

2. Grundwissen für die tägliche Arbeit eines Sysadmin
Manuals, Files, Prozesse, Geräte, grep, awk, find, ps
=====

Manuals

Kommando man:

man(1)

man(1)

NAME

man - format and display the on-line manual pages

manpath - determine user's search path for man pages

SYNOPSIS

```
man [-adfhktwW] [-m system] [-p string] [-C config_file]
    [-M path] [-P pager] [-S section_list] [section] name ...
```

DESCRIPTION

man formats and displays the on-line manual pages.

OPTIONS

-M path

Specify the list of directories to search for man pages. default list is found by consulting /usr/lib/man.config. MANPATH

-P pager

Specify which pager to use.
By default, man uses /usr/bin/less
PAGER

-S section_list

List is a colon separated list of manual sections to search. This option overrides the MANSECT environment variable.

- a By default, man will exit after displaying the first manual page it finds. Using this option forces man to display all the manual pages that match name,, not just the first.
- f Equivalent to whatis..
- k Equivalent to apropos..

ENVIRONMENT

MANPATH

If MANPATH is set, its value is used as the path to search for manual pages.

MANROFFSEQ

If MANROFFSEQ is set, its value is used to determine the set of preprocessors run before running nroff or troff. By default, pages are passed through the table preprocessor before nroff.

MANSECT

If MANSECT is set, its value is used to determine which manual sections to search.

PAGER If PAGER is set, its value is used as the name of the program to use to display the man page.

SEE ALSO

apropos(1), whatis(1), less(1), groff(1).

Konfigurationsfiles:

Solaris: /usr/share/man/man.cf
SuSE: /etc/manpath.config

Manualabschnitte:

- 1 Ausführbare Programme oder Shellbefehle
1b, 1c, 1f, 1m, 1s
- 2 Systemaufrufe (Kernelfunktionen)
- 3 Bibliotheksaufrufe (Funktionen in System-Bibliotheken)
3c, 3lib, 3xfn,
- 4 Spezielle Dateien (gewöhnlich in /dev)
- 5 Dateiformate und Konventionen, z. B. /etc/passwd
- 6 Spiele
- 7 Makropakete und Konventionen, z. B. man(7), groff(7)
- 8 Systemadministrationsbefehle (in der Regel nur für root)
- 9 Kernelroutinen [Nicht Standard]
- n neu [veraltet]
- l lokal [veraltet]
- p öffentlich [veraltet]
- o alt [veraltet]

Manpath für User:

```
MANPATH=/usr/man:/usr/local/man:/usr/openwin/man:/home/unixsoft/bell/Man
```

Manpath für Administrator:

```
MANPATH=/usr/share/man:/usr/openwin/share/man:/usr/dt/share/man:\
/usr/demo/SOUND/man:/usr/demo/link_audit/man:/usr/java1.2/man:\
/usr/apache/man:/usr/perl5/man:/usr/j2se/man:/opt/SUNWconn/ge/man:\
/opt/SUNWconn/man:/opt/SUNWrtvc/man:/opt/sfw/man:/opt/sfw/mysql/man:\
/opt/sfw/kde/man:/opt/SUNWut/Solaris_JRE_1.2.2_12/man:/opt/SUNWut/man:\
/opt/SUNWut/share/man:/opt/SUNWconn/man:/usr/local/man:\
/usr/local/share/man
```

Beispiele:

```
man man
man manpath (nur bei Linux)
man -k manpath - apropos manpath
whatis man
man write
man -a write
man 2 write
man -s 3c reboot
man reboot
```

Erzeugen der Datenbasis für apropos oder whatis:

```
/usr/lib/make-whatis oder catman -w
```

Weitere Informationsquellen:

```
/usr/share
/usr/doc
/opt/csw/share, /opt/csw/doc
/opt/sfw/share, /opt/sfw/info
/usr/share/doc
/usr/share/doc/packages
```

Files

Filetypen: ls-Kennung

reguläre Files	-	keine
Fileverzeichnisse	-	d
Special Files	-	c,b
Geräte, Speicher, Netzwerk		
Links	-	l
harte Links, symbolische Links		
named Pipes	-	p
sockets	-	s
door-Files	-	D (nur bei Solaris)

