

# CS3543 Networking Hands-on: Basic of VyOS and Static Routing

Kotaro Kataoka

# Preparation for Running VMs (1/2)

```
sudo apt-get update
sudo apt-get install kvm libvirt-bin bridge-utils
sudo apt-get install virt-manager
sudo apt-get install vlan
sudo apt-get install iperf traceroute tcpdump
```

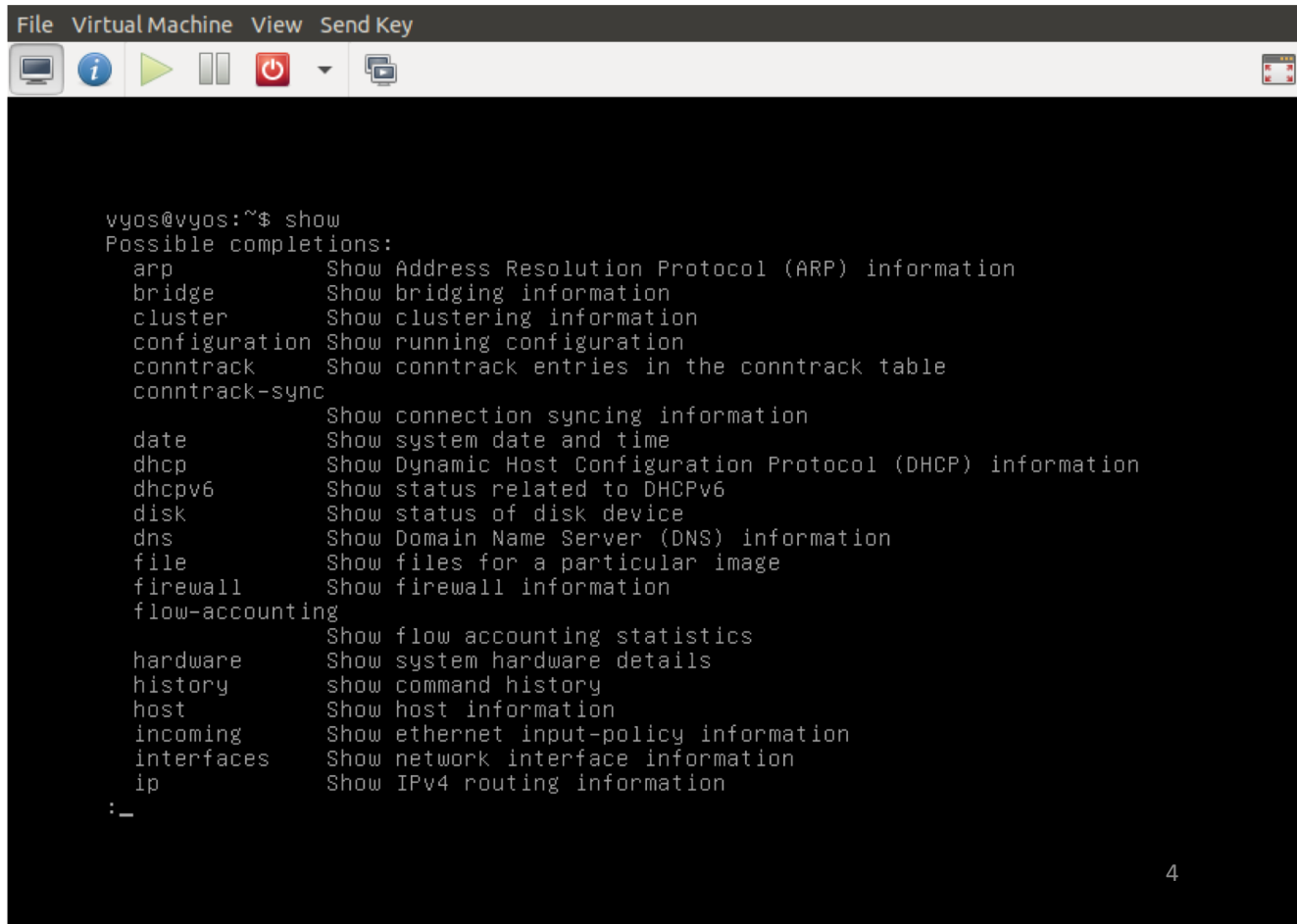
## Preparation for Running VMs (2/2)

- Copy ISO image of VyOS 1.1.8 to your laptop
- Install the first VyOS on virt-manager
- Login to VyOS
- Execute “install image”

# The most important commands (1/2)

\$ show ?

