General Linux Part II

Exam Information:

There are three levels of LPI Certification (LPIC):

These Exam Notes will go over the 2nd Level

Level 2 – General Linux II

Test 102: General Linux I

This exam tests basic working knowledge in the areas of:

- o Hardware installation and SCSI
- o Configuring and compiling the kernel
- o Using text editors such as vi
- o Configuring and troubleshooting printing
- o Shell scripting
- o Configuring and installing x-windows
- o Installation, configuration and troubleshooting of TCP/IP and related services
- o Sendmail
- o DNS
- o Apache
- o NFS
- o Samba
- o Tcpwrappers
- o Shadow password configuration
- o Disabling services in inetd.conf

Note: All current LPI exams use computer-based tests administered through VUE. Each exam costs $100 (US dollars)

- o **Requirements**: To complete Level 1, candidates must complete two exams:

1. Complete the 101 (formerly T1a) exam
2. Complete the 102 (formerly T1b) exam

(Note: that as of February 2000, the requirement for the distribution-specific "T2" exams was removed.)

Note: Passing the exams will give you **LPIC** Certification

Visit Examnotes.net for all your certification needs.
Visit Cert21.com for the best online practice exams.
Visit CertPortal.com – most powerful IT certifications search engine.

Study Tips:

o The First Level of Linux Certification is somewhat easy if you have working knowledge of the Unix / Linux command structure and a basic working knowledge of the OS.

o This doesn't necessarily mean that it is a "beginner" based certification for those that have no prior knowledge of Unix / Linux or any variation of it. You will be expected to know a decent amount about this OS.

o Lastly, Do not depend one source of information to prepare for this exam. By no means should you read these notes alone and expect to pass this exam. This is not an overly easy exam and is not covered heavily by many CBT's, or workbook study guides. Make sure you use the links provided below for additional FREE study information.

Note: The Exam Objectives are listed in the first link of the table below.

Free Links and Resources:

FREE Resources	Apache Today
Exam Objectives	BSD central
LPI Home Page	BSD Today
FREE Sample Questions from LPI	Enterprise Linux Today
Glossary Of Terms	Just Linux
Exam Development	Linux Central
LPI FAQ's	Linuxnewbie
Certification Information	Linux Planet
Contact LPI	Linux Start
Hardcore Linux	Linux Today
LinuxDoc	Linuxprogramming.com
Linux ORG	PHPBuilder
Caldera	Linux Weekly News
Redhat	Slashdot
Debian	LILO Bible
Linux-Mandrake	GNU Project
Linux.com	Apache week
Linuxhelp.org	Apache FAQ's
Linuxtoday.com	Unix FAQ's
All Linux Devices	Linux Presentation

For an **excellent guide**, visit the Cramsession for LPI 102

Note: Please read this free information – it will provide you with a wealth of information. There is no quick path

