

# Studiegids Linux

## *LPI level 1 deel 2*

### studieWijzer; aanvullingen op de 102 examenStof:

===== **READ ME !** =====

Opzet van deze 'samenvatting':

Ik heb op 19mei2005 de objectives van [www.lpi.org](http://www.lpi.org) gedownload. (Dit moet dus de meest recente informatie zijn m.b.t. de examenstof.)

Daar bij, per onderwerp, de verwijzingen naar de boeken van Jeroen Baten gezet.

Waar de informatie uit studieGids of studieWijzer te sumier leek, is het aangevuld met URL's. En als 'extra'; verwijzingen naar examCram2 van Ross Brunson. Het onderwerp (topic) begint met die verwijzing.

Belangrijk: zie ook de diverse samenvattingen die gemaakt zijn, via <http://www.linuxhoorn.nl/LZGHoornAgenda.html>

NB: een Topic 110 bestaat niet. Niet bij lpi.org, niet bij Jeroen Baten en niet in examCram2.

===== **/READ ME !** =====

### *Leerdoelen level 1 deel 102:*

18 mei 2005:

## *Exam level 1-102: Detailed Objectives*

This is a required exam for LPI certification Level 1. It covers basic system administration skills that are common across all distributions of linux.

Each objective is assigned a weighting value. The weights range roughly from 1 to 10, and indicate the relative importance of each objective. Objectives with higher weights will be covered in the exam with more questions.

# Topic 105: Kernel

ExamCram2: Hoofdstuk 14 vanaf blz 333; Kernel configuration and custom compilation.

- **1.105.1 Manage/Query kernel and kernel modules at runtime**

StudieGidsen Jeroen Baten Boek 2, blz 4.78.  
m.u.v. AliasDefinitions, te plaatsen in /etc/modules.conf. Dit is de laatste jaren een populaire manier geworden om modules te laten verwijzen naar specifieke hardware. Zie voorbeeld op studieWijzer blz 33.  
studieWijzer: [ftp://ftp.instruct.nl/pub/overig/LP11\\_studiewijzer.pdf](ftp://ftp.instruct.nl/pub/overig/LP11_studiewijzer.pdf)

Modified: 2003-Mar-17  
Maintainer: [Mark Miller](#)  
Weight: 4

**Description:** Candidates should be able to manage and/or query a kernel and kernel loadable modules. This objective includes using command-line utilities to get information about the currently running kernel and kernel modules. It also includes manually loading and unloading modules as appropriate. It also includes being able to determine when modules can be unloaded and what parameters a module accepts. Candidates should be able to configure the system to load modules by names other than their file name.

**Key files, *terms*, and utilities include:**

/lib/modules/kernel-version/modules.dep  
/etc/modules.conf & /etc/conf.modules  
**depmod**  
**insmod**  
**lsmod**  
**rmmod**  
**modinfo**  
**modprobe**  
**uname**

- **1.105.2 Reconfigure, build, and install a custom kernel and kernel modules**

StudieGidsen Jeroen Baten Boek 2, blz 4.83

Modified: 2003-Mar-17  
Maintainer: [Mark Miller](#)  
Weight: 3

**Description:** Candidates should be able to customize, build, and install a kernel and kernel loadable modules from source. This objective includes customizing the current kernel configuration, building a new kernel, and building kernel modules as appropriate. It also includes installing the new kernel as well as any modules, and ensuring that the boot manager can locate the new kernel and associated files (generally located under /boot, see objective 1.102.2 for more details about boot manager configuration).

**Key files, *terms*, and utilities include:**

/usr/src/linux/\*  
/usr/src/linux/.config  
/lib/modules/kernel-version/\*

```
/boot/*  
make  
make targets: config, menuconfig, xconfig, oldconfig, modules, install,  
modules_install, depmod
```

=> ExamCram2 heeft duidelijker verhaal dan studieGids.

# Topic 106: Boot, Initialization, Shutdown and Runlevels

ExamCram2: Hoofdstuk 1 vanaf blz 14; Linux installation (Bootloaders)  
Hoofdstuk 10 vanaf blz 245; Linux bootProcess and runlevels.

