NETWORK CONFIGURATION

To configure the hostname with hostnamectl

```
[root@localhost p]# hostnamectl set-hostname vivek.gandhi.com.
[root@localhost p]# hostnamectl set-hostname vivek.gandhi.com
```

To set hostname permanent in /etc/hostname

```
[root@localhost p]# vi /etc/hostname
[root@localhost p]# hostnamectl status
   Static hostname: vivek.gandhi.com
         Icon name: computer-vm
           Chassis: vm
        Machine ID: 644b6001247e43f2b7a8730caf44a407
           Boot ID: 31d0b89c6d6d420883d7e618e47af641
    Virtualization: vmware
  Operating System: Red Hat Enterprise Linux 8.2 (Ootpa)
       CPE OS Name: cpe:/o:redhat:enterprise_linux:8.2:GA
            Kernel: Linux 4.18.0-193.el8.x86_64
      Architecture: x86-64
```

restart service for immediate effect

```
[root@localhost p]# systemctl restart systemd-hostnamed
```

After reboot system

To see the current hostname

```
root@vivek ~]# hostnamectl status
  Static hostname: vivek.gandhi.com
        Icon name: computer-vm
          Chassis: vm
       Machine ID: 644b6001247e43f2b7a8730caf44a407
          Boot ID: be8f5319f38e4a0abd3814e7eb6c5055
   Virtualization: vmware
 Operating System: Red Hat Enterprise Linux 8.2 (Ootpa)
      CPE OS Name: cpe:/o:redhat:enterprise_linux:8.2:GA
           Kernel: Linux 4.18.0-193.el8.x86_64
     Architecture: x86-64
root@vivek ~]#
```

Ping check only special name

First both server and client side add entry both ip and hostname or special name

```
┌──(root💀kali)-[~]
└─# vi /etc/hosts
```

```
File  Actions  Edit  View  Help
127.0.0.1       localhost
127.0.1.1       kali
192.168.254.135 vivek.gandhi.com vivek
192.168.254.137 kali pooja

# The following lines are desirable for IPv6 capable hosts
::1     localhost ip6-localhost ip6-loopback
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
```

Both side change compulsory

Output

```
┌──(root💀kali)-[~]
└─# ping vivek
PING vivek.gandhi.com (192.168.254.135) 56(84) bytes of data.
64 bytes from vivek.gandhi.com (192.168.254.135): icmp_seq=1 ttl=64 time=0.992 ms
64 bytes from vivek.gandhi.com (192.168.254.135): icmp_seq=2 ttl=64 time=0.737 ms
64 bytes from vivek.gandhi.com (192.168.254.135): icmp_seq=3 ttl=64 time=0.727 ms
64 bytes from vivek.gandhi.com (192.168.254.135): icmp_seq=4 ttl=64 time=0.568 ms
```

NETWORK CONFIGURATION

DNS Resolving

```
[root@vivek p]# vi /etc/hosts
```

```
127.0.0.1   localhost localhost.localdomain localhost4 localhost4.localdomain4
::1         localhost localhost.localdomain localhost6 localhost6.localdomain6
192.168.10.2 vivek.gandhi.com   vivek
~
```

To verify host name resolution

```
[root@vivek p]# getent hosts vivek.gandhi.com
fe80::20c:29ff:fe01:9046 vivek.gandhi.com
[root@vivek p]# vi /etc/hosts
```

Some Important configuration files/directories of network configurations

```
[root@vivek p]# cd /etc/sysconfig/network-scripts/
```

information about the hostname assigned

```
[root@vivek network-scripts]# cat /etc/sysconfig/network
NETWORKING=yes
HOSTNAME=192.168.10.11
GATEWAY=192.168.10.0
NETWORKING_IPV6=no
IPV6INIT=no
[root@vivek network-scripts]#
```

Check If Kernel Recognized Network Card

```
[root@vivek ~]# dmesg |grep -i ens160
[    3.372841] vmxnet3 0000:03:00.0 ens160: renamed from eth0
[   12.812677] IPv6: ADDRCONF(NETDEV_UP): ens160: link is not ready
[   12.865278] vmxnet3 0000:03:00.0 ens160: intr type 3, mode 0, 3 vectors allocated
[   12.865549] vmxnet3 0000:03:00.0 ens160: NIC Link is Up 10000 Mbps
[   13.585018] vmxnet3 0000:03:00.0 ens160: intr type 3, mode 0, 3 vectors allocated
[   13.585272] vmxnet3 0000:03:00.0 ens160: NIC Link is Up 10000 Mbps
[   13.593956] bond0: (slave ens160): making interface the new active one
[   13.594981] bond0: (slave ens160): Enslaving as an active interface with an up link
[root@vivek ~]#
```

