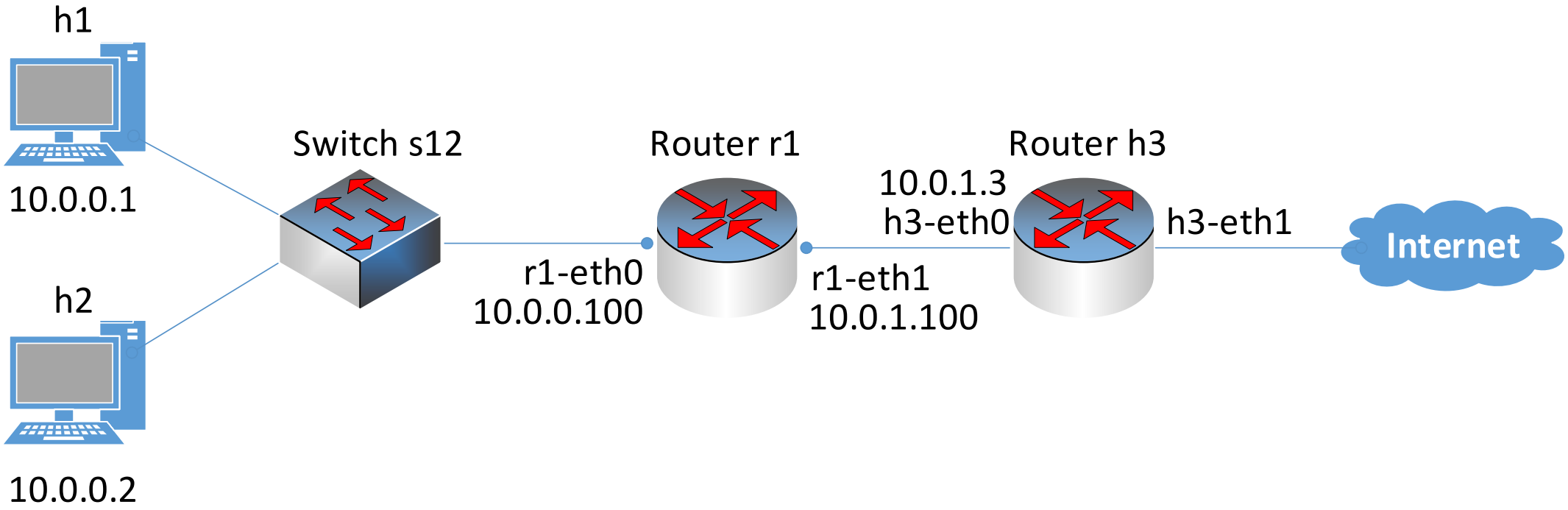
Connecting Virtual Environment to the Real World Using NAT

