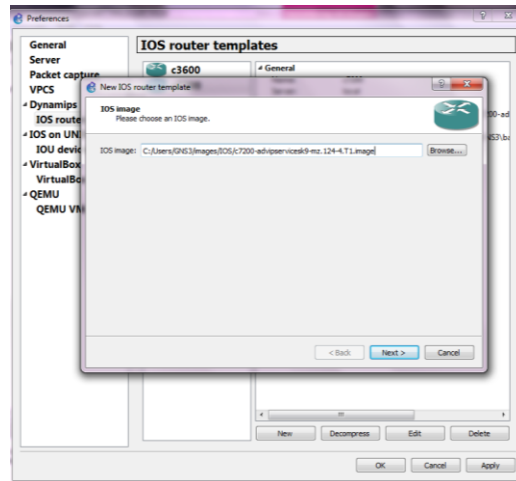
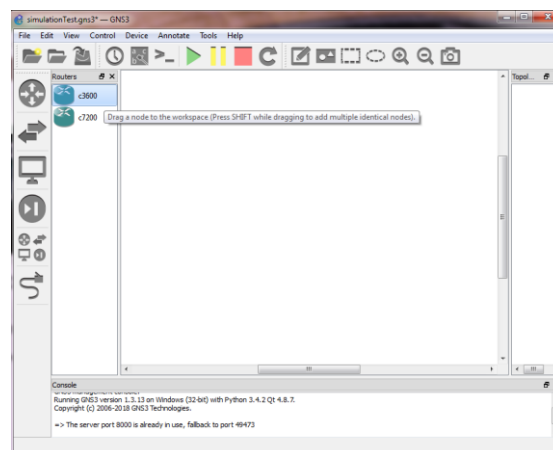


In this document, I will give you explain of how made the network design of the assignment using the application GNS3 version 1.3.13. How first step, I downloaded the GNS3 both the ISO router Cisco 7200. Next, we import the ISO image into the GNS3.



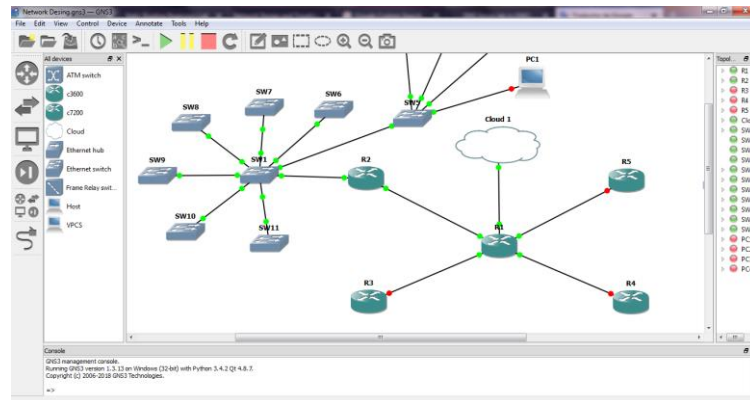
View to import the ISO image

Inside our section “Routers”, we can find the router downloaded for be used. In this moment we can drag the components inside of our workspace.



View of the workspace

We can design our topology using all the components that GNS3 has, in this components we will find routers of CISCO, switches, hosts, VPCS, cloud for the connection to internet, hubs and wire for join the components.



View of star topology

We will use two ips for our network; the ip address public is 130.140.150.160/26 with this we can connect to internet and our ip address private 192.168.168.0/24 which this establish inside the company. It has four departments, connected in the same network each other with different number of host.

Due to, we will apply subnetting to the ip address private for we will obtain four different networks for each department. This distribution will be showed in the table below.

Nº	Requested host	Found Host	Network address	Mask	Decimal mask	First usable IP	Last usable IP	Broadcast address
Finance	67 Computers 1 Printer 1 server	126	192.168.168.0	/25	255.255.255.128	192.168.168.1	192.168.168.254	192.168.168.255
IT	37 Computers 1 Printer 1 Server	62	192.168.168.128	/26	255.255.255.192	192.168.168.129	192.168.168.190	192.168.168.191
HR	17 Computers 1 Printer	30	192.168.168.192	/27	255.255.255.224	192.168.168.193	192.168.168.222	192.168.168.223

1 Server								
<b>Marketing</b>	9							
	Computer	14	192.168.168.2	/28	255.255.255.2	192.168.168.2	192.168.168.2	192.168.168.2
	s	24			40	25	38	39
	1 Printer							
	1 Server							

Table subnetting information

Each network will be configured with a VLAN, listed of the next way:

Department	VLAN number
Finance	100
Information Technology	200
Human Resources	300
Marketing	400

Table VLAN information

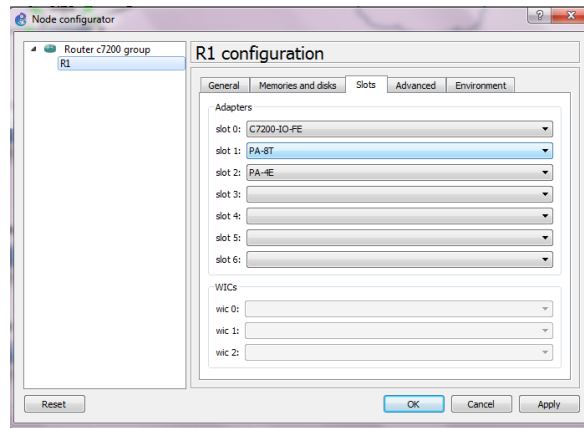
In all the routers be to executed the follow lines inside its console. This will be available after to start the router.

```
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#line console 0
R1(config-line)#no exec-timeout
R1(config-line)#end
R1#
```

Commands lines for timeout

These lines disable the timeout for that the router doesn't disconnect after some seconds of inactivity.

