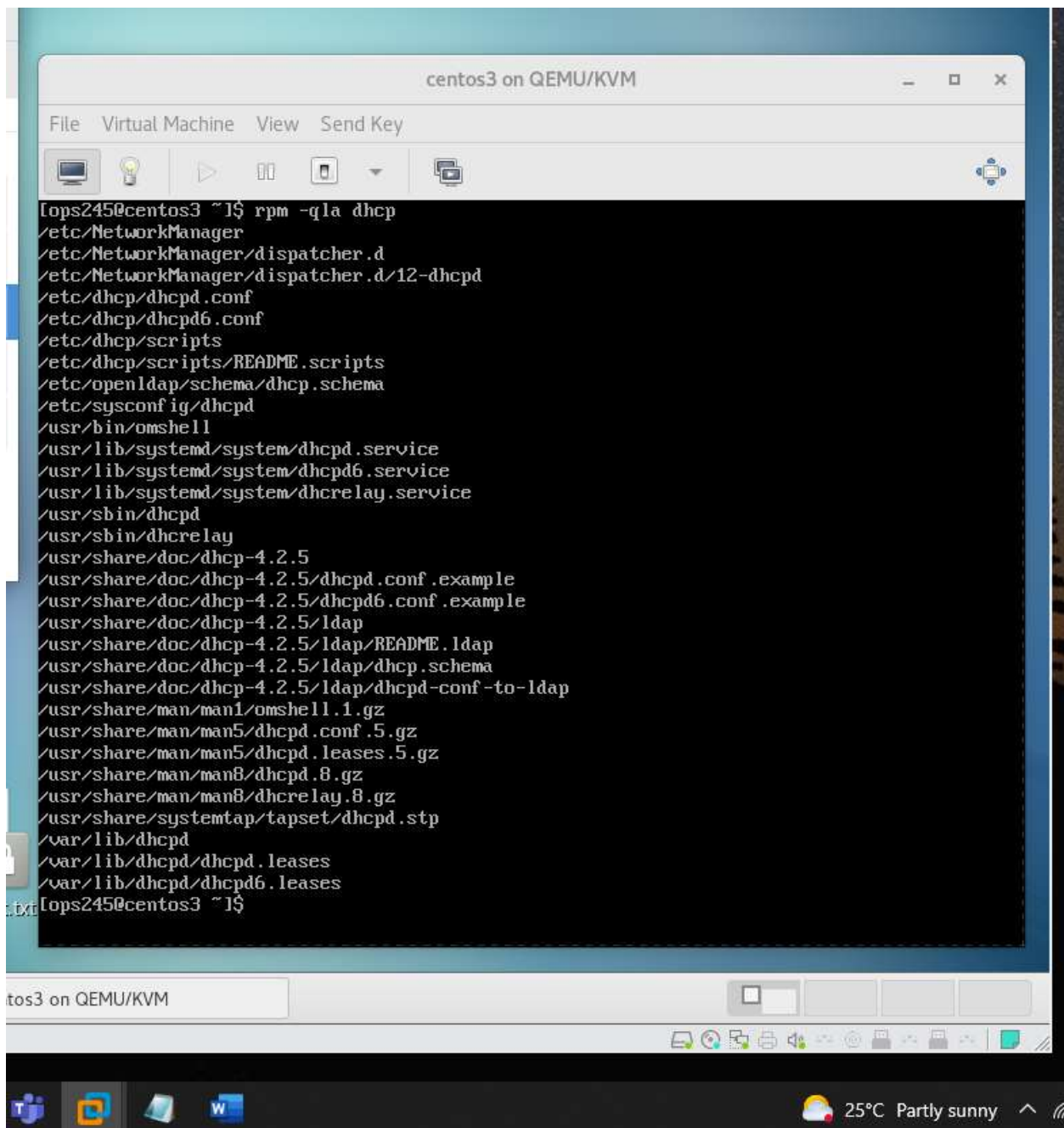
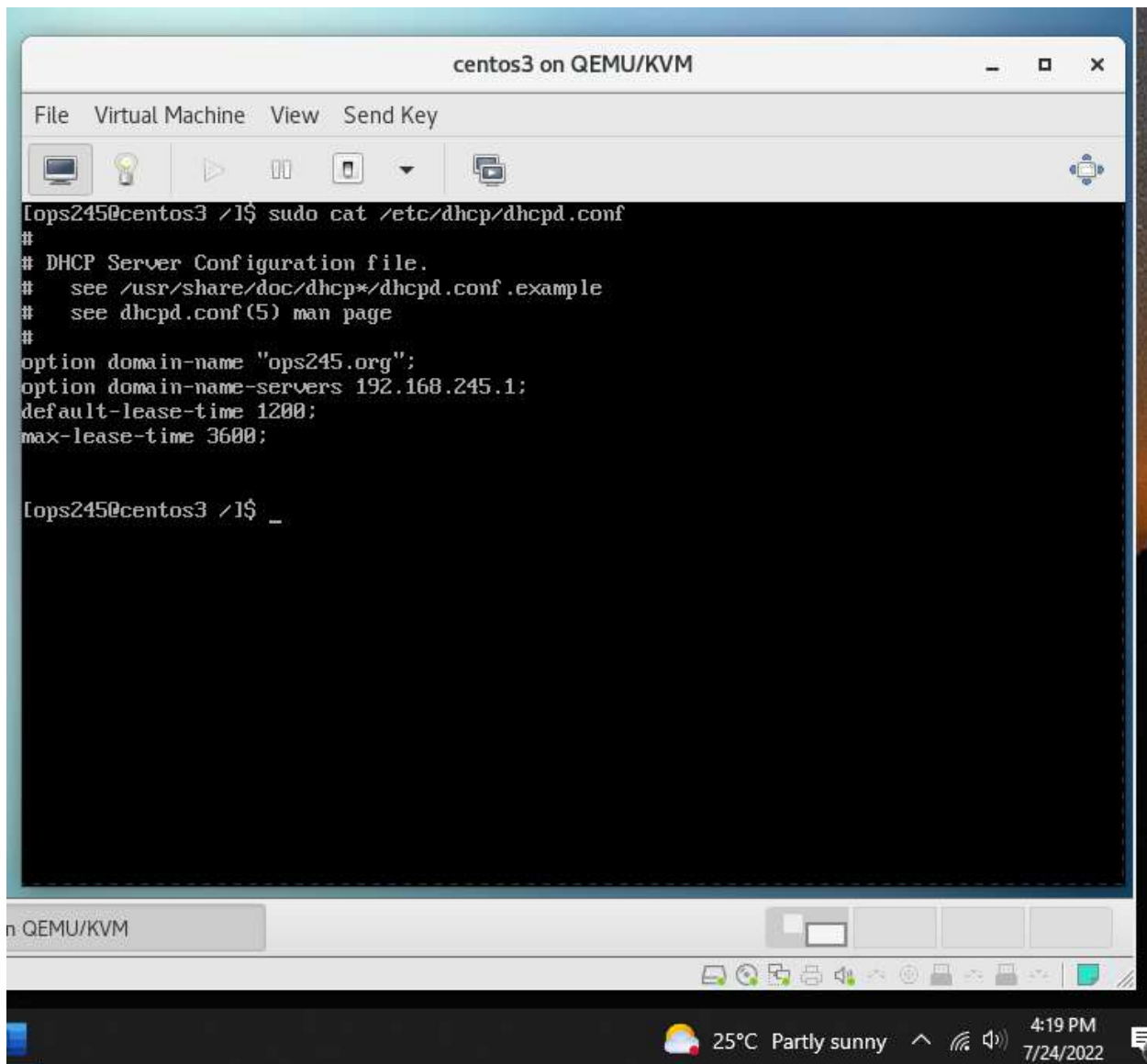


Investigation 1:



```
centos3 on QEMU/KVM
File Virtual Machine View Send Key
lps245@centos3 ~1$ rpm -qla dhcp
/etc/NetworkManager
/etc/NetworkManager/dispatcher.d
/etc/NetworkManager/dispatcher.d/12-dhcpd
/etc/dhcp/dhcpd.conf
/etc/dhcp/dhcpd6.conf
/etc/dhcp/scripts
/etc/dhcp/scripts/README.scripts
/etc/openldap/schema/dhcp.schema
/etc/sysconfig/dhcpd
/usr/bin/omshell
/usr/lib/systemd/system/dhcpd.service
/usr/lib/systemd/system/dhcpd6.service
/usr/lib/systemd/system/dhcrelay.service
/usr/sbin/dhcpd
/usr/sbin/dhcrelay
/usr/share/doc/dhcp-4.2.5
/usr/share/doc/dhcp-4.2.5/dhcpd.conf.example
/usr/share/doc/dhcp-4.2.5/dhcpd6.conf.example
/usr/share/doc/dhcp-4.2.5/ldap
/usr/share/doc/dhcp-4.2.5/ldap/README.ldap
/usr/share/doc/dhcp-4.2.5/ldap/dhcp.schema
/usr/share/doc/dhcp-4.2.5/ldap/dhcpd-conf-to-ldap
/usr/share/man/man1/omshell.1.gz
/usr/share/man/man5/dhcpd.conf.5.gz
/usr/share/man/man5/dhcpd.leases.5.gz
/usr/share/man/man8/dhcpd.8.gz
/usr/share/man/man8/dhcrelay.8.gz
/usr/share/systemtap/tapset/dhcpd.stp
/var/lib/dhcpd
/var/lib/dhcpd/dhcpd.leases
/var/lib/dhcpd/dhcpd6.leases
lps245@centos3 ~1$
```

