LINUX Administrator's Quick Reference Card

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User Management

Files

/etc/group **/etc/passwd** **/etc/shadow**	User account information.
/etc/bashrc **/etc/profile** **$HOME/.bashrc** **$HOME/.bash_profile**	BASH system wide and per user init files.
/etc/csh.cshrc **/etc/csh.login** **$HOME/.cshrc** **$HOME/.tcshrc** **$HOME/.login**	TCSH system wide and per user init files.
/etc/skel	template files for new users.
/etc/default	default for certain commands.
/etc/redhat-release **/etc/slackware-version**	Redhat and Slackware version info (Linux kernel version with "uname –a")

Commands

adduser	script to create an new user interactively (slackware) or link to useradd (Redhat).
useradd, userdel, usermod	create, delete, modify an new user or update default new user information..
newusers	update and create new users (batch mode).
groupadd, groupdel, groupmod	add, delete or modify group.
chage. chfn, chsh	modify account policy (password length, expire data etc.) or finger information (full name, phone number etc.) change default login shell.
linux init=/bin/sh rw	gain root access during boot prompt without password, can be used to fix some problems. **mount –w -n –o remount /**
makebootdisk	make a bootable floppy disk

Network Configuration

Files

/etc/rc.d/rc.inet1 (Slackware) **/etc/sysconfig/nework-scripts/ifcfg-eth0 (Redhat)**	IP address, Network mask, Default gateway are in these files. May edit manually to modify network parameters.
/etc/rc.d/rc.netdevice **/etc/modules.conf**	Put network card driver (e.g., e100) in "rc.netdevice" ***/sbin/modprobe e100*** Or in "modules.conf" ***alias eth0 e100***
/etc/HOSTNAME **/etc/NETWORKING (Slackware)**	hostname is set by "/bin/hostname" during boot and the name is read from these files. May change manually.
/etc/sysconfig/network (Redhat)	
etc/resolv.conf	specify name server, DNS domain and search order. For Example: ***search la.asu.edu*** ***nameserver 129.219.17.200***
/etc/hosts	host name to IP mapping file.
/etc/host.conf	host name information look up order. Example: ***order hosts, bind*** ***multi on***
/etc/nsswitch.conf	new way to specify information source.
/etc/networks **/etc/protocols** **/etc/services**	TCP/IP services and ports mapping.
/etc/rpc	RPC service name to their program numbers mapping.

Commands

netconfig	menu driven Ethernet setup program.
pppsetup	setup PPP connection (Slackware).
ifconfig	setup Ethernet during boot, for example */sbin/ifconfig eth0 ${IPADDR} broadcast ${BROADCAST} netmask ${NETMASK}* /sbin/route add -net ${NETWORK} netmask ${NETMASK} eth0 /sbin/route add default gw ${GATEWAY} netmask 0.0.0.0 metric 1
host	lookup host name or IP (similar to nslookup).
dnsdomainname	show DNS domain name.
arping; arp	find out Ethernet address by first arping then arp.
ipchains	firewall and NAT (/etc/sysconfig/ipchains on Redhat)
iptables	firewall and NAT (/etc/sysconfig/iptables on Redhat)
ntsysv	menu driven SYSV service configuration (Redhat)
chkconfig	command line SYSV service configuration (Redhat)

Redhat files in /etc/sysconfig

Configuration Files

keyboard	keyboard map, e.g., KEYBOARD="/usr/lib/kdb/keytables/us.map"
mouse	Mouse type, e.g., MOUSETYPE=Microsoft XEMU3=yes
network	network settings, contains NETWORKING=yes HOSTNAME=hostname.domain.com

NFS File Sharing

Files

/etc/fstab	file systems mounted during boot.
/etc/exports	NFS server export list.
/etc/auto.master	auto mount master file.

Commands

mount	mount a file system or all entries in fstab.
exportfs	export file system listed in exports
showmount –e *hostname*	show file systems exported

Printer Configuration

Files

/etc/printcap **/etc/printcap.local**	Printer capabilities data base.
/etc/lpd.conf	LPRng configuration file.
/etc/lpd.perms	permissions control file for the LPRng line printer spooler
/etc/hosts.lpd	Access control (BSD lpd).
/etc/hosts.equiv	trusted hosts.
PRINTER	Environment variable of default printer.
/dev/lp0	parallel port.

