?)

Interfaces and saving configuration

```
R1# config terminal
R1(config)# interface FastEthernet 0/0
R1(config-if)# ip address 10.0.0.1 255.255.255.0
R1(config-if)# no shutdown
R1(config-if)# exit
R1(config)# exit
R1# copy running-config startup-config

R1# ping 10.0.0.1
```