

01. Boot your Fedora Linux virtual machine. After your Linux system has been loaded, switch to a command-line terminal (tty2) by pressing Ctrl+Alt+F2 and log in to the terminal using the user name of root and the password of LNXrocks!

=>

```
Fedora 24 (Workstation Edition)
Kernel 4.5.5-300.fc24.x86_64 on an x86_64 (tty2)

localhost login: root
Password:
[root@localhost ~]# _
```

02. At the command prompt, type runlevel and press Enter. What is your current runlevel? What is the most recent runlevel?

=>N 5

```
Fedora 24 (Workstation Edition)
Kernel 4.5.5-300.fc24.x86_64 on an x86_64 (tty2)

localhost login: root
Password:
[root@localhost ~]# runlevel
N 5
[root@localhost ~]# _
```

03. At the command prompt, type `cat /etc/inittab` and press Enter. View the commented sections. Why is `/etc/inittab` not used in Fedora 20?

=>

```
[root@localhost ~]# runlevel
N 5
[root@localhost ~]# cat initab
cat: initab: No such file or directory
[root@localhost ~]# cat inittab
cat: inittab: No such file or directory
[root@localhost ~]# cat /etc/inittab
# inittab is no longer used.
#
# ADDING CONFIGURATION HERE WILL HAVE NO EFFECT ON YOUR SYSTEM.
#
# Ctrl-Alt-Delete is handled by /usr/lib/systemd/system/ctrl-alt-del.target
#
# systemd uses 'targets' instead of runlevels. By default, there are two main ta
rgets:
#
# multi-user.target: analogous to runlevel 3
# graphical.target: analogous to runlevel 5
#
# To view current default target, run:
# systemctl get-default
#
# To set a default target, run:
# systemctl set-default TARGET.target
[root@localhost ~]#
```

```
# inittab is no longer used.
#
# ADDING CONFIGURATION HERE WILL HAVE NO EFFECT ON YOUR SYSTEM.
#
# Ctrl-Alt-Delete is handled by /usr/lib/systemd/system/ctrl-alt-
del.target
#
# systemd uses 'targets' instead of runlevels. By default, there are two
main targets:
#
# multi-user.target: analogous to runlevel 3
# graphical.target: analogous to runlevel 5
#
# To view current default target, run:
# systemctl get-default
#
# To set a default target, run:
# systemctl set-default TARGET.target
```

04. At the command prompt, type `ls /usr/lib/systemd/system` and press Enter. What do the contents represent?

=>

```

ModemManager.service
multipathd.service
multi-user.target
multi-user.target.wants
netcf-transaction.service
NetworkManager-dispatcher.service
NetworkManager.service
NetworkManager-wait-online.service
network-online.target
network-online.target.wants
network-pre.target
network.target
nfs-blkmap.service
nfs-client.target
nfs-config.service
nfs-idmapd.service
nfs-idmap.service
nfs-lock.service
nfs-mountd.service
nfs-secure.service
nfs-server.service
nfs.service
nfs.target.wants
nfs-utils.service
[root@localhost ~]#

```

```

teamd@.service
timedatex.service
timers.target
timers.target.wants
time-sync.target
tmp.mount
udisks2.service
umount.target
unbound-anchor.service
unbound-anchor.timer
upower.service
usbmuxd.service
user@.service
user.slice
var-lib-nfs-rpc_pipefs.mount
vgauthd.service
virtlockd.service
virtlockd.socket
virtlogd.service
virtlogd.socket
vmtoolsd.service
wacom-inputattach@.service
wpa_supplicant.service
zram.service

```

Different types of core system services , buses , targets

```

abrt-ccpp.service
abrttd.service
abrt-journal-core.service
abrt-oops.service
abrt-pstoreoops.service
abrt-vmcore.service
abrt-xorg.service
accounts-daemon.service
adb.service
alsa-restore.service
alsa-state.service
anaconda-direct.service
anaconda-nm-config.service
anaconda-noshell.service
anaconda.service
anaconda-shell@.service
anaconda-sshd.service
anaconda.target
anaconda.target.wants
anaconda-tmux@.service
arp-ethers.service
atd.service
auditd.service
auth-rpcgss-module.service
autovt@.service
avahi-daemon.service
avahi-daemon.socket
org.freedesktop.locale1.busname
org.freedesktop.login1.busname
org.freedesktop.machin1.busname
org.freedesktop.network1.busname
org.freedesktop.resolve1.busname
org.freedesktop.systemd1.busname
org.freedesktop.timedat1.busname
packagekit-offline-update.service
packagekit.service
paths.target
pcscd.service
pcscd.socket
plymouth-halt.service
plymouth-kexec.service
plymouth-poweroff.service
plymouth-quit.service
plymouth-quit-wait.service
plymouth-read-write.service
plymouth-reboot.service
plymouth-start.service
plymouth-switch-root.service
polkit.service
postgresql.service
postgresql@.service
poweroff.target
poweroff.target.wants
pppoe-server.service

```

```
basic.target
basic.target.wants
blk-availability.service
bluetooth.service
bluetooth.target
brltty.service
busnames.target
busnames.target.wants
canberra-system-bootup.service
canberra-system-shutdown-reboot.service
canberra-system-shutdown.service
capi.service
chrony-dnssrv@.service
chrony-dnssrv@.timer
chronyd.service
chrony-wait.service
colord.service
configure-printer@.service
console-getty.service
console-shell.service
container-getty@.service
corosync-notifyd.service
corosync.service
crond.service
cryptsetup-pre.target
cryptsetup.target
ctrl-alt-del.target
cups-browsed.service
cups.path
cups.service
cups.socket
dbus-org.freedesktop.hostname1.service
dbus-org.freedesktop.import1.service
dbus-org.freedesktop.locale1.service
dbus-org.freedesktop.login1.service
dbus-org.freedesktop.machine1.service
dbus-org.freedesktop.network1.service
dbus-org.freedesktop.resolve1.service
dbus-org.freedesktop.timedate1.service
dbus.service
dbus.socket
dbus.target.wants
debug-shell.service
default.target
default.target.wants
dev-hugepages.mount
dev-mqueue.mount
printer.target
proc-fs-nfsd.mount
proc-sys-fs-binfmt_misc.automount
proc-sys-fs-binfmt_misc.mount
psacct.service
qemu-guest-agent.service
quotaon.service
radvd.service
rc-local.service
rdisc.service
realmd.service
reboot.target
reboot.target.wants
remote-fs-pre.target
remote-fs.target
rescue.service
rescue.target
rescue.target.wants
rngd.service
rpcbind.service
rpcbind.socket
rpcbind.target
rpc-gssd.service
rpc-statd-notify.service
rpc-statd.service
rsyslog.service
rtkit-daemon.service
runlevel10.target
runlevel11.target
runlevel11.target.wants
runlevel12.target
runlevel12.target.wants
runlevel13.target
runlevel13.target.wants
runlevel14.target
runlevel14.target.wants
runlevel15.target
runlevel15.target.wants
runlevel16.target
sasauthd.service
serial-getty@.service
sheepdog.service
shutdown.target
sigpwr.target
sleep.target
-.slice
slices.target
```



