

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:

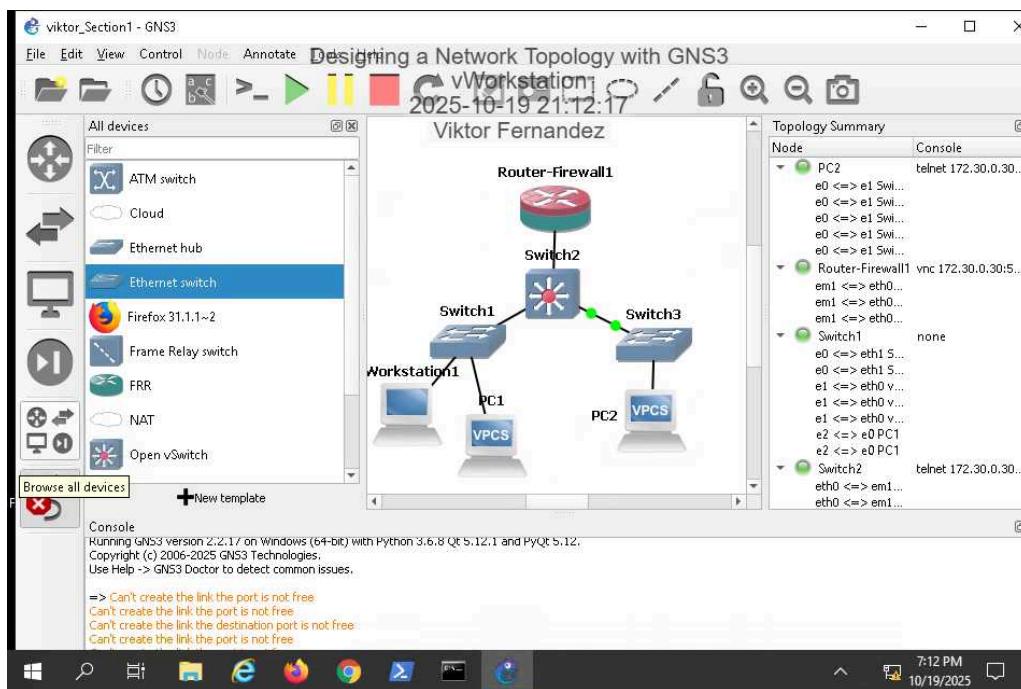
100%

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

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

```
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 Meng (mirnshi@gmail.com)
All rights reserved.

Viktor Fernandez
2025-10-19 21:22:41

VPCS is free software, distributed under the terms of the GNU General Public License.
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
C. done

PC1>
```

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

```
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

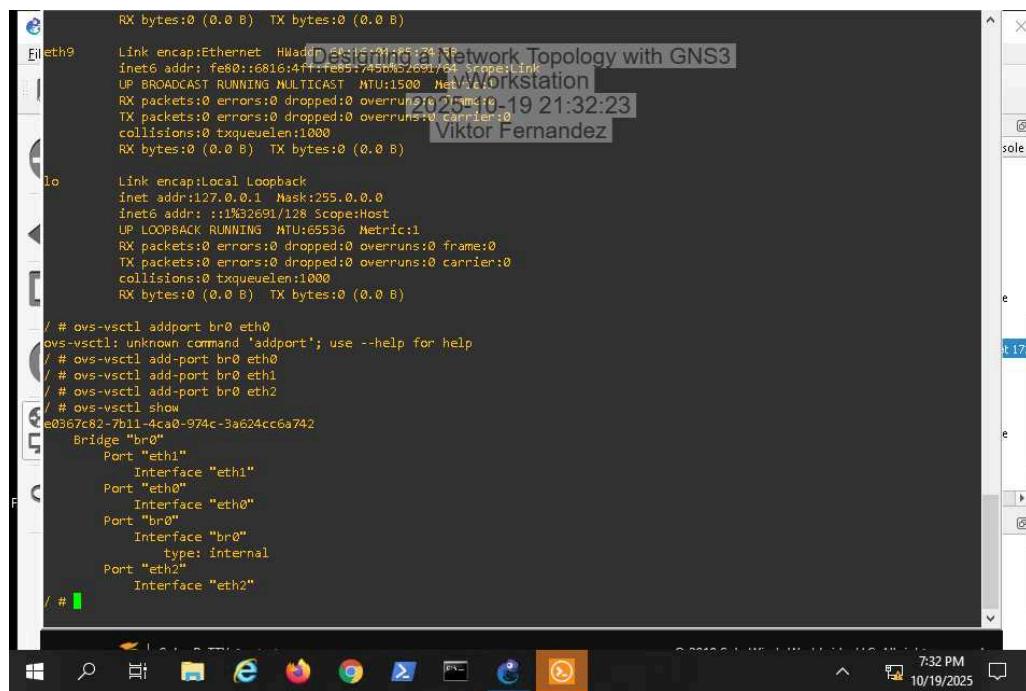
PC2> save
Saving startup configuration to startup.vpc
C. done

PC2>
```

