

B

- base kernel patches, 37
- basename program, 48, 50
- battery life, conserving, 73
- binutils, 6
- blinkerlights parameter, 88
- BLK_DEV_DM option, 143
- BLK_DEV_IDE option, 140
- BLK_DEV_IDECD option, 140
- BLK_DEV_IDEDISK option, 140
- BLK_DEV_IDEFLOPPY option, 141
- BLK_DEV_MD option, 143
- BLK_DEV_SD option, 141
- BLK_DEV_SR option, 142
- block devices, 60
 - combined to resemble one logical device, 81
 - finding all drivers for sda block device, helper script, 61
- Bluetooth, 78, 137
- books about Linux and the kernel, 168
- boot command-line parameters, 87–116
 - console options, 88–91
 - CPU options, 95–97
 - hardware-specific options, 113
 - init options, 101
 - interrupt options, 91
 - kexec options, 101
 - memory options, 92–94
 - miscellaneous options, 115
 - module-specific, 87
 - network options, 111
 - NFS options, 111
 - PCI options, 107
 - PnP BIOS options, 109
 - Ramdisk options, 98
 - RCU (Read Copy Update) options, 102
 - root disk options, 99
 - scheduler options, 97
 - SCSI options, 106
 - SELinux, 110
 - suspend options, 94
 - timer options, 114
- /boot directory
 - /grub subdirectory, 32
 - installation of static kernel portion, 30
- boot process
 - LOGO option, 150
 - root filesystem, 59–61

bootloader program

- modifying for new kernel, 32–34
 - GRUB, 32
 - LILO, 33
- notification of new kernel
 - installation, 30
- build targets, make utility, 119
- building the kernel, 23–28
 - advanced options, 26–28
 - building faster on multiprocessor machines, 26
 - building only a portion of kernel, 27
 - different architectures, 28
 - kernel build source in one place, output in another, 27
- command-line reference, 117–121
- make command, 23–26
- tools, 5
 - compiler, 5
 - linker, 6
 - make, 6

built as a module kernel configuration

- options
 - gconfig and xconfig methods, 22
 - menuconfig method, 19

built into the kernel configuration

- options
 - gconfig method, 22
 - menuconfig method, 19

burning a CD-ROM, 66

bzip2 command, 38

C

- C compiler, gcc, 5
- cachesize option, 95
- capability model (security), 82
- CardBus device support, 69
- CD-ROMs
 - burning, 66
 - CD writers, SCSI, 142
 - IDE, 140
 - SCSI or FireWire, 142
- checkreqprot option, 110
- CHR_DEV_SCH option, 142
- CHR_DEV_SG option, 142
- CHR_DEV_ST option, 142
- CIFS (Common Internet File System), 81, 156

- class device
 - script to find all modules and drivers for, 61
 - sysfs filesystem, 50
 - cleaning targets, make utility, 118
 - clocksource option, 115
 - cluster filesystem (OCFS2), 82, 155
 - combined_mode, 116
 - command line
 - downloading kernel source, 14
 - command-line reference, kernel
 - build, 117–121
 - Common Internet File System (CIFS), 81, 156
 - compiler (gcc), 5
 - .config file
 - backing up before upgrading kernel, 35
 - updating for new kernel release, 40
 - CONFIG_ rule that builds a module, finding, 48, 51
 - config.gz file, 46
 - configuration, kernel, 17–23, 63–84
 - configuring from scratch, 17
 - CPU, 71–75, 124
 - debugging, 83
 - default options, 18
 - devices, 66–70
 - disk controller support, 63–66
 - CD-ROM drives, 66
 - IDE disks, 64
 - SATA (Serial ATA), 65
 - USB storage, 63
 - filesystems, 80–82
 - modifying, 18–23
 - console-based menuconfig tool, 19–21
 - graphical methods, 22
 - option reference, 122
 - security, 82
 - configuration options, make utility, 118
 - configuration, kernel
 - networking, 75–80
 - conserving power and battery life, 73
 - console option, 88
 - console-based kernel configuration (menuconfig), 19–21
 - consoles
 - kernel boot command-line parameters, 88–91
 - support on virtual terminal, 147
 - VGA_CONSOLE kernel option, 150
 - CPU, 71–75
 - ACPI (Advanced Configuration and Power Interface), 75
 - choosing, 125
 - frequency scaling, 73, 131
 - isolating from kernel scheduler, 97
 - memory models, 74
 - options, 95–97
 - cachesize, 95
 - lpj (loops per jiffy), 95
 - max_cpus, 97
 - mce (machine check exception), 96
 - nmi_watchdog, 96
 - no387, 96
 - nofxsr, 96
 - no-hlt, 96
 - nomce, 96
 - nosep, 96
 - nosmp, 96
 - notsc, 97
 - preemption, 72
 - processor types, 71
 - SMP, 72
 - suspending, 73
 - crashkernel option, 101
 - cross-compiled manner, building kernel in, 28
 - C-state, processor, 106
 - curl utility, downloading kernel source, 15
 - customizing a kernel, 45–62
 - determining correct module from scratch, 52–62
 - helper script, 61
 - root filesystem, 59–61
 - using distribution kernel, 45–52
 - finding kernel configuration, 45
 - finding modules needed to drive hardware, 46–52
- ## D
- databases, filesystem for, 82
 - debug option, 89
 - DEBUG_FS option, 158
 - debugging, kernel, 83
 - console options, 88–91
 - debug filesystem, 84
 - DEBUG_KERNEL option, 158
 - finding problem code, 121
 - general configuration options, 84