Part 2: added new lines in dhcpd.conf file



```
centos3 on QEMU/KVM
File Virtual Machine View Send Key
[ops245@centos3 ~]$ sudo cat /etc/dhcp/dhcpd.conf
#
# DHCP Server Configuration file.
#   see /usr/share/doc/dhcp*/dhcpd.conf.example
#   see dhcpd.conf(5) man page
#
option domain-name "ops245.org";
option domain-name-servers 192.168.245.1;
default-lease-time 1200;
max-lease-time 3600;

[ops245@centos3 ~]$ _
```

Part 3:

```
centos3 on QEMU/KVM
File Virtual Machine View Send Key
[ops245@centos3 /1]$ sudo cat /etc/dhcp/dhcpd.conf
[sudo] password for ops245:
Sorry, try again.
[sudo] password for ops245:
#
# DHCP Server Configuration file.
#   see /usr/share/doc/dhcp*/dhcpd.conf.example
#   see dhcpd.conf(5) man page
#
option domain-name "ops245.org";
option domain-name-servers 192.168.245.1;
default-lease-time 1200;
max-lease-time 3600;

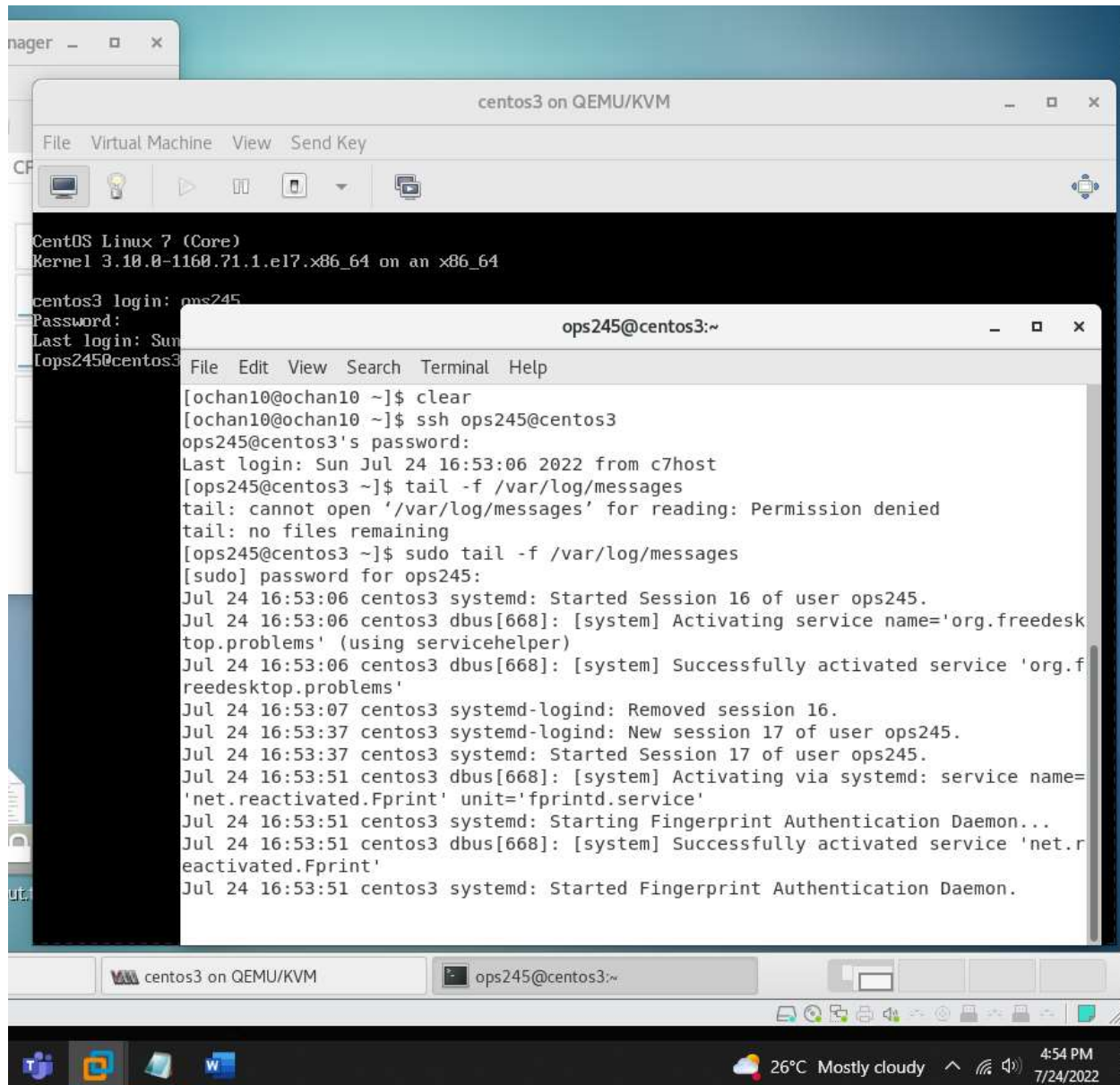
subnet 192.168.245.0 netmask 255.255.255.0 {
  range 192.168.245.51 192.168.245.60;
  router 192.168.245.1
}

[ops245@centos3 /1]$ _
```

QEMU/KVM

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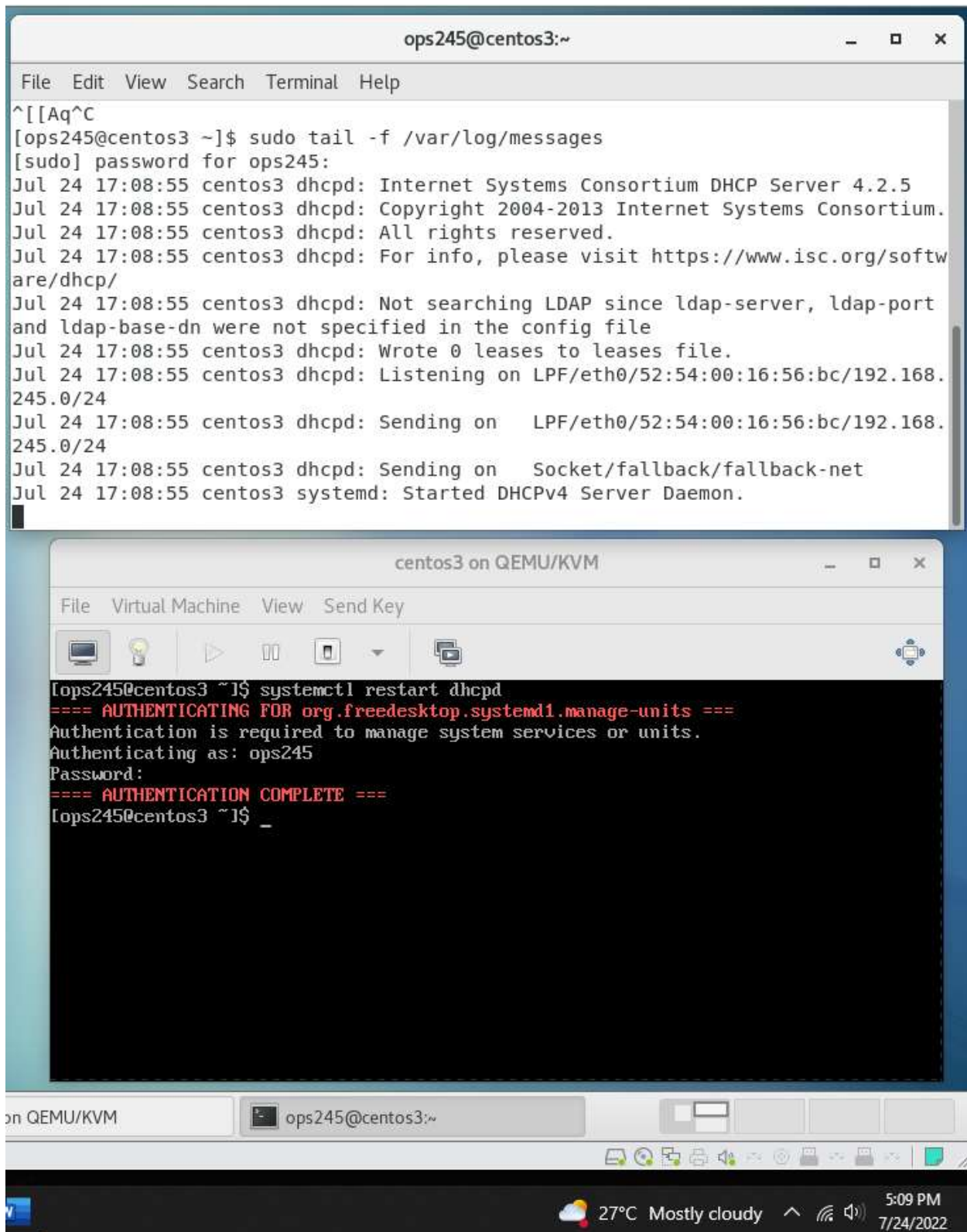
Ssh from c7host to centos3:



```
CentOS Linux 7 (Core)
Kernel 3.10.0-1160.71.1.el7.x86_64 on an x86_64

centos3 login: ops245
Password:
Last login: Sun Jul 24 16:53:06 2022 from c7host
ops245@centos3 ~$ clear
[ochan10@ochan10 ~]$ ssh ops245@centos3
ops245@centos3's password:
Last login: Sun Jul 24 16:53:06 2022 from c7host
[ops245@centos3 ~]$ tail -f /var/log/messages
tail: cannot open '/var/log/messages' for reading: Permission denied
tail: no files remaining
[ops245@centos3 ~]$ sudo tail -f /var/log/messages
[sudo] password for ops245:
Jul 24 16:53:06 centos3 systemd: Started Session 16 of user ops245.
Jul 24 16:53:06 centos3 dbus[668]: [system] Activating service name='org.freedesktop.problems' (using servicehelper)
Jul 24 16:53:06 centos3 dbus[668]: [system] Successfully activated service 'org.freedesktop.problems'
Jul 24 16:53:07 centos3 systemd-logind: Removed session 16.
Jul 24 16:53:37 centos3 systemd-logind: New session 17 of user ops245.
Jul 24 16:53:37 centos3 systemd: Started Session 17 of user ops245.
Jul 24 16:53:51 centos3 dbus[668]: [system] Activating via systemd: service name='net.reactivated.Fprint' unit='fprintd.service'
Jul 24 16:53:51 centos3 systemd: Starting Fingerprint Authentication Daemon...
Jul 24 16:53:51 centos3 dbus[668]: [system] Successfully activated service 'net.reactivated.Fprint'
Jul 24 16:53:51 centos3 systemd: Started Fingerprint Authentication Daemon.
```

