

Busybox

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Motivation

Was ist Busybox?

Busybox einrichten

Entwicklung

Zusammenfassung

Motivation

Motivation



- Ziel: Open-Source Software überall
- Problem: auch auf Systemen mit beschränkten Ressourcen
- Gewöhnlicher GNU Werkzeugkasten zu groß

Was ist Busybox?

Was ist Busybox?

- Sammlung wichtiger Unix-Tools
- Fokus auf Kompaktheit
- Modularer Aufbau (396 Programme)
- Größe Busybox 1.31.1 \approx 1 MB, Defaultconfig für X86

Currently defined functions:

```
[, [, acpid, add-shell, addgroup, adduser, adjtimex, arch, arp, arping, ash, awk, base64, basename, bc, beep,
blkdiscard, blkid, blockdev, bootchartd, brctl, bunzip2, bzip2, cal, cat, chat, chatter, chgrp, chmod, chown,
chpasswd, chpst, chroot, chrt, chvt, cksum, clear, cmp, comm, conspy, cp, cpio, crond, crontab, cryptpw, ctyhack,
cut, date, dc, dd, dealloctv, delgroup, deluser, depmod, devmem, df, dhcprelay, diff, dirname, dmesg, dnsd,
dnsdomainname, dos2unix, dpkg, dpkg-deb, du, dumpkmap, dumpleases, echo, ed, egrep, eject, env, envdir, envuidgid,
ether-wake, expand, expr, factor, fakeidentd, falloccate, false, fatattr, fbset, fbsplash, fdflush, fdformat, fdisk,
fgconsole, fgrep, find, findfs, flock, fold, free, freeramdisk, fsck, fsck.minix, fsfreeze, fstrim, fsync, ftpd,
ftppget, ftpput, fuser, getopt, getty, grep, groups, gunzip, gzip, halt, hd, hdparm, head, hexdump, hexedit, hostid,
hostname, httpd, hush, hwclock, i2cdetect, i2cdump, i2cget, i2cset, i2ctransfer, id, ifconfig, ifdown, ifenslave,
ifplugd, ifup, inetd, init, insmod, install, ionice, iostat, ip, ipaddr, ipcalc, ipcrm, ipcs, iplink, ipneigh,
iproute, iprule, iptunnel, kbd_mode, kill, killall, killall5, klogd, last, less, link, linux32, linux64, linuxrc, ln,
loadfont, loadkmap, logger, login, logname, logread, losetup, lpd, lpq, lpr, ls, lsattr, lsmod, lsof, lspci, lsscsi,
lsusb, lzcat, lzma, lzop, makedevs, makemime, man, md5sum, mdev, mesg, microcom, mkkdir, mkdosfs, mke2fs, mkfifo,
mkfs.ext2, mkfs.minix, mkfs.vfat, mknod, mkpasswd, mkswap, mktemp, modinfo, modprobe, more, mount, mountpoint, mpstat,
mt, mv, nameif, nanddump, nandwrite, nbd-client, nc, netstat, nice, nl, nmeter, nohup, nologin, nproc, nsenter,
nslookup, ntpd, nuke, od, openvt, partprobe, passwd, paste, patch, pgrep, pidof, ping, ping6, pipe_progress,
pivot_root, pkill, pmap, popmaildir, poweroff, powertop, printenv, printf, ps, pscan, pstree, pwd, pwdx, raidautorun,
rdate, rdev, readahead, readlink, readprofile, realpath, reboot, reformime, remove-shell, renice, reset, resize,
resume, rev, rm, rmdir, rmmod, route, rpm, rpm2cpio, rtcwake, run-init, run-parts, runlevel, runsv, runsvdir, rx,
script, scriptreplay, sed, sendmail, seq, setarch, setconsole, setfattr, setfont, setkeycodes, setlogcons, setpriv,
setserial, setsid, setuidgid, sh, shasum, sha256sum, sha3sum, sha512sum, showkey, shred, shuf, slattach, sleep,
smemcap, soffitlimit, sort, split, ssl_client, start-stop-daemon, stat, strings, stty, su, sulogin, sum, sv, svc,
svlogd, svok, swapoff, swapon, switch_root, sync, sysctl, syslogd, tac, tail, tar, taskset, tc, tcpsvd, tee, telnet,
telnetd, test, tftp, tftpd, time, timeout, top, touch, tr, traceroute, traceroute6, true, truncate, ts, tty, ttysize,
tunctl, ubiattach, ubidetach, ubimkvol, ubirename, ubirmvol, ubirsvol, ubiupdatevol, udhcp, udhcp6, udhcpd, udpsvd,
uevent, umount, uname, unexpand, uniq, unix2dos, unlink, unlzma, unshare, unxz, unzip, uptime, users, usleep,
uudecode, uuenocode, vconfig, vi, vlock, volname, w, wall, watch, watchdog, wc, wget, which, who, whoami, whois, xargs,
xxd, xz, xzcat, yes, zcat, zcip
```

