

# ESSENTIALS OF RED HAT LINUX

Session 2

## Linux Installation



# Objectives

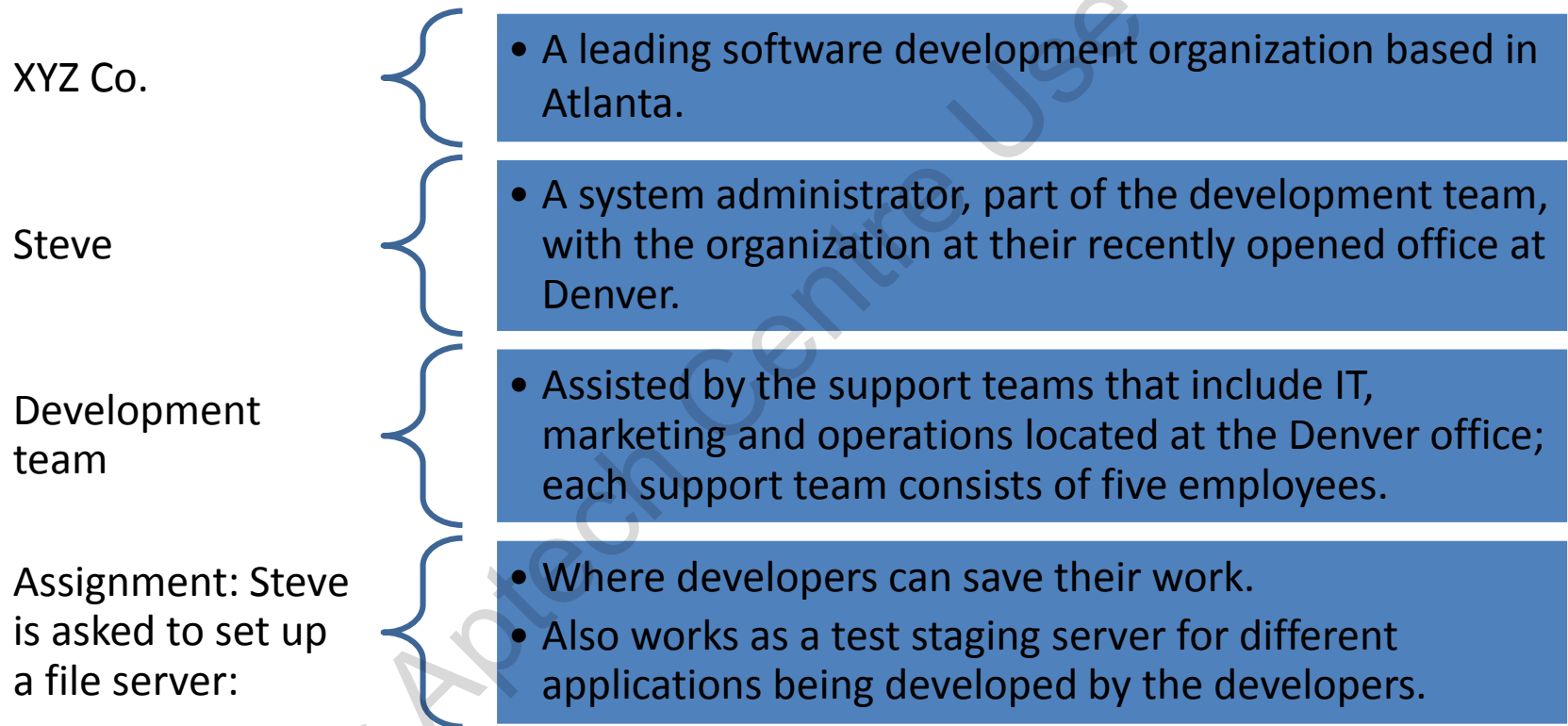


- Explain the process of installing Linux operating system
- Explain the process of logging on the Linux operating system
- Explain the process of installing software packages
- Perform the Red Hat Enterprise 5.0 installation
- Create users and log into the system
- Manage Users
- Use Linux commands

# Installing Linux [1-2]



- This scenario helps users to understand the Linux installation process.





# Installing Linux [2-2]

- Steve decides to set up RHEL server to work as file and application hosting server for the purpose.
- Steve's expectations for the server are:
  - Robust enough to take higher workloads
  - Modular by design
  - Less prone to virus attacks as compared to other operating systems
  - Highly reliable and scalable for hosting enterprise applications
- The installation tasks and pre-installation requirements are:
  - Required version of RHEL
  - Compatibility of the hardware with the selected distribution of Linux

# Identifying the Pre-requisites for Installation [1-2]



- Ensure that the computer meets the minimum hardware requirements, including:

A compatible processor
Bus
Memory
Modem
Printer
Network Interface Card (NIC)
Hard disk
Video card
Mouse
Keyboard
CD-ROM drive

- Ensure that devices used during installation are compatible with the distribution of installed Linux.

