Study Guide for

GNU/Linux System Administration 1

1   /

Lab work for LPI 101 (RPM)
LPI 101 (RPM)

released under the GFDL by LinuxIT

Arabic Translation by Arabization and Translation Team, GNU/Linux Syria
/

April 2004
2005   :

2005 (C)   /

1.2   GNU   /

                    –   :

Arabic Translation by Arabization and Translation Team, GNU/Linux " :

    "   /   "   "Syria

)   .

                                                                .(GNU

:Acknowledgments

The original material was made available by LinuxIT's technical training centre www.linuxit.com. Many thanks to Andrew Meredith for suggesting the idea in the first place. A special thanks to all the students who have helped dilute the technical aspects of Linux administration through their many questions, this has led to the inclusion of more illustrations attempting to introduce concepts in a userfriendly way. Finally, many thanks to Paul McEnery for the technical advice and for starting off some of the most difficult chapters such as the ones covering the X server (101), modems (102) and the Linux kernel (102).

The manual is available online at http://savannah.nongnu.org/projects/lpi-manuals/. Thank you to the Savannah Volunteers for assessing the project and providing us with the Web space.

:   /

sylsine@scs-net.org

ayda_j@maktoob.com

mays@scs-net.org

n-benni@scs-net.org

m-sultan@scs-net.org

gsm@scs-net.org

wissam@tawileh.net

Hithammamoun@Hotmail.com

wassemshiek@hotmail.com

anas@tawileh.net

anas@tawileh.net   :

:History

- First release (version 0.0) October 2003. Reviewed by Adrian Thomasset
  Revised January 2004 after review by Andrew Meredith.
- :   **/**   **1** -   1.0   2005
  –   /   www.linuxsyria.org

تبرئة المسؤولية No Guarantee:
The manual comes with no guarantee at all.

/

.

GNU Free Documentation License

Version 1.2, November 2002

```
Copyright (C) 2000,2001,2002  Free Software Foundation, Inc.
59 Temple Place, Suite 330, Boston, MA  02111-1307  USA
Everyone is permitted to copy and distribute verbatim copies
of this license document, but changing it is not allowed.
```

0. PREAMBLE

The purpose of this License is to make a manual, textbook, or other functional and useful document "free" in the sense of freedom: to assure everyone the effective freedom to copy and redistribute it, with or without modifying it, either commercially or noncommercially. Secondarily, this License preserves for the author and publisher a way to get credit for their work, while not being considered responsible for modifications made by others.

This License is a kind of "copyleft", which means that derivative works of the document must themselves be free in the same sense. It complements the GNU General Public License, which is a copyleft license designed for free software.

We have designed this License in order to use it for manuals for free software, because free software needs free documentation: a free program should come with manuals providing the same freedoms that the software does. But this License is not limited to software manuals; it can be used for any textual work, regardless of subject matter or whether it is published as a printed book. We recommend this License principally for works whose purpose is instruction or reference.

1. APPLICABILITY AND DEFINITIONS

This License applies to any manual or other work, in any medium, that contains a notice placed by the copyright holder saying it can be distributed under the terms of this License. Such a notice grants a world-wide, royalty-free license, unlimited in duration, to use that work under the conditions stated herein. The "Document", below, refers to any such manual or work. Any member of the public is a licensee, and is addressed as "you". You accept the license if you copy, modify or distribute the work in a way requiring permission under copyright law.

A "Modified Version" of the Document means any work containing the Document or a portion of it, either copied verbatim, or with modifications and/or translated into another language.

A "Secondary Section" is a named appendix or a front-matter section of the Document that deals exclusively with the relationship of the publishers or authors of the Document to the Document's overall subject (or to related matters) and contains nothing that could fall directly within that overall subject. (Thus, if the Document is in part a textbook of mathematics, a Secondary Section may not explain any mathematics.) The relationship could be a matter of historical connection with the subject or with related matters, or of legal, commercial, philosophical, ethical or political position regarding them.

The "Invariant Sections" are certain Secondary Sections whose titles are designated, as being those of Invariant Sections, in the notice that says that the Document is released under this License. If a section does not fit the above definition of Secondary then it is not allowed to be designated as Invariant. The Document may contain zero Invariant Sections. If the Document does not identify any Invariant Sections then there are none.

The "Cover Texts" are certain short passages of text that are listed, as Front-Cover Texts or Back-Cover Texts, in the notice that says that the Document is released under this License. A Front-Cover Text may be at most 5 words, and a Back-Cover Text may be at most 25 words.

A "Transparent" copy of the Document means a machine-readable copy, represented in a format whose specification is available to the general public, that is suitable for revising the document straightforwardly with generic text editors or (for images composed of pixels) generic paint programs or (for drawings) some widely available drawing editor, and that is suitable for input to text formatters or for automatic translation to a variety of formats suitable for input to text formatters. A copy made in an otherwise Transparent file format whose markup, or absence of markup, has been arranged to thwart or discourage subsequent modification by readers is not Transparent. An image format is not Transparent if used for any substantial amount of text. A copy that is not "Transparent" is called "Opaque".

Examples of suitable formats for Transparent copies include plain ASCII without markup, Texinfo input format, LaTeX input format, SGML or XML using a publicly available DTD, and standard-conforming simple HTML, PostScript or PDF designed for human modification. Examples of transparent image formats include PNG, XCF and JPG. Opaque formats include proprietary formats that can be read and edited only by proprietary word processors, SGML or XML for which the DTD and/or processing tools are not generally available, and the machine-generated HTML, PostScript or PDF produced by some word processors for output purposes only.

The "Title Page" means, for a printed book, the title page itself, plus such following pages as are needed to hold, legibly, the material this License requires to appear in the title page. For works in formats which do not have any title page as such, "Title Page" means the text near the most prominent appearance of the work's title, preceding the beginning of the body of the text.

A section "Entitled XYZ" means a named subunit of the Document whose title either is precisely XYZ or contains XYZ in parentheses following text that translates XYZ in another language. (Here XYZ stands for a specific section name mentioned below, such as "Acknowledgements", "Dedications", "Endorsements", or "History".) To "Preserve the Title" of such a section when you modify the Document means that it remains a section "Entitled XYZ" according to this definition.

The Document may include Warranty Disclaimers next to the notice which states that this License applies to the Document. These Warranty Disclaimers are considered to be included by reference in this License, but only as regards disclaiming warranties: any other implication that these Warranty Disclaimers may have is void and has no effect on the meaning of this License.

2. VERBATIM COPYING

You may copy and distribute the Document in any medium, either commercially or noncommercially, provided that this License, the copyright notices, and the license notice saying this License applies to the Document are reproduced in all copies, and that you add no other conditions whatsoever to those of this License. You may not use technical measures to obstruct or control the reading or further copying of the copies you make or distribute. However, you may accept compensation in exchange for copies. If you distribute a large enough number of copies you must also follow the conditions in section 3.

You may also lend copies, under the same conditions stated above, and you may publicly display copies.

3. COPYING IN QUANTITY

If you publish printed copies (or copies in media that commonly have printed covers) of the Document, numbering more than 100, and the Document's license notice requires Cover Texts, you must enclose the copies in covers that carry, clearly and legibly, all these Cover Texts: Front-Cover Texts on the front cover, and Back-Cover Texts on the back cover. Both covers must also clearly and legibly identify you as the publisher of these copies. The front cover must present the full title with all words of the title equally prominent and visible. You may add other material on the covers in addition. Copying with changes limited to the covers, as long as they preserve the title of the Document and satisfy these conditions, can be treated as verbatim copying in other respects.

If the required texts for either cover are too voluminous to fit legibly, you should put the first ones listed (as many as fit reasonably) on the actual cover, and continue the rest onto adjacent pages.

If you publish or distribute Opaque copies of the Document numbering more than 100, you must either include a machine-readable Transparent copy along with each Opaque copy, or state in or with each Opaque copy a computer-network location from which the general network-using public has access to download using public-standard network protocols a complete Transparent copy of the Document, free of added material. If you use the latter option, you must take reasonably prudent steps, when you begin distribution of Opaque copies in quantity, to ensure that this Transparent copy will remain thus accessible at the stated location until at least one year after the last time you distribute an Opaque copy (directly or through your agents or retailers) of that edition to the public.

It is requested, but not required, that you contact the authors of the Document well before redistributing any large number of copies, to give them a chance to provide you with an updated version of the Document.

4. MODIFICATIONS

You may copy and distribute a Modified Version of the Document under the conditions of sections 2 and 3 above, provided that you release the Modified Version under precisely this License, with the Modified Version filling the role of the Document, thus licensing distribution and modification of the Modified Version to whoever possesses a copy of it. In addition, you must do these things in the Modified Version:

- **A.** Use in the Title Page (and on the covers, if any) a title distinct from that of the Document, and from those of previous versions (which should, if there were any, be listed in the History section of the Document). You may use the same title as a previous version if the original publisher of that version gives permission.
- **B.** List on the Title Page, as authors, one or more persons or entities responsible for authorship of the modifications in the Modified Version, together with at least five of the principal authors of the Document (all of its principal authors, if it has fewer than five), unless they release you from this requirement.
- **C.** State on the Title page the name of the publisher of the Modified Version, as the publisher.
- **D.** Preserve all the copyright notices of the Document.
- **E.** Add an appropriate copyright notice for your modifications adjacent to the other copyright notices.
- **F.** Include, immediately after the copyright notices, a license notice giving the public permission to use the Modified Version under the terms of this License, in the form shown in the Addendum below.

❿G. Preserve in that license notice the full lists of Invariant Sections and required Cover Texts given in the Document's license notice.

❿H. Include an unaltered copy of this License.

❿I. Preserve the section Entitled "History", Preserve its Title, and add to it an item stating at least the title, year, new authors, and publisher of the Modified Version as given on the Title Page. If there is no section Entitled "History" in the Document, create one stating the title, year, authors, and publisher of the Document as given on its Title Page, then add an item describing the Modified Version as stated in the previous sentence.

❿J. Preserve the network location, if any, given in the Document for public access to a Transparent copy of the Document, and likewise the network locations given in the Document for previous versions it was based on. These may be placed in the "History" section. You may omit a network location for a work that was published at least four years before the Document itself, or if the original publisher of the version it refers to gives permission.

❿K. For any section Entitled "Acknowledgements" or "Dedications", Preserve the Title of the section, and preserve in the section all the substance and tone of each of the contributor acknowledgements and/or dedications given therein.

❿L. Preserve all the Invariant Sections of the Document, unaltered in their text and in their titles. Section numbers or the equivalent are not considered part of the section titles.

❿M. Delete any section Entitled "Endorsements". Such a section may not be included in the Modified Version.

❿N. Do not retitle any existing section to be Entitled "Endorsements" or to conflict in title with any Invariant Section.

❿O. Preserve any Warranty Disclaimers.

If the Modified Version includes new front-matter sections or appendices that qualify as Secondary Sections and contain no material copied from the Document, you may at your option designate some or all of these sections as invariant. To do this, add their titles to the list of Invariant Sections in the Modified Version's license notice. These titles must be distinct from any other section titles.

You may add a section Entitled "Endorsements", provided it contains nothing but endorsements of your Modified Version by various parties--for example, statements of peer review or that the text has been approved by an organization as the authoritative definition of a standard.

You may add a passage of up to five words as a Front-Cover Text, and a passage of up to 25 words as a Back-Cover Text, to the end of the list of Cover Texts in the Modified Version. Only one passage of Front-Cover Text and one of Back-Cover Text may be added by (or through arrangements made by) any one entity. If the Document already includes a cover text for the same cover, previously added by you or by arrangement made by the same entity you are acting on behalf of, you may not add another; but you may replace the old one, on explicit permission from the previous publisher that added the old one.

The author(s) and publisher(s) of the Document do not by this License give permission to use their names for publicity for or to assert or imply endorsement of any Modified Version.

5. COMBINING DOCUMENTS

You may combine the Document with other documents released under this License, under the terms defined in section 4 above for modified versions, provided that you include in the combination all of the Invariant Sections of all of the original documents, unmodified, and list them all as Invariant Sections of your combined work in its license notice, and that you preserve all their Warranty Disclaimers.

The combined work need only contain one copy of this License, and multiple identical Invariant Sections may be replaced with a single copy. If there are multiple Invariant Sections with the same name but different contents, make the title of each such section unique by adding at the end of it, in parentheses, the name of the original author or publisher of that section if known, or else a unique number. Make the same adjustment to the section titles in the list of Invariant Sections in the license notice of the combined work.

In the combination, you must combine any sections Entitled "History" in the various original documents, forming one section Entitled "History"; likewise combine any sections Entitled "Acknowledgements", and any sections Entitled "Dedications". You must delete all sections Entitled "Endorsements."

6. COLLECTIONS OF DOCUMENTS

You may make a collection consisting of the Document and other documents released under this License, and replace the individual copies of this License in the various documents with a single copy that is included in the collection, provided that you follow the rules of this License for verbatim copying of each of the documents in all other respects.

You may extract a single document from such a collection, and distribute it individually under this License, provided you insert a copy of this License into the extracted document, and follow this License in all other respects regarding verbatim copying of that document.

