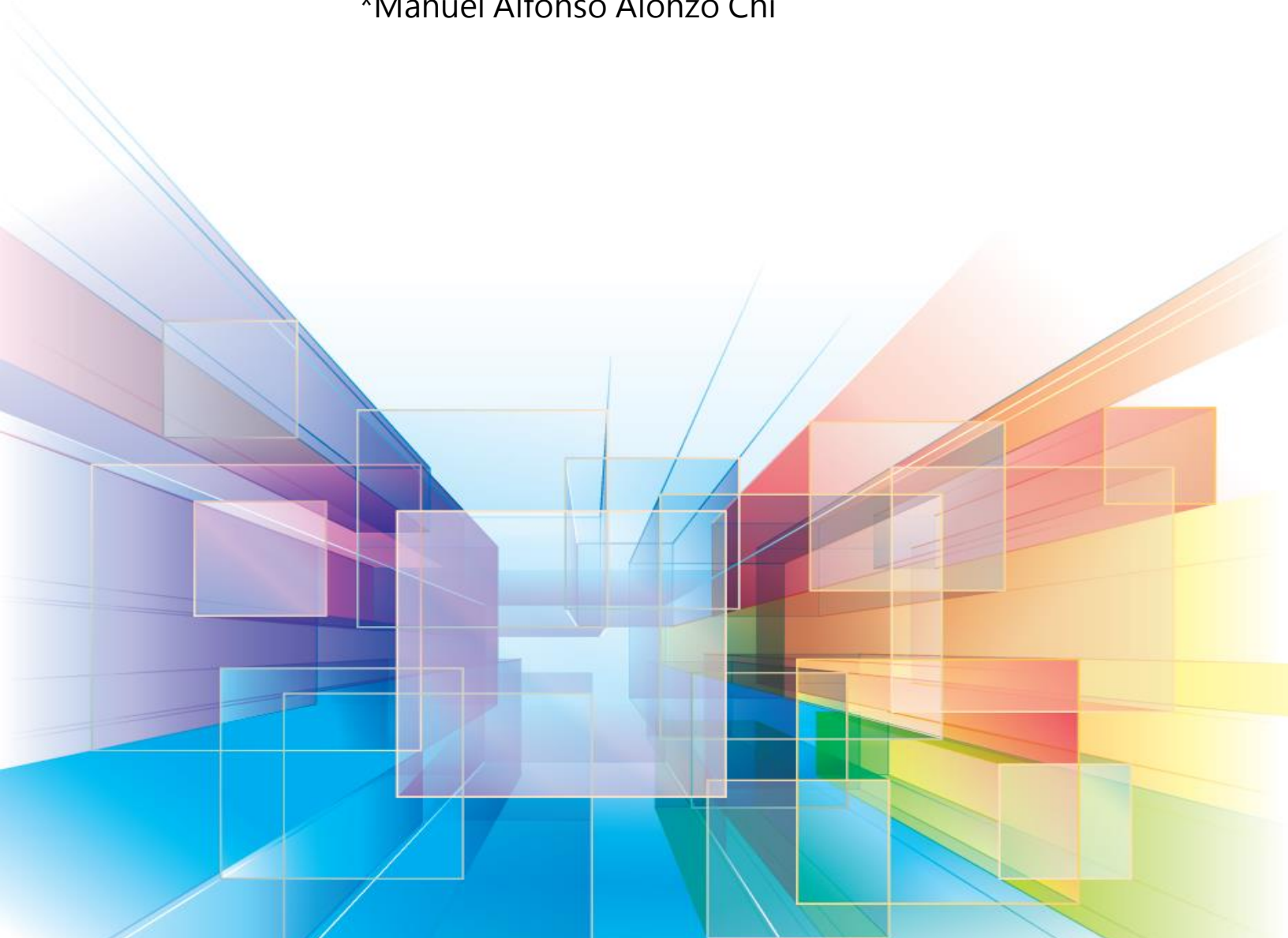


Fundamentos de Telecomunicaciones

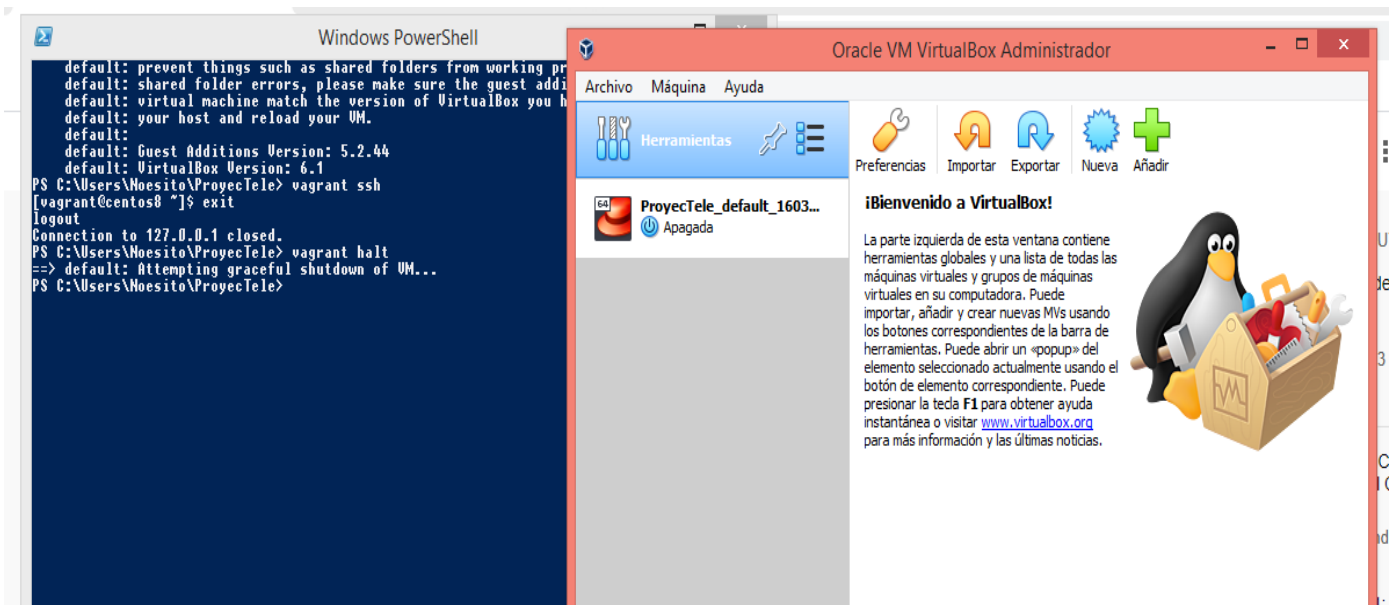
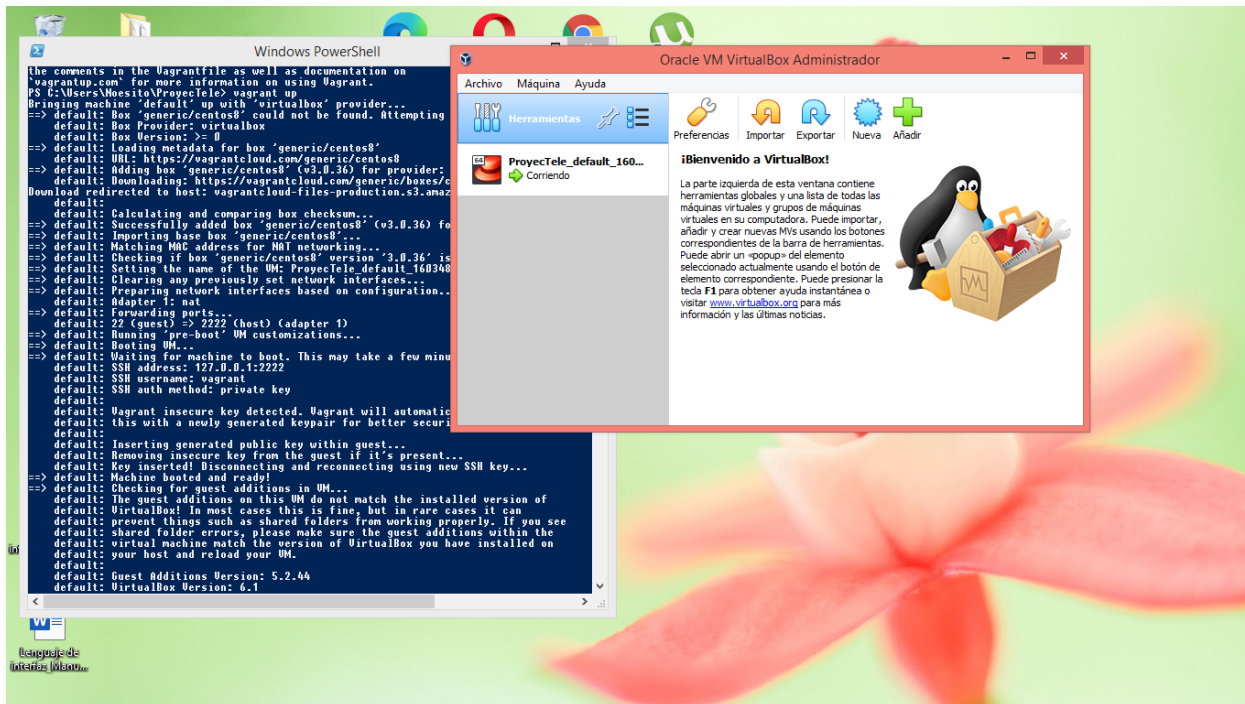
Proyecto unidad 1