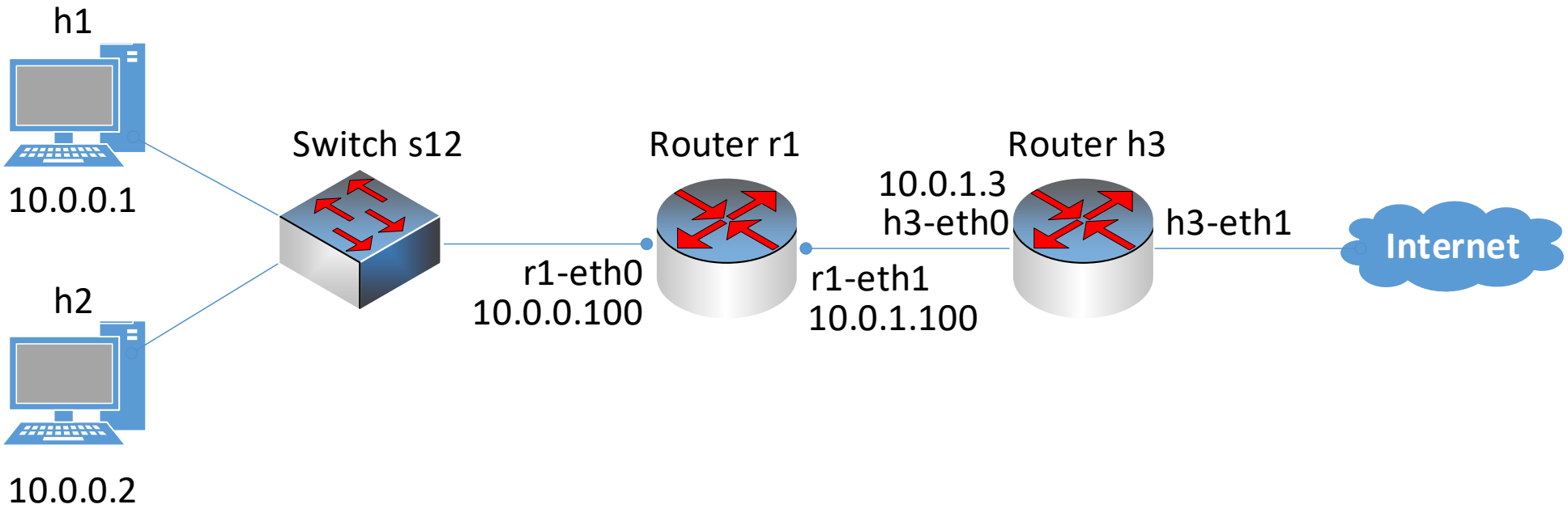
Connect a virtual network to the Internet