Commands

lpc, lpq, lprm	line printer control program, print queue maintain

Sendmail

Files

sendmail.cf **sendmail.mc**	"sendmail.cf" is the configuration file. "sendmail.mc" is a macro file which can be used to generate "sendmail.cf" by: **m4 sendmail.mc > sendmail.cf**
aliases	mail aliases, must run "newaliases" after change. use :include: to include external list in a file.
.forward	per user aliases, use \yourname to prevent further expand and keeps a copy in mailbox.
access	mail access control, FEATURE(access_db) should be set in sendmail.mc. For example, in /etc/mail/access *cyberpromo.com REJECT* *mydomain.com RELAY*

	spam@somewhere.com DISCARD
	makemap hash /etc/mail/access < /etc/mail/access
/etc/mail/relay-domains	list all host/domain accepted for relaying.

Commands

newaliases	rebuild the data base for the mail aliases file.
makemap	build access database, e.g, *makemap hash access.db<access*

Useful Configuration Files

Files

httpd.conf	Apache web server configuration file.
lilo.conf	LILO boot loder configuration file.
syslog.conf	System log daemon (syslogd) configuration.
ssh_config **sshd_config**	SSH client and server configuration files.
ld.so.conf	default dynamic library search path (run ldconfig).
mtools.conf	mtool configuration file (access DOS file).
named.conf	DNS name server (BIND).
sysctl.conf	kernel parameters by sysctl (Redhat).
ntp.conf	net time server.
inetd.conf	Internet super server.
Xinetd.conf, Xinet.d directory	Extended inetd configuration.
proftpd.conf	proftpd FTP server.
amanda.conf	network backup server.
/etc/pine.conf **/etc/pine.conf.fixed**	PINE mail client system wide settings.

Rebuild Kernel

Configure Kernel Parameters

	Unpack the tarball in /usr/src directory bzip2 -dc linux-2.4.0.tar.bz2 | tar xvf –
make config **make menuconfig** **make xconfig**	Configuring the kernel with interactive, menu or X window interface.

Compile Kernel Source

	Building and installing a new kernel.
make dep **make zImage** **make zdisk** **make zlilo** **make bzImage**	cp arch/i386/boot/bzImage /boot/bzImage-KERNEL_VERSION cp System.map /boot/System.map-KERNEL_VERSION ln -s /boot/System.map-KERNEL_VERSION /boot/System.map

Compile Modules

make modules **make modules_install**	Building and installing modules.

Manage Modules

insmod, lsmod, modinfo, modprobe, rmmod, depmod	Manage loadable modules.

Miscellaneous

Files

/etc/shells	allowed login shells
/etc/ftpusers	user names NOT allowed to use ftp.
/etc/hosts.allow **/etc/hosts.deny**	TCP wrapper access control files.
/etc/sysconfig (redhat)	contains system configuration files.
/dev/fd0	floppy drive A
/etc/inittab **/etc/init.d**	system run level control file.

Commands

fromdos, todos (Slackware) **dos2unix, unix2dos (Redhat)**	convert text file from/to linux format.
pwck, grpck	verify integrity of password and group files.
pwconv, pwunconv, grpconv, grpuncov	convert to and from shadow passwords and groups.
shadowconfig	toggle shadow passwords on and off.
quota, edquota, quotacheck, quotaon, quotaoff, repquota,	Manage disk quota.
lilo -D *dos*	set LILO default OS (default=dos in lilo.conf)
ldd	find out shared library dependencies.
lsof	list opened files.
fuser *filename*	show processes that using the file.
ifdown **ifup**	bring up/down a network interface (Redhat)
sysctl	configure kernel parameters (Redhat).
socklist	list opened socked.
shutdown [–r|h] now	reboot / halt computer
nmap	scan a host for opened ports.
crontab	show or edit cron jobs.
sys-unconfig	unconfigure system
chkconfig --list	list services started at different run level.
unset TMOUT	disable BASH auto-logout feature
unset autologout	disable TCSH auto-logout feature
kudzu	probe for new hardware (Redhat).
Rpm	rpm -i INSTALL a package rpm -e UNINSTALL a package rpm -q QUERY a package rpm -U UPDATE a package
man *cmd* | col –b >*cmd.txt*	save a man page as a text file and remove control characters.
ntop –w 3000	Run **ntop** and listen on web port 3000. View traffic with browser to http://hostsname:3000

Configure Apache 2.0 with SSL

mod_ssl

(1) when compile apache, specify –enable-ssl for configure script. By default, ssl is not enabled. After compiling, use "httpd –l" to list the modules. "mod_ssl" should be in them.

