



KERNEL LINUX

Por Jussara Reis

KERNEL

O kernel do Linux foi idealizado pelo estudante de ciência da computação finlandês Linus Benedict Torvalds da Universidade de Helsinque na Finlândia, em 1991.

Torvalds foi motivado pela criação de um kernel que disponibilizasse de memória virtual, pudesse ser modificado pelos seus usuários e adaptados de acordo com a necessidade de cada um.

Possui suporte multitarefa nos modos de usuário e do núcleo, memória virtual, compartilhamento das bibliotecas, gerenciamento da memória, protocolos da internet e *threading* .



- **Licença GPL (GNU Public License):** o autor disponibiliza os direitos de uso, copia, alteração e redistribuição do seu código, sendo que toda obra derivada da original deve ser distribuída com a licença GPL.
- **Arquiteturas suportadas:**
Alpha , arm, arm26, cris, h8300, i386, ia64, m68k, m68knommu, mips , parisc, ppc, ppc64, s390, sh, sparc, sparc64, um, v850, x86_64



KERNEL LINUX 2.6.35

A versão do kernel Linux utilizada nas aplicações deste trabalho foi a versão 2.6.35.4 lançada no dia 26 de agosto de 2010.

Segundo Hess (2010), a versão 2.6.35 trouxe inovações em recursos de processamento de dados em rede, compactação de memória, gerenciamento de energia em chips gráficos, recurso de I/O direto no sistema de arquivos Btrfs e suporte SR IOV para virtualização.



COMPILANDO UM KERNEL LINUX

1. Baixar do site <http://www.kernel.org> a versão desejada do kernel, neste exemplo esta a versão atualizada Linux 2.6.35.4
2. No terminal logar como super usuário (usuário root).
3. Descompactar e desempacote o arquivo utilizando o comando

```
# tar xjvf <local onde está o arquivo> linux-2.6.35.4.tar.bz2 -C /usr/src
```
4. Crie um link simbólico /usr/src/linux

```
# ln -sf /usr/src/linux-2.6.35.4 /usr/src/linux
```
5. Para configurar o kernel, execute os comandos:

```
# cd /usr/src/Linux (acessar o /usr/src/Linux)  
#make mrproper (retorna ao padrão as configurações)  
# make menuconfig ou make xconfig
```



COMPILANDO UM KERNEL LINUX

6. Salve as configurações depois de feita.
7. Para compilar o kernel execute:

```
# make bzImage
```
8. Para instalar os módulos

```
# make modules
```

```
#make modules_install
```
9. Copiando o arquivo para o diretório/ *boot* da arquitetura escolhida

```
# cp /usr/src/Linux/arch/x86/boot/bzImage /boot/vmlinuz-2.6.35-x86-c1
```
10. Copiar o arquivo System.map para /boot

```
# cp /usr/src/linux/System.map /boot/System.map-2.6.35-x86-c1
```
11. Cria um link simbolico para System.map:

```
# ln-sf /boot/System.map-2.6.35-x86-c1
```

Obs: Nomeie os arquivos de acordo sua versão e arquitetura.



COMPILANDO UM KERNEL LINUX

11. Copiar o .config para o /boot

```
#cp /usr/src/linux/System.map /boot/System.map-2.6.35-x86-c1
```

12. Configurando o gerenciador de boot GRUB ou LILO.

```
#cd /boot/grub
```

```
# vi menu.lst
```

```
title Debian GNU/Linux, Kernel 2.6.35-x86
```

```
root (hd0,1)
```

```
kernel /boot/initrd-2.6.35-x86.img
```

Salva o arquivo.