- Network configuration with a connection to the real world

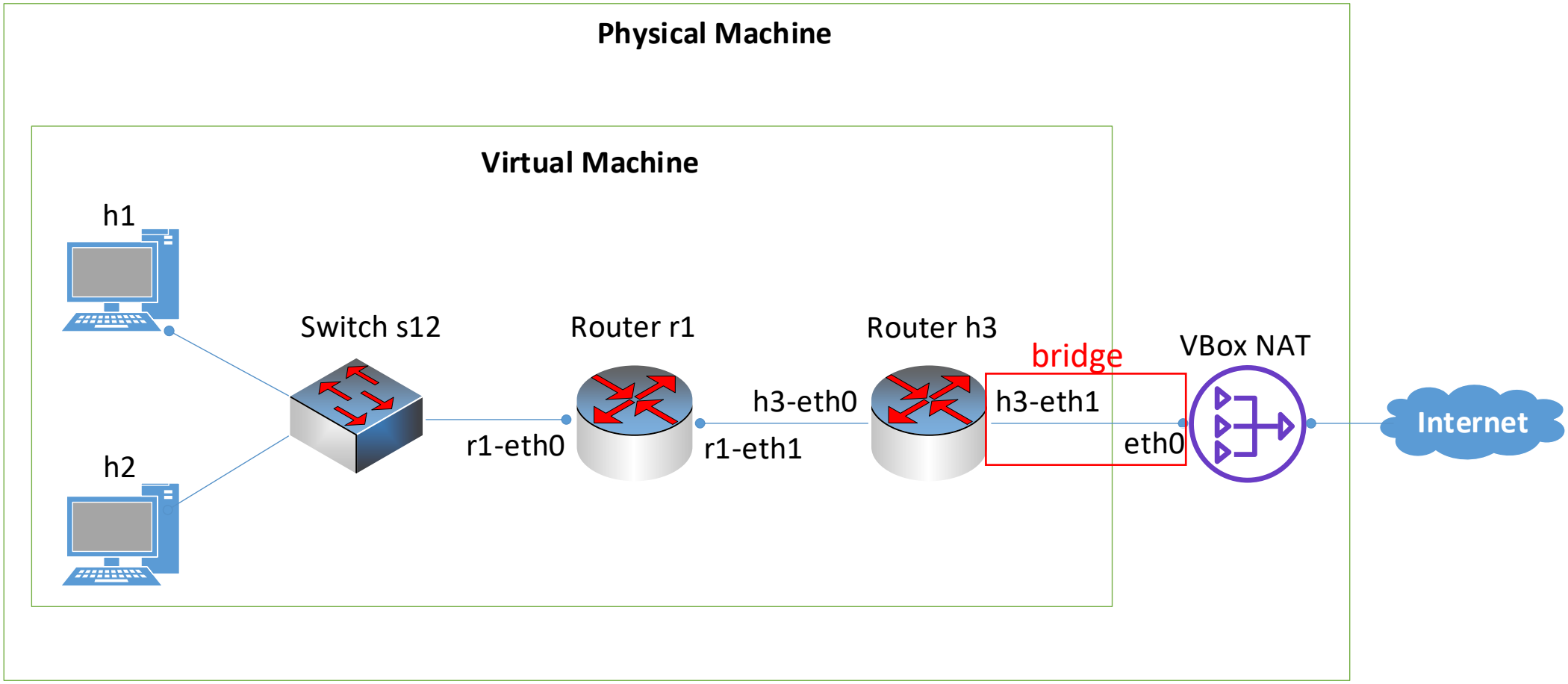


Connect a virtual network to the Internet

- Main steps:
  1. We require a real IP address on h3-eth1 interface of h3.
  2. We need to masquerade the traffic coming from h1 and h2.