- debugging, kernel (*continued*)
 - IRQ debugging, 92
 - kernel log timestamps, 83
 - Mutex debugging, 41
 - SysRq keys, 83
 - default kernel configuration, 18
 - /dev directory, device naming system (udev), 10
 - development branch (Linux kernel), 12
 - device drivers
 - determining correct kernel module
 - from scratch, 52–62
 - helper script, 61
 - PCI devices, 53–56
 - root filesystem, 59–61
 - USB devices, 56–59
 - enabling for individual USB devices, 67
 - enabling for specific FireWire devices, 68
 - finding modules needed for your hardware, 46
 - determining network driver (example), 47–50
 - determining USB device driver (example), 50
 - script to find all modules, 51
 - summary of device discovery, 50
 - network, 76
 - wireless, 79
 - Device Drivers menu, 19
 - device IDs
 - PCI devices, 54
 - USB devices, 58
 - Device Mapper (DM), 81, 143
 - device naming system in the /dev directory, 10
 - devices, 66–70
 - ALSA (Advanced Linux Sound Architecture), 70
 - IEEE 1394 (FireWire), 68
 - PCI hotplug, 68
 - dhash_entries option, 111, 115
 - diff program, 161
 - Digital Video Broadcasting (DVB), 149
 - Direct Rendering Infrastructure (DRI), 148
 - Direct Rendering Manager (DRM), 148
 - disable_8254_timer option, 115
 - disable_timer_pin_1 option, 114
 - discovery of devices, summary of process, 50
 - disks
 - combining multiple to resemble a logical disk with RAID, 80
 - combining portions of, using LVM and DM, 81
 - configuring support by Linux kernel, 63–66
 - CD-ROM, 66
 - IDE disks, 64
 - SATA (Serial ATA), 65
 - USB storage device, 63
 - distributions
 - using distribution kernel
 - finding kernel configuration, 45
 - finding modules needed to drive hardware, 46–52
 - using distribution kernel to determine necessary modules, 45–52
 - DM (Device Mapper), 81, 143
 - DMAs not used by PnP BIOS, 109
 - dmesg command, 83
 - documentation targets, make utility, 121
 - downloading kernel, 12–16
 - DRI (Direct Rendering Infrastructure), 148
 - drivers (see device drivers)
 - drivers/usb/serial directory, building files in, 27
 - DRM (Direct Rendering Manager), 148
 - Dual Core CPU, 72
 - DVB (Digital Video Broadcasting), 149
- ## E
- e2fsprogs package, 8
 - earlyprintk option, 89
 - ECDT (Embedded Controller Description Table), 105
 - EDAC option, 153
 - EHCI (Enhanced Host Controller Interface), 151
 - EIDE (Enhanced IDE), 139
 - elevator option, 115
 - elfcorehdr option, 102
 - Embedded Controller Description Table (ECDT), 105
 - embedded controller interrupt mode, 105

