



INTRODUCTION TO COMPUTER NETWORKS

LAB REPORT Nº 05

GNS3

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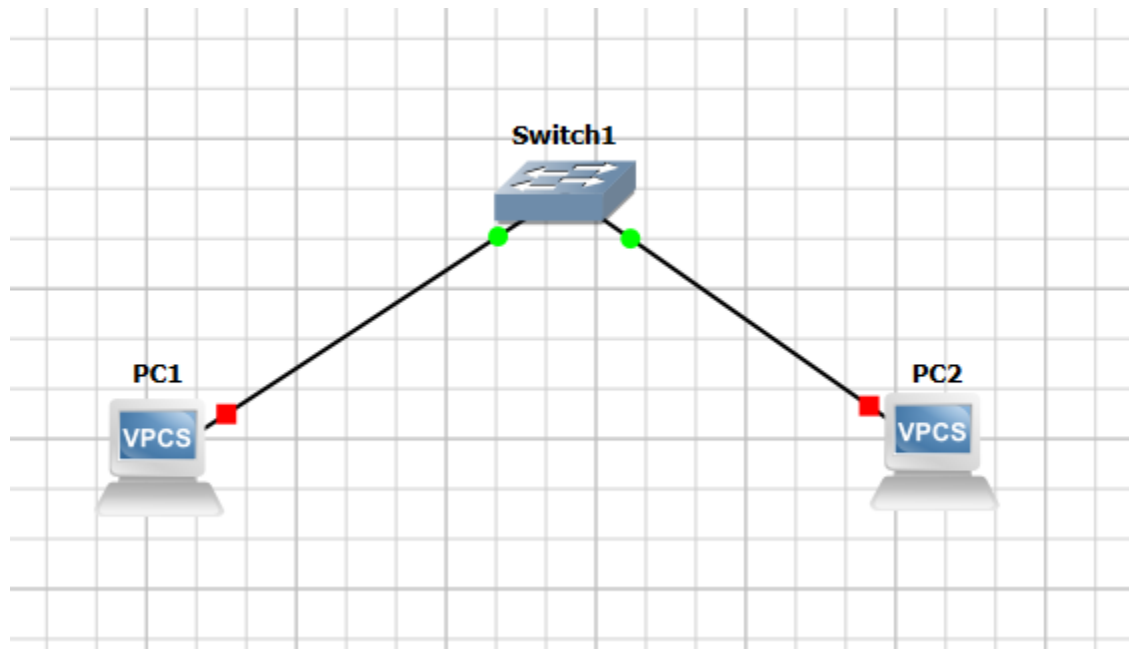
For this lab, we used the **GNS3** software. **GNS3** is a network software emulator, it allows the combination of virtual and real devices, used to simulate complex networks.

In order to install the software, is very straightforward. The software can be downloaded at <https://www.gns3.com/software/download>.

When you are installing the software, the installer will advise you to download a virtual machine, in order to use the software in a better way.

To download the virtual machine can be downloaded at <https://gns3.com/software/download-vm> you can select any option, but the most used is the first one.

Once I had the software installed on my computer the first that I did was create a new project. Then I installed a switch, and two PC as is shown in this screenshot:



To install the switch and computers I used these two sections:



The first button is to install a switch. There are four types of switches, I used the third one.



ATM switch



Ethernet hub



Ethernet switch



Frame Relay switch

The second button is to install a computer. There are three types of computers, I used the third one.



Cloud



NAT



VPCS

Then I connected the pc and switch with the cables. To set up the cables is this option:



The next past that we did in the lab is to set up the IP for the two pc. To do that I right-clicked on the pc icon and selected the option “custom console”.