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

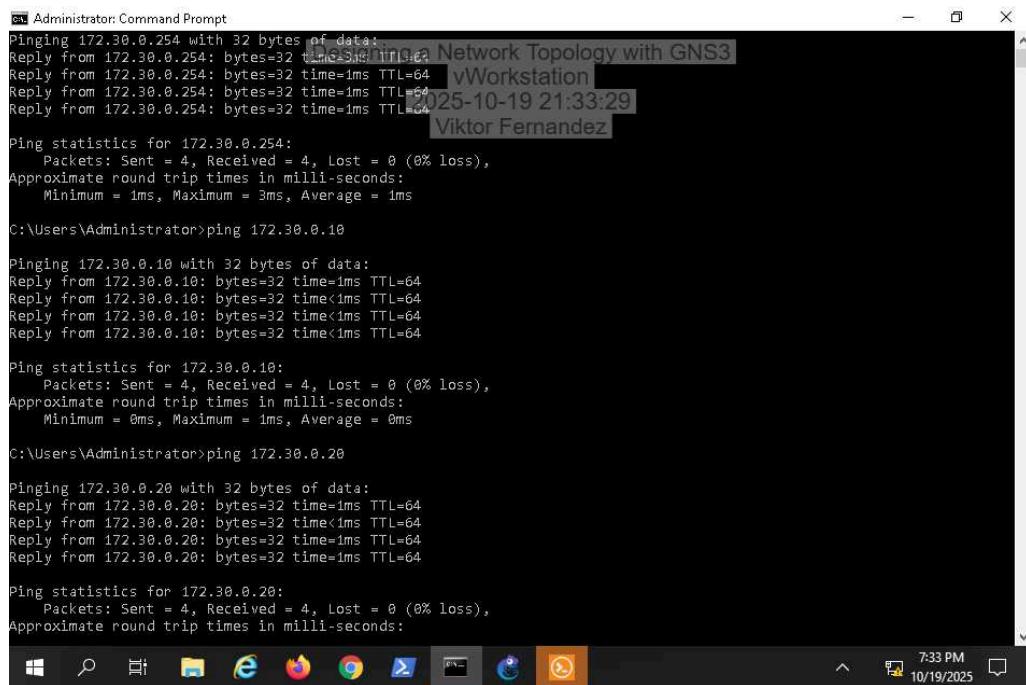


```
RX bytes:0 (0.0 B) TX bytes:0 (0.0 B)
eth0 Link encap:Ethernet HWaddr 00:0c:29:1f:85:24
inet6 addr: fe80::680c:4ff:fe85:745b%2691/64 Scope:Link
UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
RX packets:0 errors:0 dropped:0 overruns:0 frame:0
TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:0 (0.0 B) TX bytes:0 (0.0 B)

lo Link encap:Local Loopback
inet addr:127.0.0.1 Mask:255.0.0.0
inet6 addr: ::1%2691/128 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
e0367e82-7b11-4ca0-974c-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.



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

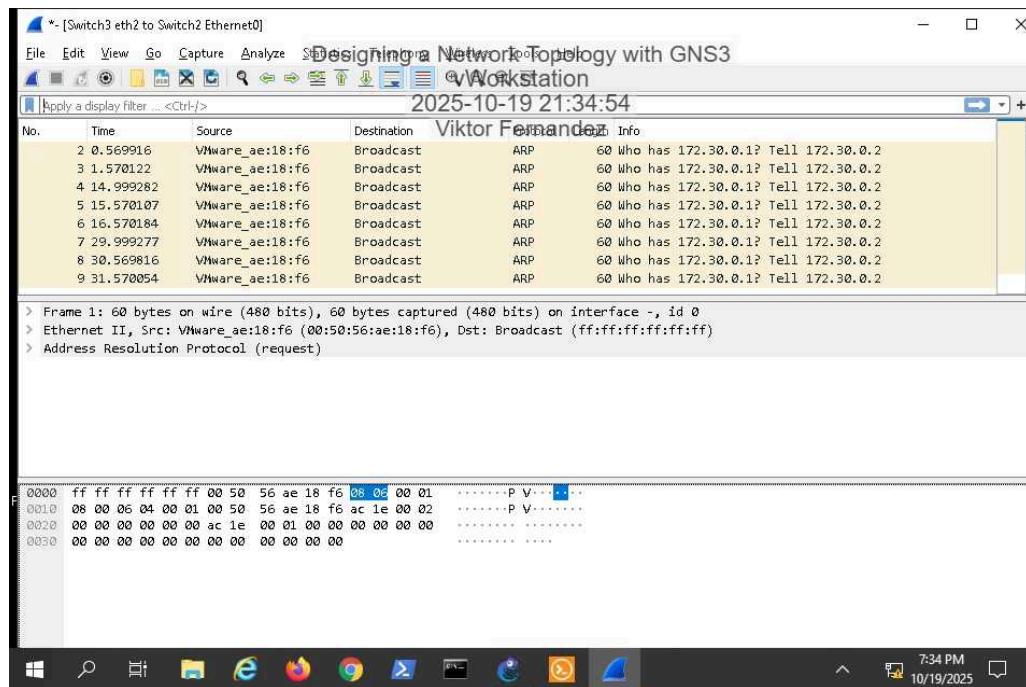
Pingng 172.30.0.10 with 32 bytes of data:
Reply from 172.30.0.10: bytes=32 time=1ms TTL=64
Reply from 172.30.0.10: bytes=32 time<1ms TTL=64
Reply from 172.30.0.10: bytes=32 time<1ms TTL=64
Reply from 172.30.0.10: bytes=32 time<1ms TTL=64
Ping statistics for 172.30.0.10:
  Packets: Sent = 4, Received = 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

Pingng 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:
```