# Identifying the Pre-requisites for Installation [2-2]



- The devices are:

Processor
Bus
Memory
Modem
Printer
SCSI Controller
Hard Drive
NIC
Video Card

# Choosing the Type of Installation



- After understanding the hardware and software requirements for RHEL, the user determines whether to perform:
  - An upgrade or
  - A new installation

Upgrade is recommended when users are moving to the next version.

It is difficult to upgrade from a very old version to the new version because of incompatibilities between the versions.

When users upgrade their computer, the system installs updated versions of the packages.

- The upgrade process preserves the existing configuration files by renaming them with an `.rpmsave` extension.

# Choosing the Mode of Installation [1-2]



- To install RHEL, choose an appropriate installation method.
  - The selected method depends on how users access the installation files.
- The table lists the supported installation methods.

Installation Method	Description
Using a CD Drive/DVD	This method uses a CD-ROM/DVD that stores the installation files for RHEL. By default, the installation program searches for the IDE CD-ROM/DVD drive to initiate the installation. However, if users are using the SCSI CD-ROM/DVD drive, they must select a SCSI driver during the installation. The CD-ROM method should be used if users have to install RHEL on a single computer or users do not have a setup ready for installing it over a network.
Using a hard drive	This method uses the RHEL installation files stored in a folder on the hard drive of a local computer for Linux installation. The installation files are stored in the same folder structure of a CD-ROM/DVD in the form of an ISO image. This enables the installation program to access this directory to install Linux. The hard drive method requires that the hard disk used for installation should have an operating system installed on it. This method of installation is the quickest because the installation files are locally stored on the hard disk. The hard drive method is used only if users do not have the startup CD-ROM to install Linux.



# Choosing the Mode of Installation [2-2]



Installation Method	Description
Using a Network File System (NFS) Server	This method uses an NFS server that stores the Linux installation files. The NFS server exports the directory that contains Linux installation files to the system when users install Linux. Alternatively, the NFS server can export the mirror image of the Linux installation files. Users should configure the NFS server to access the installation files to install Linux. Users can use the NFS method if they have to install Linux over LAN. NFS method is useful when users have a large number of installations to perform. For example, Steve has to install Linux on all the computers on the network. Steve should use the NFS method if NFS is already configured on the network.
Using a File Transfer Protocol (FTP) Server	This method uses an FTP server to install Linux. For the installation, users should access the installation files stored in a directory on the FTP server. FTP method should be used when there are a large number of installations to be done.
Using an Hyper Text Transfer Protocol (HTTP) server	This method uses the HTTP (Web) server to install Linux. For the installation, users should access the installation files stored in a directory on the HTTP server. Users can access the HTTP server by using its name or IP address. HTTP method should be used when there are a large number of installations to be done.



# Serial Console Installation

- Commonly used on servers and computers without an interface.
- To enable a serial console installation, two computers are required:

One computer, on which the Linux installation takes place

One from where the installation is initiated and controlled

A null modem cable between the serial ports is used to connect both computers.

A terminal script is executed on the computer controlling the installation, to provide access to the console of the server.

- The command to be executed to initiate the installation:  
`boot: console=<device>`
- In the given command, the <device> parameter specifies the device name of the serial port, such as ttyS0.

# Troubleshooting Installation Issues [1-2]



- The table lists some of the common troubleshooting problems along with the appropriate solutions.

Problem	Description/Symptom	Solution
Unable to boot RHEL	Users can face a situation where they just performed installation but cannot restart the computer.	Reinstall and rearrange disk partitioning.
Computer displays signal 11 error	<p>This type of error is also referred to as segmentation fault. This can occur due to reasons that are as follows:</p> <ul style="list-style-type: none"><li>One of the programs tried to access the memory location that was not assigned to it.</li><li>There is a bug in one of the software programs installed on the computer.</li><li>There is a hardware error in the memory of the system's bus.</li></ul>	<p>The steps to be performed are as follows:</p> <ol style="list-style-type: none"><li>Ensure that users have the latest installation updates and images from Red Hat.</li><li>If this solution does not work, it can be a hardware issue. These issues are generally related to the computer's memory or CPU-cache.</li><li>A possible solution for this error is to turn off the CPU-cache in the BIOS.</li><li>Swap the computer's memory in another motherboard slot to check if the problem is with the slot or memory.</li><li>Check the installation media.</li></ol>