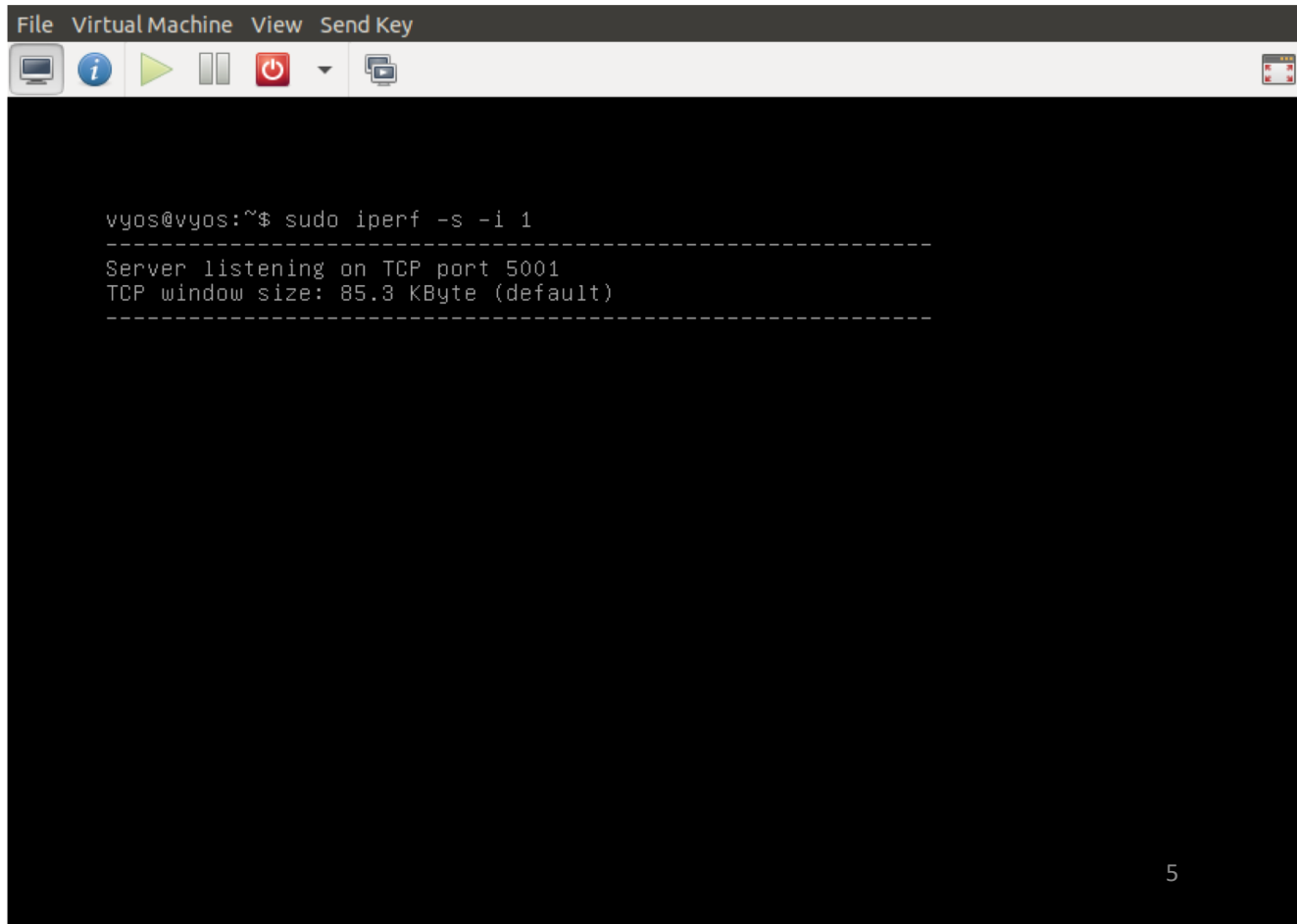
- What does it give?