- enable_8254_timer option, 114
- enable_timer_pin_1 option, 114
- enforcing option, 110
- Enhanced Host Controller Interface (EHCI), 151
- Enhanced IDE (EIDE), 139
- environment variables passed to
 - make, 120
- error information, console
 - options, 88–91
- errors
 - building the kernel, 26
 - core system, reporting, 153
- /etc directory, /lilo.conf file, 32
- eth0, eth1, and eth2 directories, 47
- Ethernet devices
 - NET_ETHERNET kernel
 - option, 144
 - PCI, 53, 77
 - PPPOE kernel option, 145
- ExpressCard, 68
- ext2/ext3/ext4 filesystems, 8
- EXT2_FS option, 154
- EXT3_FS option, 154

F

- FB (frame buffer) option, 149
- file compression
 - uncompressing kernel patches, 38
- filesystems, 80–82
 - debugfs, 84, 158
 - kernel configuration options, 154
 - Linux, sharing files with
 - Windows, 81
 - NFS options, 111
 - OCFS2 (cluster filesystem from Oracle), 82
 - RAID, 80
 - root, 59–61
 - rootfstype, 100
 - specific tools for using the kernel, 8
 - sysfs (virtual filesystem), 46
- filtering and manipulating network
 - packets, 76
- find command, 48, 51
- firewalling, 76, 134
- FireWire, 68
 - IEEE 1394 option, 143
- “flash” device (USB), 63
- floating-point registers, 96

- FM radio cards, 149
- frame buffer (FB) option, 149
- frequency scaling, CPU, 73
- FUSE_FS option, 156

G

- gcc compiler, 5
- gconfig method, 22
- Generic Driver Options menu, 19
- Gentoo Linux, LILO configuration
 - file, 33
- getting kernel, 12–16
- git tool, 165
- graphical methods, kernel
 - configuration, 22
- graphics, AGP support, 147
- grep command, 51
- GRUB
 - checking for presence of, 32
 - modifying for new kernel, 32
- GTK+-based graphical configuration
 - method (gconfig), 22

H

- hardware monitoring (HWMON
 - option), 149
- hardware options, 113
 - lp, 113
 - nousb, 113
 - nr_uarts, 114
 - parport, 113
 - parport_init_mode, 114
- hardware RAID, 80, 143
- hash buckets for kernel inode cache, 93
- hashdist option, 115
- HCD (Host Controller Driver), 151
- highmem option, 92
- Host Controller Driver (HCD), 151
- hotkey driver, 105
- hpet option, 115
- hugepages option, 92
- HWMON option, 149
- HyperThreaded or Dual Core CPU, 72

I

- I2C option, 148
- I2O (Intelligent Input/Output), 144
- IB (InfiniBand) support, 153
- IBM JFS filesystem, 8, 154

- IDE (Integrated Disk Electronics)
 - CD-ROM drives, 66, 140
 - configuring disk support by
 - kernel, 64
 - kernel configuration
 - options, 139–141
- IDs
 - PCI devices, vendor and product, 54
 - USB devices, vendor and product, 58
- IEEE 1394 (FireWire), 68, 143
- IEEE 802.11
 - kernel configuration option, 138
 - network configuration option, 79
- IEEE 802.3 (Ethernet), 144
- ifconfig utility, 47
- ihash_entries option, 93
- images, kernel
 - automatic creation of initial ramdisk
 - image, 30
 - generating using config.gz file, 46
- incremental kernel patches, 37
- INFINIBAND option, 153
- informational targets, make utility, 117
- infrared protocol (IrDA), 77
- init options, 101
 - init, 101
 - rdinit, 101
 - S (single-user), 101
- initcall_debug option, 90
- initrd option, 98
- INPUT option, 146
- installing the kernel
 - by hand, 31
 - modifying bootloader for new
 - kernel, 32–34
 - using distribution's installation
 - scripts, 30
- Integrated Disk Electronics (see IDE)
- Integrated Services Digital Networks (ISDN), 146
- interactive kernel configuration
 - tools, 18
- interrupt options, 91
- interruptions, kernel, 72
- I/O
 - INPUT kernel option, 146
 - Intelligent Input/Output (I2O)
 - architecture, 144
 - ports not used by PnP BIOS, 109
- IrDA (infrared protocol), 77
- IRQ balancing, 91
 - ACPI options, 104