(2) generate private key with command:
openssl genrsa -out server.key 1024

(3) generate certificate request
openssl req -new -key server.key -out server.csr

(4) generate self-signed certificate
openssl x509 -req -days 60 -in server.csr -signkey server.key -out server.crt

(5) modify "ssl.conf" which is included in "httpd.conf". To start web server with SSL support , use "httpd –DSSL" or "apachectl startssl", otherwise, commented out <IfDefine SSL> in ssl.conf.

(*) Trouble shoot SSl connection with command
openssl s_client –connect yourhost.yourdomain.com:443

Syslog.conf

Each line consists of a selector and an action. A selector has two parts: facilities and priorites, separated by a period (.),You may precede every priority with an equation sign (``=") to specify only this single priority and not any of the above. You may also (both is valid, too) precede the priority with an exclamation mark (``!") to ignore all that priorities, either exact this one or this and any higher priority.

Example:

```
mail.notice          /var/log/mail # log to a file
*.emerg              @myhost.mydomain.org      # log to remote host
```

Note: separator between first column and second colume (log file name) must be TAB, not spaces.

Facilities	auth, auth-priv, cron, daemon, kern, lpr, mail, mark, news, syslog, user, uucp, local0 – local7.
Priorities	debug, info, notice, warning, err, crit, alert, emerg.
Action	**Regular File:** File with full pathname beginning with "/". **Terminal and Console:** Specify a tty, same with /dev/console. **Remote Machine:** @myhost.mydomain.org

Printing with CUPS

Introduction

Common Unix Printing System (CUPS) is the default printing system on many Linux distros and Mac OSX. The latest version can be downloaded from http://www.cups.org. You have to download CUPS package and optionally ESP Ghostscript package if you don't have a Postscript printer.

You compile and install both packages with commands
configure; (see configure –help)
make;
make install

The printing daemon "/usr/sbin/cupsd" is controlled by a configuration file "/etc/cups/cupsd.conf". The syntax of this file is similar to Apache's httpd.conf. You can edit this file with a text editor, but normally the default settings work fine. After change any configuration, you restart "cupsd" to let it read new settings (for example: rc.cups start).

Another important configuration file is "Printers.conf". This file defines each local or network (socket or IPP) printer. You can edit this file with a text editor and then restart "cupsd" to have it read the new settings. Another way to change printer settings is to use command line program "lpadmin". CUPS has a web-based administration tool. You point a web browser to http://localhost:631. Each Linux distribution also has its own GUI printer administration tool.

lpadmin -p *myprint* -E -v parallel:/dev/lp0 –m *laserjet.ppd*
lpadmin -p *myprint* -E -v socket://11.22.33.44 -m *myprint.ppd*
lpadmin -p *myprint* -E -v lpd://11.22.33.44/ -m *myprint.ppd*
lpadmin -p *myprint* -E -v ipp://11.22.33.44/ -m *myprint.ppd*
lpadmin -p *myprint* -E -v ipp://user:passwd@11.22.33.44/ -m *myprint.ppd*

The about commands add a printer connected to (1) local parallel port, (2) JetDirect printer, and (3) LPD printer. –m option specifying a Postscript Printing Definition (PPD) files. CUPS has a few PPD files preinstalled. In order to use full features of your printer, you may need to find a proper PPD file and put it in **"/usr/share/cups/model"** directory.

kcmshell printmgr	KDE printer manager
http://localhost:631	CUPS web administration interface
lpadm –d *myprint* **lpadm –x *myprint***	-d option set default printer -x option delete a installed printer.
enable/disable **accept/reject**	Control printing queue
lpadmin –p *myprint* –P another.PPD	Change PPD file
lpoptions –p *myprint* -l	Display associate PPD
lpinfo –v	List supported printing protocols
lp –d *myprint* filename **lpr –P *myprint* filename**	Print a file
cancel id **lprm id**	remove a print job from queue
/etc/cups/printers.conf **/etc/cups/classes.conf** **/etc/cups/cupsd.conf**	CUPS related configuration files
/etc/cups **/usr/lib/cups** **/usr/share/cups**	CUPS related directories