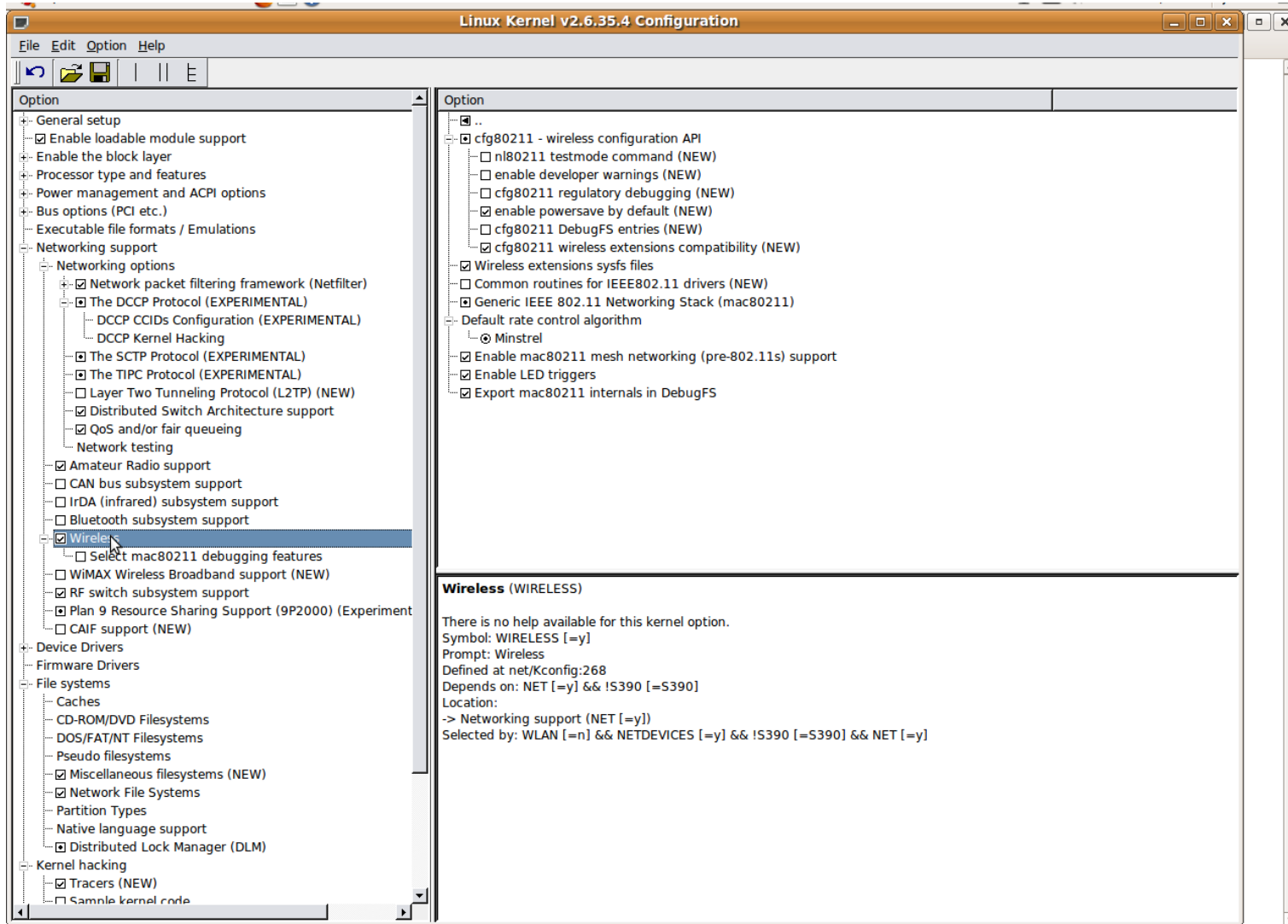
Não precisa regravar o GRUB no MBR ou partição específica após feitas as alterações.

Caso seja o LILO, este é preciso gravar no MBR ou partição específica após feitas as alterações, com o comando: # /sbin/lilo

13. Reinicie a máquina e escolha o modo com o novo kernel.



CONFIGURANDO



The image shows a screenshot of the 'Linux Kernel v2.6.35.4 Configuration' window. The window is divided into two main panes. The left pane shows a tree view of configuration options, with 'Networking support' expanded to 'Networking options', and 'Wireless' selected. The right pane shows the details for the selected 'Wireless' option.