7. AGGREGATION WITH INDEPENDENT WORKS

A compilation of the Document or its derivatives with other separate and independent documents or works, in or on a volume of a storage or distribution medium, is called an "aggregate" if the copyright resulting from the compilation is not used to limit the legal rights of the compilation's users beyond what the individual works permit. When the Document is included in an aggregate, this License does not apply to the other works in the aggregate which are not themselves derivative works of the Document.

If the Cover Text requirement of section 3 is applicable to these copies of the Document, then if the Document is less than one half of the entire aggregate, the Document's Cover Texts may be placed on covers that bracket the Document within the aggregate, or the electronic equivalent of covers if the Document is in electronic form. Otherwise they must appear on printed covers that bracket the whole aggregate.

8. TRANSLATION

Translation is considered a kind of modification, so you may distribute translations of the Document under the terms of section 4. Replacing Invariant Sections with translations requires special permission from their copyright holders, but you may include translations of some or all Invariant Sections in addition to the original versions of these Invariant Sections. You may include a translation of this License, and all the license notices in the Document, and any Warranty Disclaimers, provided that you also include the original English version of this License and the original versions of those notices and disclaimers. In case of a disagreement between the translation and the original version of this License or a notice or disclaimer, the original version will prevail.

If a section in the Document is Entitled "Acknowledgements", "Dedications", or "History", the requirement (section 4) to Preserve its Title (section 1) will typically require changing the actual title.

9. TERMINATION

You may not copy, modify, sublicense, or distribute the Document except as expressly provided for under this License. Any other attempt to copy, modify, sublicense or distribute the Document is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

10. FUTURE REVISIONS OF THIS LICENSE

The Free Software Foundation may publish new, revised versions of the GNU Free Documentation License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns. See http://www.gnu.org/copyleft/.

Each version of the License is given a distinguishing version number. If the Document specifies that a particular numbered version of this License "or any later version" applies to it, you have the option of following the terms and conditions either of that specified version or of any later version that has been published (not as a draft) by the Free Software Foundation. If the Document does not specify a version number of this License, you may choose any version ever published (not as a draft) by the Free Software Foundation.

GNU Free Documentation License - Version 1.2

This is an unofficial translation of GNU Free Documentation License into Arabic language. It was not published by the Free Software Foundation, and does not legally state the distribution terms of software that uses the GNU FDL - only the original English text of the GNU FDL does that. However, we hope that this translation will help Arabic language speakers understand the GNU FDL better

GNU   .

-GNU FDL   .

GNU FDL   .

0-   :

(" "   :   (   )

.

.

"   "Copyleft

GNU Public License   .

:   ,   ,

,   .

.

1-   :

.

.   .   (   )   (   ).

(   )   .

(   )   (   )

)

.(.(

(   )   (   )   (   )

.(   )   (   )

.

(   )

.   .

(   )

(   )   (   )

(   )   (   )   .

.   .

.(   )

LaTeX	Texinfo		ASCII	
PDF	PostScript	HTML	DTD	XML SGML

.JPG XCF PNG

DTD   XML SGML

PDF PostScript   HTML

(   )

"   " (")   (   )   (   )
) .   (   )
.   (   )   (   )   .("

-2

3

-3

(   )   (   )
:   (   )

.

(   )

.(   )

(   )

-4

3   2

(   )   .
.((   )   )
(   )   (   )
(   )
.(   )

(   )

(   )

(   )

)

.(

(   ) (   )

/

(   )

(   )

(   )

)

(

(   )   (   )

-5   **:**

4

(   )   (   )
.(   )   .(   )   (   )

-6   **:**

.

7- :

(   )
.
.

3

.
.

8- :

4.

.
.
.

(   )   4   (   ) ( ) (   )
.

9- :

.
.
.

10- :

.
/www.gnu.org/copyleft   .

(   )   .
.   (-   –   )
(-   –   )
.

anas@tawileh.net

This translation has been done by Anas TAWILEH at December 2004, Please send your comments to **anas@tawileh.net**

Installation

. rescue mode

1- :The Installation CD

:

Generic Installation CD layout

	القرص المدمجcdrom

| dosutils
أدوات دوس | الصورimages | الرزم البرمجيةpackages |
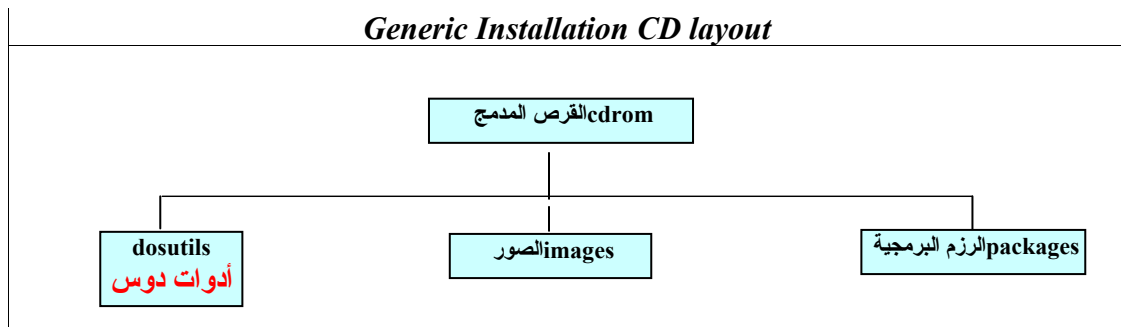
Packages:

. pre-compiled packages

:

- *debian* : dist
- *mandrake* : Mandrake
- *redhat* : RedHat
- *suse* : suse

images:

.

initrd .initial ramdisk

:

-
- additional kernel modules

---

rescue the system ▪

.CD-ROM

.rawrite **dd**

.

Image file structure
DIR1   ←——— **image file**
DIR2
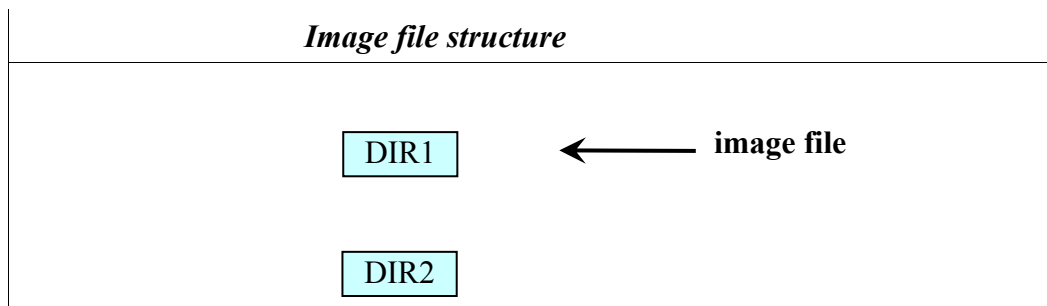
image . loop device (mount)

: /mnt/floppy

mount -o loop /path/to/Image /mnt/floppy

: dosutils

. rawrite.exe DOS

FAT c:\ fips

.NTFS

:Local Installation **−2**

iso .

. CD-ROM .

:CD-ROM installation ▪

BIOS

.

■   **Floppy installation:**

a   CD-ROM

floppy installation image .

iso   .

dd if=/path/to/<image_name> of=/dev/fd0
(NT   )   rawrite.exe

RedHat   images.   boot.img

bootnet.img   pcmcia.img .

Suse   disks   bootdisk.

3–   **Network Installation:**

.

bootnet.img   :

dd /mnt/cdrom/images/bootnet.img of=/dev/fdo

.

FTP NFS HTTP   NFS

FTP, HTTP   .

4 –   **Rescue disk:**

.   )

(mount   .

.

IDE (/dev/hda5)

RAM : /mnt/system .

Changing perspectives:

( ) . **chroot** :

chroot /mnt/system

Rescue mode

الذاكرة RAM   النواة kernel

initrd

نظام ملفات الجذر في الذاكرة RAM   نظام ملفات الجذر على القرص الصلب

بدء العمل:

:
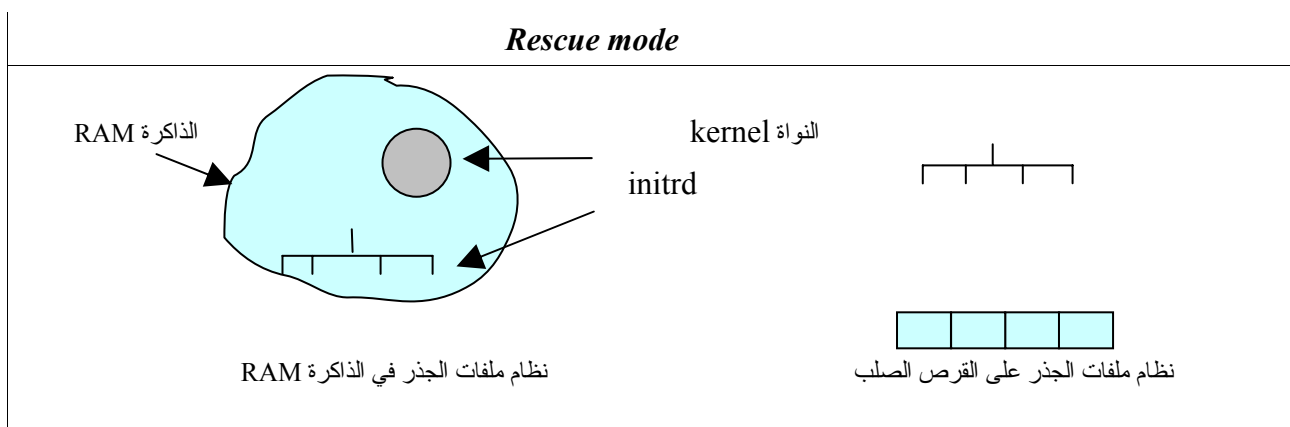
1. boot.img :
   dd if=boot.img of=/dev/fd0

2. rescue.img :
   dd if=rescue.img of=/dev/fd0

3. boot.img

4. LILO : "linux rescue" :

Insert root file system disk:

5. rescue.img Enter.

6. shell .

7. .

:

1. (Suse, RedHat, Mandrake …)

2. "linux rescue"

3. .

4. .

/mnt/sysimage :

chroot /mnt/sysimage
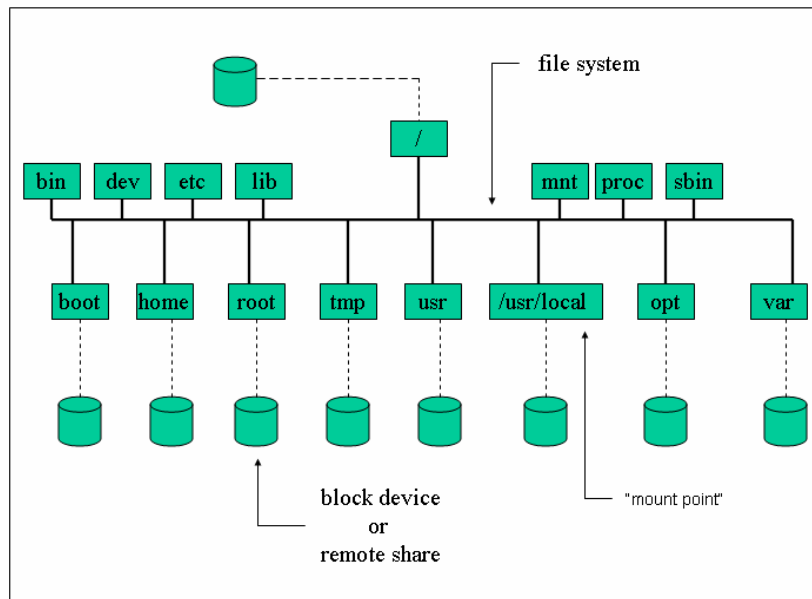
5– Partitioning Schemes :

. .

. mount points

root "/" .

. .

.

2 :

6– : Easy Dual Booting

( )

9X/2K LILO .

:

defragmentation .

.

fips PartitionMagic C:\ .

( ) .

: 1GB.

DOS:

NT DOS.

:

E:\DOSUTILS\AUTOBOOT.BAT

.

DOS:

E:\setup.exe

:

. NTFS   FAT

.

:

.(   )   /dev/hda1

.   /mnt/dos   /dos

. C:\

7– **:**

.1 **network installation** **bootnet.img :**

() **"Custom System"**

( ) **"Disk Druid"**

3GB .

/usr **( ).**

: 100MB !!

/boot	20M
/	250M
/usr	2300M
/home	50M
/tmp	100M
/var	150M
SWAP	128M

SWAP mount point .

( ) LILO /dev/hda2 /dev/hda3

/dev/hda MBR .

– . bootloader ()

.

() ( ) :(

- "Network Support"
- "Classic X Window System"
- "X Window System"
- "Software Development" :

.

( ) .

2– **:Rescue the system**

() bootnet.img (   ).

:

linux rescue

( ) .   chroot   .
( )   /etc/lilo.conf (vi)

:

```
boot=/dev/fd0
prompt
linear
timeout=50
image=/boot/vmlinuz-<kernel-version>
label=linux
read-only
root=/dev/<root-partition>
```

( ) /sbin/lilo .   lba32
.

إعداد العتاديات Hardware Configuration

1- Memory Support:

RAM / BIOS .

(EDO DRAM SDRAM).

/ BIOS 64MB

.

LILO /etc/lilo.conf :

append="mem=<*amount of ram*>M"

/sbin/lilo

GRUB /etc/grub.conf kernel :

kernel vmlinuz mem=<*amount of ram*>M

2- Resource Allocation:

CPU

. : IRQ / I/O

address DMA.