We configure the slots in each router what it will permit us have the interface for the connections between the components. In our case, we will use a slot with eight interfaces in each router. This will show in the picture below:



View configuration of router slots

Next step will be to configure a network that connects the main router with the department router. We use the ip address showed below in the table:

Network address	Router	Router address	Interface main router (R1)	Interface address
172.16.0.0/30	R2	172.16.0.2	Ethernet 1/0	172.16.0.1
172.16.1.0/30	R3	172.16.1.2	Ethernet 1/1	172.16.1.1
172.16.2.0/30	R4	172.16.2.2	Ethernet 1/2	172.16.2.1
172.16.3.0/30	R5	172.16.3.2	Ethernet 1/3	172.16.3.1

Table network WAN ip address

The commands are the follows:



Commands lines for configure the WAN

In the same way, we configure the main route in each interface connected to the routers and the interface for the external connection. The next image show each interface with its configuration.

```
R1
FastEthernet0/0      unassigned      YES NVRAM    administratively down down
Serial1/0            172.16.0.1    YES manual  up             up
Serial1/1            172.16.1.1    YES manual  up             up
Serial1/2            172.16.2.1    YES manual  up             down
Serial1/3            172.16.3.1    YES manual  up             down
Serial1/4            unassigned    YES unset   administratively down down
Serial1/5            unassigned    YES unset   administratively down down
Serial1/6            unassigned    YES unset   administratively down down
Serial1/7            unassigned    YES unset   administratively down down
Ethernet2/0          unassigned    YES NVRAM    up             up
Ethernet2/1          unassigned    YES NVRAM    up             up
--More--
```

View main router

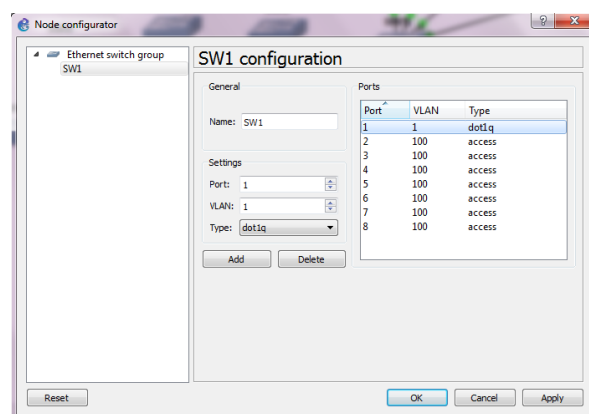
We can try the connection using the ping command with the direction of the router

```
R2
R2#ping 172.16.0.1
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.0.1, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 92/279/704 ms
R2#
```

View check the connection

Note: If it shows a high percentage of send, then the routers have a good communication.

Now configure the switches with the name of the VLANs that it will be used into of each department.

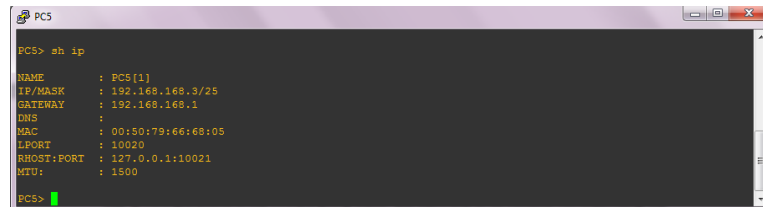


Configuration of the VLANs

Our ip configurations in the PCs are going static, put each one in its console corresponding in the next command line:

```
ip 192.168.168.3 255.255.255.128 192.168.168.1
```

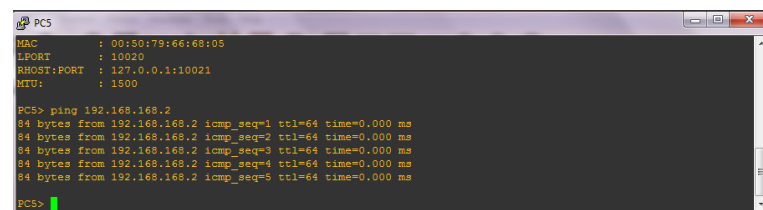
Indicating the ip address, mask and ip address gateway corresponding



```
PC5> sh ip
NAME      : PC5[1]
IP/MASK   : 192.168.168.3/25
GATEWAY   : 192.168.168.1
DNS       :
MAC       : 00:50:79:66:68:05
LPORT     : 10020
RHOST:PORT : 127.0.0.1:10021
MTU       : 1500
PC5>
```

View ip address in a PC

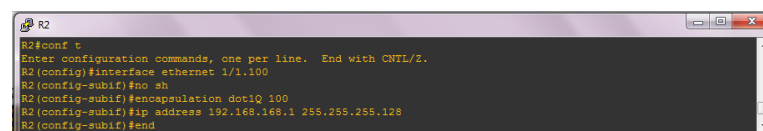
We make a ping between the two computer configured to try that the connection is success



```
PC5> ping 192.168.168.2
84 bytes from 192.168.168.2: icmp_seq=1 ttl=64 time=0.000 ms
84 bytes from 192.168.168.2: icmp_seq=2 ttl=64 time=0.000 ms
84 bytes from 192.168.168.2: icmp_seq=3 ttl=64 time=0.000 ms
84 bytes from 192.168.168.2: icmp_seq=4 ttl=64 time=0.000 ms
84 bytes from 192.168.168.2: icmp_seq=5 ttl=64 time=0.000 ms
PC5>
```

View ping success between the connections

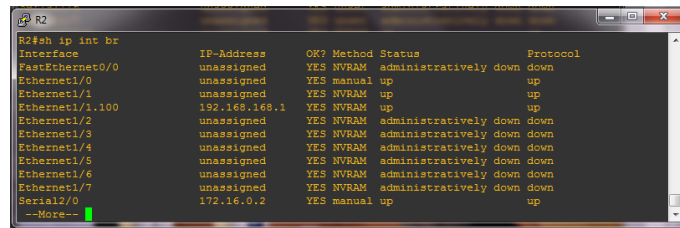
We configure in each interface of the main router the VLAN corresponding with the ip address of the subnetting



```
R2>conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#interface ethernet 1/1.100
R2(config-subif)#no sh
R2(config-subif)#encapsulation dot1Q 100
R2(config-subif)#ip address 192.168.168.1 255.255.255.128
R2(config-subif)#end
```

Stablish configuration of VLAN network

In the table of our interfaces should show the follow:



Interface	IP-Address	OK?	Method	Status	Protocol
FastEthernet0/0	unassigned	YES	NVRAM	administratively down	down
Ethernet1/0	unassigned	YES	manual	up	up
Ethernet1/1	unassigned	YES	NVRAM	up	up
Ethernet1/1.100	192.168.168.1	YES	NVRAM	up	up
Ethernet1/2	unassigned	YES	NVRAM	administratively down	down
Ethernet1/3	unassigned	YES	NVRAM	administratively down	down
Ethernet1/4	unassigned	YES	NVRAM	administratively down	down
Ethernet1/5	unassigned	YES	NVRAM	administratively down	down
Ethernet1/6	unassigned	YES	NVRAM	administratively down	down
Ethernet1/7	unassigned	YES	NVRAM	administratively down	down
Serial2/0	172.16.0.2	YES	manual	up	up