Restart dhcpd after fixing the issue with the filesu



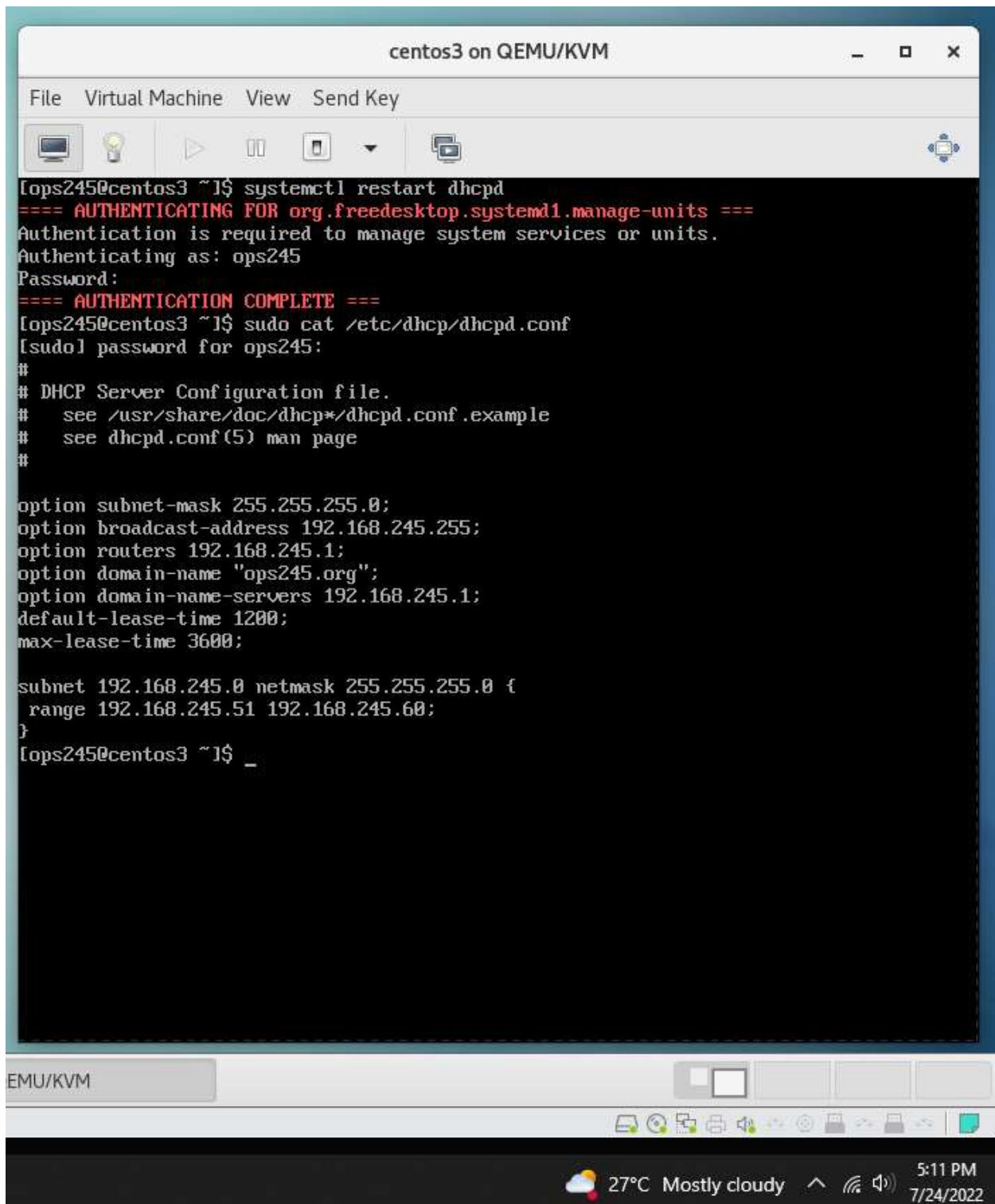
The screenshot shows a terminal window titled 'ops245@centos3:~' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal displays the output of 'sudo tail -f /var/log/messages', showing logs for the DHCP server (dhcpd) and system daemon (systemd). The logs indicate the server is listening on the network interface and sending packets. Below this, a second terminal window titled 'centos3 on QEMU/KVM' is shown, displaying the command 'systemctl restart dhcpd' and its output, which includes authentication prompts and a successful restart message.

```
ops245@centos3:~  
File Edit View Search Terminal Help  
^[[Aq^C  
[ops245@centos3 ~]$ sudo tail -f /var/log/messages  
[sudo] password for ops245:  
Jul 24 17:08:55 centos3 dhcpd: Internet Systems Consortium DHCP Server 4.2.5  
Jul 24 17:08:55 centos3 dhcpd: Copyright 2004-2013 Internet Systems Consortium.  
Jul 24 17:08:55 centos3 dhcpd: All rights reserved.  
Jul 24 17:08:55 centos3 dhcpd: For info, please visit https://www.isc.org/software/dhcp/  
Jul 24 17:08:55 centos3 dhcpd: Not searching LDAP since ldap-server, ldap-port  
and ldap-base-dn were not specified in the config file  
Jul 24 17:08:55 centos3 dhcpd: Wrote 0 leases to leases file.  
Jul 24 17:08:55 centos3 dhcpd: Listening on LPF/eth0/52:54:00:16:56:bc/192.168.  
245.0/24  
Jul 24 17:08:55 centos3 dhcpd: Sending on LPF/eth0/52:54:00:16:56:bc/192.168.  
245.0/24  
Jul 24 17:08:55 centos3 dhcpd: Sending on Socket/fallback/fallback-net  
Jul 24 17:08:55 centos3 systemd: Started DHCPv4 Server Daemon.  
  
centos3 on QEMU/KVM  
File Virtual Machine View Send Key  
[ops245@centos3 ~]$ systemctl restart dhcpd  
==== AUTHENTICATING FOR org.freedesktop.systemd1.manage-units ====  
Authentication is required to manage system services or units.  
Authenticating as: ops245  
Password:  
==== AUTHENTICATION COMPLETE ====  
[ops245@centos3 ~]$ _
```