- **1.106.1 Boot the system**

StudieGidsen Jeroen Baten Boek 1, blz 8.144  
m.u.v. GRUB; een multibootloader. Zie hiervoor studieWijzer JB blz 23 t/m 27, onder 1.102.2. Duidelijker verhaal staat in examCram2 H1 v.a. blz 14.

URL: <http://www.faqs.org/docs/Linux-mini/Multiboot-with-GRUB.html>

Er bestaat inmiddels (mei2005) een GRUB-legacy en (bijna?) een GRUB-2.

URL: <http://www.gnu.org/software/grub/>

Zie ook <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 26 februari 2005

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 3

**Description:** Candidates should be able to guide the system through the booting process. This includes giving commands to the boot loader and giving options to the kernel at boot time, and checking the events in the log files.

**Key files, terms, and utilities include:**

`/var/log/messages`

`/etc/conf.modules` or `/etc/modules.conf`

**dmesg**

LILO

GRUB

- **1.106.2 Change runlevels and shutdown or reboot system**

StudieGidsen Jeroen Baten Boek 1, blz 8.148

Zie ook <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 26 februari 2005

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 3

**Description:** Candidates should be able to manage the runlevel of the system. This objective includes changing to single user mode, shutdown or rebooting the system. Candidates should be able to alert users before switching runlevel, and properly terminate processes. This objective also includes setting the default runlevel.

**Key files, terms, and utilities include:**

`/etc/inittab`

**shutdown**

**init**

# Topic 107: Printing

ExamCram2: Hoofdstuk 16 vanaf blz 379; Linux printing.

- **1.107.2 Manage printers and print queues**

StudieGidsen Jeroen Baten Boek 2, blz 5.106

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 1

**Description:** Candidates should be able to manage print queues and user print jobs. This objective includes monitoring print server and user print queues and troubleshooting general printing problems.

**Key files, terms, and utilities include:**

/etc/printcap

**lpc**

**lpq**

**lprm**

**lp**

- **1.107.3 Print files**

StudieGidsen Jeroen Baten Boek 2, blz 5.105

m.u.v. mpage dat vergelijkbaar is met a2ps (blz 5.106) aldus JB.

Zie studieWijzer blz 35 voor uitleg van mpage (multiplePage).

URL a2ps <http://www.gnu.org/software/a2ps/>

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight:1

**Description:** Candidates should be able to manage print queues and manipulate print jobs. This objective includes adding and removing jobs from configured printer queues and converting text files to postscript for printing.

**Key files, terms, and utilities include:**

**lpr**

**lpq**

**mpage**

- **1.107.4 Install and configure local and remote printers**

StudieGidsen Jeroen Baten Boek 2, blz 5.110.

Let op het path naar het filter.

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 1

Candidate should be able to install a printer daemon, install and configure a print filter (e.g.: apsfiler, magicfilter). This objective includes making local and remote printers accessible for a Linux system, including postscript, non-postscript, and Samba printers.

**Key files, terms, and utilities include:**

/etc/printcap

/etc/apsfilter/\*

/var/lib/apsfilter/\*/

/etc/magicfilter/\*/

/var/spool/lpd/\*/

**lpd**

# Topic 108: Documentation

ExamCram2: Hoofdstuk 11 vanaf blz 263; Using Linux and GNU Documentation.

- **1.108.1 Use and manage local system documentation**

StudieGidsen Jeroen Baten Boek 1, blz 9.154

m.u.v. MANPATH. zie studieWijzer Jeroen Baten blz 36.

MANPATH is een commando waarmee ingesteld kan worden in welke volgorde het commando 'man' de directories doorzoekt naar een bepaalde man-page.

Zie ook <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 12 maart 2005

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 4

Candidates should be able to use and administer the man facility and the material in /usr/share/doc/. This objective includes finding relevant man pages, searching man page sections, finding commands and man pages related to them, and configuring access to man sources and the man system. It also includes using system documentation stored in /usr/share/doc/ and determining what documentation to keep in /usr/share/doc/.