Table of interfaces R2

We try the connection between our PCs and the router R2

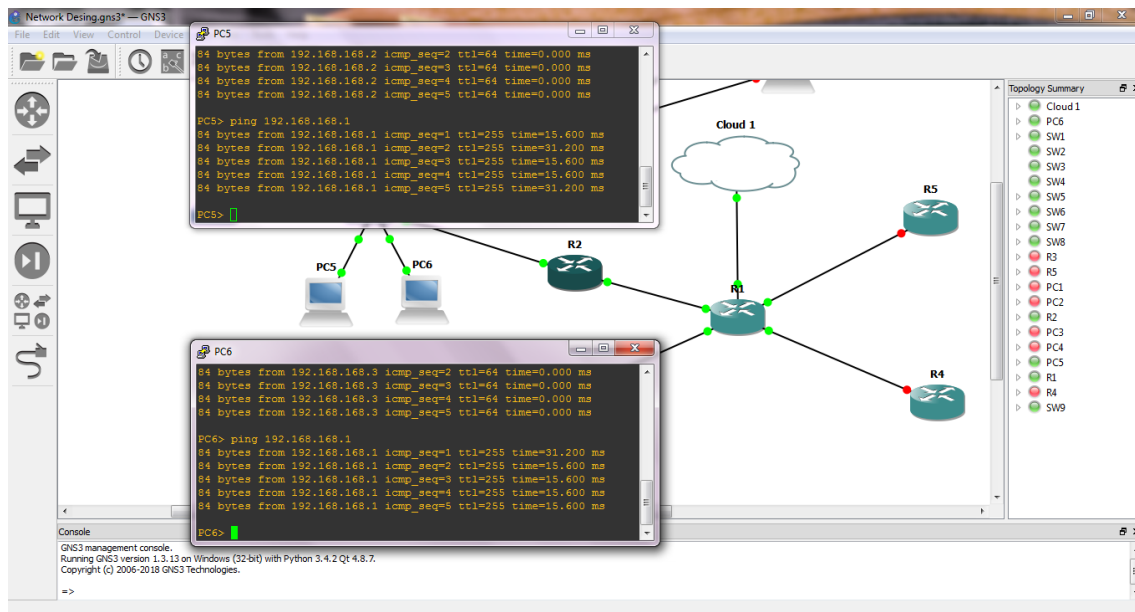


Image about connections

We configure the static route of the follow way:



```

R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip route 192.168.168.0 255.255.255.128 172.16.0.2
R1(config)#end
R1#
Nov 18 04:10:48.871: %SYS-5-CONFIG_I: Configured from console by console
R1#wr
Building configuration...

```

Static route in the main router



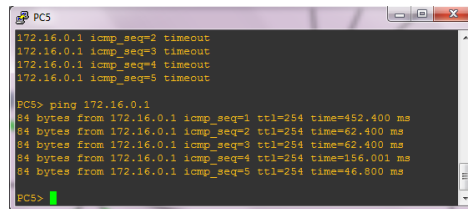
```

R2#
R2(config)#ip route 0.0.0.0 0.0.0.0 172.16.0.1
R2(config)#end
R2#wr
Nov 18 04:13:03.547: %SYS-5-CONFIG_I: Configured from console by console
R2#wr
Building configuration...

```

Static route in the department router

And we ping from a PC to test the connection, showing that we can already reach the R1.



```
PC5
172.16.0.1 icmp_seq=2 timeout
172.16.0.1 icmp_seq=3 timeout
172.16.0.1 icmp_seq=4 timeout
172.16.0.1 icmp_seq=5 timeout

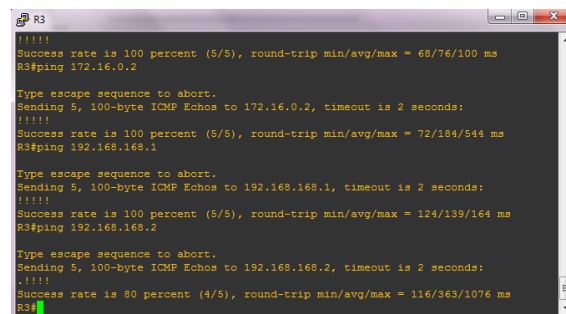
PC5> ping 172.16.0.1
64 bytes from 172.16.0.1 icmp_seq=1 ttl=254 time=452.400 ms
64 bytes from 172.16.0.1 icmp_seq=2 ttl=254 time=62.400 ms
64 bytes from 172.16.0.1 icmp_seq=3 ttl=254 time=62.400 ms
64 bytes from 172.16.0.1 icmp_seq=4 ttl=254 time=156.001 ms
64 bytes from 172.16.0.1 icmp_seq=5 ttl=254 time=46.800 ms

PC5>
```

View of a ping

Now we go to create the access list for permit or deny the communication, in this case, we are going to deny the entrance the communication to others departments.

In the next image, we can watch that the R3 can communicate with the host the other department through the command ping.



```
R3
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 68/76/100 ms
R3#ping 172.16.0.2

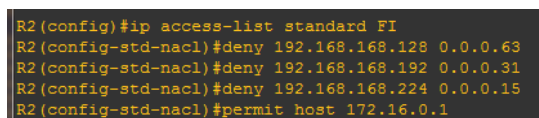
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echoes to 172.16.0.2, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 72/184/544 ms
R3#ping 192.168.168.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echoes to 192.168.168.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 124/139/164 ms
R3#ping 192.168.168.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echoes to 192.168.168.2, timeout is 2 seconds:
!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 116/363/1076 ms
R3#
```

View ping made over R3

Use the next command line to create the access-list



```
R2(config)#ip access-list standard FI
R2(config-std-nacl)#deny 192.168.168.128 0.0.0.63
R2(config-std-nacl)#deny 192.168.168.192 0.0.0.31
R2(config-std-nacl)#deny 192.168.168.224 0.0.0.15
R2(config-std-nacl)#permit host 172.16.0.1
```

View access list for Finances department



```
R2
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/4 ms
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#int e2/0
R2(config-if)#ip access-group FI in
R2(config-if)#int e1/1
R2(config-if)#ip access-group FI in
R2(config-if)#end
R2#
*Nov 18 19:14:41.431: %SYS-5-CONFIG_I: Configured from console by console
R2#wr
Building configuration...
```