In the console, I wrote the following code "ip 192.168.1.1/24" this established the IP of the computer that we are working then I wrote in the console “save”. This is a screenshot of the console:

```
ip ARG ... [OPTION]
  Configure the current VPC's IP settings
  ARG ...:
    address [mask] [gateway]
    address [gateway] [mask]
    Set the VPC's ip, default gateway ip and network mask
    Default IPv4 mask is /24, IPv6 is /64. Example:
    ip 10.1.1.70/26 10.1.1.65 set the VPC's ip to 10.1.1.70,
    the gateway to 10.1.1.65, the netmask to 255.255.255.192.
    In tap mode, the ip of the tapx is the maximum host ID
    of the subnet. In the example above the tapx ip would be
    10.1.1.126
    mask may be written as /26, 26 or 255.255.255.192
  auto      Attempt to obtain IPv6 address, mask and gateway using SLAAC
  dhcp [OPTION] Attempt to obtain IPv4 address, mask, gateway, DNS via DHCP
    -d      Show DHCP packet decode
    -r      Renew DHCP lease
    -x      Release DHCP lease
  dns ip    Set DNS server ip, delete if ip is '0'
  domain NAME Set local domain name to NAME

PC1> ip 192.168.1.1/24
Checking for duplicate address...
PC1 : 192.168.1.1 255.255.255.0

PC1> save
Saving startup configuration to startup.vpc
. done

PC1> █
```

I repeat the same procedure on the second computer but the IP was: 192.168.1.2/24.

```
Welcome to Virtual PC Simulator, version 0.6.2
Dedicated to Daling.
Build time: Apr 10 2019 02:42:20
Copyright (c) 2007-2014, Paul Meng (mirnshi@gmail.com)
All rights reserved.

VPCS is free software, distributed under the terms of the "BSD" licence
Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

PC2> ip 192.168.1.2/24
Checking for duplicate address...
PC1 : 192.168.1.2 255.255.255.0

PC2> save
Saving startup configuration to startup.vpc
. done

PC2> █
```

When the two computers had their IP. I do a ping between them. Ping allows a user to test and verify if a particular destination IP address exists and can accept requests in computer network administration. To do a ping, I wrote “ping with the IP of the other computer” for example, if I was on the first pc, I put “ping 192.168.1.2/24”.

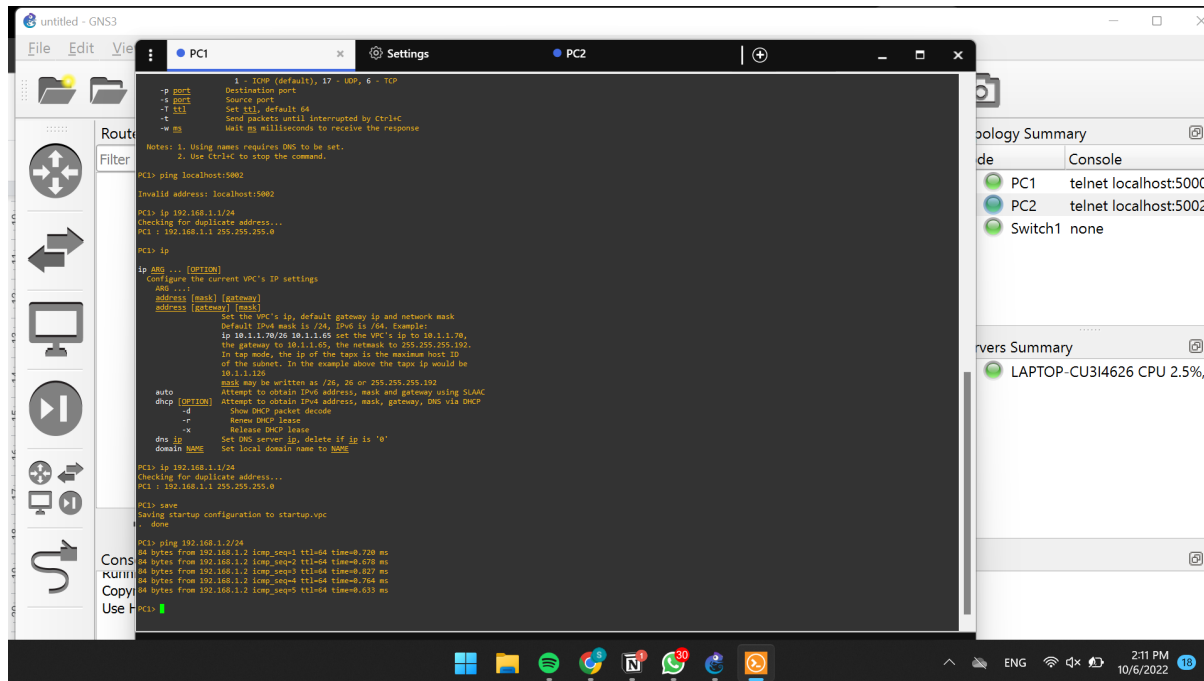
```
PC1> ping 192.168.1.2/24
84 bytes from 192.168.1.2 icmp_seq=1 ttl=64 time=0.720 ms
84 bytes from 192.168.1.2 icmp_seq=2 ttl=64 time=0.678 ms
84 bytes from 192.168.1.2 icmp_seq=3 ttl=64 time=0.827 ms
84 bytes from 192.168.1.2 icmp_seq=4 ttl=64 time=0.764 ms
84 bytes from 192.168.1.2 icmp_seq=5 ttl=64 time=0.633 ms

PC1> █
```

```
PC2> ping 192.168.1.1/24
84 bytes from 192.168.1.1 icmp_seq=1 ttl=64 time=0.730 ms
84 bytes from 192.168.1.1 icmp_seq=2 ttl=64 time=0.769 ms
84 bytes from 192.168.1.1 icmp_seq=3 ttl=64 time=0.803 ms
84 bytes from 192.168.1.1 icmp_seq=4 ttl=64 time=0.724 ms
84 bytes from 192.168.1.1 icmp_seq=5 ttl=64 time=0.646 ms

PC2> █
```

