

Moderne Kommandozeilen Werkzeuge



0 0
1 1 0
1 1 0 0
1 1 0 0
1 0 1
0 0 1
1 0 0
1 1 0 0 1
1 0 0
1 0 0 0 1 1 0
1 1 0 0 1 1 0 0 1 0 1
0 1 0 1 0 1 1 1 1 1 0 0
0 0 1 1 1 0 1 1 1 1 0
0 E A S T E R H E G G
0 1 1 1 0 0 1 2 0 1 8
0 0 1 1 1 0 1 0 0 1 1
0 0 0 1 0 0 1 1 1 0 1
0 1 0 1 1 1 0 0 1
0 0 1 1 0 0 1 1 1

#eh18

@LEYRER

Plan

Historie / Abgrenzung

systemd

dig

tracepath / mtr

iproute2

tmux

zsh

HTTPIe / aria2c

ripgrep

exa

fzf

icdiff

pv / progress

Eure Vorschläge

“simplel”

```
$ cat post-list.csv | split -l 30 -  
--filter='jq -R . | jq --slurp -c .'  
| xargs -d "\n" -I % sh -c 'curl -H  
"Content-Type: application/json" -X  
POST -d '""' '{"type":1,"entries":  
%}' '""' http://127.0.0.1:8080/purge-  
something && sleep 30'
```

Single UNIX Specification

Product	Vendor	Architecture	UNIX V7	UNIX 03	UNIX 98	UNIX 95	UNIX 93
AIX	IBM Corporation	PowerPC	No	Yes	Yes	No	No
FTX	Cemprus LLC	PA-RISC	No	No	No	No	Yes
EulerOS	Huawei	x86-64	No	Yes	No	No	No
HP-UX	Hewlett-Packard Company	IA-64, PA-RISC	No	Yes	No	Yes	No
IRIX	Silicon Graphics, Inc.	MIPS	No	No	No	Yes	No
K-UX	Inspur	x86-64	No	Yes	No	No	No
macOS	Apple	x86-64	No	Yes	No	No	No
OpenServer	XinuOS	IA-32	No	No	No	No	Yes
Solaris	Oracle Corporation	IA-32, x86-64, SPARC	No	Yes	Yes	No	No
Tru64 UNIX	DEC	Alpha	No	No	Yes	No	No
UnixWare	XinuOS	IA-32	No	No	No	Yes	No
z/OS USS	IBM Corporation	z/Architecture	No	No	No	Yes	No

IEEE Std 1003.1-2008 utilities

admin, alias, ar, asa, at, awk, basename, batch, bc, bg, cc/c99, cal, cat, cd, cflow, chgrp, chmod, chown, cksum, cmp, comm, command, compress, cp, crontab, csplit, ctags, cut, cxref, date, dd, delta, df, diff, dirname, du, echo, ed, env, ex, expand, expr, false, fc, fg, file, find, fold, fort77, fuser, gencat, get, getconf, getopts, grep, hash, head, iconv, id, ipcrm, ipcs, jobs, join, kill, lex, link, ln, locale, localedef, logger, logname, lp, ls, m4, mailx, make, man, msg, mkdir, mkfifo, more, mv, newgrp, nice, nl, nm, nohup, od, paste, patch, pathchk, pax, pr, printf, prs, ps, pwd, qalter, qdel, qhold, qmove, qmsg, qrerun, qrls, qselect, qsig, qstat, qsub, read, renice, rm, rmdel, rmdir, sact, sccs, sed, sh, sleep, sort, split, strings, strip, stty, tabs, tail, talk, tee, test, time, touch, tput, tr, true, tsort, tty, type, ulimit, umask, unalias, uname, uncompress, unexpand, unget, uniq, unlink, uucp, uudecode, uuencode, uustat, uux, val, vi, wait, wc, what, who, write, xargs, yacc, zcat

POSIX

- Portable Operating System Interface
- pahz-icks, as in positive, not poh-six
- Defines
 - application programming interface (API)
 - command line shells
 - utility interfaces

Linux Standard Base (LSB)

- Basiert auf POSIX und der Single UNIX Specification
- The goal of the LSB is to develop and promote a set of open standards that will increase compatibility among Linux distribution ...
- ... few Linux distributions actually go through certification as LSB compliant

LSB commands and utilities

[, dmesg, id, more, sleep, ar, du, install, mount, sort, at, echo, install_initd, msgfmt, split, awk, ed, ipcrm, mv, strip, basename, egrep, ipcs, newgrp, stty, batch, env, join, nice, su, bc, expand, kill, nl, sync, cat, expr, killall, nohup, tail, chfn, false, ln, od, tar, chgrp, fgrep, locale, passwd, tee, chmod, file, localedef, paste, test, chown, find, logger, patch, time, chsh, fold, logname, pathchk, touch, cksum, fuser, lp, pax, tr, cmp, gencat, lpr, pidof, true, col, getconf, ls, pr, tsort, comm, gettext, lsb_release, printf, tty, cp, grep, lsbinstall, ps, umount, cpio, groupadd, m4, pwd, uname, crontab, groupdel, mailx, remove_initd, unexpand, csplit, groupmod, make, renice, uniq, cut, groups, man, rm, useradd, date, gunzip, md5sum, rmdir, userdel, dd, gzip, mkdir, sed, usermod, df, head, mkfifo, sendmail, wc, diff, hostname, mknod, sh, xargs, dirname, iconv, mktemp, shutdown, cd, getopt, read, umask, wait

util-linux

addpart, agetty, blkdiscard, blkid, blockdev, cal, cfdisk, chcpu, chfn, chrt, chsh, col, colcrt, colrm, column, ctrlaltdel, delpart, dmesg, eject, fallocate, fdformat, fdisk, findfs, findmnt, flock, fsck, fsck.cramfs, fsck.minix, fsfreeze, fstab, fstrim, getopt, hexdump, hwclock, ionice, ipcmk, ipcrm, ipcs, isosize, kill, last, ldattach, line, logger, login, look, losetup, lsblk, lscpu[6], lslocks, lslogins, mcookie, mesg, mkfs, mkfs.bfs, mkfs.cramfs, mkfs.minix, mkswap, more, mount, mountpoint, namei, newgrp, nologin, nsenter, partx, pg, pivot_root, prlimit, raw, readprofile, rename, renice, reset, resizepart, rev, RTCAlarm, runuser, script, scriptreplay, setarch, setpriv, setsid, setterm, sfdisk, su, sulogin, swapon, swapoff, swapon, switch_root, tailf, taskset, tunelp, ul, umount, unshare, utmpdump, uudd, uuddgen, vipw, wall, wdctl, whereis, wipefs, write, zramctl

GNU Core Utilities commands

chcon, chgrp, chown, chmod, cp, dd, df, dir, dircolors, install, ln, ls, mkdir, mkfifo, mknod, mktemp, mv, realpath, rm, rmdir, shred, sync, touch, truncate, vdir, b2sum, base32, base64, cat, cksum, comm, csplit, cut, expand, fmt, fold, head, join, md5sum, nl, numfmt, od, paste, ptx, pr, sha1sum, sha224sum, sha256sum, sha384sum, sha512sum, shuf, sort, split, sum, tac, tail, tr, tsort, unexpand, uniq, wc, arch, basename, chroot, date, dirname, du, echo, env, expr, factor, false, groups, hostid, id, link, logname, nice, nohup, nproc, pathchk, pinky, printenv, printf, pwd, readlink, runcon, seq, sleep, stat, stdbuf, stty, tee, test, timeout, true, tty, uname, unlink, uptime, users, who, whoami, yes

Regeln des Talks

1. Wir sprechen nicht über Tools, die am Rechner laufende Server brauchen.
2. Wir sprechen nicht über Tools, die am Rechner laufende Server brauchen.

systemd

- Löst(e) UNIX System V init scripts ab
- Sorgt für “Spaß” am Gerät (yummv)

systemd

Old and tired

`/etc/init.d/tool start`

`/etc/init.d/tool stop`

`/etc/init.d/tool
restart`

`/etc/init.d/tool
status`

New Hotness

`systemctl start tool`

`systemctl stop tool`

`systemctl restart tool`

`systemctl status tool`

```
$ /etc/init.d/apache2 status  
* apache2 is running
```


apache2.service - LSB: Apache2 web server

Loaded: loaded (/etc/init.d/apache2)

Active: failed (Result: exit-code) since Wed 2016-03-09 10:32:34 GMT; 9s ago

Docs: man:systemd-sysv-generator(8)

Process: 3479 ExecStop=/etc/init.d/apache2 stop (code=exited, status=0/SUCCESS)

Process: 3503 ExecStart=/etc/init.d/apache2 start (code=exited, status=1/FAILURE)

Mar 09 10:32:34 Ubuntu14 apache2[3503]: *

Mar 09 10:32:34 Ubuntu14 apache2[3503]: * The apache2 configtest failed.

Mar 09 10:32:34 Ubuntu14 apache2[3503]: Output of config test was:

Mar 09 10:32:34 Ubuntu14 apache2[3503]: apache2: Syntax error on line 224 of...y

Mar 09 10:32:34 Ubuntu14 apache2[3503]: Action 'configtest' failed.

Mar 09 10:32:34 Ubuntu14 apache2[3503]: The Apache error log may have more i....

Mar 09 10:32:34 Ubuntu14 systemd[1]: apache2.service: Control process exite...=1

Mar 09 10:32:34 Ubuntu14 systemd[1]: Failed to start LSB: Apache2 web server.

Mar 09 10:32:34 Ubuntu14 systemd[1]: apache2.service: Unit entered failed state.