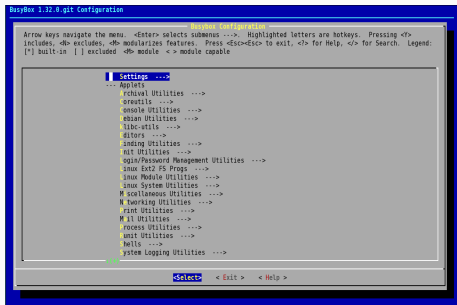
Beispiele:

Programm	Größe Cip	Größe Busybox
ls	139 KB	14 KB
diff	220 KB	13 KB
grep	199 KB	8,6 KB

Busybox einrichten

Busybox einrichten

- \$ git clone git://git.busybox.net/busybox
- Initialkonfiguration:
 - \$ make defconfig
 - \$ make allnoconfig
 - ...
- Selbstkonfiguration:
 - \$ make menuconfig
 - \$ make
- \$ make install



Entwicklung

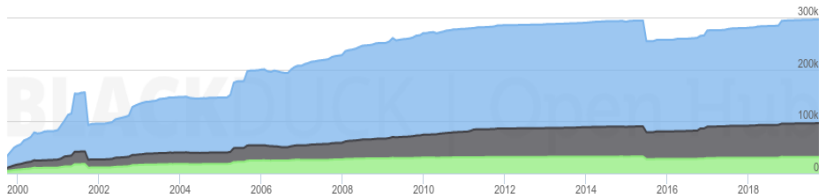
Total Lines : 296,129
Number of Languages : 10

Code Lines : 199,689
Total Comment Lines : 65,007
Total Blank Lines : 31,433

Percent Code Lines : 67.4%
Percent Comment Lines : 22.0%
Percent Blank Lines : 10.6%

Code, Comments and Blank Lines

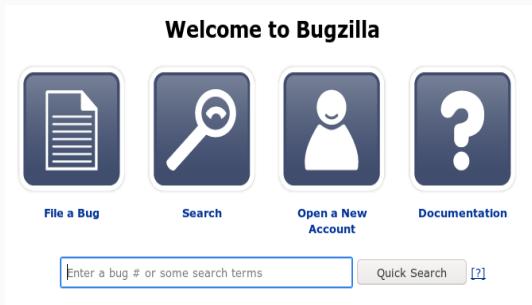
Zoom 1yr 3yr 5yr 10yr **All**



- Lizenz: GNU General Public License Version 2 (GPLv2)
→ gleiche Lizenz wie Linux Kernel
- → Bei Veränderung und Verbreitung: Offenlegen des Quellcodes
- Lizenzverletzung: Durchsetzung durch Software Freedom Conservancy

- Bug gefunden - was nun?
 - `busybox@busybox.net`
 - 2-3 Tage ohne Resultat → erneute Mail
 - Bugzilla: `bugs.busybox.net`

Welcome to Bugzilla



The screenshot displays the Bugzilla interface with four main navigation icons in a row: a document icon for 'File a Bug', a magnifying glass for 'Search', a person icon for 'Open a New Account', and a question mark for 'Documentation'. Below these icons is a search input field with the placeholder text 'Enter a bug # or some search terms' and a 'Quick Search' button with a help icon [?].

File a Bug **Search** **Open a New Account** **Documentation**

Enter a bug # or some search terms Quick Search [?]

- Wie frage ich ein neues Feature an?
 - Suche nach Entwickler: `busybox@busybox.net`
 - Alternativ: Mail an Projekt Maintainer
(`vda.linux@googlemail.com`)
- Sponsoring hilft

- Contributing:
 - Patchvorschläge an Mailingliste immer möglich
 - Git-Schreibzugriff:
 - bereits mehrere sinnvolle Patches eingereicht
 - Nutzern aushelfen
 - Bewerbung um Account an Maintainer
 - `$ git push`

Zusammenfassung

- Gewöhnliche GNU Konsolenwerkzeuge verlangen auf kleinen (eingebetteten) Systemen zu viel Speicher
- Busybox liefert eine kompaktifizierte Sammlung dieser Tools
- Einsatzgebiete:
 - TomTom Navigationsgeräte
 - OpenWrt, aber auch AVM Fritzboxen
 - Linux Distributionen: z.B. Alpine

- Bild Router: http://www.cdr.pl/galerie/tp-link-tl-wr940n_7974.jpg
- Bild Bugzilla: <https://bugs.busybox.net/>
- Code-Statistik: https://www.openhub.net/p/busybox/analyses/latest/languages_summary
- <https://alpinelinux.org/about/>
- https://www.tomtom.com/de_de/opensource/go-version-4/
- <https://www.fritzmod.net/?s=busybox>
- <https://www.busybox.net/>