Workshop: Linux Installation and Administration
RedHat 7.1 Installation Guide

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Contents

How to use this guide

- This workshop guide is mixed with descriptions of the tasks, explanation of concepts and the steps and keystrokes required. To accomplish the whole installation, you only need to refer to the steps and keystrokes listed in the **How:** sub-sections.

  It does not mean the other descriptions and explanations are useless, on the contrary, the are more important, because they are the usually the reasons behind the steps and keystrokes.

- Text or names in `typewriter` font face are keystrokes.

  e.g.

  Type "`cd /usr/bin`"

  You are told to key in "c", "d", "/", "u", "s", and so on.

Introduction

Different Linux distributions have different installation procedures and environments. In this workshop, we use RedHat 7.1. RedHat 7.1 provides a lot of flexibility for installation without making the installation too complicated to master. Due to its flexibility, we describe one installation procedure that is the simplest. Throughout the installation, variations will be talked about.

This document serves as a guideline for this workshop only. It is not self-contained. To accomplish the requirement of this workshop, this document is enough. For full understanding and more details, you need to read the RedHat manuals listed in the reference section.

Preparation

During installation, you may need the hardware information of your PC. It is better if you have them at hand. The information that you need are:

Display card	Chipset, RAM size
Monitor	Model
Keyboard	Type of keyboard 104key/105key
Mouse	2-button or 3-button, PS/2 or Serial,...

You also need the **RedHat 7.1 CD set**, plus a 1.44M floppy disc.

Procedures

- Basic installation
- Follow-up
- Optional installation steps
- Basic configuration

1 Basic Installation

1.1 Booting

Boot your PC using Disk 1 of RedHat Linux 7.1 CD set. Make sure your PC is able to boot from CD and the boot sequence is set such that CD is looked first. In doubt, check your BIOS setup.

Upon successful loading, you will see a page of description in text mode and a prompt "`boot:`" at the bottom of the screen.

Press "**Enter**" key to proceed booting.

After successful booting, you will be able to see a graphical screen showing "`Language Selection`" on the left-hand column.

1.2 Language Selection

Choose "`English`". This is the default language to be used.

. . . press the "`Next`" button at the bottom to proceed.

1.3 Keyboard Configuration

Here you need to specify your keyboard type and characteristics.

- For "`Model`", pick "`Generic 104-key PC`" which is common for most users.
- For "`Layout`", pick "`U.S. English w/deadkeys`".
- For "`Dead Keys`", "`Enable dead keys`".

. . . press the "`Next`" button at the bottom to proceed.

1.4 Mouse Configuration

Select a mouse type which is nearest to yours. Most PCs nowadays come with 2-button PS/2 mouse. In Unix, 3-button mouse is better. In case yours is a 2-button mouse, select "**Emulate 3 Buttons**" checkbox. Besides generic mouse, there are newer and sophisticated mouses such as *Logitech MouseMan*, *First Mouse*, *Microsoft IntelliMouse*, and so on.

. . . press the "`Next`" button at the bottom to proceed.

1.5 Install Options

Several installation options are available. Two main install options are "`Install`" and "`Upgrade`". "`Install`" allows you to install a plain new RedHat linux with the removal of any data and previous installation. "`Upgrade`" allows you to make your old RedHat installation (e.g. RedHat 7.0, RedHat 6.2, and so on) to the latest RedHat 7.1.

In "`Install`" option, you are allowed to fine tune your installation by selecting "`Server system`", "`Workstation`", "`Laptop`", and "`Custom system`". For most cases, use "`Install`" and "`Workstation`" for desktop PC and "`Install`" and "`Laptop`" for notebook.

How:

Select "`Install`"
Select "`Workstation`"

. . . press the "`Next`" button at the bottom to proceed.

1.6 Disk Partitioning

Here you need to allocate space for storing Linux. Minimally it needs a partition of several Megabytes, we recommend several partitions and 2GB in total for end user system (i.e., "`Workstation`" install option) for data safety, smoothness of system running and ease of backup.

Why partitioning?

1. Better performance when fsck is needed.
2. Crashing of one filesystem (partition) does not affect the others
3. Backup made easy
4. Using different version of the same filesystem made easy.

There is no general rules of partitioning that fit all situations. Plan according to your specific requirements.