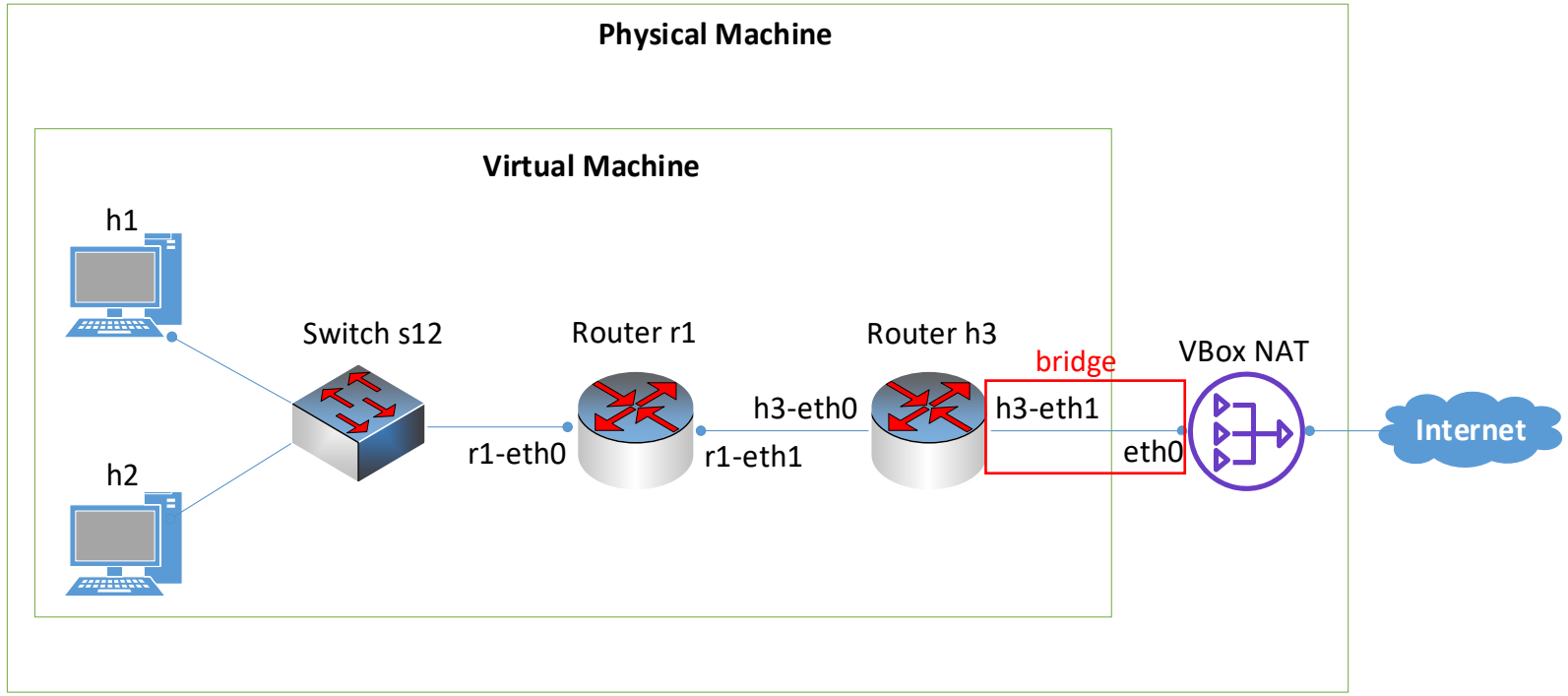


Bridging the network adapter

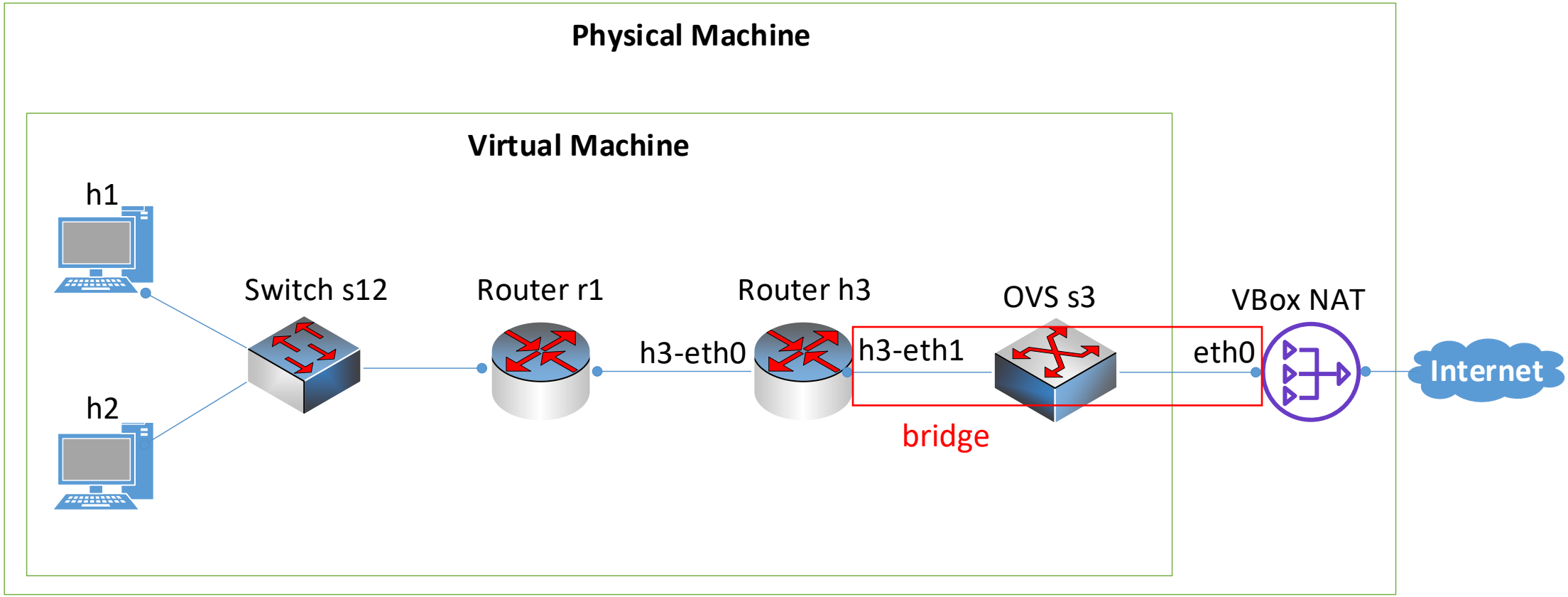


Borrowing an IP Address

1. Create a bridge between a real interface in your host machine, and h3's eth1.
2. Finding and setting up a suitable IP address for h3-eth1.