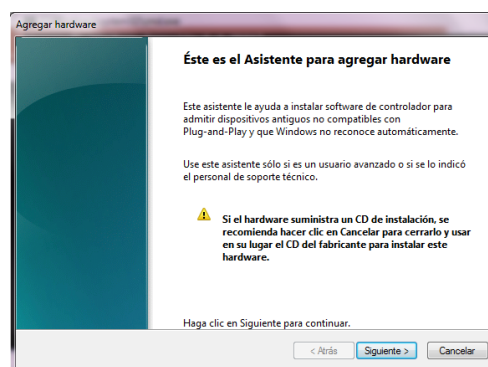
## Assignment to each router interface

```
R2
Success rate is 0 percent (0/5)
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ip access-list astandard FI
^
% Invalid input detected at '^' marker.

R2(config)#ip access-list standard FI
R2(config-std-nacl)#permit any
R2(config-std-nacl)#end
R2#
*Nov 18 11:52:39.949: %SYS-5-CONFIG_I: Configured from console by console
R2#wr
Building configuration...
[OK]
R2#sh access-list
Standard IP access list FI
 40 permit 172.16.0.1 (121 matches)
 10 deny 192.168.168.128, wildcard bits 0.0.0.63 (60 matches)
 20 deny 192.168.168.192, wildcard bits 0.0.0.31
 30 deny 192.168.168.224, wildcard bits 0.0.0.15
 50 permit any
Standard IP access list NO_ACCESS
R2#
```

## Access control list for finance department

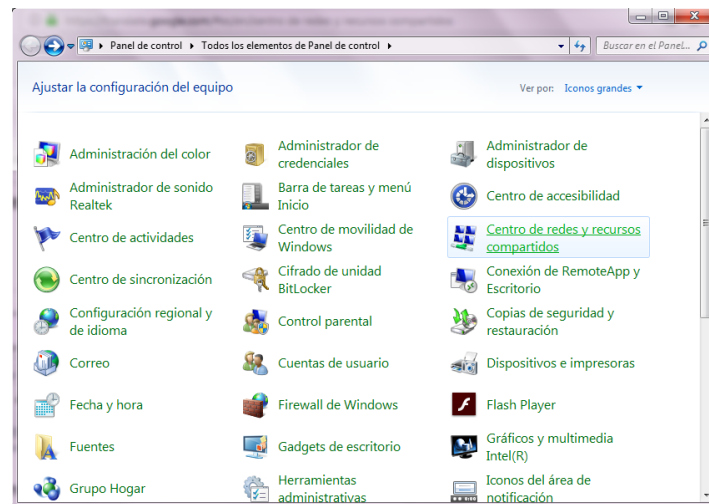
Now for we connect to internet, we need create a loopback interface of the next way, open the cmd in our computer and typing “hdwwiz”, and will appear a window as like:



## Window for help

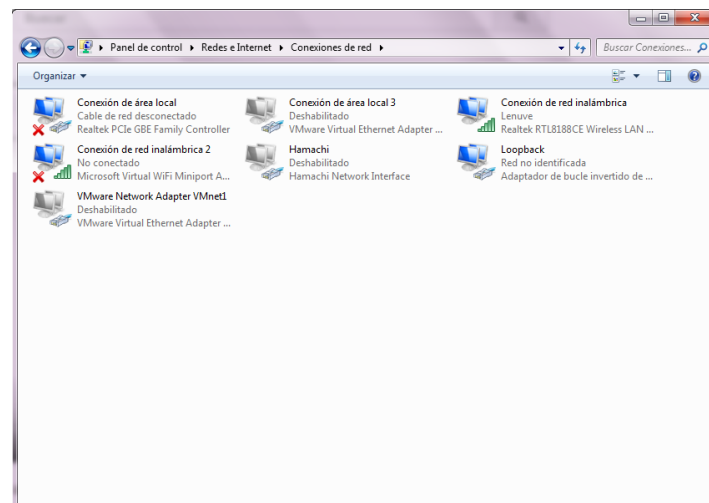
Click in next and choose the option Install the hardware manually, search “Network Adapter” and click in “next”, choose the “Microsoft fabricator > Loopback adapter “and “next” in the other views.

In “control panel” select “center network and sharing”



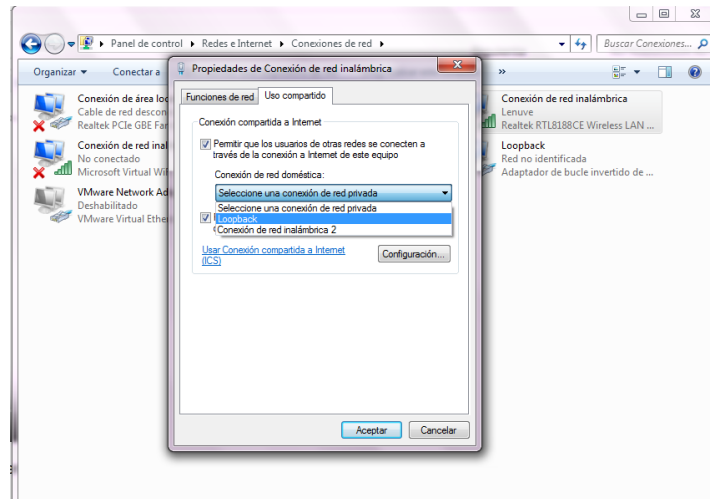
Configuration window

Click in “change the adapter configuration”