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



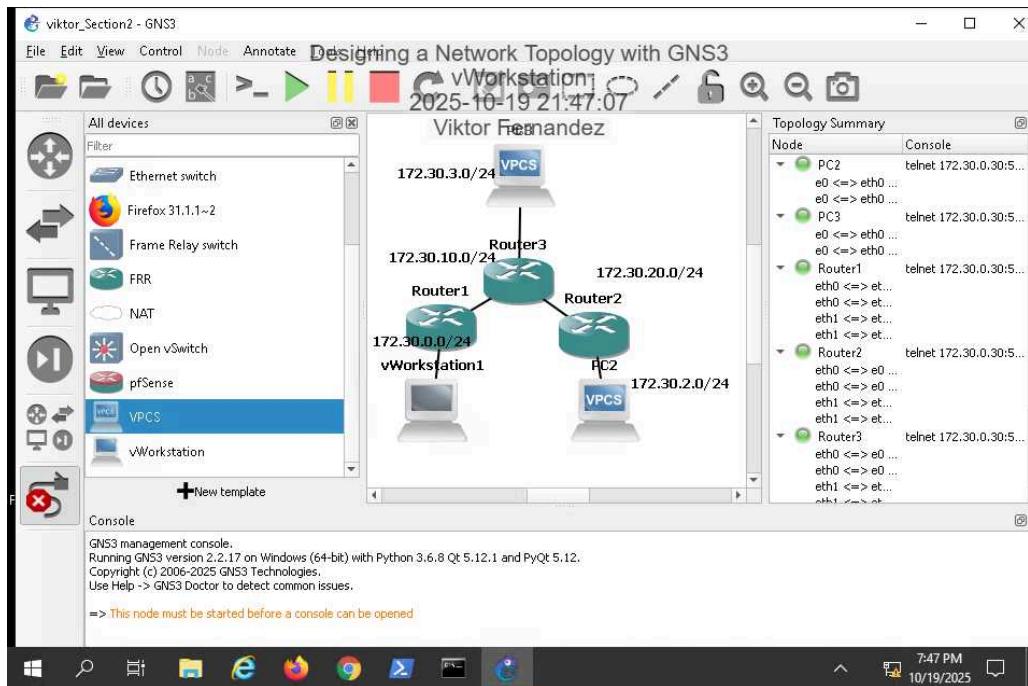
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Section 2: Applied Learning

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.