Option

- General setup
 - Enable loadable module support
 - Enable the block layer
 - Processor type and features
 - Power management and ACPI options
 - Bus options (PCI etc.)
 - Executable file formats / Emulations
- Networking support
 - Networking options
 - Network packet filtering framework (Netfilter)
 - The DCCP Protocol (EXPERIMENTAL)
 - DCCP CCIDs Configuration (EXPERIMENTAL)
 - DCCP Kernel Hacking
 - The SCTP Protocol (EXPERIMENTAL)
 - The TIPC Protocol (EXPERIMENTAL)
 - Layer Two Tunneling Protocol (L2TP) (NEW)
 - Distributed Switch Architecture support
 - QoS and/or fair queueing
 - Network testing
 - Amateur Radio support
 - CAN bus subsystem support
 - IrDA (infrared) subsystem support
 - Bluetooth subsystem support
 - Wireless
 - Select mac80211 debugging features
 - WiMAX Wireless Broadband support (NEW)
 - RF switch subsystem support
 - Plan 9 Resource Sharing Support (9P2000) (Experiment
 - CAIF support (NEW)
- Device Drivers
- Firmware Drivers
- File systems
 - Caches
 - CD-ROM/DVD Filesystems
 - DOS/FAT/NT Filesystems
 - Pseudo filesystems
 - Miscellaneous filesystems (NEW)
 - Network File Systems
 - Partition Types
 - Native language support
 - Distributed Lock Manager (DLM)
- Kernel hacking
 - Tracers (NEW)
 - Sample kernel code

Option

- ..
 - cfg80211 - wireless configuration API
 - nl80211 testmode command (NEW)
 - enable developer warnings (NEW)
 - cfg80211 regulatory debugging (NEW)
 - enable powersave by default (NEW)
 - cfg80211 DebugFS entries (NEW)
 - cfg80211 wireless extensions compatibility (NEW)
 - Wireless extensions sysfs files
 - Common routines for IEEE802.11 drivers (NEW)
 - Generic IEEE 802.11 Networking Stack (mac80211)
- Default rate control algorithm
 - Minstrel
- Enable mac80211 mesh networking (pre-802.11s) support
- Enable LED triggers
- Export mac80211 internals in DebugFS

Wireless (WIRELESS)

There is no help available for this kernel option.
Symbol: WIRELESS [=y]
Prompt: Wireless
Defined at net/Kconfig:268
Depends on: NET [=y] && !S390 [=S390]
Location:
-> Networking support (NET [=y])
Selected by: WLAN [=n] && NETDEVICES [=y] && !S390 [=S390] && NET [=y]



COPILANDO

```
root@Jujuba: /usr/src/linux
Arquivo  Editar  Ver  Terminal  Ajuda
/boot/config-2.6.28-19-generic:1030:warning: symbol value 'm' invalid for GFS2_F
S_LOCKING_DLM
/boot/config-2.6.28-19-generic:1315:warning: symbol value 'm' invalid for INET_L
RO
/boot/config-2.6.28-19-generic:1444:warning: symbol value 'm' invalid for IP_DCC
P_CCID3
/boot/config-2.6.28-19-generic:1448:warning: symbol value 'm' invalid for IP_DCC
P_TFRM_LIB
/boot/config-2.6.28-19-generic:1830:warning: symbol value 'm' invalid for MFD_WM
8350
/boot/config-2.6.28-19-generic:1831:warning: symbol value 'm' invalid for MFD_WM
8350_I2C
/boot/config-2.6.28-19-generic:1861:warning: symbol value 'm' invalid for MMC_RI
COH_MMC
/boot/config-2.6.28-19-generic:2389:warning: symbol value 'm' invalid for RFA1D1
_INPUT
/boot/config-2.6.28-19-generic:3314:warning: symbol value 'm' invalid for THRUST
MASTER_FF
/boot/config-2.6.28-19-generic:3928:warning: symbol value 'm' invalid for ZEROPL
US_FF
#
# configuration written to .config
#
root@Jujuba: /usr/src/linux# make bzImage
scripts/kconfig/conf -s arch/x86/Kconfig
#
# configuration written to .config
#
CHK    include/linux/version.h
UPD    include/linux/version.h
CHK    include/generated/utsrelease.h
UPD    include/generated/utsrelease.h
CC     kernel/bounds.s
GEN    include/generated/bounds.h
CC     arch/x86/kernel/asm-offsets.s
GEN    include/generated/asm-offsets.h
CALL   scripts/checksyscalls.sh
HOSTCC scripts/genksyms/genksyms.o
SHIPPED scripts/genksyms/lex.c
SHIPPED scripts/genksyms/parse.h
SHIPPED scripts/genksyms/keywords.c
HOSTCC scripts/genksyms/lex.o
SHIPPED scripts/genksyms/parse.c
HOSTCC scripts/genksyms/parse.o
HOSTLD scripts/genksyms/genksyms
CC     scripts/mod/empty.o
HOSTCC scripts/mod/mk_elfconfig
MKELF  scripts/mod/elfconfig.h
HOSTCC scripts/mod/file2alias.o
```