# Troubleshooting Installation Issues [2-2]



Problem	Description/Symptom	Solution
Facing issues with booting into the graphical installation	There can be issues with some video cards that can lead to problems with booting into the graphical installation. In such a scenario, if the installation does not run using its default settings, it tries to run in a lower resolution mode. Alternatively, the installation software attempts to run in text mode.	Possible solutions are as follows: 1. To adjust the resolution from the boot option. 2. To update the video card drivers. There can be a possibility that the correct video card drivers were not loaded with the operating system boot up. Installing correct video card drivers can solve this problem.
No devices found to install RHEL Error Message	If this error occurs, there can be a problem that the SCSI/IDE controller is not being recognized by the installation program.	One of the possible solutions is to check the hardware vendor's Web site to determine if the drivers are available.
Using all the available free space	Users have created a swap and a / root partition and selected the root partition to use the remaining space, but they still see unused hard disk space.	In case the hard drive is more than 1 GB, users can use all of the remaining space on the hard drive by creating a boot partition.

# Logging on to the Red Hat Enterprise Linux System



- After starting the Linux system, a login prompt that appears as:  
Red Hat Enterprise Linux Server release 6.0 (Santiago)  
Kernel 2.6.32-71.el6 on an i686  
<server name> login: \_
- In the prompt, <server name> indicates the hostname of the system – enter the user name at the login prompt and enter the password.

```
Red Hat Enterprise Linux Server release 6.0 (Santiago)
Kernel 2.6.32-71.el6 on an i686
<server name> login: root
Password:
```

- The entire login process appears as:

```
Red Hat Enterprise Linux Server release 6.0 (Santiago)
Kernel 2.6.32-71.el6 on an i686
<user name> login: root
Password:
Last login: Mon Oct 21 11:18:01 from 171.15.58.123
[user name> root]$ _
```

# Working with Gnome [1-2]



- GNOME is:
  - A user-friendly desktop environment that can run on multiple operating systems.
  - The default desktop environment for RHEL.
  - An open source desktop environment.
  - Consists of a set of X clients built to support an X desktop environment.

The default window manager for GNOME is Metacity.

It can run with other window managers that are GNOME-compliant, such as Enlightenment and Sawfish.

Being GNOME-compliant indicates being aware of the GNOME features.

Users can run non-compliant window managers on the GNOME desktop environment with a negligible loss of functionality.

# Working with Gnome [2-2]



- The GNOME desktop is divided into:
  - Top Menu Panel which is the grey bar at the top of the desktop
  - Desktop Area which is the working area in the centre
  - Bottom Menu Panel which is the grey bar at the bottom



**GNOME Desktop**



# Top Menu Panel [1-3]

- Top Menu Panel contains the following default components.

## Applications Menu

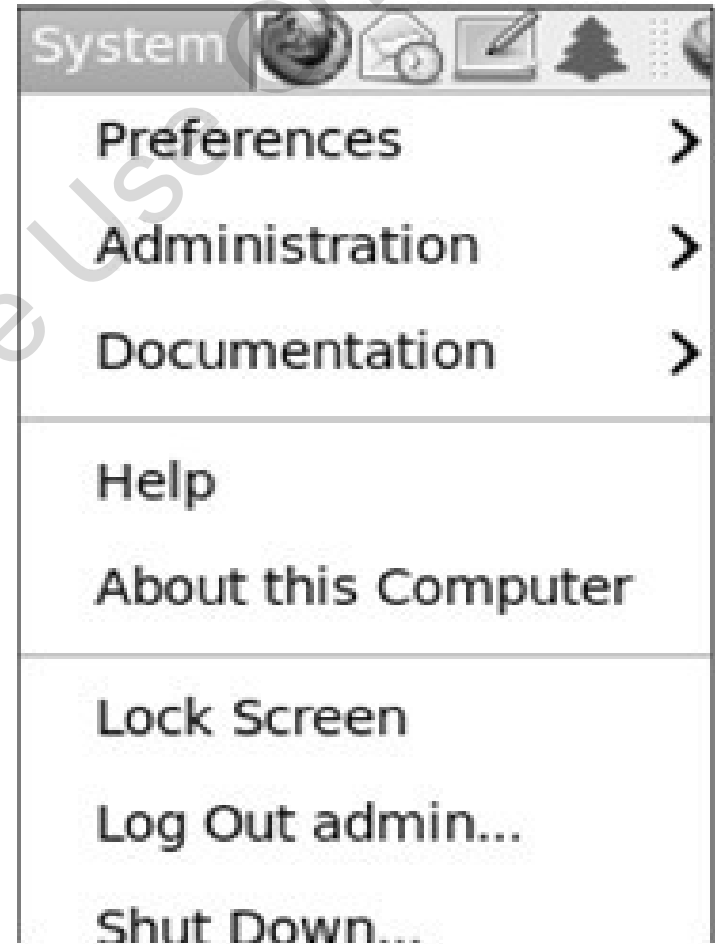
- Contains a hierarchy of submenus, from which applications that are installed on the system can be started.