There are three choices of disk partitioning:

1. Automatically partition and REMOVE DATA
2. Manually partition with Disk Druid
3. Manually partition with fdisk [experts only]

Pick the first one only when you want an easy life. All disk space not used in any partition plus any existing Linux partitions will be used to create new pre-set linux partitions. All data in the existing Linux partitions will be removed. No recovery is possible.

The next two choices requires you to have knowledge on disk partitioning. Both of them are not difficult, but partitioning with Disk Druid is a bit easier than with fdisk, so we go for the second choice – **Disk Druid**. (But sooner or later, you need to use **fdisk**.)

How:

Select "**Manually partition with Disk Druid**"

. . . press the "`Next`" button at the bottom to proceed.

1.7 Partition

There are many different ways to partition your harddisk, depending on your needs, personal favors, harddisk sizes and the preservation of disk partitions.

In this workshop, we need 5 linux partitions only. Any existing partitions have to be removed first.

Basic operations:

- Use "**Delete**" button to delete unwanted partitions.
- Use "**Add**" button to add new partitions.
- Use "**Edit**" button to change new partitions.

Details of the partitions required for this workshop:

Mount points	**Size** (MB)	**Type**	**Use Remaining Space**	**Allowable Drives**	**On partition**
/	256	Linux Native	no	hda	hda1
swap	512	Linux Swap	no	hda	hda2
/usr	2048	Linux Native	no	hda	hda3
/home	784	Linux Native	no	hda	hda5
/opt	496	Linux Native	yes	hda	hda6

*In case you want to use the existing partitions, set the mount points by using "***Edit***" button.*

. . . press the "`Next`" button at the bottom to proceed.

1.8 Choose Partitions to Format

We need to format all partitions, otherwise previous useless data and files will remain in the harddisk occupying precious disk space.

How:

Select all but `/dev/hda6` partitions.
Select "**Check for bad blocks while formatting**" if
this is the first time you use this harddrive, and/or
after prolonged usage of this harddrive without reformatting.

. . . press the "`Next`" button at the bottom to proceed.

1.9 Network Configuration

N.B. only when the installation program detects the presence of network interface on your PC this configuration step appears.

Configuration of the network serves two purposes:

1. for network installation.
2. for proper network operation after installation.

Even if you are installing using CD set, you may need network operation after installation.

- **Scenario 1:**

  At CSE, we have permanent internet access, it's better to set it up.

  How:

  Select "**Configure using DHCP**"
  Select "**Activate on boot**"
  Leave others untouched.

- **Scenario 2:**

  At Home, you probably have only broadband or dialup network access, it's better to postpone the network setup until the system is installed.

  How:

Blank "**Configure using DHCP**"
Blank "**Active on boot**"
Blank "**IP Address**"
Blank "**Netmask**"
Blank "**Network**"
Blank "**Broadcast**"
Fill-in "**Hostname**" any name you want
Blank "**Gateway**"
Fill-in "**Primary DNS**" ask your ISP
Fill-in "**Secondary DNS" and "Ternary DNS**" if any
ask your ISP for DNS server IP addresses
For example, primary DNS and secondary DNS for ISP Netvigator are `202.252.144.77` and `208.167.231.55` respectively.

. . . press the "`Next`" button at the bottom to proceed.

1.10 Firewall Configuration

Firewall setup protects your system from hostile attack. On safe bet, we better pick the one with better security, so...

How:

Select "**High**"
Select "**Use default firewall rules**"

. . . press the "`Next`" button at the bottom to proceed.

1.11 Language Support Selection

Choosing the languages, you will be able to change the default language to use after installation is complete.

How:

Select "**English (USA)**"
Select "**Chinese (Taiwan R.O.C)**"
Select "English (USA)" as the default language

. . . press the "`Next`*" button at the bottom to proceed.*

1.12 Time Zone Selection

To correctly display time, you need to specify time zone.

How:

Select "**Asia/Hong_Kong**"

. . . press the "`Next`*" button at the bottom to proceed.*

1.13 Account Configuration

You need to give a good password to your root account. Root account is the one with all privileges. A reasonably complicated password yet easy for you to remember is need to protect your system, since this account is used to do all privileged system operations. Never ever write down the password.