Mar 09 10:32:34 Ubuntu14 systemd[1]: apache2.service: Failed with result 'e...'.
Hint: Some lines were ellipsized, use -l to show in full.

journalctl

```
leyrer@eh18demo:~% journalctl -u apache2.service
-- Logs begin at Sat 2018-03-31 12:24:35 CEST, end at Sat 2018-03-31 20:16:36 CEST.
--
Mär 31 12:25:02 Betty systemd[1]: Starting LSB: Apache2 web server...
Mär 31 12:25:02 Betty apache2[1256]:  * Starting Apache httpd web server apache2
Mär 31 12:25:04 Betty apache2[1256]: AH00558: apache2: Could not reliably determine
the server's fully qualified domain nam
Mär 31 12:25:05 Betty apache2[1256]:  *
Mär 31 12:25:05 Betty systemd[1]: Started LSB: Apache2 web server.
```

nslookup / dig

- DNS Abfragen
- Hostnamen, IP-Adressen, MX-Records, etc.

```
$ dig iceportal.de
```

```
; <<>> DiG 9.9.5-3ubuntu0.17-Ubuntu <<>> iceportal.de
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 41191
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL:
0
```

```
;; QUESTION SECTION:
;iceportal.de.          IN A
```

```
;; ANSWER SECTION:
iceportal.de.  0   IN A  172.18.1.110
```

```
;; Query time: 1 msec
;; SERVER: 127.0.0.1#53(127.0.0.1)
;; WHEN: Thu Mar 29 13:30:55 CEST 2018
;; MSG SIZE rcvd: 46
```

```
$ dig +short iceportal.de  
172.18.1.110
```

```
$ nslookup  
eh18.easterhegg.eu  
Server:      127.0.0.1  
Address: 127.0.0.1#53
```

```
Non-authoritative answer:  
Name:  eh18.easterhegg.eu  
Address: 148.251.171.26
```

```
$ dig eh18.easterhegg.eu
```

```
;; ANSWER SECTION:
```

```
eh18.easterhegg.eu.    273  IN  A  148.251.171.26
```



```
$ nslookup -q=mx eh18.easterhegg.eu
```

Non-authoritative answer:

```
eh18.easterhegg.eu mail exchanger = 10  
mail.eh18.easterhegg.eu.
```

```
$ dig eh18.easterhegg.eu MX
```

```
;; ANSWER SECTION:
```

```
eh18.easterhegg.eu. 116 IN MX 10  
mail.eh18.easterhegg.eu.
```

```
$ nslookup -q=any eh18.easterhegg.eu  
;; Truncated, retrying in TCP mode.  
;; connection timed out; no servers could be  
reached
```

\$ dig eh18.easterhegg.eu ANY

;; ANSWER SECTION:

```
eh18.easterhegg.eu. 600 IN TYPE257 \# 34
0005696F6465666D61696C746F3A61646D696E73406E657264326E65 72642E6F7267
eh18.easterhegg.eu. 600 IN TYPE257 \# 22
800569737375656C657473656E63727970742E6F7267
eh18.easterhegg.eu. 600 IN TXT "v=spf1 a aaaa mx ptr ~all"
eh18.easterhegg.eu. 600 IN AAAA 2a01:4f8:190:3211::26
eh18.easterhegg.eu. 600 IN SOAns.eh18.easterhegg.eu.
root.easterhegg.eu. 2018012002 43200 3600 1209600 3600
eh18.easterhegg.eu. 600 IN MX 10 mail.eh18.easterhegg.eu.
eh18.easterhegg.eu. 600 IN A 148.251.171.26
eh18.easterhegg.eu. 82749 IN RRSIG NSEC 8 3 86400 20180411202704
20180312192704 41124 easterhegg.eu.
iIerjyXShb0YkkfK2qB0PcQQ6qAPc3x6KrqVcL64IJiDKZZjH6Z49LQ6
MAKY0D150Ag80Ipgtzn6zKiELVB8SBC90xRtee14d1LVXrRuY87owavS
DJken7kkqaF4EABEZ7o3GgPaoIl0iixCYpC4bL1D0rmUMfmX+ZqkSGMy Sz8=
eh18.easterhegg.eu. 82749 IN NSEC soup.easterhegg.eu. NS RRSIG NSEC
eh18.easterhegg.eu. 600 IN NS ns2.eh18.easterhegg.eu.
eh18.easterhegg.eu. 600 IN NS ns.eh18.easterhegg.eu.
```

tracpath

- Userspace Version von traceroute
- Kann die “Path MTU” ermitteln

```
$ tracepath -b eh18.easterhegg.eu
```

1?: [LOCALHOST]	pmtu 1440	
1: 172.18.0.1 (172.18.0.1)	1.285ms	
1: 172.18.0.1 (172.18.0.1)	1.297ms	
2: 10.255.255.1 (10.255.255.1)	1378.761ms	
2: 10.255.255.1 (10.255.255.1)	1316.753ms	
3: 192.168.64.2 (192.168.64.2)	1185.594ms	asymm 4
4: 46.183.103.29 (46.183.103.29)	1086.725ms	
5: bb1-euraix.relaix.net (93.159.250.170)	1022.017ms	
6: hetzner.interxionfra4.nl-ix.net (193.239.117.110)	833.638ms	
7: core24.fsn1.hetzner.com (213.239.203.150)	873.089ms	
9: no reply		
8: ex9k1.dc10.fsn1.hetzner.com (213.239.229.54)	3490.817ms	
9: n2nsrv.nerd2nerd.org (5.9.149.10)	4916.648ms	
9: n2nsrv.nerd2nerd.org (5.9.149.10)	5642.754ms	
9: n2nsrv.nerd2nerd.org (5.9.149.10)	5613.657ms	
10: web.nerd2nerd.org (148.251.171.26)	5535.071ms	reached
Resume: pmtu 1440 hops 10 back 10		

mtr - My Traceroute

- Kombiniert ping und traceroute
- Aktualisiert sich laufend
- Bietet auch GUI-Varianten (ncurses, Gtk)

DEMO TIME

\$ mtr --report eh18.easterhegg.eu

Start: Thu Mar 29 14:30:57 2018

HOST: mother	Loss%	Snt	Last	Avg	Best	Wrst	StDev
1. -- 172.18.0.1	0.0%	10	1.2	2.1	0.9	6.8	1.8
2. -- 10.255.255.1	60.0%	10	1529.	1643.	1523.	1906.	180.0
3. -- 192.168.64.2	60.0%	10	1575.	1637.	1497.	1869.	161.4
4. -- 46.183.103.29	50.0%	10	5397.	2474.	1496.	5397.	1649.4
5. -- bb1-euraix.relaix.net	60.0%	10	2177.	1781.	1508.	2177.	290.2
6. -- hetzner.interxionfra4.nl-	60.0%	10	2501.	1857.	1515.	2501.	443.6
7. -- core23.fsn1.hetzner.com	60.0%	10	2546.	1875.	1571.	2546.	456.2
8. -- ex9k1.dc10.fsn1.hetzner.c	60.0%	10	2608.	1890.	1612.	2608.	482.1
9. -- n2nsrv.nerd2nerd.org	75.0%	8	2638.	2088.	1537.	2638.	779.1
10. -- web.nerd2nerd.org	75.0%	8	3164.	2311.	1458.	3164.	1206.6

iproute2 (ip)

- Löst ifconfig, route, ... ab

- Konsistenter:

ip addr [befehl] [argumente]

- ip link – L2: MTU, VLANs, bridges, ...
- ip addr – L3 addresses
- ip neigh – ARP/ND
- ip route – Routing + MPLS

Geräte und Konfiguration

Old and tired

`ifconfig`

New Hotness

`ip addr show`

`ip link show`

```
$ ip addr show
```

```
...
```

```
3: wlan0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1440 qdisc mq  
state UP group default qlen 1000
```

```
    link/ether a4:4e:31:95:9f:58 brd ff:ff:ff:ff:ff:ff
```

```
    inet 172.18.251.101/16 brd 172.18.255.255 scope global wlan0
```

```
        valid_lft forever preferred_lft forever
```

```
    inet6 fe80::a64e:31ff:fe95:9f58/64 scope link
```

```
        valid_lft forever preferred_lft forever
```

```
$ ip link show
```

```
...
```

```
3: wlan0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1440 qdisc mq  
state UP mode DORMANT group default qlen 1000  
    link/ether a4:4e:31:95:9f:58 brd ff:ff:ff:ff:ff:ff
```

NIC up/down

Old and tired

```
ifconfig eth0 up
```

```
ifconfig eth0 down
```

New Hotness

```
ip link set eth0  
up
```

```
ip link set eth0  
down
```

IP Adresse setzen

Old and tired

```
ifconfig eth0  
192.168.0.42  
netmask  
255.255.255.0  
broadcast  
192.168.0.255
```

New Hotness

```
ip addr add  
192.168.0.42/24  
broadcast  
192.168.0.255 dev  
eth0
```

IP Adresse löschen

Old and tired

New Hotness

```
ip addr del  
192.168.0.42/24  
dev eth0
```


ARP Eintrag hinzufügen

Old and tired

```
arp -i eth0 -s  
192.168.0.1  
00:11:22:33:44:55
```

New Hotness

```
ip neigh add  
192.168.0.1 lladdr  
00:11:22:33:44:55  
nud permanent dev  
eth0
```

Route anzeigen

Old and tired

route

New Hotness

ip route show

Route hinzufügen

Old and tired

```
route add -net  
192.168.3.0/24 dev  
eth3
```

New Hotness

```
ip route add  
192.168.3.0/24 dev  
eth3
```

Mehr route2 Magie

@BarbarossaTM:

Contemporary Linux Networking

<https://www.slideshare.net/BarbarossaTM/contemporary-linux-networking>

tmux

- Terminalmultiplexer
- Gemeinsames Arbeiten in einer Session
- Aktive Entwickle, als screen
- Mehr und modernere Funktionen

DEMO TIME

mother

0

1

tail

15:41:13

~

\$

1

[

|||

]

2

[

||

]

3

[

|||

]

4

[

|

]

Mem

[

|||||||

6653

]

Swp

[

]

5

[

|||

]

6

[

||

]

7

[

|||

]

8

[

|

]

Tasks: 214, 1022 thr; 1 running

Load average: 0.81 0.63

Uptime: 04:12:11

PID	USER	PRI	NI	VIRT	RES	SHR	S	CPU%	MEM%	TIME+	Comma
4010	at007489	20	0	917M	198M	32708	S	13.3	0.8	3:46.34	/usr/
4196	at007489	20	0	1966M	252M	96788	S	5.1	1.1	10:31.27	comp
5218	at007489	20	0	32896	5080	2992	R	4.4	0.0	0:01.08	htop
4246	at007489	20	0	1326M	281M	39340	S	3.2	1.2	1:03.35	/usr/
1928		20	0	789M	240M	206M	S	2.5	1.0	11:33.06	/usr/
4029	at007489	20	0	917M	198M	32708	S	2.5	0.8	1:03.00	/usr/

F1Help F2Setup F3Search F4Filter F5Tree F6SortBy F7Nice -F8Nice +F9Ki

^C

15:41:22

x

~

\$ tail -F /var/log/syslog

Mar 29 15:38:19 mother acvpnagent[2770]: Function: tableCallbackHandler File: RouteMgr.cpp Line: 1723 Invoked Function: recv Return Code: 11 (0x0000000B) Description: unknown

Mar 29 15:38:48 mother hddtemp[2441]: /dev/sdb: ST9500420AS: 35 C

Mar 29 15:39:12 mother wpa_supplicant[4758]: wlan0: CTRL-EVENT-SCAN-STARTED

Mar 29 15:39:18 mother hddtemp[2441]: /dev/sdb: ST9500420AS: 35 C

Mar 29 15:39:19 mother acvpnagent[2770]: Function: tableCallbackHandler File: RouteMgr.cpp Line: 1723 Invoked Function: recv Return Code: 11 (0x0000000B) Description: unknown

Mar 29 15:39:19 mother acvpnagent[2770]: Function: tableCallbackHandler File: RouteMgr.cpp Line: 1723 Invoked Function: recv Return Code: 11 (0x0000000B) Description: unknown

Mar 29 15:39:48 mother hddtemp[2441]: /dev/sdb: ST9500420AS: 35 C

Mar 29 15:40:48 mother hddtemp[2441]: message repeated 2 times: [/dev/sdb: ST9500420AS: 35 C]

Mar 29 15:41:12 mother wpa_supplicant[4758]: wlan0: CTRL-EVENT-SCAN-STARTED

Mar 29 15:41:18 mother hddtemp[2441]: /dev/sdb: ST9500420AS: 35 C

zsh

- Interaktive Login-Shell
- Kommandozeileninterpreter für Shellskripte
- Erweiterte Bourne-Shell
- Erweiterbar !!!1111elf111!!!!!!

oh-my-zsh

- Themes
- Plugins
- Updates (!)
- <http://ohmyz.sh/>

oh-my-zsh Plugins

apache2-macports archlinux asdf aterminal autojump autopep8 aws bower brew
bundler cabal cake capistrano cask cating celery chruby chucknorris command-not-
found Composer cloudapp coffee common-aliases compleat cpanm debian dircycle
dirhistory dirpersist django dnf docker encode64 fabric fbterm Forklift fasd gas
geeknote gem gpg-agent git gitfast git-extras git-flow git-flow-avh git-hubflow
git_remote_branch github gradle grails httpie history jira jsontools knife laravel4 last-
working-dir lein lighthouse lol macports mercurial meteor mvn mysql-macports nanoc
ng node npm nyan osx pass per-directory-history perl perms pep8 phing pip pod pow
powify pyenv pylint python rails rand-quote redis-cli repo ruby rvm sbt scala screen
sprunge ssh-agent sublime sudo supervisor suse svn svn-fast-info symfony2
systemd taskwarrior terminalapp terminitor textmate tig thor tmux tmuxinator tugboat
urltools vagrant vi-mode virtualenvwrapper web-search yarn yii yii2 yum zeus wd

HTTPIe

- cURL wrapper
- Auto-Formatierung
- Farben
- Einfacher Aufruf
- <https://httpie.org/>

```
$ http --verify=no https://eh18.easterhegg.eu/
HTTP/1.1 200 OK
Cache-Control: no-store, no-cache, must-revalidate
Connection: Keep-Alive
Content-Encoding: gzip
Content-Type: text/html; charset=utf-8
Date: Thu, 29 Mar 2018 14:08:14 GMT
Expires: Thu, 19 Nov 1981 08:52:00 GMT
Keep-Alive: timeout=5, max=100
Pragma: no-cache
Referrer-Policy: no-referrer-when-downgrade
Server: Apache/2.4.25 (Debian)
Set-Cookie: DokuWiki=6lu1s8ahuludkmlbsahd3ct3j4; path=/; secure; HttpOnly
Set-Cookie: DW7fa065a06cb74b536c124cfbe56ac6d3=deleted; expires=Thu, 01-Jan-1970 00:00:01 GMT; Max-Age=0; path=/; secure; HttpOnly
Strict-Transport-Security: max-age=15768000;
Transfer-Encoding: chunked
Vary: Accept-Encoding
X-Content-Type-Options: nosniff
X-Frame-Options: SAMEORIGIN
X-UA-Compatible: IE=edge,chrome=1
X-XSS-Protection: 1; mode=block
```

```
<!DOCTYPE html>
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="de-informal"
  lang="de-informal" dir="ltr" class="no-js">
<head>
  <meta charset="UTF-8" />
  <meta http-equiv="X-UA-Compatible" content="IE=edge" />
  <title>EasterHegg 18 - index</title>
  <script>(function(H){H.className=H.className.replace(/\bno-js\b/,'js')})(document.documentElement)</script>
  <meta name="viewport" content="width=device-width,initial-scale=1" />
  <meta property="thumbnail" content="eh18_logo_black.png">
  <meta property="og:image" content="eh18_logo_black.png">
  <meta name="og:title" content=" EasterHegg 2018 ">
  <meta name="og:description" content="EasterHegg 2018">
  <meta name="og:url" content="https://eh18.easterhegg.eu/">
  <meta name="twitter:card" content="summary">
```

HTTPIe & JSON

```
$ http PUT example.org name=John email=john@example.org
```

```
PUT / HTTP/1.1
```

```
Accept: application/json, */*
```

```
Accept-Encoding: gzip, deflate
```

```
Content-Type: application/json
```

```
Host: example.org
```

```
{  
  "name": "John",  
  "email": "john@example.org"  
}
```

aria2

- Download Utility
- Multi-source
- Multi-protocol
 - HTTP/HTTPS
 - FTP
 - SFTP
 - BitTorrent
 - Metalink

```
$ aria2c -c -j 2 -x 10  
https://archive.org/download/upd-gold/UPD%20Gold  
%20%281995%29%28Weird%20Science%29%28Disc  
%201%20of%204%29%5B%21%5D.iso
```

ripgrep

- rekursives regex grep
- berücksichtigt .gitignore files
- SCHNELL
- <https://github.com/BurntSushi/ripgrep>

Tool	Command	Line count	Time
ripgrep (Unicode)	rg -n -w '[A-Z]+_SUSPEND'	450	0.106s
git grep	LC_ALL=C git grep -E -n -w '[A-Z]+_SUSPEND'	450	0.553s
The Silver Searcher	ag -w '[A-Z]+_SUSPEND'	450	0.589s
git grep (Unicode)	LC_ALL=en_US.UTF-8 git grep -E -n -w '[A-Z]+_SUSPEND'	450	2.266s
sift	sift --git -n -w '[A-Z]+_SUSPEND'	450	3.505s
ack	ack -w '[A-Z]+_SUSPEND'	1878	6.823s
The Platinum Searcher	pt -w -e '[A-Z]+_SUSPEND'	450	14.208s