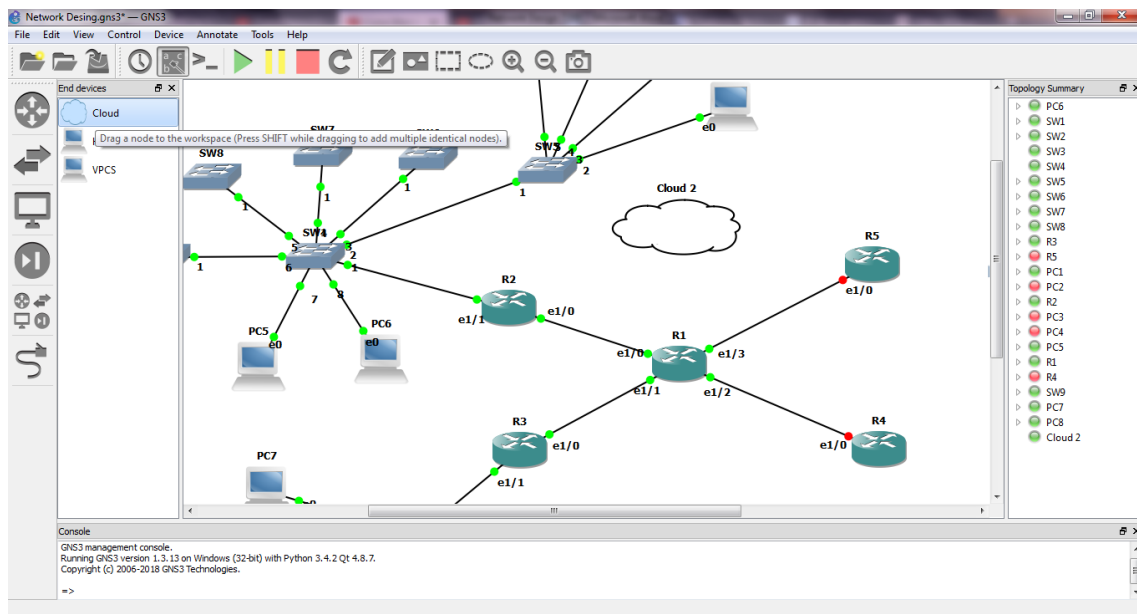
View of all the connections

Change the name to our adapter, after make right click in our adapter that it provide us internet. Click in the tab “shared use”, checked in the first option and choose our Loopback adapter. Click in “Ok” and reset the pc.



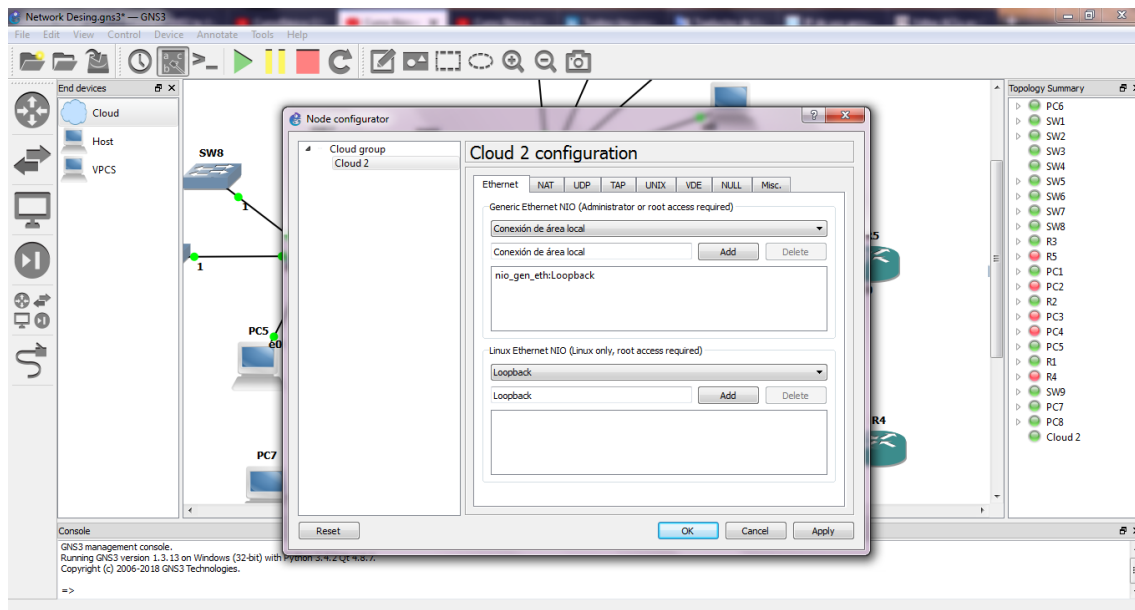
Configuration window

Select the cloud of our store of components and we put it into of the workspace.



View of the workspace

Right click on the cloud > configure and select the “generic Ethernet” that we create, click on “Add” and on “Ok”.



View cloud configuration

Make the connection with the Loopback interface. Into the console of router R1 typing the next lines for obtain an ip address from our real network.

```

R1
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int e2/0
R1(config-if)#exit
R1(config)#int e2/1
R1(config-if)#ip address dhcp
R1(config-if)#no sh
R1(config-if)#end
R1#
*Nov 18 10:10:20.750: %LINK-3-UPDOWN: Interface Ethernet2/1, changed state to up
  
```

Command lines

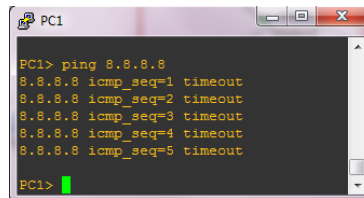
Make ping to an ip address external of our local network for check the connection.

```

R1
[OK]
R1#ping 8.8.8.8
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 8.8.8.8, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 116/119/120 ms
R1#
  
```

View ping to google.com

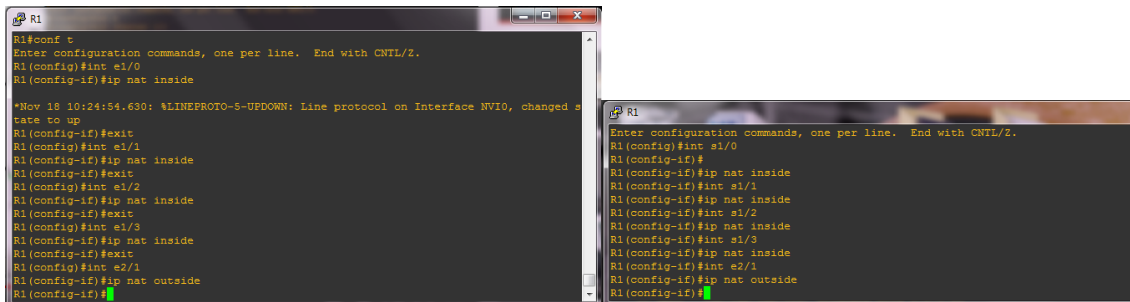
But if we try since other pc, we see that there is not connection, then for solution it we are going configure the NAT (Network address translation)



```
PC1> ping 8.8.8.8
8.8.8.8 icmp_seq=1 timeout
8.8.8.8 icmp_seq=2 timeout
8.8.8.8 icmp_seq=3 timeout
8.8.8.8 icmp_seq=4 timeout
8.8.8.8 icmp_seq=5 timeout
PC1>
```