To show current network settings

```
[root@vivek ~]# ip a    or    ip a s    or    ip addr show
```

To check the link status

```
[root@vivek ~]# ip link show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode DEFAULT group def
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
2: ens160: <BROADCAST,MULTICAST,SLAVE,UP,LOWER_UP> mtu 1500 qdisc mq master bond0 state UP
    link/ether 00:0c:29:01:90:46 brd ff:ff:ff:ff:ff:ff
3: ens224: <BROADCAST,MULTICAST,SLAVE,UP,LOWER_UP> mtu 1500 qdisc mq master bond0 state UP
    link/ether 00:0c:29:01:90:46 brd ff:ff:ff:ff:ff:ff
4: bond0: <BROADCAST,MULTICAST,MASTER,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP mode DE
    link/ether 00:0c:29:01:90:46 brd ff:ff:ff:ff:ff:ff
5: virbr0: <NO-CARRIER,BROADCAST,MULTICAST,UP> mtu 1500 qdisc noqueue state DOWN mode DEFA
    link/ether 52:54:00:9c:47:de brd ff:ff:ff:ff:ff:ff
6: virbr0-nic: <BROADCAST,MULTICAST> mtu 1500 qdisc fq_codel master virbr0 state DOWN mode
    link/ether 52:54:00:9c:47:de brd ff:ff:ff:ff:ff:ff
[root@vivek ~]#
```


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NETWORK CONFIGURATION

number of packets

```
[root@vivek ~]# ip -s link
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode DEFAULT group default qlen 1
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    RX: bytes  packets  errors  dropped overrun mcast
    14989      163      0       0       0       0
    TX: bytes  packets  errors  dropped carrier collsns
    14989      163      0       0       0       0
2: ens160: <BROADCAST,MULTICAST,SLAVE,UP,LOWER_UP> mtu 1500 qdisc mq master bond0 state UP mode DEFAU
    link/ether 00:0c:29:01:90:46 brd ff:ff:ff:ff:ff:ff
    RX: bytes  packets  errors  dropped overrun mcast
    0          0        0       0       0       0
    TX: bytes  packets  errors  dropped carrier collsns
    13738      227      0       0       0       0
3: ens224: <BROADCAST,MULTICAST,SLAVE,UP,LOWER_UP> mtu 1500 qdisc mq master bond0 state UP mode DEFAU
    link/ether 00:0c:29:01:90:46 brd ff:ff:ff:ff:ff:ff
    RX: bytes  packets  errors  dropped overrun mcast
    26746      394      0       0       0       0
    TX: bytes  packets  errors  dropped carrier collsns
    0          0        0       0       0       0
4: bond0: <BROADCAST,MULTICAST,MASTER,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP mode DEFAULT group
    link/ether 00:0c:29:01:90:46 brd ff:ff:ff:ff:ff:ff
    RX: bytes  packets  errors  dropped overrun mcast
    26746      394      0       0       0       0
    TX: bytes  packets  errors  dropped carrier collsns
    13738      227      0       0       0       0
```

FULL DETAILS PORTS AND LINK DETAILS

```
[root@vivek ~]# ethtool ens160
Settings for ens160:
        Supported ports: [ TP ]
        Supported link modes:   1000baseT/Full
                                10000baseT/Full
        Supported pause frame use: No
        Supports auto-negotiation: No
        Supported FEC modes: Not reported
        Advertised link modes:  Not reported
        Advertised pause frame use: No
        Advertised auto-negotiation: No
        Advertised FEC modes: Not reported
        Speed: 10000Mb/s
        Duplex: Full
        Port: Twisted Pair
        PHYAD: 0
        Transceiver: internal
        Auto-negotiation: off
        MDI-X: Unknown
        Supports Wake-on: uag
        Wake-on: d
        Link detected: yes
```

```
[root@vivek ~]# mii-tool bond0
bond0: 10 Mbit, half duplex, link ok
[root@vivek ~]#
```

check the running status of NetworkManager service

```
[root@vivek p]# systemctl status NetworkManager
● NetworkManager.service - Network Manager
   Loaded: loaded (/usr/lib/systemd/system/NetworkManager.service; enabled; vendor preset: enabled)
   Active: active (running) since Tue 2022-02-15 00:24:37 EST; 1min 35s ago
     Docs: man:NetworkManager(8)
 Main PID: 1226 (NetworkManager)
    Tasks: 3 (limit: 11160)
   Memory: 4.4M
   CGroup: /system.slice/NetworkManager.service
           └─1226 /usr/sbin/NetworkManager --no-daemon
```