A screenshot of a virtual machine window titled "Virtual Machine" with a menu bar containing "File", "Virtual Machine", "View", and "Send Key". The window contains a terminal window with a black background and white text. The terminal shows the prompt "vyos@vyos:~\$ show" followed by "Possible completions:". Below this, a list of commands and their descriptions is displayed. The list includes: arp (Show Address Resolution Protocol (ARP) information), bridge (Show bridging information), cluster (Show clustering information), configuration (Show running configuration), conntrack (Show conntrack entries in the conntrack table), conntrack-sync (Show connection syncing information), date (Show system date and time), dhcp (Show Dynamic Host Configuration Protocol (DHCP) information), dhcpv6 (Show status related to DHCPv6), disk (Show status of disk device), dns (Show Domain Name Server (DNS) information), file (Show files for a particular image), firewall (Show firewall information), flow-accounting (Show flow accounting statistics), hardware (Show system hardware details), history (show command history), host (Show host information), incoming (Show ethernet input-policy information), interfaces (Show network interface information), ip (Show IPv4 routing information), and a final line with a colon and an underscore ":"\_.

# The most important commands (2/2)

\$ sudo SOMETHING

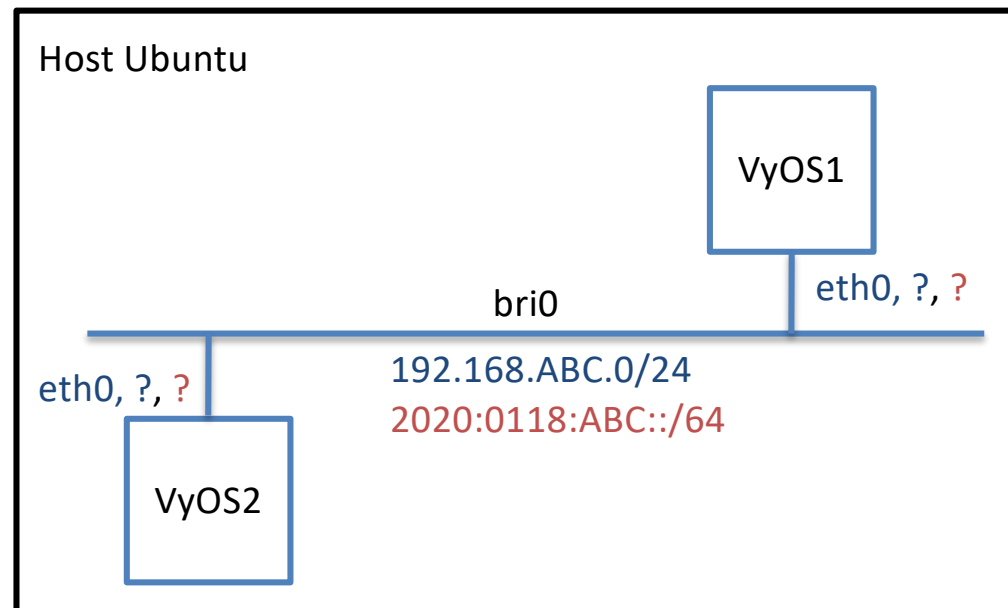
- Can execute Linux (not VyOS) commands

A screenshot of a Virtual Machine window titled "Virtual Machine". The window has a menu bar with "File", "Virtual Machine", "View", and "Send Key". Below the menu bar is a toolbar with icons for a monitor, information, play/pause, power, and a dropdown menu. The main area is a black terminal window with white text. The text shows a user prompt "vyos@vyos:~\$" followed by the command "sudo iperf -s -i 1". The output shows "Server listening on TCP port 5001" and "TCP window size: 85.3 KByte (default)".

```
vyos@vyos:~$ sudo iperf -s -i 1
-----
Server listening on TCP port 5001
TCP window size: 85.3 KByte (default)
-----
```

# Question 1: Connecting 2 VyOS via Bridge I/F (Virtual Connection) (1/2)

- Goal: Let VyOS1 and VyOS2 communicate with each other
- eth0 of VyOS1 and VyOS2 will be connected via Bridge I/F (bri0)
- Fix the IPv4/v6 address to give to each NIC by yourself