Samba File and Printer Sharing

Introduction

Samba provides file and printer sharing with MS Windows computers. It makes UNIX speaks SMB/ICFS file and printer sharing protocol. The latest version of samba can be downloaded from http://www.samba.org.
Samba is controlled by a configuration file "smb.conf". On Redhat Linux, one can use "**redhat-config-samba**" to modify the configuration file. On other systems, SWAT is a web based GUI interface. SWAT is run from "inetd" and listen to port 901. You just need point your browser to http://localhost:901 after starting swat.

Commands

To test if the syntax of "smb.conf" is correct, use
testparm smb.conf
List shares on a Samba or Windows server
smbclient –L *machinename* **-U** *username*
Connect to a Samba or Windows server and get/put files using FTP like commands:
smbclient *//machinename/sharename* **-U** *username*

Security Mode in "smb.conf"

security = user
In this (default) security mode, samba maintain its own user login database which is usually in /etc/samba/smbpasswd. This file is created with command /usr/sbin/smbpasswd. Note, the user login file and command have the same name but in different directories. Following settings are used:

encrypt passwords = yes
smb passwd file = /etc/samba/smbpasswd

security = domain
In this security mode, samba server must join to an NT domain (using net command) and authenticate users by a domain controller. A user must have both valid UNIX and NT account in order to access files.

security = server
Use another computer (NT or W2k) to authenticate users. No need to join a domain. Need to specify a login server:
password server = ***mywin.domain.com***

security = share
Give each share a password, no user name needed.

IPtables (Netfilter)

Command Syntax

iptables [-t <*table* >] <*command*> <*chain* > <*parameters*>

Save and Restore rules
/sbin/iptables-save > /etc/sysconfig/iptables
/sbin/iptables-restore < /etc/sysconfig/iptables

Firewall script sample
http://tiger.la.asu.edu/iptables_examples.htm

Build-in Table

filter This is the default table for handling network packets. Build-in chains are:

1. INPUT — This chain applies to packets received via a network interface.
2. OUTPUT — This chain applies to packets sent out via the same network interface which received the packets.
3. FORWARD — This chain applies to packets received on one network interface and sent out on another.

nat This table used to alter packets that create a new connection. Build-in chains:

1. PREROUTING — This chain alters packets received via a network interface when they arrive.
2. OUTPUT — This chain alters locally-generated packets before they are routed via a network interface.
3. POSTROUTING — This chain alters packets before they are sent out via a network interface.

Masquerade everything out ppp0.
iptables -t nat -A POSTROUTING -o ppp0 -j MASQUERADE

Change source addresses to 1.2.3.4.
iptables -t nat -A POSTROUTING -o eth0 -j SNAT --to 1.2.3.4

mangle This table is used for specific types of packet alteration. Build-in chains:

1. *PREROUTING* — This chain alters packets received via a network interface before they are routed.
2. *OUTPUT* — This chain alters locally-generated packets before they are routed via a network interface.

Commands

--flush | -F	Flush (delete) rules in the selected chain.
--policy | -P	Set default policy for a particular chain.
--list | -L	List all rules in filter table, use [–t tablename] to specify other tables.
--append | -A	A appends a rule to the end of the specified chain.
-insert | -I	Inserts a rule in a chain at a particular point.

Other commands:

(1) --new | -N (2) --delete | -D (3) --replace | -D (4) --zero | -Z
(5) –check | -C (6) delete-chain | -X (7) rename-chain | -E

Parameters

--proto | -p [!] *name*	protocol: by number or name, including **tcp, udp, icmp or all**.
--source | -s [!] *addr/mask*	source IP address.
--destination | -d *addr/mask*	destination IP address.
--in-interface | -i	incoming interface name, e.g. eth0 or ppp0.
--out-interface | -o	outgoing interface name.
--jump | -j	jump to a particular target when matching a rule. Standard options: **ACCEPT, DROP, QUEUE, RETURN**, **REJECT**. May jump to a user defined chain.
--fragment | -f	match second or further fragments only.

Options for TCP and UDP protocol

--sport | --source-port **--dport | destination-port**	source and/or destination port. Can specify a range like 0:65535, use exclamation character (!) to NOT match ports.