to learning or mastering Unix / Linux. The operating system has many different flavors due to its free source code. It will take a lot of work and effort – but unbelievably, most of the information you will need is available online. Please incorporate these resources into your study.
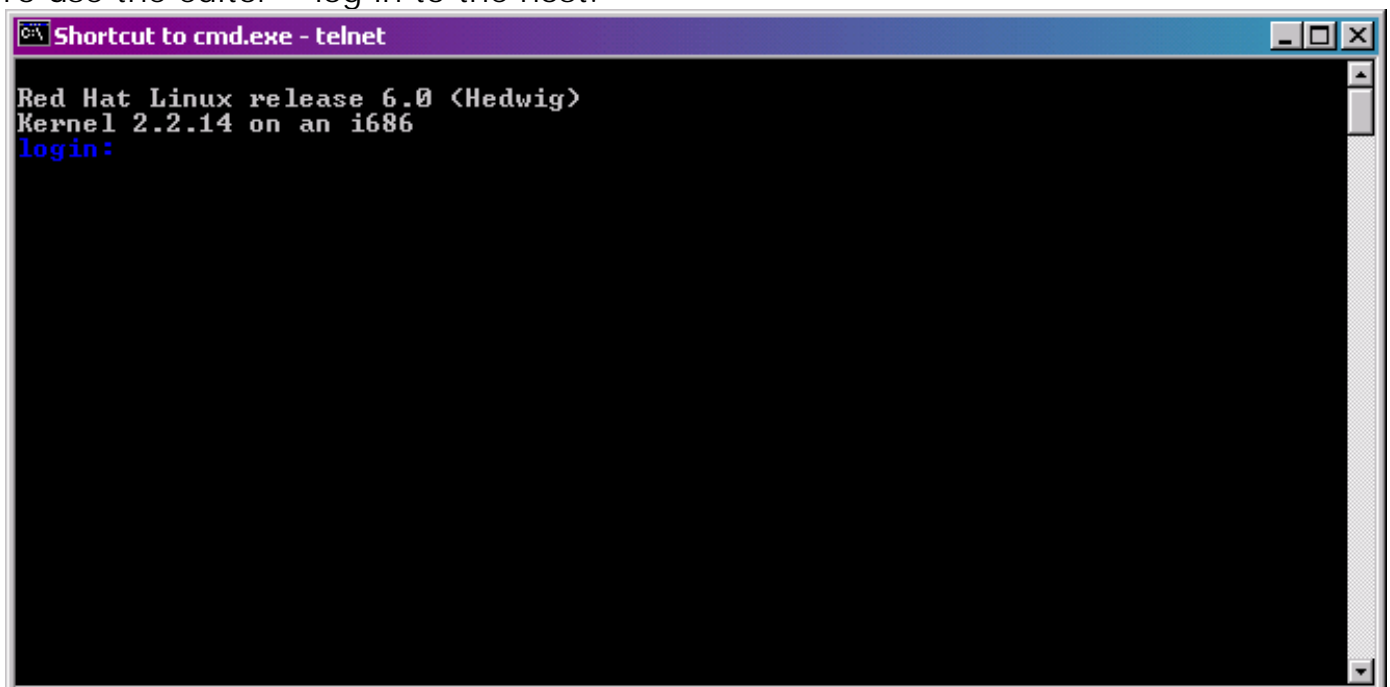
Exam Notes for 102

Configuring and compiling the kernel

- o The Kernel is LINUX itself.
- o All other pieces are deemed bells and whistles. Remember that the Kernel is Linux.
- o The kernel has 2 main components: compiled and held in memory and the rest of it goes into modules
- o You MUST visit this site just designated to the Linux Kernel http://www.linuxdoc.org/LDP/tlk/tlk.html
- o You can use: menuconfig – config – or xconfig
- o The text based version is Config
- o The menu driven version is menuconfig
- o The GUI version is xconfig
- o To view currently loaded modules: more /proc/modules
- o View the current directory contents with ls and change directories with cd
- o To unload a module – type: rmmod {module}
- o To get important in depth info type: man proc
- o To gather dependencies for each source file - make dep
- o to build the kernel itself use: make zImage

Using text editors such as vi

- o The VI editor is a simple text editor but has a grand array of options and flexibility.
- o To use the editor – log in to the host:

```
Shortcut to cmd.exe - telnet

Red Hat Linux release 6.0 (Hedwig)
Kernel 2.2.14 on an i686
login:
```

Visit Examnotes.net for all your certification needs.
Visit Cert21.com for the best online practice exams.
Visit CertPortal.com – most powerful IT certifications search engine.

o Next – to open the specific document – like an HTML file – simply type: **vi new.htm**
o You will open a new session where you can create a HTML document as seen below:

```
Shortcut to cmd.exe - telnet                                          _ □ ×

<html>

<head>
<meta http-equiv="Content-Type" content="text/html; charset=windows-1252">
<meta http-equiv="Content-Language" content="en-us">
<meta name="GENERATOR" content="Microsoft FrontPage 4.0">
<meta name="ProgId" content="FrontPage.Editor.Document">
<title>RSNETWORKS: RJS</title>
<!--mstheme--><link rel="stylesheet" type="text/css" href="_themes/balance/bala1
111.css"><meta name="Microsoft Theme" content="balance 1111, default">
</head>

<body>
<div align="center">
<table border="3" width="100%">
  <tr>
    <td width="100%" bgcolor="#000080">
      <p align="center"><b><font color="#FFFFFF">Current Industry Certifications
      For Robert J. Shimonski</font></b></td>
  </tr>
</table><p align="center"><font face="Comic Sans MS">~This is a listing of my
current certifications and progress~</font> </p>
<hr>
<p align="center">  </p>
"web_design.htm" 254 lines, 10111 characters
```