dm-event.service	smartcard.target
dm-event.socket	smartd.service
dmraid-activation.service	sockets.target
dnf-makecache.service	sockets.target.wants
dnf-makecache.timer	sound.target
dnsmasq.service	speech-dispatcherd.service
dracut-cmdline.service	spice-vdagentd.service
dracut-initqueue.service	spice-vdagentd.target
dracut-mount.service	sshd-keygen@.service
dracut-pre-mount.service	sshd-keygen.target
dracut-pre-pivot.service	sshd.service
dracut-pre-trigger.service	sshd@.service
dracut-pre-udev.service	sshd.socket
dracut-shutdown.service	sssd-secrets.service
eatables.service	sssd-secrets.socket
emergency.service	sssd.service
emergency.target	suspend.target
exit.target	svnserve.service
fcoe.service	swap.target
fedora-autorelabel-mark.service	sys-fs-fuse-connections.mount
fedora-autorelabel.service	sysinit.target
fedora-domainname.service	sysinit.target.wants
fedora-import-state.service	sys-kernel-config.mount
fedora-loadmodules.service	sys-kernel-debug.mount
fedora-readonly.service	syslog.socket
final.target	syslog.target.wants
firewalld.service	systemd-ask-password-console.path
fprintd.service	systemd-ask-password-
console.service	systemd-ask-password-
fstrim.service	systemd-ask-password-
plymouth.path	systemd-ask-password-wall.path
fstrim.timer	systemd-ask-password-wall.service
plymouth.service	systemd-backlight@.service
fwupdate-cleanup.service	systemd-binfmt.service
fwupd-offline-update.service	systemd-bootchart.service
fwupd.service	systemd-bus-proxyd.service
gdm.service	systemd-bus-proxyd.socket
geoclue.service	systemd-coredump@.service
getty@.service	systemd-coredump.socket
getty.target	systemd-exit.service
graphical.target	systemd-firstboot.service
graphical.target.wants	systemd-fsck-root.service
gssproxy.service	systemd-fsck@.service
halt-local.service	systemd-halt.service
halt.target	
halt.target.wants	
hibernate.target	

— years
☆☆☆

```
htcacheclean.service
httpd.service
httpd.service.d
httpd.socket
httpd.socket.d
hybrid-sleep.target
hypervfcopyd.service
hypervkvpd.service
hypervvssd.service
update.service
iio-sensor-proxy.service
initial-setup.service
initrd-cleanup.service
initrd-fs.target
initrd-parse-etc.service
initrd-root-fs.target
initrd-switch-root.service
initrd-switch-root.target
initrd-switch-root.target.wants
initrd.target
initrd.target.wants
initrd-udevadm-cleanup-db.service
instperf.service
iodine-client.service
online.service
ipsec.service
irqbalance.service
iscsid.service
iscsid.socket
iscsi.service
iscsi-shutdown.service
iscsiuio.service
iscsiuio.socket
isdn.service
kdump.service
kexec.target
kexec.target.wants
kmod-static-nodes.service
ldconfig.service
libvirtd.service
libvirt-guests.service
lightdm.service
dev.service
lldpad.service
lldpad.socket
local-fs-pre.target
local-fs.target
systemd-hibernate-resume@.service
systemd-hibernate.service
systemd-hostnamed.service
systemd-hwdb-update.service
systemd-hybrid-sleep.service
systemd-importd.service
systemd-initctl.service
systemd-initctl.socket
systemd-journal-catalog-
systemd-journald-audit.socket
systemd-journald-dev-log.socket
systemd-journald.service
systemd-journald.socket
systemd-journal-flush.service
systemd-kexec.service
systemd-locale.service
systemd-logind.service
systemd-machined.service
systemd-machine-id-commit.service
systemd-modules-load.service
systemd-networkd.service
systemd-networkd.socket
systemd-networkd-wait-
systemd-nsspawn@.service
systemd-poweroff.service
systemd-quotacheck.service
systemd-random-seed.service
systemd-reboot.service
systemd-remount-fs.service
systemd-resolved.service
systemd-rfkill.service
systemd-rfkill.socket
systemd-suspend.service
systemd-sysctl.service
systemd-sysusers.service
systemd-timedated.service
systemd-timesyncd.service
systemd-tmpfiles-clean.service
systemd-tmpfiles-clean.timer
systemd-tmpfiles-setup-
systemd-tmpfiles-setup.service
systemd-udev-control.socket
systemd-udev-kernel.socket
systemd-udev.service
```

local-fs.target.wants
lvm2-lvmetad.service
lvm2-lvmetad.socket
lvm2-lvmpolld.service
runlevel.service
lvm2-lvmpolld.socket
lvm2-monitor.service
lvm2-pvscan@.service
machine.slice
machines.target
mcelog.service
mdadm-grow-continue@.service
mdadm-last-resort@.service
mdadm-last-resort@.timer
mdmonitor.service
mdmon@.service
messagebus.service
mlocate-updatedb.service
mlocate-updatedb.timer
ModemManager.service
multipathd.service
multi-user.target
multi-user.target.wants
mysqld.service
mysqld@.service
netcf-transaction.service
NetworkManager-dispatcher.service
NetworkManager.service
NetworkManager-wait-online.service
network-online.target
network-online.target.wants
network-pre.target
network.target
nfs-blkmap.service
nfs-client.target
nfs-config.service
nfs-idmapd.service
nfs-idmap.service
nfs-lock.service
nfs-mountd.service
nfs-secure.service
nfs-server.service
nfs.service
nfs-utils.service
nss-lookup.target
nss-user-lookup.target
numad.service

systemd-udev-settle.service
systemd-udev-trigger.service
systemd-update-done.service
systemd-update-utmp-

systemd-update-utmp.service
systemd-user-sessions.service
systemd-vconsole-setup.service
system.slice
system-update.target
system-update.target.wants
tcsd.service
teamd@.service
timedatex.service
timers.target
timers.target.wants
time-sync.target
tmp.mount
udisks2.service
umount.target
unbound-anchor.service
unbound-anchor.timer
upower.service
usb_modeswitch@.service
usbmuxd.service
user@.service
user.slice
var-lib-machines.mount
var-lib-nfs-rpc_pipefs.mount
vboxautostart-service.service
vboxballoonctrl-service.service
vboxdrv.service
vboxweb-service.service
vgauthd.service
virtlockd.service
virtlockd.socket
virtlogd.service
virtlogd.socket
vmttoolsd.service
vsftpd.service
vsftpd@.service
vsftpd.target
wacom-inputattach@.service
wpa_supplicant.service
xinetd.service
xl2tpd.service
yum-makecache.service



```
openvpn@.service          yum-makecache.timer
org.freedesktop.hostname1.busname  zram.service
org.freedesktop.import1.busname    zvbid.service
```

05. At the command prompt, type `ls /etc/rc.d` and press Enter. Do you see `init.d` and `rc[runlevel].d` subdirectories? Why?

=>

```
[root@localhost ~]# ls /etc/rc.d
init.d rc0.d rc1.d rc2.d rc3.d rc4.d rc5.d rc6.d
[root@localhost ~]# _
```

```
init.d rc0.d rc1.d rc2.d rc3.d rc4.d rc5.d rc6.d
```

These are program automatically start at boottime.

