

Designing a Network Topology with GNS3

Fundamentals of Communications and Networking, Third Edition - Lab 06

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Time on Task:

1 hour, 46 minutes

Progress:

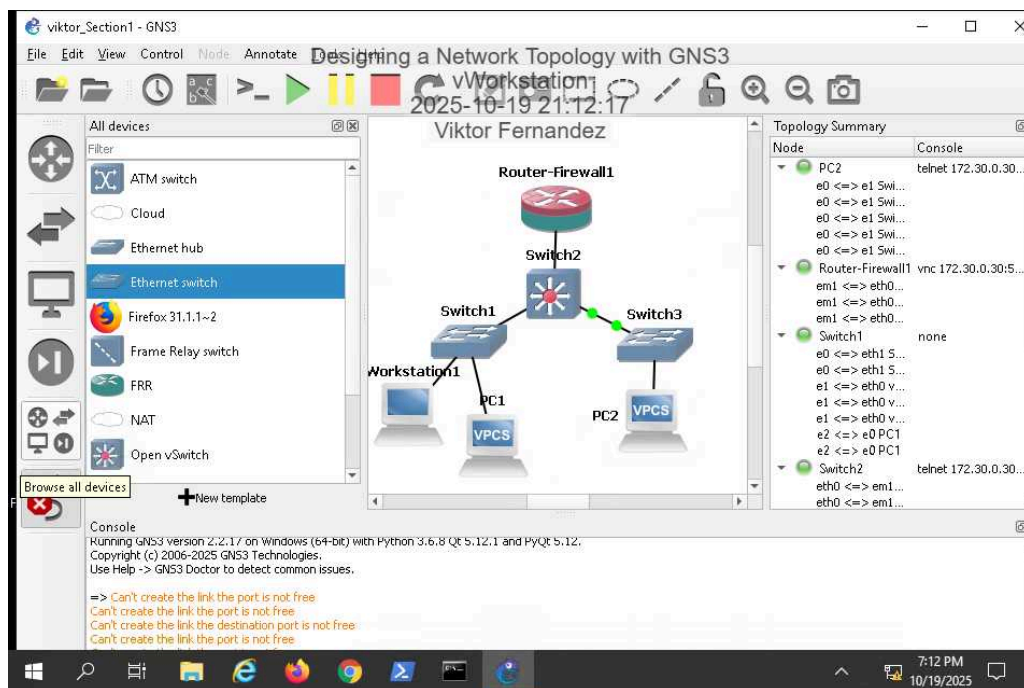
100%

Report Generated: Sunday, October 19, 2025 at 11:39 PM

Section 1: Hands-On Demonstration

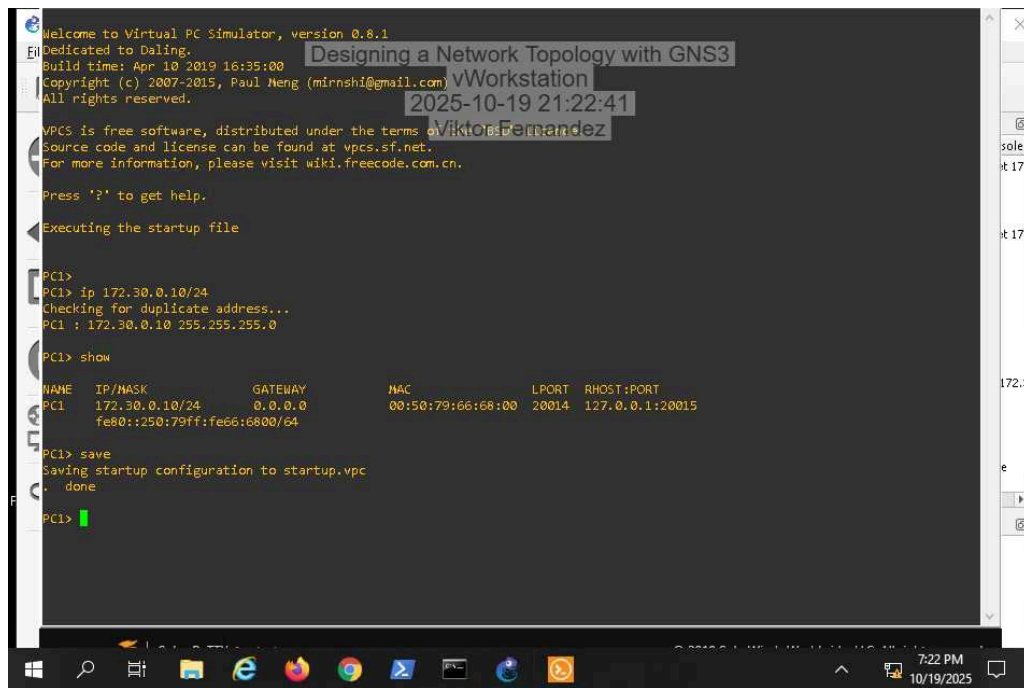
Part 1: Configure Physical Connectivity on a Layer 2 Network

25. **Make a screen capture** showing the **completed topology** and the **active nodes and interfaces displayed in the Topology Summary**.



