

1. The systemctl command belongs to _____ daemon management system, and the service command belongs to _____ daemon management system.

Systemd

SysVinit

2. After finishing the Microsoft Windows installation process, and connecting the network adapter to VMnet2 or 'Private to my Mac' (for MacOS users), the VM is obtaining an IP address in the range of 169.254.0.1 through 169.254.255.254. However the DHCP server is turned off, and the network adapter in VMware Workstation/Fusion is not connected to NAT. Why is the Windows system getting an IP address if there is no DHCP server available for it?

The Windows system is assigning itself an IP address through automatic private IP addressing (APIPA).

3. Using the 4th subnet of the 192.168.100.0/27. Configure a DHCP server on your server0 CentOS system with only one Microsoft Windows client.

- Assign the first valid IP to the network adapter connected to your VMnet2 or 'Private to my Mac' on your CentOS server0.
- Assign the 8.8.4.4 as a DNS server for all the DHCP client systems.
- Assign the second valid IP as a gateway for all the DHCP client systems.
- Assign the last valid IP to your Microsoft Windows DHCP client (use the client MAC address to assign the IP).

Submit:

1. A screenshot of the server executing the command ifconfig with the correct IP address

```
[sysadmin@server0 ~]$ ifconfig ens37
ens37: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.100.97 netmask 255.255.255.224 broadcast 192.168.100.127
    inet6 fe80::345d:bb3d:f457:f9c prefixlen 64 scopeid 0x20<link>
    ether 00:0c:29:ac:62:d3 txqueuelen 1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 347 bytes 53342 (52.0 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

[sysadmin@server0 ~]$ _
```

2. A screenshot of the client executing the command route -n with the correct DNS output

```

Select Command Prompt
C:\Users\PhommalyBruceY(MU-St>route print
=====
Interface List
 5...00 0c 29 bc 70 41 .....Intel(R) 82574L Gigabit Network Connection
 7...28 f0 76 6e 9f 6d .....Bluetooth Device (Personal Area Network)
 1.....Software Loopback Interface 1
=====

IPv4 Route Table
=====
Active Routes:
Network Destination        Netmask          Gateway          Interface        Metric
0.0.0.0                    0.0.0.0          192.168.100.98   192.168.100.126   25
127.0.0.0                  255.0.0.0        On-link          127.0.0.1         331
127.0.0.1                  255.255.255.255  On-link          127.0.0.1         331
127.255.255.255            255.255.255.255  On-link          127.0.0.1         331
192.168.100.96              255.255.255.224  On-link          192.168.100.126   281
192.168.100.126             255.255.255.255  On-link          192.168.100.126   281
192.168.100.127             255.255.255.255  On-link          192.168.100.126   281
224.0.0.0                  240.0.0.0        On-link          127.0.0.1         331
224.0.0.0                  240.0.0.0        On-link          192.168.100.126   281
255.255.255.255            255.255.255.255  On-link          127.0.0.1         331
255.255.255.255            255.255.255.255  On-link          192.168.100.126   281
=====
Persistent Routes:
None

IPv6 Route Table
=====
Active Routes:
If Metric Network Destination      Gateway
1 331 ::1/128                      On-link
5 281 fe80::/64                    On-link
5 281 fe80::c4c8:c8e8:3abe:f959/128 On-link
1 331 ff00::/8                      On-link
5 281 ff00::/8                      On-link
=====
Persistent Routes:
None

C:\Users\PhommalyBruceY(MU-St>

