

08-1 BusyBox

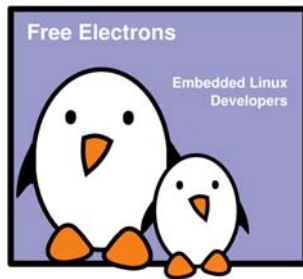
Chapters 9 and 10

- 9: File Systems
 - Partitions
 - ext2, ext3, ext4
 - ReiserFS
 - JFF2
 - NFS
 - /proc, /sys
- 10: Memory Technology Devices (MTD) Subsystem
 - Supports memory-like devices such as Flash
 - Device driver layer that provides an API for raw flash devices
 - Neither *block* nor *char*

Embedded Linux system development

BusyBox

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Latest update: 10/28/2013.
Document sources, updates and translations:
<http://free-electrons.com/docs/busybox>
Corrections, suggestions, contributions and translations are welcome!

General purpose toolbox: BusyBox

<http://www.busybox.net/>

- ▶ Most Unix command line utilities within a single executable!
It even includes a web server!
- ▶ Sizes less than < 500 KB (statically compiled with [uClibc](#)) or less than 1 MB (statically compiled with [glibc](#))
- ▶ Easy to configure which features to include
- ▶ The best choice for
 - ▶ Initramfs / initrd with complex scripts
 - ▶ Small and medium size embedded systems



See <http://www.ibm.com/developerworks/linux/library/l-busybox/> for a nice introduction

BusyBox was first written by Bruce Perens in 1996

BusyBox commands!

[, [, acpid, addgroup, adduser, adjtimex, ar, arp, arping, ash, awk, basename, beep, blkid, brctl, bunzip2, bzip2, bzip2, cal, cat, catv, chat, chattr, chgrp, chmod, chown, chpasswd, chpst, chroot, chrt, chvt, cksum, clear, cmp, comm, cp, cpio, crond, crontab, cryptpw, cut, date, dc, dd, deallocvt, delgroup, deluser, depmod, devmem, df, dhcprelay, diff, dirname, dmesg, dnsd, dnsdomainname, dos2unix, dpkg, du, dumpkmap, dumpleases, echo, ed, egrep, eject, env, envdir, envuidgid, expand, expr, fakeidentd, false, fbset, fbsplash, fdflush, fdformat, fdisk, fgrep, find, findfs, flash_lock, flash_unlock, fold, free, freeramdisk, fsck, fsck.minix, fsync, ftop, ftpget, ftpput, fuser, getopt, getty, grep, gunzip, gzip, hd, hdparm, head, hexdump, hostid, hostname, httpd, hush, hwclock, id, ifconfig, ifdown, ifenslave, ifplugd, ifup, inetd, init, inotifyd, insmod, install, ionice, ip, ipaddr, ipcalc, ipcrm, ipcs, iplink, iproute, iprule, iptunnel, kbd_mode, kill, killall, killall5, klogd, last, length, less, linux32, linux64, linuxrc, ln, loadfont, loadkmap, logger, login, logname, logread, losetup, lpd, lpq, lpr, ls, lsattr, lsmod, lsmacat, lzop, lzopcat, makemime, man, md5sum, mdev, mesg, microcom, mkdir, mkdosfs, mkfifo, mkfs.minix, mkfs.vfat, mknod, mkpasswd, mkswap, mkttemp, modprobe, more, mount, mountpoint, mt, mv, nameif, nc, netstat, nice, nmeter, nohup, nslookup, od, openvt, passwd, patch, pgrep, pidof, ping, ping6, pipe_progress, pivot_root, pkill, popmaildir, printenv, printf, ps, pscan, pwd, raidautorun, rdate, rdev, readlink, readprofile, realpath, reformime, renice, reset, resize, rm, rmdir, rmmod, route, rpm, rpm2cpio, rtcwake, run-parts, runlevel, runsv, runsvdir, rx, script, scriptreplay, sed, sendmail, seq, setarch, setconsole, setfont, setkeycodes, setlogcons, setsid, setuidgid, sh, sha1sum, sha256sum, sha512sum, showkey, slattach, sleep, softlimit, sort, split, start-stop-daemon, stat, strings, stty, su, sulogin, sum, sv, syslogd, swapoff, swapon, switch_root, sync, sysctl, syslogd, tac, tail, tar, taskset, tcpdump, tee, telnet, telnetd, test, tftp, tftpd, time, timeout, top, touch, tr, traceroute, true, tty, tysize, udhcpd, udhcpd, udevd, umount, uname, uncompress, unexpand, uniq, unix2dos, unlzma, unzip, uptime, usleep, uudecode, uuencode, vconfig, vi, vlock, volname, watch, watchdog, wc, wget, which, who, whoami, xargs, yes, zcat, zip

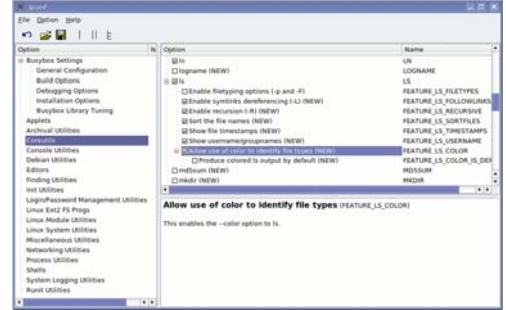
Commands available in BusyBox 1.22

Applet highlight - BusyBox vi

- ▶ If you are using [BusyBox](#), adding [vi](#) supports only adds 20K. (built with shared libraries, using [uClibc](#))
- ▶ You can select which exact features to compile in
- ▶ Users hardly realize that they are using a lightweight [vi](#) version!
- ▶ Tip: you can learn [vi](#) on the desktop, by running the [vimtutor](#) command



Same configuration interfaces as the ones used by the Linux kernel



- ▶ A similar set of tiny utilities for embedded systems. Version 0.19 (Aug. 2008): 90 common commands are implemented
- ▶ Can only be built statically with diet libc!
- ▶ Compared to BusyBox: Much less momentum, user and developer base. (Last date 2008) Still misses key commands and features ([ifconfig](#), for example)
- ▶ But can achieve smaller size than BusyBox on standalone executables

- Basic file, shell and text manipulation utilities of the GNU operating system
- These are the core utilities which are expected to exist on every operating system
- Previously these utilities were offered as three individual sets of GNU utilities, [Fileutils](#), [Shellutils](#), and [Textutils](#).
 - Those three have been combined into a single set of utilities called Coreutils
- 14-Feb-2013