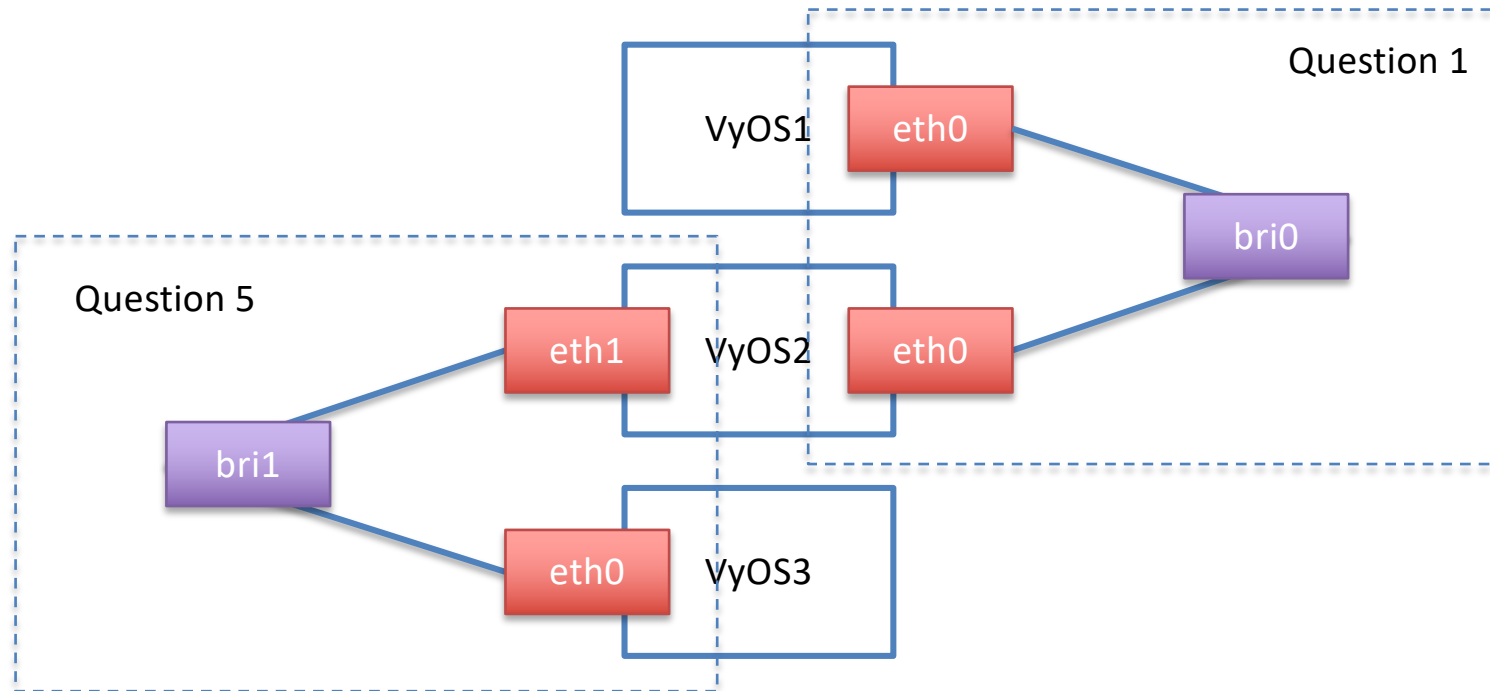


## Question 1: Connecting 2 VyOS via Bridge I/F (Virtual Connection) (2/2)

- Installing second VyOS
- Creating a bridge interface on Host Ubuntu
- Configuring two VyOSes to connect with each other via Bridge I/F on virt-manager
- Configuring IPv4/v6 addresses on NICs on VMs
- Running ping and iperf between two VyOSes

# Bridge I/F and VM NIC Configuration for Questions 1 and 5 (hints)

- Bridge I/F can be created using “brctl” command
  - “man brctl” if needed
  - Activate and choose in virt-manager appropriately





# Setting Up Bridge I/Fs on Host Ubuntu

- Creating 2 bridge interfaces

```
$ sudo brctl addbr bri0
```

```
$ sudo brctl addbr bri1
```