06. At the command prompt, type `ls /etc/rc.d/init.d` and press Enter. Which UNIX SysV daemons are available on Fedora 20?


```
[root@localhost ~]# ls /etc/rc.d/init.d
functions  livesys  livesys-late  netconsole  network  README
[root@localhost ~]# _
```

07. At the command prompt, type `chkconfig --list netconsole` and press Enter. In which runlevels is the netconsole daemon started by default?

```
[root@localhost ~]# ls /etc/rc.d/init.d
functions  livesys  livesys-late  netconsole  network  README
[root@localhost ~]# chkconfig --list netconsole
```

Note: This output shows SysV services only and does not include native systemd services. SysV configuration data might be overridden by native systemd configuration.

If you want to list systemd services use 'systemctl list-unit-files'.
To see services enabled on particular target use
'systemctl list-dependencies [target]'.

```
netconsole    0:off  1:off  2:off  3:off  4:off  5:off  6:off
[root@localhost ~]# _
```

08. At the command prompt, type `chkconfig --level 23 netconsole on` and press Enter to configure the netconsole daemon to start in runlevels 2 and 3. Next, type `ls /etc/rc.d/rc[23].d` and press Enter. Does the symbolic link to the netconsole rc script start with S? Why?

```

[root@localhost ~]# ls /etc/rc.d/init.d
functions  livesys  livesys-late  netconsole  network  README
[root@localhost ~]# chkconfig --list netconsole

Note: This output shows SysV services only and does not include native
systemd services. SysV configuration data might be overridden by native
systemd configuration.

If you want to list systemd services use 'systemctl list-unit-files'.
To see services enabled on particular target use
'systemctl list-dependencies [target]'.

netconsole      0:off  1:off  2:off  3:off  4:off  5:off  6:off
[root@localhost ~]# chkconfig --level 23 netconsole
only one runlevel may be specified for a chkconfig query
[root@localhost ~]# chkconfig --level 23 netconsole on
[root@localhost ~]# ls /etc/rc.d/rc[23].d
/etc/rc.d/rc2.d:
K01livesys-late  K90network  K99livesys  S50netconsole

/etc/rc.d/rc3.d:
K90network  S00livesys  S50netconsole  S99livesys-late
[root@localhost ~]# _

```

09. At the command prompt, type `init 3` and press Enter to switch to runlevel 3 (`multiuser.target`). Note that you are on `tty1` and the `gdm` is not loaded. Log in to the terminal using the user name of `root` and the password of `LNXRocks!`.

```

Fedora 24 (Workstation Edition)
Kernel 4.5.5-300.fc24.x86_64 on an x86_64 (tty1)

localhost login: root
Password:
Last login: Fri Nov  4 18:03:44 on tty2
[root@localhost ~]# _

```

10. Next, type `runlevel` and press Enter. What is your current and most recent runlevel?

=>5

11. At the command prompt, type `init 1` and press Enter to switch to single

user mode (rescue.target). Supply the root password of LNXrocks! when prompted.

=>

```
Fedora 24 (Workstation Edition)
Kernel 4.5.5-300.fc24.x86_64 on an x86_64 (tty1)

localhost login: root
Password:
System is going down.

Last login: Fri Nov  4 18:23:09 on tty1
[root@localhost ~]# _
```

12. Next, type `runlevel` and press Enter. What is your current and most recent runlevel?

```
Fedora 24 (Workstation Edition)
Kernel 4.5.5-300.fc24.x86_64 on an x86_64 (tty1)

localhost login: root
Password:
System is going down.

Last login: Fri Nov  4 18:23:09 on tty1
[root@localhost ~]# runlevel
5 1
[root@localhost ~]# _
```

13. At the command prompt, type `systemctl isolate graphical.target` and press Enter to switch to runlevel 5 (graphical.target). Note that the `gdm` is loaded. Press `Ctrl+Alt+F2` and log in to the terminal using the user

name of root and the password of LNXrocks!.

14. At the command prompt, type `systemctl -a | grep crond.service` and press Enter. Is the Systemd cron daemon running?

```
Fedora 24 (Workstation Edition)
Kernel 4.5.5-300.fc24.x86_64 on an x86_64 (tty3)

localhost login: root
Password:
Last login: Fri Nov  4 18:42:20 on tty4
[root@localhost ~]# systemctl -a | grep crond.service
    crond.service                                loaded active running Command Scheduler
[root@localhost ~]# _
```

15. At the command prompt, type `systemctl restart crond.service` and press Enter to restart the Systemd cron daemon.

```
Fedora 24 (Workstation Edition)
Kernel 4.5.5-300.fc24.x86_64 on an x86_64 (tty3)

localhost login: root
Password:
Last login: Fri Nov  4 18:42:20 on tty4
[root@localhost ~]# systemctl -a | grep crond.service
    crond.service                                loaded active running Command Scheduler
[root@localhost ~]# systemctl restart crond.service
[root@localhost ~]# _
```

16. At the command prompt, type `systemctl disable crond.service` and press Enter to prevent the system from starting the cron daemon in your current runlevel/target. Note that the existing symbolic link in the `crond.service` rc script is removed. Why was this link from the

/etc/systemd/system/multi-user.target.wants directory instead of the /etc/systemd/system/graphical.target.wants directory?

```
Fedora 24 (Workstation Edition)
Kernel 4.5.5-300.fc24.x86_64 on an x86_64 (tty3)

localhost login: root
Password:
Last login: Fri Nov  4 18:42:20 on tty4
[root@localhost ~]# systemctl -a | grep crond.service
crond.service                                loaded active running Command Scheduler
[root@localhost ~]# systemctl restart crond.service
[root@localhost ~]# systemctl disable crond.service
Removed symlink /etc/systemd/system/multi-user.target.wants/crond.service.
[root@localhost ~]# _
```

17. At the command prompt, type `systemctl enable crond.service` and press Enter to start the cron daemon in your current runlevel/target. Was the symbolic link recreated?

18. At the command prompt, type `service netconsole start` and press Enter. Note that Systemd started the UNIX SysV netconsole daemon using the `systemctl` command because Systemd is backwards compatible with UNIX SysV.

```

Fedora 24 (Workstation Edition)
Kernel 4.5.5-300.fc24.x86_64 on an x86_64 (tty3)

localhost login: root
Password:
Last login: Fri Nov  4 18:42:20 on tty4
[root@localhost ~]# systemctl -a | grep crond.service
    crond.service
                                loaded active running Command Scheduler
[root@localhost ~]# systemctl restart crond.service
[root@localhost ~]# systemctl disable crond.service
Removed symlink /etc/systemd/system/multi-user.target.wants/crond.service.
[root@localhost ~]# systemctl enable crond.service
Created symlink from /etc/systemd/system/multi-user.target.wants/crond.service to /usr/lib/systemd/system/crond.service.
[root@localhost ~]# service netconsole start
Starting netconsole (via systemctl): Job for netconsole.service failed because the control process exited with error code. See "systemctl status netconsole.service" and "journalctl -xe" for details.
                                                                    [FAILED]
[root@localhost ~]# _

```

19. At the command prompt, type `poweroff` and press Enter to power off your Fedora Linux virtual machine.

20. Boot your Ubuntu Server Linux virtual machine. After your Linux system has been loaded, log into `ttty1` using the user name of `root` and the password of `LNXRocks!`.

21. At the command prompt, type `runlevel` and press Enter. What is your current runlevel? What is the most recent runlevel?