IMAGEM FEITA DO KERNEL

```
root@Jujuba: /usr/src/linux
Arquivo Editar Ver Terminal Ajuda
CC arch/x86/boot/cmdline.o
AS arch/x86/boot/copy.o
HOSTCC arch/x86/boot/mkcpustr
CPUSTR arch/x86/boot/cpustr.h
CC arch/x86/boot/cpu.o
CC arch/x86/boot/cpucheck.o
CC arch/x86/boot/edd.o
VOFFSET arch/x86/boot/voffset.h
LDS arch/x86/boot/compressed/vmlinux.lds
AS arch/x86/boot/compressed/head_32.o
CC arch/x86/boot/compressed/misc.o
OBJCOPY arch/x86/boot/compressed/vmlinux.bin
HOSTCC arch/x86/boot/compressed/relocs
RELOCS arch/x86/boot/compressed/vmlinux.relocs
GZIP arch/x86/boot/compressed/vmlinux.bin.gz
HOSTCC arch/x86/boot/compressed/mkpiggy
arch/x86/boot/compressed/mkpiggy.c: In function 'main':
arch/x86/boot/compressed/mkpiggy.c:65: aviso: ignoring return value of 'fread', declared with attribute warn_unused_result
MKPIGGY arch/x86/boot/compressed/piggy.S
AS arch/x86/boot/compressed/piggy.o
LD arch/x86/boot/compressed/vmlinux
ZOFFSET arch/x86/boot/zoffset.h
AS arch/x86/boot/header.o
CC arch/x86/boot/main.o
CC arch/x86/boot/mca.o
CC arch/x86/boot/memory.o
CC arch/x86/boot/pm.o
AS arch/x86/boot/pmjump.o
CC arch/x86/boot/printf.o
CC arch/x86/boot/regs.o
CC arch/x86/boot/string.o
CC arch/x86/boot/tty.o
CC arch/x86/boot/video.o
CC arch/x86/boot/video-mode.o
CC arch/x86/boot/version.o
CC arch/x86/boot/apm.o
CC arch/x86/boot/video-vga.o
CC arch/x86/boot/video-vesa.o
CC arch/x86/boot/video-bios.o
LD arch/x86/boot/setup.elf
OBJCOPY arch/x86/boot/setup.bin
OBJCOPY arch/x86/boot/vmlinux.bin
HOSTCC arch/x86/boot/tools/build
BUILD arch/x86/boot/bzImage
Root device is (8, 1)
Setup is 13580 bytes (padded to 13824 bytes).
System is 3673 kB
CRC faf8bb3c
Kernel: arch/x86/boot/bzImage is ready (#1)
root@Jujuba: /usr/src/linux#
```