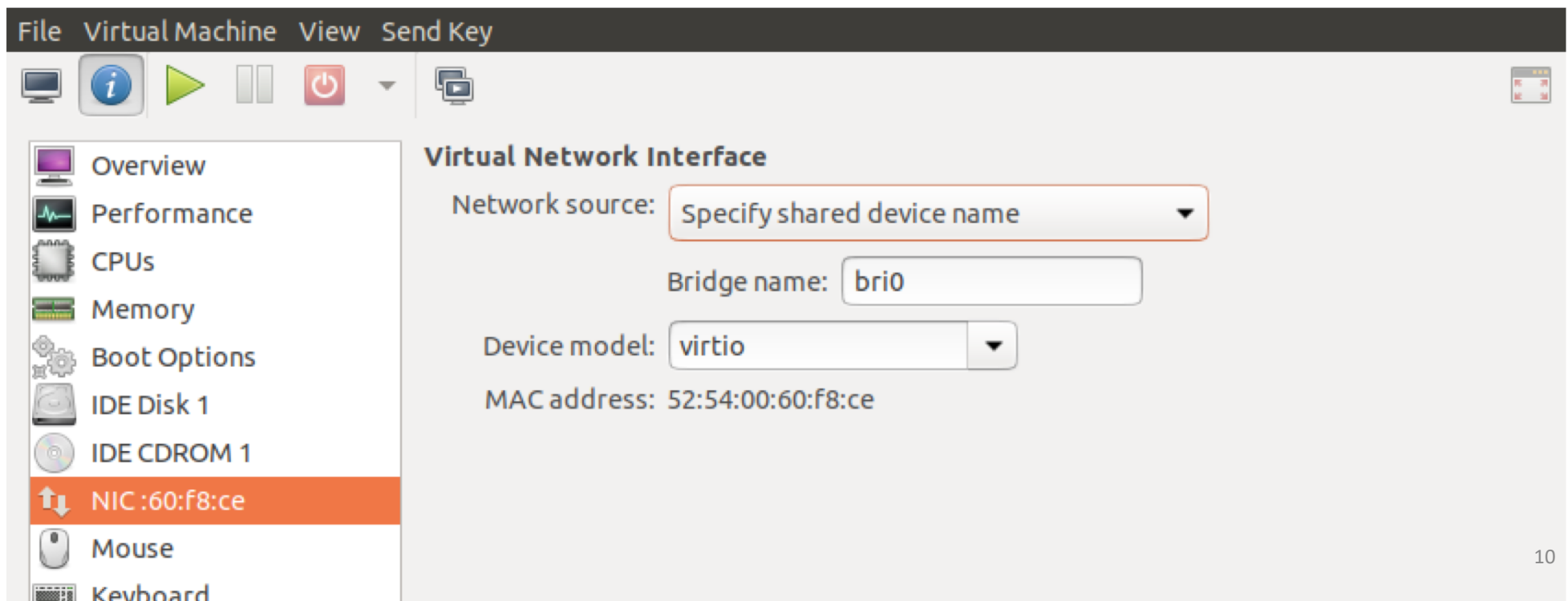
- Making the interfaces up and running

```
$ sudo ip link set bri0 up
```

```
$ sudo ip link set bri1 up
```

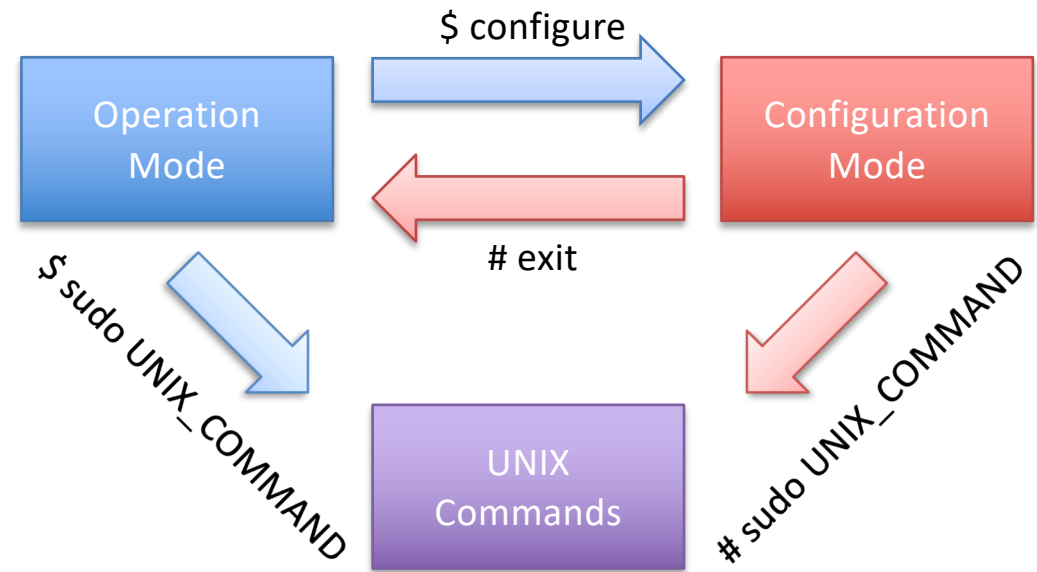
# Selecting an appropriate Bridge I/F on virt-manager