- irqfixup option, 92
- irqpoll option, 92
- ISAPNP option, 139
- ISDN (Integrated Services Digital Networks), 146
- ISO 8802-2 (Ethernet), 144
- isolcpus option, 97

J

- JFS filesystem (IBM), 8
- JFS_FS option, 154
- jfsutils package, 8
- journaled filesystems, 154

K

- kernel message (printk) output, 157
- kernel.org web sites, 13
 - main site, 14
 - list of current kernel versions for
 - download, 36
- ketchup program, 42, 166
- kexec options, 101
 - crashkernel, 101
 - elfcorehdr, 102
- klogd program, 90
- KPROBES option, 157
- kstack option, 91

L

- lapic option, 91
- laptop docking stations, 68
- laptops, suspending kernel, 73
- latest kernel versions, determining, 15
- left out altogether (N), menuconfig
 - options, 19
- libata kernel library, SATA disks, 65
- LILO
 - checking for presence of, 32
 - modifying configuration for new
 - kernel, 33
- linking source files (binutils), 6
- linux/ directory for kernel source
 - files, 15
- Linux kernel, overview, 3
- lo directory, 47
- load_ramdisk option, 98
- lockd.nlm_grace_period option, 111
- lockd.nlm_tcpport option, 112
- lockd.nlm_timeout option, 112
- lockd.nlm_udpport option, 112

- locks, interruptions to a main kernel
 - lock, 72
- logging
 - kernel log timestamps, 83
 - log_buf_len option, 90
 - loglevel option, 90
- logical device controlling a block
 - device, 60
- Logical Unit Numbers (LUNs), 106, 142
- Logical Volume Manager (LVM), 81
- LOGO option, 150
- lp option, 113
- lpj (loops per jiffy) option, 95
- lspci program, 53
 - determining if you have an IDE disk controller, 64
 - leading 0000 in PCI device bus ID, 54
- lsusb program, 57
 - identifying USB storage device, 63
- LUNs (Logical Unit Numbers), 106, 142
- LVM (Logical Volume Manager), 81

M

- machine check exception (mce)
 - option, 96
- MAGIC_SYSRQ option, 157
- make utility, 6, 17, 117–121
 - analysis targets, 121
 - architecture-specific targets, 121
 - build targets, 119
 - building the kernel, 23–26
 - building faster on multiprocessor machines, 26
 - building only a portion, 27
 - different architectures, 28
 - source in one place, output in another, 27
 - cleaning targets, 118
 - configuration options, 118
 - documentation targets, 121
 - informational targets, 117
 - installing the kernel, 30
 - make config method, 17
 - oldconfig option, 40
 - packaging targets, 120
 - silentoldconfig option, 40

- Makefiles
 - kernel, searching for CONFIG_ rule that builds a module, 48, 51
 - verifying output of kernel patch, 39
- math emulation library (387), 96
- max_addr option, 93
- max_cpus option, 97
- max_loop option, 116
- max_luns option, 106
- max_report_luns option, 106
- mce (machine check exception)
 - option, 96
- media changers, SCSI, 142
- mem option, 93
- memmap option, 93, 105
- memory
 - Memory Technology Device (MTD) support, 138
 - pnp_reserve_mem option, 109
 - Ramdisk options, 98
- memory models, 74
- memory options, 92–94
 - highmem, 92
 - hugepages, 92
 - ihash_entries, 93
 - max_addr, 93
 - mem, 93
 - memmap, 93
 - noexec, 94
 - norandmaps, 94
 - reserve, 94
 - vdso, 94
 - vmalloc, 94
- menuconfig tool, 19–21
 - searching for option to enable module, 49
- MFM/RLL/IDE hard disks, 140
- micro controller applications, 148
- migration_cost option, 97
- migration_debug option, 98
- migration_factor option, 98
- MMC (MultiMedia Card) option, 153
- mobile phones, Bluetooth wireless technology, 78
- modalias files, finding, 51
- modprobe program, 51
- module-init-tools package, 7
- modules, kernel
 - boot command-line parameters, 87
 - gconfig and xconfig methods, 22

modules, kernel (*continued*)
 installing, 30
 menuconfig method, 19
 mount command, 59
 MTD (Memory Technology Device)
 option, 138
 MultiMedia Card (MMC) option, 153
 multiprocessing, enabling, 72
 multiprocessors
 building kernel faster, 26
 nosmp option, 96
 Mutex debugging, 41