Fileprotection:

Klassen: user, group, other

Arten: File: ausführen, lesen, schreiben

Directory: durchsuchen, lesen, schreiben

1

4

2

Besonderheiten bei der Fileprotection:

t - Sticky Bit:

File: save text mode

Directory: löschen von Files nur durch Eigentümer
spezieller Schutz für /tmp /usr/spool/mail

rwxrwxrwt

s - SUID Bit: Setze UID für Prozess bei Ausführung

Eigentümer rws--x--x

s - GUID Bit:

File: Setze GID für Prozess bei Ausführung

Directory: Übername der GID für neue Files im Directory,
rekursiv

l - GUID Bit: erzwingt File Locking beim Lesen und Schreiben
(Solaris, Tru64, nicht bei Linux)

S - ???

Eigentümer neuer Files:

UID - EUID des Prozesses

GID - EGID des Prozesses (System V)

GID der Directory (BSD)

Zugriffsrechte neuer Files:

Spezifikation bei open unter Berücksichtigung von umask

Geräte

Verzeichnis /dev /devices

Prozesse

Attribute von Prozessen:

PID - Prozessnummer

PPID - Prozessnummer des Elternprozesses

Nice Number - vom Sysadmin steuerbare Prozesspriorität

TTY - Terminal des Prozesses (eventuell nicht vorhanden)

RUID - real UID

EUID - effektiver UID

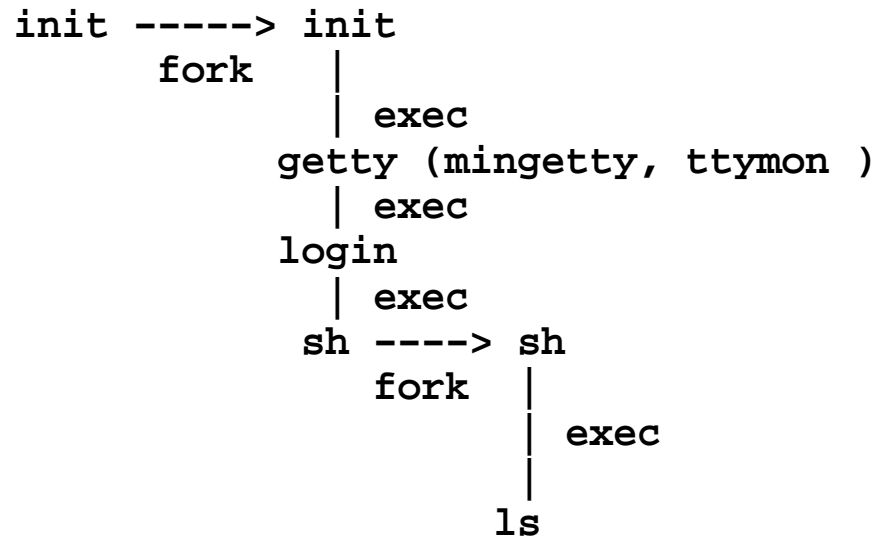
RGID - real GID

EGID - effektiver GID

Lebenszyklus eines Prozesses:

fork, exec, exit (wait)

login:



Arten von Prozessen

Interaktive Prozesse - durch Nutzer gestartet
(auch im Hintergrund)

Prozess-Steuerung:

- & - Hintergrundprozess
- ^Z - anhalten des Vordergrundprozesses
- jobs - anzeigen der Hintergrundprozesse
- %n - bezeichnet Hintergrundprozess n
- suspend - Vordergrundprozeß anhalten, Hintergrundprozeß in
den Vordergrund
- fg %n - Hintergrundprozess n in Vordergrund
- bg - Restart eines Hintergrundprozesses

Batch-Prozesse: durch Batch-Systeme gestartet
z.B.: NQS - Network Queuing System

Dämonen: Prozesse durch Unix-System beim boot gestartet
z.B.: portmap, inetd, nfsd, automountd, cron, lpd, ...