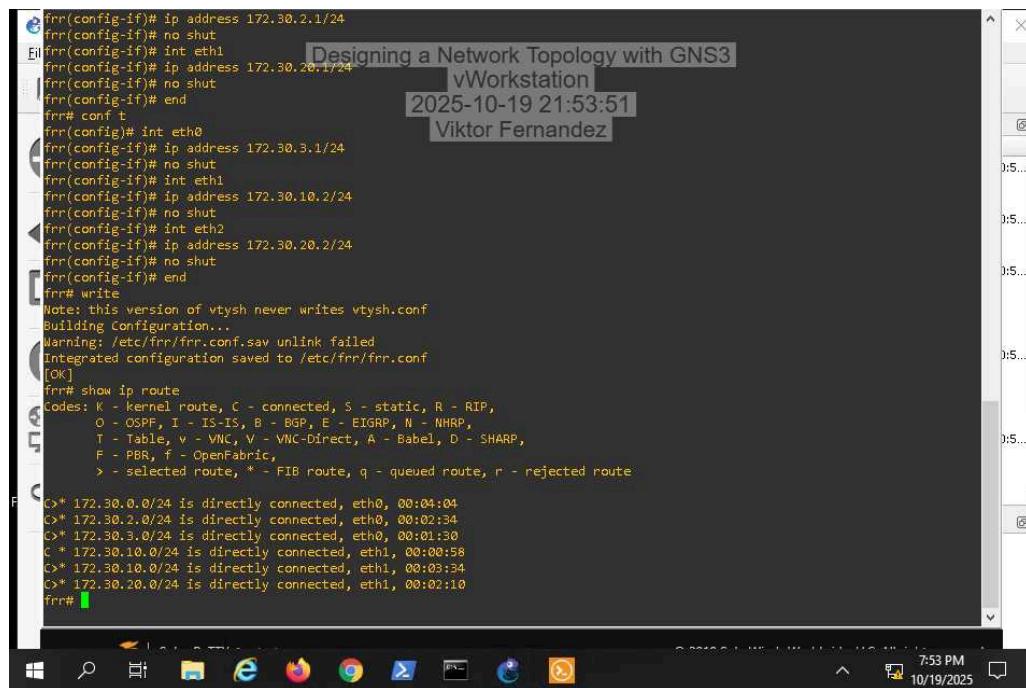


Part 2: Configure Logical Connectivity on a Layer 3 Network

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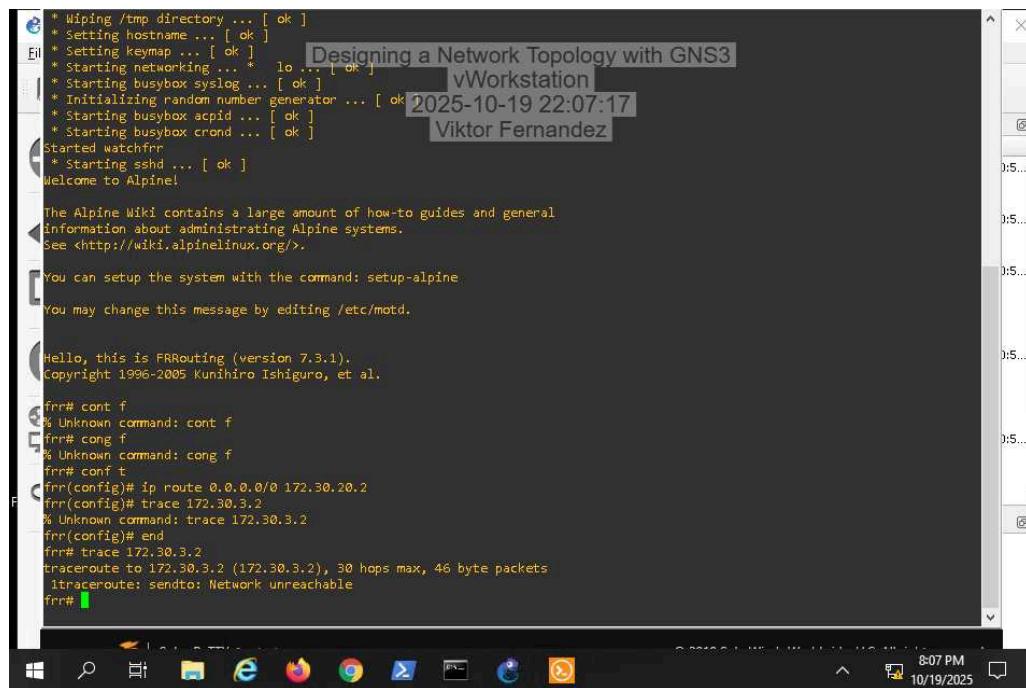
13. Make a screen capture showing the routes currently known by Router3.