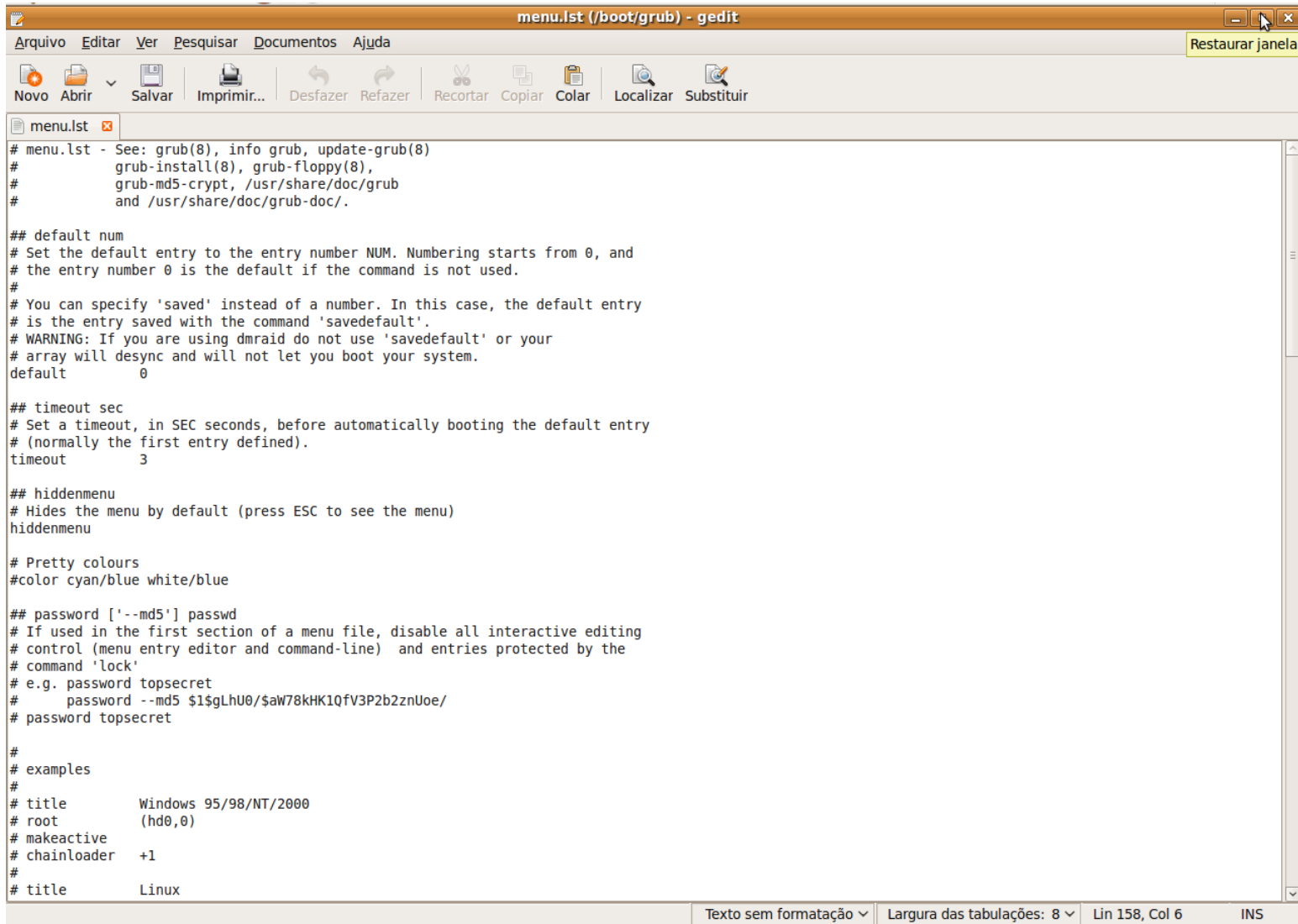


INSTALANDO OS MODULOS

```
root@Jujuba: /usr/src/linux
Arquivo Editar Ver Terminal Ajuda
INSTALL drivers/char/hw_random/via-rng.ko
INSTALL drivers/char/hw_random/virtio-rng.ko
INSTALL drivers/char/i8k.ko
INSTALL drivers/char/ip2/ip2.ko
INSTALL drivers/char/ipmi/ipmi_devintf.ko
INSTALL drivers/char/ipmi/ipmi_msghandler.ko
INSTALL drivers/char/ipmi/ipmi_poweroff.ko
INSTALL drivers/char/ipmi/ipmi_si.ko
INSTALL drivers/char/ipmi/ipmi_watchdog.ko
INSTALL drivers/char/istallation.ko
INSTALL drivers/char/lp.ko
INSTALL drivers/char/moxa.ko
INSTALL drivers/char/mwave/mwave.ko
INSTALL drivers/char/mxser.ko
INSTALL drivers/char/n_hdlc.ko
INSTALL drivers/char/n_r3964.ko
INSTALL drivers/char/nözomi.ko
INSTALL drivers/char/nsc_gpio.ko
INSTALL drivers/char/nvram.ko
INSTALL drivers/char/pc8736x_gpio.ko
INSTALL drivers/char/pcmcia/cm4000_cs.ko
INSTALL drivers/char/pcmcia/cm4040_cs.ko
INSTALL drivers/char/pcmcia/ipwireless/ipwireless.ko
INSTALL drivers/char/pcmcia/synclink_cs.ko
INSTALL drivers/char/ppdev.ko
INSTALL drivers/char/raw.ko
INSTALL drivers/char/riscom8.ko
INSTALL drivers/char/rocket.ko
INSTALL drivers/char/scx200_gpio.ko
INSTALL drivers/char/sonypi.ko
INSTALL drivers/char/specialix.ko
INSTALL drivers/char/stallion.ko
INSTALL drivers/char/synclink.ko
INSTALL drivers/char/synclink_gt.ko
INSTALL drivers/char/synclinkmp.ko
INSTALL drivers/char/tlclk.ko
INSTALL drivers/char/tpm/tpm.ko
INSTALL drivers/char/tpm/tpm_atmel.ko
INSTALL drivers/char/tpm/tpm_bios.ko
INSTALL drivers/char/tpm/tpm_infineon.ko
INSTALL drivers/char/tpm/tpm_nsc.ko
INSTALL drivers/char/tpm/tpm_tis.ko
INSTALL drivers/char/virtio_console.ko