22. At the command prompt, type `ls /etc/init.d` and press Enter. What do the contents represent?

=>

```

apparmor          hostname.sh       mountkernfs.sh
reboot            udev
bootlogs          hwclock.sh       mountnfs-bootclean.sh
rmnologin        udev-finish
bootmisc.sh       killprocs         mountnfs.sh
rsyslog           umountfs
checkfs.sh        kmod              nginx
sendsigs          umountnfs.sh
checkroot-bootclean.sh lxc                procps
single            umountroot
checkroot.sh      motd              rc
skeleton          urandom
cron              mountall-bootclean.sh rc.local          ssh
x11-common
docker            mountall.sh       rcS               sudo
halt              mountdevsubfs.sh  README
supervisor

```

23. At the command prompt, type `ls /etc/init` and press Enter. What do the contents represent?

=>

```
apparmor.conf  startpar-bridge.conf      udev-finish.conf
docker.conf    udev.conf                  udevmonitor.conf
ssh.conf       udev-fallback-graphics.conf udevtrigger.conf
```

24. At the command prompt, type `cat /etc/init/ssh.conf` and press Enter. In which runlevels is the ssh daemon started?

=>

```
# ssh - OpenBSD Secure Shell server
#
# The OpenSSH server provides secure shell access to the system.
description      "OpenSSH server"
start on runlevel [2345]
stop on runlevel [!2345]
respawn
respawn limit 10 5
umask 022
env SSH_SIGSTOP=1
expect stop
# 'sshd -D' leaks stderr and confuses things in conjunction with 'console
log'
console none
pre-start script
    test -x /usr/sbin/sshd || { stop; exit 0; }
    test -e /etc/ssh/sshd_not_to_be_run && { stop; exit 0; }
    mkdir -p -m0755 /var/run/sshd
end script
# if you used to set SSHD_OPTS in /etc/default/ssh, you can change the
# 'exec' line here instead
exec /usr/sbin/sshd -D
```

25. At the command prompt, type `restart ssh` and press Enter. Why did the restart command successfully restart the ssh daemon?

=>command not found

26. At the command prompt, type `ls /etc/rc2.d` and press Enter. Are there any traditional UNIX SysV daemons started in your current runlevel? Why? Is the postgresql daemon started before or after the apache2 daemon? Why?

```
=>README S01bootlogs S01motd S01rsyslog S01supervisor S02cron
S02docker S02lxc S02nginx S02ssh S03rc.local S03rmnologin
```

27. At the command prompt, type `restart postgresql` and press Enter. Why did you receive an error message? (If your error message indicates that

postgresql is not present, add it you your system by typing apt-get install postgresql and select y when prompted to complete the installation)

```
=-bash: restart: command not found
```

28. At the command prompt, type /etc/init.d/postgresql restart and press Enter. Did the postgresql daemon restart?

```
=Restarting PostgreSQL 9.4 database server: main.
```

29. At the command prompt, type update-rc.d -f postgresql remove and press Enter to remove the symbolic links that start the postgresql daemon. Which runlevels was the postgresql daemon originally started in?

```
usage: update-rc.d [-n] [-f] <basename> remove update-rc.d
[-n] <basename> disable|enable [S|2|3|4|5] -n:
not really -f: forceThe disable|enable API is not
stable and might change in the future.
```

30. At the command prompt, type update-rc.d postgresql defaults and press Enter to configure the symbolic links to start the postgresql daemon in runlevels 2 through 5.

```
=>
```

31. At the command prompt, type telinit 6 and press Enter to reboot your system. Could you have used the init command in place of the telinit command?

```
=> telinit restarted booting process.
```

32. Once your system has rebooted, log into tty1 using the user name of root and the password of LNXrocks!.

```
=> done
```

33. At the command prompt, type poweroff and press Enter to power off your Ubuntu Server Linux virtual machine.

34. Boot your Fedora Linux virtual machine. After your Linux system has been loaded, switch to a command-line terminal (tty2) by pressing Ctrl+Alt+F2 and log in to the terminal using the user name of root and the password of LNXrocks!.

35. At the command prompt, type init 3 and press Enter to switch to runlevel 3 (multi-user.target). Note that the gdm is no longer loaded in tty1. Log into tty1 using the user name of root and the password of LNXrocks!.

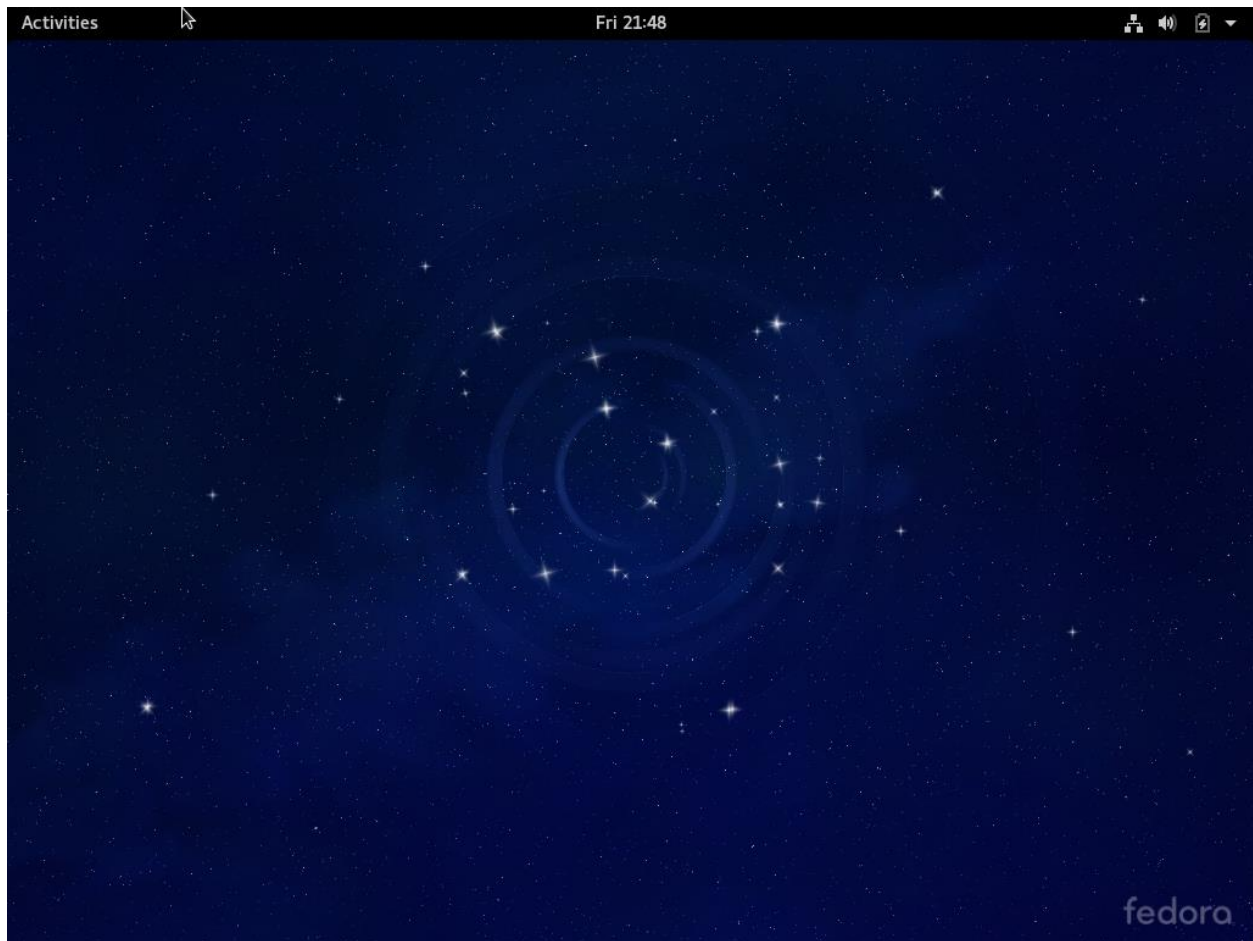
36. At the command prompt, type startx and press Enter. What desktop environment was loaded by default and why? Since the root user has not logged into GNOME previously, you will be prompted to choose GNOME preferences.

a. At the Welcome screen, ensure that English (United States) is selected and click Next.

b. At the Input Sources screen, ensure that the English (US) keyboard layout is selected and click Next.

c. At the Online Accounts screen, click Next to bypass personal account configuration.