Part 2: Configure Logical Connectivity on a Layer 2 Network

8. Make a screen capture showing the interface configuration on PC1.



The screenshot shows a terminal window titled "Designing a Network Topology with GNS3" running a Virtual PC Simulator. The terminal displays the following commands and output:

```
Welcome to Virtual PC Simulator, version 0.8.1
Dedicated to Daling.
Build time: Apr 10 2019 16:35:00
Copyright (c) 2007-2015, Paul Neng (minnshi@gmail.com)
All rights reserved.

VPCS is free software, distributed under the terms of the
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

PC1>
PC1> ip 172.30.0.10/24
Checking for duplicate address...
PC1 : 172.30.0.10 255.255.255.0

PC1> show

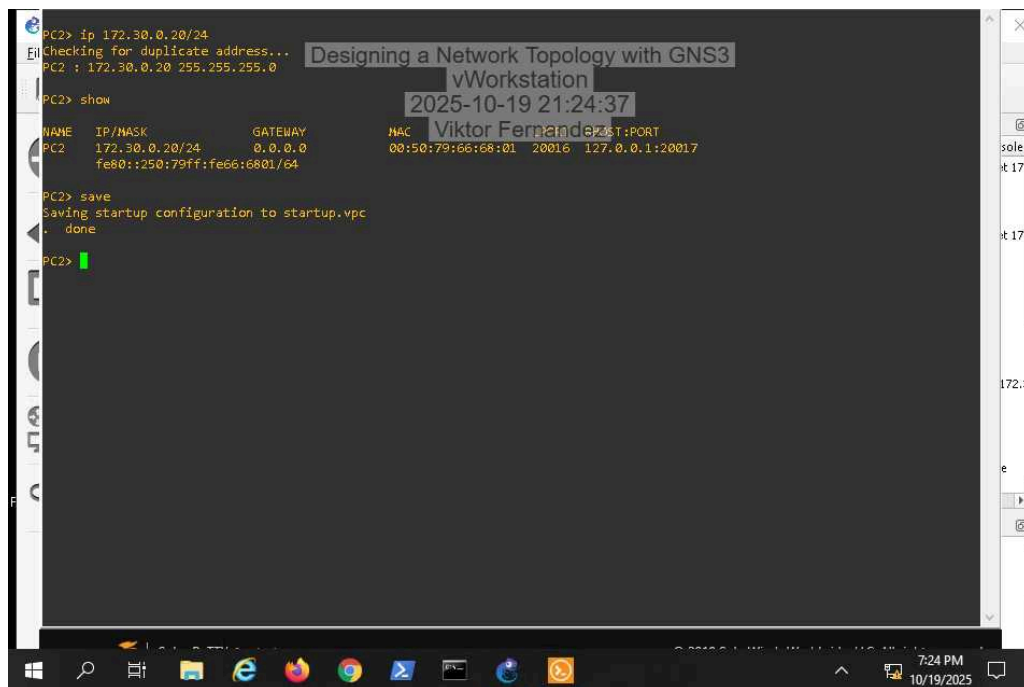
NAME IP/MASK GATEWAY MAC LPORT RHOST:PORT
PC1 172.30.0.10/24 0.0.0.0 00:50:79:66:68:00 20014 127.0.0.1:20015
fe80::250:79ff:fe66:6800/64

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

PC1>
```

The terminal window is overlaid on a Windows desktop with a taskbar at the bottom showing the time as 7:22 PM on 10/19/2025.

10. Make a screen capture showing the interface configuration on PC2.



The screenshot shows a terminal window titled "Designing a Network Topology with GNS3" running a Virtual PC Simulator. The terminal displays the following commands and output:

```
PC2> ip 172.30.0.20/24
Checking for duplicate address...
PC2 : 172.30.0.20 255.255.255.0

PC2> show

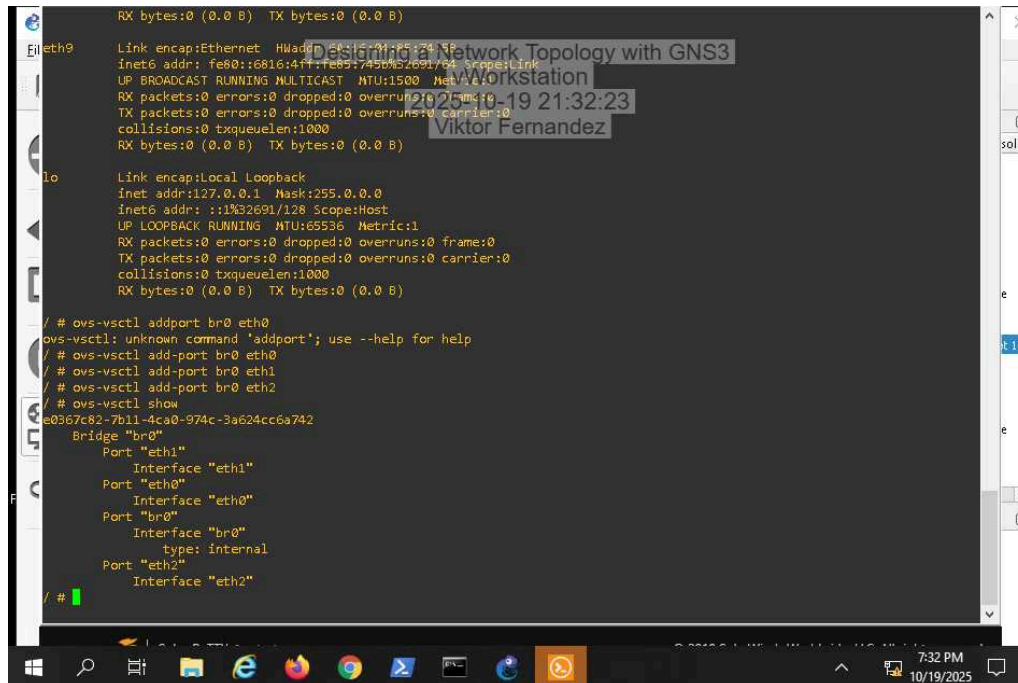
NAME IP/MASK GATEWAY MAC LPORT RHOST:PORT
PC2 172.30.0.20/24 0.0.0.0 00:50:79:66:68:01 20016 127.0.0.1:20017
fe80::250:79ff:fe66:6801/64

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

PC2>
```

The terminal window is overlaid on a Windows desktop with a taskbar at the bottom showing the time as 7:24 PM on 10/19/2025.