INSTALL drivers/clocksource/scx200_hrt.ko
INSTALL drivers/crypto/geode-aes.ko
INSTALL drivers/crypto/hifn_795x.ko
INSTALL drivers/crypto/padlock-aes.ko
INSTALL drivers/crypto/padlock-sha.ko
INSTALL drivers/dca/dca.ko
```



CONFIGURANDO O GRUB/BOOT



```
menu.lst - See: grub(8), info grub, update-grub(8)
#
# grub-install(8), grub-floppy(8),
# grub-md5-crypt, /usr/share/doc/grub
# and /usr/share/doc/grub-doc/.

## default num
# Set the default entry to the entry number NUM. Numbering starts from 0, and
# the entry number 0 is the default if the command is not used.
#
# You can specify 'saved' instead of a number. In this case, the default entry
# is the entry saved with the command 'savedefault'.
# WARNING: If you are using dmraid do not use 'savedefault' or your
# array will desync and will not let you boot your system.
default 0

## timeout sec
# Set a timeout, in SEC seconds, before automatically booting the default entry
# (normally the first entry defined).
timeout 3

## hiddenmenu
# Hides the menu by default (press ESC to see the menu)
hiddenmenu

# Pretty colours
#color cyan/blue white/blue

## password ['--md5'] passwd
# If used in the first section of a menu file, disable all interactive editing
# control (menu entry editor and command-line) and entries protected by the
# command 'lock'
# e.g. password topsecret
# password --md5 $1$gLhU0/$aW78kHK1QfV3P2b2znUoe/
# password topsecret

#
# examples
#
# title Windows 95/98/NT/2000
# root (hd0,0)
# makeactive
# chainloader +1
#
# title Linux
```

Restaurar janela

Texto sem formatação | Largura das tabulações: 8 | Lin 158, Col 6 | INS



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