View success of ping to google.com

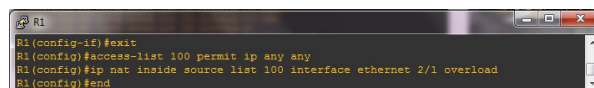
First we see which are the inside interfaces that we want to change, in the design are four (e1/0, e1/1, e1/2, e1/3), and existing one outside interface (e2/1)



```
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int e1/0
R1(config-if)#ip nat inside
*Nov 18 10:24:54.630: %LINEPROTO-5-UPDOWN: Line protocol on Interface NV10, changed s
tate to up
R1(config-if)#exit
R1(config)#int e1/1
R1(config-if)#ip nat inside
R1(config-if)#exit
R1(config)#int e1/2
R1(config-if)#ip nat inside
R1(config-if)#exit
R1(config)#int e1/3
R1(config-if)#ip nat inside
R1(config-if)#exit
R1(config)#int e2/1
R1(config-if)#ip nat outside
R1(config-if)#
```

View interface configuration

After, we create a access list for permit all the ips address that can be to transform with NAT, using dynamic mapping.



```
R1(config-if)#exit
R1(config)#access-list 100 permit ip any any
R1(config)#ip nat inside source list 100 interface ethernet 2/1 overload
R1(config)#end
```

View for permit all the ip direction

Configure the Loopback interface in the router R1

```

R1
Success rate is 100 percent (5/5), round-trip min/avg/max = 120/130/152 ms
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#int loopback 0
R1(config-if)#
*Nov 18 10:43:15.297: %LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback0, chan
ged state to up
R1(config-if)#ip address 130.140.150.160 255.255.255.128
% 130.140.150.128 overlaps with Ethernet2/0
R1(config-if)#ip address 130.140.150.161 255.255.255.128
% 130.140.150.128 overlaps with Ethernet2/0
R1(config-if)#ip address 130.140.150.160 255.255.255.0
% 130.140.150.0 overlaps with Ethernet2/0
R1(config-if)#ip address 130.140.150.160 255.255.255.255
% 130.140.150.160 overlaps with Ethernet2/0
R1(config-if)#ip address 130.140.150.161 255.255.255.0
% 130.140.150.0 overlaps with Ethernet2/0
R1(config-if)#ip address 130.140.150.161 255.255.255.255
% 130.140.150.161 overlaps with Ethernet2/0
R1(config-if)#int e2/0
R1(config-if)#no ip address
R1(config-if)#int e2/1
R1(config-if)#ip address 130.140.150.160 255.255.255.192
R1(config-if)#no ip address
R1(config-if)#do sh ip int br
Interface      IP-Address      OK? Method Status        Protocol
FastEthernet0/0  unassigned      YES NVRAM   administratively down down
Ethernet1/0      172.16.0.1       YES NVRAM   up             up
Ethernet1/1      172.16.1.1       YES NVRAM   up             up
Ethernet1/2      172.16.2.1       YES NVRAM   up             up
Ethernet1/3      172.16.3.1       YES NVRAM   up             up
Ethernet2/0      unassigned      YES manual up             up
Ethernet2/1      unassigned      YES manual up             up
Ethernet2/2      unassigned      YES NVRAM   administratively down down
Ethernet2/3      unassigned      YES NVRAM   administratively down down
NVI0            unassigned      YES unset  up             up
Loopback0       unassigned      YES unset  up             up
R1(config-if)#exit
R1(config)#int loopback 0
R1(config-if)#ip address 130.140.150.160 255.255.255.192
R1(config-if)#do sh ip int br
Interface      IP-Address      OK? Method Status        Protocol
FastEthernet0/0  unassigned      YES NVRAM   administratively down down

```

## View Interface Loopback

The address obtain is 130.140.150.128, the next table is shown with the command “sh ip route”

```

R1
Gateway of last resort is not set

  172.16.0.0/30 is subnetted, 4 subnets
C      172.16.0.0 is directly connected, Ethernet1/0
C      172.16.1.0 is directly connected, Ethernet1/1
C      172.16.2.0 is directly connected, Ethernet1/2
C      172.16.3.0 is directly connected, Ethernet1/3
  130.140.0.0/26 is subnetted, 1 subnets
C      130.140.150.128 is directly connected, Loopback0
  192.168.168.0/24 is variably subnetted, 2 subnets, 2 masks
S      192.168.168.128/26 [1/0] via 172.16.1.2
S      192.168.168.0/25 [1/0] via 172.16.0.2
R1(config)#

```

## View route table

We can procedure to configure the DNS server of the next way:

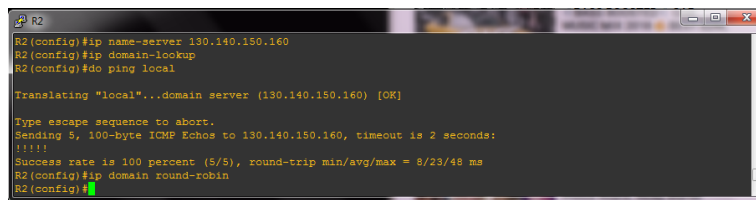
```

R1
R1(config)#ip dns server
R1(config)#ip dns primary sysco.co.uk soa local.sysco.co.uk admin.sysco.co.uk
R1(config)#ip host sysco.co.uk ns 130.140.150.160
R1(config)#do show ip int br
Interface      IP-Address      OK? Method Status        Protocol
FastEthernet0/0  unassigned      YES NVRAM   administratively down down
Ethernet1/0      172.16.0.1       YES NVRAM   up             up
Ethernet1/1      172.16.1.1       YES NVRAM   up             up
Ethernet1/2      172.16.2.1       YES NVRAM   up             up
Ethernet1/3      172.16.3.1       YES NVRAM   up             up
Ethernet2/0      unassigned      YES manual up             up
Ethernet2/1      192.168.137.120 YES DHCP    up             up
Ethernet2/2      unassigned      YES NVRAM   administratively down down
Ethernet2/3      unassigned      YES NVRAM   administratively down down
NVI0            unassigned      YES unset  up             up
Loopback0       130.140.150.160 YES manual up             up
R1(config)#ip host local 130.140.150.160

