

# LPI Linux Essentials Study Guide

## File Archiving

**Archiving** - Compresses large amounts of files.

**Tar (Command)** - File archiver. Output results in a 'tarball'. Part of the compressing program is within the tarball.

**Zip (Command)** - Similar to tar command.

**Compressing** - Just a singular file.

If a 't' is before any of the file ext. (ex. .tgz) that means it is a tarball.

**GZIP** - Uncompress (gunzip) Filename (.gz)

**BZIP2** - Uncompress (bunzip2) Filename (.bz2)

**XZ** - Uncompress (unxz) Filename (.xz)

## Basic Regular Expressions

**'[]'** - Searches for anything between the brackets b[au]g returns bag, bug. Can also do [2-4] returns 2,3,4.

**'.'** - represents one character. A.z returns aiz,a2z,a3z.

**^** - Gives you the start of the line

**\$** - Gives you the end of the line.

**\** - Escapes a character's meaning. Same as putting it in "".

## Most Common Distros and Apps

**Ubuntu** - Best User friendly GUI. Unity desktop.

**openSUSE** - Very similar to Windows.

**Debian** - Similar to others.

**Gentoo** - Lower requirement distro.

**LibreWriter** - Microsoft Word copy.

**LibreCalc** - Spreadsheet Program.

**LibreOffice Impress** - Slideshow Program.

**VLC** - MediaPlayer, can play almost anything.

**Postfix** - Mail transfer agent.

**Gimp** - Adobe photoshop alternative.

**Kdenlive** - Audio and video editor

**Audacity** - Best audio editor.

**GParted** - Disk partition management tool.

**TimeShift** - Backup tool.

**Atom** - Text editor, like notepad.

**puTTY** - SSH tool.

**ownCloud** - is a suite of client-server software for creating and using file hosting services.

## **Most Important Operators**

**<<** - redirection operator accepts text on the following lines as standard input.

**>>** - Opens the output to the document instead of replacing it.

**>** - Replaces the txt file with the standard output.

**<** - Uses file to the right as standard input.

**2>** - Outputs standard error to a file, replaces anything already in the file.

**2>>** - Opens standard error to a file.

**&>** - Creates new file that contains standard output and standard error.

## **Most Important Directories and Files**

**/sbin/init** - First process loaded by the kernel.

**/dev/hda1** - First partition on first device.

**/dev/hdb2** - Second partition on second device.

**/dev/null** - Trash folder. Commonly used to redirect parts of a command you don't want to see.

**/etc/passwd** -

**/etc/shadow** -

**/etc/user** -

**/etc/group** -

**/sys** -

**/proc** -

## **Most Important Commands**

### **Sys Info**

**uname -a** # Display Linux system information

**uname -r** # Display kernel release information

**cat /etc/redhat-release** # Show which version of Red Hat installed

**lsb\_release -a** # Show which version of Ubuntu installed

**uptime** # Show how long the system has been running + load

**hostname** # Show system host name

**hostname -I** # Display all local IP addresses of the host

**last reboot** # Show system reboot history

**date** # Show the current date and time

**cal** # Show this month's calendar

**w** # Display who is online

**whoami # Who you are logged in as**

## **Hardware Info**

**dmesg # Display messages in kernel ring buffer**

**cat /proc/cpuinfo # Display CPU information**

**cat /proc/meminfo # Display memory information**

**free -h # Display free and used memory ( -h for human readable,  
-m for MB, -g for GB.)**

**lspci -tv # Display PCI devices**

**lsusb -tv # Display USB devices**

**dmidecode # Display DMI/SMBIOS (hardware info) from the BIOS**

**hdparm -i /dev/sda # Show info about disk sda**

**hdparm -tT /dev/sda # Perform a read speed test on disk sda**

**badblocks -s /dev/sda # Test for unreadable blocks on disk sda**

**lshw # Display information about CPU, memory, storage, and  
network interfaces**

## **Performance Monitoring and Stats**

**top # Display and manage the top processes**

**htop # Interactive process viewer (top alternative)**

**mpstat 1 # Display processor related statistics**

**vmstat 1 # Display virtual memory statistics**

**iostat 1 # Display I/O statistics**

**tail -100 /var/log/messages # Display the last 100 syslog messages (Use**

**/var/log/syslog for Debian based systems.)**

**tcpdump -i eth0 # Capture and display all packets on interface eth0**

**tcpdump -i eth0 'port 80' # Monitor all traffic on port 80 ( HTTP )**

**lsof # List all open files on the system**

**lsof -u user # List files opened by user**

**free -h # Display free and used memory ( -h for human  
readable, -m for MB, -g for GB.)**

**watch df -h # Execute "df -h", showing periodic updates**

**mpstat # Display statistics about CPU usage**

**pidstat # Display statistics about processes running**

## **USER INFORMATION AND MANAGEMENT**

**id # Display the user and group ids of your  
current user.**

**last # Display the last users who have logged onto  
the system.**

**who # Show who is logged into the system.**

**w # Show who is logged in and what they are  
doing.**

**groupadd test # Create a group named "test".**

**useradd -c "John Smith" -m john # Create an account named john, with a**

## **File and Directory Commands**

**ls -al # List all files in a long listing (detailed) format**

**pwd # Display the present working directory**

**mkdir directory # Create a directory**

**rm file # Remove (delete) file**

**rm -r directory # Remove the directory and its contents  
recursively**

**rm -f file # Force removal of file without prompting for  
confirmation**

**rm -rf directory # Forcefully remove directory recursively**

**cp file1 file2 # Copy file1 to file2**

**cp -r source\_directory destination # Copy source\_directory recursively to  
destination. If destination exists, copy  
source\_directory into destination,  
otherwise create destination with the  
contents of source\_directory.**

**mv file1 file2 # Rename or move file1 to file2. If file2 is  
an existing directory, move file1 into directory  
file2**