Options for TCP only

--syn	Match SYN packets.
--tcp-flags	Match TCP packets with specific bits set. For example, -p tcp –tcp-flags ACK,FIN,SYN SYN will only match TCP packets that have the SYN flag set and the ACK and FIN flags unset.

Options for ICMP only

--icmp-type [!] *type*	Match specified ICMP type. Valid ICMP type can be list by **iptables –p icmp -h**

Option for state module (-m state --state)

ESTABLISHED	The matching packet is associated with other packets in an established connection.
RELATED	The matching packet is starting a new connection related in some way to an existing connection.
NEW	The matching packet is either creating a new connection or is part of a two-way connection not previously seen.
INVALID	The matching packet cannot be tied to a known connection.

X Window (XFree86)

Files

To set screen resolution, in “Screen” section and Subsection “Display”, specify a mode. For example: Modes “1024x768”

To specify screen refresh rate, in “Monitor” section, specify vertical rate. For example: VertRefresh 70-120

$HOME/.xinitrc **/etc/X11/xinit/xinitrc** **/etc/X11/xinit/xinitrc.d** **$HOME/.Xclients** **/etc/X11/xinit/Xclients**	scripts run after X server started
/etc/sysconfig/desktop	decide which desktop (GNORM, KDE) to start (Redhat). (by /etc/X11/prefdm)
/etc/X11/fs/config	configuration of X11 font path (font server).

Commands

startx	start X window system.
Xconfigurator (Redhat) **xfree86setup (Slackware)** **xf86config**	setup X server and generate XF86config.
XFree86 -configure	XFreee86 auto configuration (Plug-n-Play), generate a template named “XF86Config.new”
Ctrl+Alt+Del	stop X server (on some system Ctrl+Alt+ESC).
Ctrl+Alt+F1 **Ctrl+Alt+F7**	F1 temporary switch to text mode, F7 switch back to graphic mode.
SuperProbe	detect graphic hardware.
xvidtune	adjust X server origin and size.
xmodmap	modifying key map and mouse button map.
xhost	server access control program for X.
xsetroot	root window parameter setting utility for X.
xlsfonts	server font list displayer for X.
xset	ser preference utility for X.

XF86Config (xorg.conf)

XFree86 uses a configuration file called **XF86Config** for its initial setup. This file is normally located in “/etc/X11” or “/etc” directory. The XF86Config file is composed of a number of sections which may be present in any order. Each section has the form:

```
Section "SectionName"
  SectionEntry
  ...
EndSection
```

The graphics boards are described in the **Device** sections, and the monitors are described in the **Monitor** sections. They are bound together by a **Screen** section. Keyboard and Mouse are described in **InputDevice** sections, although *Keyboard* and *Pointer* are still recognized. **ServerLayout** section is at the highest level and bind together the InputDevice and Screen sections.

A special keyword called **Option** may be used to provide free-form data to various components of the server. The Option keyword takes either one or two string arguments. The first is the option name, and the optional second argument is the option value. All Option values must be enclosed in quotes.

File Section

FontPath "path"
Font path elements may be either absolute directory paths, or a font server identifier

RGBPath "path"
Sets the path name for the RGB color database.

ModulePath "path"
Allows you to set up multiple directories to use for storing modules loaded by the XFree86 server.

EXAMPLE

```
Section "Files"
   RgbPath "/usr/X11R6/lib/X11/rgb"
   FontPath   "unix/:7100"
EndSection
```

Serverflags Section

Option "DontZap" "boolean"
Disable use **Ctrl+Alt+Backspace** to terminate X server.

Option "DontZoom" "boolean"
Disable use ‘Ctrl+Alt+Keypad +’ and ‘Ctrl+Alt+Keypad -’ to switch video mode.

Option "BlankTime" "time"
Sets the inactivity timeout for the blanking phase of the screensaver in minutes. Default 10 min.

Option "StandbyTime" "time"
Sets the inactivity timeout for the "standby" phase of DPMS mode in minutes. Default 20 min.

Option "SuspendTime" "time"
Sets the inactivity timeout for the "suspend" phase of DPMS mode, default 30 min.

Option "OffTime" "time"
Sets the inactivity timeout for the "off" phase of DPMS mode, default 40 min.