## Places Menu

- Provides the user places or locations to store the personal files, folders, or documents.

## System Menu

- Provides user access to configuration tools, access to help documentation and allows the user to log out or shut down and many more.



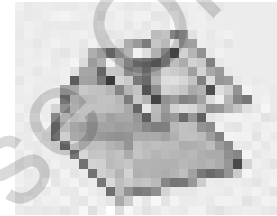
**System Menu**



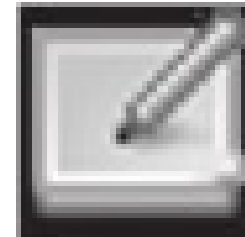
# Top Menu Panel [2-3]



- Application Launchers:
  - Series of icons located next to the menus
  - Help access commonly used applications
- The icons in the Application Launchers are:
  - Mozilla Firefox: Web browser
  - Evolution: Mail client and personal information manager
  - Gnote: Helps taking notes



**Evolution Icon**



**Gnote Icon**

# Top Menu Panel [3-3]



- The right side of the top menu panel contains the following default components:

Notification Area

Volume Control and Sounds  
Preferences Applet

Network Manager Applet

User Switch Area

Clock and Calendar Applet

# Desktop Area



- The default desktop area or workspace contains three icons.

## Computer Icon

Lists the available storage devices on a computer.

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## User Home Icon

A window that contains all the logged-in user's files, such as music, movies, and documents, which are stored by default.

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## Trash Icon

Refers to the Trash folder from which users can access a file that has been deleted.

---

# Bottom Menu Panel or Window List Panel



- The bottom menu panel has three components.

The Window List Panel

- Displays any open application whether visible or hidden as small buttons.

The Workspace Switcher

- Allows a user to move between work spaces.

The Trash Icon

- When users delete a file, it is moved to this area.



# Adding Software Packages

Users can install software packages manually using the `rpm` command.

Software packages for Red Hat supported or sponsored operating systems are made in RPM format.

Software packages for Windows operating system are made available in `.exe` or `.msi` format; Red Hat software packages are made available in `.rpm` format.

These software packages are called rpms or rpm packages.



# Finding RPM Packages

- Users can:
  - Use the `rpm` command to install, update, remove, or query information about rpm software packages.
  - Find a number of rpm packages for different utilities in the rpm repositories.
- The rpm repositories are:
  - Red Hat Enterprise Linux CD/DVD
  - Red Hat Errata Page
  - Red Hat Network

## Red Hat Enterprise Linux CD/DVD

- A repository of all the rpm packages shipped with the Red Hat Enterprise operating system.

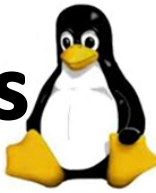
## Red Hat Errata Page

- A repository of rpm packages shipped with the different versions and variants of operating systems by Red Hat.

## Red Hat Network

- An online repository of rpm packages for the different versions and variants of operating systems by Red Hat.

# Using the `rpm` Command to Install Packages



- Users can use the `rpm` command to install rpm packages from the command line.
- The following command can be used to install an rpm package:

```
rpm -ivh<complete path of the rpm package>
```

Where,

- `-i` option indicates that the command involves installation of the rpm package in question.
- `-v` option indicates that the execution of the command is verbose and messages are printed on the screen.
- `-h` option indicates that `#` marks are printed to show the progress of any operations being performed by the command.

# Using the rpm Command to Update Packages



- Users can use the following command to update an rpm package:

```
rpm -Uvh<complete path of the rpm package>
```

Where,

- -U option indicates that the command involves updating the rpm package in question.
- -v option indicates that the execution of the command is verbose and messages are printed on the screen.
- -h option indicates that # marks are printed to show the progress of any operations being performed by the command.



# Using the rpm Command to Query Installed Packages



- Users can use the following command to query all the installed packages:

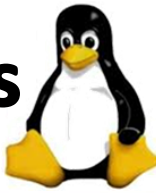
```
rpm -qa
```

Where,

- -q option indicates that the command involves querying an rpm package
  - -a option indicates that the command involves querying all the installed rpm packages
- To check if a particular installation package is installed users can use the following command:

```
rpm -qa | grep <name of the rpm package>
```

# Using the `yum` Command to Install RPM Packages



- Users can use the following command to install an rpm package with yum:

```
yum install <complete path of the rpm package>
```

- To search an rpm, users can execute the following command:

```
yum search <name of the rpm package>
```

# Summary



- Before installing Linux, ensure that the computer meets the minimum hardware requirements.
- Users can either choose to upgrade their computer or do a fresh installation.
- GNOME is a user-friendly environment that can be run on multiple operating systems. The GNOME desktop consists of various components, such as Top Menu panel, Bottom Menu panel, and desktop icons.
- RHEL provides the rpm command to manage the rpm software packages.