



Red Hat System Administration II

Course Outlines

- Network Configuration
- Installing and Managing Software



Network Configuration



Network Interfaces

- Interface names

- eth0
- eth1
- eth2
- wlan0 (the first wireless device)
- virbr0 (internal bridge set up for virtual hosts)
- ...

- To view MAC address

- Use `ifconfig` command
- Use `/sbin/ip` command



Network Interfaces Commands

- /sbin/ip is used to show or temporarily modify devices
 - # ip addr show eth0
- The `ifconfig` command displays and configures IP addresses on network interfaces.
- To display the network settings of all active network devices
 - # `ifconfig`
- To see both active and inactive network device setting
 - # `ifconfig -a`
- To bring up or down a network interface
 - # `ifdown eth0`
 - # `ifup eth0`



Hostname Resolution

- The hostname command displays or temporarily modifies hostname

```
# hostname
```

```
iti.gov.eg
```

```
# cat /etc/hosts
```

```
192.168.0.250  iti.gov.eg  iti #Added by NetworkManager
```

```
127.0.0.1      localhost.localdomain localhost
```

```
.....
```



Modifying Network Configuration

- NetworkManger provides network status information and graphical configuration tools that can create, edit and remove connections and interfaces.
- To change from using DHCP to static IP address
 - Right-click the NetworkManger icon in the top Panel and select **Edit connections**
 - On the **wired** tab, select **System eth0** and click **Edit** tab
 - Select **IPv4 Setting** tab
 - On the **Method** drop-down menu, change **Automatic (DHCP)** to **Manual**
 - Under **Addresses** click **Add** and enter the Ipv4 address, netmask gateway router and DNS server to use
 - Make sure that **Connect automatically** is checked so the interface starts at boot and **Available t o all users** is checked so that it is available system-wide
 - Click **Apply** to apply your changes



Modifying Network Configuration cont'd

- Editing interface configuration files `/etc/sysconfig/network-scripts/ifcfg-<interface-name>`

Static	DHCP	Any
<code>BOOTPROTO=static</code> <code>IPADDR=192.168.0.250</code> <code>PREFIX=24</code> <code>GATEWAY=192.168.0.254</code> <code>DNS1=192.168.0.254</code>	<code>BOOTPROTO=dhcp</code>	<code>DEVICE=eth0</code> <code>ONBOOT=yes</code> <code>HWADDR=52:54:00:00:00:FA</code> <code>MODE=Managed</code>



Modifying Network Configuration cont'd

- The `/etc/sysconfig/network` is used to specify hostname and may specify a static default gateway

```
# cat /etc/sysconfig/network
```

```
NETWORKING=yes
```

```
HOSTNAME=iti.gov.eg
```

```
GATEWAY=192.168.0.254
```

- If an entry is not found in `/etc/hosts`, then the DNS will be responsible for associating hostnames with IP addresses

```
# more /etc/resolv.conf
```

```
domain gov.eg
```

```
search gov.eg
```

```
nameserver 213.131.65.20
```

```
Nameserver 163.121.12.2
```

When changing any system configuration, remember to:

Modify the configuration file

Restart a service

Verify the change



Network Troubleshooting

- IP Address and Subnet mask
 - Test using ping command
 - Check ip addr
 - Fix by editing in /etc/sysconfig/network-scripts/ifcfg-*
- Routing/Default Gateway
 - Test using traceroute command
 - Check ip route
 - Fix by editing in /etc/sysconfig/network-scripts/ifcfg-*
- Name Resolution
 - Test using host command
 - Check /etc/hosts and /etc/resolv.conf
 - Fix by editing in /etc/sysconfig/network-scripts/ifcfg-*



Useful Commands

```
# ping -c 2 192.168.0250
```

```
... .
```

```
# traceroute -Tn www.redhat.com
```

```
... .
```

```
#host ns1.redhat.com
```

```
ns1.redhat.com has address 66.187.233.210
```

```
# getent hosts ns1.redhat.com
```

```
# nslookup ns1.redhat.com
```

```
Server:          216.99.225.30
```

```
Address: 216.99.255.30#53
```

```
Non-authoritative answer:
```

```
Name: ns1.redhat.com
```

```
Address: 66.187.233.210
```



