



INSTITUTO SUPERIOR TÉCNICO

# **Traffic Engineering**

Lab Project #2

Part A

**Revision of/Introduction to - GNS3**

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# 1 Goal

The next lab sessions will be dedicated to MPLS. Since most of the work will be developed in GNS3, the goal of this lab session is to recall basic GNS3 concepts or become familiar with GNS3 and Cisco IOS if you have not used it before.

# 2 Equipment

PC with GNS3, VPCS, Wireshark and Cisco IOS.

# 3 Preparation of the work

To start getting familiar with Cisco IOS there are several introductory tutorials in Cisco site. There are also several videos in YouTube explaining the basics of Cisco IOS. We recommend that you install GNS3 and VPCS in your own PC to be able to replicate these and other exercises at home. In the Web site of GNS3, there are various videos and documents that explain how to download, install, and configure GNS3. You may also easily find tutorials on VPCS.

# 4 Setup

## 4.1 Configuration of PCs

Open the **VPCS** application (Virtual PC Simulator for Dynamips/GNS3). You can simulate up to 9 PCs with this application. The prompt indicates the PC that is being configured or analyzed. To change to a specific PC just type its number. Thus, to configure PC1 type **1**, if the prompt indicates another PC.

Note: For sake of simplicity, if you wish and understand what you are doing, you may replace the PC emulation with VPCS with simple IP routers. Important note for the following up work: if using this option, do not enable MPLS on these routers

## 4.2 Configuration of network architecture

Implement a simple network architecture with 5 routers, R1 to R5 and two servers, which may be emulated as PC1 and PC2. Consider that there are physical links between the following routers:

R1 – R2

R2 - R3

R3 - R5

R3 – R4

R4 – R5

R1 – R4

Connect a PC1 to R1 and PC2 to R5. How many local areas exist on this network?

Define IPv4 addresses, network and netmask addresses and configure the network using an adequate routing protocol. Adopted IP addresses must be in the range 192.168.[GroupNumber].0/24. Segment this /24 network in CIDR subnets compatible with the required topology. Draw a graphic representation of the network, specifying all IP addresses; this will be helpful to verify network consistency.

1. Verify/show that the connection between PC1 and PC2 is active.
2. Emulate the activation / de-activation of some network links and observe changes in routing.

3. Call the supervisor to show that the network is operational, and that routing converges upon link activation changes.

## **5 Assignment duration**

This assignment is the first part of a project which will cover at least 4 lab sessions. The delivery of the report will be only required upon completion of all lab sessions.