exa

- ersetzt/erweitert ls
- bunt
- rekursiv
- unterstützt git
- <https://the.exa.website/>

```
exa — fish /Users/ben/Code/exa/exa

[ben ~/C/e/exa:master]
$ exa
Cargo.lock  LICENCE  README.md  generate-testcases.sh  src
Cargo.toml  Makefile  contrib   screenshot.png         target

[ben ~/C/e/exa:master]
$ exa -l
.rw-r--r-- 11k ben 18 Nov 18:28 Cargo.lock
.rw-r--r-- 549 ben 15 Nov 18:38 Cargo.toml
.rw-r--r-- 1.1k ben 23 Nov 2014 LICENCE
.rw-r--r-- 775 ben 2 Aug 15:28 Makefile
.rw-r--r-- 2.7k ben 19 Nov 13:18 README.md
drwxr-xr-x - ben 7 Jun 16:45 contrib
.rwxr-xr-x 3.1k ben 3 Sep 13:26 generate-testcases.sh
.rw-r--r-- 382k ben 8 Jun 21:00 screenshot.png
drwxr-xr-x - ben 18 Nov 18:55 src
drwxr-xr-x - ben 3 Nov 0:48 target

[ben ~/C/e/exa:master]
$ exa -abghlIs
inode Permissions Links Size Blocks User Group Date Modified Name
30030336 .rw-r--r-- 1 6.0Ki 16 ben staff 23 Nov 0:31 .DS_Store
1971258 drwxr-xr-x 15 - - ben staff 19 Nov 13:21 .git
30048390 .rw-r--r-- 1 20 8 ben staff 2 Nov 20:45 .gitignore
30163566 .rw-r--r-- 1 200 8 ben staff 4 Nov 16:55 .travis.yml
31959543 .rw-r--r-- 1 11Ki 24 ben staff 18 Nov 18:28 Cargo.lock
31959544 .rw-r--r-- 1 549 8 ben staff 15 Nov 18:38 Cargo.toml
1971322 .rw-r--r-- 1 1.1Ki 8 ben staff 23 Nov 2014 LICENCE
23377412 .rw-r--r-- 1 775 8 ben staff 2 Aug 15:28 Makefile
30163567 .rw-r--r-- 1 2.6Ki 8 ben staff 19 Nov 13:18 README.md
12375448 drwxr-xr-x 4 - - ben staff 7 Jun 16:45 contrib
24377288 .rwxr-xr-x 1 3.1Ki 8 ben staff 3 Sep 13:26 generate-testcases.sh
20087308 .rw-r--r-- 1 373Ki 752 ben staff 8 Jun 21:00 screenshot.png
1971325 drwxr-xr-x 11 - - ben staff 18 Nov 18:55 src
30083756 drwxr-xr-x 3 - - ben staff 3 Nov 0:48 target

[ben ~/C/e/exa:master]
$
```

```
exa — fish /Users/ben/Code/exa/exa

[ben ~/C/e/exa:master]
$ exa --long --grid src/
.rw-r--r-- 4.8k ben 18 Nov 18:55 colours.rs      .rw-r--r--@ 4.4k ben 15 Nov 18:38 main.rs
.rw-r--r-- 2.9k ben 4 Nov 11:59 dir.rs        .rw-r--r--@ 29k ben 19 Nov 12:45 options.rs
drwxr-xr-x - ben 4 Nov 16:55 feature            drwxr-xr-x - ben 18 Nov 18:28 output
.rw-r--r-- 19k ben 15 Nov 18:37 file.rs         .rw-r--r--@ 1.7k ben 4 Sep 11:30 term.rs
.rw-r--r-- 4.5k ben 2 Sep 16:13 filetype.rs

[ben ~/C/e/exa:master]
$ exa --long --tree src
drwxr-xr-x - ben 18 Nov 18:55 src
.rw-r--r-- 4.8k ben 18 Nov 18:55 | colours.rs
.rw-r--r-- 2.9k ben 4 Nov 11:59 | dir.rs
drwxr-xr-x - ben 4 Nov 16:55 | feature
.rw-r--r-- 3.3k ben 4 Nov 11:59 | | git.rs
.rw-r--r-- 604 ben 26 Aug 12:19 | | mod.rs
.rw-r--r-- 7.2k ben 4 Nov 16:55 | | xattr.rs
.rw-r--r-- 19k ben 15 Nov 18:37 | file.rs
.rw-r--r-- 4.5k ben 2 Sep 16:13 | filetype.rs
.rw-r--r-- 4.4k ben 15 Nov 18:38 | main.rs
.rw-r--r-- 29k ben 19 Nov 12:45 | options.rs
drwxr-xr-x - ben 18 Nov 18:28 | output
.rw-r--r-- 5.6k ben 18 Nov 19:02 | | column.rs
.rw-r--r-- 35k ben 16 Nov 3:05 | | details.rs
.rw-r--r-- 1.2k ben 3 Nov 11:12 | | grid.rs
.rw-r--r-- 4.1k ben 15 Nov 18:37 | | grid_details.rs
.rw-r--r-- 384 ben 29 Jun 14:50 | | lines.rs
.rw-r--r-- 1.3k ben 18 Nov 18:27 | | mod.rs
.rw-r--r-- 1.7k ben 4 Sep 11:30 | term.rs

[ben ~/C/e/exa:master]
$
```

fzf

- Kommandozeilen fuzzy finder
- schnell
- praktisch
- unterstützt vim, tmux, ...
- <https://github.com/junegunn/fzf>

DEMO TIME

```

src/util/eventbox_test.go
src/curses/curses_test.go
src/util/atomicbool.go
src/util/util_test.go
src/tokenizer_test.go
src/chunklist_test.go
src/algo/algo_test.go
src/util/eventbox.go
src/curses/curses.go
src/pattern_test.go
src/options_test.go
src/history_test.go
src/reader_test.go
src/merger_test.go
src/cache_test.go
src/util/util.go
src/tokenizer.go
src/item_test.go
src/constants.go
src/chunklist.go
src/ansi_test.go
src/algo/algo.go
src/terminal.go
src/fzf/main.go
src/pattern.go
> src/options.go
src/matcher.go
src/history.go
src/reader.go
src/merger.go
src/cache.go
src/item.go
src/core.go
src/ansi.go
35/63
> .go$

```

```

package fzf

import (
    "fmt"
    "os"
    "regexp"
    "strconv"
    "strings"
    "unicode/utf8"

    "github.com/junegunn/fzf/src/curses"

    "github.com/junegunn/go-shellwords"
)

const usage = `usage: fzf [options]

Search
  -x, --extended           Extended-search mode
                           (enabled by default; +x or --no-extended to disable)
  -e, --exact             Enable Exact-match
  -i                      Case-insensitive match (default: smart-case match)
  +i                      Case-sensitive match
  -n, --nth=N[,..]       Comma-separated list of field index expressions
                           for limiting search scope. Each can be a non-zero
                           integer or a range expression ([BEGIN]..[END]).
                           --with-nth=N[,..] Transform the presentation of each line using
                           field index expressions
  -d, --delimiter=STR    Field delimiter regex (default: AWK-style)
  +s, --no-sort           Do not sort the result
  --tac                  Reverse the order of the input
  --tiebreak=CRI[,..]   Comma-separated list of sort criteria to apply
                           when the scores are tied [length|begin|end|index]
                           (default: length)

```

icdiff

- ergänzt diff
- klein
- simpel
- <https://www.jefftk.com/icdiff>

Terminal — bash — 48x14

```
~ $ diff button-{a,b}.css
2c2
< width: 350px;
---
> width: 400px;
4,6c4,6
< margin: 0px;
< padding: 0px;
< margin-bottom: 15px;
---
> font-size: 30px;
> margin: 0;
> padding: 0;
~ $
```

Terminal — bash — 48x14

```
~ $ icdiff button-{a,b}.css
button-a.css      button-b.css
#input, #button {  #input, #button {
  width: 350px;     width: 400px;
  height: 40px;     height: 40px;
                   font-size: 30px;
  margin: 0px;      margin: 0;
  padding: 0px;     padding: 0;
  margin-bottom: 15px;
  text-align: center;
}                  }
~ $
```


progress - Coreutils Progress Viewer

- fokussiert auf coreutils Kommandos (cp, mv, dd, tar, gzip/gunzip, cat, ...)
- zeigt Fortschritt an
- <https://github.com/Xfennec/progress>

```
% dd if=/dev/urandom bs=1M count=500 | pv -petra -s 500m | dd  
of=/dev/null  
500+0 records in/s] [ 150MiB/s] [=====> ] 90% ETA  
0:00:00  
500+0 records out  
524288000 bytes (524 MB, 500 MiB) copied, 3,33126 s, 157 MB/s  
0:00:03 [ 150MiB/s] [ 150MiB/s] [=====>] 100%  
1024000+0 records in  
1024000+0 records out  
524288000 bytes (524 MB, 500 MiB) copied, 3,33104 s, 157 MB/s
```

▣ progress ▸ 1 ▸ cp ▸ 2 ~/Projekte/eh18

10:21:29 ▸ ✖ ▸ ~/Projekte/eh18

\$ cp -a ~/* /media/████████/MoreData/temp

< 10:22 < Fre 30 Mär * 96% < CPU 5.74%

Every 2,0s: progress -q Fri Mar 30 10:22:21 2018

[12262] cp /home/at007489/Android/Sdk/system-images/and
roid-25/google_apis/x86/system.img
81.3% (1.6 GiB / 2 GiB)



derphilipp

@derphilipp

Following



Neues Tool kennen gelernt: Diffoscope
#eh18

Translate from German

8:22 PM - 31 Mar 2018

3 Retweets 2 Likes



3



2



Was kennt ihr noch?

C:\>

Fragen, Anregungen?

Martin Leyrer

<https://martin.leyrer.priv.at>

@leyrer on Twitter



00
1100
11000
11000
101
001
100
11001
1000
1000110
11001100101
010101111100
00111011110
001110012018
001111010011
000100011101
010111001
001100111

Moderne Kommandozeilen Werkzeuge



00
1100
11000
11000
101
001
100
11001
1
1000110
11001100101
0101011111100
001111011110
001110012018
001111010011
001111011101
010 111001
001 100111

#eh18

@LEYRER

Plan

Diese Themen bzw. Tools versuche ich zu behandeln. Auch hier gilt wieder:

falls Euch das nicht interessiert bin ich Euch nicht böse, wenn Ihr in einen anderen Talk oder Netzwerken geht,

Also, nach dieser Warnung, in medias res ...