The screenshot shows a terminal window titled "Designing a Network Topology with GNS3" running on a Windows operating system. The terminal displays the configuration of Router3, including interface configurations and a route table. The route table shows direct connections to various network segments via interfaces eth0, eth1, and eth2.

```
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-if)# 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.



The screenshot shows a terminal window titled "Designing a Network Topology with GNS3" running on a Windows operating system. The terminal displays the configuration of Router3 and a traceroute attempt to the "vWorkstation" node. The traceroute command is issued and shows the path taken by the packets, which is limited by a hop limit of 30.

```
* Wiping /tmp directory ... [ ok ]
* Setting hostname ... [ ok ]
* Setting keymap ... [ ok ]
* Starting networking ... * lo ... [ ok ]
* Starting busybox syslog ... [ ok ]
* Initializing random number generator ... [ ok ] 2025-10-19 22:07:17
* Starting busybox acpid ... [ ok ]
* Starting busybox crond ... [ ok ]
Started watchfr
* Starting sshd ... [ ok ]
Welcome to Alpine!

The Alpine Wiki contains a large amount of how-to guides and general
information about administering 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.

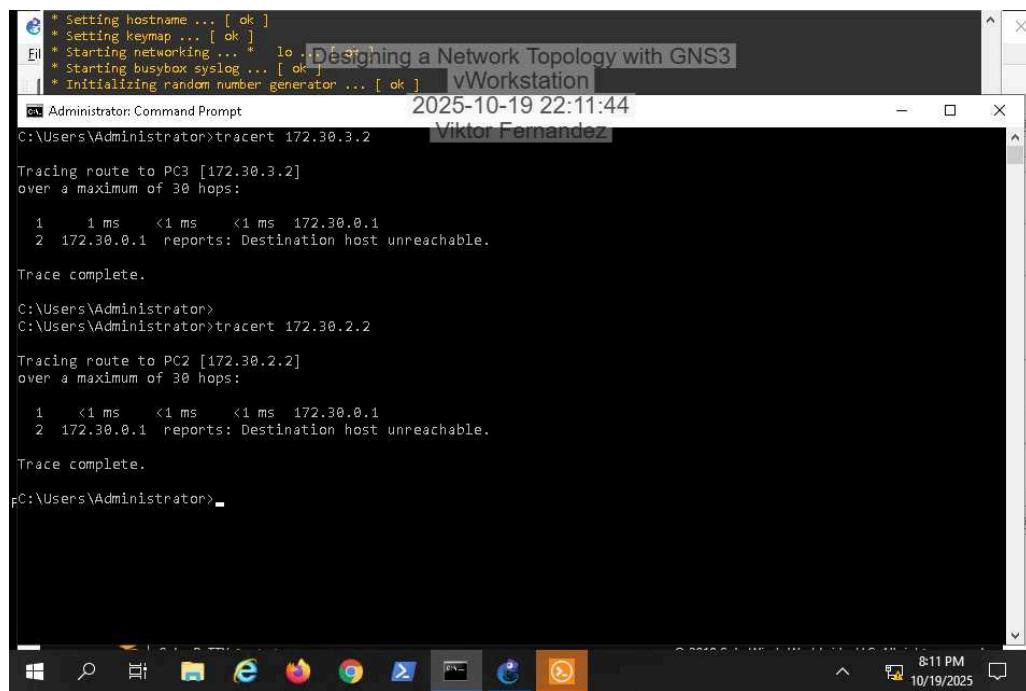
Hello, this is FRRouting (version 7.3.1).
Copyright 1996-2005 Kunihiro Ishiguro, et al.