Option "DefaultServerLayout" "layout_id"
Specify the default ServerLayout section to use. Default is the first ServerLayout section.

EXAMPLE

```
Section "ServerFlags"
  Option "BlankTime"   "99999"
  Option "StandbyTime" "99999"
  Option "SuspendTime" "99999"
  Option "OffTime"     "99999"
EndSection
```

Module Section

Load "modulename"
Load a module. The module name given should be the module's standard name, not the module file name.

EXAMPLE

```
Section "Module"
   Load          "extmod"
   Load          "type1"
EndSection
```

InputDevice Section

There are normally at least two InputDevice sections, one for Keyboard and one for Mouse.

Identifier
Specify an unique name for this input device.

Driver
Specify the name of the driver to use for this input device..

Option "CorePointer"
This input device is installed as the primary pointer device.

Option "CoreKeyboard"
This input device is the primary Keyboard.

EXAMPLE

```
Section "InputDevice"
   Identifier      "Generic Keyboard"
   Driver          "keyboard"
   Option "AutoRepeat" "500 30"
   Option          "CoreKeyboard"
EndSection

Section "InputDevice"
   Identifier      "PS2 Mouse"
   Driver          "mouse"
   Option          "CorePointer"
   Option          "Device"       "/dev/mouse"
   Option          "Protocol"     "PS/2"
   Option          "Emulate3Buttons"   "true"
EndSection
```

Device Section

Specifies information about the video card used by the system. You must have at least one Device section in your configuration file. The active device is in ServerLayout->Screen.

Identifier
Specify an unique name for this graphics card.

Driver
Specify the name of the driver to use for this graphics card.

EXAMPLE

```
Section "Device"
   Identifier      "ATI Mach64"
   VendorName    "ATI MACH64"
   VideoRam       2048
EndSection
```

Monitor Section

Monitor section describes a monitor. There must be at least one monitor section and the active one is used in ServerLayout->Screen.

Identifier
Specify an unique name for this monitor.

HorizSync horizsync-range
Gives the range(s) of horizontal sync frequencies of this monitor in kHz.

VertRefresh vertrefresh-range
Gives the range(s) of vertical sync frequencies of this monitor in Hz.

EXAMPLE

```
Section "Monitor"
   Identifier   "Generic Monitor "
   VendorName   "Monitor Vendor"
   ModelName    "Monitor Model"
   HorizSync    31.5-56.6
   VertRefresh  40-70
EndSection
```

Screen Section

Screen Section binds Device and Monitor sections. There must be at least one Screen Section. The active one is in ServerLayout section.

Identifier
Specify an unique name for this Screen Section.

Device "device-id"
This specifies the Identifier of **Device section** to be used for this screen.

Monitor "monitor-id"
This specifies the Identifier of **Monitor section** to be used for this screen.

DefaultDepth depth
Default color depth, like 8, 16 or 24.

Option "Accel"
Enables XAA (X Acceleration Architecture), default is ON.

DISPLAY SUBSECTION
Each Screen section must have at least one Display Subsection which matches the depth values in DefaultDepth.

Depth depth
This entry specifies what color depth of this Display Subsection.

Virtual xdim ydim
Specifies the virtual screen resolution to be used.

ViewPort x0 y0
Sets the upper left corner of the initial display.

Modes "mode-name" ...
Secifies the list of video modes to use. Each mode-name specified must be in double quotes. They must correspond to those specified in the appropriate Monitor section (including implicitly referenced built-in ESA standard modes). mode can be switched with Ctrl+Alt+Keypad-Plus or Ctrl+Alt+Keypad-Minus.

EXAMPLE

```
Section "Screen"
        Identifier "My Screen"
        Device     " ATI Mach64"
        Monitor    " Generic Monitor"
        DefaultDepth 16
        SubSection "Display"
           Depth     16
           Modes     "1024x768" "800x600" "640x480"
        EndSubSection
        SubSection "Display"
          Depth     24
           Modes     "1024x768" "800x600" "640x480"
        EndSubSection
EndSection
```

ServerLayout Section

ServerLayout section binds a Screen section and one or more InputSection to form a complete configuration. The active ServerLayout section is specified in ServerFlags. If not, the first ServerLayout section is active. If no ServerLayout sections are present, the single active screen and two active (core) input devices are selected as described in the relevant sections.