18. Make a screen capture showing the bridge configuration on Switch3.



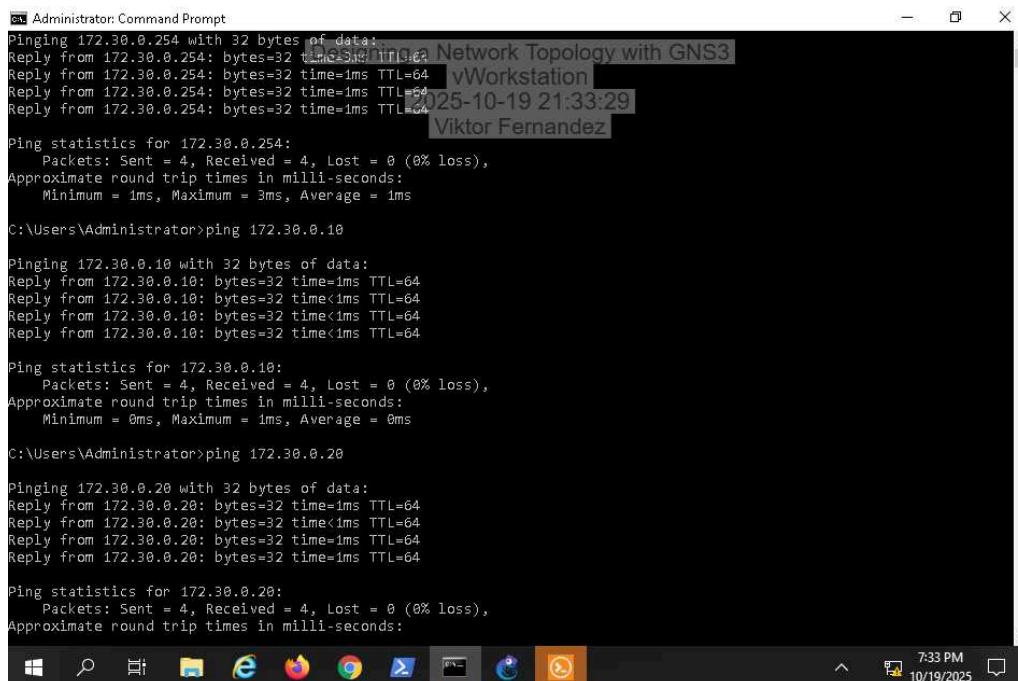
The screenshot shows a terminal window with the following output:

```
RX bytes:0 (0.0 B) TX bytes:0 (0.0 B)
eth0
  Link encap:Ethernet  HWaddr 82:5e:60:11:24:14
  inet6 addr: fe80::6816:4fff:fe85:745b%201/64 Scope:Link
  UP BROADCAST RUNNING MULTICAST  MTU:1500  NetVLAN:0
  RX packets:0 errors:0 dropped:0 overruns:0 frame:0
  TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
  collisions:0 txqueuelen:1000
  RX bytes:0 (0.0 B) TX bytes:0 (0.0 B)

lo
  Link encap:Local Loopback
  inet addr:127.0.0.1 Mask:255.0.0.0
  inet6 addr: ::1%32691/128 Scope:Host
  UP LOOPBACK RUNNING  MTU:65536  Metric:1
  RX packets:0 errors:0 dropped:0 overruns:0 frame:0
  TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
  collisions:0 txqueuelen:1000
  RX bytes:0 (0.0 B) TX bytes:0 (0.0 B)

# ovs-vsctl addport br0 eth0
ovs-vsctl: unknown command 'addport'; use --help for help
# ovs-vsctl add-port br0 eth0
# ovs-vsctl add-port br0 eth1
# ovs-vsctl add-port br0 eth2
# ovs-vsctl show
e8367c82-7b11-4ca0-974c-3a624cc6a742
  Bridge "br0"
    Port "eth1"
      Interface "eth1"
    Port "eth0"
      Interface "eth0"
    Port "br0"
      Interface "br0"
      type: internal
    Port "eth2"
      Interface "eth2"
```