How:

Set root account information:

Field	Explanation
Root Password	6-8 characters, reasonably complicated. no dictionary and well-known words, intermingled with alphabets, numbers, non-alphabetic characters.
Confirm	Same password for re-confirmation

Add a normal user account:

Choose whatever usernames you like, e.g. `mary`.

Field	Explanation
Account Name	Username
Password	Must be different from root password
Password (confirm)	Same password for re-confirmation
Full Name	Optional
Press "**Add**" button.	
Repeat if there are additional users.	

. . . press the "`Next`*" button at the bottom to proceed.*

1.14 Selecting Package Groups

Both **GNOME** and **KDE** are graphical environment for your Linux system. Normally choosing either one of them is sufficient. If you have a lot of free disk space for linux (approx. 2GB), and want to play with both of them, we suggest you select them all. The install program will select the appropriate packages to install based on your selection here. However, you can select the individual packages to install if you like, but this is for expert users only.

How:

Select "**GNOME**"
Select "**KDE**" and "**Games**" if you like.
You may select "**Select individual packages**",
but we highly discourage you pick this one. If you do so, you are on your own!

. . . press the "`Next`" button at the bottom to proceed.

1.15 X Configuration

The installation program is sophisticated enough to detect your graphics display card and monitor, provided that they are not too new. In case it cannot detect correctly, choose from the list yourself.

. . . press the "`Next`" button at the bottom to proceed.

1.16 Custom Configuration

Here you can set the color depth, resolution, and default desktop.

How:

Color depth:	True Color (24 Bit)
Screen Resolution:	1024x768
Default Desktop:	GNOME
Login type:	Graphical

1.17 About to Install

. . . press the "`Next`" button at the bottom to proceed.

When the installation program finished using Disk 1, your will prompted to insert Disk 2.

The total installation time from now onwards is about 20 minutes depending on the speed of your harddisk and CDROM.

1.18 Boot Disk Creation

Before the installation is finished, you will be asked if you want to create a boot disk for this system. You are **highly recommended** to make one. This is a rescue disk, in case your Linux can't be booted up. In fact, you can use Disk 1 of your RedHat CD set as your rescue disk, but using floppy is safer. Not all PC supports booting from CD.

How:

If you do not want to create boot disk, select
Skip creation of boot disk.

. . . press the "`Next`" button at the bottom to proceed.

1.19 Rebooting

The system will be rebooted itself, Disk 2 will be ejected. Wait until the system is booted up.

2 Installation follow-up

2.1 Update your system

N.B. If you do the installation at home and you don't have internet connection at this moment, skip this step until you have internet access.

How:

- Login as root, i.e. use `root` as username.
- Open a terminal (check the icon on the task bar at the bottom of the screen)
- Go to directory: `/usr/src/redhat/RPMS/i386`

  Type `cd /usr/src/redhat/RPMS/i386` in the terminal.
- Download required files:
  - Type `ftp ftp.cse.cuhk.edu.hk` in the terminal.
  - Use `ftp` as username
  - Use `a@` as password

    N.B. If you failed to login, try again in a few second. The server may have reached its limit on maximum login sessions.
  - Type `cd /pub/redhat/updates/7.1/en/os/i386`
  - Type `binary`
  - Type `prompt`
  - Type `mget *`
  - Type `bye`
- Install patches:
  - Type `rpm -Fvh *.rpm`
- Remove patches:

  - Type `/bin/rm ./*.rpm`
- Update lilo:

  You need to update lilo if you have upgraded the Linux kernel. How do you know you have upgraded the Linux kernel?
  - Your currently running Linux kernel version: **uname -r**
  - The installed/upgraded kernel: **rpm -q kernel**

  If **uname -r** returns **2.4.2-2** but **rpm -q kernel** returns **kernel-2.4.3-12**, your kernel has been upgraded. The version of the redhat-customized linux kernel you are currently using is 2.4.2-3, but the installed version becomes 2.4.3-12.

  To update your lilo, edit `/etc/lilo.conf`, change **vmlinuz-2.4.2-3** to **vmlinuz**, commented the **initrd** line (if any) by adding **#** at the beginning of the line. Run the command **/sbin/lilo** once.