Installing and Managing Software



Introduction to yum command

- Yum is a powerful command-line tool that can be used to
 - Install
 - Update
 - Remove
 - And query software packages
- Yum is automatically configured to use Red Hat repository when you register your machine, but still you can configure yum to get packages from third-party package repositories over the network



Basic yum Commands

- To display usage information
 - `yum help`
- To display installed and available packages
 - `yum list`
- To list packages by keywords
 - `yum search KEYWORD`
- To display detailed information about a package
 - `yum info PACKAGENAME`



Basic yum Commands Cont'd

- To obtain and install a software package, including dependencies

`yum install PACKAGENAME`

- To remove an installed software package, including any supported packages

`yum remove PACKAGENAME`

- To obtain and install a newer version of software package, including any dependencies

`yum update PACKAGENAME`

- To display the packages that match pathname specified

`yum provides PATHNAME`

To install local packages files

`yum localinstall PACKAGEFILE.rpm`



Introduction to RPM

- Package installation is never interactive
- No such thing as a patch
- The local RPM database is maintained in `/var/lib/rpm`
- Package name: `name-version-release .architecture.rpm`



RPM Package Manager

- RPM components
 - Local Database
 - In `/var/lib/rpm`
 - Stores information about installed packages such as file attributes and package prerequisites
 - rpm and related executable
 - Compressed archives of files and associated dependency information.
 - Package files
 - Package files named `name-version-release.architecture.rpm`
 - Version refers to the open source version of the project
 - Release refers to Red Hat internal patches to the open source code.



RPM Package Manager cont'd

- Primary Functions
 - Install
 - Upgrade
 - Remove
 - Query
 - Verify



Install Software

- When installing an rpm package, `rpm` will consult the local database to ensure that
 - Any prerequisites are installed on the system
 - Installing the rpm will not clobber any preexisting files.
- To install software
 - `-i` or `--install` option
- To omit the dependency check
 - `--nodeps` option
- To omit the replacement check
 - `--replacement` option
- To omit both checks
 - `--force` option



Installing Software cont'd

- Example

```
# rpm -i zip-2.5-8.i386.rpm
```

- Useful options

- **-v** option
 - Print package name
- **h** option
 - Print hash marks



Upgrading Software

- The original package will be removed except the configuration files.
- Configuration files from the original installation are saved with `.rpmsave` extension.
- To upgrade software
 - `-U` option
- Freshening software
 - `-F` option

*What is the different between upgrade and freshening ??



Uninstalling Software

- To remove software
 - -e or --erase option

Example

```
#rpm -ihv zip-2.3-8.386.rpm
```

```
#rpm -e zip
```

* The package argument must be the installed package's name, not the package file name.



Query Software

- Query options fall into one of two categories
 - Specify which packages to query.
 - Specify what information to retrieve.

- To list all installed packages

```
#rpm -qa
```

- To display the name including the version and release of a specific package

```
#rpm -q pkg-name
```



Query Software cont'd

- To display a package information

```
# rpm -qi pkg-name
```

- To list files contained in a package

```
# rpm -ql pkg-name
```

- To display the package name that owns a certain file

```
# rpm -qf filename
```

- To display package prerequisites

```
# rpm -q --requires pkg-name
```



RPM Verification

- Verifying an installed package compares the file sizes, permissions, type, owner, group, checksum and modification time against RPM database.
- Any inconsistencies will be reported.
- An installed package can also be verified against a package file



RPM Verification cont'd

- To verify an installed package against the RPM database

```
#rpm -V pkgname
```

- To verify all installed RPMs against the RPM database

```
#rpm -Va
```

- To verify installed package against a given package file

```
#rpm -Vp pkg-name
```



Using Third-Party Repositories

- Third-party repository are network-accessible of software package files which can be accessed by yum
- Put file in /etc/yum.repos.d directory to enable support for new third-party repository.
- Example of /etc/yum.repos.d/*.repo configuration

```
[Myrepo]  
name= my repository  
baseurl=file:///media/...  
gpgcheck=0
```



Thanks ☺

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