```

3. A screenshot of the client executing the command `cat /etc/resolv.conf` with the correct DNS output

```
Command Prompt
=====
Persistent Routes:
None

C:\Users\PhommalyBruceY(MU-St>ipconfig /all

Windows IP Configuration

    Host Name . . . . . : DESKTOP-U0N589H
    Primary Dns Suffix . . . . . :
    Node Type . . . . . : Hybrid
    IP Routing Enabled. . . . . : No
    WINS Proxy Enabled. . . . . : No
    DNS Suffix Search List. . . . . : example.org

Ethernet adapter Ethernet0:

    Connection-specific DNS Suffix  . : example.org
    Description . . . . . : Intel(R) 82574L Gigabit Network Connection
    Physical Address. . . . . : 00-0C-29-BC-70-41
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . : Yes
    Link-local IPv6 Address . . . . . : fe80::c4c8:c8e8:3abe:f959%5(Preferred)
    IPv4 Address. . . . . : 192.168.100.126(Preferred)
    Subnet Mask . . . . . : 255.255.255.224
    Lease Obtained. . . . . : Saturday, February 23, 2019 3:44:17 PM
    Lease Expires . . . . . : Sunday, February 24, 2019 3:44:16 PM
    Default Gateway . . . . . : 192.168.100.98
    DHCP Server . . . . . : 192.168.100.97
    DHCPv6 IAID . . . . . : 83889193
    DHCPv6 Client DUID. . . . . : 00-01-00-01-24-03-90-B5-00-0C-29-BC-70-41
    DNS Servers . . . . . : 8.8.4.4
    NetBIOS over Tcpip. . . . . : Enabled

Ethernet adapter Bluetooth Network Connection:

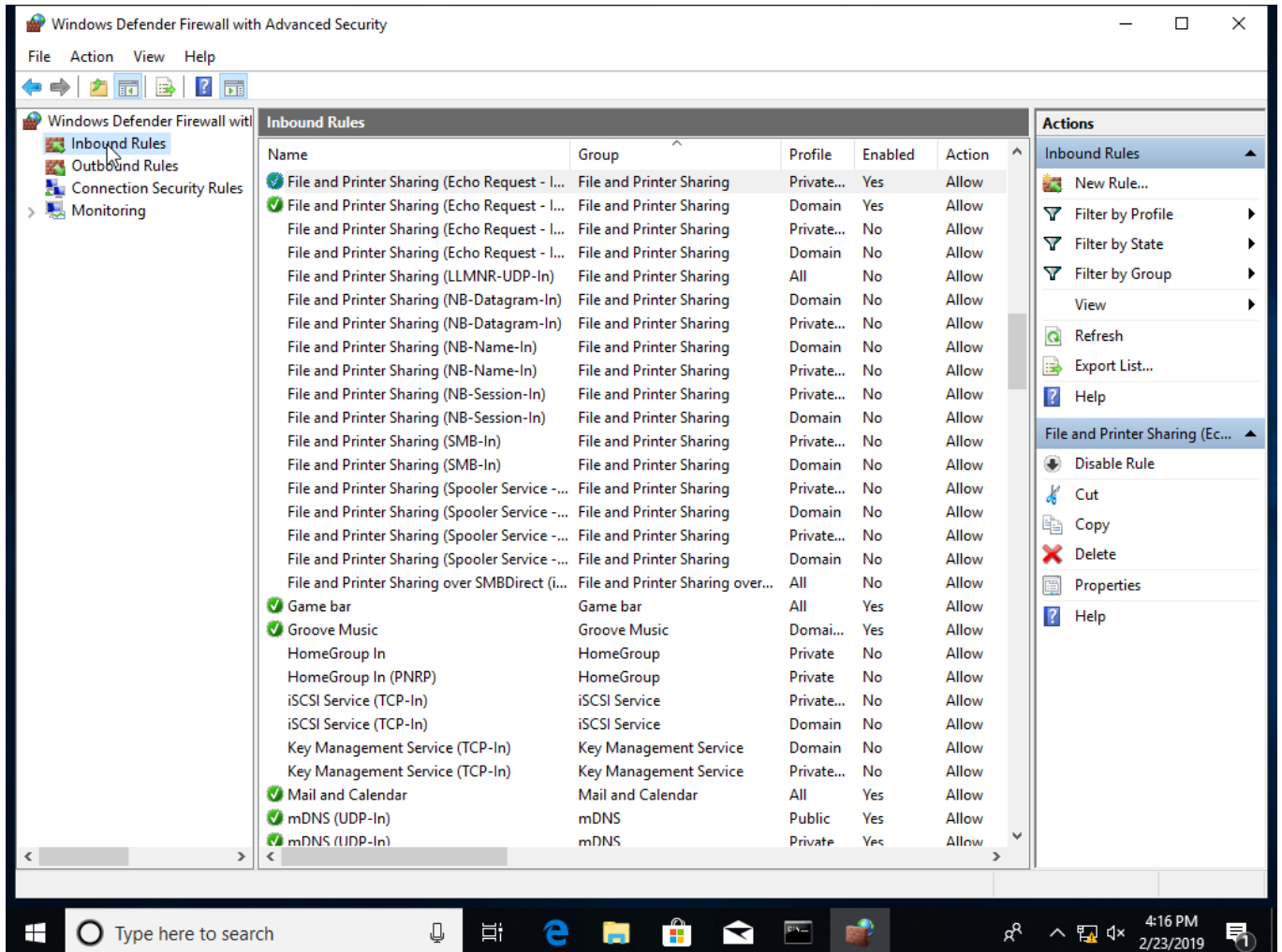
    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :
    Description . . . . . : Bluetooth Device (Personal Area Network)
    Physical Address. . . . . : 28-F0-76-6E-9F-6D
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . : Yes

C:\Users\PhommalyBruceY(MU-St>
```