22. Make a screen capture showing the successful replies from PC1 and PC2 in the Command Prompt window.



The screenshot shows a Command Prompt window with the following output:

```
Administrator: Command Prompt
Pinging 172.30.0.254 with 32 bytes of data:
Reply from 172.30.0.254: bytes=32 time=1ms TTL=64
Reply from 172.30.0.254: bytes=32 time=1ms TTL=64
Reply from 172.30.0.254: bytes=32 time=1ms TTL=64
Reply from 172.30.0.254: bytes=32 time=1ms TTL=64

Ping statistics for 172.30.0.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 3ms, Average = 1ms

C:\Users\Administrator>ping 172.30.0.10

Pinging 172.30.0.10 with 32 bytes of data:
Reply from 172.30.0.10: bytes=32 time=1ms TTL=64
Reply from 172.30.0.10: bytes=32 time=1ms TTL=64
Reply from 172.30.0.10: bytes=32 time=1ms TTL=64
Reply from 172.30.0.10: bytes=32 time=1ms TTL=64

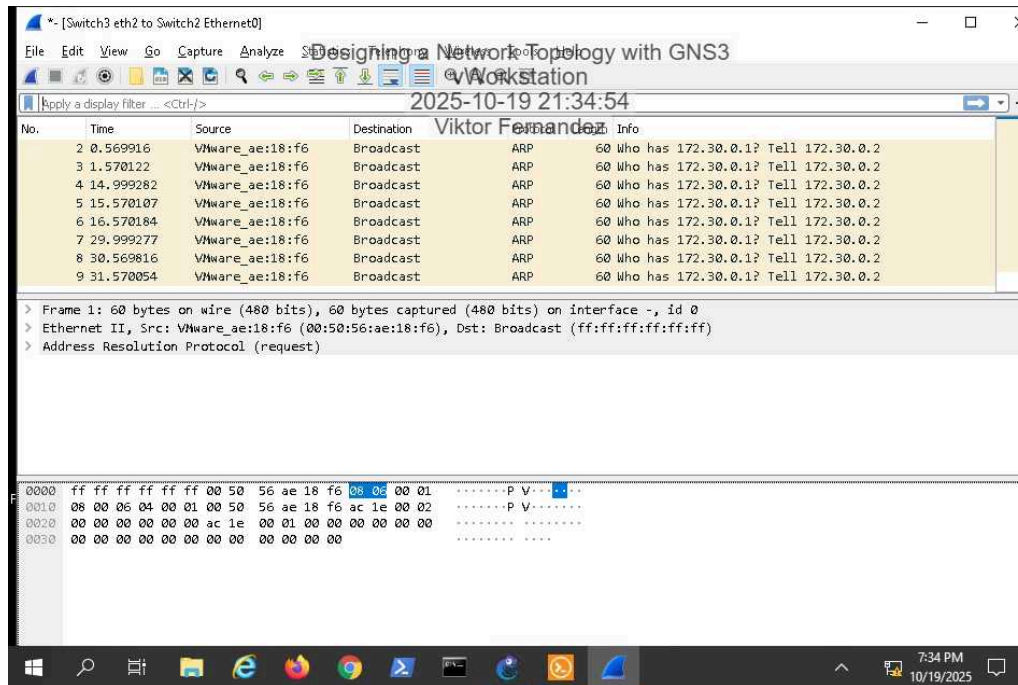
Ping statistics for 172.30.0.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\Users\Administrator>ping 172.30.0.20

Pinging 172.30.0.20 with 32 bytes of data:
Reply from 172.30.0.20: bytes=32 time=1ms TTL=64
Reply from 172.30.0.20: bytes=32 time=1ms TTL=64
Reply from 172.30.0.20: bytes=32 time=1ms TTL=64
Reply from 172.30.0.20: bytes=32 time=1ms TTL=64

Ping statistics for 172.30.0.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
```

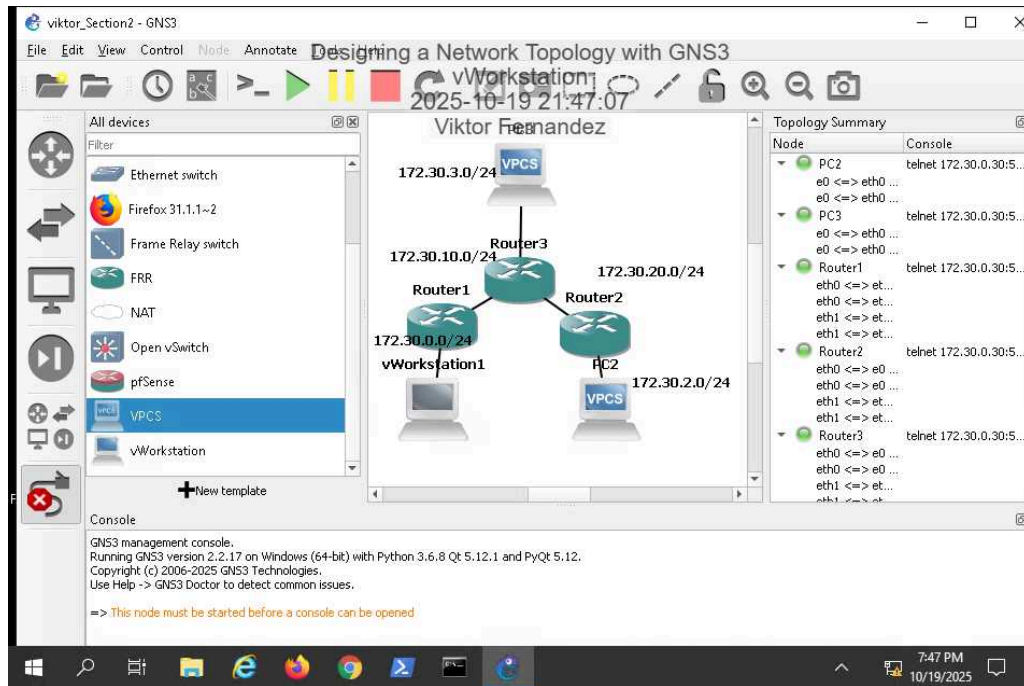
31. Make a screen capture showing the **ARP broadcast packets** captured on the **Switch2>PC2** link.