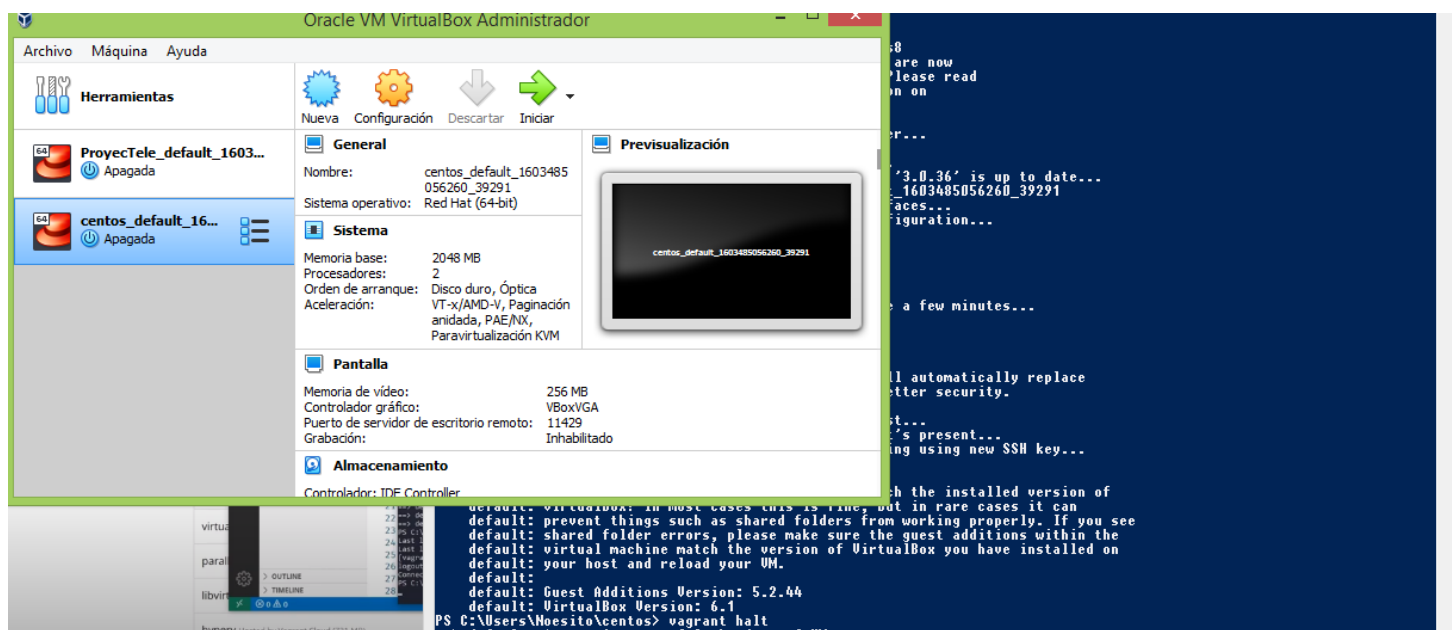
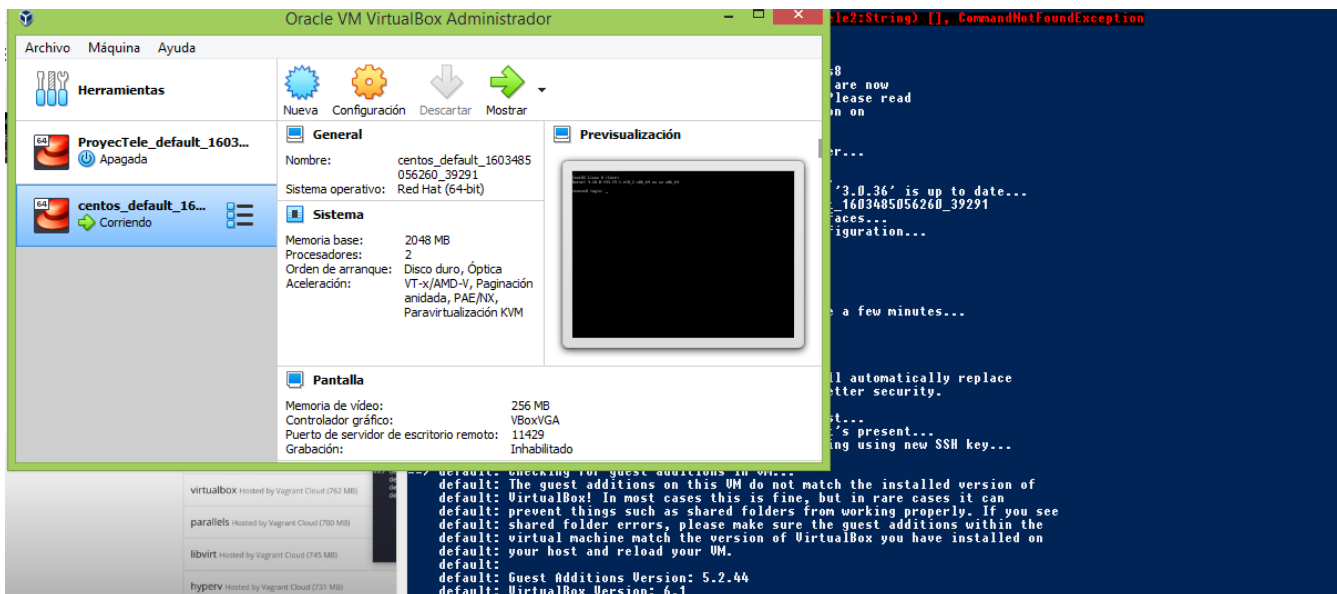
Alumno