Identifier
An unique name for this ServerLayout Section.

Screen screen-num "screen-id" position-information
The screen-id field is mandatory, and specifies the Screen section being referenced.

InputDevice "idev-id" "option" ...
Normally at least two are required, one for the core pointer and the other for the primary keyboard devices.

EXAMPLE

```
Section "ServerLayout"
   Identifier      "Default Layout"
   Screen          "My Screen"
   InputDevice   "Generic Keyboard"
   InputDevice   "PS/2 Mouse"
EndSection
```

Boot Sequences

Redhat

Usually the Linux kernel file is **/boot/vmlinuz** and is loaded by a boot loder (e.g., LILO). The first process created by the kernel is **/sbin/init**. It uses a configuration file **/etc/inittab**. init process runs **/etc/rc.d/rc.sysinit** script first, then runs all scripts in **/etc/rc.d/rc*N*.d**, where *N* is the default run level defined in inittab. The actual scripts are stored in **/etc/rc.d/init.d** and proper links are created in run level directoris to point to corresponding scripts in init.d directory. The last script to run is /etc/rc.d/rc.local.

Run level 1: Single user mode
Run level 3: Multiuser mode
Run level 5: Multiuser model with X11

Slackware

In Slackware, Linux kernel is **/boot/vmlinuz** and the first process started by the kernel is **/sbin/init**. Its configuration file is **/etc/inittab**. init first runs script **/etc/rc.d/rc.S**, then runs **/etc/rc.K** for single user mode or **/etc/rc.M** for multiuser mode. The last script to run is /etc/rc.d/rc.local.

rc.S calls scripts (**rc.modules, rc.pcmcia, rc.serial and rc.sysvinit**).
rc.M calls scripts (**rc.inet1, rc.inet2, rc.httpd, rc.samba**) and start some network server (lpd, httpd etc.)
rc.inet1 sets IP address, Mask, and default Gateway.

Run level 1: Single user mode
Run level 3: Multiuser mode
Run level 4: Multiuser model with X11

Fix Slackware boot after Ghost

- boot with slackware installation CD
- mount root partition (mount /dev/hda2 /mnt)
- change root (chroot /mnt)
- re-run LILO (cd /mnt/etc; lilo)

GRUB boot loader

Introduction

More Linux distributions are using GRUB as the boot loader instead of LILO. GRUB can be downloaded from http://www.gnu.org/software/grub/

The newer version of GRUB (called GRUB2) is totally rewritten and uses somewhat different syntax than Ver 0.xxx (called GRUB Legacy). After unpacking GRUN, compile and install it with following commands:
./configure
make
make install

First test GRUB by creating a bootable floppy disk with command

grub-install /dev/fd0

Suppose you have Windows installed on the first hard disk and Linux on the second disk, boot with just created floppy, when grub> prompt appears, type following commands

=== Boot Linux ===
grub> root (hd1,0)
grub> kernel /boot/vmlinuz
(or linux /boot/vmlinuz if using GRUB2***)***
grub> boot

=== Boot Windows ===
grub>rootnoverify(hd0, 0)
chainloader +1
boot

Other Useful GRUB commands

ls	Display disks and partitions (GRUB2)
geometry(*hd0*)	Show hard disk geometry, test if HD exist
configfile *(hd1,0)/boot/grub/grub.conf*	Display boot menu
cat (hd1, 0)/etc/fstab	Display a file content, can figure out which partition was used as root partition in an unbootable system, then pass root parameter in “kernel” command
help	List available commands

Sample GRUB configuration file

```
#==================
# GRUB ver 0.xxx
#==================
default=0
timeout=10
splashimage=(hd1,2)/grub/splash.xpm.gz
title Linux
        root (hd1,0)
        kernel /boot/vmlinuz  root=/dev/sdb1

title Windows XP
        rootnoverify (hd0,0)
        chainloader +1
```

```
#==================
# GRUB2
#==================
set timeout=10
set default=0

# Entry 0 - Load Linux kernel
menuentry "Linux" {
   set root=(hd1,0)
   linux /boot/vmlinuz root=/dev/hda2
   initrd /initrd
}

# Entry 1 - Chainload another bootloader
menuentry "Windows" {
   set root=(hd0,0)
   chainloader +1
}
```