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NETWORK CONFIGURATION

Shows active and inactive connections

```
[root@vivek p]# nmcli con s
NAME    UUID                                  TYPE      DEVICE
bond0   ad33d8b0-1f7b-cab9-9447-ba07f855b143  bond      bond0
virbr0  4eaa1606-3432-48aa-842a-e1e839a32ecd  bridge    virbr0
ens160  96936179-64c0-427e-936c-52b77060eadc  ethernet  ens160
ens224  e4014630-448b-5ad3-4992-f4678202147c  ethernet  ens224
[root@vivek p]#
```

To see all properties of the connection

```
[root@vivek p]# nmcli con s bond0
connection.id:                          bond0
connection.uuid:                        ad33d8b0-1f7b-cab9-9447-ba07f855b143
connection.stable-id:                   --
connection.type:                        bond
connection.interface-name:              bond0
connection.autoconnect:                 yes
connection.autoconnect-priority:        0
connection.autoconnect-retries:         -1 (default)
connection.multi-connect:               0 (default)
connection.auth-retries:                -1
connection.timestamp:                   1644903277
connection.read-only:                   no
```

To show a list of all devices

```
[root@vivek p]# nmcli dev status
DEVICE      TYPE      STATE      CONNECTION
bond0       bond      connected  bond0
virbr0      bridge    connected  virbr0
ens160      ethernet  connected  ens160
ens224      ethernet  connected  ens224
lo          loopback  unmanaged  --
virbr0-nic  tun       unmanaged  --
```

To show settings for a specific device

```
[root@vivek p]# nmcli con s bond0
connection.id:                          bond0
connection.uuid:                        ad33d8b0-1f7b-cab9-9447-ba07f855b143
connection.stable-id:                   --
connection.type:                        bond
connection.interface-name:              bond0
connection.autoconnect:                 yes
connection.autoconnect-priority:        0
connection.autoconnect-retries:         -1 (default)
connection.multi-connect:               0 (default)
connection.auth-retries:                -1
connection.timestamp:                   1644903277
connection.read-only:                   no
connection.permissions:                 --
connection.zone:                        --
connection.master:                      --
connection.slave-type:                  --
connection.autoconnect-slaves:          -1 (default)
```

NETWORK CONFIGURATION

Working on Network Configuration Files

```
[root@vivek p]# cd /etc/sysconfig/network-scripts
[root@vivek network-scripts]# pwd
/etc/sysconfig/network-scripts
[root@vivek network-scripts]# ls
ifcfg-bond0  ifcfg-ens160  ifcfg-ens224
[root@vivek network-scripts]# cat ifcfg-ens160
TYPE=Ethernet
PROXY_METHOD=none
BROWSER_ONLY=no
BOOTPROTO=none
DEFROUTE=yes
IPV4_FAILURE_FATAL=no
IPV6INIT=yes
IPV6_AUTOCONF=yes
IPV6_DEFROUTE=yes
IPV6_FAILURE_FATAL=no
IPV6_ADDR_GEN_MODE=stable-privacy
NAME=ens160
UUID=96936179-64c0-427e-936c-52b77060eadc
DEVICE=ens160
ONBOOT=yes
IPADDR=192.168.10.2
PREFIX=24
IPADDR1=255.255.255.0
PREFIX1=32
GATEWAY=192.168.0.0
MASTER=bond0
SLAVE=yes
```