*Manuel Alfonso Alonzo Chi

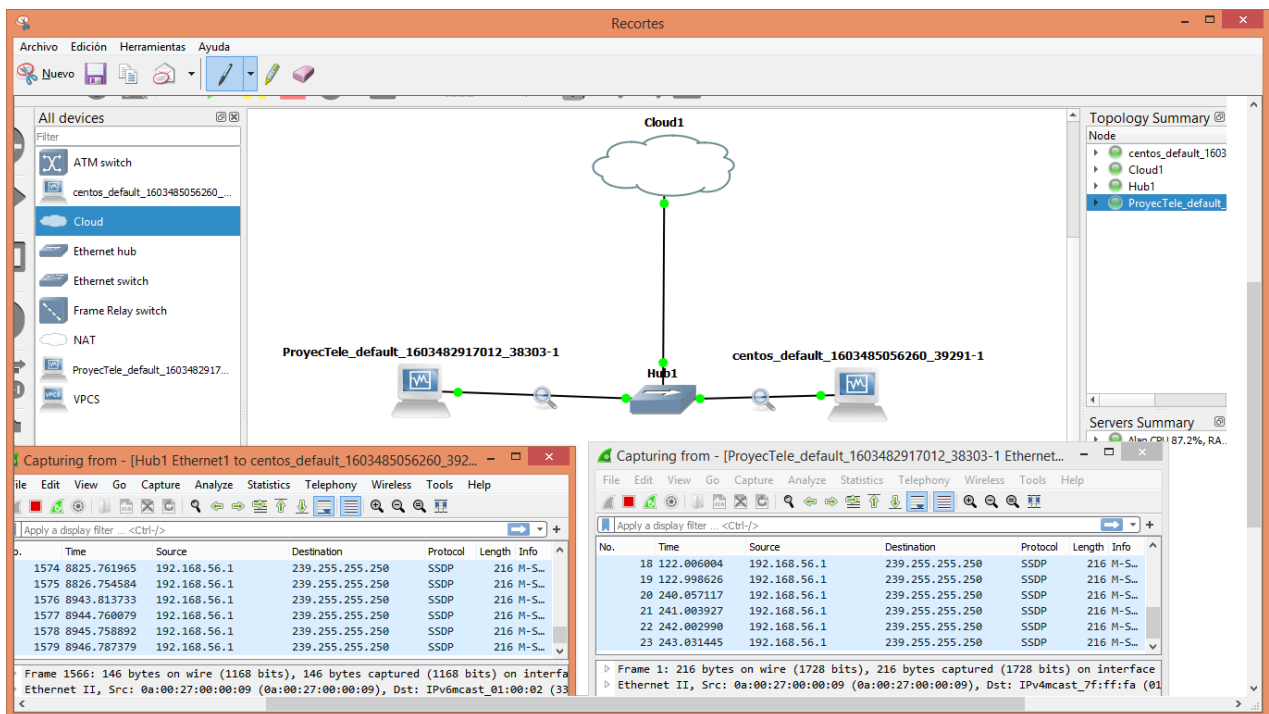
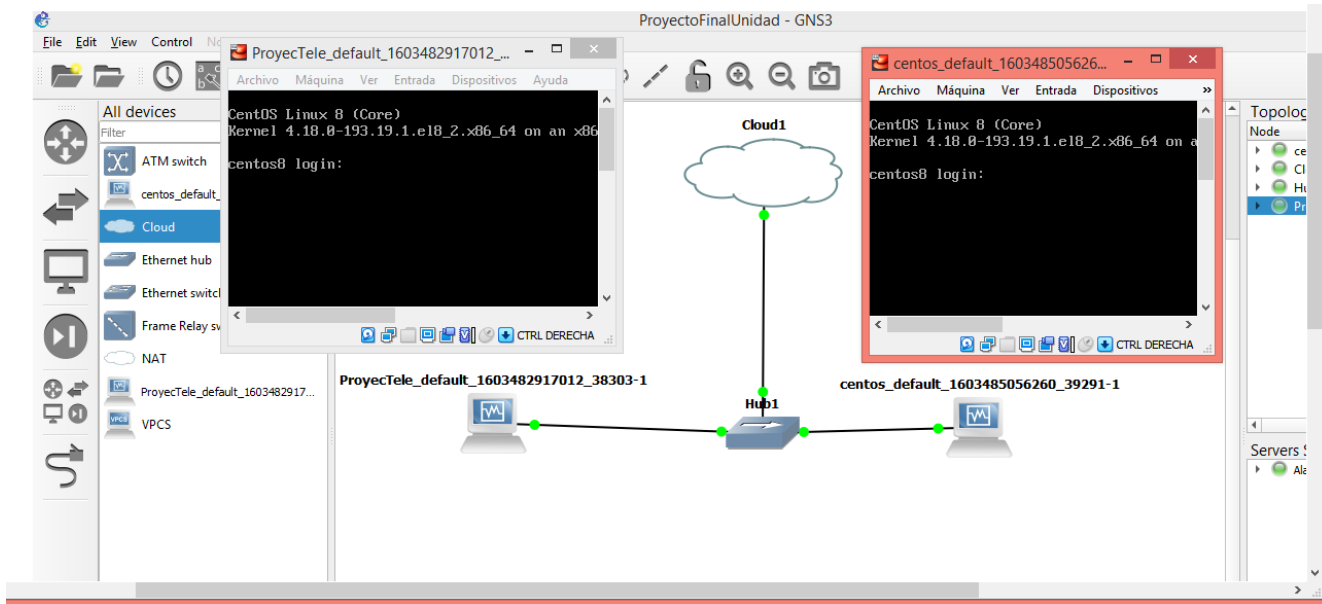