▪ **IRQs:** .

. IRQ 0 15.

▪ **I/O address :** .

.

▪ **DMA:** DMA

.

Listing Allocated Resources :

/proc :

/proc/dma
/proc/interrupts
/proc/ioports
/proc/pci

lspci dmesg :

lspci: IRQ / PCI

-v . -b (BUS)

/ BIOS .

dmesg: .

drivers . :

/var/log/dmesg

Typical Resources :

Device	I/O port /	IRQ
/dev/ttyS0	0x03f8	4
/dev/ttyS1	0x02f8	3
/dev/lp0	0x378	7
/dev/lp1	0x278	5
soundcard	0x220	

■ **تحصيص الموارد يدوياً:**

: kernel modules LPI

102 3.

: ( ) :

– statically compiled modules

. ( )

:

ether=9,0x340,eth1 ether=10,0x300,eth0

:

- .I/O 0x300   IRQ 10
- .I/O 0x340   IRQ 9

:   LILO/GRUB   'boot:'

/etc/lilo.conf (append= statement   )

:

/etc/grub.conf

. init=   mem=   root= :   ether= statement
(…Intel, Netgear   )

– dynamically compiled modules
I/O   IRQ   /etc/modules.conf   (/etc/conf.modules   ).

/etc/modules.conf   e100.o

:

alias eth0 e100
alias eth1 e100
options eth0 io=0x300 irq=10
options eth1 io=0x340 irq=9

3-   USB:

USB   .

:

- .Display Devices
- .Communication Devices
- .Audio Devices
- .Mass Storage Devices
- (   ) Human Interface Devices (HID).

USB ‏ ‏.USB ‏ ‏ USB

‏ . (The Linux USB sub-system HOWTO) 2.2.7

‏ USB host controllers: ‏ USB

Host Controller Module	Kernel
OHCI (Compaq)	`usb-ohci.o`
UHCI (Intel)	`usb-uhci.o`
EHCI (USB v 2.0)	`Ehci-hdc.o`

4- ‏ SCSI:

SCSI:

SCSI :

- ‏ 8 ‏ 8 ‏ 7 ‏ ( )
(…
- ‏ 16 ‏ (WIDE) ‏ 16 ‏ 15 ‏ .

‏ SCSI ID ‏ jumpers ‏ .
‏ 7 0 ‏ 8 ‏ 0 15 ‏ 16 .

Logical units:

‏ LUN ‏ SCSI .
‏ .

‏ .

SCSI:

‏ SCSI ID 0 ‏ SCSI BIOS

‏ .

5- بطاقات الشبكة:

• **واجهة الشبكة:**

NIC .

:

Dmesg   lspci, scanpci   /proc/interrupts   /sbin/lsmod   etc/modules.conf

```
dmesg
Linux Tulip driver cersion 0.9.14 (February 20, 2001)
PCI: Enabled device 00:0f.0 (0004 ->0007)
PCI: Found IRQ 10 for device 00:0f.0
eth0: Lite-On 82cl68 PNIC rev 32 at 0xf800, 00:0A:CC:D3:6E:0F,
IRQ 10
eth0: MII transceiver #1 config 3000 status 7829 advertising
```

```
                      cat /proc/interrupts
 0:    8729602        XT-PIC   timer
 1:          4        XT-PIC   keyboard
         2:           0          XT-PIC   cascade
 7:          0        XT-PIC   parport0
 8:          1        XT-PIC   rtc
10:     622417        XT-PIC   eth0
11:          0        XT-PIC   usb-uhci
14:     143040        XT-PIC   ide0
15:        180        XT-PIC   ide1
```

```
                         /sbin/lsmod
          Module               Size  Used by
tulip                 37360   1 (autoclean)
```

0xf800   /   Tulip   (   )

.10

/   I/O   IRQ .

/   (modprobe   insmod)

/etc/modules.conf (.)

6- :

 :

DOS COM .

 :

DOS	***Linux***
COM1	/dev/ttyS0
COM2	/dev/ttyS1
COM3	/dev/ttyS2

GUIs .

setserial . -g :

```
setserial -g /dev/ttyS*

►   /dev/ttyS0, UART: 16550A, Port: 0x03f8, IRQ: 4
    /dev/ttyS1, UART: 16550A, Port: 0x02f8, IRQ: 3
```

/dev/modem .

 :

```
ln -s /dev/ttyS1 /dev/modem
```

setserial .

• LPI101 Dialup Configuration (
.(

wvdial script wvdialconf (
USB). :

: /etc/wvdial.conf

```
[Dialer Defaults]
Modem = /dev/ttyS1
Baud = 115200
Init1 = ATZ
Init2 = ATQ0 V1 E1 S0=0 &C1 &D2 S11=55 +FCLASS=0
; Phone = <Target Phone Number>
; Username = <Your Login Name>
; Password = <Your Password>
```

WorldISP   Defaults

:   Password   Username

wvdial WorldISP

:   −7

. LPI 102

. dmesg

postscript

:gs   ghostscript
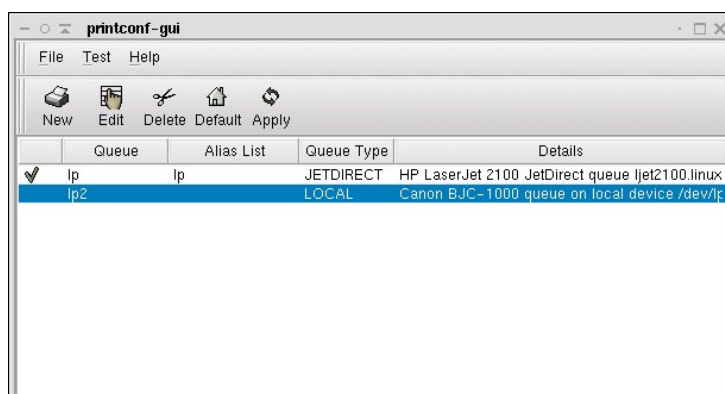
printtool:

(   )

input_filter=if :   ./etc/printcap

spool_directory=sd   printer_device=lp.

dmesg   printtool

.

: /dev/lp0

Parallel port scan at the end of dmesg
parport0: PC-style at 0x378 (0x778) [SPP,ECP,ECPEPP,ECPPS2]
parport0: detected irq 7; use procfs to enable interrupt-driven operation.
parport_probe: succeeded
parport0: Printer, HEWLETT-PACKARD DESKJET 610C
lp0: using parport0 (polling)

Sample /etc/printcap file
This file can be edited with the printtool in the control-panel.
##PRINTTOOL3## LOCAL cdj550 300x300 a4 {} DeskJet550 3 {}
lp:\
     :sd=/var/spool/lpd/lp:\
     :mx#0:\
     :sh:\
     :lp=/dev/lp0:\
     :if=/var/spool/lpd/lp/filter:

---

cups:

cups   .   . /etc/cups

cups   . /usr/lib/cups

CUPS   GUI   631.

cups   cupsd   lpd .

:   USP.

. dmesg

8- :

1- dmesg   ./var/log/dmesg   USB, tty *ETH0*.
- USB   .
- IRQs   .

2-   :
/proc/ioports
/proc/interrupts
/proc/pci
/proc/dma

3-   PCI :
- : lspci -v   scanpci –v .   .
- ./proc/pci

4- USB:
- lsmod   lsusb   host controller
UHCI   OHCI   EHCI (USB v 2.0).
- usbmodules   .

Managing Devices

1–   **:**

:

/dev .

. /proc/devices   / .

IDE   3 :

```
Block devices:
 1 ramdisk
 2 fd
 3 ide0
```

SCSI   sd   IDE   hd   /dev

.   .   st   SCSI

1	
hda	Primary Master
hdb	Primary Slave
hdc	Secondary Master
hdd	Secondary Slave
sda	First SCSI disk
sdb	Second SCSI disk

SCSI

.

:

.   .

2	
hda1	
hda2	
sdc3	SCSI

extended .   primary   IDE

logical .   IDE   64   IDE   SCSI   16   .

1:

(8 7 6 5 2 1) (4 3 2 1)
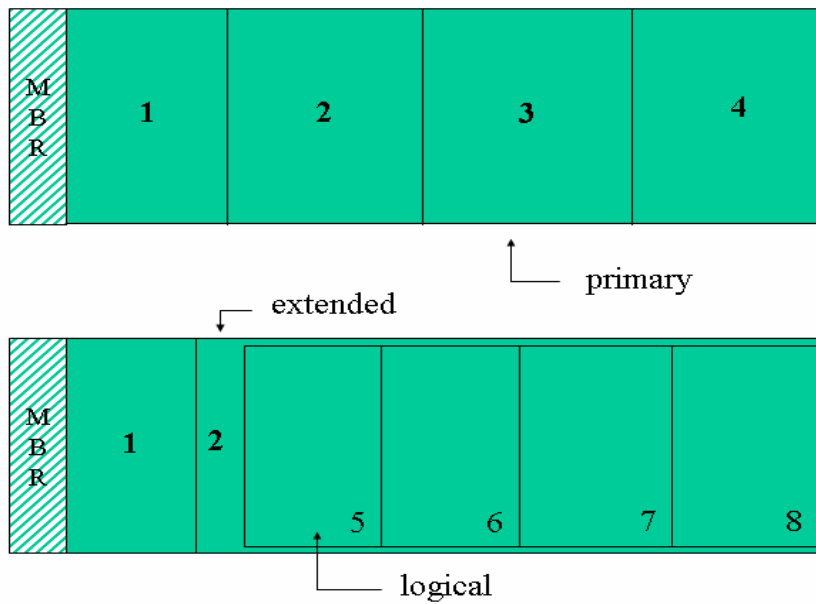
fdisk –l

```
Device      Boot      Start      End           Blocks        Id        System
/dev/hda1   *         1          748           6297448+      b         Win95 FAT32
/dev/hda2             785        788           32130         83        Linux
/dev/hda3             789        2432          13205430      5         Extended
/dev/hda5             789        1235          3590496       83        Linux
/dev/hda6             1236       1618          3076416       83        Linux
/dev/hda7             1619       1720          819283+       83        Linux
/dev/hda8             1721       1784          514048+       83        Linux
/dev/hda9             1785       1835          409626        83        Linux
/dev/hda10            1836       1874          313236        83        Linux
/dev/hda11            1875       1883          72261         82        Linux swap
```

8   (/dev/hda3)   .

"   "   .   /dev/hda3   .

.

:   .

IDE.

2- :

1- : (   )

PartitionMagic
fips

PartitionMagic   .   fat32   fat16   fips
.   UNIX
.   d:\   d:\   c:\

:

2- : (   )

.

.

mount point (   )

C:\   /   . (   )
./dev/hda3   /boot   /dev/hda2
.   block device   ./boot   /dev/hda3

.   .

:

.1   fdisk   .

.2   .

.

Diskdrake : (Mandrake   )

DiskDruid : (RedHat   )

DiskDruid.

.

3-   :

fdisk   .

fdisk

:

(1   :

fdisk /dev/hda	

(2   m   .   n.

(3   w.

(4   .

.   .

.

:   mkfs   mke2fs   .

.   .

3-   Bootloaders:

.   (512   )

"active   "   .

LILO

:

1.   LILO
.   LILO

/boot/boot.b

2.   /etc/lilo.conf

boot*   LILO (/dev/had   )   (

install   (boot.b   )

prompt   .

default   .

timeout   prompt   LILO   ( )

image*   ("other"   ) (   )

label*   .

root*   /

read-only*   fsck   .

append

linear/lba32   LILO   .

linear   lba32   1024

.

3.   /sbin/lilo

/etc/lilo.conf   LILO.

/sbin/lilo   /etc/lilo.conf.

: **the Grand Unified Bootloader GRUB**

GRUB   MBR   .

/sbin/grub-install   /boot/grub/grub.conf   /sbin/grub

GRUB   info   .

GRUB   (/boot/grub/grub.conf)

1. **General/Global**

default   (0)

timeout   .

2. **Image**

title

root   .   hd0,0   /dev/had

kernel   .   /vmlinuz

ro

root

Example   grub.conf

```
default=0
timeout=10
splashimage=(hd0,0)/grub/splash.xpm.gz
title   Linux (2.4.18-14)
        root (hd0,0)
        kernel /vmlinuz-2.4.18-14 ro root=/dev/hda5
        initrd /initrd-2.4.18-14.img
```

4- الأجهزة المدارة Managed devices:

/etc/fstab   .

/etc/fstab

–   –   –   fsck-number – dump-number –

/etc/fstab

```
LABEL=/              /            ext2  defaults         1 1
LABEL=/boot       /boot         ext2  defaults         1 2
LABEL=/home       /home         ext3  defaults         1 2
/dev/fd0            /mnt/floppy  auto noauto,owner      0 0
LABEL=/usr        /usr          ext2  defaults         1 2
LABEL=/var        /var          ext3  defaults         1 2
none               /proc        proc  defaults         0 0
none               /dev/shm     tmpfs defaults         0 0
none               /dev/pts     devpts  gid=5,mode=620 0 0
/dev/hdc9          swap,pri=-1 swap  defaults         0 0
/dev/cdrom         /mnt/cdrom  iso9660  noauto,owner,kudzu,ro 0 0
```

.   /etc/fstab

:

```
mount /dev/cdrom
```

.   fstab

:tune2fs   .label

```
tune2fs -L /usr/local /dev/hdb12
```

mount	
rw,ro	–
users	
user	
owner	
usrquota	
grpquota	

:

noauto   /etc/fstab   mount –a

:   -5

.