o
o To exit the editor type: CTRL+Z
o To find more than you ever wanted to know on the VI – go here

<u>Configuring and troubleshooting printing</u>

o Print related commands:

lpc	Printer control
lpd	Print daemon
lpq	Print spool control
lpr	The print spooler
lprm	Print job removal
pac	Print account report generation

Visit Examnotes.net for all your certification needs.
Visit Cert21.com for the best online practice exams.
Visit CertPortal.com – most powerful IT certifications search engine.

- o The lpc command is used with this syntax: lpc {command} {value}

?	Prints help about a command
Abort	Kill active print daemon
Clean	Removes unprintable files
Disable	Turn off printers queue
Down	Turn off printers queue
Enable	Turn on printers queue
Help	Prints help about a command
Restart	Shuts down current session – starts a new one
Start	Turns printing on
Status	Gives a status of queue
Stop	Shuts off the spooling daemon
Topq	Moves jobs to top of queue
Up	Turns on printer queue

- o Syntax: for the other commands
- o Syntax for lpd: lpd {flag} {port}
- o Flags for lpd: -l
- o Syntax for lpq: lpq {flag} {job} {user}
- o Flags for lpq: -l and –P{printer}
- o Syntax for lprm: lprm {flag} {job} {user}
- o Flags for lprm: a single dash (-) will remove all jobs and –P{printer}

Shell scripting

- o Some available shells: (not all of them)

ash	Based on system V
bash	Default Linux shell
bsh	Based on AIX
csh	Based on C programming
pdksh	Korn – Public Domain version
tcsh	Updated version of csh

- o Bash shell scripts
- o Usually start with - #!/bin/bash
- o Redirection symbols: > intercepts data STDOUT
- o Redirection symbols: 2> intercepts data STDERR
- o Redirection symbols: < sends data to STDIN
- o Redirection symbols: >> intercepts data STDOUT but also appending

For a great set of printable tutorials to learn how to shell script go here: scripting

Linux Gazette – Shell Scripting tutorial: scripting and Scripting part II

Please visit these sites for great information on how to do advanced scripting

Sendmail

o http://www.sendmail.org/

o On the Internet, Sendmail is the most popular UNIX-based implementation of the Simple Mail Transfer Protocol for transmitting e-mail.
o When a Sendmail server receives e-mail, it attempts to deliver the mail to the intended recipient immediately and, if the recipient is not present, it queues messages for later delivery.
o Because it does not provide a mailbox facility and for other reasons, other software such as a POP3 or Internet Message Access Protocol server are needed.
o Most Internet service providers provide both an SMTP server (such as Sendmail) and a POP or IMAP server.
o A commercial version of Sendmail, called Sendmail, includes a POP3 server and other enhancements to the basic open source Sendmail.
o There is also a version that can be installed on a Windows NT

DNS

o DNS – of course resolves IP addresses to host names through the use of records
o Either through a local file on the client or a dedicated server to service the clients
o LINUX / UNIX DNS servers are very common to see in the field
o There is a site called Linuxdocs.org that will show you show to build an entire DNS server on LINUX from scratch.
o Please visit here: http://www.linuxdoc.org/HOWTO/DNS-HOWTO.html and download a copy.
o This is one of the best links I found – how to troubleshoot Linux DNS servers.
o Please visit: http://www.troubleshooters.com/linux/dns.htm
o To set up Bind Version 8: http://www.troubleshooters.com/tpromag/9811/dns.htm
o Please download and read these articles – they are free and will help you greatly in understanding how to set up a Linux based DNS server and how to troubleshoot it.