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 (172.30.3.2), 30 hops max, 46 byte packets
traceroute to 172.30.3.2 (172.30.3.2), 30 hops max, 46 byte packets
 1 traceroute: sendto: Network unreachable
frr#
```

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



```
* Setting hostname ... [ ok ]
* Setting keymap ... [ ok ]
* Starting networking ... * 1o : Designing a Network Topology with GNS3
| * Initializing random number generator ... [ ok ] vWorkstation
Administrator: Command Prompt 2025-10-19 22:11:44 Viktor Fernandez
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>
```

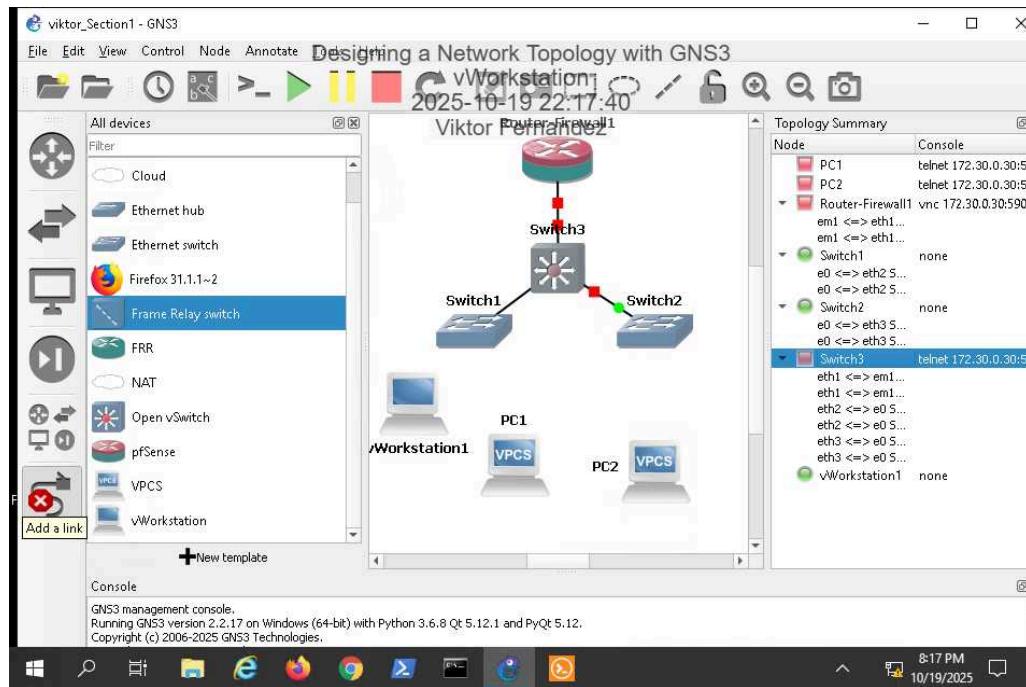
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Section 3: Challenge and Analysis

Part 1: Manage Switch Ports

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

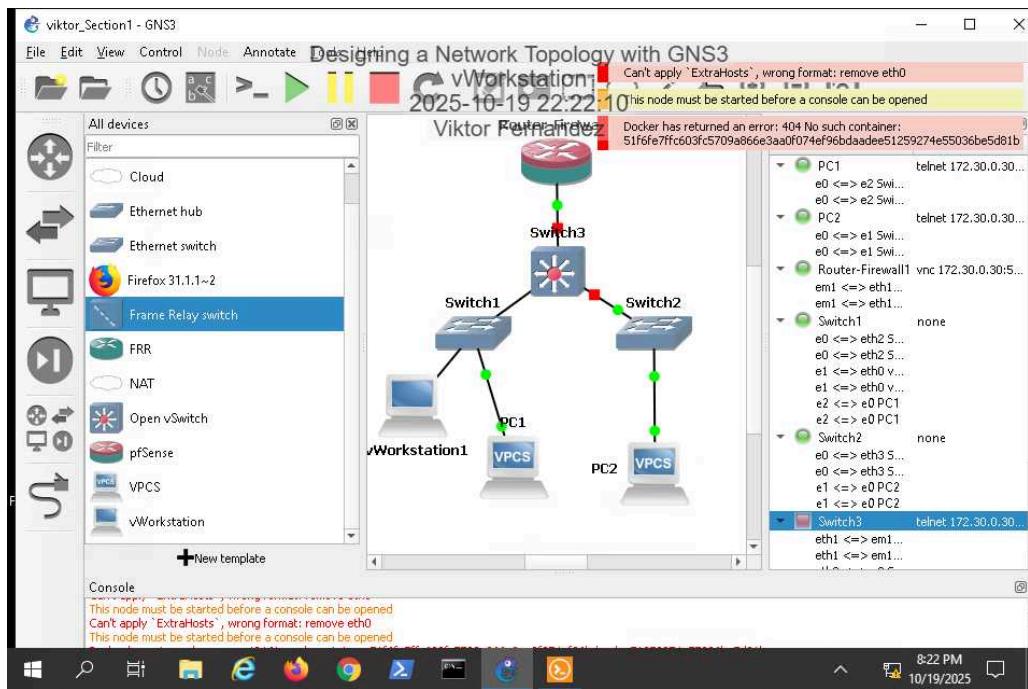


Part 2: Rearrange Ports on a Bridge

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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.