on QEMU/KVM ops245@centos3:~

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Wording dhcpd.conf file



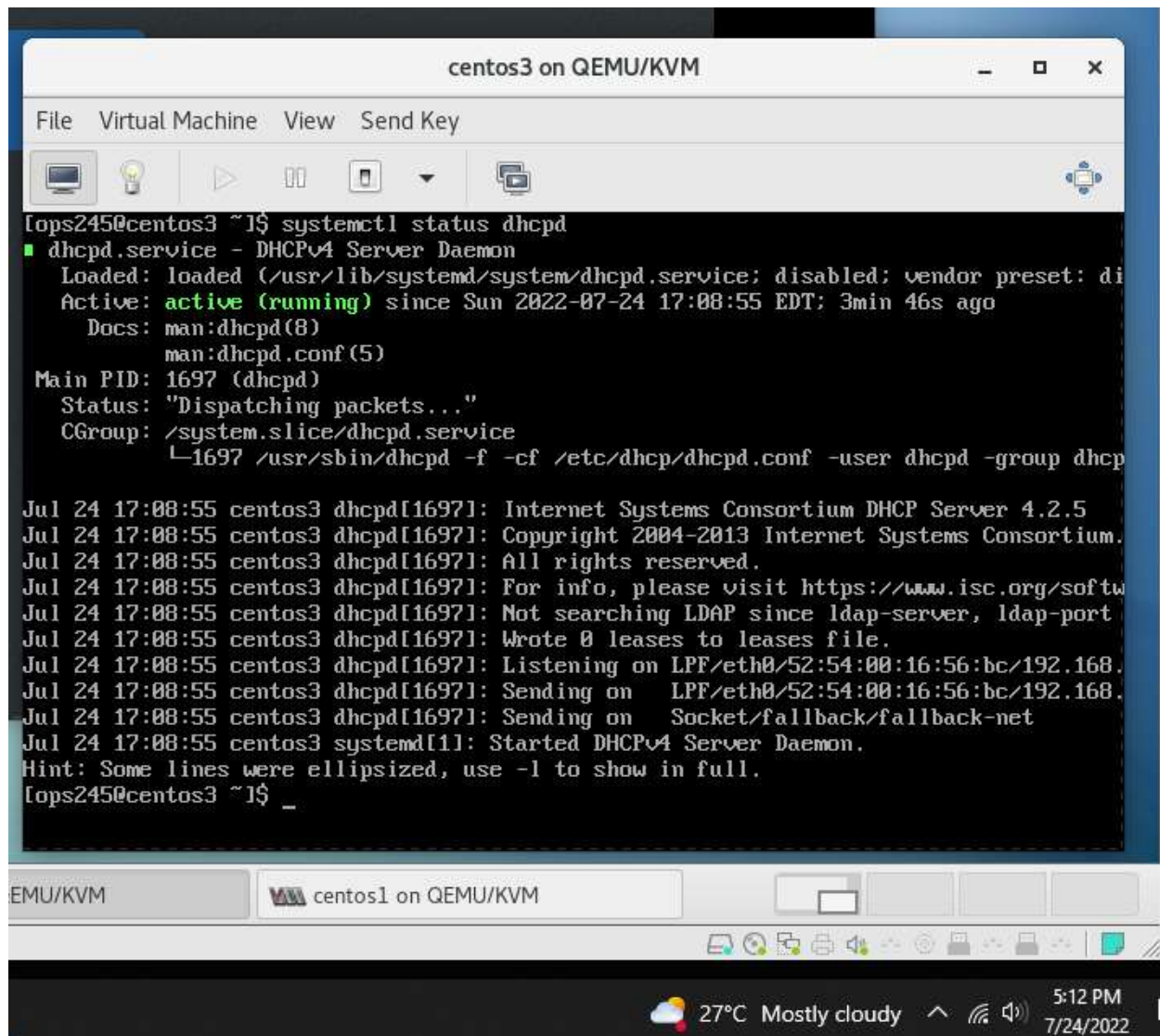
```
centos3 on QEMU/KVM
File Virtual Machine View Send Key
[ops245@centos3 ~]$ systemctl restart dhcpd
==== AUTHENTICATING FOR org.freedesktop.systemd1.manage-units ====
Authentication is required to manage system services or units.
Authenticating as: ops245
Password:
==== AUTHENTICATION COMPLETE ====
[ops245@centos3 ~]$ sudo cat /etc/dhcp/dhcpd.conf
[sudo] password for ops245:
#
# DHCP Server Configuration file.
#   see /usr/share/doc/dhcp*/dhcpd.conf.example
#   see dhcpd.conf(5) man page
#
option subnet-mask 255.255.255.0;
option broadcast-address 192.168.245.255;
option routers 192.168.245.1;
option domain-name "ops245.org";
option domain-name-servers 192.168.245.1;
default-lease-time 1200;
max-lease-time 3600;

subnet 192.168.245.0 netmask 255.255.255.0 {
    range 192.168.245.51 192.168.245.60;
}
[ops245@centos3 ~]$ _
```

EMU/KVM

27°C Mostly cloudy 5:11 PM 7/24/2022

Dhcp status



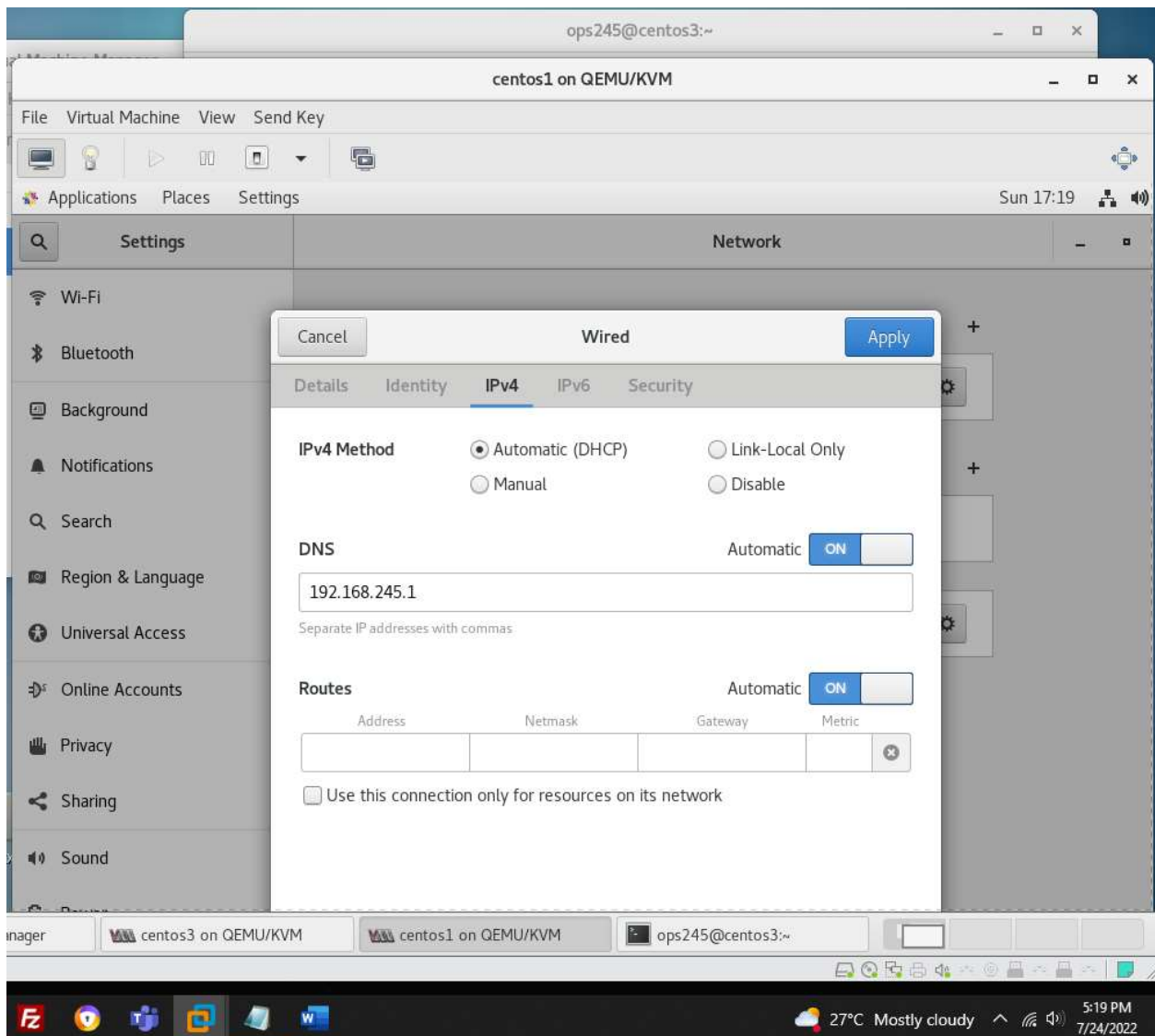
```
centos3 on QEMU/KVM
File Virtual Machine View Send Key
[ops245@centos3 ~]$ systemctl status dhcpd
■ dhcpd.service - DHCPv4 Server Daemon
   Loaded: loaded (/usr/lib/systemd/system/dhcpd.service; disabled; vendor preset: disabled)
   Active: active (running) since Sun 2022-07-24 17:08:55 EDT; 3min 46s ago
     Docs: man:dhcpd(8)
           man:dhcpd.conf(5)
   Main PID: 1697 (dhcpd)
   Status: "Dispatching packets..."
   CGroup: /system.slice/dhcpd.service
           └─1697 /usr/sbin/dhcpd -f -cf /etc/dhcp/dhcpd.conf -user dhcpd -group dhcpd

Jul 24 17:08:55 centos3 dhcpd[1697]: Internet Systems Consortium DHCP Server 4.2.5
Jul 24 17:08:55 centos3 dhcpd[1697]: Copyright 2004-2013 Internet Systems Consortium.
Jul 24 17:08:55 centos3 dhcpd[1697]: All rights reserved.
Jul 24 17:08:55 centos3 dhcpd[1697]: For info, please visit https://www.isc.org/software/
Jul 24 17:08:55 centos3 dhcpd[1697]: Not searching LDAP since ldap-server, ldap-port are not set
Jul 24 17:08:55 centos3 dhcpd[1697]: Wrote 0 leases to leases file.
Jul 24 17:08:55 centos3 dhcpd[1697]: Listening on LPF/eth0/52:54:00:16:56:bc/192.168.1.1
Jul 24 17:08:55 centos3 dhcpd[1697]: Sending on LPF/eth0/52:54:00:16:56:bc/192.168.1.1
Jul 24 17:08:55 centos3 dhcpd[1697]: Sending on Socket/fallback/fallback-net
Jul 24 17:08:55 centos3 systemd[1]: Started DHCPv4 Server Daemon.
Hint: Some lines were ellipsized, use -l to show in full.
[ops245@centos3 ~]$ _
```