N

N (left out menuconfig kernel
 options), 19
 NETDEVICES option, 144
 NET_ETHERNET option, 144
 Netfilter, 76, 134
 netlink interface and Xtables support
 (Netfilter), 76
 NET_RADIO option, 145
 network configuration option
 (main), 75
 network driver, determining
 (example), 47–50
 network loopback device, 47
 networking, 75–80
 IrDA (infrared protocol), 77
 kernel configuration options, 144
 Netfilter, 76
 network drivers, 76
 options, 111
 dhash_entries, 111
 netdev, 111
 shapers, 111
 thash_entries, 111
 wireless, 79
 NFS filesystem, 9
 NFS options
 lockd.nlm_grace_period, 111
 lockd.nlm_tcpport, 112
 lockd.nlm_timeout, 112
 lockd.nlm_udpport, 112
 nfs.callback_tcpport, 112
 nfs.idmap_cache_timeout, 113
 nfs-utils package, 9
 nmi_watchdog option, 96
 no387 option, 96
 noapic option, 91
 noexec option, 94

nofxsr option, 96
 no-hlt option, 96
 noinitrd option, 99
 noirqbalance option, 91
 noirqdebug option, 92
 noisapnp option, 109
 nolapic option, 91
 nomce option, 96
 nonexecutable, mapping memory
 sections as, 94
 non-maskable interrupt (NMI)
 watchdog, 96
 norandmaps option, 94
 noresume option, 95
 nosept option, 96
 nosmp option, 96
 NOTIFY option, 155
 notsc option, 97
 nousb option, 113
 nr_uarts option, 114
 NSA Security-Enhanced Linux
 (SELinux), 158
 NUMA nodes, distributing large hashes
 across, 115

O

OCFS2 (cluster filesystem from
 Oracle), 82
 OCFS2_FS option, 155
 OHCI (Open Host Controller
 Interface), 152
 oops dumps, printing words from kernel
 stack, 91
 Open Host Controller Interface
 (OHCI), 152
 operating system name, faking to
 ACPI, 104
 OPROFILE option, 157
 Oracle cluster filesystem (OCFS2), 82,
 155
 _OSI method, disabling, 104
 OSS sound protocol, 70

P

packaging targets, make utility, 120
 paging, hugepages option, 92
 panic option, 116
 parallel port options, 113, 138
 parport option, 113
 parport_init_mode option, 114

- patch program, 161
 - using with quilt, 164
- patches
 - applying, 38–40
 - determining correct patch for specific release, 37
 - finding for a kernel release, 38
 - kernel upgrades, 36
 - managing with quilt
 - program, 163–165
- pause_on_oops option, 116
- PC-compatible option, 71
- PCI devices
 - boot command-line options, 107
 - IDE disk controllers, 64
 - matching to driver, 53–56
 - steps in process, 56
 - network device, 76
 - network interface card,
 - determining, 47
 - SATA disk controller, 65
- PCI hotplug, 68
- PCMCIA devices
 - configuring kernel support, 69
 - tools for using with Linux, 10
- pcmciautils, 10
- PHONE option, 146
- Plug and Play (see PnP)
- pmtimer, 105
- PnP (Plug and Play)
 - BIOS options, 109
 - noisapnp, 109
 - pnpbios, 109
 - pnp_reserve_dma, 109
 - pnp_reserve_io, 109
 - pnp_reserve_irq, 109
 - pnp_reserve_mem, 109
 - kernel configuration options, 138
- pnpacpi option, 106
- PNPBIOS option, 139
- power management, 73, 130
 - suspend options, 94
- PPP (Point-to-Point Protocol), 145
- PPPOE (PPP over Ethernet) option, 145
- preemption, 72, 127
- PRINTK_TIME option, 157
- /proc filesystem, 45
 - /config.gz filename, 46
- processes running on the system, tools
 - for, 10
- processor types, 71, 74

- processor.max_cstate option, 106
- procfcs, 84
- procps package, 10
- product IDs
 - PCI devices, 54
 - USB devices, 58
- profile option, 116
- PROFILING option, 157
- prompt_ramdisk option, 99
- prompts, xii
- protocols, selecting for filtering, 76
- ps tool, 10