Section 2: Applied Learning

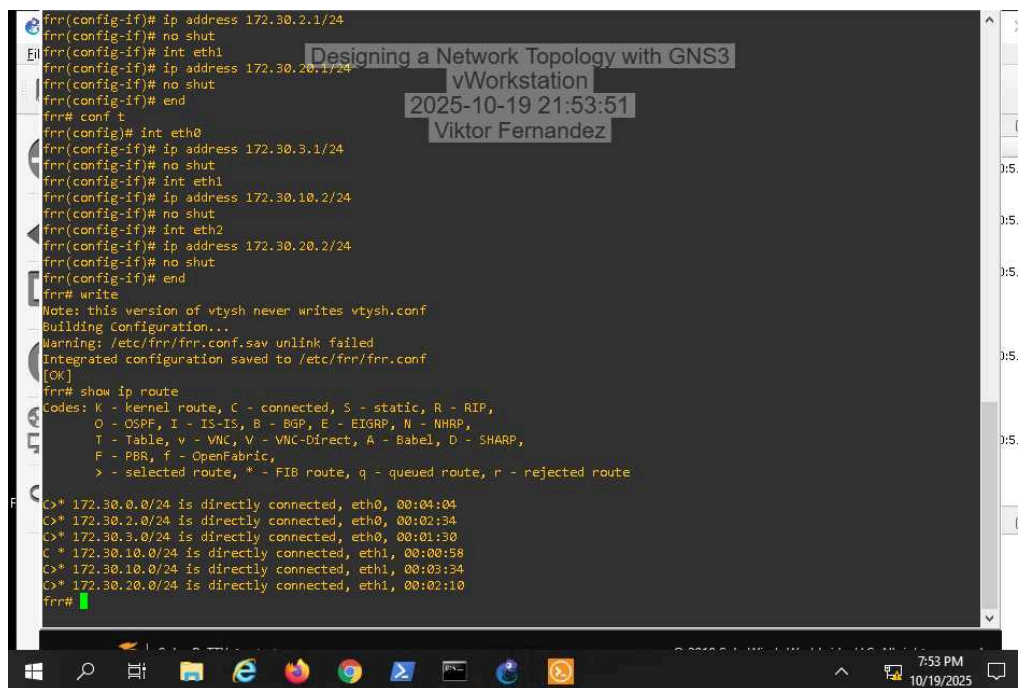
Part 1: Configure Physical Connectivity on a Layer 3 Network

16. Make a screen capture showing the **completed topology** in the workspace, as well as the **nodes and their links** in the **Topology Summary**.



Part 2: Configure Logical Connectivity on a Layer 3 Network

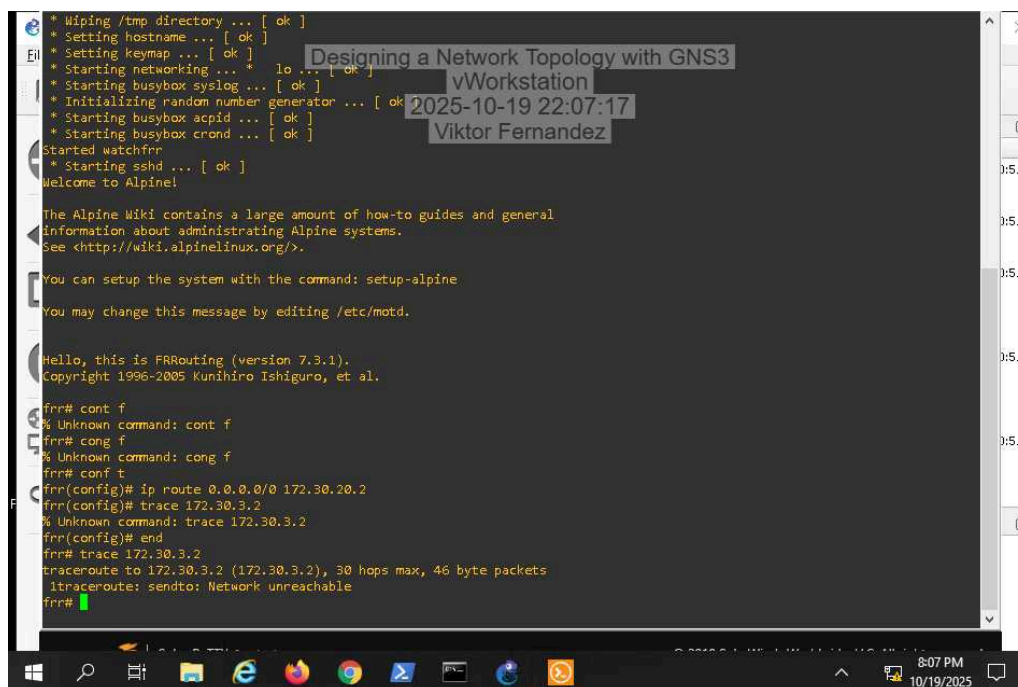
13. Make a screen capture showing the routes currently known by Router3.



```
frr(config-if)# ip address 172.30.2.1/24
frr(config-if)# no shut
frr(config-if)# int eth1
frr(config-if)# ip address 172.30.20.1/24
frr(config-if)# no shut
frr(config-if)# end
frr# conf t
frr(config)# int eth0
frr(config-if)# ip address 172.30.3.1/24
frr(config-if)# no shut
frr(config-if)# int eth1
frr(config-if)# ip address 172.30.10.2/24
frr(config-if)# no shut
frr(config-if)# int eth2
frr(config-if)# ip address 172.30.20.2/24
frr(config-if)# no shut
frr(config-if)# end
frr# write
Note: this version of vtysh never writes vtysh.conf
Building Configuration...
Warning: /etc/frr/frr.conf.sav unlink failed
Integrated configuration saved to /etc/frr/frr.conf
[OK]
frr# show ip route
Codes: K - kernel route, C - connected, S - static, R - RIP,
O - OSPF, I - IS-IS, B - BGP, E - EIGRP, N - NHRP,
T - Table, v - VNC, V - VNC-Direct, A - Babel, D - SHARP,
F - PBR, f - OpenFabric,
> - selected route, * - FIB route, q - queued route, r - rejected route

C* 172.30.0.0/24 is directly connected, eth0, 00:04:04
C* 172.30.2.0/24 is directly connected, eth0, 00:02:34
C* 172.30.3.0/24 is directly connected, eth0, 00:01:30
C* 172.30.10.0/24 is directly connected, eth1, 00:00:58
C* 172.30.10.0/24 is directly connected, eth1, 00:03:34
C* 172.30.20.0/24 is directly connected, eth1, 00:02:10
frr#
```