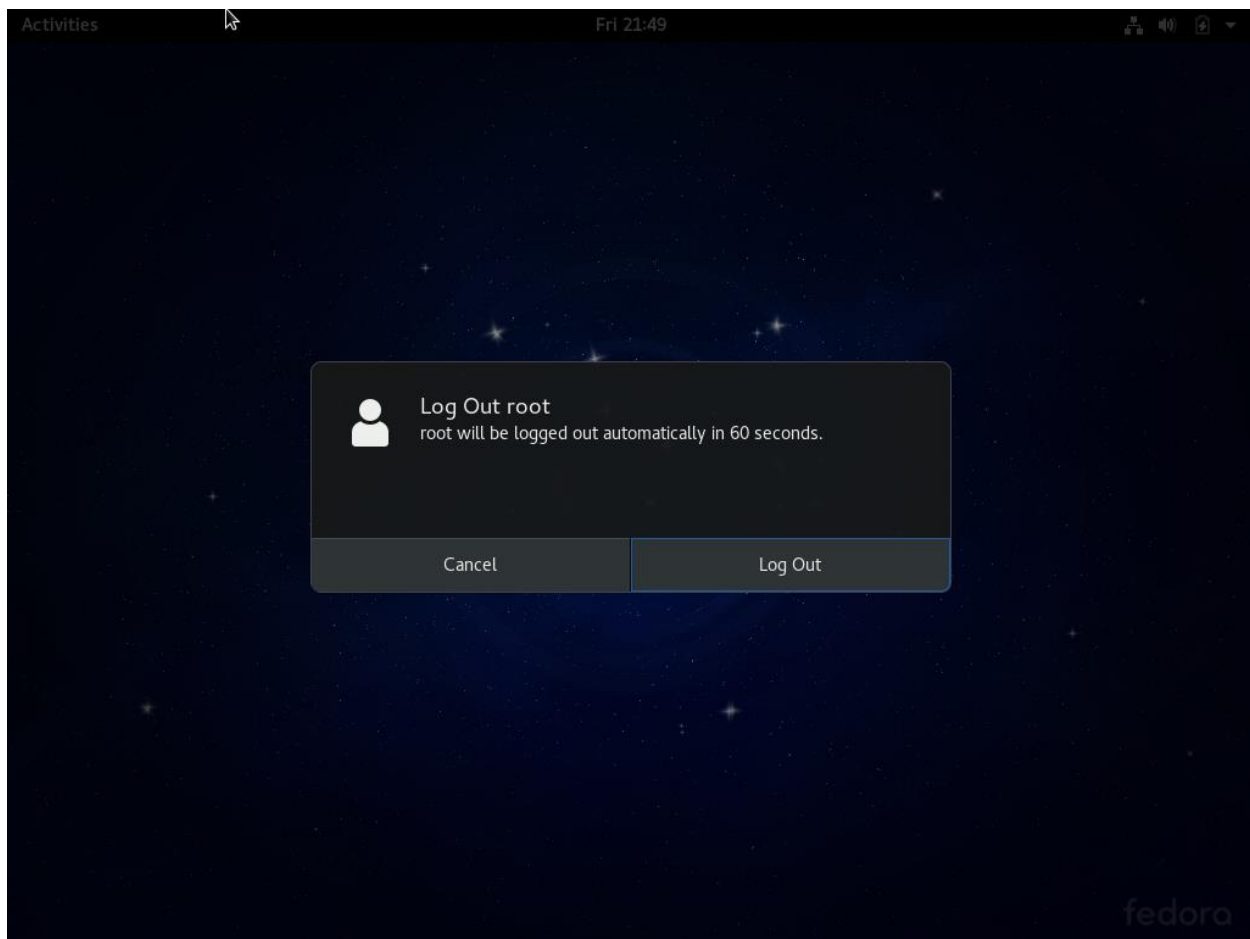
d. On the Thank You screen, click Start using Fedora.



37. Click the power icon in the upper right of the GNOME desktop, click root, Log Out, and then click Log Out again to log out of the GNOME desktop. Were you returned to your original BASH shell on tty1?

a. If the system did not display root in the drop down menu allowing you to log out, why not?

(Hint: launch and consult the Help application) Take the necessary steps in system settings to allow you to log out using the menu resulting from clicking on the power icon. Briefly describe the steps you took and why.