4. A screenshot of the server executing showing the content of /var/log/messages with the correct DHCP communication process from the client (i.e. DHCP messages type: DHCPDiscover, DHCPOffer, DHCPRequest, DHCPACK).

```
[sysadmin@server0 ~]$ sudo tail -f /var/log/messages
Feb 23 15:57:21 server0 dhcpd: Listening on LPF/ens37/00:0c:29:ac:62:d3/192.168.100.96/27
Feb 23 15:57:21 server0 dhcpd: Sending on LPF/ens37/00:0c:29:ac:62:d3/192.168.100.96/27
Feb 23 15:57:21 server0 dhcpd: Listening on LPF/ens33/00:0c:29:ac:62:c9/192.168.100.96/27
Feb 23 15:57:21 server0 dhcpd: Sending on LPF/ens33/00:0c:29:ac:62:c9/192.168.100.96/27
Feb 23 15:57:21 server0 dhcpd: Sending on Socket/fallback/fallback-net
Feb 23 15:57:21 server0 systemd: Started DHCPv4 Server Daemon.
Feb 23 16:01:01 server0 systemd: Started Session 3 of user root.
Feb 23 16:06:47 server0 dhcpd: DHCPREQUEST for 192.168.100.126 from 00:0c:29:bc:70:41 via ens37
Feb 23 16:06:47 server0 dhcpd: DHCPACK on 192.168.100.126 to 00:0c:29:bc:70:41 via ens37
Feb 23 16:07:11 server0 dhcpd: DHCPRELEASE of 192.168.100.126 from 00:0c:29:bc:70:41 via ens37 (not found)
Feb 23 16:07:29 server0 dhcpd: DHCPDISCOVER from 00:0c:29:bc:70:41 via ens37
Feb 23 16:07:29 server0 dhcpd: DHCPOFFER on 192.168.100.126 to 00:0c:29:bc:70:41 via ens37
Feb 23 16:07:29 server0 dhcpd: DHCPREQUEST for 192.168.100.126 (192.168.100.97) from 00:0c:29:bc:70:41 via ens37
Feb 23 16:07:29 server0 dhcpd: DHCPACK on 192.168.100.126 to 00:0c:29:bc:70:41 via ens37
```

4. Once we finalize configuring the DHCP server on CentOS, the Windows system gets an IP address from there. The Windows system can ping to the DHCP server successfully. However, the DHCP server cannot ping to the windows VM. Inquire about the reason or reasons why this communication is not possible. Provide an explanation and the steps you follow on your Windows VM to solve the problem. Include a screenshot.