Primera fase instalación de 2 centos8

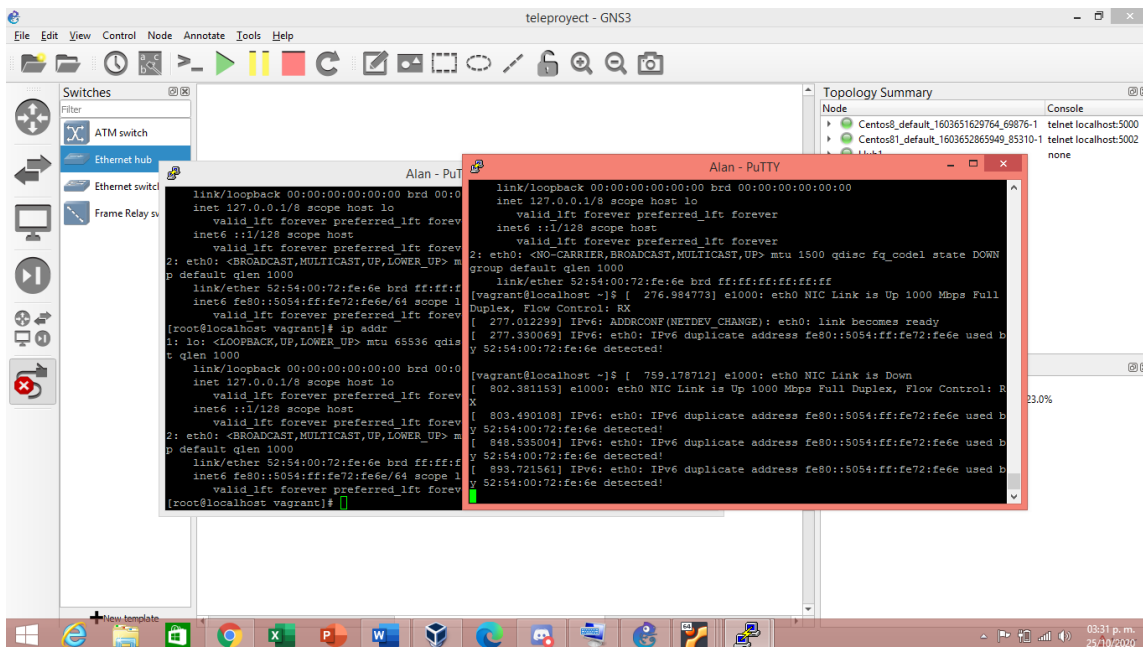
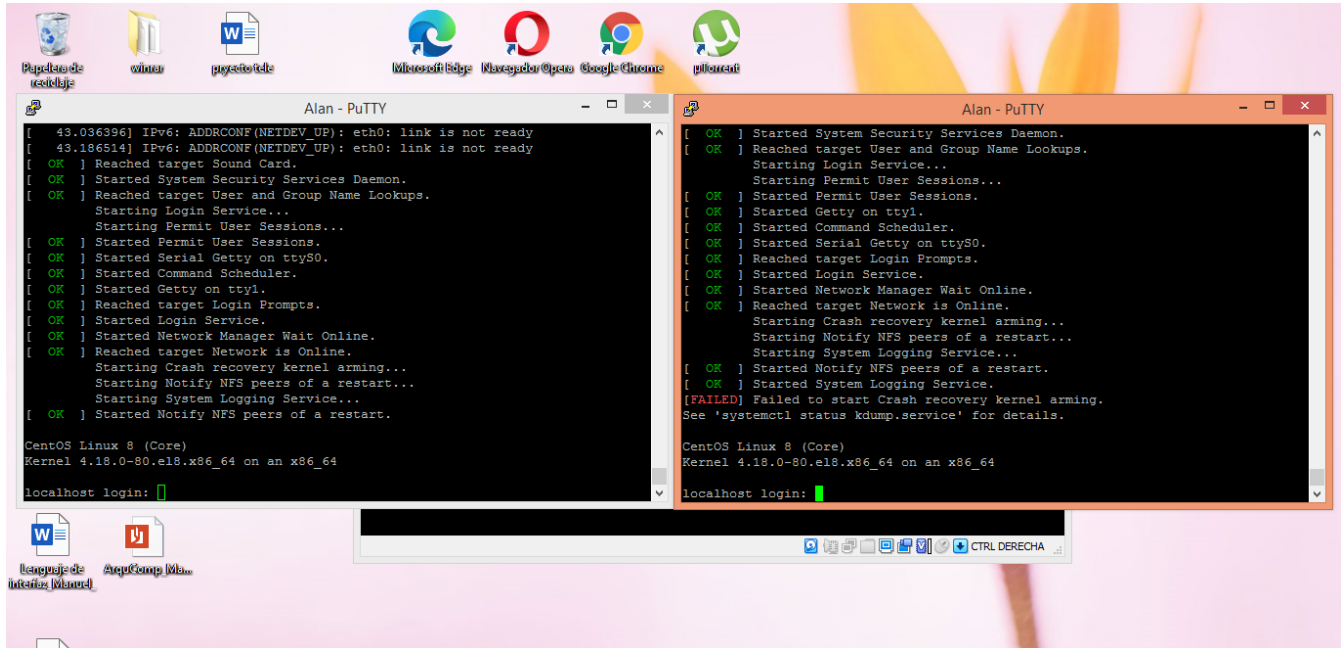




Fase2 - Conectar en GNS3, las dos VMs de CentOS con un switch ethernet



Fase3 - Usar los scripts de Python para conectar las dos VMs usando sockets



teleproject - GNS3

File Edit View Control Node Annotate Tools Help

Switches Filter ATM switch

Alan - PuTTY

```
64 bytes from 127.0.0.1: icmp_seq=17 ttl=64 time=0.137 ms
64 bytes from 127.0.0.1: icmp_seq=18 ttl=64 time=0.205 ms
64 bytes from 127.0.0.1: icmp_seq=19 ttl=64 time=0.365 ms
64 bytes from 127.0.0.1: icmp_seq=20 ttl=64 time=0.165 ms
64 bytes from 127.0.0.1: icmp_seq=21 ttl=64 time=0.135 ms
64 bytes from 127.0.0.1: icmp_seq=22 ttl=64 time=0.140 ms
64 bytes from 127.0.0.1: icmp_seq=23 ttl=64 time=0.210 ms
64 bytes from 127.0.0.1: icmp_seq=24 ttl=64 time=1.67 ms
64 bytes from 127.0.0.1: icmp_seq=25 ttl=64 time=0.159 ms
64 bytes from 127.0.0.1: icmp_seq=26 ttl=64 time=0.141 ms
64 bytes from 127.0.0.1: icmp_seq=27 ttl=64 time=0.142 ms
64 bytes from 127.0.0.1: icmp_seq=28 ttl=64 time=0.104 ms
64 bytes from 127.0.0.1: icmp_seq=29 ttl=64 time=0.105 ms
64 bytes from 127.0.0.1: icmp_seq=30 ttl=64 time=0.288 ms
64 bytes from 127.0.0.1: icmp_seq=31 ttl=64 time=0.142 ms
64 bytes from 127.0.0.1: icmp_seq=32 ttl=64 time=0.387 ms
64 bytes from 127.0.0.1: icmp_seq=33 ttl=64 time=0.279 ms
64 bytes from 127.0.0.1: icmp_seq=34 ttl=64 time=0.209 ms
64 bytes from 127.0.0.1: icmp_seq=35 ttl=64 time=0.107 ms
64 bytes from 127.0.0.1: icmp_seq=36 ttl=64 time=0.138 ms
64 bytes from 127.0.0.1: icmp_seq=37 ttl=64 time=0.151 ms
64 bytes from 127.0.0.1: icmp_seq=38 ttl=64 time=0.234 ms
64 bytes from 127.0.0.1: icmp_seq=39 ttl=64 time=0.144 ms
```

Alan - PuTTY

```
[ 848.535004] IPv6: eth0: IPv6 duplicate address fe80::5054:ff:fe72:fe6e used b
y 52:54:00:72:fe:6e detected!
[ 893.721561] IPv6: eth0: IPv6 duplicate address fe80::5054:ff:fe72:fe6e used b
y 52:54:00:72:fe:6e detected!
[ 938.774340] IPv6: eth0: IPv6 duplicate address fe80::5054:ff:fe72:fe6e used b
y 52:54:00:72:fe:6e detected!

[vagrant@localhost ~]$ ping 127.0.0.1
PING 127.0.0.1 (127.0.0.1) 56(84) bytes of data.
64 bytes from 127.0.0.1: icmp_seq=1 ttl=64 time=0.233 ms
64 bytes from 127.0.0.1: icmp_seq=2 ttl=64 time=0.143 ms
64 bytes from 127.0.0.1: icmp_seq=3 ttl=64 time=0.142 ms
64 bytes from 127.0.0.1: icmp_seq=4 ttl=64 time=0.141 ms
64 bytes from 127.0.0.1: icmp_seq=5 ttl=64 time=0.165 ms
64 bytes from 127.0.0.1: icmp_seq=6 ttl=64 time=0.214 ms
64 bytes from 127.0.0.1: icmp_seq=7 ttl=64 time=0.264 ms
64 bytes from 127.0.0.1: icmp_seq=8 ttl=64 time=0.307 ms
64 bytes from 127.0.0.1: icmp_seq=9 ttl=64 time=0.146 ms
64 bytes from 127.0.0.1: icmp_seq=10 ttl=64 time=0.143 ms
64 bytes from 127.0.0.1: icmp_seq=11 ttl=64 time=0.501 ms
64 bytes from 127.0.0.1: icmp_seq=12 ttl=64 time=0.227 ms
64 bytes from 127.0.0.1: icmp_seq=13 ttl=64 time=0.140 ms
64 bytes from 127.0.0.1: icmp_seq=14 ttl=64 time=0.139 ms
```

Topology Summary

Node	Console
Centos8_default_1603651629764_69876-1	telnet localhost:5000
Centos81_default_1603652865949_85310-1	telnet localhost:5002