**Key files, terms, and utilities include:**

MANPATH

man

apropos

whatis

- **1.108.2 Find Linux documentation on the Internet**

StudieGidsen Jeroen Baten Boek 1, blz 9.158

Zie ook <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 12 maart 2005

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 3

**Description:** Candidates should be able to find and use Linux documentation. This objective includes using Linux documentation at sources such as the *Linux Documentation Project* (LDP), vendor and third-party websites, newsgroups, newsgroup archives, and mailing lists.

**Key files, terms, and utilities include:**

not applicable

- **1.108.5 Notify users on system-related issues**

Niet in studieGidsen, maar wel in de StudieWijzer (!! ) Jeroen Baten blz 36 & 37.

Het gaat hierbij over bestanden waarmee een sysAd gebruikers op de hoogte van bijzonderheden, met betrekking tot het systeem waarop ingelogd is, houdt. Meestal via een bericht dat bij inloggen verschijnt.

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 1

**Description:** Candidates should be able to notify the users about current issues related to the system. This objective includes automating the communication process, e.g. through logon messages.

**Key files, *terms*, and utilities include:**

`/etc/issue`

`/etc/issue.net`

`/etc/motd`

# Topic 109: Shells, Scripting, Programming and Compiling

ExamCram2: Hoofdstuk 15 vanaf blz 355; Linux shells and scripting

- **1.109.1 Customize and use the shell environment**

StudieGidsen Jeroen Baten Boek 2, blz 6.124

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 5

**Description:** Candidate should be able to customize shell environments to meet users' needs. This objective includes setting environment variables (e.g. PATH) at login or when spawning a new shell. It also includes writing bash functions for frequently used sequences of commands.

**Key files, *terms*, and utilities include:**

~/.bash\_profile

~/.bash\_login

~/.profile

~/.bashrc

~/.bash\_logout

~/.inputrc

**function** (Bash built-in command)

**export**

**env**

**set** (Bash built-in command)

**unset** (Bash built-in command)

- **1.109.2 Customize or write simple scripts**

StudieGidsen Jeroen Baten Boek 2, blz 6.127

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 3

**Description:** Candidate should be able to customize existing scripts, or write simple new (ba)sh scripts. This objective includes using standard sh syntax (loops, tests), using command substitution, testing command return values, testing of file status, and conditional mailing to the superuser. This objective also includes making sure the correct interpreter is called on the first (!) line of scripts. This objective also includes managing location, ownership, execution and suid-rights of scripts.

**Key files, *terms*, and utilities include:**

**while**

**for**

**test**

**chmod**

# Er is geen topic 110.

## Topic 111: Administrative Tasks

ExamCram2: Hoofdstuk 6 vanaf blz 145; working with permissions etc.  
Hoofdstuk 12 vanaf blz 277; managing users and groups.  
Hoofdstuk 13 vanaf blz 299; system administration.

- **1.111.1 Manage users and group accounts and related system files**

StudieGidsen Jeroen Baten Boek 1, blz 10.168

m.u.v. pwconv, pwunconv, grpconv en grpunconv.

pwconv = hiermee kun je een passwordBestand converteren naar een shadowPasswordBestand. Met pwunconv doe je het tegengestelde.

grpconv = als hierboven maar voor groupPasswords, en grpunconv is het

tegegengestelde. Zie hiervoor ook de studieWijzer, blz. 38 & 39 en

ExamCram2 blz 290 & 291.

Zie ook <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 12 maart 2005

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 4

**Description:** Candidate should be able to add, remove, suspend and change user accounts. Tasks include to add and remove groups, to change user/group info in passwd/group databases. The objective also includes creating special purpose and limited accounts.

