

Debian/GNU Linux

Working on a Command Line

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November 19, 2009



1 General

2 man

3 ps-top

4 find

5 du/df

6 user-env

7 dpkg

8 account

9 The Shell

Agenda

1 General

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3 ps-top

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Working on a command line

i.e. working in a shell

Summary

- you work in a terminal window on the console
- starting the terminal window KDE:
 - Kmenu: System: Terminal Program (Konsole)
 - Kmenu: Utilities: Terminal / Root Terminal
- more terminal programs are available
 - **konsole** (KDE), **gnome-terminal** (gnome), **xterm** the original X terminal
- connecting remotely to a terminal window (to a computer)
 - from a MS Windows computer by SSH (ssh.com, putty)
 - from other Linux/Unix/Mac computer:
 - ssh -X -l username computernname
- you are working with a shell in the terminal window

Working on a command line

i.e. working in a shell

Advantages

- common for every Linux/Unix system
- more flexible than a windowing interface
- based on commands you can write (big) shell programs
- according your rights
 - you can start (all) programs on the system
 - you have (full) control on the OS
 - as root user you have the full control without restrictions by GUIs

Most important advantage

- using the command you have full access to all parameters
- no restrictions against GUI represented solution
 - using these access only to programed features is available !!!

Working on a command line

Useful commands: an overview - I

File system

- Manage files:
 - create file (touch); delete file (rm); list file (cat); copy file (cp); move file (mv); compare files (cmp);
- Manage directories:
 - create directory (mkdir); remove empty directory (rmdir); remove directory (rm -r); move directory (mv); copy directory (cp -r); print working directory (pwd); change directory (cd); list directory content (ls);
- Manage attributes:
 - chmod, chown, chgrp, umask;
- Other commands:
 - du, df, ln, mount

Working on a command line

Useful commands: an overview - II

Processes

- kill, killall, nice, ps, sleep, top

User environment

- finger, id, passwd, su, sudo, uptime, w, wall, who, whoami, talk

Text processing

- awk, cut, join, ed, sed, head, tail, less, more, sort, strings, tr, vi, wc

Networking

- netstat, ping, traceroute

Searching

- find, locate, whereis, which; grep

Packaging

- dpkg



Working on a command line

Useful commands: top ten

Useful commands:

- man man; man top; man ps;
- ls -laRtrF (d: directory; -: ordinary files; l: link)
- du -s *
- top - display Linux tasks; htop
- ps - list processes
- kill - kill processes
- find . -name "*pattern*"
 - man find, please check, extreme powerful command
 - find /tmp -name EXP; find / -name "*latex*"
- grep -r -i -v pattern path; egrep; searchmonkey
 - grep process lenny-allpackages.txt | wc
 - grep " processes" software/lenny-allpackages.txt | wc
- difference between OS commands and shell builtin commands !

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Working on a command line

How to get information about commands, files, etc.

Man pages

- if command not known:
 - **man** -k topic (e.g.: man -k file; man -k shell; man -k ls)
- structure of man pages (learn, check: 8 sections)
 - man man; man tty; man 1 tty; man 4 tty;
- xman: graphical tool

Info pages

- another structuring of the information
- man info; info info, etc. (often man page points to info page)

T LDP - The Linux Documentation Project

- <http://www.tldp.org/>
- HOWTOs, GUIDEs, FAQs, Wiki, etc.

Working on a command line

examples: man -k

```
hades:sysadmin!16> man -k "file manager"
```

- | | |
|---------------------|--|
| filerunner (1) | - simple and efficient file manager with FTP |
| fr (1) | - simple and efficient file manager with FTP |
| gnome-commander (1) | - A GNOME file manager |
| konqueror (1) | - Web browser, file manager, ... |
| nautilus (1) | - the GNOME File Manager |

```
hades:sysadmin!17>
```

```
hades:sysadmin!29> man -k "ripper"
```

- | | |
|-------------------|--|
| grip (1) | - A gtk-based cd-player and cd-ripper |
| kaudiocreator (1) | - CD ripper and audio encoder front-end |
| sound-juicer (1) | - GNOME-desktop CD ripper and player using GStreamer |

```
hades:sysadmin!30>
```

Working on a command line

Guides and HowTos

<http://www.tldp.org/guides.html> - some guides in TLDP

- Windows+OpenSolaris+CentOS Installation Guide
 - Explains how three different operating systems can
 - be installed and configured on a single hard disk
- Introduction to Linux - A Hands on Guide
 - an overview of the Linux Operating System
 - an exploration tour and getting started guide

<http://www.tldp.org/HOWTO/pdf/> - some HowTos

- Home-Network-mini-HOWTO.pdf
- Networking-Overview-HOWTO.pdf
- Printing-HOWTO.pdf
- etc.