Q

- QT-based graphical configuration
 - method (xconfig), 22
- quiet option, 89
- quilt program, 163–165
- QUOTA option, 155
- quota-tools package, 9

R

- radio cards (FM), 149
- RAID, 80
 - BLK_DEV_MD kernel option, 143
- RAM-based filesystems, 84
- Ramdisk options, 98
 - initrd, 98
 - load_ramdisk, 98
 - noinitrd, 99
 - prompt_ramdisk, 99
 - ramdisk_blocksize, 99
 - ramdisk_size, 99
 - rdinit, 101
- randomization, address space of
 - programs, 94
- rc versions, kernel, 12
- RCU (Read Copy Update) options, 102
 - rcu.blimit, 102
 - rcu.qhimark, 102
 - rcu.qlowmark, 102
 - rcu.rsinterval, 102
- readlink command, 48, 50
- read-only root device, 99
- read-write root device, 100
- ReiserFS filesystem, 8
- REISERFS_FS option, 154
- reiserfsprogs package, 8
- removing files from previous builds, 118
- reserve option, 94

- resume option, 94
- root disk options, 99
 - ro, 99
 - rootfstype, 100
 - root, 99
 - rootdelay, 100
 - rootflags, 100
 - rw, 100
- root filesystem, 59–61
- root partition, filesystem type, 59
- root shell prompt (#), xii
- root user, prefixing commands with
 - sudo, 29

S

- S (single-user) mode, 101
- Samba, 81
- SATA (Serial ATA), 65
 - CD-ROM drives, 66
 - SCSI_SATA kernel option, 143
- scanners, SCSI, 142
- scheduler options, 97
 - isolcpus, 97
 - migration_cost, 97
 - migration_debug, 98
 - migration_factor, 98
- SCSI CD-ROM drive, 66
- SCSI disk controller driver, 60
- SCSI options
 - kernel boot, 106
 - max_luns, 106
 - kernel configuration, 141–143
 - max_report_luns, 106
 - scsi_dev_flags, 107
- SCSI_MULTI_LUN option, 142
- SCSI_SATA option, 143
- sda block device
 - finding all drivers for, helper
 - script, 61
 - symlink in device directory pointing
 - to controlling logical
 - device, 60
- security, 82
 - standard security model, 82
 - (see also SELinux)
- SECURITY option, 158
- SECURITY_SELINUX option, 158
- self-monitoring, analysis, and reporting
 - technology (SMART
 - IDE), 140

- SELinux (Security-Enhanced Linux), 82, 158
 - boot command-line options, 110
 - checkreqprot, 110
 - enforcing, 110
 - selinux, 110
 - selinux_compat_net, 110
- Serial ATA (see SATA)
- Serial Peripheral Interface (SPI), 148
- serial ports, 147
 - USB_SERIAL kernel option, 152
- SERIAL_8250 option, 147
- Server Message Block (see SMB)
- servers, preemption modes to handle
 - workloads, 72
- SGI, XFS filesystem, 9
- shapers option, 111
- shell prompts, xii
- single-user mode (S), 101
- SMART IDE (self-monitoring, analysis, and reporting
 - technology), 140
- SMB (Server Message Block)
 - SMB filesystem, 81
 - SMB_FS option, 156
- SMBus (System Management Bus), 148
- SND option, 151
- SND_USB_AUDIO option, 151
- software RAID, 80, 143
- SOUND option, 150
- sound system for Linux kernel
 - (ALSA), 70
- source code, kernel
 - downloading patch for kernel
 - upgrade, 36–38
 - determining correct patch, 37
 - finding the patch, 38
 - git (control tool), 165
 - location of, 4
 - managing patches with
 - quilt, 163–165
 - patching, then porting changes to
 - new kernel version, 161
 - retrieving, 12–16
 - what to do with the source, 15
 - where to find kernel source, 13
 - which tree to use, 12
 - storing separately from output of
 - kernel build, 27
 - tool web sites, 169
 - updating or switching between
 - versions with ketchup, 166