03:33 p.m. 25/10/2020

teleproject - GNS3

Alan - PuTTY

```
bytes from 127.0.0.1: icmp_seq=119 ttl=64 time=0.141 ms
bytes from 127.0.0.1: icmp_seq=120 ttl=64 time=0.138 ms
bytes from 127.0.0.1: icmp_seq=121 ttl=64 time=0.313 ms
bytes from 127.0.0.1: icmp_seq=122 ttl=64 time=0.221 ms
bytes from 127.0.0.1: icmp_seq=123 ttl=64 time=0.143 ms
bytes from 127.0.0.1: icmp_seq=124 ttl=64 time=0.159 ms
bytes from 127.0.0.1: icmp_seq=125 ttl=64 time=0.153 ms
bytes from 127.0.0.1: icmp_seq=126 ttl=64 time=0.282 ms
bytes from 127.0.0.1: icmp_seq=127 ttl=64 time=0.198 ms
bytes from 127.0.0.1: icmp_seq=128 ttl=64 time=0.169 ms
bytes from 127.0.0.1: icmp_seq=129 ttl=64 time=0.105 ms
bytes from 127.0.0.1: icmp_seq=130 ttl=64 time=1.34 ms
bytes from 127.0.0.1: icmp_seq=131 ttl=64 time=0.136 ms
bytes from 127.0.0.1: icmp_seq=132 ttl=64 time=0.137 ms
bytes from 127.0.0.1: icmp_seq=133 ttl=64 time=0.144 ms
bytes from 127.0.0.1: icmp_seq=134 ttl=64 time=0.139 ms
bytes from 127.0.0.1: icmp_seq=135 ttl=64 time=0.174 ms
bytes from 127.0.0.1: icmp_seq=136 ttl=64 time=0.141 ms
bytes from 127.0.0.1: icmp_seq=137 ttl=64 time=0.136 ms
```

Centos81_default_1603652865949_85310-1

Alan - PuTTY

```
64 bytes from 127.0.0.1: icmp_seq=94 ttl=64 time=0.138 ms
64 bytes from 127.0.0.1: icmp_seq=95 ttl=64 time=0.192 ms
64 bytes from 127.0.0.1: icmp_seq=96 ttl=64 time=0.111 ms
64 bytes from 127.0.0.1: icmp_seq=97 ttl=64 time=0.138 ms
64 bytes from 127.0.0.1: icmp_seq=98 ttl=64 time=1.57 ms
64 bytes from 127.0.0.1: icmp_seq=99 ttl=64 time=0.143 ms
64 bytes from 127.0.0.1: icmp_seq=100 ttl=64 time=0.159 ms
64 bytes from 127.0.0.1: icmp_seq=101 ttl=64 time=0.142 ms
64 bytes from 127.0.0.1: icmp_seq=102 ttl=64 time=0.139 ms
64 bytes from 127.0.0.1: icmp_seq=103 ttl=64 time=0.104 ms
64 bytes from 127.0.0.1: icmp_seq=104 ttl=64 time=0.334 ms
64 bytes from 127.0.0.1: icmp_seq=105 ttl=64 time=0.206 ms
64 bytes from 127.0.0.1: icmp_seq=106 ttl=64 time=0.483 ms
64 bytes from 127.0.0.1: icmp_seq=107 ttl=64 time=0.195 ms
64 bytes from 127.0.0.1: icmp_seq=108 ttl=64 time=0.139 ms
64 bytes from 127.0.0.1: icmp_seq=109 ttl=64 time=0.135 ms
64 bytes from 127.0.0.1: icmp_seq=110 ttl=64 time=0.142 ms
64 bytes from 127.0.0.1: icmp_seq=111 ttl=64 time=0.200 ms
64 bytes from 127.0.0.1: icmp_seq=112 ttl=64 time=0.159 ms
```

Topology Summary

Node	Console
Centos8_default_1603651629764_69876-1	telnet localhost:5000
Centos81_default_1603652865949_85310-1	telnet localhost:5002
Hub1	none

03:35 p.m. 25/10/2020

Alan - PuTTY

```

bytes from 127.0.0.1: icmp_seq=141 ttl=64 time=0.168 ms
bytes from 127.0.0.1: icmp_seq=142 ttl=64 time=0.098 ms
bytes from 127.0.0.1: icmp_seq=143 ttl=64 time=0.467 ms
bytes from 127.0.0.1: icmp_seq=144 ttl=64 time=0.140 ms
bytes from 127.0.0.1: icmp_seq=145 ttl=64 time=0.138 ms
bytes from 127.0.0.1: icmp_seq=146 ttl=64 time=0.141 ms
bytes from 127.0.0.1: icmp_seq=147 ttl=64 time=0.357 ms
bytes from 127.0.0.1: icmp_seq=148 ttl=64 time=0.143 ms
bytes from 127.0.0.1: icmp_seq=149 ttl=64 time=0.226 ms
bytes from 127.0.0.1: icmp_seq=150 ttl=64 time=0.104 ms
bytes from 127.0.0.1: icmp_seq=151 ttl=64 time=0.160 ms
bytes from 127.0.0.1: icmp_seq=152 ttl=64 time=0.105 ms
bytes from 127.0.0.1: icmp_seq=153 ttl=64 time=0.161 ms
bytes from 127.0.0.1: icmp_seq=154 ttl=64 time=0.141 ms
bytes from 127.0.0.1: icmp_seq=155 ttl=64 time=0.104 ms
bytes from 127.0.0.1: icmp_seq=156 ttl=64 time=0.142 ms
bytes from 127.0.0.1: icmp_seq=157 ttl=64 time=0.139 ms
+ Stopped
bot@localhost vagrant]$ ping 127.0.0.1

```

teleproject - GNS3

Centos81_default_1603652865949_85310-1

Alan - PuTTY

```

64 bytes from 127.0.0.1: icmp_seq=122 ttl=64 time=0.140 ms
64 bytes from 127.0.0.1: icmp_seq=123 ttl=64 time=0.137 ms
64 bytes from 127.0.0.1: icmp_seq=124 ttl=64 time=0.103 ms
64 bytes from 127.0.0.1: icmp_seq=125 ttl=64 time=0.218 ms
64 bytes from 127.0.0.1: icmp_seq=126 ttl=64 time=0.227 ms
64 bytes from 127.0.0.1: icmp_seq=127 ttl=64 time=1.18 ms
64 bytes from 127.0.0.1: icmp_seq=128 ttl=64 time=0.140 ms
64 bytes from 127.0.0.1: icmp_seq=129 ttl=64 time=0.144 ms
64 bytes from 127.0.0.1: icmp_seq=130 ttl=64 time=0.439 ms
64 bytes from 127.0.0.1: icmp_seq=131 ttl=64 time=0.144 ms
64 bytes from 127.0.0.1: icmp_seq=132 ttl=64 time=0.211 ms
64 bytes from 127.0.0.1: icmp_seq=133 ttl=64 time=0.134 ms
64 bytes from 127.0.0.1: icmp_seq=134 ttl=64 time=0.138 ms
64 bytes from 127.0.0.1: icmp_seq=135 ttl=64 time=0.238 ms
64 bytes from 127.0.0.1: icmp_seq=136 ttl=64 time=0.220 ms
64 bytes from 127.0.0.1: icmp_seq=137 ttl=64 time=0.068 ms
64 bytes from 127.0.0.1: icmp_seq=138 ttl=64 time=0.139 ms
[!]+ Stopped
[vagrant@localhost ~]$

```

Topology Summary

Node	Console
Centos8_default_1603651630764_69876-1	telnet localhost:5000
Centos81_default_1603652865949_85310-1	telnet localhost:5002
Hub1	none

