Lecture -9

Basic Configuration

Managing Ethernet connections:

- Network interfaces are named sequentially: **etho, eth1,** etc
  - Multiple addresses can be assigned to a device with aliases
  - Aliases are labeled eth0:1, eth0:2, etc
  - Aliases ate treated like separate interfaces

View interface configuration with ifconfig [ethx]

If you want to see your LAN card configuration u can see by this command

For example:

[student@stationX ~] **$ Ifconfig ethx** (x is the name of your LAN card)

For enabling and disabling the LAN card

For enable: [student@stationX ~] **$ ifup ethx**

For disable: [student@stationX ~] **$ ifdown ethx**

Network connection names consist of a prefix. Based on the device type, and a number to distinguish a particular device from others of its type. For example, all Ethernet devices have the prefix eth. The first detected Ethernet card is assigned the name eth0. the second eth1 and so forth every system also has a special network device called the 1o, which represent the ‘’ localhost’’ or ‘’ loopback’’ device with address 127.0.0.1 you can view the basic settings of a network device by running the **ifconfig** command. By default will print information on all active devices. If given a device name as an argument. It will print information about that device only:

[student@stationX ~] **$ Ifconfig eth0**

```
Eth0            link encap:Ethernet HWaddr 00:09:6b:cd:2b:87

                Inet addr: 192.168.0.254 Bcast: 192.168.0.255 mask: 255.255.255.0

                Inet6 addr: fe80:: 209:6bff: fecd:2b87/64 scope: link

                UP BROADCAST RUNNING MULTICAST MTU: 1500 metric: 1

                RX packets:851525 errors:0 dropped :0 overruns:0 frame:0

                TX packets:1132322 errors:0 dropped:0 overruns:0 carrier:0

                Collisions:0 txqueuelen: 1000

                RX bytes:211140434 (201.3 mib)  TX bytes: 1113058956 (1.0 gib)
```

Graphical Network Configuration sstem-config-network:

- System->Administration->Network
    - Activate/deactivate interfaces
    - Assign IP Addresses/DHCP
    - Modify DNS settings
    - Modify gateway address

Network Configuration Files Ethernet Devices:

- **Device configuration store in text files**
        - /etc/sysconfig/network-scripts/ifcfg-ethx
    - **Complete list of options in**
        - /usr/share/doc/initscripts-* /sysconfig.txt

Dynamic configuration	**Static configuration**

DEVICE=ethx
HWADDR=0:02:8a:A6:30:45
BOOTPROTO=dhcp
ONBOOT=YES
	DEVICE=ethx
	HWADDR=0:02:8a:A6:30:45
	IPADDR=192.168.0.254
	NETMASK=255.255.255.0

TYPE=ethernet	GATEWAY=192.168.2.254
	ONBOOT=YES
	TYPE=ehternet

Network Configuration File other Global Network Settings:

- Global setting in /etc/sysconfig/network
    - **Many may be provided by DHCP**
    - **Gateway can be overrdden in if cfg file**

```
NETWORKING =YES

HOSTNAME=server1.example.com

GATEWAY= 192.168.2.254
```

Some network settings are defined by globally. Rather than on a per-interface basis. These global network settings are defined in the /etc/sysconfig/network file. Some of the more important settings that can be defined in this file include:

Setting	**meaning**
Networking	Whether to enable networking at all. Should normally be set to yes.
GATEWAY	The IP Address of the system or devices to send message

destined for hosts on another networks. It is the responsibility of the gateway to determine how to contact the destination host. Specifying this is only necessary when not using DHCP. This can also be set in an ifcfg, the gateway defined in the most recently activated ifcfg file used

HOSTNAME — The system’s hostname. This should be the DNS name that Resolves to its primary IP address. If you are using DHCP, it Is probably not necessary to define this. If you do not define this and your system it is not using DHCP then it will ask DNS what name is associated with your IP address and use that. If DNS does not have a name associated with your IP, your system will be assigned the name localhost.localhost in

Network Configuration Files DNS Configuration:

- Domain Name Service translates hostnames to network addresses
- Server address is specified by dhcp or in /etc/resolv .conf

```
Search example.com cracker.org

name server 192.168.0.254

name server 192.168.1.254
```

Printing in Linux:

- Printer may be local or networked
- Print requests are sent to queues
- Queued jobs are sent to the printer on a first come first served basis
- Jobs may be canceled before or during printing

Printing:

Having created a file, you will no doubt what to print it. The printing system in red Hat enterprise Linux is very flexible. Printers may be parallel, serial, or networked. Support is included for printing to remote CPU's IPP, ipd (common Linux and UNIX printing subsystem), windows, Netware, and jetdirect printers.