- SPI (Serial Peripheral Interface), 148
- stable branch (Linux kernel), 12
- stable kernel patches, 37
- stable kernel version, downloading
 - latest, 14
- storage devices, USB, 152
- struct pci_device_id values, 55
- struct usb_device_id, 58
- su command, 29
- sudo command, 29
- superuser permissions, 4
- suspend options, 94
 - noresume, 95
 - resume, 94
- suspending kernel to disk, 73
- swap partitions, kernel, 73
- symlinks
 - for eth0 device, 48
 - following to module names, script
 - for, 51
 - to logical device controlling block
 - device, 60
 - output to readlink command, putting
 - into basename, 48
 - sysfs filesystem, to different portions
 - of kernel, 46
- synthesizers, SCSI, 142
- SYSENTER/SYSEXIT support, 96
- sysfs (virtual filesystem), 46, 84
 - block devices, 60
 - device discovery, use in, 50
 - listing PCI device names, 44
 - tty section, 50
- SysRq key, 83, 157
- system logfile, 83
- System Management Bus (SMBus), 148

T

- tape drive, SCSI, 142
- TCP/IP option, 75
- telephony support, 146
- terminal devices, 146
- terminal-based kernel configuration
 - tool, 18
- thash_entries option, 111
- time option, 91
- time stamp counter, 97
- timer options, 114
 - clocksource, 115
 - disable_8254_timer, 115
 - disable_timer_pin_1, 114

- enable_8254_timer, 114
- enable_timer_pin_1, 114
- hpet, 115
- timing information in printk
 - output, 157
- tools
 - building the kernel, 5
 - interactive kernel configuration, 18
 - to use the kernel, 6–11
 - closely tied to kernel version, 9
 - filesystem-specific, 8
 - module-init-tools, 7
 - util-linux, 7
 - web sites for source code, 169
 - (see also utilities)
- top tool, 10
- tty files, searching for device, 50

U

- udev program, 10
- udev startup process, 53
- UHCI (Universal Host Controller Interface), 152
- uncompressing files, 16, 38
- Universal Host Controller Interface (UHCI), 152
- Universal Serial Bus (see USB)
- updating a kernel, 162
- upgrading a kernel, 35–42
 - applying the patch, 38–40
 - automating the process, 42
 - downloading new source
 - code, 36–38
 - determining correct patch for a
 - release, 37
 - finding the patch, 38
 - reconfiguring kernel after
 - upgrade, 40
- USB devices
 - enabling, 66
 - storage, 63
- USB (Universal Serial Bus)
 - determining driver for USB-to-serial
 - converter, 50
 - determining if machine has USB
 - controller, 66
 - finding driver for USB wireless
 - device, 56–59
 - finding drivers for USB-to-serial
 - device (helper script), 61
 - kernel configuration options, 151

USB (Universal Serial Bus) (*continued*)

- nousb option, 113
- wireless networking device
 - drivers, 80
- USB_EHCI_HCD option, 151
- USB_GADGET option, 153
- USB_OHCI_HCD option, 152
- USB_SERIAL option, 152
- USB_STORAGE option, 152
- USB_UHCI_HCD option, 152
- user prompt (\$), xii
- using the kernel, tools for, 6–11
 - closely tied to kernel version, 9
 - filesystem-specific, 8
- utilities, 161–167
 - git, 165
 - ketchup, 166
 - patch and diff, 161
 - quilt, 163–165
 - web sites for source code, 169
 - (see also tools)
- util-linux package, 7

V

- vdso option, 94
- vendor IDs
 - PCI devices, 54
 - USB devices, 58
- versions, kernel, 31, 117
 - current, for different kernel trees, 14
 - determining latest, 15
 - updating, 162
- VGA_CONSOLE option, 150
- VIDEO_DEV option, 149
- Virtual Dynamic Shared Object (VDSO), 94

- virtual filesystem (see sysfs)
- virtual terminal (VT) option, 146
- vmalloc option, 94
- volume managers, 81, 143
- VT (virtual terminal) option, 146
- VT_CONSOLE option, 147

W

- web site for this book, xiii
- web sites
 - main kernel.org site, 14
 - tools, source code for, 169
- wget utility, 14
- Windows systems, filesharing with
 - Linux, 81, 156
- wireless
 - Bluetooth technology, 78
 - IEEE 802.11 option, 138
 - NET_RADIO kernel option, 145
 - networking, 79
 - USB device, finding driver, 57–59

X

- x86 floating-point save and restore, 96
- xconfig method, 22
- XFS filesystem, 9
- XFS_FS option, 154
- xfspg package, 9

Y

- Y (menuconfig options built into the kernel), 19