Alan - PuTTY

```

import socket
target_host = "10.0.0.3"
target_port = 420

# create a socket object
client = socket.socket(socket.AF_INET, socket.SOCK_STREAM)

# connect the client
client.connect((target_host, target_port))

# send some data
client.send("GET / HTTP/1.1\r\nHost: google.com\r\n\r\n")

# receive some data
response = client.recv(4096)

print response

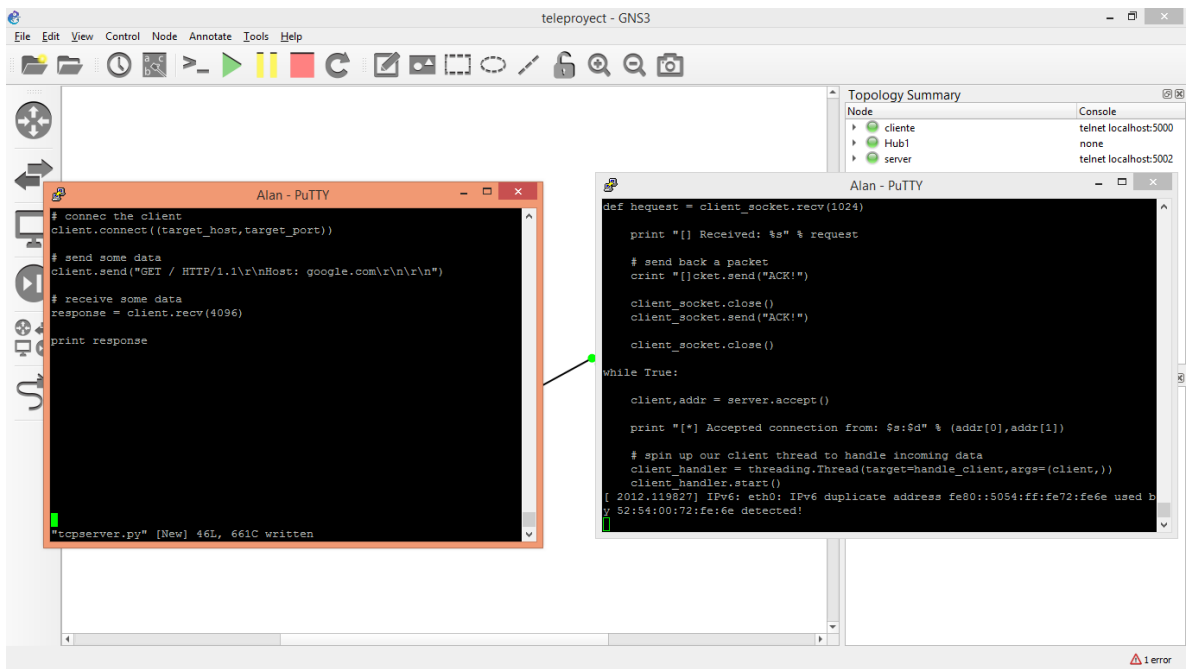
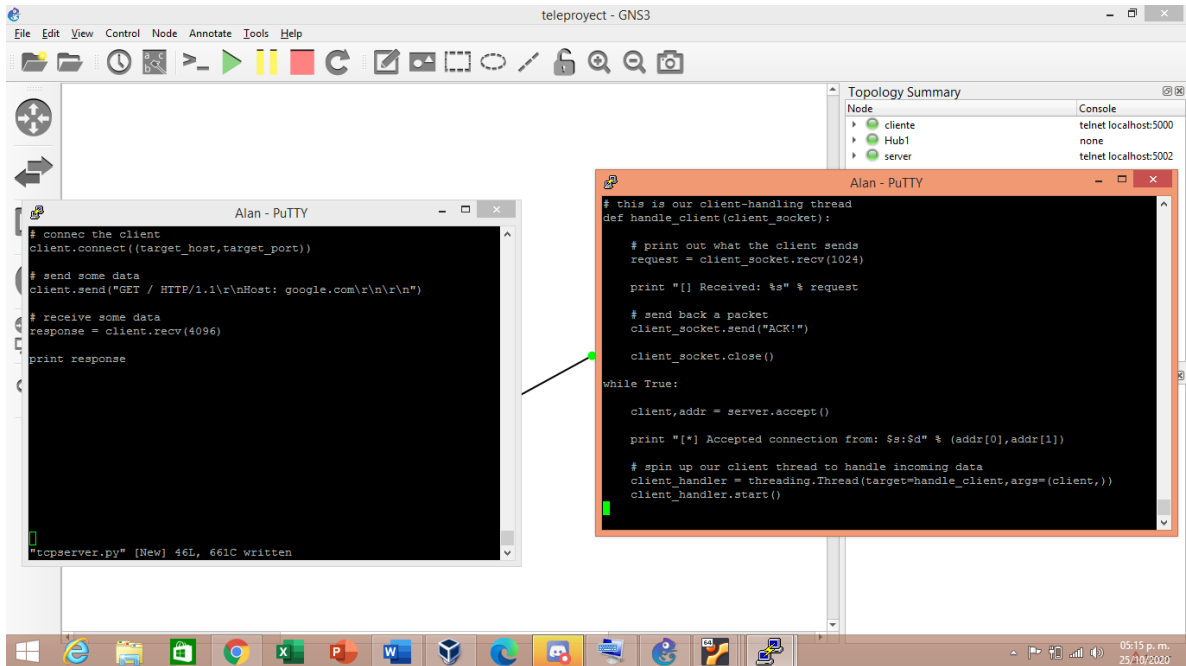
```