Finally, as we can see in this screenshot both computers are working on my computer, not on a virtual machine.



The screenshot shows the GNS3 interface with a terminal window for PC1. The terminal displays the following commands and output:

```

1 - ICMP (default), 17 - UDP, 6 - TCP
-P port      Destination port
-S port      Source port
-T ttl        Set ttl, default 64
-C           Send packets until interrupted by Ctrl+C
-W m         Wait m milliseconds to receive the response

Notes: 1. Using names requires DNS to be set..
      2. Use Ctrl+C to stop the command.

PC1> ping localhost5002
[invalid address] localhost5002

PC1> ip 192.168.1.1/24
Checking for duplicate address...
PC1 : 192.168.1.1 255.255.255.0

PC1> ip
ip ... [OPTION]
Configure the current VPC's IP settings
add ...:
address [mask] [gateway]
address [gateway] [mask]
Set the VPC's ip, default gateway ip and network mask
Default IPv4 mask is /24, IPv6 is /64. Example:
ip 10.1.1.70/26 10.1.1.65 set the VPC's ip to 10.1.1.70,
the gateway to 10.1.1.65, the network to 255.255.255.192.
In tap mode, the ip of the tap is the mainline host ID
of the subnet. In the example above the tap's ip would be
10.1.1.120
mask may be written as /24, 26 or 255.255.255.192
auto [OPTION] Attempt to obtain IPv6 address, mask and gateway using SLAAC
dhcp [OPTION] Attempt to obtain IPv4 address, mask, gateway, DNS via DHCP
-d          Show DHCP packet decode
-r          Release DHCP lease
-x          Release DHCP lease
dns ip      Set DNS server IP, delete if ip is '0'
domain NAME Set local domain name to NAME

PC1> ip 192.168.1.1/24
Checking for duplicate address...
PC1 : 192.168.1.1 255.255.255.0

PC1> save
Saving startup configuration to startup.vpc
done

PC1> ping 192.168.1.2/24
64 bytes from 192.168.1.2: icmp_seq=1 ttl=64 time=0.720 ms
64 bytes from 192.168.1.2: icmp_seq=2 ttl=64 time=0.628 ms
64 bytes from 192.168.1.2: icmp_seq=3 ttl=64 time=0.627 ms
64 bytes from 192.168.1.2: icmp_seq=4 ttl=64 time=0.768 ms
64 bytes from 192.168.1.2: icmp_seq=5 ttl=64 time=0.633 ms

```

On the right side of the interface, the 'Topology Summary' table shows:

Device	Console
PC1	telnet localhost:5000
PC2	telnet localhost:5002
Switch1	none

The 'Servers Summary' table shows:

Device	Console
LAPTOP-CU3I4626	CPU 2.5%,...