**Key files, terms, and utilities include:**

/etc/passwd

/etc/shadow

/etc/group

/etc/gshadow

chage

gpasswd

groupadd

groupdel

groupmod

grpconv

grpunconv

passwd

pwconv

pwunconv

useradd

userdel

usermod

- **1.111.2 Tune the user environment and system environment variables**

StudieGidsen Jeroen Baten Boek 1, blz 10.179

Zie ook <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 12 maart 2005

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 3

**Description:** Candidate should be able to modify global and user profiles. This includes setting environment variables, maintaining skel directories for new user accounts and setting command search path with the proper directory.

**Key files, terms, and utilities include:**

/etc/profile  
/etc/skel  
**env**  
**export**  
**set**  
**unset**

- **1.111.3 Configure and use system log files to meet administrative and security needs**

StudieGidsen Jeroen Baten Boek 1, blz 11.190, m.u.v. logrotate, dat een commando is om oude logfiles automatisch op te laten ruimen. Zie studieWijzer Jeroen Baten, blz 39 & 40. Betekenis 'roteren': Rotating logfiles is copying them to a backup file and creating a new logfile. Zie <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 20 november2004 Modified: 2003-Mar-17 Maintainer: [Mark Miller](#) Weight: 3

**Description:** Candidate should be able to configure system logs. This objective includes managing the type and level of information logged, manually scanning log files for notable activity, monitoring log files, arranging for automatic rotation and archiving of logs and tracking down problems noted in logs.

**Key files, terms, and utilities include:**

/etc/syslog.conf  
/var/log/\*  
**logrotate**  
**tail -f**

- **1.111.4 Automate system administration tasks by scheduling jobs to run in the future**

StudieGidsen Jeroen Baten Boek 1, blz 11.194, m.u.v. anacrontab. Zie hiervoor studieWijzer JB blz 40 & 41. Anacron hervat een proces wanneer bv een stroomstoring het starten ervan heeft voorkomen. Wat cron betreft is daarentegen de taak vergeten zodra het tijdstip gepaseerd is. In /var/spool/anacron wordt bijgehouden welke taken zijn uitgevoerd. Configuratie in /etc/anacrontab. Meer informatie: <http://anacron.sourceforge.net/> Zie <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 20 november2004 Modified: 2003-Mar-17 Maintainer: [Mark Miller](#) Weight: 4

**Description:** Candidate should be able to use **cron** or **anacron** to run jobs at regular intervals and to use **at** to run jobs at a specific time. Task include managing **cron** and **at** jobs and configuring user access to **cron** and **at** services.

**Key files, terms, and utilities include:**

/etc/anacrontab  
/etc/at.deny  
/etc/at.allow  
/etc/crontab  
/etc/cron.allow  
/etc/cron.deny  
/var/spool/cron/\*  
**at**

atq  
atrm  
crontab

- 1.111.5 Maintain an effective data backup strategy

StudieGidsen Jeroen Baten Boek 1, blz 11.200,  
m.u.v. dd, dump en restore. Zie hiervoor studieWijzer JB blz 41 & 42.  
“dd” is een commando dat data byte voor byte kan kopiëren naar een andere locatie.  
Meer informatie op <http://www.geocities.com/tipsforlinux/articles/036.html>  
“dump” En “restore” zijn ongeschikt voor ext3 en reiserfs, maar bedoeld voor  
systeemBackups, niet zozeer voor bestanden. Voor meer informatie zie  
<http://surf.ap.seikei.ac.jp/~nakano/dump-restore/dump-restore-mini-HOWTO.en.html>  
Zie <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 20 november2004  
Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 3 **Description:**

Candidate should be able to plan a backup strategy and backup filesystems automatically to various media. Tasks include dumping a raw device to a file or vice versa, performing partial and manual backups, verifying the integrity of backup files and partially or fully restoring backups.