Apache

• http://www.apache.org/

o Apache is a freely available Web server that is distributed under an "open source" license.
o Version 1.3 runs on most UNIX-based operating systems (such as Linux, Solaris, Digital UNIX, and AIX), on other UNIX/POSIX-derived systems (such as Rhapsody, BeOS, and BS2000/OSD), on AmigaOS, and on Windows NT/95/98.
o Although Windows-based systems with Web servers from Microsoft, Netscape, and other companies are probably gaining in terms of numbers, Apache is likely to remain popular in enterprises and server locations where UNIX-based systems are prevalent.
o Apache complies with the newest level of the Hypertext Transport Protocol, HTTP 1.1. Free support is provided through a bug reporting system and several Usenet newsgroups.

NFS

- o The Network File System (NFS) is a client/server application that lets a computer user view and optionally store and update file on a remote computer as though they were on the user's own computer.
- o The user's system needs to have an NFS client and the other computer needs the NFS server.
- o Both of them require that you also have TCP/IP installed since the NFS server and client use TCP/IP as the program that sends the files and updates back and forth.
- o NFS was developed by Sun Microsystems and has been designated a file server standard.
- o Its protocol uses the RPC - Remote Procedure Call method of communication between computers.
- o You can install NFS on Windows 95 and some other operating systems using products like Sun's Solstice Network Client.
- o Using NFS, the user or a system administrator can mount all or a portion of a file system
- o The portion of your file system that is mounted (designated as accessible) can be accessed with whatever privileges go with your access to each file

Samba

- o http://www.samba.org/
- o http://us1.samba.org/samba/docs/SambaIntro.html (An introduction to SAMBA)
- o What is SMB? Visit this site for an excellent tutorial: What is SMB?
- o Samba is a popular freeware program that allows end users to access and use files, printers, and other commonly shared resources on a company's intranet or on the Internet.
- o Samba is often referred to as a Network File System and can be installed on a variety of operating system platform, including: Linux, most common UNIX platforms, OpenVMS, and OS/2.
- o Samba is based on the common client/server protocol of Server Message Block (SMB) and Common Internet File System (CIFS)
- o Using client software that also supports SMB/CIFS an end user sends a series of client requests to the Samba server on another computer in order to open that computer's files, access a shared printer, or access other resources.
- o The Samba server on the other computer responds to each client request, either granting or denying access to its shared files and resources.
- o The Samba SMB/CIFS client is called smbclient.
- o Samba basics commands are:
- o Smbclient - Used to communicate with SMB Servers
- o Testparm - checks the smb.conf file for obvious errors
- o Testprns - checks a printer name against the system printcap file.
- o Smbstatus - lists the connections on the Samba server

Tcpwrappers

- o How to get and compile: click here
- o It doesn't prevent port scans from finding open sockets
- o It sits in between inetd and the actual daemon, so there is another level of protection
- o After you have weeded unused services out of inetd.conf, you can use the tcpwrappers (tcpd) program to protect and log the remaining services.

Visit Examnotes.net for all your certification needs.
Visit Cert21.com for the best online practice exams.
Visit CertPortal.com – most powerful IT certifications search engine.

- There are several ways to set up tcpd but all have the same result.
- When a service request arrives, the inetd daemon will invoke tcpd instead of the service.
- Tcpd can log the request according to how you have syslog.conf set up Tcpd can also enforce access control and, if everything checks out, pass the request on to the actual requested service's executable.
- TCP_WRAPPERS is made up of 2 separate files:

/etc/hosts.allow	/etc/hosts.deny

Shadow password configuration

- The passwd command changes the password or lists password attributes associated with the user's login name.
- Additionally, privileged users may use passwd to install or change passwords and attributes associated with any login name.
- When used to change a password, passwd prompts everyone for his or her old password, if any.
- It then prompts for the new password twice. When the old password is entered, passwd checks to see if it has "aged" sufficiently.
- If "aging" is insufficient, passwd terminates