```

## Command lines for DNS

In the routers for each department configure the next it:



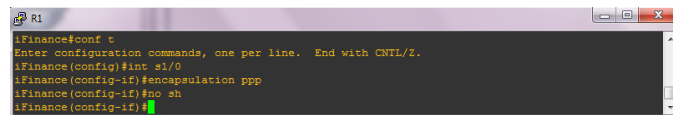
```
R2
R2(config)#ip name-server 130.140.150.160
R2(config)#ip domain-lookup
R2(config)#do ping local

Translating "local"...domain server (130.140.150.160) [OK]

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 130.140.150.160, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 8/23/48 ms
R2(config)#ip domain round-robin
R2(config)#
```

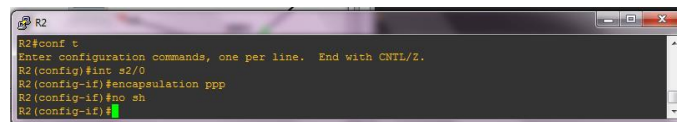
View for obtain the DNS

We use the PAP method authentication in the network WAN between the routers with the protocol PPP of the next way



```
R1
iFinance#conf t
Enter configuration commands, one per line. End with CNTL/Z.
iFinance(config)#int s1/0
iFinance(config-if)#encapsulation ppp
iFinance(config-if)#no sh
iFinance(config-if)#
```

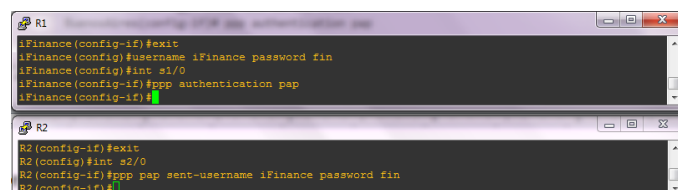
Command lines for encapsulation main router



```
R2
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#int s2/0
R2(config-if)#encapsulation ppp
R2(config-if)#no sh
R2(config-if)#
```

Command lines for department router

Now for the authentication, add PAP in this configuration of the next way in a unidirectional sense, establish one router that send its user and password and the other wait to receive it, else it will be rejected:



```
R1
iFinance(config-if)#exit
iFinance(config)#username iFinance password fin
iFinance(config)#int s1/0
iFinance(config-if)#ppp authentication pap
iFinance(config-if)#

R2
R2(config-if)#exit
R2(config)#int s2/0
R2(config-if)#ppp pap sent-username iFinance password fin
R2(config-if)#
```

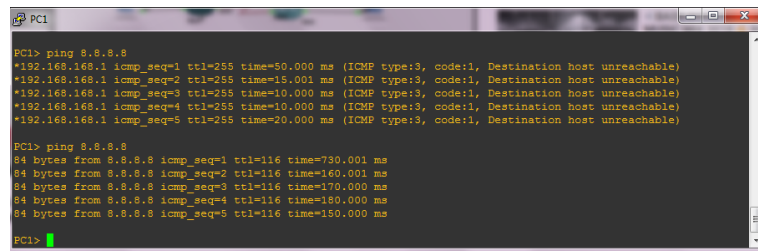
Configuration for authentication

And this way, we can see that there is an authentication between the routers successfully, when R1 shows us the next message



```
R1
R1(config)#
*Nov 18 23:37:24.583: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/1, changed state to up
R1(config)#
```

Message success



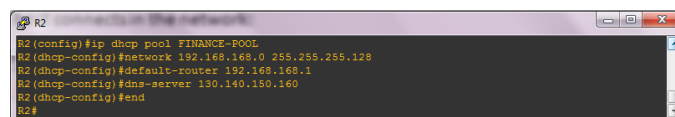
```
PC1> ping 8.8.8.8
*192.168.168.1 icmp_seq=1 ttl=255 time=50.000 ms (ICMP type:3, code:1, Destination host unreachable)
*192.168.168.1 icmp_seq=2 ttl=255 time=15.001 ms (ICMP type:3, code:1, Destination host unreachable)
*192.168.168.1 icmp_seq=3 ttl=255 time=10.000 ms (ICMP type:3, code:1, Destination host unreachable)
*192.168.168.1 icmp_seq=4 ttl=255 time=10.000 ms (ICMP type:3, code:1, Destination host unreachable)
*192.168.168.1 icmp_seq=5 ttl=255 time=20.000 ms (ICMP type:3, code:1, Destination host unreachable)

PC1> ping 8.8.8.8
64 bytes from 8.8.8.8 icmp_seq=1 ttl=116 time=730.001 ms
64 bytes from 8.8.8.8 icmp_seq=2 ttl=116 time=160.001 ms
64 bytes from 8.8.8.8 icmp_seq=3 ttl=116 time=170.000 ms
64 bytes from 8.8.8.8 icmp_seq=4 ttl=116 time=180.000 ms
64 bytes from 8.8.8.8 icmp_seq=5 ttl=116 time=150.000 ms

PC1>
```

Connection to internet

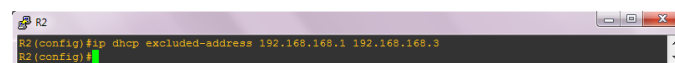
For putting the IP address to each host automatically, we configure the DHCP in each router with the next command lines:



```
R2
R2(config)#ip dhcp pool FINANCE-POOL
R2(dhcp-config)#network 192.168.168.0 255.255.255.128
R2(dhcp-config)#default-router 192.168.168.1
R2(dhcp-config)#dns-server 130.140.150.160
R2(dhcp-config)#end
R2#
```

Command lines to create a dhcp pool

We can exclude any IPs to avoid duplicates with the address of the network, the server and the printer.



```
R2
R2(config)#ip dhcp excluded-address 192.168.168.1 192.168.168.3
R2(config)#
```

Command for exclude IPs

At the first moment, the host will be without the IP address.



```

PC2> sh ip
NAME       : PC2[1]
IP/MASK    : 0.0.0.0/0
GATEWAY    : 0.0.0.0
DNS        :
MAC        : 00:50:79:66:68:01
LPORT      : 10013
RHOST:PORT : 127.0.0.1:10012
MTU        : 1500
PC2>