  Keystrokes:

  `login as root first`

  ```
  vi /etc/lilo.conf
  /vmlinuz
  e
  <SPACE>
  D
  /initrd
  0
  i#<ESC>
  :wq<ENTER>
  /sbin/lilo.conf
  ```

3 Optional Installation

3.1 Ximian GNOME

If you do the installation at home and you don't have internet connection at this moment, skip this step until you have internet access.

How:

Installing Ximian GNOME requires root privilege and graphical interface, so login as root on the graphical login screen.

- Open a terminal (click on "Terminal" icon)
- *At CSE only,*
  Type `export http_proxy="http://proxy.cse.cuhk.edu.hk:8000/"`
  Type `export ftp_proxy="http://proxy.cse.cuhk.edu.hk:8000/"`
- Type `lynx -source http://go-gnome.com | sh`

- At "**Welcome to the Ximian GNOME preinstaller**", press "**Enter**" to proceed.
- Choose "**1) Ximian, Inc**" as the mirror site.
- A window is popped up showing "**Welcome to the Ximian GNOME Installer**"
  . . . press the "`Next`*" button at the bottom to proceed.*
- Select "**Ximian Mirror Site**" as "**Software Source**".
  . . . press the "`Next`*" button at the bottom to proceed.*
- At "**HTTP Proxy Setup**"
  This step is only for installation at CSE. Skip this if you do the installation elsewhere.
  Check **Enable HTTP Proxy**
  And put
  "`proxy.cse.cuhk.edu.hk`" at **Proxy Host**
  "`8000`" at **Proxy Port**

  . . . press the "`Next`*" button at the bottom to proceed.*
- At **Mirror Selection**,
  Pick **Ximian, Inc**
  . . . press the "`Next`*" button at the bottom to proceed.*
- Select **Normal Installation**
  . . . press the "`Next`*" button at the bottom to proceed.*
- Restart X server and first time login
- At **Welcome to Ximian GNOME 1.4**, press `Next` button.
- At **Registration**, check **No thanks, ...** and then `Next` button.
- Check **Help me create custom desktop settings** and then `Next` button.
- Desktop Manager: **Nautilus**
- Panel Style: **Ximian GNOME**
- Application Theme: **EazelBlue**
- Window Borders: **BeOS**
- Desktop Wallpaper: **Keep my current desktop background**
  . . . press the "`Next`*" button at the bottom to proceed.*
- Press the "`Ok`" button.

Notes:

If the installation keeps failing, remove `/var/cache/redcarpet` *or even reboot your PC and try again.*

3.2 Dialup networking

To setup dialup networking, you need `rp3-config`. To use dialup networking, you need `rp3`.

How:

- **Setup**

  if there is an icon named "**Dialup Configuration**" on your desktop, double-click it once. otherwise login as root, open a terminal (click on "Terminal" icon), and type `rp3-config`. Both will bring up a small window. You need to do two things: **1) Create account** and **2) Setup modem**.

  - **Create accounts**

    Click the "**Account**" tab
    Click the "**Add**" button
    Press "**Next**" button
    Type in the account name – any name to identify the connection is ok
    Type in the phone number – your ISP phone number
    Leave **Prefix** and **Area/Country code** blank
    Press "**Next**" button again
    Type in **User name** – the username used to login ISP
    Type in **Password** – the password used to authenticate yourself to ISP
    Select "**Normal ISP**"
    Press "**Finish**" button

  - **Setup modem**

    Click the "**Modem**" tab
    Press "**Add**" button
    Press "**Auto Configure**"
    Select "**Make this modem the default modem**"
    Press "**OK**" button

- **Use**

  Open a terminal (click on "Terminal" icon)
  Type "`rp3`"
  Select connection account
  Press "**OK**"
  Wait until another window is opened without error message.

3.3 Broadband internet

- **Setup**

  Open a terminal (click on "Terminal" icon)
  Type `/usr/sbin/adsl-setup`

  At >>> `Enter your PPPoE user name (default ...):`,
  type your broadband internet username,
  e.g. "`abc@ultraline`" for netvigator broadband.

  At >>> `Enter the Ethernet interface connected to the ADSL modem`,
  type `eth0`

  At >>> `Enter the demand value`,
  type `no`

  At >>> `Enter the DNS information here:`,
  type the IP address of your broadband ISP DNS servers

  At >>> `Enter the secondary DNS information here:`,
  type the IP address of your broadband ISP secondary DNS servers.
  if there is no secondary DNS, press "**Enter**" key.