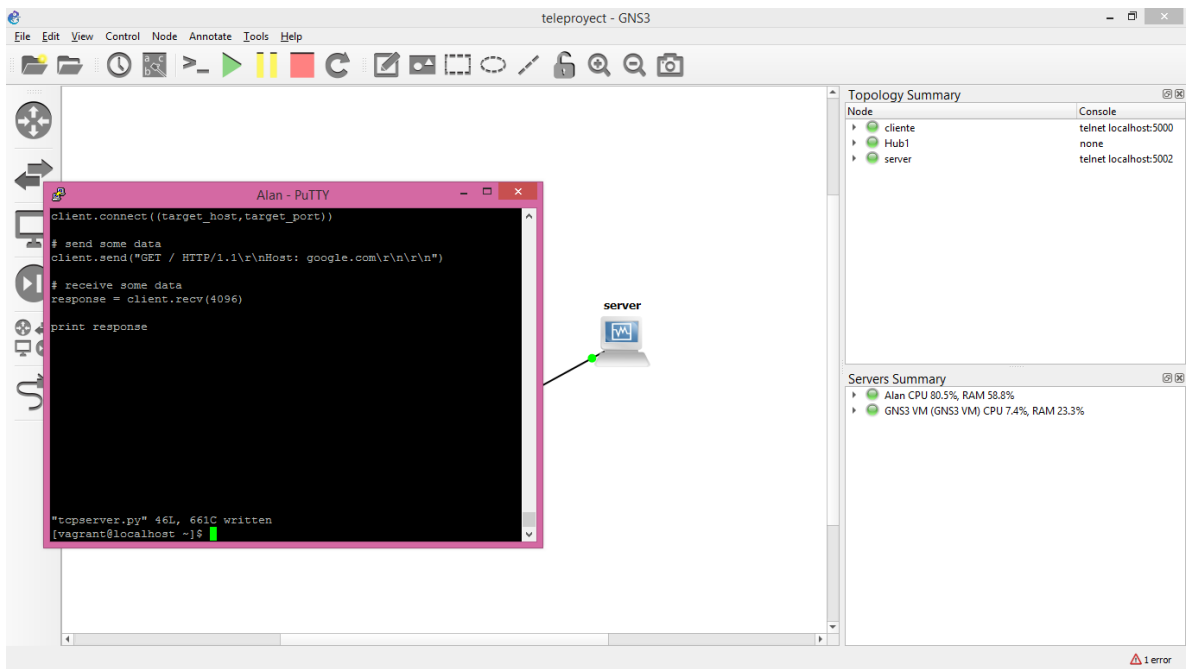
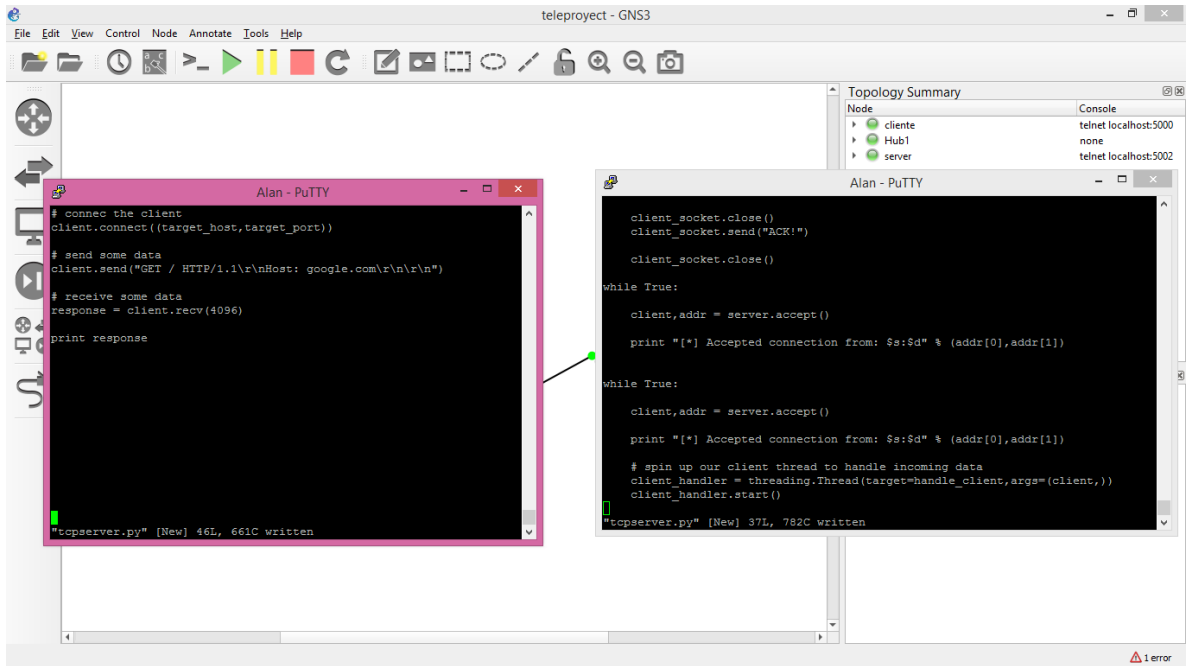
Topology Summary

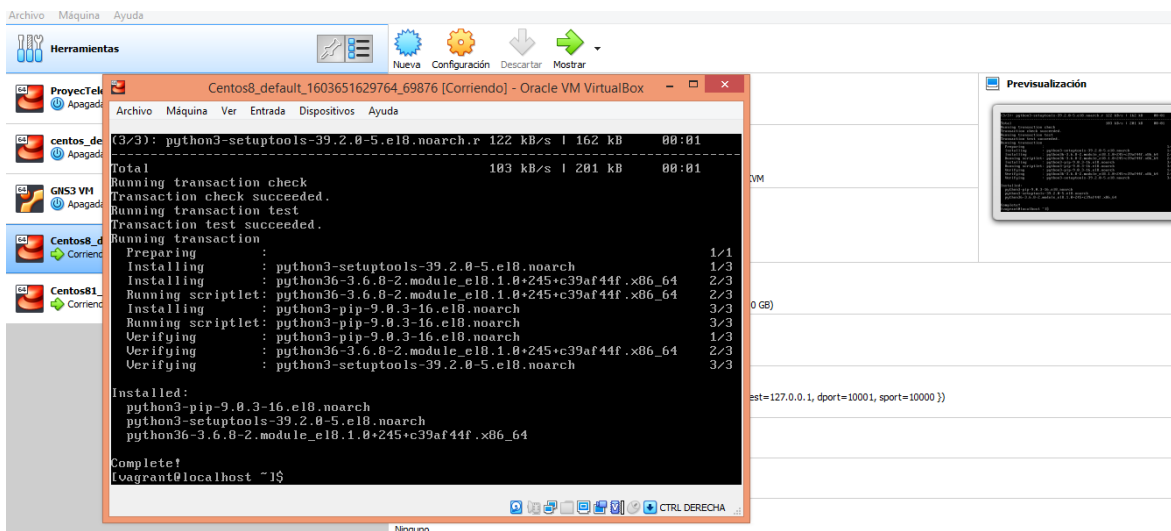
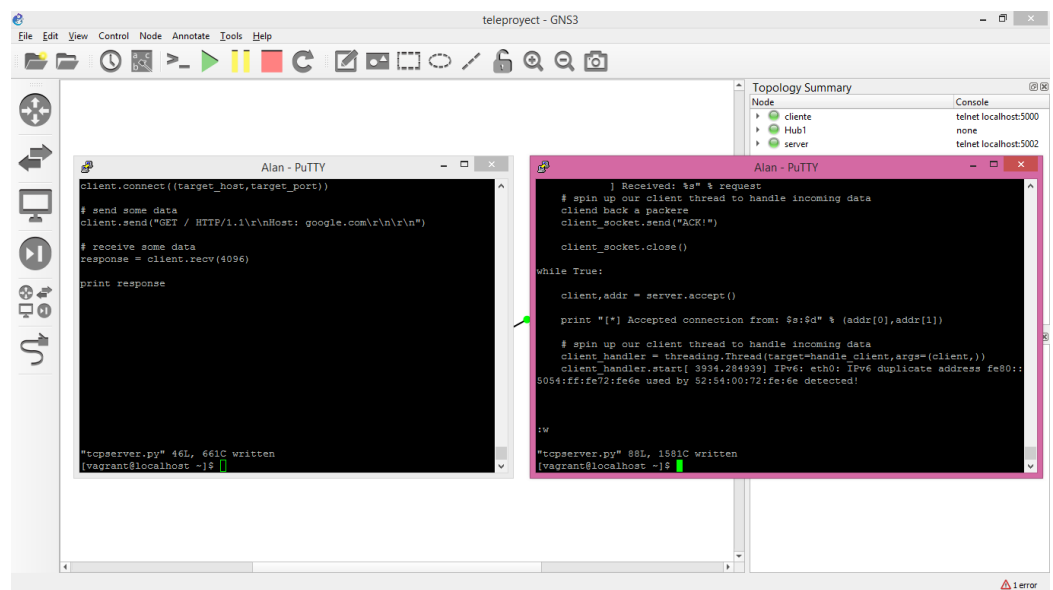
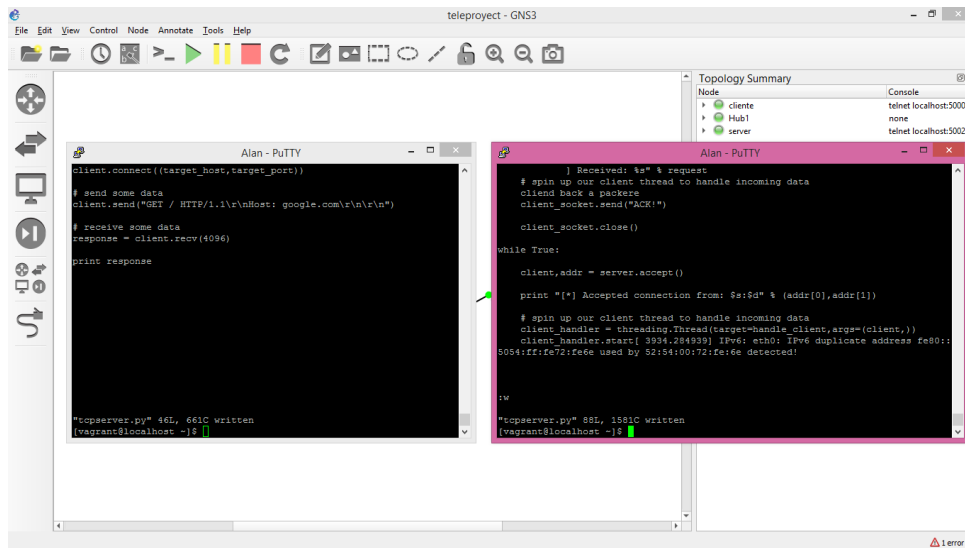
Node	Console
cliente	telnet localhost:5000
Hub1	none
server	telnet localhost:5002