26. Make a screen capture showing the traceroute attempt to the vWorkstation node.



```
* Wiping /tmp directory ... [ ok ]
* Setting hostname ... [ ok ]
* Setting keymap ... [ ok ]
* Starting networking ... * lo ... [ ok ]
* Starting busybox syslog ... [ ok ]
* Initializing random number generator ... [ ok ]
* Starting busybox acpid ... [ ok ]
* Starting busybox crond ... [ ok ]
Started Watchdog
* Starting sshd ... [ ok ]
Welcome to Alpine!

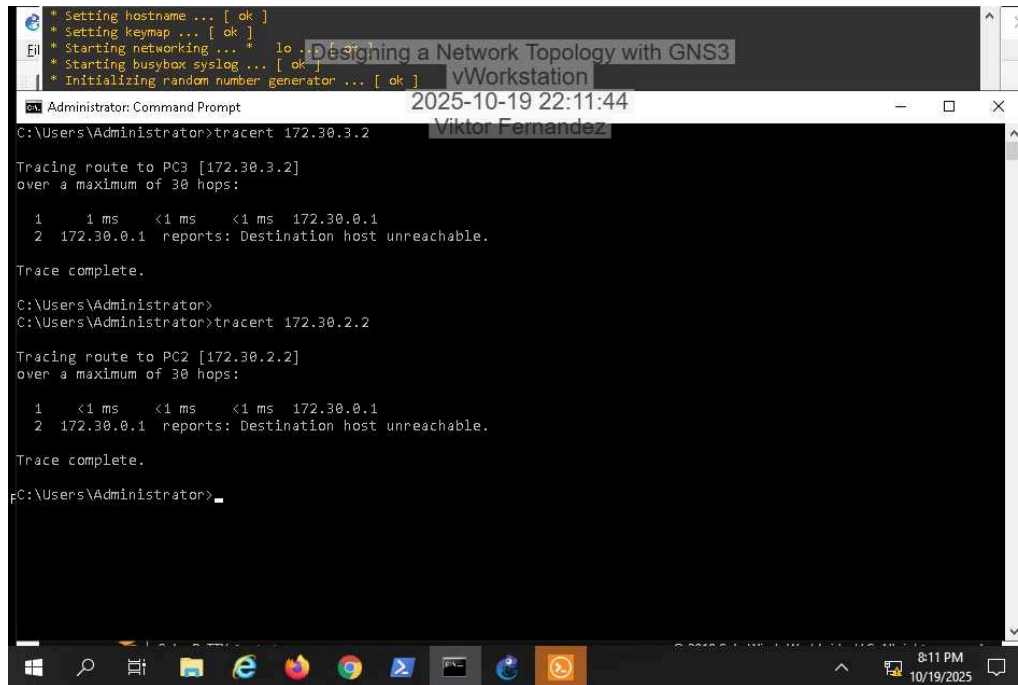
The Alpine Wiki contains a large amount of how-to guides and general
information about administrating Alpine systems.
See <http://wiki.alpinelinux.org/>.

You can setup the system with the command: setup-alpine
You may change this message by editing /etc/motd.

Hello, this is FRRouting (version 7.3.1).
Copyright 1996-2005 Kunihiro Ishiguro, et al.

frr# cont f
% Unknown command: cont f
frr# cong f
% Unknown command: cong f
frr# conf t
frr(config)# ip route 0.0.0.0/0 172.30.20.2
frr(config)# trace 172.30.3.2
% Unknown command: trace 172.30.3.2
frr(config)# end
frr# trace 172.30.3.2
traceroute to 172.30.3.2 (172.30.3.2), 30 hops max, 46 byte packets
1:traceroute: sendto: Network unreachable
frr#
```