“simpel”

“simpel”

post-list.csv contains list of URLs in my example.

split -l 30 Split by 30 lines

- Use stdin as input for split

--filter Couldn't find a way to easily pipe to stdout from split, hence --filter

jq -R . From the jq manual - Don't parse the input as JSON. Instead, each line of text is passed to the filter as a string

jq --slurp -c . From the jq manual - Instead of running the filter for each JSON object in the input, read the entire input stream into a large array and run the filter just once. -c makes it easier to pipe and use it in the xargs that follows.

xargs -d "\n" -l % sh -c Execute a command for each array. Use "\n" as delimiter. Use % as a placeholder in the command that follows.

Single quotes inside sh -c ' ... ' are escaped as """" single-double-single-double-single. You can do whatever you need to inside sh -c ' ... && sleep 123'

Single UNIX Specification

The Single UNIX Specification (SUS) is the collective name of a family of standards for computer operating systems, compliance with which is required to qualify for using the "UNIX" trademark.

Product	Vendor	Architecture	UNIX V7	UNIX 03	UNIX 98	UNIX 95	UNIX 93
AIX	IBM Corporation	PowerPC	No	Yes	Yes	No	No
FTX	Cemprus LLC	PA-RISC	No	No	No	No	Yes
EulerOS	Huawei	x86-64	No	Yes	No	No	No
HP-UX	Hewlett-Packard Company	IA-64, PA-RISC	No	Yes	No	Yes	No
IRIX	Silicon Graphics, Inc.	MIPS	No	No	No	Yes	No
K-UX	Inspur	x86-64	No	Yes	No	No	No
macOS	Apple	x86-64	No	Yes	No	No	No
OpenServer	XinuOS	IA-32	No	No	No	No	Yes
Solaris	Oracle Corporation	IA-32, x86-64, SPARC	No	Yes	Yes	No	No
Tru64 UNIX	DEC	Alpha	No	No	Yes	No	No
UnixWare	XinuOS	IA-32	No	No	No	Yes	No
z/OS USS	IBM Corporation	z/Architecture	No	No	No	Yes	No

Very few BSD and Linux-based operating systems are submitted for compliance with the Single UNIX Specification, although system developers generally aim for compliance with POSIX standards, which form the core of the Single UNIX Specification.

2001: Single UNIX Specification version 3,
POSIX:2001

2008: Single UNIX Specification version 4,
POSIX:2008

IEEE Std 1003.1-2008 utilities

161 commandos

part of the Single UNIX Specification (SUS).

These commands can be found on Unix operating systems and most Unix-like operating systems.

POSIX

The Portable Operating System Interface (POSIX)[1]
is a family of standards specified by the IEEE
Computer Society

IEEE: Institute of Electrical and Electronics Engineers
for maintaining compatibility between operating
systems.

The standards emerged from a project that began
circa 1985. Richard Stallman

Linux Standard Base (LSB)

- Basiert auf POSIX und der Single UNIX Specification
- The goal of the LSB is to develop and promote a set of open standards that will increase compatibility among Linux distribution ...
- ... few Linux distributions actually go through certification as LSB compliant

LSB commands and utilities

util-linux

util-linux is a standard package distributed by the Linux Kernel Organization for use as part of the Linux operating system. A fork, util-linux-ng—with ng meaning "next generation"—was created when development stalled,[3] but as of January 2011 has been renamed back to util-linux, and is the official version of the package.[4]

GNU Core Utilities commands

The GNU Core Utilities are the 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.

Regeln des Talks

“simpel”

systemd

“simpel”

systemd

Old and tired

New Hotness

```
$ /etc/init.d/apache2 status
* apache2 is running
```

DIG response header:

Flags:

AA = Authoritative Answer

TC = Truncation

RD = Recursion Desired (set in a query and copied into the response if recursion is supported)

RA = Recursion Available (if set, denotes recursive query support is available)

AD = Authenticated Data (for DNSSEC only; indicates that the data was authenticated)

CD = Checking Disabled (DNSSEC only; disables checking at the receiving server)

```
apache2.service - LSB: Apache2 web server
  Loaded: loaded (/etc/init.d/apache2)
  Active: failed (Result: exit-code) since Wed 2016-03-09 10:32:34 GMT; 9s ago
  Docs: man:systemd-sysv-generator(8)
  Process: 3479 ExecStop=/etc/init.d/apache2 stop (code=exited, status=0/SUCCESS)
  Process: 3503 ExecStart=/etc/init.d/apache2 start (code=exited, status=1/FAILURE)

Mar 09 10:32:34 Ubuntu14 apache2[3503]: *
Mar 09 10:32:34 Ubuntu14 apache2[3503]: * The apache2 configtest failed.
Mar 09 10:32:34 Ubuntu14 apache2[3503]: Output of config test was:
Mar 09 10:32:34 Ubuntu14 apache2[3503]: apache2: Syntax error on line 224 of...y
Mar 09 10:32:34 Ubuntu14 apache2[3503]: Action 'configtest' failed.
Mar 09 10:32:34 Ubuntu14 apache2[3503]: The Apache error log may have more i....
Mar 09 10:32:34 Ubuntu14 systemd[1]: apache2.service: Control process exite...=1
Mar 09 10:32:34 Ubuntu14 systemd[1]: Failed to start LSB: Apache2 web server.
Mar 09 10:32:34 Ubuntu14 systemd[1]: apache2.service: Unit entered failed state.
Mar 09 10:32:34 Ubuntu14 systemd[1]: apache2.service: Failed with result 'e...'.
Hint: Some lines were ellipsized, use -l to show in full.
```

DIG response header:

Flags:

AA = Authoritative Answer

TC = Truncation

RD = Recursion Desired (set in a query and copied into the response if recursion is supported)

RA = Recursion Available (if set, denotes recursive query support is available)

AD = Authenticated Data (for DNSSEC only; indicates that the data was authenticated)

CD = Checking Disabled (DNSSEC only; disables checking at the receiving server)

journalctl

systemd journal: centralize the management of logs

The journald daemon collects data from all available sources and stores them in a binary format for easy and dynamic manipulation.

=> div. ausgabeformate (json, ...) unterschiedliche zeitzonen,


```
leyrer@eh18demo:~% journalctl -u apache2.service
-- Logs begin at Sat 2018-03-31 12:24:35 CEST, end at Sat 2018-03-31 20:16:36 CEST.
--
Mär 31 12:25:02 Betty systemd[1]: Starting LSB: Apache2 web server...
Mär 31 12:25:02 Betty apache2[1256]: * Starting Apache httpd web server apache2
Mär 31 12:25:04 Betty apache2[1256]: AH00558: apache2: Could not reliably determine
the server's fully qualified domain nam
Mär 31 12:25:05 Betty apache2[1256]: *
Mär 31 12:25:05 Betty systemd[1]: Started LSB: Apache2 web server.
```

DIG response header:

Flags:

AA = Authoritative Answer

TC = Truncation

RD = Recursion Desired (set in a query and copied into the response if recursion is supported)

RA = Recursion Available (if set, denotes recursive query support is available)

AD = Authenticated Data (for DNSSEC only; indicates that the data was authenticated)

CD = Checking Disabled (DNSSEC only; disables checking at the receiving server)

nslookup / dig

“simpel”

```
$ dig iceportal.de
```

```
; <<>> DiG 9.9.5-3ubuntu0.17-Ubuntu <<>> iceportal.de
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 41191
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL:
0
```

```
;; QUESTION SECTION:
;iceportal.de.          IN A
```

```
;; ANSWER SECTION:
iceportal.de.  0   IN A  172.18.1.110
```

```
;; Query time: 1 msec
;; SERVER: 127.0.0.1#53(127.0.0.1)
;; WHEN: Thu Mar 29 13:30:55 CEST 2018
;; MSG SIZE rcvd: 46
```

```
$ dig +short iceportal.de  
172.18.1.110
```

KURZ

Woran erkennt man Microsoft Admins?

Nslookup und dig aufruf.vergleiche

```
$ nslookup  
eh18.easterhegg.eu  
Server:      127.0.0.1  
Address: 127.0.0.1#53
```

```
Non-authoritative answer:  
Name: eh18.easterhegg.eu  
Address: 148.251.171.26
```

```
$ dig eh18.easterhegg.eu
```

```
;; ANSWER SECTION:
```

```
eh18.easterhegg.eu. 273 IN A 148.251.171.26
```

```
$ nslookup -q=mx eh18.easterhegg.eu
```

```
Non-authoritative answer:
```

```
eh18.easterhegg.eu mail exchanger = 10  
mail.eh18.easterhegg.eu.
```