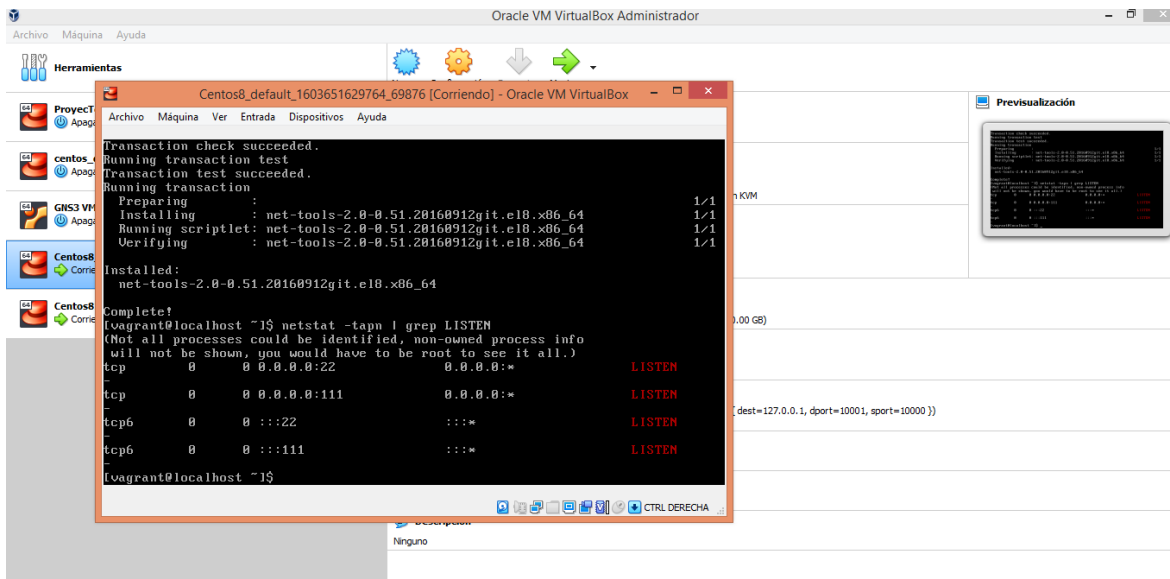
Servers Summary

- Alan CPU 72.1%, RAM 58.6%
- GNS3 VM (GNS3 VM) CPU 5.2%, RAM 23.2%



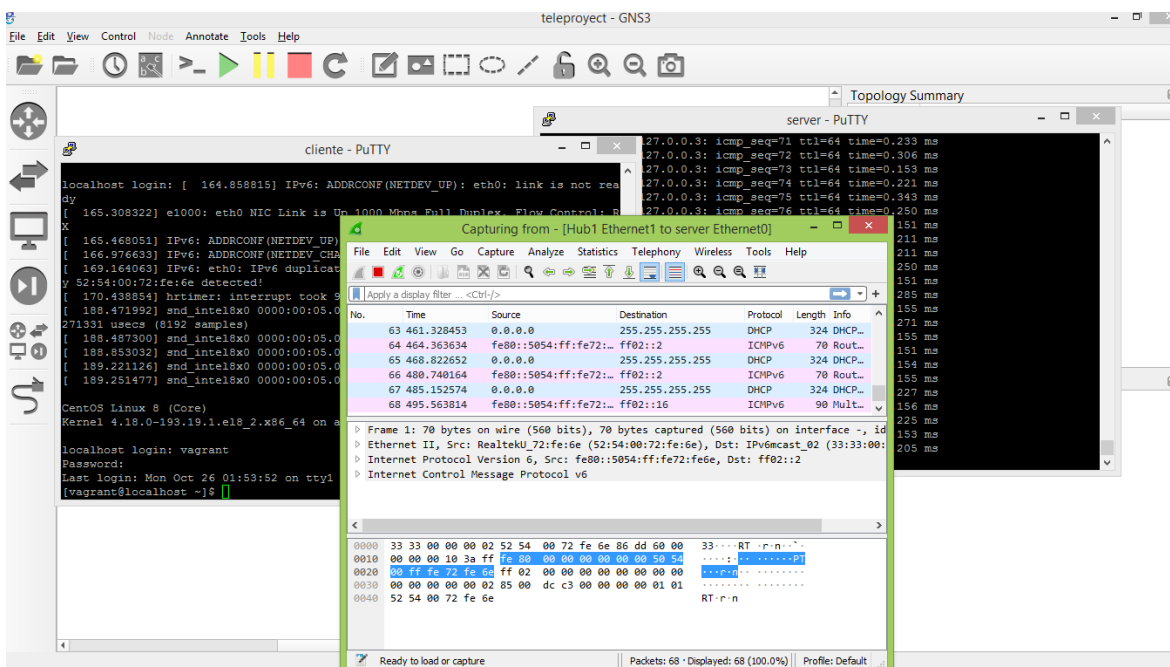






Fase4 - Capturar el tráfico de la comunicación entre las dos VMs al momento de utilizar los scripts

los scripts.



Fase 5 - Hacer reporte de conclusiones.

Muchas veces para la programación y desarrollo de aplicaciones hace falta instalar varias aplicaciones, como librerías, interpretes, compiladores, base de datos, etc. Ya que los programadores pueden requerir múltiples versiones de la misma herramienta, o trabajar en múltiples proyectos, es por eso que se crearon herramientas como vagrant ya que esta nos permite administrar varias maquinas virtuales bajo la infraestructura como código, pero esta no funciona por si sola ya que necesita de un proveedor, para este proyecto utilizamos virtual box.

Para este proyecto en particular lo que se realizo fue conectar y levantar dos máquinas virtuales en este caso fueron dos Centos8. Que para este proyecto uno funciono como servidor y el otro como cliente.

En este caso ambas maquinas virtuales se iniciaron usando gns3, para lograr la conexión de ambas maquinas virtuales. Instalamos en las dos máquinas Python y se configuro las ip de cada servidor, y se colocaron las scripts para realizar la conexión.

Para este proyecto con ayuda del putty tuvimos acceso a la consola y con ayuda de wireshark capturamos el tráfico de datos.

Al finalizar esta practica se pudo notar que la conexión entre las dos maquinas virtuales fue satisfactoria. De igual manera se entendió con mucha mas claridad el uso de protocolos visto en clase, como lo son el triple handshake con tres vías [SYN], [SYN, ACK], [ACK].

[SYN]: sincronización

[SYN, ACK]: recibimiento de manera satisfactoria de la solicitud para la comunicación entre ambas

[ACK]: reconocimiento del cliente

con esto podemos concluir que se aplicaron de manera satisfactoria los procedimientos vistos en clase.