38. At the command prompt, type `init 5` and press Enter to switch to runlevel 5 (`graphical.target`). Note that the `gdm` is now loaded in `ttty1`. Log into the GNOME desktop using the user name of `user1` and the password of `LNXRocks!`.

```

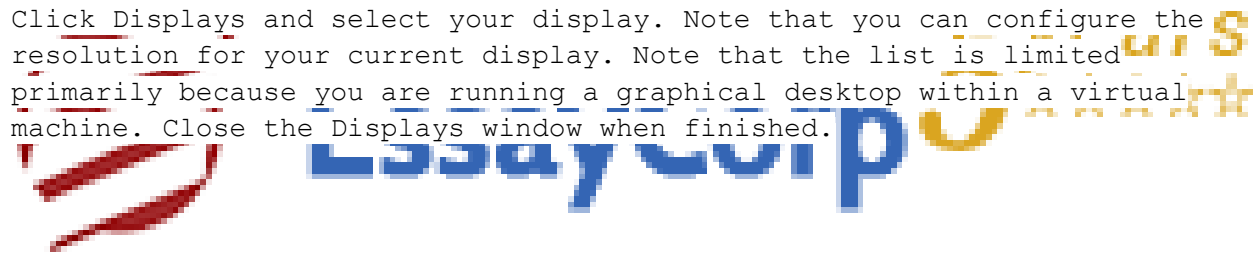
Build Operating System: 4.4.6-301.fc23.x86_64
Current Operating System: Linux localhost.localdomain 4.5.5-300.fc24.x86_64 #1 SMP Thu May 19 13:05:32 UTC 2016 x86_64
Kernel command line: BOOT_IMAGE=/vmlinuz-4.5.5-300.fc24.x86_64 root=/dev/mapper/fedora-root ro rd.lvm.lv=fedora/root rd.lvm.lv=fedora/swap rhgb quiet LANG=en_US.UTF-8
Build Date: 04 May 2016 10:36:18PM
Build ID: xorg-x11-server 1.18.3-2.fc24
Current version of pixman: 0.34.0
    Before reporting problems, check http://wiki.x.org
    to make sure that you have the latest version.
Markers: (--) probed, (**) from config file, (==) default setting,
    (++) from command line, (!!) notice, (II) informational,
    (WW) warning, (EE) error, (NI) not implemented, (??) unknown.
(==) Log file: "/var/log/Xorg.1.log", Time: Fri Nov 4 21:47:02 2016
(==) Using config directory: "/etc/X11/xorg.conf.d"
(==) Using system config directory "/usr/share/X11/xorg.conf.d"
xinit: connection to X server lost

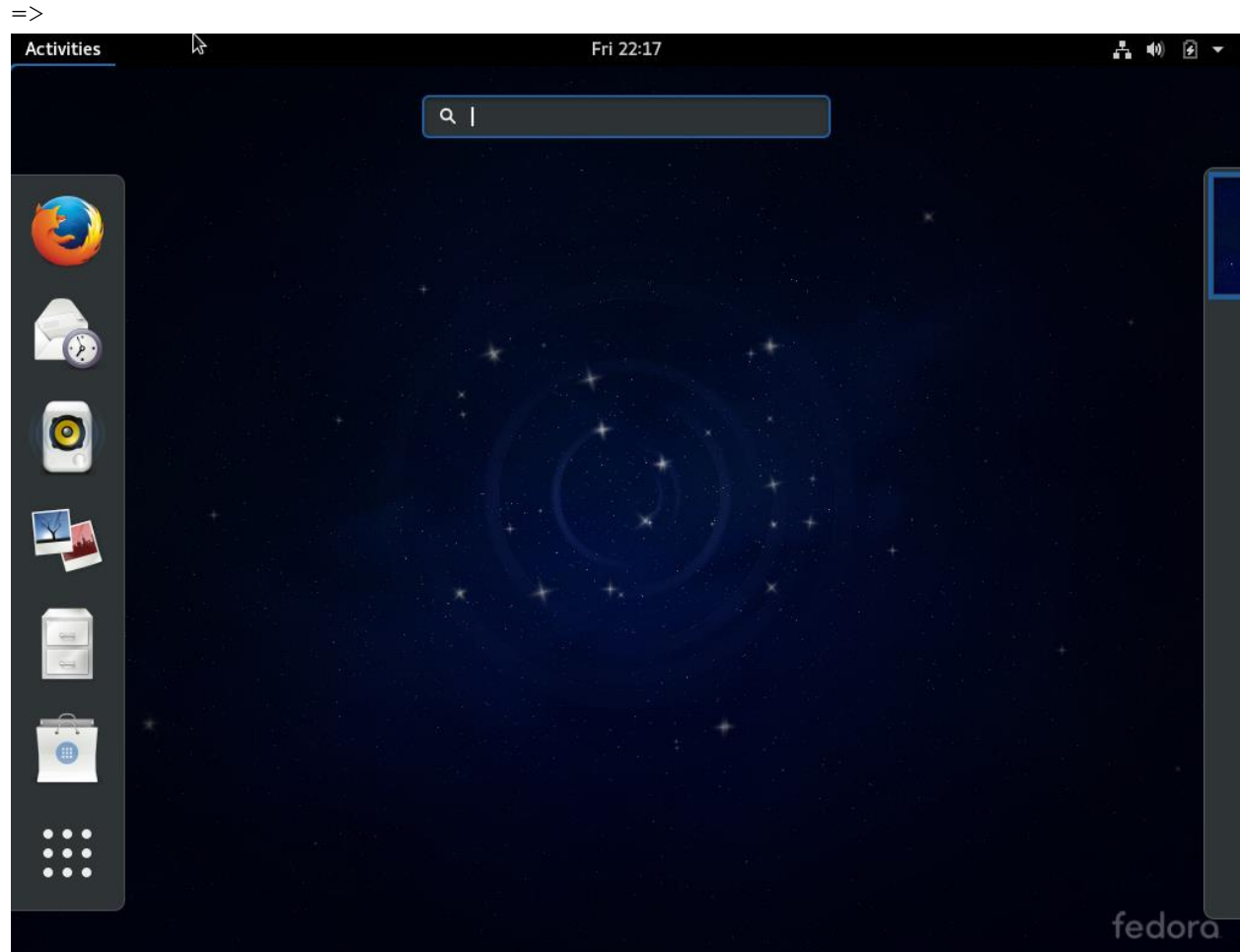
waiting for X server to shut down error setting MTRR (base = 0xe0000000, size =
0x08000000, type = 1) No such device (19)
    (II) Server terminated successfully (0)
. Closing log file.

[root@localhost ~]# _

```

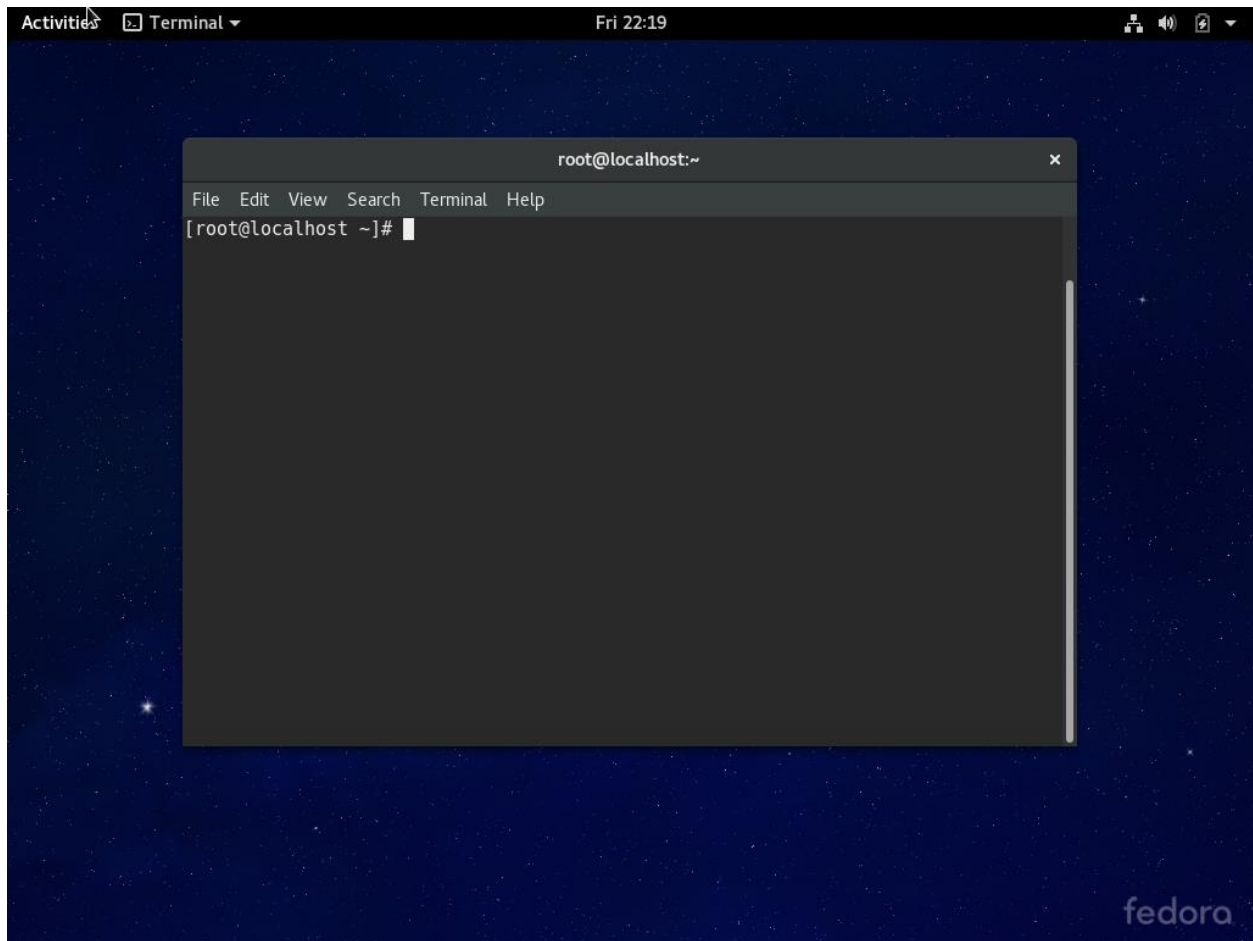
39. Click the Activities menu and navigate to Show Applications, Settings. Click Displays and select your display. Note that you can configure the resolution for your current display. Note that the list is limited primarily because you are running a graphical desktop within a virtual machine. Close the Displays window when finished.