```

View a console ofpc

We assign it through the command DHCP and the same way, we check the connection with the network

```

PC2> dhcp
DORA IP 192.168.168.4/25 GW 192.168.168.1

PC2> sh ip

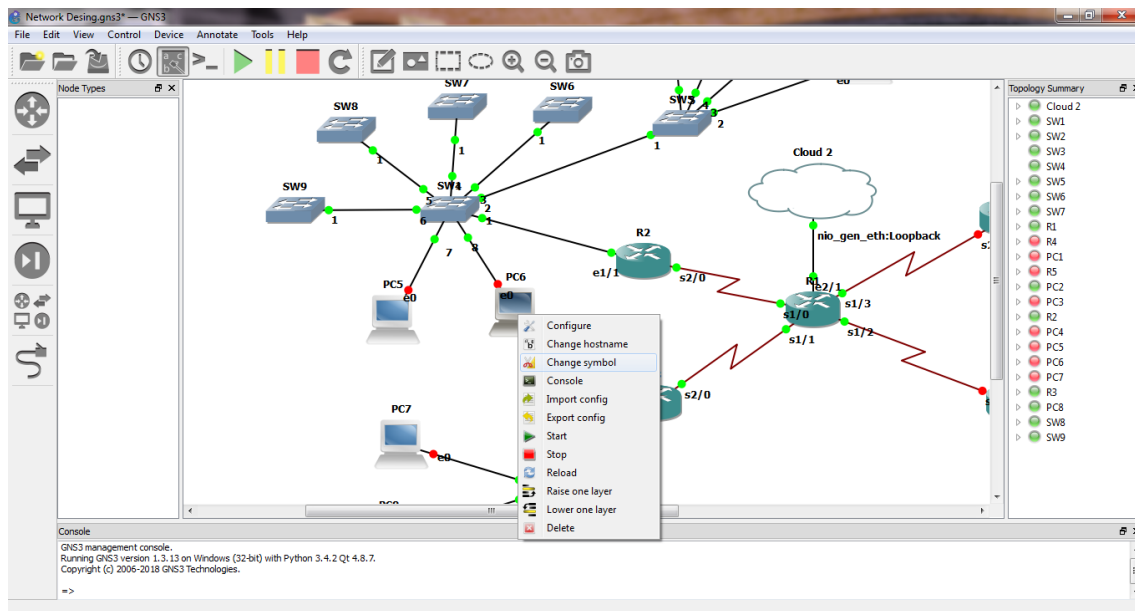
NAME       : PC2[1]
IP/MASK    : 192.168.168.4/25
GATEWAY    : 192.168.168.1
DNS        : 192.168.168.1
DHCP SERVER : 192.168.168.1
DHCP LEASE  : 86388, 86400/43200/75600
MAC        : 00:50:79:66:68:01
LPORT      : 10013
RHOST:PORT : 127.0.0.1:10012
MTU        : 1500

PC2> ping 8.8.8.8
64 bytes from 8.8.8.8 icmp_seq=1 ttl=116 time=940.001 ms
64 bytes from 8.8.8.8 icmp_seq=2 ttl=116 time=200.001 ms
64 bytes from 8.8.8.8 icmp_seq=3 ttl=116 time=162.002 ms
64 bytes from 8.8.8.8 icmp_seq=4 ttl=116 time=150.000 ms
64 bytes from 8.8.8.8 icmp_seq=5 ttl=116 time=160.001 ms
PC2>

```

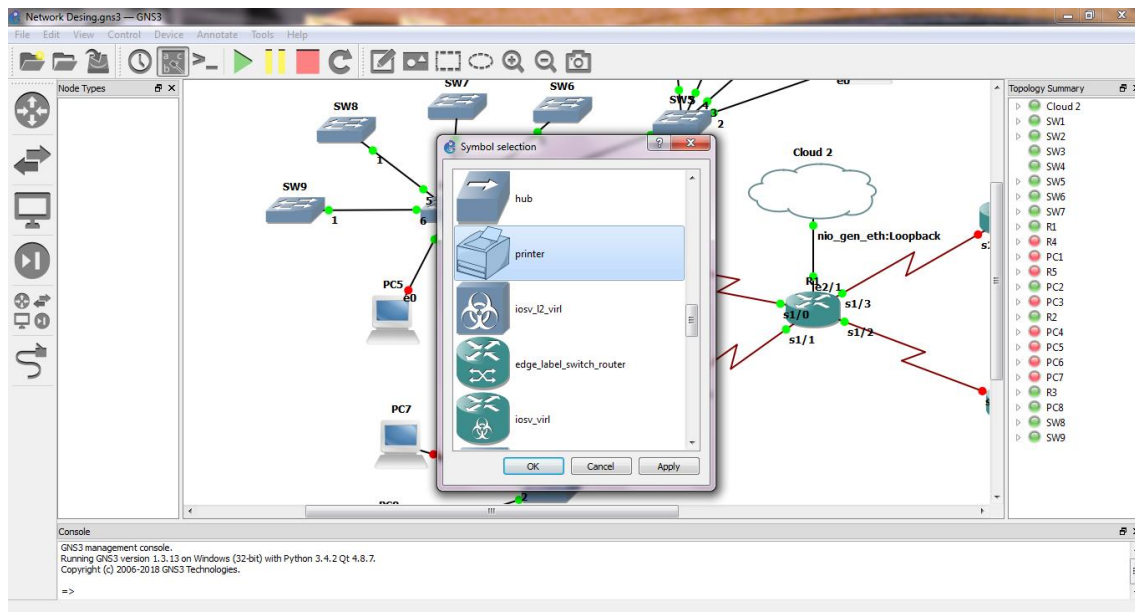
Assignment of ip with dhcp

Change the symbol of the components server and printer doing right click over the element, click in “Change symbol”.



View for change the symbol of the component

Select the image that represents the component and click on “Ok”



View for select the symbol

## REFERENCES

- Cisco.com,(2018). *Cisco Official Website*. [online] Available at: <https://www.cisco.com/> [Accessed Nov. 2018]
- gns3vault.com,(2018). *GNS3 VAULT Official Website*. [online] Available at: <https://gns3vault.com/> [Accessed Nov. 2018]
- gns3.com,(2018). *Documentation GNS3 Official Website*. [online] Available at: <https://docs.gns3.com/> [Accessed Nov. 2018]
- Youtube.com,(2011). *DNS Server lab in GNS3*. [online] Available at: [https://www.youtube.com/watch?v=hMB5iRv\\_Kjk/](https://www.youtube.com/watch?v=hMB5iRv_Kjk/) [Accessed Nov. 2018]