Kommandos

Prozesse auflisten lassen - ps

AIX:

```
ps [-A] [-a] [-d] [-e] [-f] [-k] [-l] [-F Format] [-G Glist]
    [-g Glist] [-p Plist] [-t Tlist] [-U Ulist] [-u Ulist]
```

```
ps [a] [c] [e] [ew] [eww] [g] [n] [U] [w] [x] [l|s|u|v]
    [t Tty] [ ProcessNumber ]
```

Beispiel: ps -efal

Linux:

```
ps -ANadefjLFLmwV [-<option> <wert>] ...
    aTgrxXZjlsuvScefhnwHmL [-<option> <wert>] ...
```

Beispiel: ps -efa

ps aux

Solaris:

```
ps [ -aAcdefjLL ] [ -g grplist ] [ -n namelist ]
    [[ -o format ] ... ] [ -p proclist ]
    [ -s sidlist ] [ -t term ] [ -u uidlist ]
    [ -U uidlist ] [ -G gidlist ]
```

Beispiel: ps -efa

ps -efaL # mit allen Threads

BSD Compatible Syntax

```
ps [aAeghjLLmsSTuvwx] [oO specifier][==header],... [tty]
    [process_number]
```

Beispiel: ps -efa

ps aux

Auslastung des Rechners - top/prstat

Linux:

```
top -hv | -bcHiSs -d delay -n limit -u|U user -p pid[,pid] -w [cols]
```

- h - help
- b - batch (für Scripte)
- u - Nutzer spezifisch
- p - für spezielle Prozesse

Solaris:

```
top ..
```

```
prstat [-acHJLmRrtTv] [-d u | d] [-C psrsetlist] [-h lgrplist]  
[-j projlist] [-k tasklist] [-n ntop[,nbottom]]  
[-p pidlist] [-P cpulist] [-s key | -S key ]  
[-u euidlist] [-U uidlist] [-z zoneidlist] [-Z]  
[interval [count]]
```

- L - LWL-Prozesse

Fileverzeichnisse anschauen - ls

AIX:

```
ls [-AadiLNRrs] [-F | -p] [-b | -q] [-C | -m]
  [{-c | -u} [-l ] [-t]] | [[-g | -n | -l | -o | -e] [-t]]
  [ File ... ] [ Directory ... ]
```

```
ls -f [ -d ] [ -i ] [ -s ] [ -C | -m | -x ]
  [ Directory ... ]
```

Linux:

```
ls [OPTION]... [FILE]...
```

Solaris:

```
/usr/bin/ls [ -aAbcCdFfgilLmnopqrRstuxl ] [ file... ]
/usr/xpg4/bin/ls [ -aAbcCdFfgilLmnopqrRstuxl ] [ file... ]
```

Beispiele:

```
ls -lF          # Kennzeichen des Filetypes
ls -lisa        # alles mit Erstellungszeit
ls -lisac       # alles mit change-Time !!
ls -lisact      # alles mit change-Time und nach Zeit sortiert
ls -ld         # nur Directories
ls -i          # mit I-Node-Nummer
```

Ändern der Zugriffsrechte - chmod

Absolute Modes

```
/bin/chmod [ -fRcv ] mode filename ...  
/usr/bin/chmod [ -fRcv ] mode filename ...  
/usr/5bin/chmod [ -fRcv ] mode filename ...
```

```
-R  rekursiv absteigend  
-f  leise  
-c  verbose bei Aktionen  
-v  verbose - geschwätzig
```

mode

```
400  Read by owner.  
200  Write by owner.  
100  Execute (search in directory) by owner.  
040  Read by group.  
020  Write by group.  
010  Execute (search) by group.  
004  Read by others.  
002  Write by others.  
001  Execute (search) by others.  
4000 Set user ID on execution.  
2000 Set group ID on execution.  
1000 Sticky bit.
```

Symbolic Modes

```
/bin/chmod [ -fRcv ] <who><op><permission> filename ...  
/usr/bin/chmod [ -fRcv ] <who><op><permission> filename ...  
/usr/5bin/chmod [ -fRcv ] <who><op><permission> filename ...
```

who is a combination of:

u	User's permissions.
g	Group permissions.
o	Others.
a	All, or ugo.