- “Network source” must be Bridge I/F for VM-VM connection on the same virt-manager



# Basic Operation of VyOS

- Operation Mode
  - Show configuration and status
  - Restart, power off the system
- Configuration Mode
  - Show and set configuration



# Showing Status and Configuration

- “\$ show SOMETHING” provides the status of your configuration and protocol behavior
- “# show SOMETHING” provides the configuration of what you have done

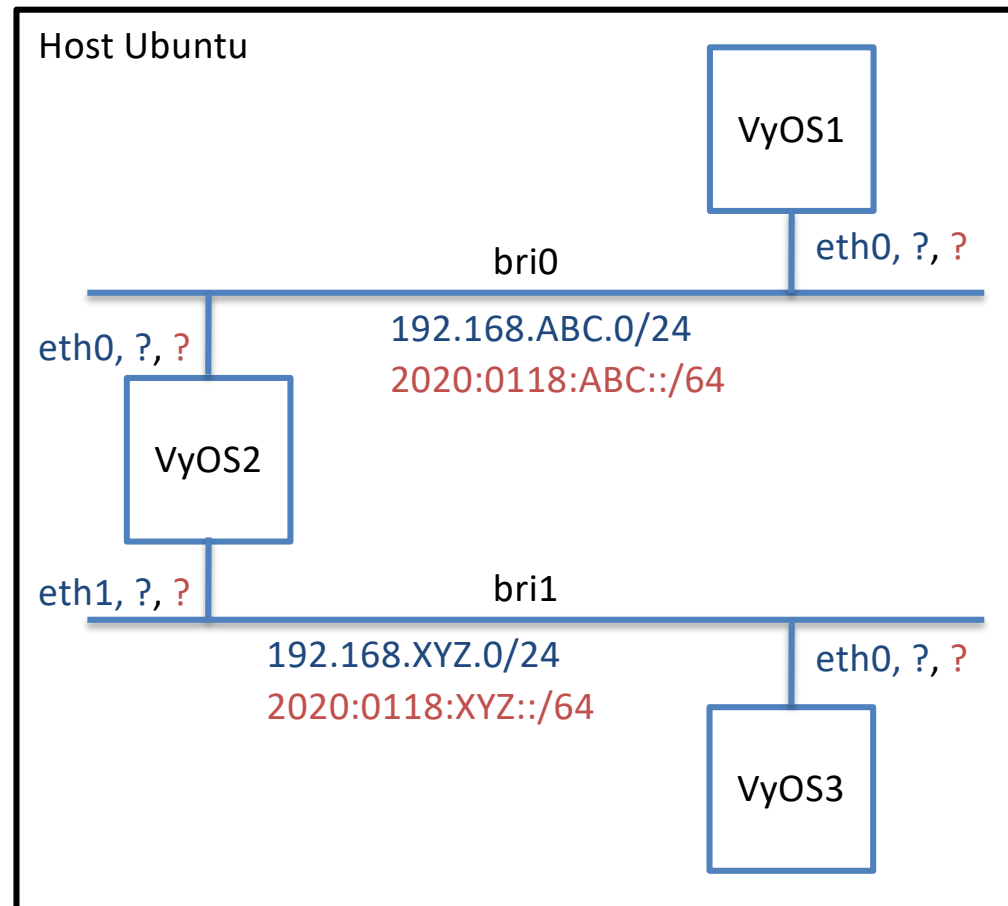
# Configuring IP Address on VyOS

- Example to configure IPv4/v6 addresses on ethX

```
$ configure
# set interfaces ethernet ethX
    address 192.168.101.10/24
# set interfaces ethernet ethX
    address 2013:ABCD:101::10/64

# commit
# save
```

## Question 5: Connecting 3 VyOS, and allow VyOS1 and VyOS3 communicate



# Configuring Static Route on VyOS

- Example to configure IPv4/v6 static route on ethX

```
$ configure
# set protocols static route 192.168.102.0.0/24
                        next-hop 192.168.100.1
# set protocols static route6 2013:ABCD:102::/64
                        next-hop 2013:ABCD:100::1
# commit
# save
```

# Deleting Configurations on VyOS

- Example to delete IPv4 address and static route

```
$ configure
# delete interfaces ethernet ethY address
                                192.168.1.10/24
# delete protocols static route 192.168.100.0/24
                                next-hop 192.168.101.1
# commit
# save
```



Done!!