Basic Network Troubleshooting command

Ping

```
[root@vivek vivek]# ping 192.168.10.2
PING 192.168.10.2 (192.168.10.2) 56(84) bytes of data.
64 bytes from 192.168.10.2: icmp_seq=1 ttl=64 time=0.595 ms
64 bytes from 192.168.10.2: icmp_seq=2 ttl=64 time=0.115 ms
64 bytes from 192.168.10.2: icmp_seq=3 ttl=64 time=0.111 ms
^C
--- 192.168.10.2 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 31ms
rtt min/avg/max/mdev = 0.111/0.273/0.595/0.228 ms
```

telnet

```
[root@vivek network-scripts]# telnet 192.168.10.2 22
Trying 192.168.10.2...
Connected to 192.168.10.2.
Escape character is '^]'.
SSH-2.0-OpenSSH_8.0
Connection closed by foreign host.
```

traceroute

```
[root@vivek vivek]# traceroute 192.168.10.2
traceroute to 192.168.10.2 (192.168.10.2), 30 hops max, 60 byte packets
 1  vivek.gandhi.com (192.168.10.2)  1.005 ms  0.783 ms  0.752 ms
[root@vivek vivek]#
```

NETWORK CONFIGURATION

To check the ARP Table use ip neighbour command

```
[root@vivek vivek]# ip neighbour
192.168.0.0 dev bond0  FAILED
[root@vivek vivek]# arp -a
_gateway (192.168.0.0) at <incomplete> on bond0
[root@vivek vivek]#
```

Validating Routing

```
[root@vivek vivek]# ip route show
default via 192.168.0.0 dev bond0 proto static metric 300
192.168.0.0 dev bond0 proto static scope link metric 300
192.168.10.0/24 dev bond0 proto kernel scope link src 192.168.10.2 metric 300
192.168.122.0/24 dev virbr0 proto kernel scope link src 192.168.122.1 linkdown
```

to Display All Listening Ports on the Local System

```
[root@vivek ~]# ss -it
State       Recv-Q       Send-Q              Local Address:Port              Peer Address:Port
[root@vivek ~]#
```


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NETWORK CONFIGURATION

SCP COMMAND USE

```
┌──(root💀kali)-[~]
└─# scp -v testing 192.168.254.135:/root/123/
Executing: program /usr/bin/ssh host 192.168.254.135, user (unspecified), command scp -v -t /root/123/
OpenSSH_8.7p1 Debian-2, OpenSSL 1.1.1l  24 Aug 2021
debug1: Reading configuration data /etc/ssh/ssh_config
debug1: /etc/ssh/ssh_config line 19: include /etc/ssh/ssh_config.d/*.conf matched no files
debug1: /etc/ssh/ssh_config line 21: Applying options for *
debug1: Connecting to 192.168.254.135 [192.168.254.135] port 22.
debug1: Connection established.
debug1: identity file /root/.ssh/id_rsa type 0
debug1: identity file /root/.ssh/id_rsa-cert type -1
debug1: identity file /root/.ssh/id_dsa type -1
debug1: identity file /root/.ssh/id_dsa-cert type -1
debug1: identity file /root/.ssh/id_ecdsa type -1
debug1: identity file /root/.ssh/id_ecdsa-cert type -1
debug1: identity file /root/.ssh/id_ecdsa_sk type -1
```

RESULT

```
[root@vivek vivek]# pwd
/root/vivek
[root@vivek vivek]# cd ..
[root@vivek ~]# mkdir 123
[root@vivek ~]# ls
123  acl  anaconda-ks.cfg  etc.tar.gz  initial-setup-ks.cfg  sudocopy  vivek
[root@vivek ~]# cd 123
[root@vivek 123]# ls
testing
[root@vivek 123]#
```