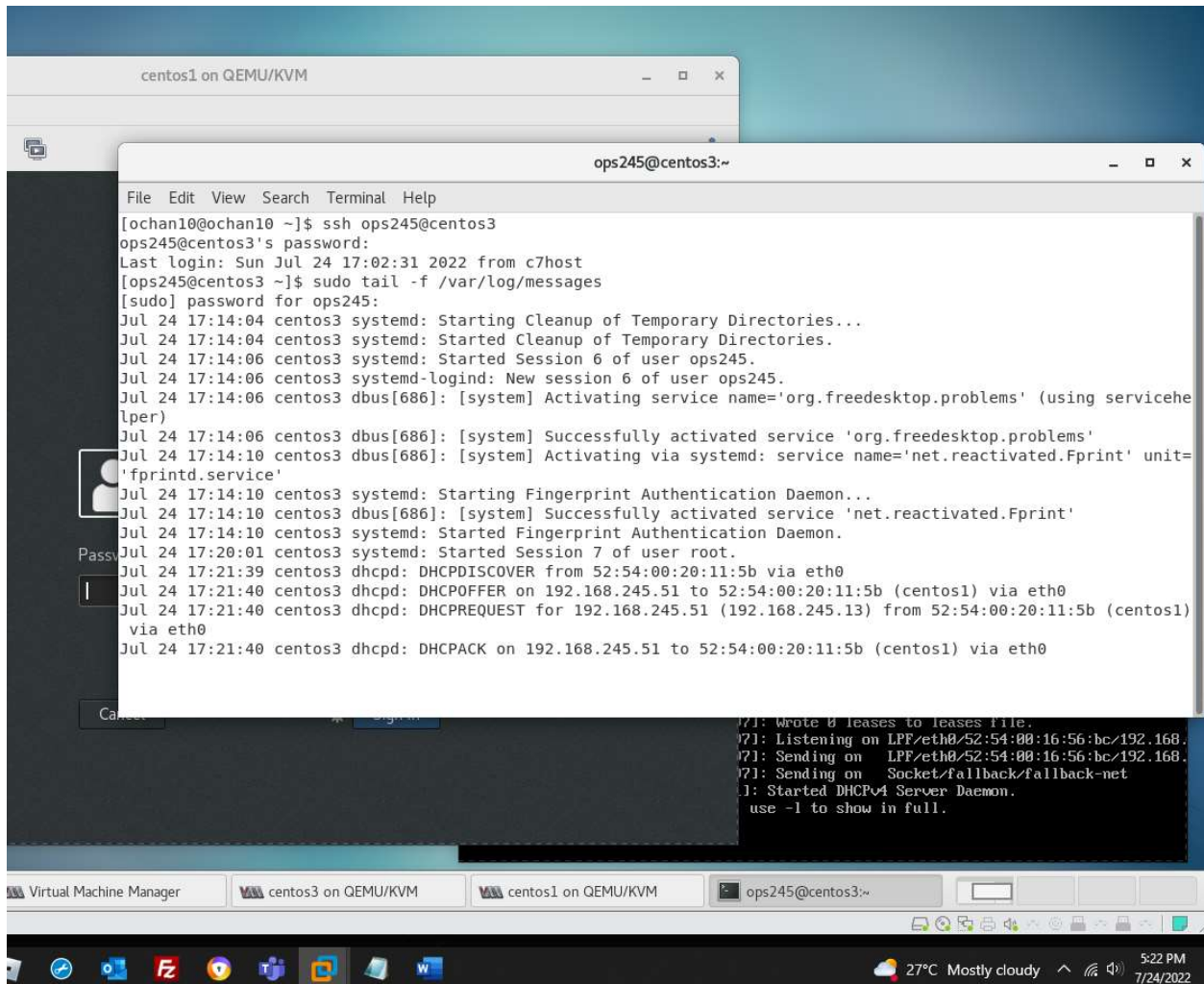
EMU/KVM centos1 on QEMU/KVM

27°C Mostly cloudy 5:12 PM 7/24/2022

Part 4:



Rebooting centos1 and check /var/log/messages:

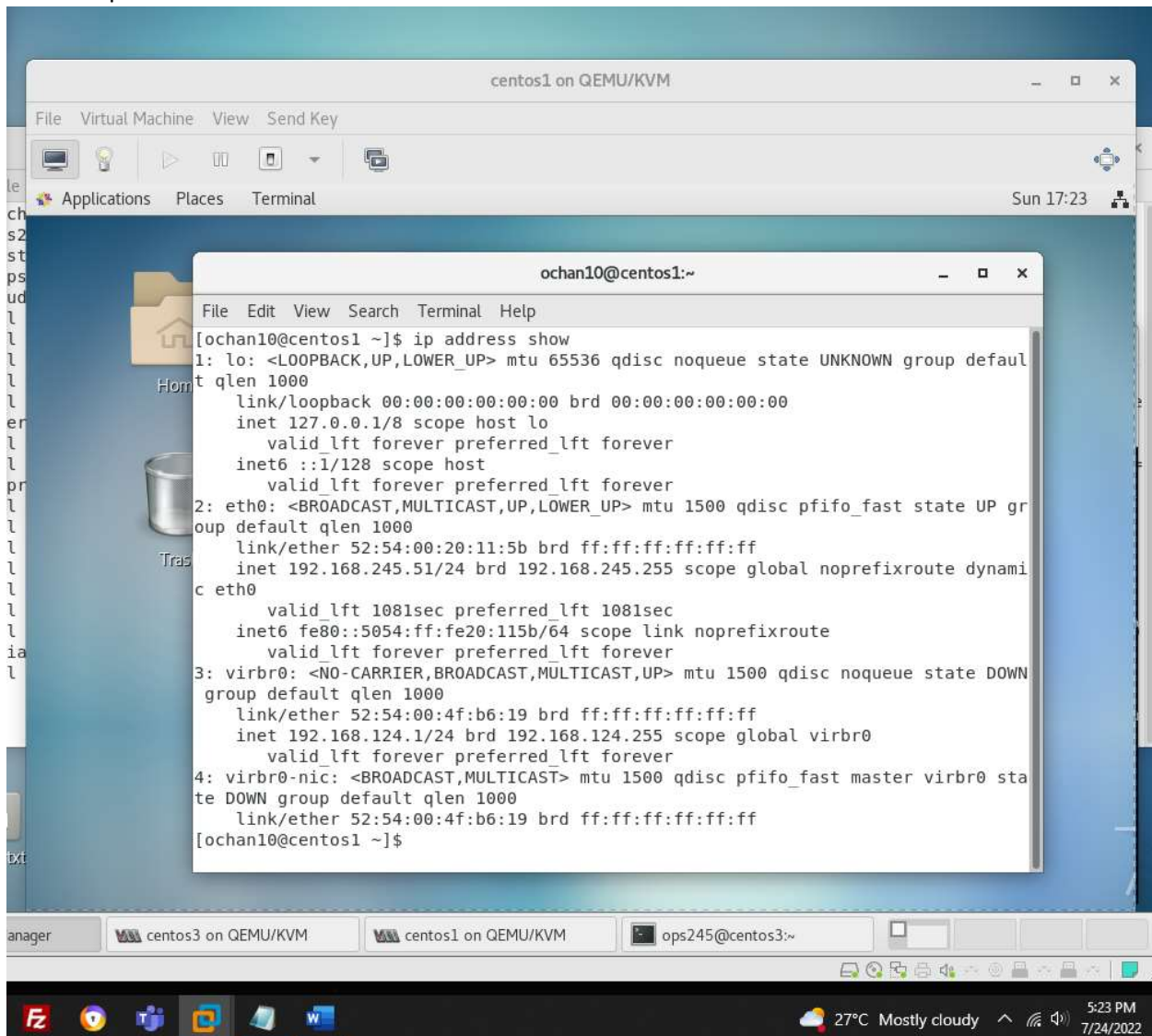


```
centos1 on QEMU/KVM
ops245@centos3:~
File Edit View Search Terminal Help
[ochan10@ochan10 ~]$ ssh ops245@centos3
ops245@centos3's password:
Last login: Sun Jul 24 17:02:31 2022 from c7host
[ops245@centos3 ~]$ sudo tail -f /var/log/messages
[sudo] password for ops245:
Jul 24 17:14:04 centos3 systemd: Starting Cleanup of Temporary Directories...
Jul 24 17:14:04 centos3 systemd: Started Cleanup of Temporary Directories.
Jul 24 17:14:06 centos3 systemd: Started Session 6 of user ops245.
Jul 24 17:14:06 centos3 systemd-logind: New session 6 of user ops245.
Jul 24 17:14:06 centos3 dbus[686]: [system] Activating service name='org.freedesktop.problems' (using servicehelper)
Jul 24 17:14:06 centos3 dbus[686]: [system] Successfully activated service 'org.freedesktop.problems'
Jul 24 17:14:10 centos3 dbus[686]: [system] Activating via systemd: service name='net.reactivated.Fprint' unit='fprintd.service'
Jul 24 17:14:10 centos3 systemd: Starting Fingerprint Authentication Daemon...
Jul 24 17:14:10 centos3 dbus[686]: [system] Successfully activated service 'net.reactivated.Fprint'
Jul 24 17:14:10 centos3 systemd: Started Fingerprint Authentication Daemon.
Jul 24 17:20:01 centos3 systemd: Started Session 7 of user root.
Jul 24 17:21:39 centos3 dhcpcd: DHCPDISCOVER from 52:54:00:20:11:5b via eth0
Jul 24 17:21:40 centos3 dhcpcd: DHCPOFFER on 192.168.245.51 to 52:54:00:20:11:5b (centos1) via eth0
Jul 24 17:21:40 centos3 dhcpcd: DHCPREQUEST for 192.168.245.51 (192.168.245.13) from 52:54:00:20:11:5b (centos1) via eth0
Jul 24 17:21:40 centos3 dhcpcd: DHCPACK on 192.168.245.51 to 52:54:00:20:11:5b (centos1) via eth0
Jul 24 17:21:40 centos3 dhcpcd: Wrote 0 leases to leases file.
Jul 24 17:21:40 centos3 dhcpcd: Listening on LPF/eth0/52:54:00:16:56:bc/192.168.245.13
Jul 24 17:21:40 centos3 dhcpcd: Sending on LPF/eth0/52:54:00:16:56:bc/192.168.245.13
Jul 24 17:21:40 centos3 dhcpcd: Sending on Socket/fallback/fallback-net
Jul 24 17:21:40 centos3 dhcpcd: Started DHCPv4 Server Daemon.
Jul 24 17:21:40 centos3 dhcpcd: use -l to show in full.
```

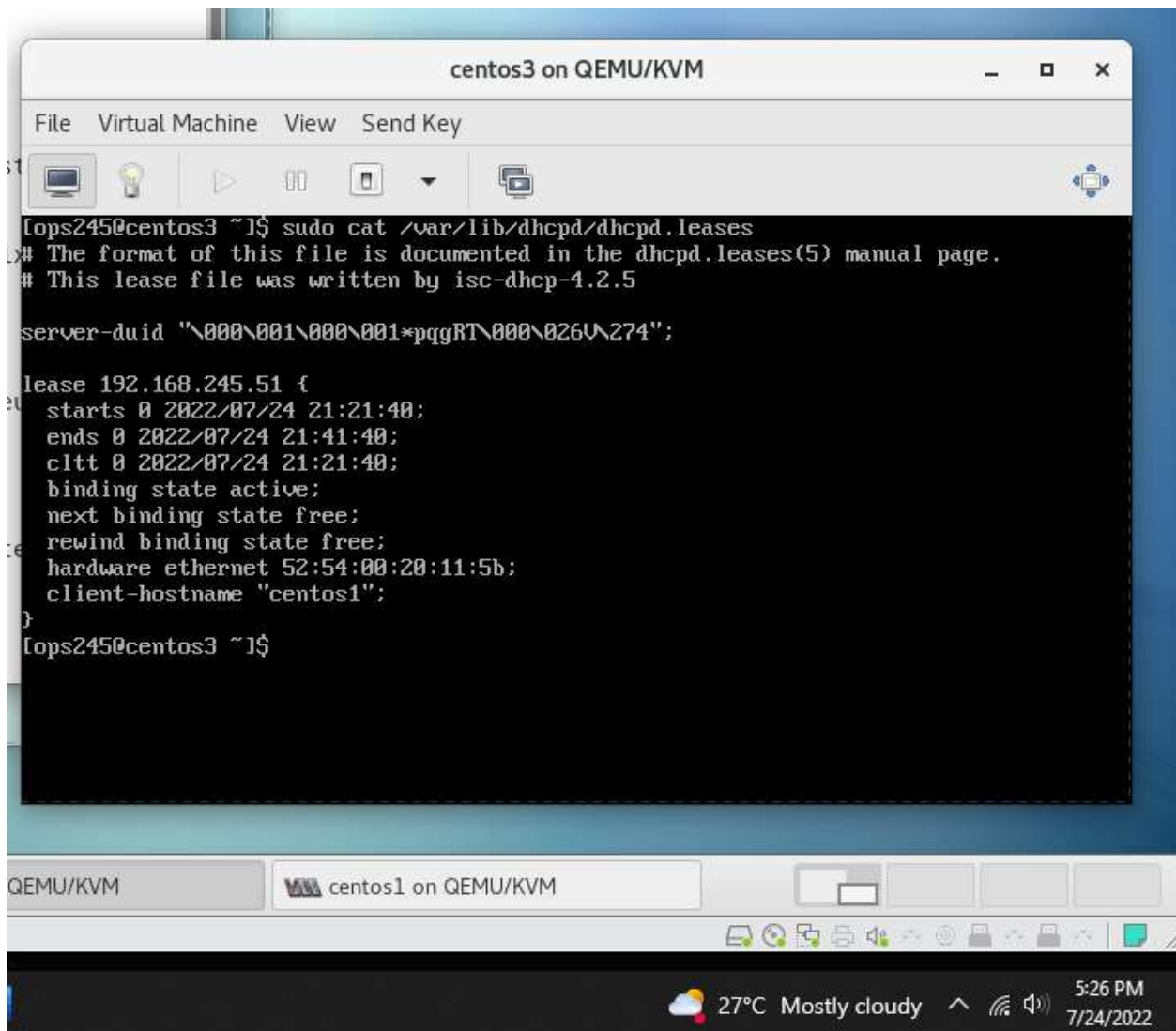
Virtual Machine Manager | centos3 on QEMU/KVM | centos1 on QEMU/KVM | ops245@centos3:~

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Centos1 ip address show:



Investigation 2:



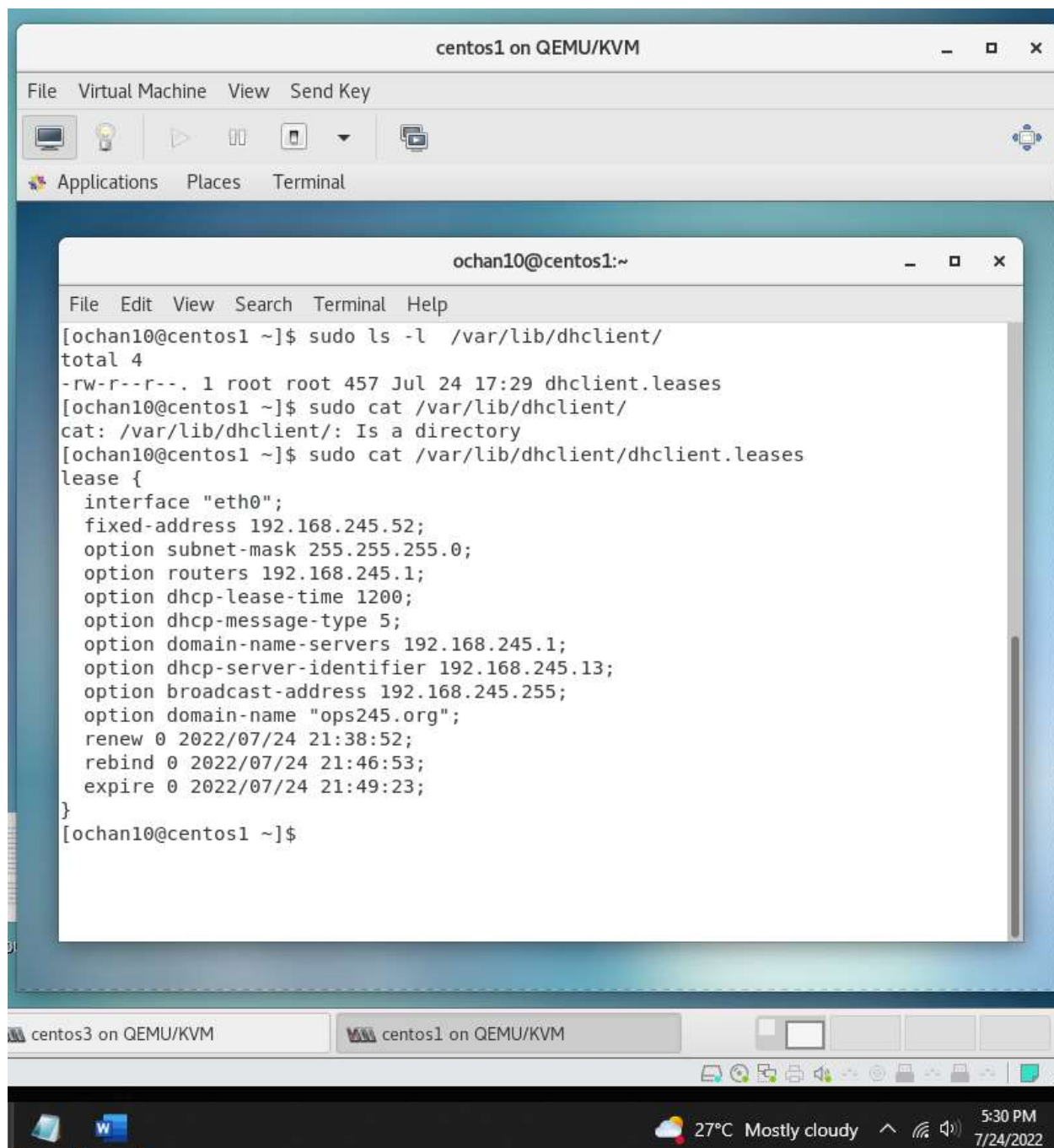
```
centos3 on QEMU/KVM
File Virtual Machine View Send Key
[ops245@centos3 ~]$ sudo cat /var/lib/dhcpd/dhcpd.leases
# The format of this file is documented in the dhcpd.leases(5) manual page.
# This lease file was written by isc-dhcp-4.2.5

server-uid "\000\001\000\001*pggRT\000\026U\274";

lease 192.168.245.51 {
  starts 0 2022/07/24 21:21:40;
  ends 0 2022/07/24 21:41:40;
  cltt 0 2022/07/24 21:21:40;
  binding state active;
  next binding state free;
  rewind binding state free;
  hardware ethernet 52:54:00:20:11:5b;
  client-hostname "centos1";
}
[ops245@centos3 ~]$
```

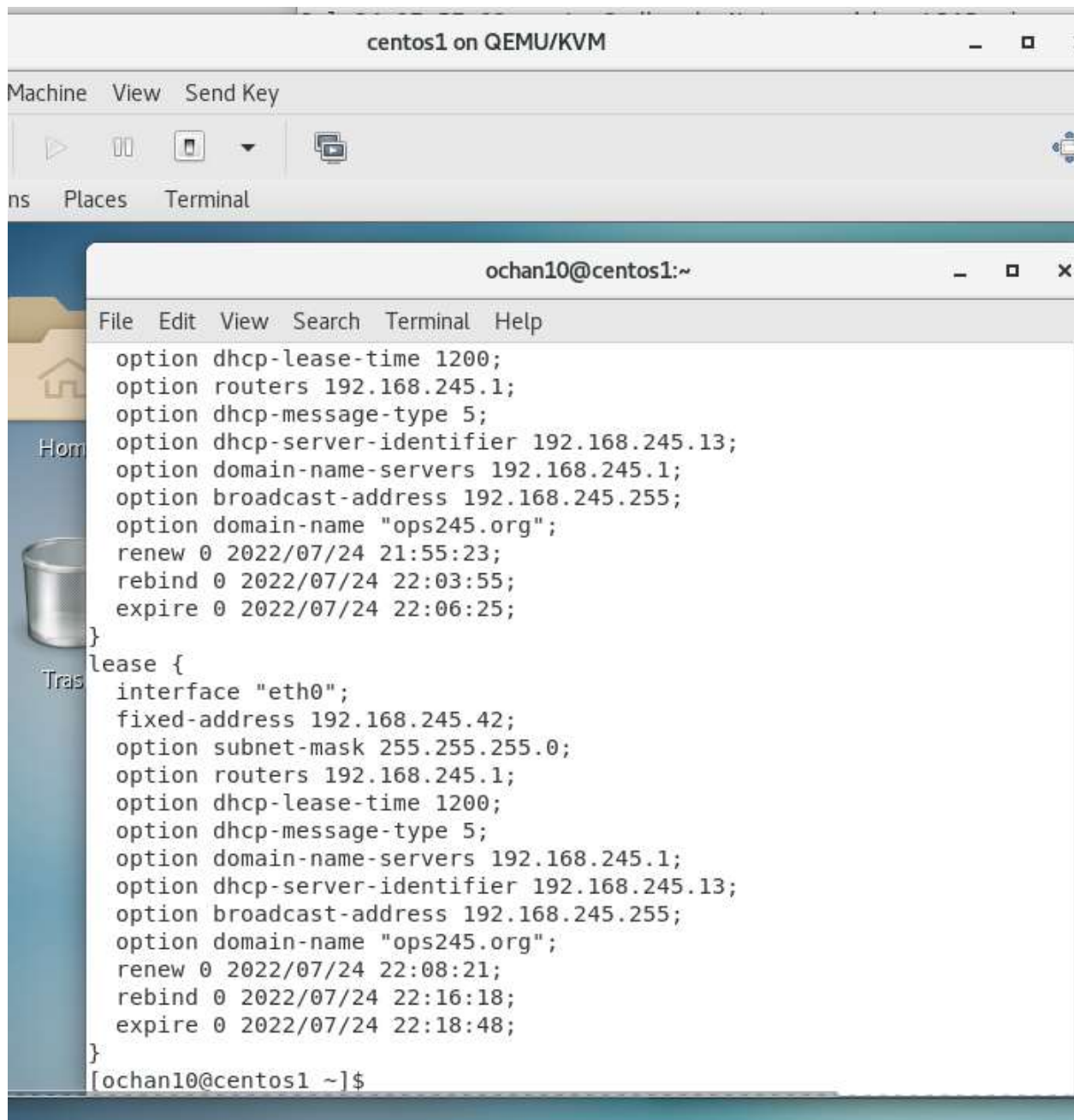
QEMU/KVM centos1 on QEMU/KVM

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Part2:

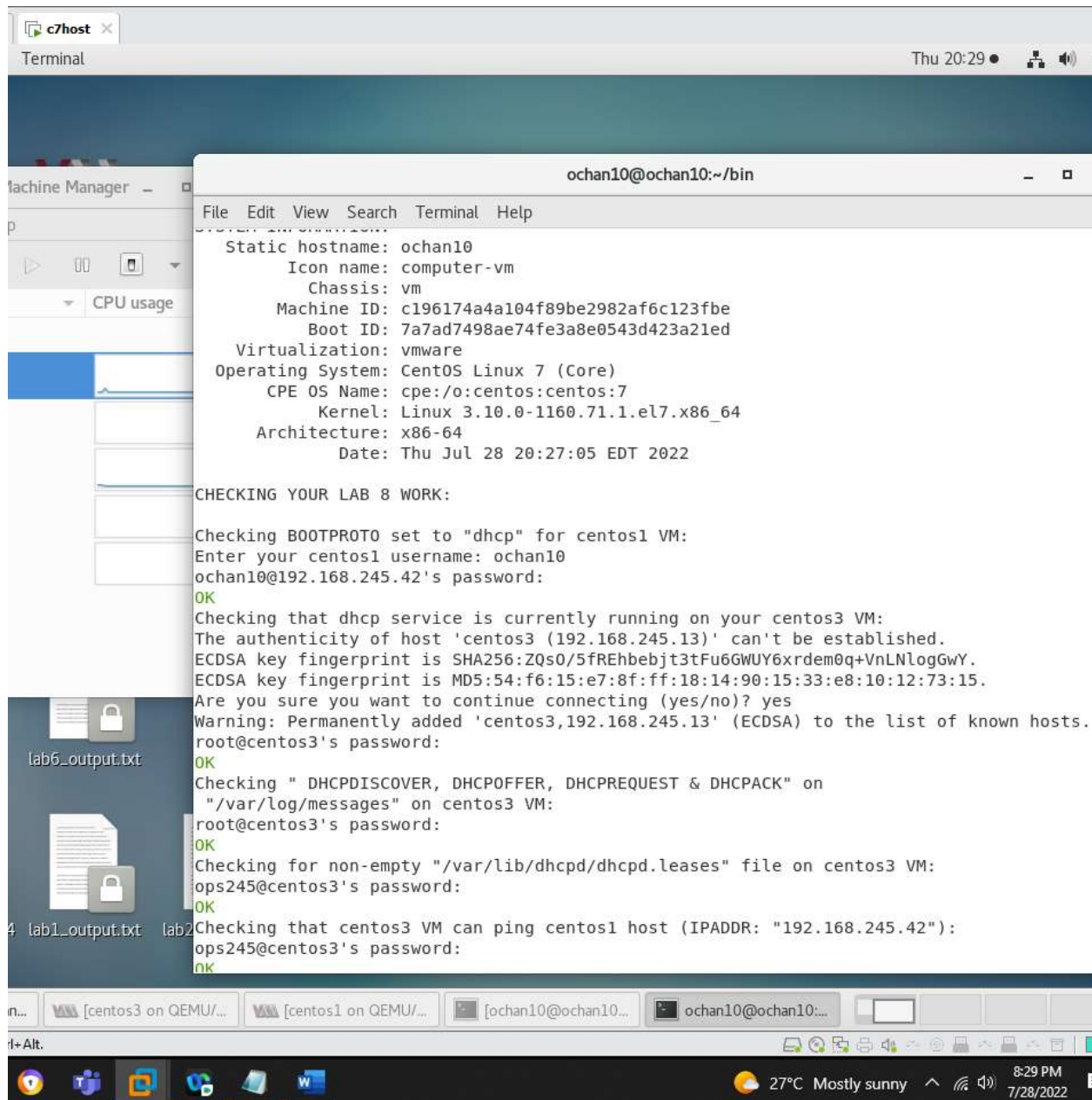
Fixed address received by centos1



```
centos1 on QEMU/KVM
Machine View Send Key
ns Places Terminal
ochan10@centos1:~
File Edit View Search Terminal Help
option dhcp-lease-time 1200;
option routers 192.168.245.1;
option dhcp-message-type 5;
option dhcp-server-identifier 192.168.245.13;
option domain-name-servers 192.168.245.1;
option broadcast-address 192.168.245.255;
option domain-name "ops245.org";
renew 0 2022/07/24 21:55:23;
rebind 0 2022/07/24 22:03:55;
expire 0 2022/07/24 22:06:25;
}
lease {
interface "eth0";
fixed-address 192.168.245.42;
option subnet-mask 255.255.255.0;
option routers 192.168.245.1;
option dhcp-lease-time 1200;
option dhcp-message-type 5;
option domain-name-servers 192.168.245.1;
option dhcp-server-identifier 192.168.245.13;
option broadcast-address 192.168.245.255;
option domain-name "ops245.org";
renew 0 2022/07/24 22:08:21;
rebind 0 2022/07/24 22:16:18;
expire 0 2022/07/24 22:18:48;
}
[ochan10@centos1 ~]$
```



```
ops245@centos3:~  
File Edit View Search Terminal Help  
Jul 24 17:57:02 centos3 dhcpd: Not searching LDAP since ldap-server, ldap-port and ldap-base-dn were not specified  
in the config file  
Jul 24 17:57:02 centos3 dhcpd: Wrote 0 deleted host decls to leases file.  
Jul 24 17:57:02 centos3 dhcpd: Wrote 0 new dynamic host decls to leases file.  
Jul 24 17:57:02 centos3 dhcpd: Wrote 2 leases to leases file.  
Jul 24 17:57:02 centos3 dhcpd: Listening on LPF/eth0/52:54:00:16:56:bc/192.168.245.0/24  
Jul 24 17:57:02 centos3 dhcpd: Sending on LPF/eth0/52:54:00:16:56:bc/192.168.245.0/24  
Jul 24 17:57:02 centos3 dhcpd: Sending on Socket/fallback/fallback-net  
Jul 24 17:57:02 centos3 systemd: Started DHCPv4 Server Daemon.  
Jul 24 17:57:39 centos3 dhcpd: DHCPREQUEST for 192.168.245.51 from 52:54:00:20:11:5b via eth0: lease 192.168.245.51  
unavailable.  
Jul 24 17:57:39 centos3 dhcpd: DHCPNAK on 192.168.245.51 to 52:54:00:20:11:5b via eth0  
Jul 24 17:57:39 centos3 dhcpd: DHCPDISCOVER from 52:54:00:20:11:5b via eth0  
Jul 24 17:57:39 centos3 dhcpd: DHCPOFFER on 192.168.245.42 to 52:54:00:20:11:5b via eth0  
Jul 24 17:57:39 centos3 dhcpd: DHCPREQUEST for 192.168.245.42 (192.168.245.13) from 52:54:00:20:11:5b via eth0  
Jul 24 17:57:39 centos3 dhcpd: DHCPACK on 192.168.245.42 to 52:54:00:20:11:5b via eth0  
Jul 24 17:58:48 centos3 dhcpd: DHCPREQUEST for 192.168.245.52 from 52:54:00:20:11:5b via eth0: lease 192.168.245.52  
unavailable.  
Jul 24 17:58:48 centos3 dhcpd: DHCPNAK on 192.168.245.52 to 52:54:00:20:11:5b via eth0  
Jul 24 17:58:48 centos3 dhcpd: DHCPDISCOVER from 52:54:00:20:11:5b via eth0  
Jul 24 17:58:48 centos3 dhcpd: DHCPOFFER on 192.168.245.42 to 52:54:00:20:11:5b via eth0  
Jul 24 17:58:48 centos3 dhcpd: DHCPREQUEST for 192.168.245.42 (192.168.245.13) from 52:54:00:20:11:5b via eth0  
Jul 24 17:58:48 centos3 dhcpd: DHCPACK on 192.168.245.42 to 52:54:00:20:11:5b via eth0  
eth0";  
s 192.168.245.42;  
s 192.168.245.42;  
s 192.168.245.42;  
For info, please visit https://www.isc.org/software/dhcp/  
Not searching LDAP since ldap-server, ldap-port and ldap-bas  
Wrote 0 deleted host decls to leases file.
```



c7host x

Terminal Thu 20:29 ●

Machine Manager

ochan10@ochan10:~/bin

File Edit View Search Terminal Help

Checking BOOTPROTO set to "dhcp" for centos1 VM:
Enter your centos1 username: ochan10
ochan10@192.168.245.42's password:
OK

Checking that dhcp service is currently running on your centos3 VM:
The authenticity of host 'centos3 (192.168.245.13)' can't be established.
ECDSA key fingerprint is SHA256:ZQs0/5fREhbebjt3tFu6GWUY6xrdem0q+VnLNlogGwY.
ECDSA key fingerprint is MD5:54:f6:15:e7:8f:ff:18:14:90:15:33:e8:10:12:73:15.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'centos3,192.168.245.13' (ECDSA) to the list of known hosts.
root@centos3's password:
OK

Checking " DHCPDISCOVER, DHCPOFFER, DHCPREQUEST & DHCPACK" on
"/var/log/messages" on centos3 VM:
root@centos3's password:
OK

Checking for non-empty "/var/lib/dhcpd/dhcpd.leases" file on centos3 VM:
ops245@centos3's password:
OK

Checking that centos3 VM can ping centos1 host (IPADDR: "192.168.245.42"):
ops245@centos3's password:
OK

Checking that "/var/lib/dhclient" directory is non-empty on centos1 VM:
ochan10@192.168.245.42's password:
OK

Congratulations!

You have successfully completed Lab 8.

1. Submit a screenshot of your entire desktop (including this window) to your course p
essor.

2. A copy of this script output has been created at /home/ochan10/Desktop/lab8_output.i
2. Submit this file along with your screenshot.

[ochan10@ochan10 bin]\$

lab6_output.txt

lab1_output.txt lab2

[centos3 on QEMU/...]

[centos1 on QEMU/...]

[ochan10@ochan10...

ochan10@ochan10:...

27°C Mostly sunny 8:29 PM 7/28/2022