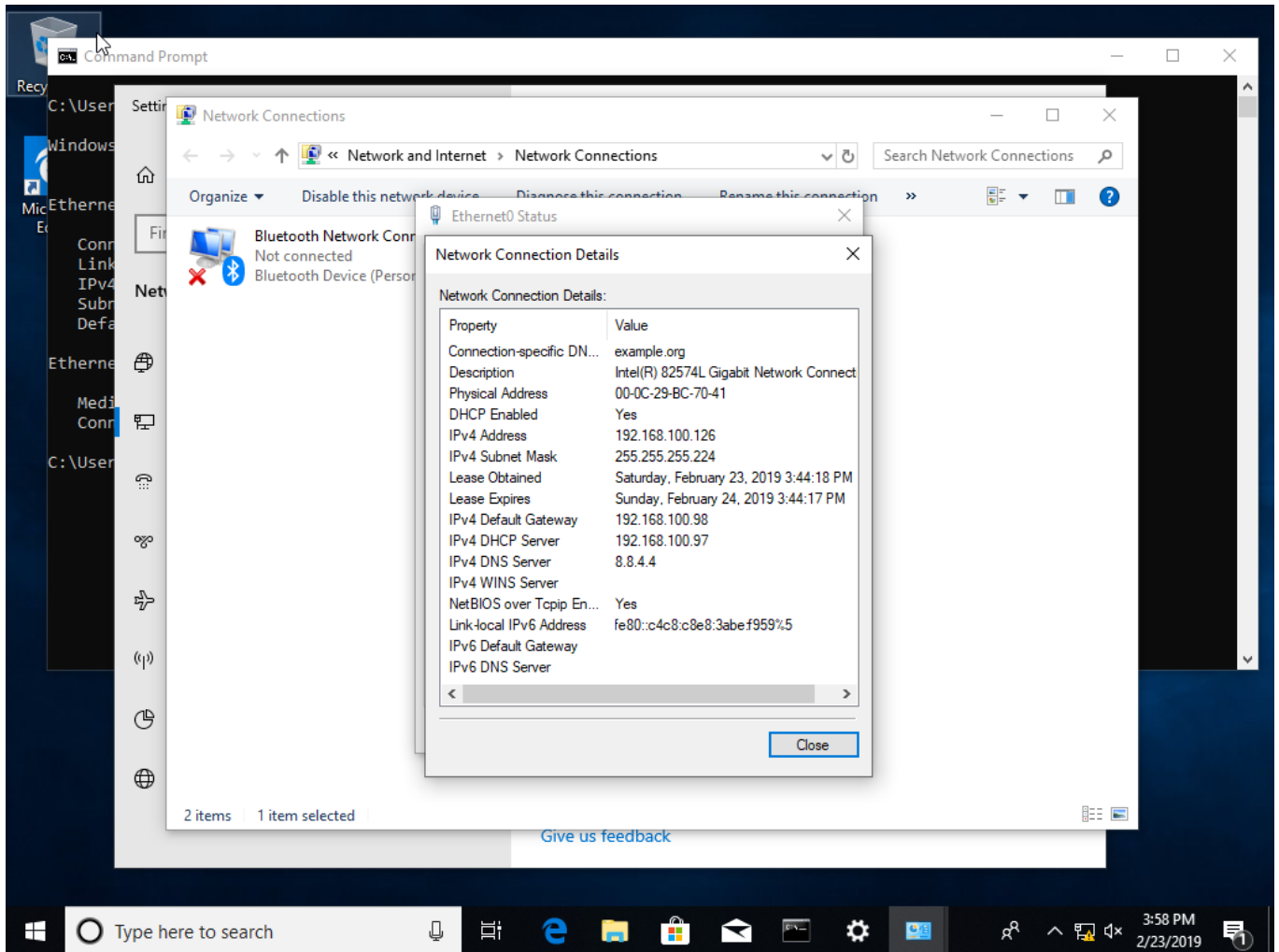


```
[sysadmin@server0 ~]$ ping -c 4 192.168.100.126
PING 192.168.100.126 (192.168.100.126) 56(84) bytes of data.
64 bytes from 192.168.100.126: icmp_seq=1 ttl=128 time=0.357 ms
64 bytes from 192.168.100.126: icmp_seq=2 ttl=128 time=0.364 ms
64 bytes from 192.168.100.126: icmp_seq=3 ttl=128 time=0.408 ms
64 bytes from 192.168.100.126: icmp_seq=4 ttl=128 time=0.397 ms

--- 192.168.100.126 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3000ms
rtt min/avg/max/mdev = 0.357/0.381/0.408/0.029 ms
[sysadmin@server0 ~]$
```

By default, ping requests are blocked by the firewall. So, search and open the windows firewall, then click advanced settings and then inbound rules on the left, find the rule File and Printer Sharing (Echo Request – ICMPv4-In) and enable the rule.

5. Our Windows VM obtained network configuration from CentOS DHCP server. How can we obtain information from Windows VM about the CentOS DHCP server IP address? Include a screenshot.



By navigating to the network configuration, then right-clicking on the network interface card, and then clicking status and finally details.

6. How can we guarantee that after rebooting our CentOS server0 with the DHCP service installed on it, the DHCP service will continue enabled and working? Show the command to be used. Tip: Service commands on 'SysVinit vs Systemd' table.

```
sudo systemctl enable dhcpd.service
```