-p =provide modification times

-P = specify the specific port to scp

-pC =file transfer faster using

-c = change SCP chipper to encrypt file

-Cl = limiting bandwith usage with scp

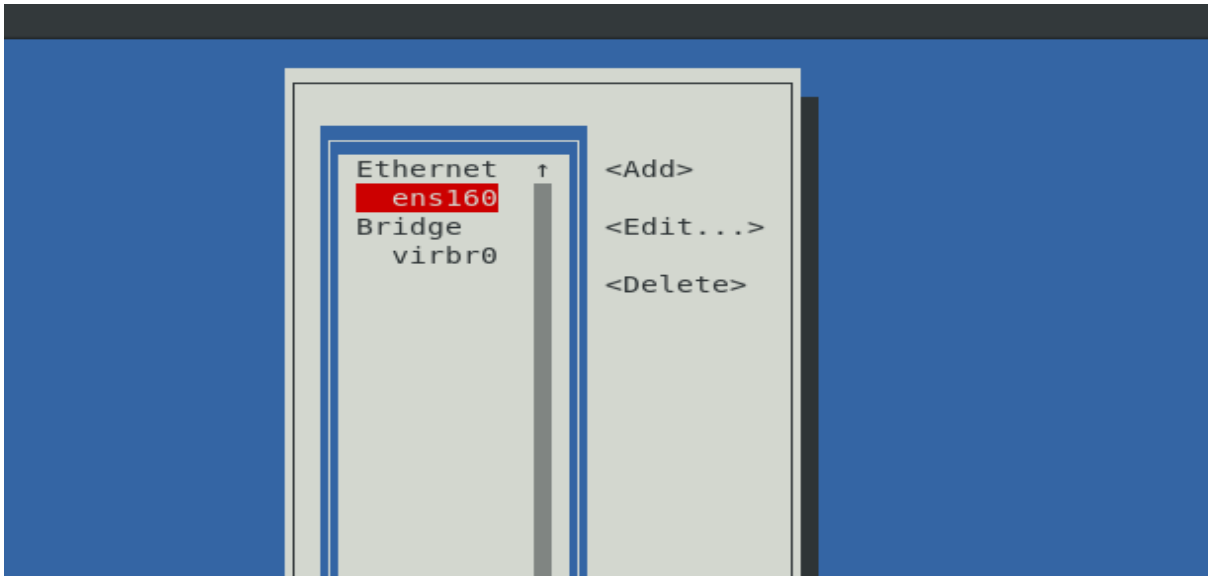
-r = copy files inside directory recursively

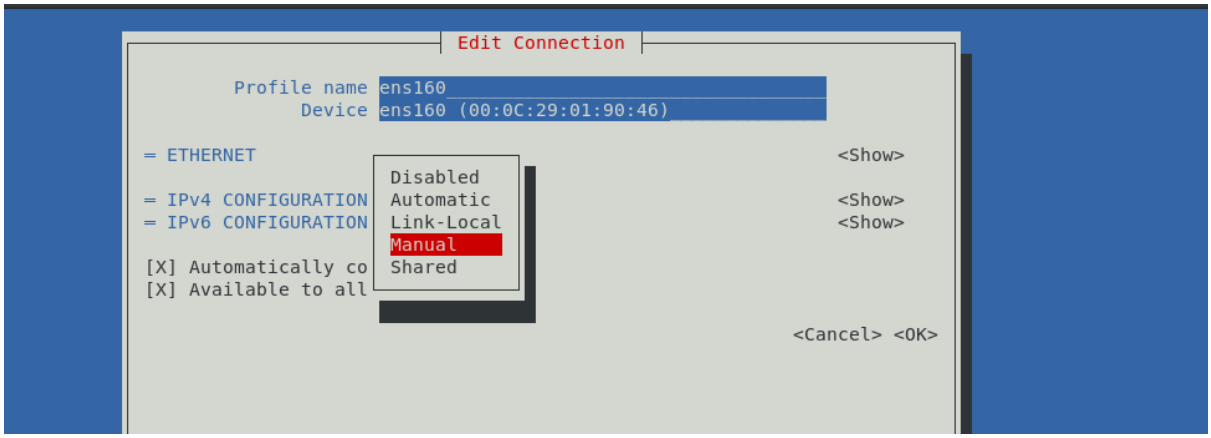
-q = disable process meter and warning / diagnostic message