**ln -s /path/to/file linkname # Create symbolic link to linkname**

**touch file # Create an empty file or update the access  
and modification times of file.**

**cat file # View the contents of file**

**less file # Browse through a text file**

**head file # Display the first 10 lines of file**

**tail file # Display the last 10 lines of file**

**tail -f file # Display the last 10 lines of file and "follow"  
the file as it grows.**

## **Process Management**

**ps # Display your currently running processes**

**ps -ef # Display all the currently running processes on the system.**

**ps -ef | grep processname # Display process information for processname**

**top # Display and manage the top processes**

**htop # Interactive process viewer (top alternative)**

**kill pid # Kill process with process ID of pid**

**killall processname # Kill all processes named processname**

**program & # Start program in the background**

**bg # Display stopped or background jobs**

**fg # Brings the most recent background job to foreground**

**fg n # Brings job n to the foreground**

**nohup processname # Runs a process even after user logs out**

## **Networking**

**ip a # Display all network interfaces and IP address**

**ip addr show dev eth0 # Display eth0 address and details**

**ethtool eth0 # Query or control network driver and hardware settings**

**ping host # Send ICMP echo request to host**

**whois domain # Display whois information for domain**

**dig domain # Display DNS information for domain**

**dig -x IP\_ADDRESS # Reverse lookup of IP\_ADDRESS**

**host domain # Display DNS IP address for domain**

**hostname -i # Display the network address of the host name.**

**hostname -I # Display all local IP addresses of the host.**

**wget http://domain.com/file # Download http://domain.com/file**

**netstat -nutlp # Display listening tcp and udp ports and corresponding programs**

**ifconfig # Display information about network interfaces**

**traceroute host # Display the path that packets take to host**

**tcpdump # Capture and analyze network traffic**

## **Archives**

**tar cf archive.tar directory # Create tar named archive.tar containing directory.**

**tar xf archive.tar # Extract the contents from archive.tar.**

**tar czf archive.tar.gz directory # Create a gzip compressed tar file name archive.tar.gz.**

**tar xzf archive.tar.gz # Extract a gzip compressed tar file.**

**tar cjf archive.tar.bz2 directory # Create a tar file with bzip2 compression**

**tar xjf archive.tar.bz2 # Extract a bzip2 compressed tar file.**

## **Installing Packages**

**yum search keyword # Search for a package by keyword.**

**yum install package # Install package.**

**yum info package # Display description and summary information**



**about package for RHEL based systems.**

**rpm -i package.rpm # Install package from local file named  
package.rpm**

**yum remove package # Remove/uninstall package for RHEL based  
systems.**

**yum update package # Update package with name package for RHEL  
based systems.**

**apt-get update # Update package list for Debian based systems.**

**apt-get upgrade # Upgrade all installed packages to their newest  
version for Debian based systems.**

**apt-get install package # Install package with name package for Debian  
based systems.**

**apt-remove package # Remove package with name package for Debian  
based systems.**