```
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.

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.

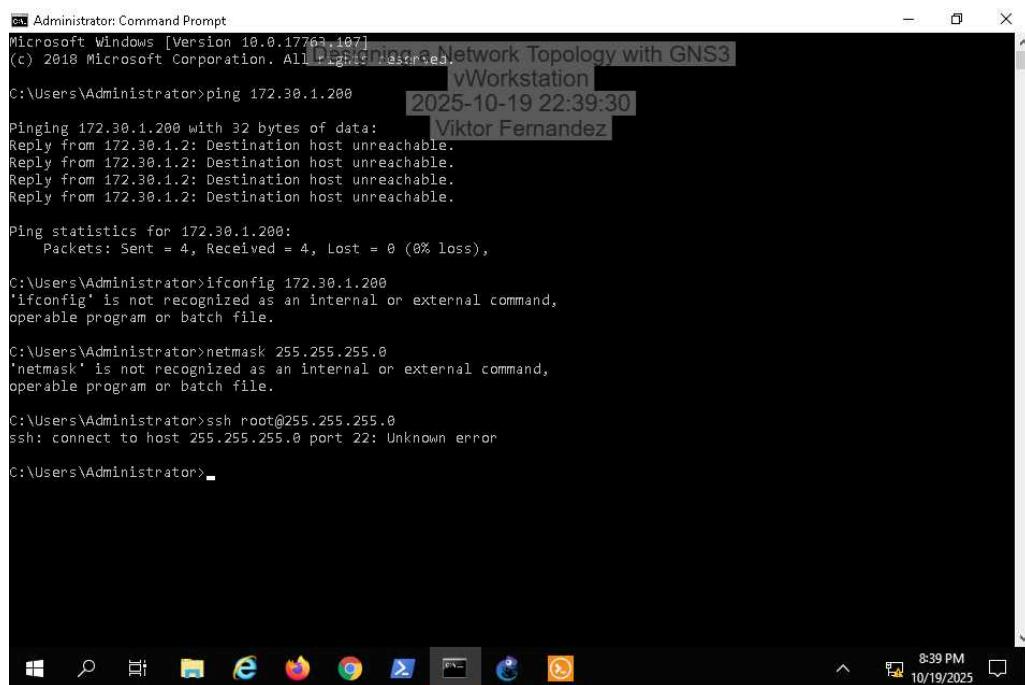
C:\Users\Administrator>ssh root@255.255.255.0
ssh: connect to host 255.255.255.0 port 22: Unknown error

C:\Users\Administrator>
```

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Make a screen capture showing the results of your ping.



The screenshot shows a Microsoft Windows Command Prompt window titled "Administrator: Command Prompt". The window displays 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
2025-10-19 22:39:30
Viktor Fernandez

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

Ping statistics for 172.30.1.200:
    Packets: Sent = 4, Received = 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 taskbar at the bottom of the screen shows various icons for applications like File Explorer, Edge, and Task View. The system tray indicates the date as 10/19/2025 and the time as 8:39 PM.