MX record

```
$ dig eh18.easterhegg.eu MX
```

```
;; ANSWER SECTION:
```

```
eh18.easterhegg.eu. 116 IN MX 10
```

```
mail.eh18.easterhegg.eu.
```



```
$ nslookup -q=any eh18.easterhegg.eu  
;; Truncated, retrying in TCP mode.  
;; connection timed out; no servers could be  
reached
```

```
$ dig eh18.easterhegg.eu ANY
;; ANSWER SECTION:
eh18.easterhegg.eu. 600 IN TYPE257 \# 34
0005696F6465666D61696C746F3A61646D696E73406E657264326E65 72642E6F7267
eh18.easterhegg.eu. 600 IN TYPE257 \# 22
800569737375656C657473656E63727970742E6F7267
eh18.easterhegg.eu. 600 IN TXT "v=spf1 a aaaa mx ptr ~all"
eh18.easterhegg.eu. 600 IN AAAA 2a01:4f8:190:3211::26
eh18.easterhegg.eu. 600 IN SOAns.eh18.easterhegg.eu.
root.easterhegg.eu. 2018012002 43200 3600 1209600 3600
eh18.easterhegg.eu. 600 IN MX 10 mail.eh18.easterhegg.eu.
eh18.easterhegg.eu. 600 IN A 148.251.171.26
eh18.easterhegg.eu. 82749 IN RRSIG NSEC 8 3 86400 20180411202704
20180312192704 41124 easterhegg.eu.
iIerjyXShb0YkkfK2qB0PcQQ6qAPc3x6KrqVcL64IJiDKZZjH6Z49LQ6
MAKY0D150Ag80Ipgtzn6zKiELVB8SBC90xRteel4d1LVXrRuY87owavS
DJken7kkqaF4EABEZ7o3GgPaoIl0iixCYpC4bL1D0rmUMfmx+ZqkSGMy Sz8=
eh18.easterhegg.eu. 82749 IN NSEC soup.easterhegg.eu. NS RRSIG NSEC
eh18.easterhegg.eu. 600 IN NS ns2.eh18.easterhegg.eu.
eh18.easterhegg.eu. 600 IN NS ns.eh18.easterhegg.eu.
```

tracepath

Ähnlich traceroute -U (use UDP), das braucht auch keine root rechte

maximum transmission unit (MTU)

Path MTU Discovery (PMTUD) is a standardized technique in computer networking for determining the maximum transmission unit (MTU) size on the network path between two Internet Protocol (IP) hosts, usually with the goal of avoiding IP fragmentation.

Since traceroute now has an --mtu option and can be run as an ordinary user, I don't even bother to install tracepath on my machines.

```

$ tracepath -b eh18.easterhegg.eu
1?: [LOCALHOST] pmtu 1440
1: 172.18.0.1 (172.18.0.1) 1.285ms
1: 172.18.0.1 (172.18.0.1) 1.297ms
2: 10.255.255.1 (10.255.255.1) 1378.761ms
2: 10.255.255.1 (10.255.255.1) 1316.753ms
3: 192.168.64.2 (192.168.64.2) 1185.594ms asymm 4
4: 46.183.103.29 (46.183.103.29) 1086.725ms
5: bb1-euraix.relaix.net (93.159.250.170) 1022.017ms
6: hetzner.interxionfra4.nl-ix.net (193.239.117.110) 833.638ms
7: core24.fsn1.hetzner.com (213.239.203.150) 873.089ms
9: no reply
8: ex9k1.dc10.fsn1.hetzner.com (213.239.229.54) 3490.817ms
9: n2nsrv.nerd2nerd.org (5.9.149.10) 4916.648ms
9: n2nsrv.nerd2nerd.org (5.9.149.10) 5642.754ms
9: n2nsrv.nerd2nerd.org (5.9.149.10) 5613.657ms
10: web.nerd2nerd.org (148.251.171.26) 5535.071ms reached
Resume: pmtu 1440 hops 10 back 10

```

As rule it contains value of RTT. Additionally, it can show Path MTU, when it changes. If the path is asymmetric or the probe finishes before it reach prescribed hop, difference between number of hops in forward and backward direction is shown folloing keyword async. This information is not reliable. F.e. the third line shows asymmetry of 1, it is because the first probe with TTL of 2 was rejected at the first hop due to Path MTU Discovery.

The last line summarizes information about all the path to the destination, it shows detected Path MTU, amount of hops to the destination and our guess about amount of hops from the destination to us, which can be different when the path is asymmetric.

Since traceroute now has an --mtu option and can be run as an ordinary user, I don't even bother to install tracepath on my machines

mtr - My Traceroute

mtr combines the functionality of the traceroute and ping programs in a single network diagnostic tool.

As mtr starts, it investigates the network connection between the host mtr runs on and HOSTNAME. by sending packets with purposely low TTLs. It continues to send packets with low TTL, noting the response time of the intervening routers. This allows mtr to print the response percentage and response times of the internet route to HOSTNAME. A sudden increase in packet loss or response time is often an indication of a bad (or simply overloaded) link.

DEMO TIME

```
$ mtr --report eh18.easterhegg.eu
```

```
Start: Thu Mar 29 14:30:57 2018
```

HOST: mother	Loss%	Snt	Last	Avg	Best	Wrst	StDev
1. -- 172.18.0.1	0.0%	10	1.2	2.1	0.9	6.8	1.8
2. -- 10.255.255.1	60.0%	10	1529.	1643.	1523.	1906.	180.0
3. -- 192.168.64.2	60.0%	10	1575.	1637.	1497.	1869.	161.4
4. -- 46.183.103.29	50.0%	10	5397.	2474.	1496.	5397.	1649.4
5. -- bb1-euraix.relaix.net	60.0%	10	2177.	1781.	1508.	2177.	290.2
6. -- hetzner.interxionfra4.nl-	60.0%	10	2501.	1857.	1515.	2501.	443.6
7. -- core23.fsn1.hetzner.com	60.0%	10	2546.	1875.	1571.	2546.	456.2
8. -- ex9k1.dc10.fsn1.hetzner.c	60.0%	10	2608.	1890.	1612.	2608.	482.1
9. -- n2nsrv.nerd2nerd.org	75.0%	8	2638.	2088.	1537.	2638.	779.1
10. -- web.nerd2nerd.org	75.0%	8	3164.	2311.	1458.	3164.	1206.6

iproute2 (ip)

Ifconfig Does not support nor use CIDR Classless Inter-Domain Routing notation
ifconfig still operates with the old-fashioned netmasks (for IPv4).

functionally organized on two layers of Networking Stack i.e. Layer 2 (Link Layer), Layer 3 (IP Layer) and does the work of all the above mentioned commands from net-tools package.

Net-tools 1.60 (ifconfig, ...): 2011-10-14

While ifconfig mostly displays or modifies the interfaces of a system, this command is capable of doing following tasks:

- Displaying or Modifying Interface properties.

- Adding, Removing ARP Cache entries along creating new Static ARP entry for a host.

- Displaying MAC addresses associated with all the interfaces.

- Displaying and modifying kernel routing tables.

Geräte und Konfiguration

Old and tired

New Hotness

Geräte und Konfiguration

```
$ ip addr show
```

```
...
```

```
3: wlan0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1440 qdisc mq  
state UP group default qlen 1000
```

```
    link/ether a4:4e:31:95:9f:58 brd ff:ff:ff:ff:ff:ff
```

```
    inet 172.18.251.101/16 brd 172.18.255.255 scope global wlan0
```

```
        valid_lft forever preferred_lft forever
```

```
    inet6 fe80::a64e:31ff:fe95:9f58/64 scope link
```

```
        valid_lft forever preferred_lft forever
```

```
$ ip link show
```

```
...
```

```
3: wlan0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1440 qdisc mq  
state UP mode DORMANT group default qlen 1000  
    link/ether a4:4e:31:95:9f:58 brd ff:ff:ff:ff:ff:ff
```

NIC up/down

Old and tired

New Hotness

Diese Themen bzw. Tools versuche ich zu behandeln. Auch hier gilt wieder:

falls Euch das nicht interessiert bin ich Euch nicht böse, wenn Ihr in einen anderen Talk oder Netzwerken geht,

Also, nach dieser Warnung, in medias res ...

IP Adresse setzen

Old and tired

New Hotness

Diese Themen bzw. Tools versuche ich zu behandeln. Auch hier gilt wieder:

falls Euch das nicht interessiert bin ich Euch nicht böse, wenn Ihr in einen anderen Talk oder Netzwerken geht,

Also, nach dieser Warnung, in medias res ...

IP Adresse löschen

Old and tired

New Hotness

Diese Themen bzw. Tools versuche ich zu behandeln. Auch hier gilt wieder:

falls Euch das nicht interessiert bin ich Euch nicht böse, wenn Ihr in einen anderen Talk oder Netzwerken geht,

Also, nach dieser Warnung, in medias res ...

ARP Eintrag hinzufügen

Old and tired

New Hotness

Diese Themen bzw. Tools versuche ich zu behandeln. Auch hier gilt wieder:

falls Euch das nicht interessiert bin ich Euch nicht böse, wenn Ihr in einen anderen Talk oder Netzwerken geht,

Also, nach dieser Warnung, in medias res ...

Route anzeigen

Old and tired

New Hotness

Diese Themen bzw. Tools versuche ich zu behandeln. Auch hier gilt wieder:

falls Euch das nicht interessiert bin ich Euch nicht böse, wenn Ihr in einen anderen Talk oder Netzwerken geht,

Also, nach dieser Warnung, in medias res ...

Route hinzufügen

Old and tired

New Hotness

Diese Themen bzw. Tools versuche ich zu behandeln. Auch hier gilt wieder:

falls Euch das nicht interessiert bin ich Euch nicht böse, wenn Ihr in einen anderen Talk oder Netzwerken geht,

Also, nach dieser Warnung, in medias res ...

Mehr route2 Magie

Ifconfig Does not support nor use CIDR notation
ifconfig still operates with the old-fashioned netmasks
(for IPv4).

Although this command might seem a bit complex at first site but it is much broader in functionality than ifconfig. It is functionally organized on two layers of Networking Stack i.e. Layer 2 (Link Layer), Layer 3 (IP Layer) and does the work of all the above mentioned commands from net-tools package.

While ifconfig mostly displays or modifies the interfaces of a system, this command is capable of doing following tasks:

- Displaying or Modifying Interface properties.

- Adding, Removing ARP Cache entries along creating new Static ARP entry for a host.

- Displaying MAC addresses associated with all the interfaces.