## **Search**

**grep pattern file # Search for pattern in file**

**grep -r pattern directory # Search recursively for pattern in directory**

**locate name # Find files and directories by name**

**find /home/john -name 'prefix\*' # Find files in /home/john that start with "prefix".**

**find /home -size +100M # Find files larger than 100MB in /home**

**whereis program # Display the location of the binary, source and  
manual page files of program.**

**which program # Display the path of executable that would run if  
program is executed.**

## SSH Logins

**ssh host # Connect to host as your local username.**

**ssh user@host # Connect to host as user**

**ssh -p port user@host # Connect to host using port**

**ssh-keygen # Create a new SSH key pair.**

**ssh-copy-id user@host # Copy SSH key to the remote host to enable passwordless logins for user.**

## File Transfers

**scp file.txt server:/tmp # Secure copy file.txt to the /tmp folder on server**

**scp server:/var/www/\*.html /tmp # Copy \*.html files from server to the local /tmp folder.**

**scp -r server:/var/www /tmp # Copy all files and directories recursively from server to the current system's /tmp folder.**

**rsync -a /home /backups/ # Synchronize /home to /backups/home**

**rsync -avz /home server:/backups/ # Synchronize files/directories between the local and remote system with compression enabled**

**ftp host # Connect to FTP server on the remote host.**

## Disk Usage

**df -h # Show free and used space on mounted filesystems**

**df -i # Show free and used inodes on mounted filesystems**

**fdisk -l # Display disks partitions sizes and types**

**du -ah # Display disk usage for all files and directories in human readable format**

**du -sh # Display total disk usage off the current directory**

**du -a directory # Display size of all files in directory.**

**findmnt # List all mounted file systems with details.**

## **Directory Navigation**

**cd .. # To go up one level of the directory tree. (Change into the parent directory.)**

**cd # Go to the \$HOME directory**

**cd /etc # Change to the /etc directory**

**alias goto='cd /etc/' # Create goto alias for command cd /etc/ .**

## **Security**

**passwd # Change the current user's password.**

**sudo -i # Switch to the root account with root's environment. (Login shell.)**

**sudo -s # Execute your current shell as root.**

**(Non-login shell.)**

**sudo -l # List sudo privileges for the current user.**

**visudo # Edit the sudoers configuration file.**

**getenforce # Display the current SELinux mode.**

**sestatus # Display SELinux details such as the current SELinux mode, the configured mode, and the loaded policy.**

**setenforce 0 # Change the current SELinux mode to Permissive. (Does not survive a reboot.)**

**setenforce 1 # Change the current SELinux mode to Enforcing. (Does not survive a reboot.)**

**SELINUX=enforcing # Set the SELinux mode to enforcing on boot by using this setting in the /etc/selinux/config file.**

**SELINUX=permissive # Set the SELinux mode to permissive on boot by using this setting in the /etc/selinux/config file.**

**SELINUX=disabled # Set the SELinux mode to disabled on boot by using this setting in the /etc/selinux/config file.**

## **Logging and Auditing**

**dmesg # Display messages in kernel ring buffer.**

**journalctl # Display logs stored in the systemd journal.**

**journalctl -u servicename # Display logs for a specific unit (service).**