**Key files, terms, and utilities include:**

cpio  
dd  
dump  
restore  
tar

- 1.111.6 Maintain system time

Niet in studieGidsen, maar wel in StudieWijzer Jeroen Baten blz 42, 43 & 44.  
NTP = network time protocol.  
/usr/share/zoneinfo = bestand waarin actuele tijdzone omschreven is. bv Greenwich.  
/etc/timezone = regelt automatische overgang zomer- wintertijd, en bevat info van  
zoneinfo wanneer dat bestand afwezig is.  
/etc/localtime = symlink naar /usr/share/zoneinfo.  
/etc/ntp.conf = hier stel je in welke server de exacte tijd aan moet leveren voor  
synchronisatie van BIOS- en systeem-klokken.  
/etc/ntp.drift = hierin wordt de drift, het verlopen, van de BIOSklok bij gehouden.  
Commando date = systeemtijd achterhalen.  
Commando hwclock = BIOSsysteemtijd instellen.  
Commando ntpd = ntpDeamon.  
ntpdate = instellen van datum en tijd via ntp.  
Meer informatie over NTP: zie <http://www.ntp.org/>

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 4

**Description:** Candidate should be able to properly maintain the system time and synchronize the clock over NTP. Tasks include setting the system date and time, setting the BIOS clock to the correct time in UTC, configuring the correct timezone for the system and configuring the system to correct clock drift to match NTP clock.

**Key files, terms, and utilities include:**

/usr/share/zoneinfo  
/etc/timezone  
/etc/localtime  
/etc/ntp.conf  
/etc/ntp.drift

date  
hwclock  
ntpd  
ntpdate

## Topic 112: Networking Fundamentals

ExamCram2: Hoofdstuk 17 vanaf blz 399; basic networking.

- 1.112.1 Fundamentals of TCP/IP

StudieGidsen Jeroen Baten Boek 2, blz 9.200

m.u.v. uitleg over CIDR. CIDR is een kunstgreep om toegewezen IP-ranges te beperken tot het hoogstnoodzakelijke, zodat er meer netwerken van een IP-range voorzien konden worden.

URL: <http://public.pacbell.net/dedicated/cidr.html>

Zie hier voor ook studieWijzer JB blz 45.

Zie <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 12 maart 2005

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 4

**Description:** Candidates should demonstrate a proper understanding of network fundamentals. This objective includes the understanding of IP-addresses, network masks and what they mean (i.e. determine a network and broadcast address for a host based on its subnet mask in "dotted quad" or abbreviated notation or determine the network address, broadcast address and netmask when given an IP-address and number of bits). It also covers the understanding of the network classes and classless subnets (CIDR) and the reserved addresses for private network use. It includes the understanding of the function and application of a default route. It also includes the understanding of basic internet protocols (IP, ICMP, TCP, UDP) and the more common TCP and UDP ports (20, 21, 23, 25, 53, 80, 110, 119, 139, 143, 161).

**Key files, terms, and utilities include:**

/etc/services

ftp

telnet

host

ping

dig

traceroute

whois

- 1.112.3 TCP/IP configuration and troubleshooting

StudieGidsen Jeroen Baten Boek 2, blz 10.222

m.u.v. TCPdump en /etc/nsswitch.conf.

TCPdump = een commando om het TCP verkeer te tonen, waarna het geanalyseerd kan worden. Zie man tcpdump op de commandline.

URL: <http://www.freesoft.org/CIE/Topics/55.htm>

Een vertaler van output van TCPdump:

<http://networking.ringofsaturn.com/Tools/tcpdump.php>

Zie ook studieWijzer JB blz 46.

/etc/nsswitch.conf = een bestand dat, naast /etc/hosts en /etc/resolv.conf, nodig is voor de configuratie van lokale systeemnamen

Zie <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 12 maart 2005

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 7

**Description:** Candidates should be able to view, change and verify configuration settings and operational status for various network interfaces. This objective includes manual and automatic configuration of interfaces and routing tables. This especially means to add, start, stop, restart, delete or reconfigure network interfaces. It also means to change, view or configure the routing table and to correct an improperly set default route manually. Candidates should be able to configure Linux as a DHCP client and a TCP/IP host and to debug problems associated with the network configuration.

**Key files, terms, and utilities include:**

/etc/HOSTNAME or /etc/hostname

/etc/hosts

/etc/networks

/etc/host.conf

/etc/resolv.conf

/etc/nsswitch.conf

**ifconfig**

**route**

**dhcpcd, dhcpcd, pump**

**host**

**hostname (domainname, dnsdomainname)**

**netstat**

**ping**

**traceroute**

**tcpdump**

the network scripts run during system initialization.