- Displaying and modifying kernel routing tables.

tmux

“simpel”

DEMO TIME

```
mother
0 1 > tail
15:41:13 ~
$

1  [|||] ] 5 [|||] ]
2  [||] ] 6 [||] ]
3  [|||] ] 7 [|||] ]
4  [|] ] 8 [|] ]
Mem[|||||||6653] ] Tasks: 214, 1022 thr; 1 running
Swp[ ] ] Load average: 0.81 0.63
Uptime: 04:12:11

PID USER PRI NI VIRT RES SHR S CPU% MEM% TIME+ Comma
4010 at007489 20 0 917M 198M 32708 S 13.3 0.8 3:46.34 /usr/
4196 at007489 20 0 1966M 252M 96788 S 5.1 1.1 10:31.27 compi
5218 at007489 20 0 32896 5080 2992 R 4.4 0.0 0:01.08 htop
4246 at007489 20 0 1326M 281M 39340 S 3.2 1.2 1:03.35 /usr/
1928 20 0 789M 240M 206M S 2.5 1.0 11:33.06 /usr/
4029 at007489 20 0 917M 198M 32708 S 2.5 0.8 1:03.00 /usr/
F1Help F2Setup F3SearchF4FilterF5Tree F6SortByF7Nice -F8Nice +F9Ki

^C
15:41:22 x ~
$ tail -F /var/log/syslog
Mar 29 15:38:19 mother acvpnagent[2770]: Function: tableCallbackHandler File: RouteMgr.cpp Line: 1723 Invoked Function: rcv Return Code:
11 (0x0000000B) Description: unknown
Mar 29 15:38:48 mother hddtemp[2441]: /dev/sdb: ST9500420AS: 35 C
Mar 29 15:39:12 mother wpa_supplicant[4758]: wlan0: CTRL-EVENT-SCAN-STARTED
Mar 29 15:39:18 mother hddtemp[2441]: /dev/sdb: ST9500420AS: 35 C
Mar 29 15:39:19 mother acvpnagent[2770]: Function: tableCallbackHandler File: RouteMgr.cpp Line: 1723 Invoked Function: rcv Return Code:
11 (0x0000000B) Description: unknown
Mar 29 15:39:19 mother acvpnagent[2770]: Function: tableCallbackHandler File: RouteMgr.cpp Line: 1723 Invoked Function: rcv Return Code:
11 (0x0000000B) Description: unknown
Mar 29 15:39:48 mother hddtemp[2441]: /dev/sdb: ST9500420AS: 35 C
Mar 29 15:40:48 mother hddtemp[2441]: message repeated 2 times: [ /dev/sdb: ST9500420AS: 35 C]
Mar 29 15:41:12 mother wpa_supplicant[4758]: wlan0: CTRL-EVENT-SCAN-STARTED
Mar 29 15:41:18 mother hddtemp[2441]: /dev/sdb: ST9500420AS: 35 C
```

zsh

Der Name zsh leitet sich von Zhong Shao, Professor an der Yale University, ab, der damals Assistent an der Princeton University war. Paul Falstad dachte, dass Shaos Login-Name „zsh“ ein guter Name für eine Shell sei.

angesehen, welche viele Verbesserungen und Eigenschaften von bash, ksh und tcsh vereint.

Verzeichniswechsle ohne CD !!!!!

oh-my-zsh

oh-my-zsh Plugins

HTTPIe

Der Name zsh leitet sich von Zhong Shao, Professor an der Yale University, ab, der damals Assistent an der Princeton University war. Paul Falstad dachte, dass Shaos Login-Name „zsh“ ein guter Name für eine Shell sei.

angesehen, welche viele Verbesserungen und Eigenschaften von bash, ksh und tcsh vereint.

Verzeichniswechsle ohne CD !!!!!

```
$ http --verify=no https://eh18.easterhegg.eu/
HTTP/1.1 200 OK
Cache-Control: no-store, no-cache, must-revalidate
Connection: Keep-Alive
Content-Encoding: gzip
Content-Type: text/html; charset=utf-8
Date: Thu, 29 Mar 2018 14:08:14 GMT
Expires: Thu, 19 Nov 1981 08:52:00 GMT
Keep-Alive: timeout=5, max=100
Pragma: no-cache
Referrer-Policy: no-referrer-when-downgrade
Server: Apache/2.4.25 (Debian)
Set-Cookie: DokuWiki=6lu1s8ahu1udkmlbsahd3ct3j4; path=/; secure; HttpOnly
Set-Cookie: DW7fa065a06cb74b536c124cfbe56ac6d3=deleted; expires=Thu, 01-Jan-1970 00:00:01 GMT; Max-Age=0; path=/; secure; HttpOnly
Strict-Transport-Security: max-age=15768000;
Transfer-Encoding: chunked
Vary: Accept-Encoding
X-Content-Type-Options: nosniff
X-Frame-Options: SAMEORIGIN
X-UA-Compatible: IE=edge,chrome=1
X-XSS-Protection: 1; mode=block

<!DOCTYPE html>
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="de-informal"
  lang="de-informal" dir="ltr" class="no-js">
<head>
  <meta charset="UTF-8" />
  <meta http-equiv="X-UA-Compatible" content="IE=edge" />
  <title>EasterHegg 18 - index</title>
  <script>(function(H){H.className=H.className.replace(/\bno-js\b/, 'js'))(document.documentElement)</script>
  <meta name="viewport" content="width=device-width,initial-scale=1" />
  <meta property="thumbnail" content="eh18_logo_black.png">
  <meta property="og:image" content="eh18_logo_black.png">
  <meta name="og:title" content=" EasterHegg 2018 ">
  <meta name="og:description" content="EasterHegg 2018">
  <meta name="og:url" content="https://eh18.easterhegg.eu/">
  <meta name="twitter:card" content="summary">
```

HTTPIe & JSON

Der Name zsh leitet sich von Zhong Shao, Professor an der Yale University, ab, der damals Assistent an der Princeton University war. Paul Falstad dachte, dass Shaos Login-Name „zsh“ ein guter Name für eine Shell sei.

angesehen, welche viele Verbesserungen und Eigenschaften von bash, ksh und tcsh vereint.

Verzeichniswechsle ohne CD !!!!!

aria2

Download-Manager/-Beschleuniger für unixoide Betriebssysteme wie Linux oder BSD.

Das Programm ist mehrsprachig und verwendet GTK+ zur Darstellung der grafischen Benutzeroberfläche. Es unterstützt die Protokolle HTTP, HTTPS, FTP und SFTP. Die aktuelle Weiterentwicklung Aria2 unterstützt auch BitTorrent und Metalinks.

Weitere Funktionen sind Pausieren und Fortsetzen sowie gleichzeitiges Herunterladen und Segmentieren des Transfervorgangs zum Zweck der Beschleunigung.

Die Entwicklung des ursprünglichen Aria wurde im Dezember 2002 eingestellt. Seit dem 17. Februar 2006 wird die Anwendung unter der Bezeichnung aria2 als textbasierte Konsolenanwendung weiterentwickelt.

```
$ aria2c -c -j 2 -x 10  
https://archive.org/download/upd-gold/UPD%20Gold  
%20%281995%29%28Weird%20Science%29%28Disc  
%201%20of%204%29%5B%21%5D.iso
```

- c continue download after abort (don't clobber)
- j number of parallel downloads
- x max connections per server

ripgrep

It can replace many use cases served by both The Silver Searcher and GNU grep because it is generally faster than both.

Like The Silver Searcher, ripgrep defaults to recursive directory search and won't search files ignored by your .gitignore files. It also ignores hidden and binary files by default.

ripgrep supports many features found in grep, such as showing the context of search results, searching multiple patterns, highlighting matches with color and full Unicode support.

ripgrep supports searching files compressed in a common format (gzip, xz, lzma or bzip2 current) with the `-z/--search-zip` flag.

ripgrep doesn't have multiline search.

ripgrep uses a regex engine based on finite automata, so if you want fancy regex features such as backreferences or lookahead, ripgrep won't provide them to you.

Tool	Command	Line count	Time
ripgrep (Unicode)	rg -n -w '[A-Z]+_SUSPEND'	450	0.106s
git grep	LC_ALL=C git grep -E -n -w '[A-Z]+_SUSPEND'	450	0.553s
The Silver Searcher	ag -w '[A-Z]+_SUSPEND'	450	0.589s
git grep (Unicode)	LC_ALL=en_US.UTF-8 git grep -E -n -w '[A-Z]+_SUSPEND'	450	2.266s
sift	sift --git -n -w '[A-Z]+_SUSPEND'	450	3.505s
ack	ack -w '[A-Z]+_SUSPEND'	1878	6.823s
The Platinum Searcher	pt -w -e '[A-Z]+_SUSPEND'	450	14.208s

This example searches the entire Linux kernel source tree (after running `make defconfig && make -j8`) for `[A-Z]+_SUSPEND`

`-n, --line-number`

Show line numbers (1-based). This is enabled by default when searching in a terminal.