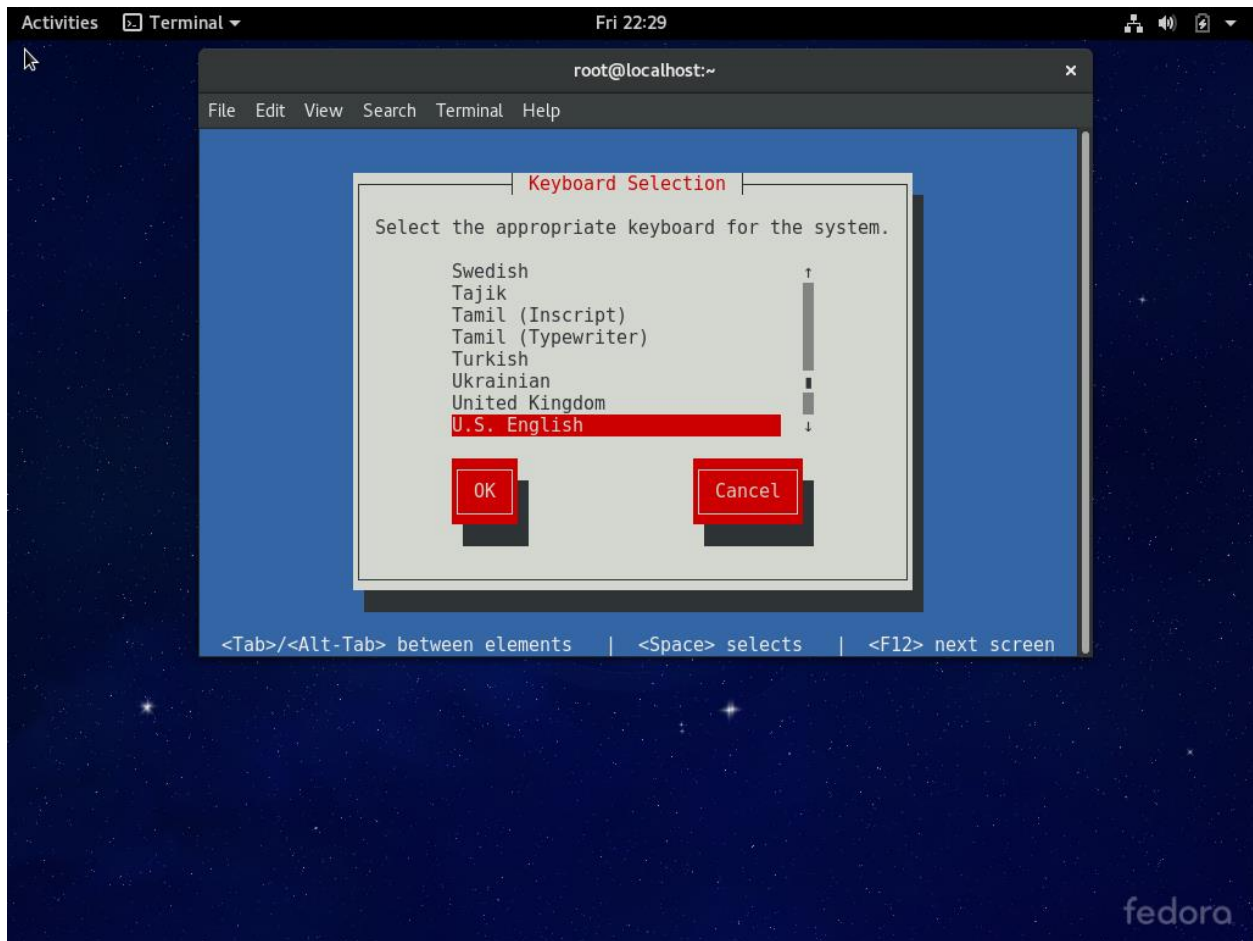
40. Click the Activities menu and navigate to Show Applications, Utilities, Terminal to open a command-line terminal. At the command prompt, type `su - root` and press Enter to switch to the root user. Supply the root user password of LNXrocks! when prompted.

=>



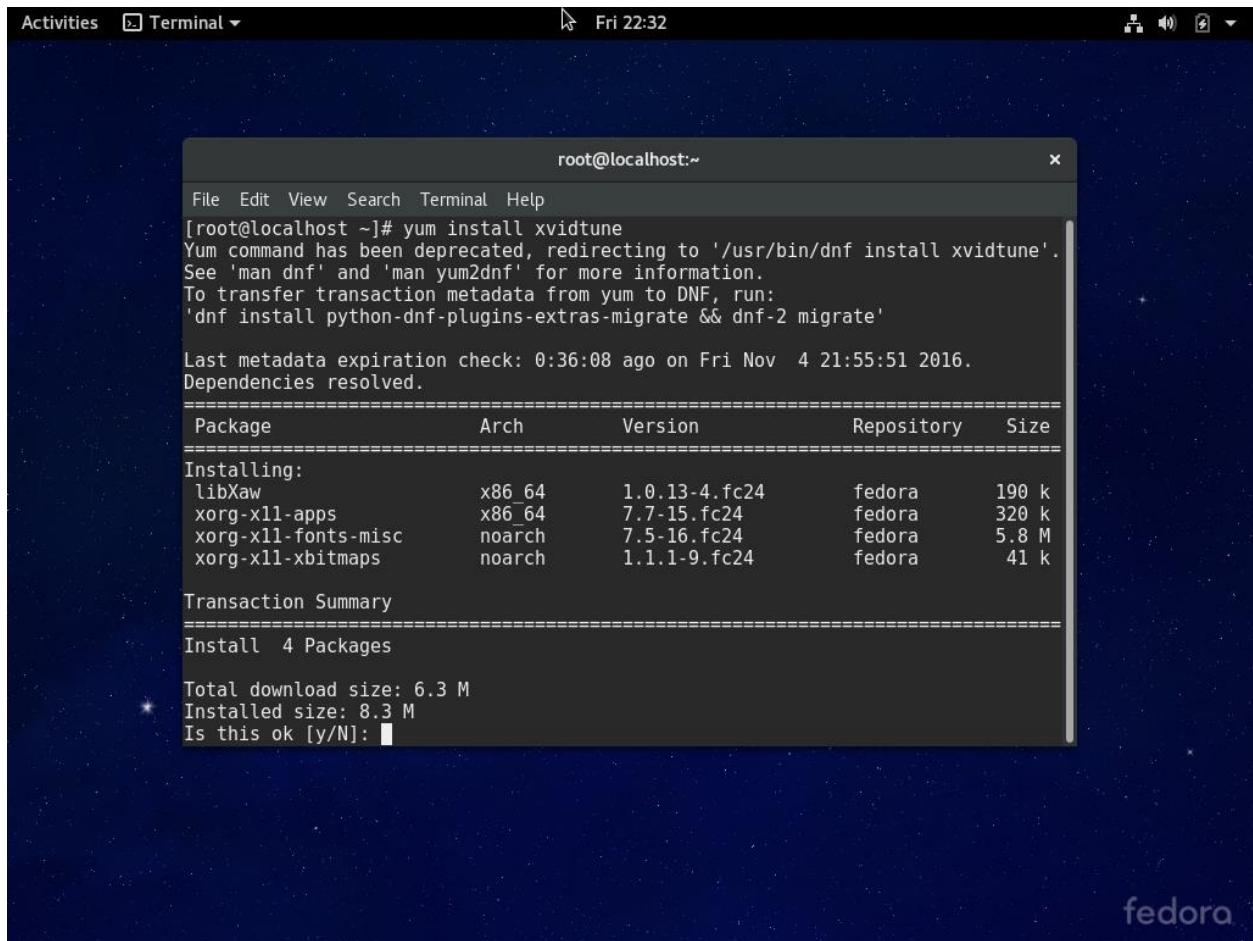
41. At the command prompt, type `system-config-keyboard` and press Enter. Note that you can optionally choose a different keyboard for use with X Windows. Use the Tab key to select the Cancel button and press Enter to quit the Keyboard Selection utility.