:

1- ‏/etc/fstab‏ ‏usrquota‏ .

2- :

```
mount  -o remount  <device>
```

3- ‏quota stats‏ :

```
quotacheck -ca
```

‏aquota.user‏ .

4- :

```
edquota -u <user>
```

5- / .

.

.

6- :

```
quotaon –a
```

quota.

repquota quotastats.

6– :

1- fdisk /dev/had
fdisk /dev/hda

: . n 83 ( )

w

: .

2- (format) :
mkfs <device>

3- - data .
mkdir /data

- /etc/fstab /data
<device> /data ext2 defaults 0 2

4- mount /etc/fstab
mount –a
fstab /data .

5- .

2 mount . /etc/fstab
―――――

3 /data
―――――

/data
chmod o+rw /data

aquota.user)   init

quotastats   repquota   quotas   .(aquota.group

/data

[chmod o+rw /data]

.NFS   (   ) -6

.   noauto   ./mnt/nfs   /etc/fstab

5. مبادلة برامج الإقلاع SWAPPING bootloaders:

-     LILO   (   )

lilo –u

-     grub.conf   .

-     GRUB

grub-install /dev/fd0

نظام ملفات لينكس The Linux Filesystem

1- :

. .

. .

. .

root (/) .

(C:\ ) DOS C:\

.

.

…
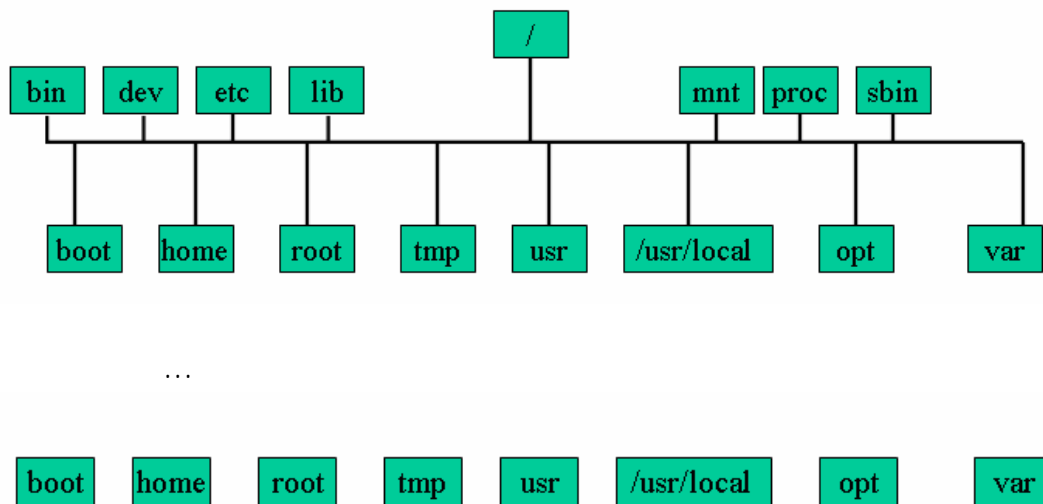
rpm . filesystem.

```
rpm -ql filesystem
```

/ .

fsck insmod mount :

/dev , /bin , /sbin , /etc , /lib : / .

:

/bin /sbin : .

/dev : .

/etc : .

/lib : /bin / sbin

.

/mnt /media : (Suse) .

/proc : . /proc/sys

/boot : .

/home : . /etc/skel

/root : . root.

/tmp : .

/usr : . .

/usr/local /opt : . .

.

/var/www /var/ftp /srv (Suse) : Html FTP

.

/var : .

/var/spool/mail /var/log

-2

.

.

. ext2 ( ).

ext3 ext2

.

SWAP swap .

نظام الملفات الثاني الممتد ext2 :

ext2 :   1024.   …

1.   (Superblocks) :   8193

....

2.   (inodes):   .   12   .

12

256   .

3.   (Data Block) :   .

أدوات التهيئة:

.

.

ext2   mkfs.ext2   mke2fs.   xfs   Silicon Graphics

mkfs.xfs   .

mkfs   .   :

mkfs –t <fstype>

ext3   ext2   (   )

1 :   jfs :

mkfs –t jfs /dev/hda12

2 :   ext2 :

mke2fs /dev/hda11   [or mkfs –t ext2 /dev/hda11]

تماسك نظام الملفات:

fsck   .

.

:

fsck –t <fstype> <device>

/dev/sdb10   reiserfs   :

```
fsck –t reiserfs /dev/sdb10
fsck.reiserfs /dev/sdb10
```

3-

df   mount

.

. /etc/mtab   umount   mount

. /etc/mtab   .   mount

./proc/mount

.   df

.   1

```
df –h

Filesystem          Size  Used Avail Use% Mounted on
/dev/hda9          289M  254M   20M  93% /
/dev/hda2           23M  7.5M   14M  35% /boot
none               62M    0   61M   0% /dev/shm
/dev/hda5          1.4G  181M  1.1G  13% /share
/dev/hda7          787M   79M  669M  11% /tmp
/dev/hda3          4.3G  3.4G  813M  81% /usr
/dev/hda6          787M  121M  627M  17% /var
//192.168.123.2/share 12G  8.8G  3.7G  71% /mnt/smb
```

du:

du   .   .

.

4–
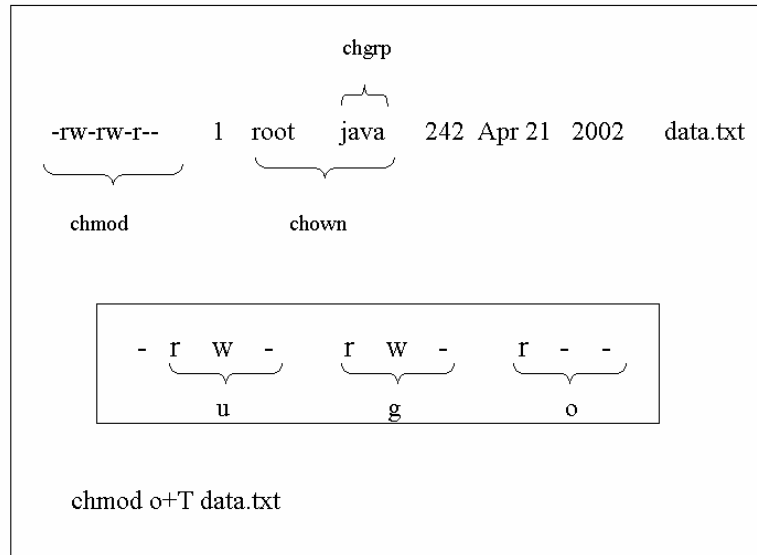
تغيير السماحيات و المالكين

chmod.   .

:

u :   /etc/passwd

g :   /etc/group

o :   .

-rw-rw-r--   1 jade   sales   24880 Oct 25 17:28 libcgic.a

```
chmod g=r,o-r libcgic.a
chmod g+w  libcgic.a
```

```
chown  root  libcgic.a
chgrp  apache libcgic.a
```

–R   chgrp   chown   chmod
.

:

:

r =   w =   x =

:

الرمز	القيمة الثمانية
	4
	2
	1

(   ).

3   .

:   755   -rwxr-xr-x   :

rwx 4+2+1=7	r_x 4+1=5	r_x 4+1=5

السماحيات القياسية:

:

666   -rw-rw-rw-

777   -rwxrwxrwx

Umask

* Umask . Umask
" " .

: umask *
( ) (logic AND) (NOT) Umask =

002 umask
022 umask Users

SUID

.

.4000 s SUID
SUID shell C
.chmod u+s chmod 4777

:

```
chmod 4755 /bin/cat
chmod u+s /bin/grep
```

SGID

.2000 s . SGID
. SGID
. newgrp

:

```
chmod 2755 /home/data
chmod g+s /bin/wc
```

:
: 1000
-
.

‐ بت والتخزين بشكل ملخص.t

‏T.

.

:

```
chmod 1666 /data/store.txt
chmod o+t /bin/bash
```

5‐ :

حول نظام الملفات:

1‐ باستخدام fdisk على 50 القرص /dev/hda
: n ثم w .

2‐ : mkfs ext2 reiserfs
: mkfs.ext2 mkfs.reiserfs.
mkfs –t <fstype> <device>

3‐ /mnt/ :
mkdir /mnt/ext2
mkdir /mnt/reiserfs

4‐
mount . fstab .
df . k .
fsck . fsck.ext2, fsck.ext3,
fsck.reiserfs :
fsck <device>

5‐ ext2 ext3
ext3 ext2 .
:

mke2fs /dev/hda10
tune2fs –j /dev/hda10

ext3 /dev/hda10

.journal ext2 ext3 .

.tune2f

1- touch .( )

664

2- umask 027.

umask /etc/profile /etc/bashrc

3-

```
useradd user1
useradd user2
```

.

4- sales

```
groupadd sales
```

5-

```
gpasswd -a user1 sales
gpasswd -a user2 sales
```

6- /news Sales .

```
mkdir -m 770 /news ; chown .sales /news
```

7- GID /news

```
chmod g+s /news
```

ls – ld /news

newgrp sales .

sales

8- ./news .

The Command Line

الأهداف:

. (Shell)

. ( ) (Shell Prompt) $ # ((root)) .

.(Scripts)

مفسرات الأوامر الأكثر استخداماً

The Bourne shell	/bin/sh
The Bourne again shell	/bin/bash
The Korn	/bin/ksh
The C	/bin/csh
Tom's C	/bin/tcsh

((Bash)) LPI .

1– :

:

command [options] {arguments}

:

( ) (echo) :

echo "this is a short line"

:

(string) .

.

( ) "PATH"

.

_: "PATH" /bin /usr/bin xeyes
/usr/X11R6/bin/xeyes

/usr/X11R6/bin/xeyes

.

<u>:</u>　　　　　xeyes　　：　　　　　　　　　　　<u>　</u>

./xeyes

2–　　　　　　**(Variables):**

.(　　　　　)　　　　　　　.

CREDIT=300 :　　　　　　　300　　　　　　CREDIT.

.1　　　　　　　　　　　　　　　　　　(　　　　) Variable_Name=value
.2　　　　　　　　　　　　　　　　　　　　　　　$Variable_Name

```
CREDIT=300
echo $CREDIT
```

Export　　　　**Set**　　　　**Env:**

: (Local)　　　(Global).

.

(Child Process) .

set　env

env   set

set

env

.

المتَحولات المحلية	*LOCAL*	المتَحولات العامة	*GLOBAL*

<u>:</u>　　　　CREDIT　　　.　　　　　　　set　env
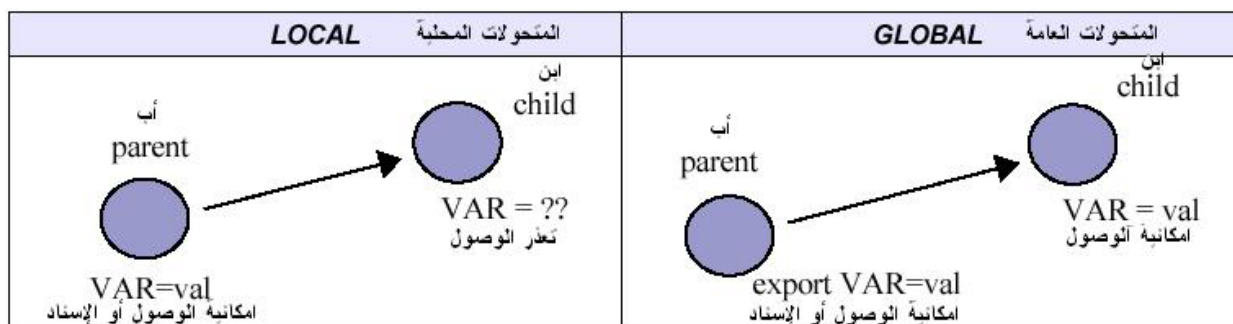
```
export CREDIT
env | grep CREDIT
```

CREDIT ( ) .

CREDIT

2-1

DISPLAY	X
HISTFILE	.bash_history
HOME	
LOGNAME	
PATH	
PWD	
SHELL	(( ))
TERM	

متحولات خاصة:

:

$!	PID
$$	PID
$?	

.

3– :

UNIX .

. **stdin** **stdout**

stderr .

( )


```
STDIN
<

      STDOUT
      >
      >>
      |

STDERR
2>
```
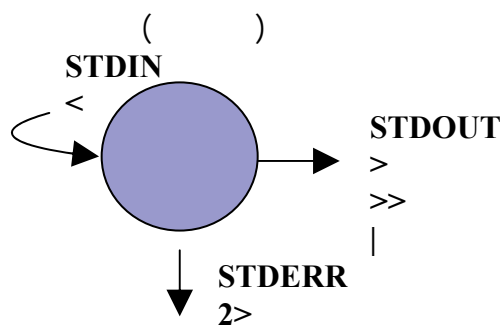
stdout   stdin, stderr

stdin	0
stdout	1
stderr	2

stdout

program > file :

fdisk –l > partions.txt

fdisk   partitions.txt.   .

partitions.txt   .