35. Make a screen capture showing the results from your **tracert** executions to **PC2** and **PC3**.



The screenshot shows a Windows Command Prompt window titled "Administrator: Command Prompt" with the following text:

```
* Setting hostname ... [ ok ]
* Setting keymap ... [ ok ]
* Starting networking ... *
* Starting busybox syslog ... [ ok ]
* Initializing random number generator ... [ ok ]

C:\Users\Administrator>tracert 172.30.3.2

Tracing route to PC3 [172.30.3.2]
over a maximum of 30 hops:

  1    1 ms    <1 ms    <1 ms  172.30.0.1
  2  172.30.0.1  reports: Destination host unreachable.

Trace complete.

C:\Users\Administrator>
C:\Users\Administrator>tracert 172.30.2.2

Tracing route to PC2 [172.30.2.2]
over a maximum of 30 hops:

  1    <1 ms    <1 ms    <1 ms  172.30.0.1
  2  172.30.0.1  reports: Destination host unreachable.

Trace complete.

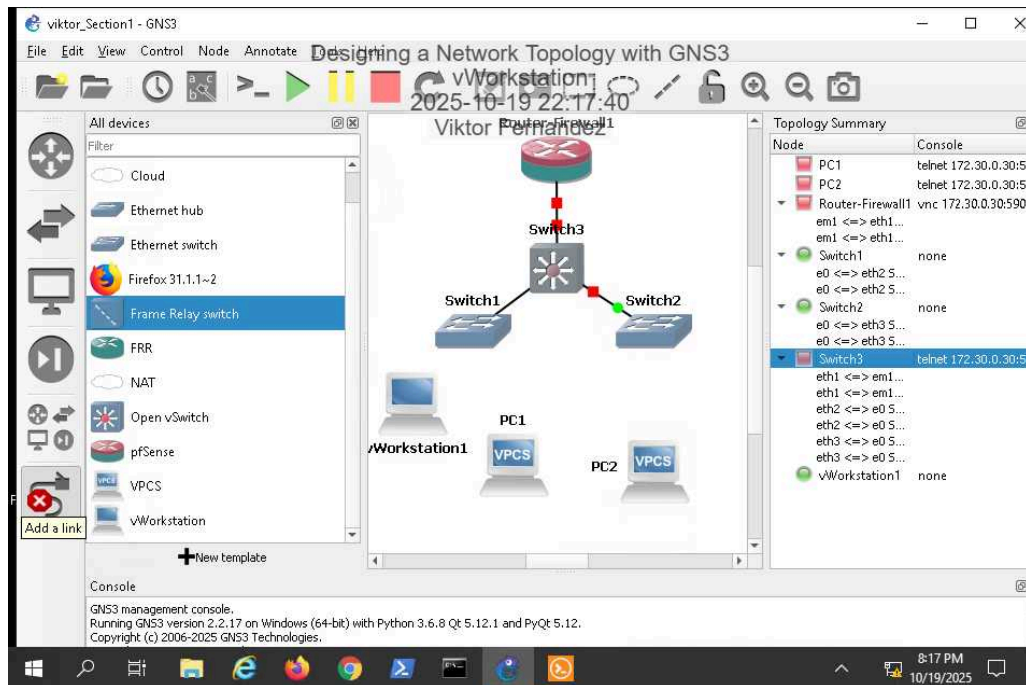
C:\Users\Administrator>
```

The window title bar includes the text "Designing a Network Topology with GNS3", "vWorkstation", and the date/time "2025-10-19 22:11:44". The taskbar at the bottom shows the Windows logo, search icon, and several application icons, with the system clock displaying "8:11 PM 10/19/2025".

Section 3: Challenge and Analysis

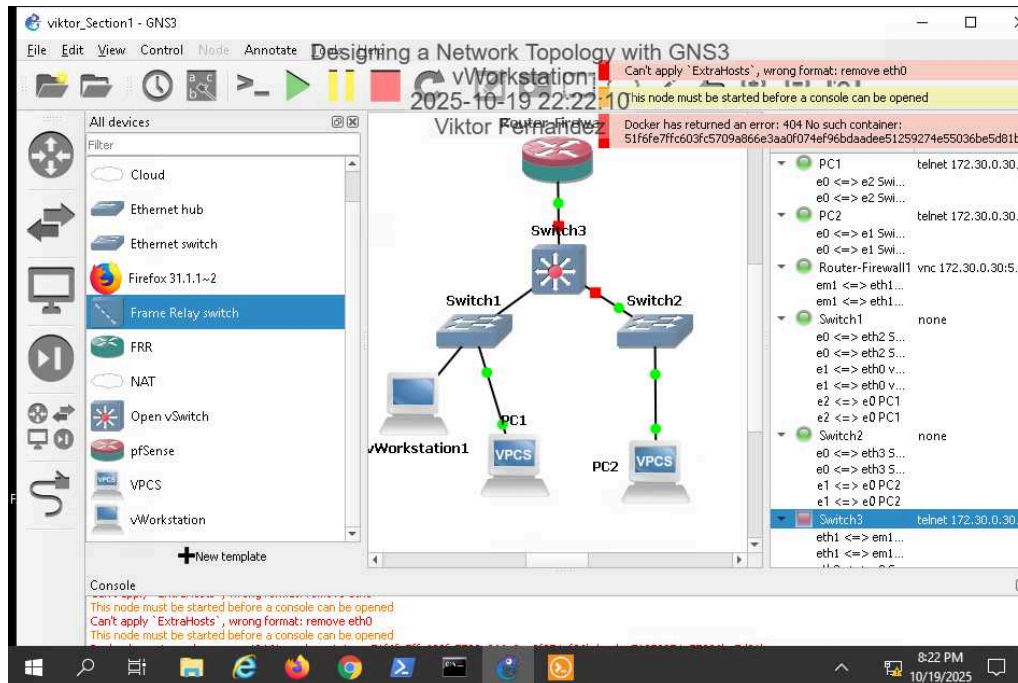
Part 1: Manage Switch Ports

Make a screen capture showing Switch3's connections in the Topology Summary.