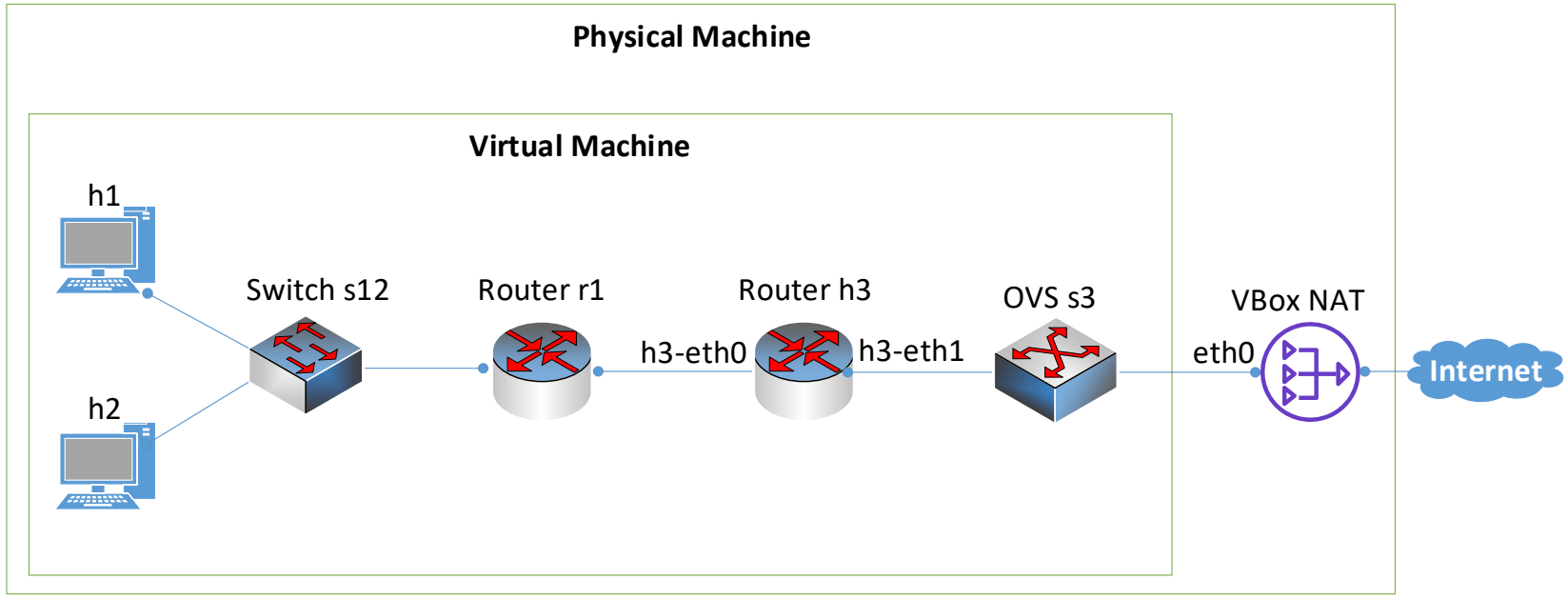


Using Open vSwitch (OVS)



Bridging the network adapter

- $ sudo mn -c
- $ sudo ip addr flush dev eth0
- $ sudo python lab4.py
- mininet> sh ovs-vsctl add-port s3 eth0