● **1.112.4 Configure Linux as a PPP client**

StudieGidsen Jeroen Baten Boek 2, blz 11.240

m.u.v. uitleg over ISDN, ADSL en wvdial.

Zie hiervoor studieWijzerJB, blz 47

Meer informatie over scripts op:

<http://www.xs4all.nl/helpdesk/besturingssysteem/linux/connectie/>

Zie <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 26 maart 2005

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 3

**Description:** Candidates should understand the basics of the PPP protocol and be able to configure and use PPP for outbound connections. This objective includes the definition of the chat sequence to connect (given a login example) and the setup commands to be run automatically when a PPP connection is made. It also includes initialisation and termination of a PPP connection, with a modem, ISDN or ADSL and setting PPP to automatically reconnect if disconnected.

**Key files, terms, and utilities include:**

/etc/ppp/options.\*

/etc/ppp/peers/\*

/etc/wvdial.conf

**/etc/ppp/ip-up**

**/etc/ppp/ip-down**

**wvdial**

**pppd**

# Topic 113: Networking Services

ExamCram2: Hoofdstuk 18 vanaf blz 433; network services.

- 1.113.1 Configure and manage inetd, xinetd, and related services

StudieGidsen Jeroen Baten Boek 2, blz 11.240

m.u.v. uitleg over xinetd. Zie hiervoor studieWijzer JB blz 48.

Of examCram2 blz 436 & 437.

URL: <http://freshmeat.net/projects/xinetd/>

URL: <http://www.macsecurity.org/resources/xinetd/tutorial.shtml>

tcpwrappers; examCram2 blz 470.

Zie <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 26 maart 2005

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 4

**Description:** Candidates should be able to configure which services are available through inetd, use tcpwrappers to allow or deny services on a host-by-host basis, manually start, stop, and restart internet services, configure basic network services including **telnet** and **ftp**. Set a service to run as another user instead of the default in inetd.conf.

**Key files, terms, and utilities include:**

/etc/inetd.conf

/etc/hosts.allow

/etc/hosts.deny

/etc/services

/etc/xinetd.conf

/etc/xinetd.log

- 1.113.2 Operate and perform basic configuration of sendmail

StudieGidsen Jeroen Baten Boek 2, blz 13.258

m.u.v. uitleg over open relay. Zie hier voor (en spam) studieWijzer JB blz 49-54.

Zie ook examCram2 vanaf blz 444.

Zie <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 9 april 2005

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 4

**Description:** Candidate should be able to modify simple parameters in sendmail configuration files (including the "Smart Host" parameter, if necessary), create mail aliases, manage the mail queue, start and stop sendmail, configure mail forwarding and perform basic troubleshooting of sendmail. The objective includes checking for and closing open relay on the mailserver. It does not include advanced custom configuration of Sendmail.

**Key files, terms, and utilities include:**

/etc/aliases or /etc/mail/aliases

/etc/mail/\*

~/forward

**mailq**

**sendmail**

**newaliases**

- 1.113.3 Operate and perform basic configuration of Apache

StudieGidsen Jeroen Baten Boek 2, blz 14.268

ExamCram2 v.a. blz 449.

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 4

**Description:** Candidates should be able to modify simple parameters in Apache configuration files, start, stop, and restart **httpd**, arrange for automatic restarting of **httpd** upon boot. Does not include advanced custom configuration of Apache.

**Key files, terms, and utilities include:**

httpd.conf

apachectl

httpd

- **1.113.4 Properly manage the NFS, smb, and nmb daemons**

StudieGidsen Jeroen Baten Boek 2, blz 15.274

ExamCram2 vanaf blz 452.

Zie <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 23 april 2005

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 4

**Description:** Candidate should know how to mount remote filesystems using NFS, configure NFS for exporting local filesystems, start, stop, and restart the NFS server. Install and configure Samba using the included GUI tools or direct edit of the /etc/smb.conf file (Note: this deliberately excludes advanced NT domain issues but includes simple sharing of home directories and printers, as well as correctly setting the nmbd as a WINS client).