op is one of:

+	To add the permission.
-	To remove the permission.
=	To assign the permission explicitly

permission is any combination of:

r	Read.
w	Write.
x	Execute.
X	Give execute permission if the file is a directory or if there is execute permissions
s	Set owner or group ID.
t	Set the sticky bit
l	Filelocking

AIX:

```
chmod [-fR] [[u][g][o] | [a]]{{-|+|=} [r][w][x][X][s][t]}
      { File ... | Directory ... }
chmod [ -R ] [ -f ] PermissionCode { File ... | Directory ... }
```

Linux:

```
chmod [OPTION]... MODE[,MODE]... FILE...
chmod [OPTION]... OCTAL-MODE FILE...
chmod [OPTION]... --reference=RFILE FILE...
OPTION - -c, -f, -v, -R
```

Solaris:

```
chmod [ -fR ] <absolute-mode> file...
chmod [ -fR ] <symbolic-mode-list> file...
```

Beispiele:

```
chmod a=r lead
chmod og+rX *
```


Minimale Zugriffsrechte:

Kommando	Zugriffsrechte	
	File	Directory
cd ./Test/a2	-	x
ls ./Test/a1	-	r
ls -lisa ./Test/a	-	rx
ls ./Test/a2/t2	-	x
cat ./Test/a2/t2	r	x
cat >> ./Test/a2/t2	w	x
cat > ./Test/a3/t3	-	wx
rm ./Test/a3/t3	-	wx
./Test/a2/x.bin	x	x
./Test/a/x.scr	rx	x

Ändern des Eigentümers und der Gruppe - chown, chgrp

Nur für SU!!!

Linux:

```
/bin/chown [ -chRv] owner[:group] filename ...  
-f    Do not report errors.  
-R    Recursively descend into directories setting the owner-  
      ship of all files in each directory encountered. When  
      symbolic links are encountered, their ownership is  
      changed, but they are not traversed.  
-h    If the file is a symbolic link, change the owner of  
      the symbolic link. Without this option, the owner of  
      the file referenced by the symbolic link is changed.
```

AIX:

```
chown [-f] [-R] [-h] Owner[:Group] { File ... | Directory ... }
```

Solaris:

```
chown [ -fhR ] owner[:group] filename ...  
chown -R [-H|-L|-P] owner[:group] filename ...
```

Beispiele:

```
chown bell xxx  
chown bell:root xxx  
chown -R bell:unixsoft dir
```

Solaris:

```
chgrp [ -fhR ] group filename...  
chgrp -R [-f] [-H|-L|-P] groupe filename
```

Beispiele:

```
chgrp mi96 ./*  
chgrp -R mi96 ./*
```

Files anschauen

more

```
more [-cdflsru] [-lines] [+linenumber] [+pattern]
      [ filename ... ]
```

less

```
less -?
less -V
less [-[+]aBcCdeEfgGiImMnNqQrsSuUVwX]
      [-b bufs] [-h lines] [-j line] [-k keyfile]
      [-{oO} logfile] [-p pattern] [-P prompt] [-t tag]
      [-T tagsfile] [-x tab] [-y lines] [-[z] lines]
      [+[[+]cmd] [filename]...
```

head

```
head [ -n ] [ filename...]
```

tail

```
tail +|-number [ lbc ] [ f ] [ filename ]
tail +|-number [ l ] [ rf ] [ filename ]
```

file

```
file [ -f ffile ] [ -cL ] [ -m mfile ] filename...
```

Beispiele:

```
more /etc/passwd
head -1 /etc/passwd
file /*
tail /var/adm/messages
```