Free security Slide show for Linux

http://www.upenn.edu/computing/security-privacy/unixwkshp/linux/ls_0.html
- Covers SSH – Tcpwrappers and Port Scanning
- Click here for the entire Index:
- http://www.upenn.edu/computing/security-privacy/unixwkshp/linux/

Linux Security Basics

- Linux Security Basics
- Fences Make Good Neighbors
- Mount /home With nosuid Option
- Keep It Simple
- Build A Custom Kernel
- Learn Your Permissions
- Password the BIOS
- Password the Boot Manager
- Secure the Console Too
- Pay Attention To Uptime And The Log Files
- Pay Attention To SUID Programs And Such
- Install Tripwire
- Encrypt Your E-mail
- Generate Really Strong Passwords
- Check Your Passwords
- Enforce Strong Passwords With PAM
- Exorcise FTP, Telnet And Other Daemons
- Exorcise Your Rc.d Daemons
- Protect Remaining Services with tcpwrappers
- Scan Your Ports
- NOLOGIN Option

Free Linux Based Tutorials I found on the web:

- [How to Install RedHat Linux.](#)
- [Linux Time Machine.](#)
- [How to Use GnoRPM to Install a New Program on RedHat Linux.](#)
- [What are Xeyes?.](#)
- [How to Configure Your Mouse for a Left Handed User in RedHat Linux.](#)
- [How to Delete a Desktop Icon in RedHat Linux.](#)
- [How to Connect to a Site Using gFTP in Linux.](#)
- [How to Download Files Using gFTP in Linux.](#)
- [Adding a Launch Button to the Panel in RedHat Linux.](#)
- [Adding and Removing Users in Linux.](#)
- [Using the Calendar in RedHat Linux.](#)
- [RedHat Drawers.](#)
- [Changing the Desktop Background Image in RedHat Linux.](#)
- [Changing the Desktop Background Color in RedHat Linux.](#)
- [Copying a File in RedHat Linux.](#)
- [Organizing the Desktop in RedHat Linux.](#)
- [Adding a Program Shortcut Icon on the Desktop in RedHat Linux.](#)
- [Exploring the File Manager Toolbar in RedHat Linux.](#)
- [Images in RedHat Linux.](#)
- [Editing the Menu in RedHat Linux.](#)
- [Opening a File with a Specified Program in RedHat Linux.](#)
- [Adding a Monitor to the Panel in RedHat Linux.](#)
- [Exploring the Panel in RedHat Linux.](#)
- [Renaming Existing Files in RedHat Linux.](#)
- [Changing the Video Resolution in RedHat Linux.](#)
- [Adding Users in Terminal Mode in RedHat Linux.](#)
- [Setting the Screensaver in RedHat Linux.](#)
- [Shutting Down the Computer in Terminal Mode in RedHat Linux.](#)
- [Event Sounds - RedHat Linux.](#)
- [Switching User Names in Terminal Mode in RedHat Linux.](#)
- [Creating and Saving Text Files in RedHat Linux.](#)
- [Giving Your System a Visual Theme in RedHat Linux.](#)
- [Accessing and Operating the CD Player in RedHat Linux.](#)
- [How to Use LinuxConf to Create a New User in RedHat Linux.](#)
- [Volume Control in Redhat Linux.](#)

Please look through the free tutorials for additional studies for both LPI exams.

More Free Tutorials on LINUX:

Please visit all links and get the free information – it helps me greatly and will help you as well.

Last Tips:

o Like any other course - Please do not try this without preparation. The test may look easy but it really isn't. You really need to have the hands on - study the objectives intensely and use these supplements to help your focus
o Make sure you are comfortable with what LPI is asking on the objectives and If you have any in depth questions feel free to email me for help and I will help you if I can.

Exam Notes for Linux General Linux LPI 101 Written by:

Robert J. Shimonski

Email: RShimonski@RSNetworks.net

Please Visit his sight at: http://www.rsnetworks.net/