=>



42. At the command prompt, type `yum install xvidtune` and press Enter. Press `y` when prompted to install the `xvidtune` utility.

=>



```
root@localhost:~  
File Edit View Search Terminal Help  
[root@localhost ~]# yum install xvidtune  
Yum command has been deprecated, redirecting to '/usr/bin/dnf install xvidtune'.  
See 'man dnf' and 'man yum2dnf' for more information.  
To transfer transaction metadata from yum to DNF, run:  
'dnf install python-dnf-plugins-extras-migrate && dnf-2 migrate'  
  
Last metadata expiration check: 0:36:08 ago on Fri Nov 4 21:55:51 2016.  
Dependencies resolved.  
=====
```

Package	Arch	Version	Repository	Size
Installing:				
libXaw	x86_64	1.0.13-4.fc24	fedora	190 k
xorg-x11-apps	x86_64	7.7-15.fc24	fedora	320 k
xorg-x11-fonts-misc	noarch	7.5-16.fc24	fedora	5.8 M
xorg-x11-xbitmaps	noarch	1.1.1-9.fc24	fedora	41 k

```
=====
```

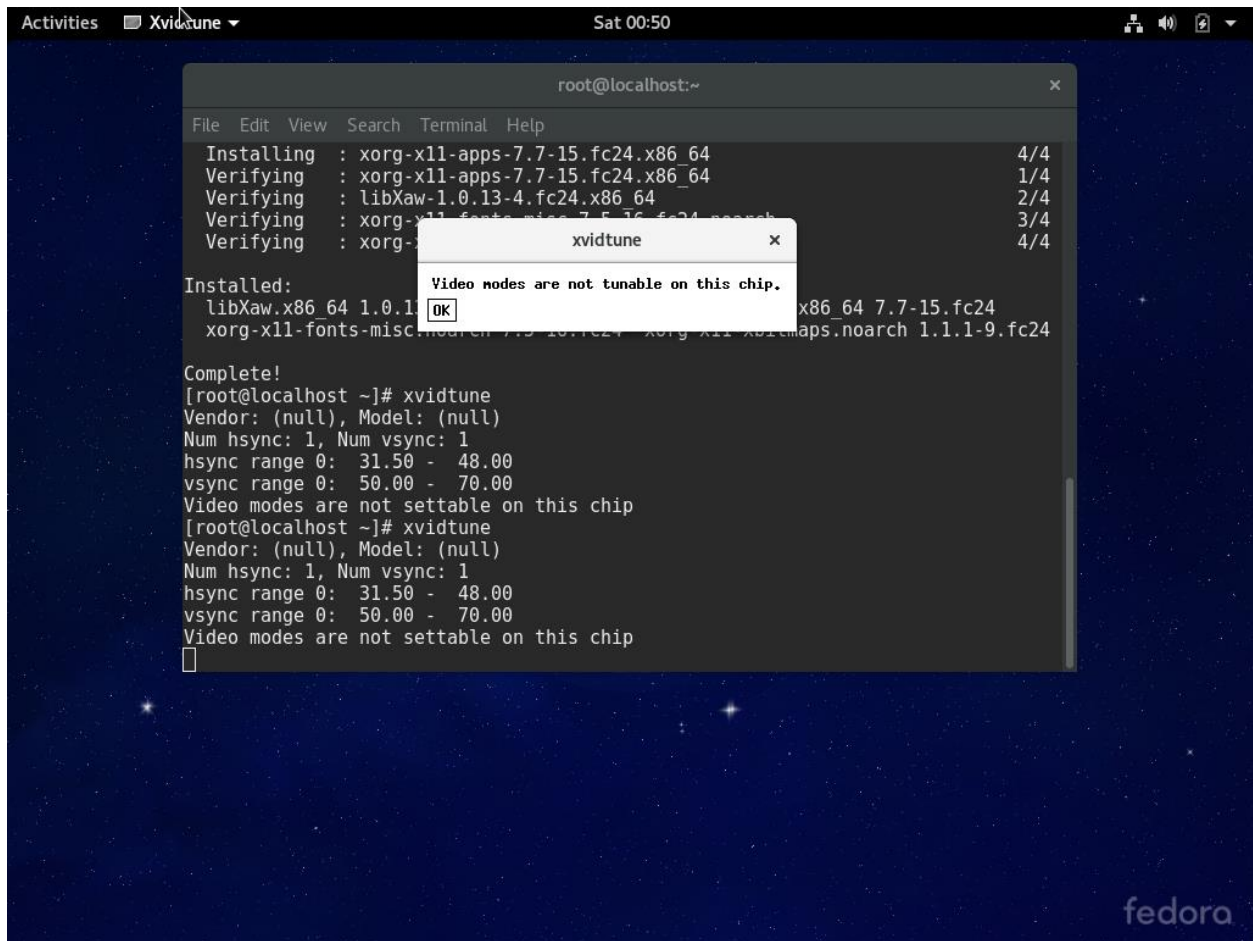
Transaction Summary
=====

Install 4 Packages

Total download size: 6.3 M
Installed size: 8.3 M
Is this ok [y/N]: █

43. At the command prompt, type xvidtune and press Enter. Observe the warning screen and click OK to close it. View the available options in the xvidtune utility and close the xvidtune window when finished.

=>



44. At the command prompt, type `poweroff` and press Enter to power off your Fedora Linux virtual machine.

=> Power off