".>"

"<<"   (   )   (   ).

توجيه (*Redirection*) *STDOUT*

>	ملف/أداة
>>	FILE /
1>	DEVICE
عملية process	
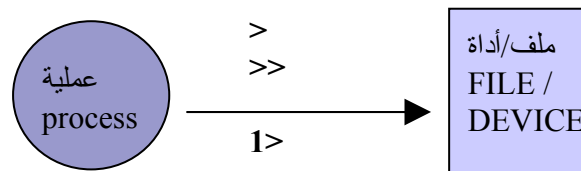
stdin

Program < file :

.stout   stdin   "<"   .

instructions   p, m, q   fdisk

/dev/had   :

fdisk /dev/hda < instructions

توجيه (*Redirection*) *STDIN*
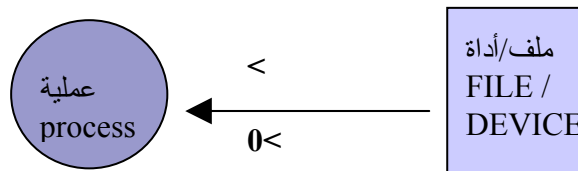
stderr

program 2> errorfile :

stdin   stdout   stderr   0   1   2   .   stderr:

find   /   2> /dev/null

توجيه(*Redirection*) *STDERR*
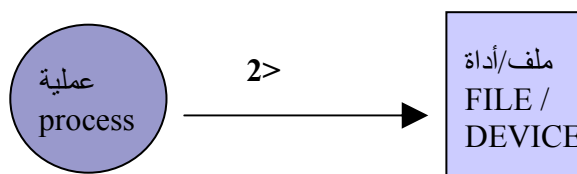
(Piped Commands)
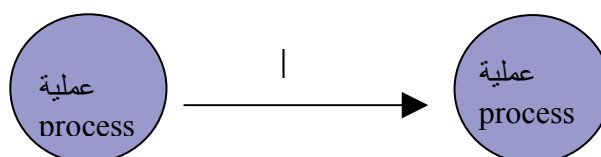
program1 | program2

"|"   .   stdout :

stdin   .

Piped Commands

cat /var/log/messages | less

:   :

Do-command 2>&1 >logfile
Do-command >logfile 2>&1

4–   **Metacharacters and Quotes:**

file globbing

.

.   ($)   (|)   (>)   (<)

.

wildcards

- *
ls /usr/bin/b*

b

-
ls /usr/bin/?b*

b

- []
ls a[0-9]

a

ls [!Aa]*

a   A.

- {*string1,string2*}
ls index.{htm,html}

(Escape Codes) **(Quotes)**

escape code Back Slash (\)

.(\)

(Single Quotes) (' ')

(Double Quotes) (" ")

.($var)   (\)   (|)

(back tick)

date   TIME   (` `)

```
TIME="Today's date is `date +%a:%d:%b`"
echo $TIME
Today's date is Sun:15:Jul
```

: $()   (   )

```
TIME=$(date)
```

‎−5‎ The Command History:

history   bash

```
History
1      ls
2      grep  500 /etc/passwd
```

(emacs)   .

                              (   )

اختصارات تحرير سجل الأوامر السابقة

Ctrl+P	( )
Ctrl+n	( )
Ctrl+b	( )
Ctrl+f	( )
Ctrl+a	(<Home>)

Ctrl+e   (<END>   )

(bang) !   .

:

!x   .(x)

!2   2   .

!-2   .

!!   .

^string1^string2   1   2.

–6

.(arguments)   :

```
alias myprog='command [options]{arguments}'
```

TAB   .

alias   .

<<   (End Of File) EOF   :

```
cat << stop
```

.'stop'

‏: ‎-7

stdin-stdout-stderr

‏: ( )

```
ls /etc ; df > /tmp/out.1
(ls /etc ; df) > /tmp/out.2

find /etc –type - f  2> /dev/null | sort

tr [a-z] [A-Z] < /etc/passwd | sort > /tmp/passwd.tmp

cat /tmp/passwd.tmp | tr [A-Z] [a-z]
```

Command Line

‏1. ‏/usr/X11r6/bin‏ x ‏:
```
ls /usr/X11R6/bin/[!x]*
```

‏2. xtrem
```
-bg <color>
-fg <color>
-e <command>
```

‏su xterm ‏(root).

```
alias su="xterm -bg orange -fg brown -e su - &"
```

_____

‏3. ‏uuencode. ‏stdout.

‏: __
```
uuencode   /bin/bash  super-shell  >  uufile
```

‏/bin/bash‏ super-shell‏ uudecode‏ uufile.

| uuencode) /bin/bash -

(< STDIN uufile

. -

```
uuencode /bin/bash super-shell > uufile
split –b 150000 uufile  base-name
```

. … base-name.aa, base-name.ab

: ( )

```
cat base-name.* > uufile.new
```

.

```
uudecode  uufile.new
```

.super-shell (Binary File)

‎ـــــــــــ PATH .3

(Variables):

: .1

ALERT 'virus'

```
ALERT=virus
```

set

```
set |grep ALERT
```

set env ALERT

'bash'. ALERT

```
bash
echo $ALERT
```

( ) ـــــــ :ALERT

exit (^D) .

export ALERT .

```
export ALERT
```

(env)

```
env | grep ALERT
```

: ALERT bash

```
bash
echo $ALERT
```

ALERT

```
export ALERT=green
```

_____ ALERT .

: .2

```
CREDIT01=300;CREDIT02=400
for VAR in CREDIT01 CREDIT02;do echo $VAR;done
```

VAR $VAR.

- .

- CREDIT01 *$CREDIT01*.

.3 (Quotes) PS1 .

(: PS1 [\u@ \W]\$ \W \w)

```
PS1='[\u@\h \w ]\$ '
```

PS2 _____

File Management

1–   :

:

(/)

•   :   (/)

•   :   (/)

:

• **pwd** :

• **cd** :

2–   :

find, which, whereis , locate

find

:

find <DIRECTORY> <CRITERIA> [-exec <COMMAND> {} \;]

DIRECTORY   find   CRITERIA

```
find /usr/X11R6/bin -name ¨x*¨.
find / -user 502
```

find   stdout

. **find** **-exec** .

502

```
find / -type f -user 502 –exec rm –f {} \;
```

xargs

xargs   find

.

:   **xargs**

```
find / -type f -user 502 | xargs rm –f
```

.   **rm**

:

```
ls |xargs rm -f
```

find	
-type	
-name	
-user	
-atime, ctime, mtime	(24)
-amin, cmin, mmin	(1)
-newer *FILE*	FILE

locate

:

```
locate <STRING>
```

STRING   **locate**

```
locate X11R
```

/var/lib/slocate   locate   .   locate

updatedb

(NFS   )   /etc/updatedb.conf   updatedb

.   (/tmp   )

which

:

```
which string
```

. PATH .... string

.... which

whereis

:

whereis string

. ... PATH .... **string**

ls

ls	
-I	inode
-h	
-n	
-p	/=@
-R	
-S	
-t	(-c)
-u	

3– :

mkdir

-m

-p

```
mkdir –p docs/programs/versions
```

rm -r   rmdir

-f   root

:

( )	dir1	rm –rf /dir1/*
	dir1	rm –rf /dir1/

–4   mv   cp

cp

:

cp [options] *file1 file2*
cp [options] *files directory*

file1   file1   (**cp** *file1 file2*)

:

file2   250   file1

file2   6238

.
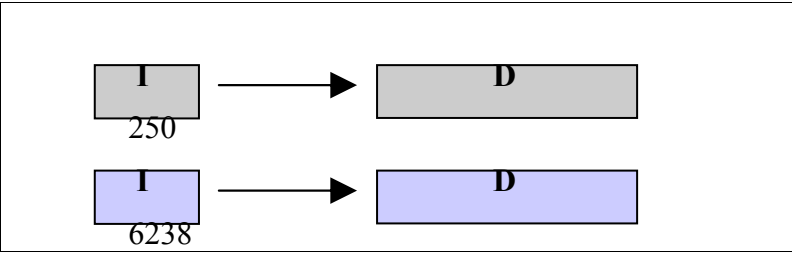
	cp
-d	(-R)
-f	
-I	
-p	
-R	

mydir	cp –r /dir/* /dir2/
mydir	cp –r /mydir/ /dir2/

mv

:

mv [options] *oldname newname*
mv [options] source destination
mv [options] source directory

mv

.

.

.   -i   -f

5-   **:**

ln -s lilo.conf lilo.sym

:   1

-rw------- **1** root root 223 Nov 9 09:06 lilo.conf
lrwxrwxrwx **1** root root 9 Nov 9 09:06 lilo.sym -> lilo.conf

)

.(

.
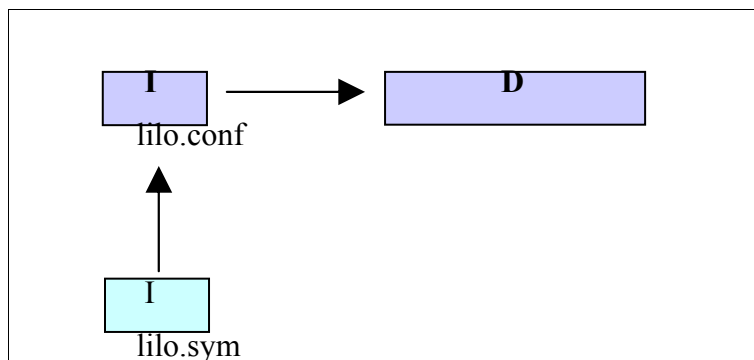
```
ln lilo.conf lilo.link
```

2

```
-rw------- 2 root  root  223  Nov  9 09:06 lilo.conf
-rw------- 2 root  root  223  Nov  9 09:06 lilo.link
```

)

.(

6- :

touch

:

touch {options} *file(s)*

touch .

file touch .

-a   -m   .   -r

.

	touch file1.txt file2.txt
lilo.conf myfile	touch myfile -r /etc/lilo.con

-errors   -

touch -- -errors

dd

I/O Block .   )

(tr

:

if= (   )

of= (   )

lcase, ucaseK, ascii   ..   conv=

```
dd if=/mnt/cdrom/images/boot.img of=/dev/fd0
```

-7 :

/bin   /tmp

mkdir /tmp/bin

(touch, cat ,vi   ) /tmp/bin   newfile

newfile   . (cd/) root

/tmp/bin

pwd

/dir1   /dir2

rm   rmdir

/usr/shar/doc

/usr/shar/doc   .   /usr/shar/doc

.   /usr/shar/doc

)   /space

.(

```
mkdir /spare
mount <device> /spare
```

du -hs /usr/share/doc   df -h /spare

/spare/   /usr/share/doc

```
cp -a /usr/share/doc /spare
```

/etc/fstab

/spare/doc   /usr/share/doc   /usr/share/doc

```
ln -s /spare/doc /usr/share/doc
```

. /home

(   )

```
find /home –mtime –1 |tee list1 |wc –-lines   (-1                    )
```

cipo   find

Processes

1- :

(ID) (Process ID) PID ( )

(Priority)

(Excutable) .

(Process_2) (Process_1) (Child

(Process . (Parent Process)

:

pstree ( )

الشكل (1) : الخرج الناتج عن الأداة **prtree**

```
Figure 1: Part of the pstree output

bash(1046)---xinit(1085)-+-X(1086)
                         `-xfwm(1094)-+-xfce(1100)---xterm(1111)---bash(1113)-+-pstree(1180)
                         |                           |-soffice.bin(1139)---soffice.bin(1152)-+
                                                                                             -soffice.bin(1153)
                         |                           |                        |-soffice.bin(1154)
                         |                           |                        |-soffice.bin(1155)
                         |                           |                        |-soffice.bin(1156)
                         |                           |                        `-soffice.bin(1157)
                         |                           `-xclock(1138)
                         |-xfgnome(1109)
                         |-xfpager(1108)
                         |-xfsound(1107)
                         `-xscreensaver(1098)
```

.

pstree   −p   −h   .

ps

.

:

ps -ux	
ps T	(Terminal)
ps aux	

ps   2

(ps manpage)   .

:

-a		tty (session leader)
-e	-A	
-f	PPID (Parent Process ID)	STIME (Start Time)
-l	-f (Long List)	
a	tty	
x	tty	

top

top   h

(Space Bar)

top   (Process Priority)

‑2

(Signals)   kill

63

SIGTERM   15

kill

```
kill SIGNAL process_PID
```

SIGKILL   (kernel) .