Queues

One or more queues is associated with each printer. Print jobs are sent to a queue, not to a printer, different. Different queues for the same printer may have differing priority or output options. A setting up print queues is the responsibilities of the system administrator; individual users do not create print queues.

Jobs:

Once a file has been sent to a queue for printing, it is called a job, jobs may be canceled while they are printing. Or when they are in the waiting to be printed.

System –Config-Printer:

- **System◊ administration◊ Printing**
- **Supported printer connections:**
  - Local (parallel or used)
  - Unix/Linux print server
  - Window print server
  - Netware print server
  - HP jet direct
- **Configuration stored in** /etc/cups/printers. Conf

Printing Commands:

- **lpr** sends a job to the queue to be printed
    - Accepts ASCII, post scripts
- **lpq** views the contents of the queue
- **lprm** removes a job from the queue
- System V printing commands such as lp, lpstat and cancel are also supported

Using the print utilities:

The **lpr** command is used to send a job to the printer. The Linux printing system will print files in ASCII. Postscript, PDF, and other formats. Most applications under Linux output post script.

The **–p** option is used to select a queue other than the default and-# is used to specify the number of copies. For example, to print 5 copies. Of the file reports on the accounting printer:

```
[student@stationX ~] $ lpr –p accounting -#5 report.ps
```

lpq views the contents of the queue

When entered without options. **Lpq** lists the jobs in the default queue. As with **lpr, -p** is used to specify a queue other than the default. For example:

```
[student@stationX ~] $ lpq
```

```
Printer: ps@localhost

Queue: no printable jobs in queue
```

```
Server: no server active

Sataus: job ‘jay@localhost+916’ removed at 12:16:03

Rank owner/id                        Class job files    size time

Done  jay@localhost+185              A  185   results   2067   08:38:04
```

To remove a job from the print queue, use **lprm** followed by the job number, specify a non-default print queue if necessary. For example:

```
[student@stationX ~] $ lprm 916
```

In this example. **Lprm** responds with the name of the queue from which the job was removed. Note that a user may only remove his own print jobs from the queue.

Printing Utilities:

- **evince** views PDF documents
- **lpstat –a** lists configured printers
- **enscripts** and **a2ps** convert text to postscripts
- **ps2pdf** convert postscripts to PDF
- **mpage** prints multiple pages per sheet

Tools to assist in printing tasks:

Several utilities are included with red Hat Enterprise Linux to create output for the printer and interact with postscript files.

Enscript, a2ps:

These command convert text to postscript and send it to the print queue or a file. They are often useful to send the output of a command to the printer via a pipe.

evince:

the evince utility is used to view PDF files.

Ps2pdf:

This utility creates PDF files. You can use any program that will create a postscript file, and then use ps2pdf to convert it to a pdf file. There are a number of versions of this program called ps2pdf12, ps2pdf13, ps2pdf14, respectively creating PDF version 1, 2, 3 and 1, 4 output files.

Pdf2ps:

This utility converts PDF files to postscripts, which makes it easy to print PDF documents right from the command line. There is also a pdftotext which converts pdf documents to plain text documents.

Mpage

Prints ASCII or postscript input with text reduced in size, so that multiple pages of input appear on a single sheet of paper.

Setting the system's Date and time:

- **GUI: system-config –date**
    - System ◊ administration ◊ date & time
    - Can set date/times manually or use NTP
    - Addition NTP servers can be added

    - Can use local time or UTC
- **CLI: date [MMDDhhmm[[cc]yy][-ss]]**
    - # date 01011330
      date   010113302007.05

The most basic way to after your system's date is to use the date command date –help reports that the following syntax should be used:

[mmddhhmm [[ccyy] [.ss]]

This means that you must at least provide two-digit values for the month, day hour and minute you wish to set, with an optional two or four digit year and an optional number of seconds, preceded, by a period some examples:

```
# date 12312359            #   31st  of dec,  at  11:59pm. No  change to the year.

# date 123123592007     #   as above,  but  also sets  the year  to  2007

# date   01010101.01       #   list  of  jan,  at  01:01:01am.  No change  to  the  year.
```

While less intuitive than graphical tools. Date has the advantages of not relying on a graphical environment and being easy to use in a shell script.

