

Course overview:

LPI201 Certification

(LP201eng)



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Overview and objectives

The LPI certification is a vendor-neutral Linux credential that measures critical Linux system and Network administration skills. LPI prides itself on delivering statistically valid exams and provides a quality testing experience for candidates around the globe. The LPIC Level II certification consists of two exams, LPI 201 and LPI 202. This 5-day course focuses on the LPI 201 exam and addresses the following knowledge areas:

- The Linux kernel
- System boot and shutdown
- File systems
- Hardware
- File and service sharing
- System maintenance
- System customization and automation

Who should attend?

This course is designed for students with 2 - 3 years of Linux experience that are interested in passing the LPI 201 exam. LPI Level I certification is recommended but not required.

The Linux Kernel

- Kernel Terminology • The Kernel • Kernel version numbering • Obtaining the Kernel source • Kernel modules • Module configuration files • modules.conf • modules.dep • Kernel module utilities • depmod • insmod • lsmod • modinfo • modprobe • rmmod • Kernel types: monolithic vs modular • Kernel dependencies • Compiling and updating a kernel • Unpacking, configuring and compiling a kernel • Unpacking the kernel source • Kernel documentation • Configuring a Kernel • Compiling the Kernel and modules • Reviewing the install.sh script • Patching a Linux Kernel • Patches • The patch command • Patching the Kernel • Removing a Kernel patch • Tuning Kernel parameters • Tunable Kernel parameters • IO scheduling • Read ahead • Swappiness • Troubleshooting Kernel errors • VFS panic

Hardware management

- Devices and drivers • How are device drivers loaded • Hard drives • Using hdparm to configure a disk • Configuring terminal devices • Terminal connection • Configuring the host • getty • stty and setserial • setserial • Configuring serial ports • Configuring multi-port cards • stty • Serial UPS devices • System configuration • The powerd daemon • Configuring powerd • powerd states • Configuring monitors • LCD monitors • Utilities • Hardware utilities • isdev • lspci • Latency timers • USBView • /proc and procinfo • PCMCIA utilities • cardmgr • The /var/lib/pcmcia/stab file • cardctl

Linux system startup

- Identifying Linux boot stages • Boot options • Runlevels • Boot stages • Stage I: BIOS • BIOS boot stages • Stage II: Boot loader • Boot loaders: LILO and GRUB • LILO • The LILO boot process • GRUB • The GRUB boot process • Boot loader stages • Stage III: Kernel • The RAM disk • nash • Kernel stages • Stage IV: init • Runlevel scripts • Debian machines and booting • Troubleshooting LILO • LILO boot messages • Map installer errors and warnings • Fatal errors • Warnings • Disk error codes • Hex-error codes • Miscellaneous problems • Restoring the MBR with LILO files • Removing LILO • Removing LILO via DOS • Customizing startup and boot processes • inittab • inittab fields • Initial RAM disks • Making an initrd image • mkinitrd • Using custom boot scripts • Recovering from a lost root password

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Maintaining and configuring a Linux file system

- File systems • Creating a file system • Mounting and unmounting devices and file systems • Mount files • Automounting • Swap files systems • File system utilities • fsck • Options for file system-specific checkers • tune2fs • badblocks • dumpe2fs • debugfs • Building packages • Debian packages • Required files • The Control files • The Copyright file • The changelog file • The rules file • Building the package • RPM packages • The build tree • The spec file • The Header section • The %prep section • The %build section • The %install section • The %clean section • The %files section • The %changelog section • Test building • Generating the file list • Building the package with rpmbuild • Testing it

RAID and LVM

- RAID basics • Limitations of RAID • RAID Levels • RAID 0 • RAID 1 • RAID 4 • RAID 5 • RAID 1+0(10) • RAID 5+0 (50) and 5+1 (51) • RAID summary • Designing RAID sets • RAID operations • Software and hardware RAIDs • Linux software RAID • The /etc.raidtab file • Persistent superblocks • The mkraid utility • Configuring software RAID • Booting with software RAID • Linux Hardware RAID • Linux LVM • The problem that LVM addresses • Alternatives to LVM • Logical volume management • LVM terminology • LVM utilities • vgscan • pvcreate • vgcreate • vgextend • vgdisplay • lvcreate • lvextend • Creating a partition using LVM

File sharing and services – NFS

- Introduction to NFS • Prerequisites • How NFS works • What needs to be configured on an NFS server • Choosing your exports • Configuring your exports • Restricting access • User ID mapping • Starting NFS • Server side options • Temporarily exporting a directory • mounting exported directories automatically • The soft touch • Hard mounting • Soft mounting • Signal handling • intr (interruptible) • Block size • Monitoring the NFS server • Defense • Secure NFS with TCP wrappers

File sharing and services – Samba

- Upgrading Samba • Configuration files • Encrypted password file (smbpasswd) • Optional items (log files and startup scripts) • Common locations • The smb.conf file • Sharing directories • Creating a simple disk share • Case sensitivity and name mangling • Restricting access • [homes] • Enabling smbfs support • Building smbmount and smbunmount tools • Sharing printers • How does SMB printing work • Samba's printing styles • Initial print share creation • Controlling a printer from remote clients • Printer service troubleshooting • Download print drivers to Windows 9x clients • The [printer\$] disk share • the [print\$] share directory • Installing drivers into [print\$] • Add printer wizard driver installation • Installing print drivers using rpcclient • Identifying the driver files • Obtaining driver files from Windows Client [print\$] shares • Installing print drivers into [print\$] • Using the smbclient to confirm driver installation • Running rpcclient with adddriver • Checking adddriver completion • Check Samba for driver recognition • Specific driver name flexibility • Running rpcclient with setdriver • First client driver installation • Setting device modes on new printers • Modify smb.conf • [printers] • Network browsing and WINS • Browsing 101 • Collect the browse list • Request a copy of the browse list • Browser elections • Browsing 102 • LMHOSTS file • Windows Internet Name Service (WINS) • Samba's WINS capabilities • Cross subnet browsing • Microsoft clients • Windows 95 and 98 • Network components • Network redirectors and password issues • Remote disk share configuration • Remote printer connection • Support for Windows 9x domain logins and logon scripts • Windows NT 4.0 • Passwords and Service Pack 3 • Disk share connections • Remote printers connections • Credential conflicts • Windows 2000 • Microsoft DOS network client 3.0

Recovering a Linux system

- Developing an onsite and offsite backup strategy • Data classifications • Ephemeral • Local • General system • System recovery • Choosing a backup method • Backup media • Magnetic media • Backup utilities • tar • cpio • rsync • dd • mt • Automate backups with cron • System recovery • Passing parameters to the kernel • Device does not work • Lost root password • Journal checking with fsck • Creating a boot disk • Installing LILO on a floppy • Creating a data CD • Creating the CD file system • Testing .iso images • Burning the CD • Duplicating data CDs

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System logging and automation

- System logging • The syslogd utility • Signals • Remote logging • Security • The syslog.conf file • Selectors • Actions • Compressed log files • Automounting with autofs • autofs • The autofs map: /etc/auto.master

Troubleshooting

- General troubleshooting • Packages, programs and scripts • Permissions • File system issues – disk space and mounting • BIOS issues • Recognising and identifying boot and kernel specific stages • The operating system • What sort of 'it doesn't work' does it do • Hardware vs software problems • Environment configurations • /etc/shadow • /etc/group • /etc/profile • /etc/login.defs

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