(daemons)   SIGHUP   "   "

	SIGHUP	1	
	SIGINT	2	Ctrl + C
	SIGQUIT	3	
	SIGKILL	9	(Kernel)
	SIGTERM	15	

killall

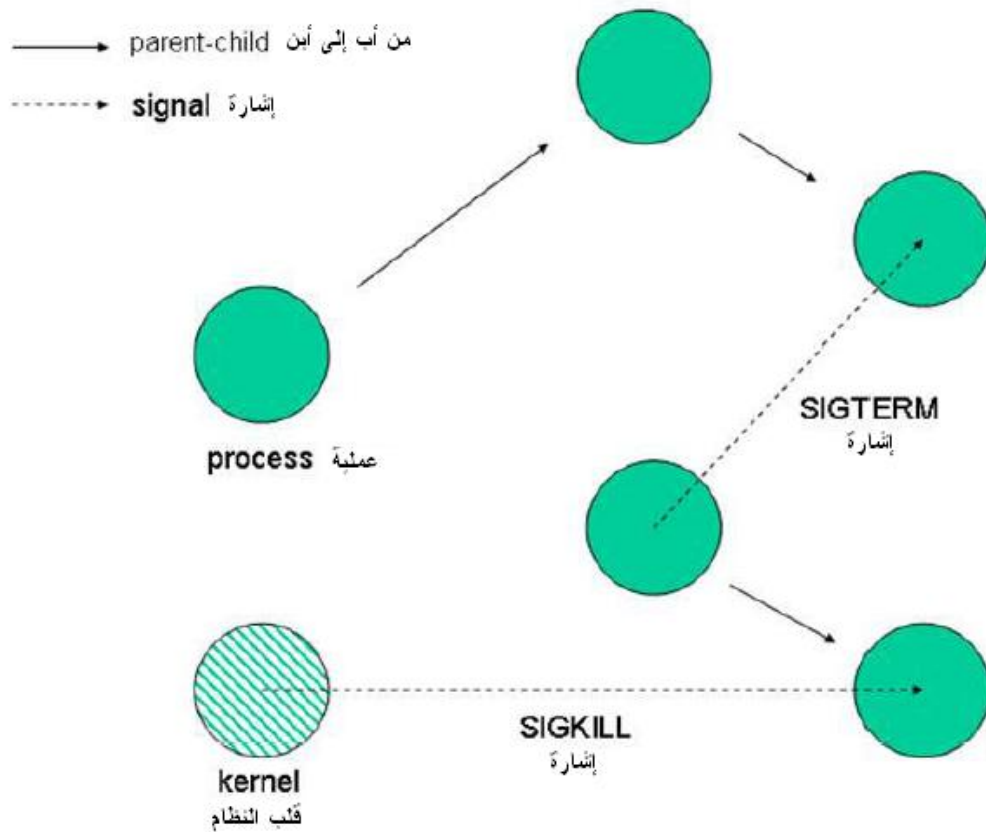**killall**

```
killall SIGNAL process_NAME
```

Fig1: Interprocess signaling

الشكل 1 : إرسال الإشارات في العمليات الداخلية

من أب إلى ابن parent-child

إشارة **signal**

عملية **process**

SIGTERM إشارة

SIGKILL إشارة

kernel قلب النظام

(Process Priority and Nice Numbers (NI))

(Nice Numbers (NI))

.

. 0   19   -20   .

(root)   .

0   root   .
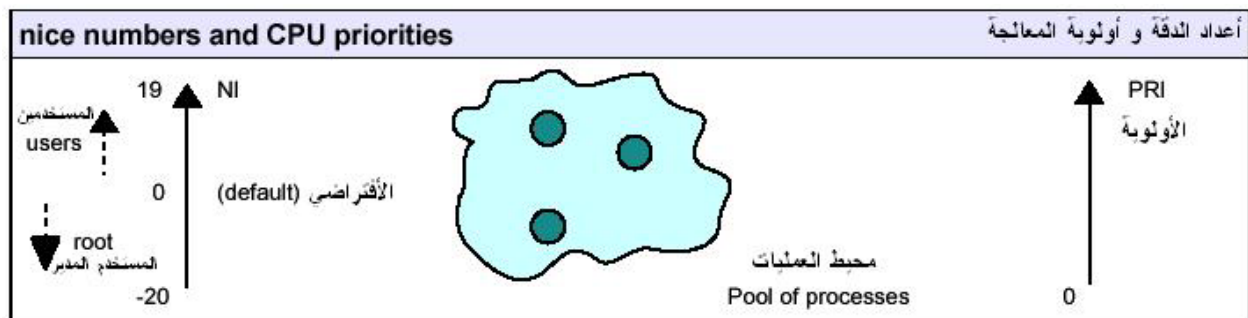
.nice   . renice

```
Nice -<NI>  <process>
renice  <+/-NI>  -p <PID>
```

renice   .
.   renice   –u

1   234   765


```
renice +1  -p 234 765
```

5-   xclock


```
nice  --5  xclock
```

.3   (Processes)   (Shell)

.

.   fg   bg

.

Ctrl + Z

(Jobs)

. (Job)   ^Z

.   bg

```
[mike localhost  /bin]$xclock
```

xclock يعمل في المقدمة . تم فقدان محرر سطر الأوامر

```
[1]+  Stopped              xclock
```
xclock استقبل الإشارة Z^

```
[mike localhost  /bin]$bg
```
تم استعادة محرر سطر الأوامر ، بالأمر bg

```
[1]+ xclock &
```
xclock يعمل الأن في الخلفية

```
[mike localhost  /bin]$
```

[1]+   .   .

+

–

jobs

.   .

Output for jobs	خرج الأمر jobs
[1]- Stopped متوقفة xclock	
[2] Running قيد العمل xman &	
[3]+ Stopped متوقفة xload	

fg   .

                    1   2

kill –9 %1

fg 2   or   أو
fg %2   or   أو
fg %?xma

nohup   **HUP**

(User Session)   nohup

HUP

nohup

bigbang   HUP

```
nohup bigbang &
```

4–

X

1- X   . renice   top
2- ^Z   kill –l
3- (daemons)

4- killall   kill
5- (kernel)
6- (virtual terminal)   tty1   tty6   .
(Script)   nohup .

print-out   /tmp

```
#!/bin/bash

count=0
while (true) do
    echo this is iteration number $count
    let count+=1
done
```

nohup

```
cd /tmp
./print-out &
exit
```

Exit   .

print-out

```
ps ux | grep print-out
```

```
nohup /tmp/print-out &
exit
```

```
ps ux |grep print-out
tail -f ~/nohup.out
Ctrl+C
killall print-out
ps ux|grep print-out
tail -f ~/nohup.out
```

معالجة النصوص Text Processing

1- **cat** (   ) **:**

Cat

Cat .

```
cat  > short-message
we are curious
to meet
penguins in Prague
Crtl+D
```

Ctrl + D . .

Cat

Cat stdout . :

-n
-b
-A (Carriage Return)

```
        cat  /etc/resolve.conf
► search    mydomain.org
  nameserver   127.0.0.1
```

tac (   )

cat

```
tac  short-message
► penguins in Prague
  to meet
  we are curious
```

2-

head و tail

head و tail   tail   head
.(logfiles)

:

: /var/log/messages

```
head -n 20 /var/log/messages
head -20  /var/log/messages
```

: /etc/aliases

```
tail -20  /etc/aliases
```

tail

25   : /var/log/messages

```
tail +25 /etc/log/messages
```

:____   90   ,   head و tail   50   65

tail   . –f

.

wc

. wc

wc

	-l	
	-w	
	-c/m	

:

(stdin)   (Arguments)   wc

cat –b   nl

```
nl -ba /etc/lilo.conf
```

```
nl -bt  /etc/lilo.conf
```

(space)   **(tabs)**

unexpand   .   expand

(Binary Files)

hexdump   (octal dump) od

-3

cut

(Fields)   (Characters)   cut
                                                              –c
                                                              :

```
cut -c {range1,range2}
```

:

```
cut -c5-10,15- /etc/password
```

/etc/password   15   10   5

.   (delimiter)
                                                  –f –d

:

```
cut -d {delimiter}   -f {fields}
```

:

```
cut -d: -f 1,7 --output-delimiter=" " /etc/passwd
```

.   /etc/password

–output-delimiter

paste

:

```
paste    text1    text2
```

join

:

```
join   -j1 {field_num}  -j2{field_num}  text1   text2              or
join    -1 {field_num}  -2{field_num}   text1   text2
```

.   stdout

sort

. −n

. fmt

.   75   fmt

fmt

	-w
	-s
	-u

:

tr

:

```
tr '[A-B]' '[a-b]'  < file.txt
```

/etc/password   (delimiters)

```
tr  ':'  ' ' < /etc/passwd
```

(Arguments)   tr   :

‎-4 ‏:

‎-1 ‏cat ‏message

```
cat >> message
line 1
 ^D
```

STOP ‏(eof) ‏(^D)

```
Cat >> message << STOP
line 2
STOP
```

echo ‏message

```
echo line 3 >> message
```

‎-2 ‏index ‏TITLE ‏REFRENCE

‏:

```
001        Using_Linux
```

pricing ‏PRICE ‏REFRENCE

‏:

```
001      9.99
```

join ‏REFRENCE ‏TITLE ‏PRICES .

‎-3 ‏(Colon :) ‏(Semicolon ;) ‏/etc/passwd

cut.

‎-4 ‏head ‏tail ‏70 ‏85 ‏/var/log/messages

‎-5 ‏cut ‏grep ‏ifconfig ‏IP (IP Address)
(network interface eth0)

‎-6 ‏files ‏/tmp

```
mkdir /tmp/files
```

50

```
#!/bin/bash
count=0
while (count –lt 50) do
touch /tmp/files/$count.txt
let count+=1
done
```

. (dat)   (txt)

```
for FILES in $(ls *.txt)
do
FILENAME=$(echo $FILES| cut –d. –fl)
mv $FILES $FILENAME.dat
done
```

Software Installation

-1

(C language)   :

:main.c

```
#include<stdlib.h>

int main ()
{
    Hello() ;
}
```

:Hello.c

```
#include<stdio.h>

void Hello()
{
  printf("Hi ! \n") ;
}
```

main   Hello.c   Hello()   main.c
(Compiler   )

.o   (object)

```
gcc –c main.c
gcc –c Hello.c
```

app   (application)   main.o , Hello.o

```
gcc – app main.o Hello.o
```

−o

a.out

Makefile :

```
SHELL = /bin/sh
CC = /usr/bin/gcc
app: main.o Hello.o
$(CC) –o app main.o Hello.o
main.o: main.c
$(CC) –c main.c
Hello.o: Hello.c
$(CC) –c Hello.c
```

2–   **:**

dll   -   –   :

.

.

.

.o   .   gcc

Code   .c

            gcc main.c Hello.o

Hello.o   a.out

:

ar   .o   .o

: .a

            ar rcs libfoo.a file1.o file2.

:

:

            gcc –c –fPIC Hello.c   creates the object file

gcc –shared –W1,soname,libfoo.so.1 –o libfoo.so.1.0 Hello.o

gcc main.c libfoo.so.1.0

<<

:

./a.out: error while loading shared libraries: **libfoo.so.1.0**: cannot open shared object file: No such file or directory

.

:

:


```
gcc –shared –soname,libfoo.so.1 –o libfoo.so.1.0
```

libfoo.so.1.0	/usr/lib/libfoo.so.1.0 → real name
	/usr/lib/libfoo.so.1 → soname
	/usr/lib/libfoo.so → link name
ldconfig	/etc/ld.so.cache
/etc/ld.so.conf	
ld.so	the linux run-time linker

.   <<
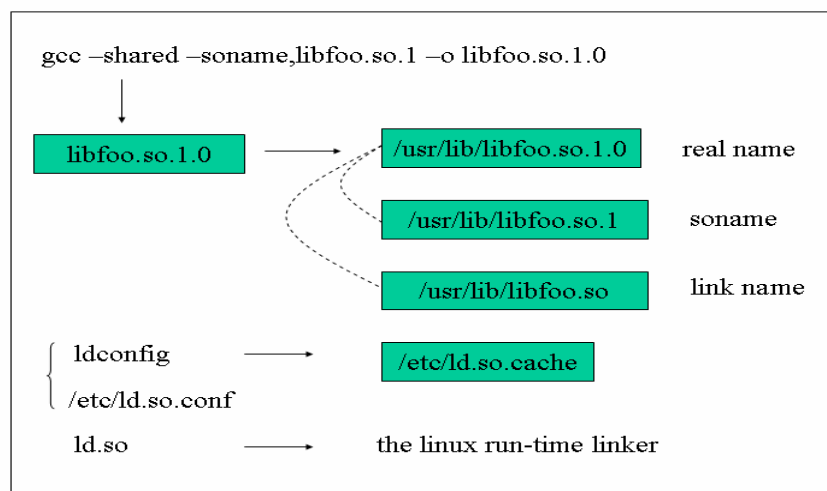
ldd   (   )

:

ldd a.out
►   libfoo.so.1.0 => **not found**
libc.so.6 => /lib/libc.so.6 (0x40028000)
/lib/ld-linux.so.2 => /lib/ld-linux.so.2 (0x40000000)

a.out   libfoo.so.1.0

libfoo.so.1.0   id.so

<<

:   LD_LIBRARY_PAHT   -1

export LD_LIBRARY_PATH=$(pwd)

idconfig   /usr/lib/   libfoo.so.1.0   -2

            / usr/local/lib   GNU

     /usr/local/bin

        make uninstall   make install

  /usr/bin   /usr/lib

   /usr/   .

           .   /usr/local

         rpm   .

---

    ldconfig   /usr/local/lib/   :

           …….   /etc/ld.so.conf

                     :   **-3**

（glade,Kdevelop … ）

             .

                   :

configure: ، . /configure :

Makfile : :
- .
- .
- .

( ) :(

:

./configure
make
make install

make install /usr /usr/local .
/configure : /configure –help .
‑‑prefix
/usr/local .