`-w, --word-regexp`

Only show matches surrounded by word boundaries. This is roughly equivalent to putting `\b` before and after all of the search patterns.

exa

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```
exa — fish /Users/ben/Code/exa/exa

[ben ~/C/e/exa:master]
$ exa
Cargo.lock  LICENCE  README.md  generate-testcases.sh  src
Cargo.toml  Makefile  contrib    screenshot.png         target

[ben ~/C/e/exa:master]
$ exa -l
.rw-r--r-- 11k ben 18 Nov 18:28 Cargo.lock
.rw-r--r-- 549 ben 15 Nov 18:38 Cargo.toml
.rw-r--r-- 1.1k ben 23 Nov 2014 LICENCE
.rw-r--r-- 775 ben 2 Aug 15:28 Makefile
.rw-r--r-- 2.7k ben 19 Nov 13:18 README.md
drwxr-xr-x - ben 7 Jun 16:45 contrib
drwxr-xr-x 3.1k ben 3 Sep 13:26 generate-testcases.sh
.rw-r--r-- 382k ben 8 Jun 21:00 screenshot.png
drwxr-xr-x - ben 18 Nov 18:55 src
drwxr-xr-x - ben 3 Nov 0:48 target

[ben ~/C/e/exa:master]
$ exa -abghllis
inode Permissions Links Size Blocks User Group Date Modified Name
30030336 .rw-r--r-- 1 6.0Ki 16 ben staff 23 Nov 0:31 .DS_Store
1971258 drwxr-xr-x 15 - - ben staff 19 Nov 13:21 .git
30048390 .rw-r--r-- 1 20 8 ben staff 2 Nov 20:45 .gitignore
30163566 .rw-r--r-- 1 200 8 ben staff 4 Nov 16:55 .travis.yml
31959543 .rw-r--r-- 1 11Ki 24 ben staff 18 Nov 18:28 Cargo.lock
31959544 .rw-r--r-- 1 549 8 ben staff 15 Nov 18:38 Cargo.toml
1971322 .rw-r--r-- 1 1.1Ki 8 ben staff 23 Nov 2014 LICENCE
23377412 .rw-r--r-- 1 775 8 ben staff 2 Aug 15:28 Makefile
30163567 .rw-r--r-- 1 2.6Ki 8 ben staff 19 Nov 13:18 README.md
12375448 drwxr-xr-x 4 - - ben staff 7 Jun 16:45 contrib
24377288 .rw-r-xr-x 1 3.1Ki 8 ben staff 3 Sep 13:26 generate-testcases.sh
20087308 .rw-r--r-- 1 373Ki 752 ben staff 8 Jun 21:00 screenshot.png
1971325 drwxr-xr-x 11 - - ben staff 18 Nov 18:55 src
30083756 drwxr-xr-x 3 - - ben staff 3 Nov 0:48 target

[ben ~/C/e/exa:master]
$
```

```
exa — fish /Users/ben/Code/exa/exa

[ben ~/C/e/exa:master]
$ exa --long --grid src/
.rw-r--r-- 4.8k ben 18 Nov 18:55 colours.rs .rw-r--r--@ 4.4k ben 15 Nov 18:38 main.rs
.rw-r--r-- 2.9k ben 4 Nov 11:59 dir.rs .rw-r--r--@ 29k ben 19 Nov 12:45 options.rs
drwxr-xr-x - ben 4 Nov 16:55 feature drwxr-xr-x - ben 18 Nov 18:28 output
.rw-r--r-- 19k ben 15 Nov 18:37 file.rs .rw-r--r--@ 1.7k ben 4 Sep 11:30 term.rs
.rw-r--r-- 4.5k ben 2 Sep 16:13 filetype.rs

[ben ~/C/e/exa:master]
$ exa --long --tree src
drwxr-xr-x - ben 18 Nov 18:55 src
.rw-r--r-- 4.8k ben 18 Nov 18:55 colours.rs
.rw-r--r-- 2.9k ben 4 Nov 11:59 dir.rs
drwxr-xr-x - ben 4 Nov 16:55 feature
.rw-r--r-- 3.3k ben 4 Nov 11:59 git.rs
.rw-r--r-- 604 ben 26 Aug 12:19 mod.rs
.rw-r--r-- 7.2k ben 4 Nov 16:55 xattr.rs
.rw-r--r-- 19k ben 15 Nov 18:37 file.rs
.rw-r--r-- 4.5k ben 2 Sep 16:13 filetype.rs
.rw-r--r-- 4.4k ben 15 Nov 18:38 main.rs
.rw-r--r-- 29k ben 19 Nov 12:45 options.rs
drwxr-xr-x - ben 18 Nov 18:28 output
.rw-r--r-- 5.6k ben 18 Nov 19:02 column.rs
.rw-r--r-- 35k ben 16 Nov 3:05 details.rs
.rw-r--r-- 1.2k ben 3 Nov 11:12 grid.rs
.rw-r--r-- 4.1k ben 15 Nov 18:37 grid_details.rs
.rw-r--r-- 384 ben 29 Jun 14:50 lines.rs
.rw-r--r-- 1.3k ben 18 Nov 18:27 mod.rs
.rw-r--r-- 1.7k ben 4 Sep 11:30 term.rs

[ben ~/C/e/exa:master]
$
```

It can replace many use cases served by both The Silver Searcher and GNU grep because it is generally faster than both.

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ripgrep supports searching files compressed in a common format (gzip, xz, lzma or bzip2 current) with the -z/--search-zip flag.

ripgrep doesn't have multiline search.

ripgrep uses a regex engine based on finite automata, so if you want fancy regex features such as backreferences or lookahead, ripgrep won't provide them to you.

fzf

It can replace many use cases served by both The Silver Searcher and GNU grep because it is generally faster than both.

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ripgrep doesn't have multiline search.

ripgrep uses a regex engine based on finite automata, so if you want fancy regex features such as backreferences or lookahead, ripgrep won't provide them to you.

DEMO TIME

```

src/util/eventbox_test.go
src/curses/curses_test.go
src/util/atomicbool.go
src/util/util_test.go
src/tokenizer_test.go
src/chunklist_test.go
src/algo/algo_test.go
src/util/eventbox.go
src/curses/curses.go
src/pattern_test.go
src/options_test.go
src/history_test.go
src/reader_test.go
src/merger_test.go
src/cache_test.go
src/util/util.go
src/tokenizer.go
src/item_test.go
src/constants.go
src/chunklist.go
src/ansi_test.go
src/algo/algo.go
src/terminal.go
src/fzf/main.go
src/pattern.go
> src/options.go
src/matcher.go
src/history.go
src/reader.go
src/merger.go
src/cache.go
src/item.go
src/core.go
src/ansi.go
35/63
> .go$

```

```

package fzf

import (
    "fmt"
    "os"
    "regexp"
    "strconv"
    "strings"
    "unicode/utf8"

    "github.com/junegunn/fzf/src/curses"
    "github.com/junegunn/go-shellwords"
)

const usage = `usage: fzf [options]

Search
  -x, --extended      Extended-search mode
                      (enabled by default; +x or --no-extended to disable)
  -e, --exact         Enable Exact-match
  -i                  Case-insensitive match (default: smart-case match)
  +i                  Case-sensitive match
  -n, --nth=N[,...]   Comma-separated list of field index expressions
                      for limiting search scope. Each can be a non-zero
                      integer or a range expression ([BEGIN]..[END]).
  --with-nth=N[,...]  Transform the presentation of each line using
                      field index expressions
  -d, --delimiter=STR Field delimiter regex (default: AWK-style)
  +s, --no-sort        Do not sort the result
  --tac               Reverse the order of the input
  --tiebreak=CRI[,...] Comma-separated list of sort criteria to apply
                      when the scores are tied [length|begin|end|index]
                      (default: length)

```

icdiff

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ripgrep doesn't have multiline search.

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```
Terminal — bash — 48x14
~ $ diff button-{a,b}.css
2c2
< width: 350px;
---
> width: 400px;
4,6c4,6
< margin: 0px;
< padding: 0px;
< margin-bottom: 15px;
---
> font-size: 30px;
> margin: 0;
> padding: 0;
~ $
```

```
Terminal — bash — 48x14
~ $ icdiff button-{a,b}.css
button-a.css      button-b.css
#input, #button {  #input, #button {
  width: 350px;     width: 400px;
  height: 40px;     height: 40px;
                   font-size: 30px;
  margin: 0px;      margin: 0;
  padding: 0px;     padding: 0;
  margin-bottom: 15px;
  text-align: center;
}                  }
~ $
```

progress - Coreutils Progress Viewer

It simply scans /proc for interesting commands, and then looks at proc directories fd and fdinfo to find opened files and seek positions, and reports status for the largest file.

It's very light, and compatible with virtually any command.

```
% dd if=/dev/urandom bs=1M count=500 | pv -petra -s 500m | dd  
of=/dev/null  
500+0 records in/s] [ 150MiB/s] [=====> ] 90% ETA  
0:00:00  
500+0 records out  
524288000 bytes (524 MB, 500 MiB) copied, 3,33126 s, 157 MB/s  
0:00:03 [ 150MiB/s] [ 150MiB/s] [=====>] 100%  
1024000+0 records in  
1024000+0 records out  
524288000 bytes (524 MB, 500 MiB) copied, 3,33104 s, 157 MB/s
```

MX record

progress 1 > cp 2 ~/Projekte/eh18

10:21:29 x ~/Projekte/eh18

\$ cp -a ~/* /media/MoreData/temp

Every 2,0s: progress -q

Fri Mar 30 10:22:21 2018

[12262] cp /home/at007489/Android/Sdk/system-images/and
roid-25/google_api/x86/system.img
81.3% (1.6 GiB / 2 GiB)



entpackt archive rekursiv

konvertiert binäre formate in durch menschen
lesbaren Text

kann u.a. tarball, iso images und pdfs vergleichen

Was kennt ihr noch?

```
C:\>
```

Fragen, Anregungen?

```

      00
      1100
      11000
      11000
      101
      001
      1001
      11001
      1
      10001100
      11001100101
      1100101111100
      010111011110
      001110012018
      001111010011
      000110011101
      010111001
      001100111

```