**Key files, terms, and utilities include:**

/etc/exports

/etc/fstab

/etc/smb.conf

mount

umount

- **1.113.5 Setup and configure basic DNS services**

StudieGidsen Jeroen Baten Boek 2, blz 16.294

ExamCram2 vanaf blz 460.

Zie <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 23 april 2005

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 4

**Description:** Candidate should be able to configure hostname lookups and troubleshoot problems with local caching-only name server. Requires an understanding of the domain registration and DNS translation process. Requires understanding key differences in configuration files for bind 4 and bind 8.

**Key files, terms, and utilities include:**

/etc/hosts

/etc/resolv.conf

/etc/nsswitch.conf => zie Topic 1.112.3

/etc/named.boot (v.4) or /etc/named.conf (v.8)

named

- **1.113.7 Set up secure shell (OpenSSH)**

studieGidsen Jeroen Baten boek 2, blz 17.310 en StudieWijzer Jeroen Baten blz 55-59. ExamCram2 H19 vanaf blz 470.

Zie <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 7 mei 2005

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 4

**Description:** The candidate should be able to obtain and configure OpenSSH. This objective includes basic OpenSSH installation and troubleshooting, as well as configuring **sshd** to start at system boot..

**Key files, *terms*, and utilities include:**

/etc/hosts.allow

/etc/hosts.deny

/etc/nologin

/etc/ssh/sshd\_config

/etc/ssh\_known\_hosts

/etc/sshr

**sshd**

**ssh-keygen**

# Topic 114: Security

ExamCram2: Hoofdstuk 19 vanaf blz 469; security.  
Hoofdstuk 12 vanaf blz 288; the shadow suite.  
Hoofdstuk 6 vanaf blz 158; using disk quotas.

- **1.114.1 Perform security administration tasks**

StudieGidsen Jeroen Baten Boek 2, blz 17.306  
m.u.v. iptables. Zie hiervoor studieWijzer JB blz 59-61 of  
ExamCram2 vanaf blz 481.

URL: <http://www.netfilter.org/documentation/HOWTO/packet-filtering-HOWTO.html>

Zie <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 7 mei 2005

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 4

**Description:** Candidates should know how to review system configuration to ensure host security in accordance with local security policies. This objective includes how to configure TCP wrappers, find files with SUID/SGID bit set, verify packages, set or change user passwords and password aging information, update binaries as recommended by CERT, BUGTRAQ, and/or distribution's security alerts. Includes basic knowledge of **ipchains** and **iptables**.

**Key files, terms, and utilities include:**

/proc/net/ip\_fwchains

/proc/net/ip\_fwnames

/proc/net/ip\_masquerade

**find**

**ipchains**

**passwd**

**socket**

**iptables**

- **1.114.2 Setup host security**

StudieGidsen Jeroen Baten Boek 2, blz 17.313

Zie <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 7 mei 2005

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 3

**Description:** Candidate should know how to set up a basic level of host security. Tasks include syslog configuration, shadowed passwords, set up of a mail alias for root's mail and turning of all network services not in use.

**Key files, terms, and utilities include:**

/etc/inetd.conf or /etc/inet.d/\*

/etc/nologin

/etc/passwd

/etc/shadow

/etc/syslog.conf

- **1.114.3 Setup user level security**

StudieGidsen Jeroen Baten Boek 2, blz 17.318 en boek 1, blz 7.127

Zie ook topic 1.111.1 en examCram2 vanaf blz 158.

Zie <http://www.linuxhoorn.nl/LZGHoornAgenda.html> bij zaterdag 6 november 2005

Modified: 2003-Mar-17

Maintainer: [Mark Miller](#)

Weight: 1

**Description:** Candidate should be able to configure user level security. Tasks include limits on user logins, processes, and memory usage.

**Key files, *terms*, and utilities include:**

**quota**

**usermod**