System-config-date is used to graphically configuration your system's date and time setting. It can be accessed by selecting system->administration->Date & time

Occasionally. all the controls on the first tab are unelectable (grayed-out). This mean that the system's time is being set from another server via the Network time protocol (NTP) and cannot be set manually. To regain manual control click the second tab. **Network Time protocol** and deselect the **Enable network Time protocol** checkbox.

On **time Zone** tab the system clock can be set for local time or for UTC (Greenwich Mean Time). This is controlled by selecting the **system clock uses UTC** checkbox.

Lab 10:

Understanding the Configuration Tools

Goal: Become familiar with some of Red Hat Enterprises Linux's system administration tools.

System Setup: A working. Installed Red Hat Enterprise Linux system with an unprivileged user account named student with a password of student. Root's password should be redhat

Sequence 1: Configuration the Network with system-config-network

Scenario: you wish to use system-config-network to add a second IP address to eth0 the address for this interfaces will be 192.168.50.x where x is your station number.

Instruction:

1. Select system->Admission->Network.

Enter the root password, **redhat**, if prompted.

1. Click New, highlight Ethernet Connection, and click forward.
2. Highlight the device associated with eth0 and click forward.
3. Enter 192.168.50.x where x is your station number in the Address field.
4. Enter 255.255.255.0 in the subnet mask field. Leave the gateway field blank.
5. Click forward, then apply.

6. You should see a new profile attached to eth0 with the nickname’’eth0:’’, Note that it is inactive by default. Highlight the new interface and click **Activate**. If you are prompted to save your changes, click **yes**

7. When your neighbor has also completed this exercise you cant test each other’s configurations with the ping. For example. If your neighbor is at station1. you can run:

[student@stationX ~] **$ Ping -c4 192.168.50.1** to test

Sequence 2: Configuring the network with interface configuration files

Scenario: you will begin by examining the **ifcfg** file created by the previous exercise then you will create a new interface using only a text editor.

Instruction:

1. Open a terminal and run **/sbin/ifconfig**. Among the output you should see an entry for your new interface:

```
Eth0:1            link encap:Ethernet          Hwaddr      00::oc:29:2e:be:8a

                   Inet  addr:192.168.50.x      bcast:192.168.50.255

                 Mask: 255.255.255.0


               UP BROADCAST  RUNNING  MULTICAST  MTU:1500 Metric:1

               Interrupt: 169 Base  Address:0x1080
```

1. Why do need to type the full path to /sbin/ifconfig if you are not logged in as root?
2. **Cd** to the /etc/sysconfig/network-scripts directory and examine the ifcfg-eth: 1 file. You should see something like this

```
[student@stationX network-scripts]$ cat ifcfg-eth0:1

# please read /usr/share/doc/initscripts-*/sysconfig.txt
# For the documentation of these parameters.


Type=Ethernet

DEVICE=eth0:1

BOOTPROTO=none

NETMASK=255.255.255.0

IPADDR=192.168.50.x

USERCTL=no

IPV6INIT=no

PEERDNS=yes
```

3. You can now use this file as a template to create new interface configurations. Begin by creating a copy of eth: 1’s configuration called eth0:2:

```
  [student@stationX network-scripts]$ sudo cp  ifcfg-eth0:1 ifcfg-eth:2
```

4. Open ifcfg-eth0:2 and the following changes:

    - Change DEVICE to **eth0:2**
    - Change IPADDR to **192.168.51.x,** where x is your station number
    - Change USERCTL to **yes**

If you are using vim, this can be accomplished with the following command sequence:

3Dwn 4w r2

3Down 2w Right r1

Down Left cw yes

Esc: wq

6. Bring your new interface up: Note that because of USERCTL, being set to yes, you do not need to be root to do this:

```
[student@stationX network-scripts] $ /sbin.ifup eth: 2
```

7. Use **ifconfig** to verify that your new interfaces have the expected settings. You should see something like:

```
Eth0:2        link encap: Ethernet       Hwaddr   00:0C:29:2e: BE: 8a

               Inet addr: 192.168.51.x Bcast: 192.168.51.255

               Mask: 255.255.255.0

               UP BROADCAST RUNNING MULTICAST MTU: 1500 Metric: 1

               Intrupt: 169 Base addresses: 0x1080
```

1. Work with a partner to use to ping to verify the connection, as in the previous exercise.
2. clean up by brining both interfaces down:

```
[student@stationX network-scripts] $ sudo ifdown eth: 1

[student@stationX network-scripts] $ Ifdown eth: 2
```

3. Will these interfaces be re-enabled if the system is rebooted? Why or not?