File suchen

```
find pathname [!]primary {operator primary} [action]
```

primary

-atime n	Zugriffszeit		+n - mehr als
-mtime n	Modifikationszeit		-n - weniger als
-size n	n Blöcke lang		n - genau
-newer file	Files neuer als <file>		
-type t	Filetype (f,d,c,b,p,l,s)		
-name file	Filename		
-perm p	Zugriffsrechte		p - genau
-user owner	Eigentümer		-4000 - SUID
-group grp	Gruppe		-2000 - GUID
-nouser	Eigentümer nicht in Passwd		
-nogroup	Gruppe nicht in Group		
-xdev	Suchen innerhalb eines Filesystems		

operator

```
-o      oder
-a      und
!      nicht
```

action

```
-print  Filename ausgeben
-ls     ls -lisa <filename>
-exec cmd Kommando ausführen {} - Filename \; - Ende
-ok cmd  Kommando ausführen mit Bestätigung
```

Beispiele:

```
find /usr/bin -perm -4000 -a -user root -ls
find /etc -mtime -2 -print
find /usr3 -name core -print -exec rm {} \;
find /usr3 -name \*.c -print
```

File suchen(2):

```
linux
locate [-d path | --database=path] [-e | --existing]
       [-i | --ignore-case ] [--version] [--help] pattern...
```

```
-d    Datenbasis
-e    nur existierende werden angezeigt (Datenbasis)
-i    Groß- und Kleinschreibung ignorieren
```

updatedb muß vorher laufen!!

Beispiele:

```
locate pcmcia
locate -i yast
```

Bearbeiten/Filtern:

```
sed [ -n ] [ -e script ] [ -f sfilename ] [ filename ]...
```

```
awk [ -f program-file ] [ -Fc ] [ program ]
     [ variable=value ... ] [ filename...]
```

Beispiel:

BSD

```
kill -15 `ps -aux | awk '$1=="mueller" {print $2}` ``
```

System V

```
kill -15 `ps -efa | awk '$1=="bell" {print $2}` ``
```

Kommunikation mit Nutzern

mail:

```

/bin/mail [-deHInNUv] [-f [filename | +folder]] [-T file]
        [-u user]
/usr/ucb/Mail [-dFinUv] [-h number] [-r address] [-s subject]
        recipient ...
/usr/bin/mailx [-BdFintUv~] [-b bcc] [-c cc] [-s subject]
        recipient
/usr/bin/mail [-BDFintv~] [-s subject] [-a attachment ]
        [-c cc-addr] [-b bcc-addr] [-r from-addr]
        [-h hops] [-A account] to-addr

```

get-mail-list: Erzeugen einer Mail-Liste aus /etc/group

```

#!/bin/sh
echo get-mail-list for $1
number=`grep $1:: /etc/group | awk -F: '{ print $3 }' `
grep :$number: /etc/netpasswd/passwd | \
        awk -F: ' { print $1 } ' | sort > $1

```

send-mail: Senden einer Mail mit Hilfe einer Mail-Liste

```

#!/bin/sh
if [ $# != 3 ]
then
    echo "usage:" $0 "<mail-list> <subject> <mail>"
    exit 1
fi
echo send mail $1 to $3
echo mail to `cat $3`
/usr/bin/mailx -s "$2" `cat $3` < $1

```

mit Datenschutz:

```
#!/bin/sh
if [ $# != 3 ]
then
    echo "usage:" $0 "<mail-list> <subject> <mail>"
    exit 1
fi
echo send mail $1 to $3
for i in `cat $3`
do
    echo mail to $i
    /usr/bin/mailx -s "$2" $i < $1
done
```

Weitere Kommunikationsmöglichkeiten:

```
write bell ttyp0      (local user)
write bell@bellus    (remote)
                    (writesrv muss aktiviert sein)

talk bell@bellus     (remote)
```


Hardware anschauen:

AIX: `lscfg -v`

Solaris: `dmesg`
`prtconf`
`prtdiag`
`sysdef`
`getdev`
`devinfo -i /dev/rdisk/clt0d0s0`
`devattr -v /dev/rdisk/clt0d0s0`
`psrinfo` - Prozessorinformationen
`cfgadm -al`
`dpcli`
`mpathadm`

Linux: `lspci` - pci-bus
`hwinfo` - Hardware-Informationen
(`cardctl` - PCMCIA-Karten)
(`scsi_info` - SCSI-Geräte)
(`ide_info`)
`lsdev`
`getsysinfo`

Software Anschauen:

Solaris: `pkginfo`

Linux: `rpm -qa`