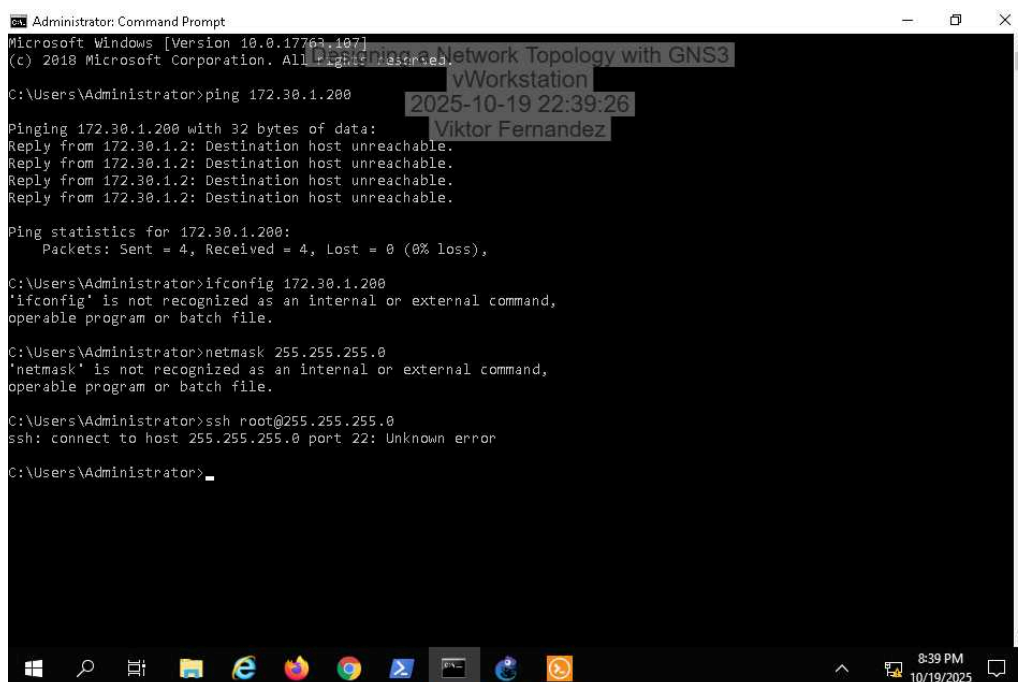
Part 2: Rearrange Ports on a Bridge

Make a screen capture showing the current Open vSwitch bridge configuration.

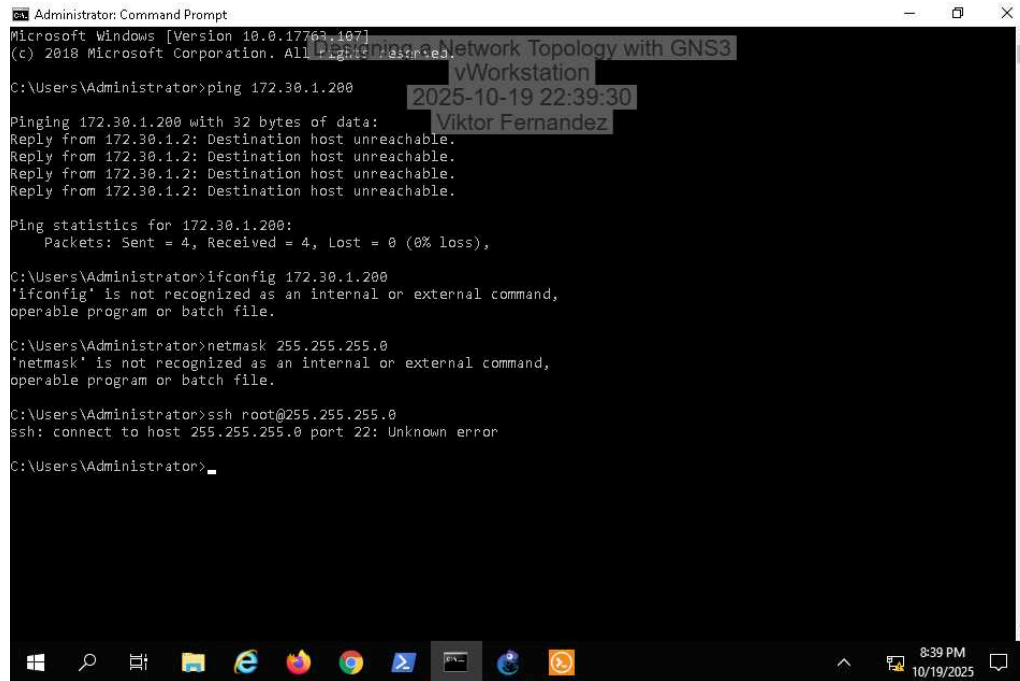


Part 3: Assign an IP Address to a Managed Switch

Make a screen capture showing the successful SSH login.



Make a screen capture showing the results of your ping.



```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.17763.107]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>ping 172.30.1.200

Pinging 172.30.1.200 with 32 bytes of data:
Reply from 172.30.1.2: Destination host unreachable.
Reply from 172.30.1.2: Destination host unreachable.
Reply from 172.30.1.2: Destination host unreachable.
Reply from 172.30.1.2: Destination host unreachable.

Ping statistics for 172.30.1.200:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

C:\Users\Administrator>ifconfig 172.30.1.200
'ifconfig' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\Administrator>netmask 255.255.255.0
'netmask' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\Administrator>ssh root@255.255.255.0
ssh: connect to host 255.255.255.0 port 22: Unknown error

C:\Users\Administrator>
```

The screenshot shows a Windows Command Prompt window with the following text: "Administrator: Command Prompt", "Microsoft Windows [Version 10.0.17763.107]", "(c) 2018 Microsoft Corporation. All rights reserved.", "C:\Users\Administrator>ping 172.30.1.200", "Pinging 172.30.1.200 with 32 bytes of data:", "Reply from 172.30.1.2: Destination host unreachable.", "Reply from 172.30.1.2: Destination host unreachable.", "Reply from 172.30.1.2: Destination host unreachable.", "Reply from 172.30.1.2: Destination host unreachable.", "Ping statistics for 172.30.1.200:", "Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),", "C:\Users\Administrator>ifconfig 172.30.1.200", "'ifconfig' is not recognized as an internal or external command, operable program or batch file.", "C:\Users\Administrator>netmask 255.255.255.0", "'netmask' is not recognized as an internal or external command, operable program or batch file.", "C:\Users\Administrator>ssh root@255.255.255.0", "ssh: connect to host 255.255.255.0 port 22: Unknown error", "C:\Users\Administrator>". The window title bar shows "Administrator: Command Prompt" and "vWorkstation". The taskbar at the bottom shows various application icons and the system clock "8:39 PM 10/19/2025".