  At >>> `Please enter your PPPoE password:`
  type your broadband account password.

  At >>> `Choose a type of firewall (0-2):`
  type "`1`"

  At `Do you want to start this connection at boot time?`
  type "`no`".

  At >>> `Accept these settings and adjust configuration files (y/n)`"
  type "`y`" if the information you given is correct.

- **Use**

Start broadband connection	Type `adsl-start`
Stop broadband connection	Type `adsl-stop`
Check connection Status	Type `adsl-status`

3.4 Acrobat reader

For reading PDF files, you need acrobat reader – **acroread**. Besides acroread, **xpdf** and **gv** can read PDF files too.

Installing Acrobat reader requires root privilege, so login as root if you have not yet done so.

How:

- Download Acrobat reader from `ftp.adobe.com`

  Open a terminal (click on "Terminal" icon)
  Type "`mkdir /tmp/ar`"
  Type "`cd /tmp/ar`"
  Type "`wget ftp://ftp.adobe.com/pub/adobe/`
  `acrobat-reader/unix/4.x/linux-ar405.tar.gz`"
  `(one line, broken to improve readable only)`

- Unpack it

  Type "`tar zxf linux-ar-405.tar.gz`"

- Install it
  Type "`cd ILINXR.install`"
  Type "`./INSTALL`"
  Type "`accept`"
  Use default `Installation directory` – `/usr/local/Acrobat4`
  Type "`y`" to create the missing directory
  Type "`/usr/local/Acrobat/bin/acroread`" to test the installation

3.5 Real Player

Installing Acrobat reader requires root privilege, so login as root if you have not yet done so.

How:

1. Download RealPlayer from `www.real.com`.

   Get **RealPlayer 8 Basic for Linux** from
   `http://huxley.real.com/real/player/unix/unix.html`

2. Install it
   Type "`chmod 700 rp8_linux20_libc6_i386_cs2.bin`"
   Window popped up
   Read license
   Press "`ACCEPT`" if you accept the license.
   Specify "**Destination Directory**" (use the default)
   Press "**Finish**" button.
   Install "**Mime Type**" and "**Plugin**".
   Press "**Finished**" button to proceed.
   Press "**Next**".
   Press "**Ok**".
   Keep your email address
   Select "**People's Republic of China**" as your country.
   Leave "**Regional Data**" blank.
   Select internet connection speed: e.g. 56K Modem.
   Press "**Finished**" button.

3.6 Macromedia Flash player

Macromedia flash player is required to display webpages that contains videos built using Macromedia Flash. Netscape communicator/navigator already contains flash player, but **Mozilla** – another web browser does not have flash player.

Installing Acrobat reader requires root privilege, so login as root if you have not yet done so.

How:

- Download
  Open a terminal (click on "Terminal" icon).
  Type "`cd /tmp`".
  Type "`netscape http://www.macromedia.com/shockwave/download`".
  Downloaded file: `flash_linux.tar.gz`
- Unpack it
  Type "`tar zxf flash_linux.tar.gz`"
  Type "`cd flash_linux`"
  Type "`cp libflashplayer.so /usr/lib/mozilla/plugins`"
- Restart mozilla.

4 Basic Configuration

Installing Acrobat reader requires root privilege, so login as root if you have not yet done so.

Hostname

Edit `/etc/sysconfig/network`, change "`localhost.localdomain`" to any name you want.

Tcp_wrappers

Put "`ALL:ALL`" into `/etc/hosts.deny`.

Sendmail

Change "`DAEMON=yes`" to "`DAEMON=no`" in `/etc/sysconfig/sendmail`

DNS server

Set `/etc/resolv.conf` accordingly:

```
nameserver <IP address of primary DNS server>
nameserver <IP address of seondary DNS server>
...
```

Example,

```
nameserver 202.252.144.77
nameserver 208.167.231.55
```

Obtain DNS server from your ISP.

References

Red Hat Linux 7.1
The Official Red Hat Linux x86 Installation Guide
Online: `http://www.redhat.com/support/manuals/RHL-7.1-Manual/install-guide`
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`http://www.redhat.com/support/docs/howto/rhl71.html`

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