–4 : (RPM : The RedHat Package Manager)

```
rpm -q bash

rpm -qf /bin/bash
```

/var/lib/rpm

database

```
rpm -qpl bash-2.05-8.i386.rpm

rpm -checksig bash-2.05-8.i386.rpm

rpm -ivh bash-2.05-8.i386.rpm
```

bash-2.05-8.i386.rpm

:
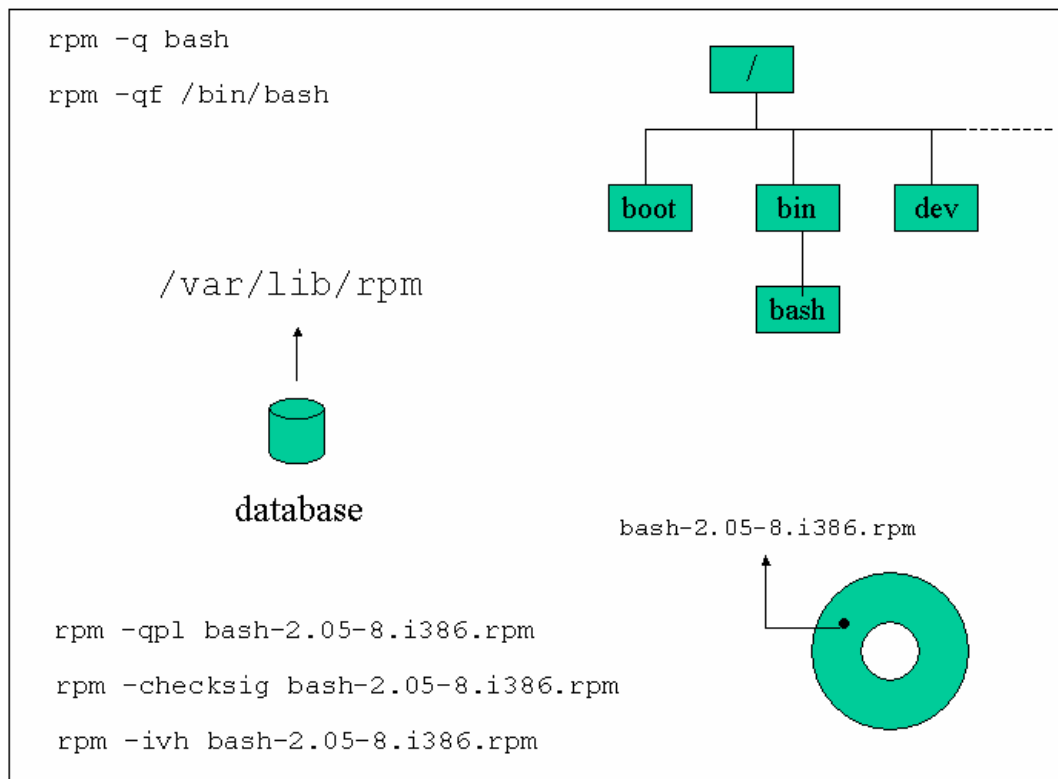
name-version-release.architecture.rpm   :   rpm

rpm.   .   −   −

:

:rpm

	-install	-i
	-update	-u
	-freshen	-f
− − …	-verify	-v
..	-query	-q
	-erase	-e

:

	a
q	c
q	d
	h
q	i
q	l
q	p
	v

:

routed-0.17.i386.rpm

: l

rpm –qpl routed-0.17.i386.rpm

:

rpm –ql routed-0.17
rpm –ql routed

:   rpm   \usr\sbin\routed

rpm –qf /usr/sbin/routed

:

-qp	
-q	
-qf	

……… , –d   , –l

:

	-nodeps
	-force
	-test
stdout	
	--requires

( ) **rpm:**

(Binary) rpm rpm

:

name-version-release.src.rpm

.src.rpm – –

(spec) .

. rpm

.

: .rpm

name-version-release.src

rpm-build <<

1:

: rpm

rpm –ivh name-version-release.src.rpm

:

/usr/src/redhat/SPECS
/user/src/redhat/SOURES

name-) . (name) name.spec

: (version-release.i386.rpm

rpm –ba name.spec

/usr/src/redhat/SOURCE

. /usr/sec/redhat/BUILD

/usr/src/redhat/RPMS/.

2:

:

rpm –rebuild name-version-release.src.rpm

3 :

.spec
name-version-release.tar.gz

:   spec

tar tzvf name-version-release.tar.gz | grep .spec

:   rpm   spec

rpm –bt name-version-release.tar.gz

–5   :

.   Redhat   debian
http://kitnet.net/programs

6- :

(bash-2.05-8.src.rpm)

:

RPM

rpm –ivh bash-2.05-8.src.rpm

:   /usr/src/redhat/SOURCES

tar xvzf bash-2.05-8.tar.gz

.   :(   )

:

: /usr/src/redhat/SOURCES
patch –p0 –b < file.patch :

/usr/src/redhat/SOURCES/bash-2.05-8
patch –p1 –b < file.patch :

:

./configure
make

make install

(Package Manager)

: RPM

rpm –rebuild package.src.rpm

:

/usr/src/redhat/RPMS

–qpl   -

-

-

Advanced Text Manipulation

:

grep, fgrep, grep

regular

.   *sed, vi*   *.expressions*

–1 :Regular Expressions

1:                                     :

x ( )	'x'
\<KEY	'KEY'
WORD\>	'WORD'
^	
$	
[Range]	ASCII
[^c]	'c'
\[	'['
"cat*"	'cat' 'ca'
"."	( )

:

+,?,( ), | :

2:                                     :

"A1|A2|A3"	'A1' 'A2' 'A3'
"cat+"	cat
"cat?"	'cat' 'ca'

2- The grep family:grep

grep : باستخدام

regex 1.

egrep:

eregex 2.

fgrep:

fast grep ( )

3- grep:

:

grep PATTERN FILE

grep	
-c	PATTERN
-f	PATTERN
-i	( )
-n	
-v	PATTERN
-w	PATTERN

: : /etc/lilo.conf

grep –v "^$" /etc/lilo.conf

3- egrep و fgrep:

fgrep . :

fgrep 'cat*' FILE

.   (*)   'cat*'

. (list   )   fgrep

:

fgrep –f LIST FILE

.   egrep

:   .pipes

egrep "linux|^image"   /etc/lilo.conf

The Stream Editor – sed   **−5**

.   UNIX   ,

.   ,   patterns   sed

−1−5   sed:

sed:

sed   [options] ´command´ [INPUTFILE]

.   sed

MODIF:

:

sed '/^#/ d ' MODIF

./ /

: /dev/sdb3   /dev/hda1

sed 's/\/dev\/hda1/\/dev\/sdb3/g' MODIF

"globally"   *g*   . substitute   *s*

.

:globally   ';'   ':'   KEY

sed ' /KEY/ s/:/;/g' MODIF

:sed   **-2-5**

'OLD'   ,   :   ,–e

:MODIF   'NEW'

sed –e '/^$/ d' -e 's/OLD/NEW/g' MODIF

.COMMANDS   ,

:(   )

COMMANDS
1 s/old/new/
/keyword/ s/old/new/g
23,25 d

:   COMMANDS

sed -f COMMANDS MODIF

.

sed

sed
-e
-f
-n

sed
d
r

	s
	w

6– :

1- FILE :

```
Using grep,
fgrep and
egrep
to grep for 99% of the cats
% these are two
% commented lines
```

- grep .
- grep ('egrep' 'fgrep'. −*w*).
- 'a'.

2- :

:

```
ca
cat
cats
catss
cat+
cat*
cat?
car
carriage
```

(egrep fgrep):

grep 'cat+' FILE

grep 'cat?' FILE

grep 'cat.' FILE

grep 'cat*' FILE

3- sed FILE:

(COMMAND)

- 'grep,' 'soap'
- 'fgrep' .
- 'egrep' ' water'
- 'grep for' .'wash'

.w

VI

. /bin   cat   greb   .   VI

-1   VI :

VI   /

•   :

.   j   .   .

.   j 10   .

•   ( )   :

.   (:)

Shell

•   :

. a   i

.

.

-2   :

(   )

.

b e	e /b
( )	/
{ }	/
w	e

^	
$	
1G	
G	

(^) ، (}‏) (w)

. ‏…. (G)

3- :

vi . I

: .

a	
A	
i	
o	
O	
s	
S	

4- :

. dd x

:

. vi

. (…. ، ،)

w	
i	

:

dw

d$

d}

.c

. {   w

5-   :

vi   y (yank)   p.

$, } , I , w …

:

y$

yy

3yy

➥   p .   .

6-   :

(regex),   vi

grep   sed .

(:) .   \   .

.   sed .

:

'comp' .

\ /<comp

z .

z^/

'VAR'   'var'.

: % s/VAR/var

7-   :

u   (   )

.

-8 :

. w .   .

.   :

:

'newfile'

:w newfile

'extract'   24   15

:w 15,24 extract

.'extract'   .

:r extract

:

.   .

. $

9– :

root

/var/log/messages /tmp

cp /var/log/messages /tmp

print" ;"

"u" .

/etc/lilo.conf /tmp , dd/p / yy/p /

:x ,ZZ , :quit, :wq , q! ( )

A, a O, o, S, s :

vim-enhanced vimtutor

vi.

The X Environment

1- :

X (Project Athena)

MIT. . X

X 11 6 (X11R6).

X .xfree86 Pentium, 80386, 80486

xfree86 System V/386 386BSD.

مكونات نظام X11R6 وإعداداته

client A	*client B*	*wm*

X11R6

xfs — Section Files

monitor — Section Monitor

mouse — Section InputDevice / Section Pointer (old)

keyboard — Section InputDevice / Section "Keyboard" (old)

video — Section Device
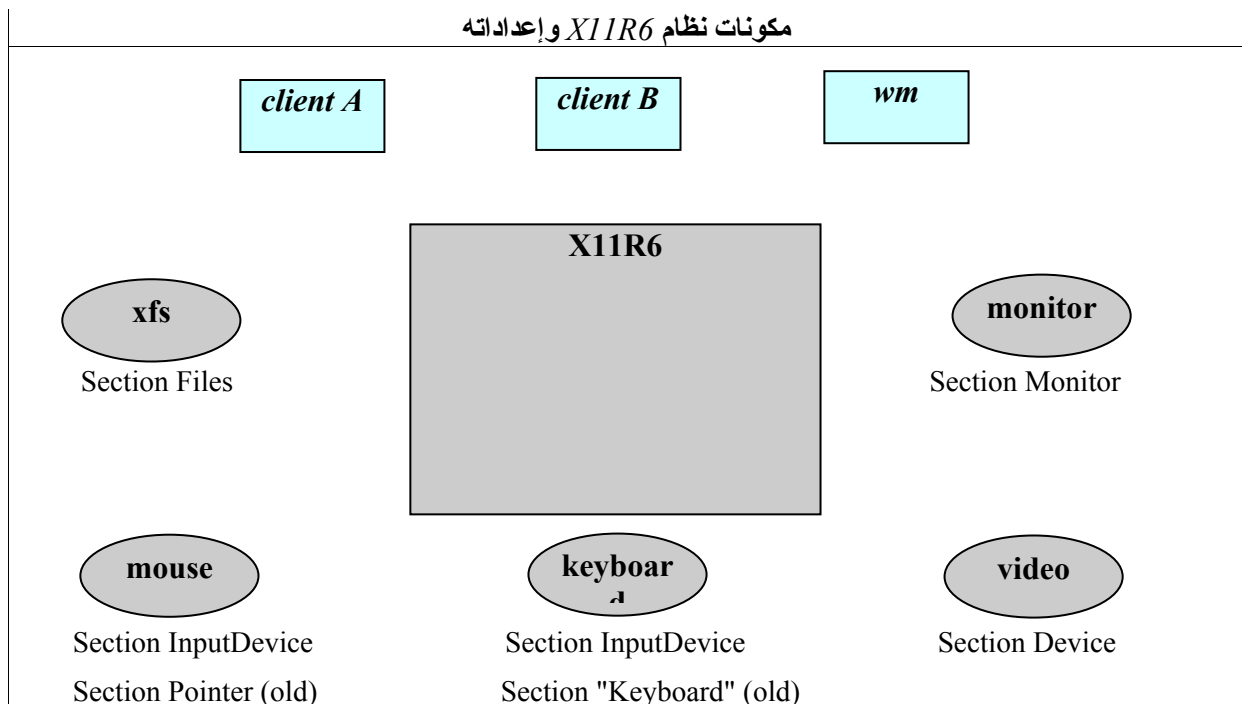
X11R6. (Section)

XFree86 ( ).

(Clients) **X-** ( ).

(Window Manager) X11R6 .

(..) .

X11R6 の .
X11R6 Xresources Xdefaults
.

−2 **:X11R6**

.xf86config   XF86Setup :   X11R6

:

(   ) Xconfigurator, redhat-config-xfree96

(   ) XFdrake

(   ) Sax

XF86Config

X   .XF86Config

/etc/X11/XF86Config :   /etc/X11   .

:   11

ServerFlags
Module
InputDevice
Device
VideoAdapter
Monitor
Modes
Screen
ServerLayout
DRI
Vendor

Pointer   Keyboard
InputDevices

(FontPath   )   . (Files)

(RgbPath   )   .