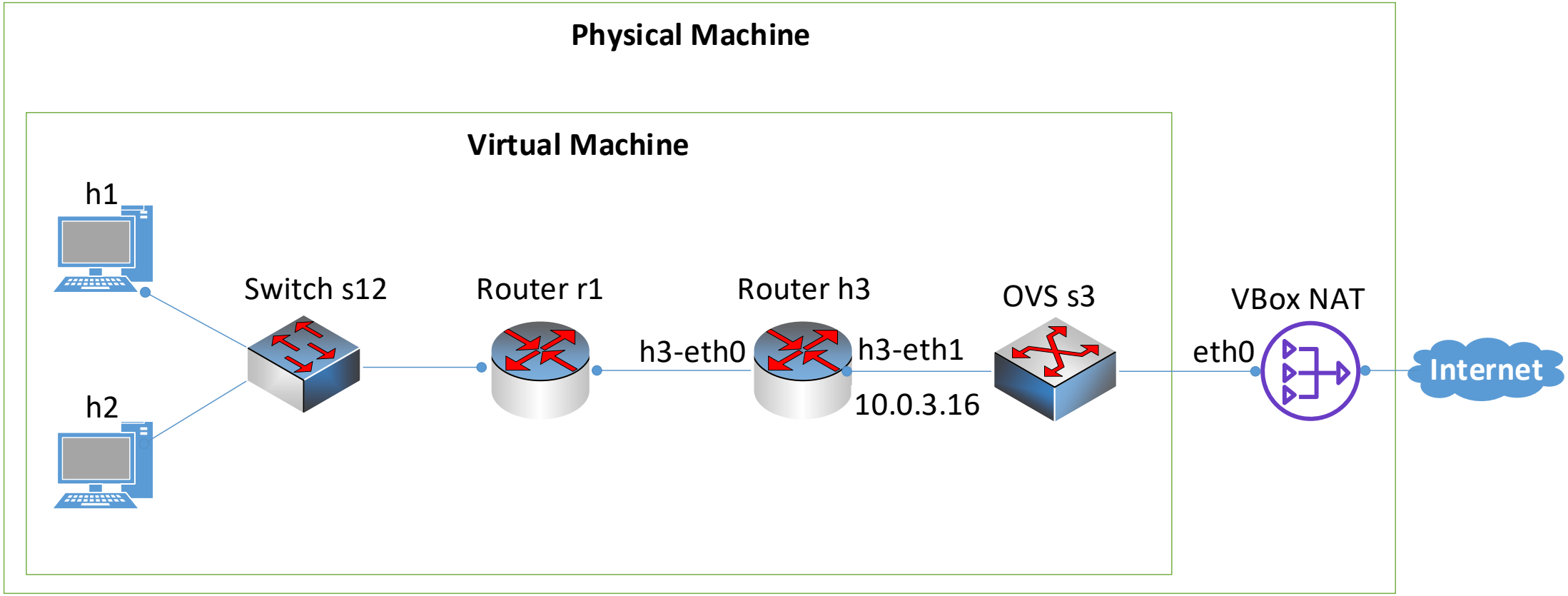
Show the interface

- mininet> sh ovs-vsctl show

```
mininet> sh ovs-vsctl add-port s3 eth0
mininet> sh ovs-vsctl show
e7a21c84-4464-4b53-9d84-7ac031b48c46
    Bridge s3
        Controller "tcp:127.0.0.1:6653"
            is_connected: true
        fail_mode: secure
        Port s3-eth1
            Interface s3-eth1
        Port eth0
            Interface eth0
        Port s3
            Interface s3
                type: internal
    Bridge s12
        Controller "tcp:127.0.0.1:6653"
            is_connected: true
        fail_mode: secure
        Port s12-eth1
            Interface s12-eth1
        Port s12-eth2
            Interface s12-eth2
        Port s12
            Interface s12
                type: internal
        Port s12-eth3
            Interface s12-eth3
    ovs version: "2.13.1"
```