NETWORK CONFIGURATION

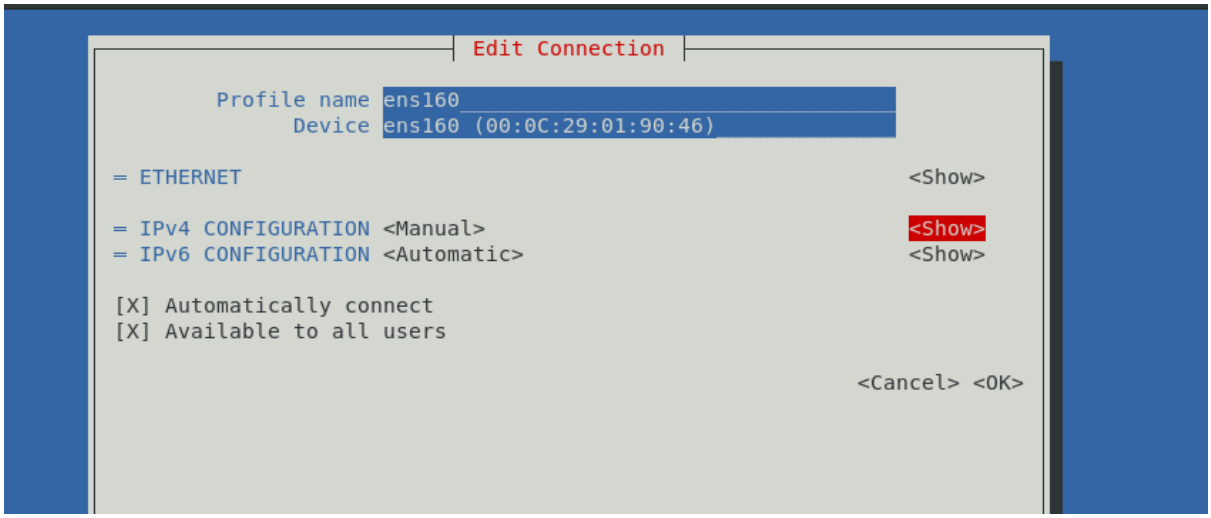
IP ADRESS CHANGE

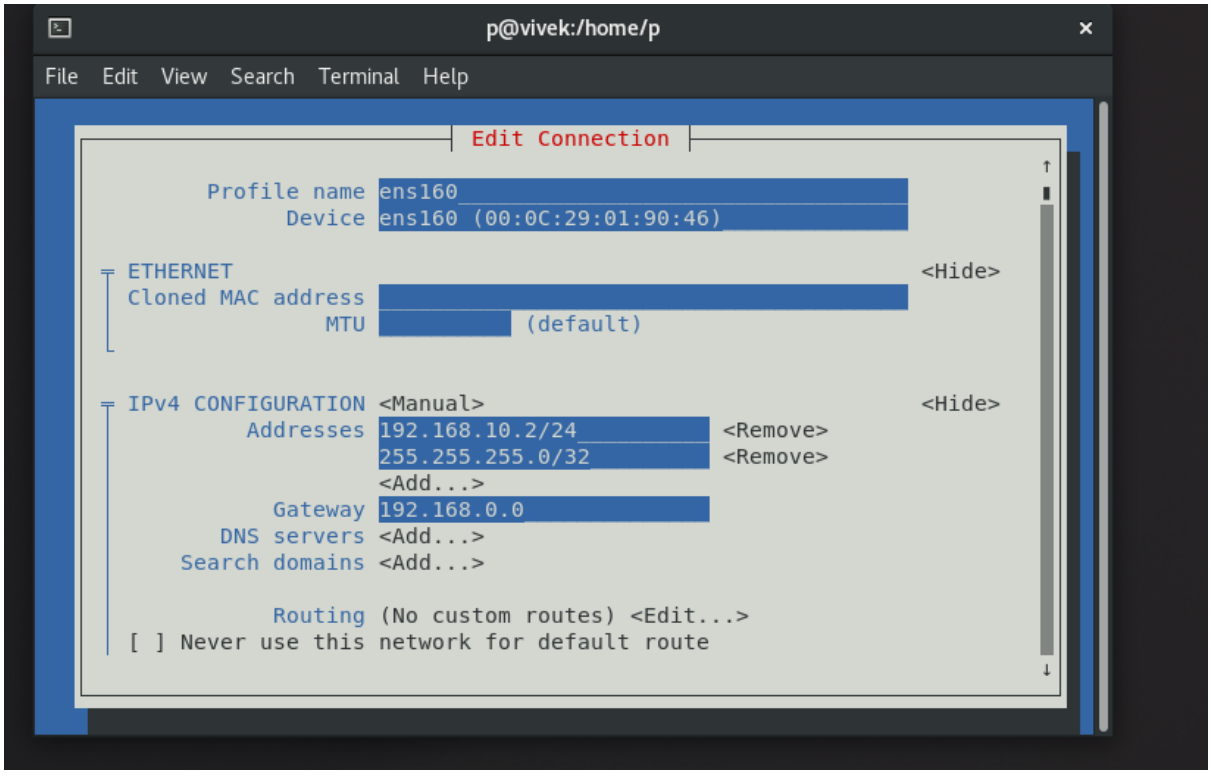
```
[root@localhost p]# nmtui
```





NETWORK CONFIGURATION





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