:   RGB   rgb

```
Section "Files"
        FontPath "/path/to/fonts/dir/"
        FontPath "trans/hostname:port"
    RgbPath   "/path/to/rgb"
EndSection
```

hostname   (unix   )   trans

.(7100   )   port

:

```
FontPath "unix/:7100"          # Local Font Server
FontPath "unix/myfontserver.mydomain.com:7100"
```

:XF86Config

```
Section "Files"
  RgbPath    "/usr/X11R6/lib/X11/rgb"
  FontPath
"/usr/X11R6/lib/X11/fonts/misc:unscaled,/usr/X11R6/lib/X11/fonts/75dpi:unscaled,/usr/X
11R6/lib/X11/fonts/100dpi:unscaled,/usr/X11R6/lib/X11/fonts/misc/"
EndSection
```

```
Section "InputDevice"
    Identifier  "Keyboard0"
    Driver     "keyboard"
EndSection
```

```
Section "InputDevice"
    Identifier  "Mouse0"
    Driver     "mouse"
    Option     "Protocol" "IMPS/2"
    Option     "Device" "/dev/psaux"
    Option     "ZAxisMapping" "4 5"
EndSection
```

```
Section "Monitor"
  Identifier     "Primary Monitor"
  VendorName     "Unknown"
  ModelName      "Unknown"
  HorizSync     31.5-37.9
```

```
   VertRefresh    55-90
   Modeline  "800x600"    40.00 800 840 968 1056 600 601 605 628 +hsync +vsync
EndSection
```

```
Section "Device"
   Identifier    "Primary Card"
   VendorName    "Unknown"
   BoardName     "None"
   VideoRam      2048
EndSection
```

```
Section "Screen"
   Driver        "Accel"
   Device        "Primary Card"
   Monitor       "Primary Monitor"
   DefaultColorDepth 24
   BlankTime     0
   SuspendTime   0
   OffTime       0

   SubSection "Display"
     Depth       24
     Modes       "800x600"
   EndSubSection
   SubSection "Display"
     Depth       32
     Modes       "800x600"
```

:   −3

.Xdefaults   .Xresources   X11R6

.   .

.Xresources

```
xterm_color*background: Black
xterm_color*foreground: Wheat
xterm_color*cursorColor: Orchid
xterm_color*reverseVideo: false
xterm_color*scrollBar: true
xterm_color*saveLines: 5000
xterm_color*reverseWrap: true
xterm_color*font: fixed
```

```
xterm_color.geometry: 80x25+20+20
xterm_color*fullCursor: true
xterm_color*scrollTtyOutput: off
xterm_color*scrollKey: on
term_color*VT100.Translations: #override\n\
        <KeyPress>Prior : scroll-back(1,page)\n\
        <KeyPress>Next : scroll-forw(1,page)
xterm_color*titleBar: false
```

.

.   *

.   .Xresources

4–   **X:**

X   :

:   startx
:   Display Manager
.

1–   :

startx   .xinit   :   X   .xinitrc

xinitrc   Xresources (   ) Xclients (

.(:

startx --> xinit --> X -> xinitrc -> Xclient (wm/desktop)

2–   Display Manager:

.   .

xdm --> xlogin --> Xsession --> Xclient

5–   The Display Manager:

: xdm (generic)   gdm (GNOME)   kdm (KDE) .

LPI   :

/etc/X11/xdm/
/etc/X11/gdm/
/etc/X11/kdm/

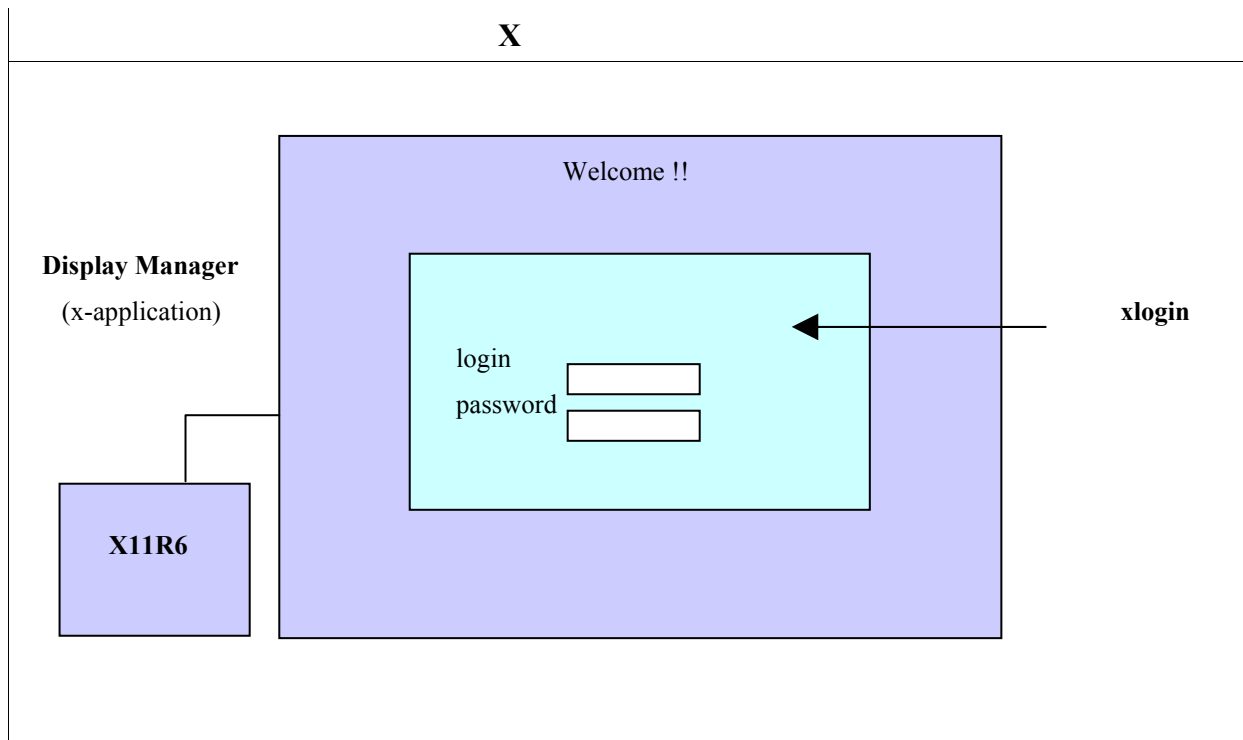.gdm xdm   kdm

.   5

XDMCP

.(X Display Manager Control Protocol) X

.(   )

X

Display Manager
(x-application)

Welcome !!

login
password

xlogin

X11R6

:
/etc/X11/xdm/Xrescources

X

gdm   ./etc/X11/xdm   Xresources
/etc/X11/gdm/Init/Default

/etc/X11/xdm/Xservers

X   :0   .   X

.   /dev/tty   X   .

/etc/X11/xdm/xdm-config

(   ) XDMCP   xdm

/etc/X11/xdm/Xaccess

XDMCP

.(–query   )

Xaccess

```
# $XConsortium: Xaccess,v 1.5 91/08/26 11:52:51 rws Exp $
#
# Access control file for XDMCP connections
# To control Direct and Broadcast access:
#
#       pattern
#
# To control Indirect queries:
#
#       pattern          list of hostnames and/or macros ...
#
# To use the chooser:
#
#       pattern          CHOOSER BROADCAST
#
# or
#
#       pattern          CHOOSER list of hostnames and/or macros ...
#
# To define macros:
#
#        %name           list of hosts ...
#
# The first form tells xdm which displays to respond to itself.
# The second form tells xdm to forward indirect queries from hosts matching
# the specified pattern to the indicated list of hosts.
# The third form tells xdm to handle indirect queries using the chooser;
# the chooser is directed to send its own queries out via the broadcast
# address and display the results on the terminal.
# The fourth form is similar to the third, except instead of using the
# broadcast address, it sends DirectQuerys to each of the hosts in the list
#
# In all cases, xdm uses the first entry which matches the terminal;
# for IndirectQuery messages only entries with right hand sides can
# match, for Direct and Broadcast Query messages, only entries without
# right hand sides can match.
#
```

*   #any host can get a login window

```
#
# To hardwire a specific terminal to a specific host, you can
# leave the terminal sending indirect queries to this host, and
# use an entry of the form:
#

#terminal-a     host-a

# The nicest way to run the chooser is to just ask it to broadcast
# requests to the network - that way new hosts show up automatically.
# Sometimes, however, the chooser can't figure out how to broadcast,
# so this may not work in all environments.
#

*               CHOOSER BROADCAST       #any indirect host can get a chooser

# If you'd prefer to configure the set of hosts each terminal sees,
```

```
# then just uncomment these lines (and comment the CHOOSER line above)
# and edit the %hostlist line as appropriate
#
#%hostlist      host-a host-b
#*             CHOOSER %hostlist      #
```

```
# $XConsortium: Xserv.ws.cpp,v 1.3 93/09/28 14:30:30 gildea Exp $
#
#
# $XFree86: xc/programs/xdm/config/Xserv.ws.cpp,v 1.1.1.1.12.2 1998/10/04 15:23:14 hohndel Exp $
#
# Xservers file, workstation prototype
#
# This file should contain an entry to start the server on the
# local display; if you have more than one display (not screen),
# you can add entries to the list (one per line).  If you also
# have some X terminals connected which do not support XDMCP,
# you can add them here as well.  Each X terminal line should
# look like:
#       XTerminalName:0 foreign
#
:0 local /usr/X11R6/bin/X
```

.Xresources   Xresources   X

                                                      .

```
! $XConsortium: Xresources /main/8 1996/11/11 09:24:46 swick $
xlogin*borderWidth: 3
xlogin*greeting: CLIENTHOST
xlogin*namePrompt: login:\040
xlogin*fail: Login incorrect
#ifdef COLOR
xlogin*greetColor: CadetBlue
xlogin*failColor: red
*Foreground: black
*Background: #fffff0
#else
xlogin*Foreground: black
xlogin*Background: white
#endif

XConsole.text.geometry:        480x130
XConsole.verbose:      true
XConsole*iconic:       true
XConsole*font:         fixed
```

```
! $XFree86: xc/programs/xdm/config/xdm-conf.cpp,v 1.1.1.2.4.2 1999/10/12 18:33:29 hohndel Exp $
!
DisplayManager.servers:                 /etc/X11/xdm/Xservers
DisplayManager.accessFile:    /etc/X11/xdm/Xaccess
! All displays should use authorization, but we cannot be sure
! X terminals will be configured that way, so by default
! use authorization only for local displays :0, :1, etc.
DisplayManager._0.authorize:  true
DisplayManager._1.authorize:  true
!
DisplayManager*resources:     /etc/X11/xdm/Xresources
```

```
DisplayManager*session:              /etc/X11/xdm/Xsession
DisplayManager*authComplain:  false
! SECURITY: do not listen for XDMCP or Chooser requests
! Comment out this line if you want to manage X terminals with xdm
DisplayManager.requestPort:    0
```

6– :

)

(Zombie Processes

ps ( ) 1 (init).

9- .

7– :

( )

X. X

(..)

: http://www.PliG.org/xwinman

:

ftp://metalab.unc.e/pub/Linux/X11/window-managers

GNOME KDE .

:

fvwm
icewm
amiWM
lvwm
dfm
olwm
olvwm
mwm
Window Maker
AfterStep
Enlightenment

8- :

: 3

init 3

1- (Alt+F1)
2- /etc/X11/XF86Config
:

<u>Redhat</u>: Xconfigurator, redhat-config-xfree86 (8.0)
<u>Mandrake</u> : XFdrake
<u>Suse</u>: sax

XF86Setup
xf86config
X (X -configure)
3- **X** **X** **X** .
(Ctrl+Alt+F2) :

export DISPLAY=localhost:0
xterm&

X Ctrl+Alt+F7 (/etc/inittab)
xterm . :

twm&

twm X ( )
(Ctrl+Alt+F2 :

X :1

(tty3) :

export DISPLAY=:1; xterm&

X 0 1.

4- XDMCP:

*

/etc/X11/xdm/Xaccess

xdm **kdm**   xdm-config

!DisplayManager.requestPort: 0

         (   )

                                           .(   ) 0

gdm   gdm.conf   :

enable=true

gdm

X   1.2.3.4   IP

                                                 :

X –query 1.2.3.4 :1

X -indirect 1.2.3.4 :1

	shell		Kernel
-	Packages		rescue mode
	Pre-compiled		Compiler
	Module		initial ramdisk
-	Utility		kernel modules
	Local Installations		Install
	Download		installation image
	mount		Setup
	unmounted		is mounted
	file retrieval protocol		mount points
	Root filesystem		Script
	Dialup		Modem
postscript	Postscript		Detection
	Custom System	- —	Format
	CD-ROM		flat files
	partition table	_ _	Partition
	Partitioning Schemes		logical partition
	Directory		Dual Booting
SCSI	SCSI tape		Block devices
,	Primary		Hard disk descriptor
	master boot record MBR		Extended
	Parameter		boot loader
	user quotas (on the device)		Prompt
	preliminary file		quota stats
	Support		Configuration
_	ID	_	Resource
	Interrupt Request		Allocation
	Jumpers		Device
	Adapters		Robot

	Peripherals		Universal Serial Bus
	interface card		by default
	Architecture		Chipset
	Host		Plug and play
–	Software	/	soft/hard limit
	Inode	–	Hardware
	Linux	– –	Process