Set an IP address to h3-eth1

- (h3)# dhclient h3-eth1



Check connectivity

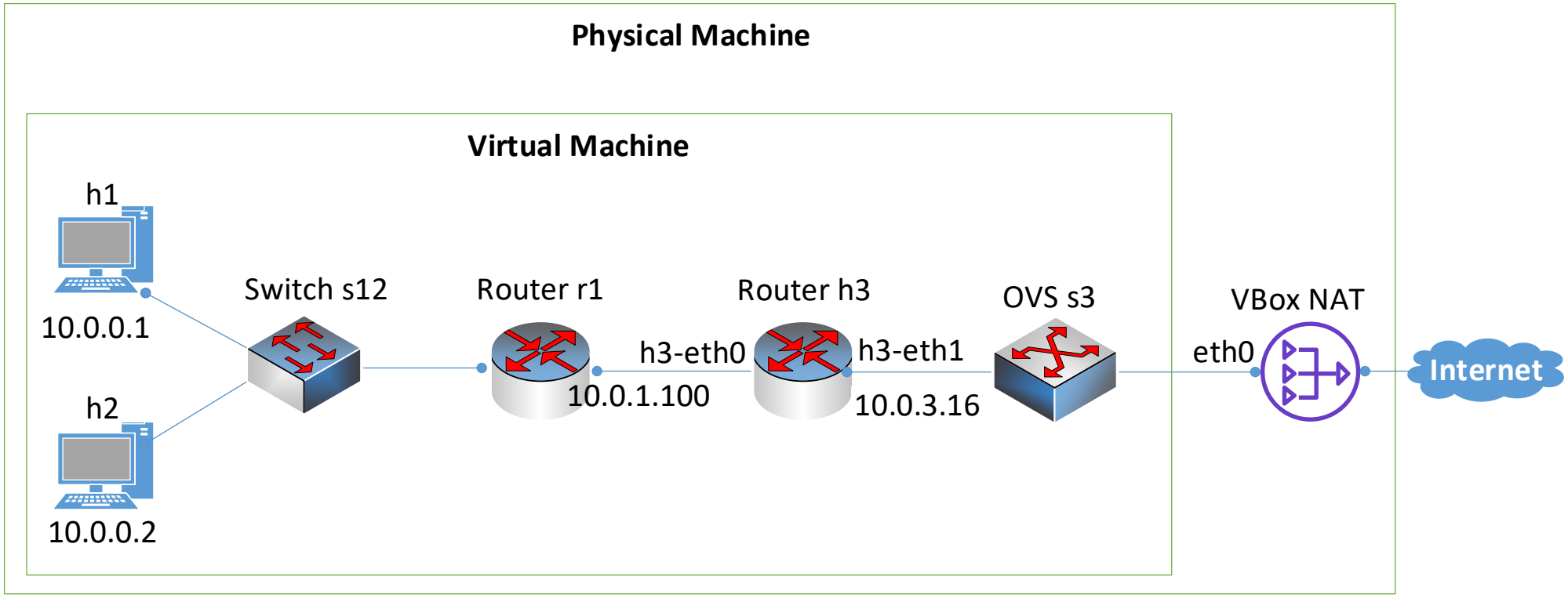
- # ping google.com

```
root@mininet-vm:/home/mininet/Downloads# ping google.com
ping: google.com: Temporary failure in name resolution
```

- This error occurs when the system cannot translate a website name into an IP address. The system cannot communicate with the DNS server and returns the error.

- # ping 8.8.8.8

Masquerade



- (h3)# iptables -t nat -A POSTROUTING -o h3-eth1 -j MASQUERADE

Specify the address of DNS server

- Ping google with its IP address
  - # ping 8.8.8.8

- Configure the DNS server:
  - # sudo su
  - # echo nameserver 8.8.8.8 > /etc/resolv.conf

- Ping google with its domain name:
  - # ping google.com