Working on a command line

Usefull commands: ls

ls -laRtrFd

- l: use a long listing format
 - first character in the list entry:
 - d: directory; -:ordinary files; l: link;
- a: do not ignore entries starting with .
- R: list subdirectories recursively
- t: sort by modification time
- r: reverse order while sorting
- F: append indicator (one of */=>@|) to entries
- d: list directory entries instead of contents
- 1: list one file per line
- and a lot of other parameters

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Working on a command line

Usefull commands: top

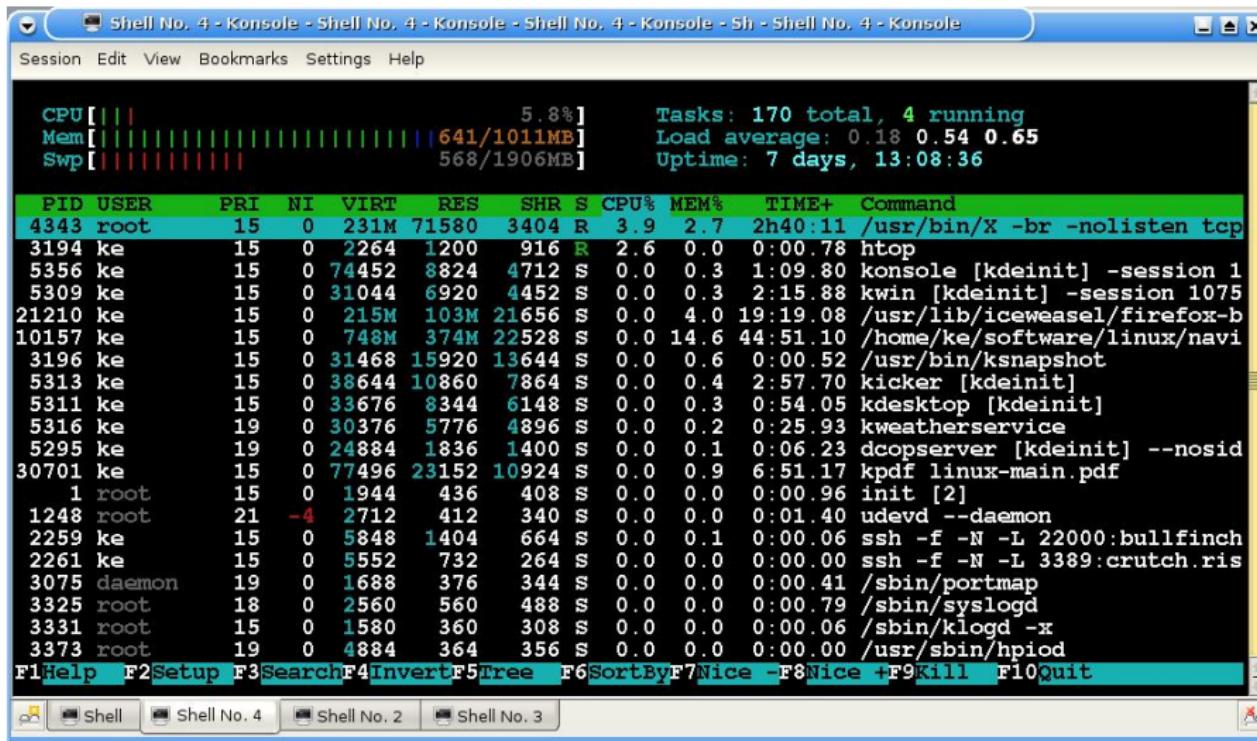
top - display Linux tasks

```
top - 10:34:51 up 3 days, 5:15, 2 users, load average: 0.09, 0.06, 0
Tasks: 125 total, 2 running, 123 sleeping, 0 stopped, 0 zombie
Cpu(s): 2.2%us, 0.2%sy, 0.0%ni, 97.7%id, 0.0%wa, 0.0%hi, 0.0%si,
Mem: 1034352k total, 1002484k used, 31868k free, 228300k buffer
Swap: 3028212k total, 51428k used, 2976784k free, 260068k cached
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
9840	craab	20	0	179m	98m	17m	S	5	9.7	104:16.82	Mathematica
8123	craab	20	0	89908	6040	2884	S	1	0.6	14:14.38	gnome-terminal
18956	root	20	0	2888	688	540	S	1	0.1	0:01.06	dirmngr
26613	sysadmin	20	0	2356	1168	920	R	1	0.1	0:00.12	top
8117	craab	20	0	35348	27m	2888	S	0	2.7	7:40.05	Xvnc4
9847	craab	20	0	223m	64m	12m	S	0	6.4	17:37.62	MathKernel
9990	craab	20	0	435m	33m	8748	S	0	3.3	15:14.87	java

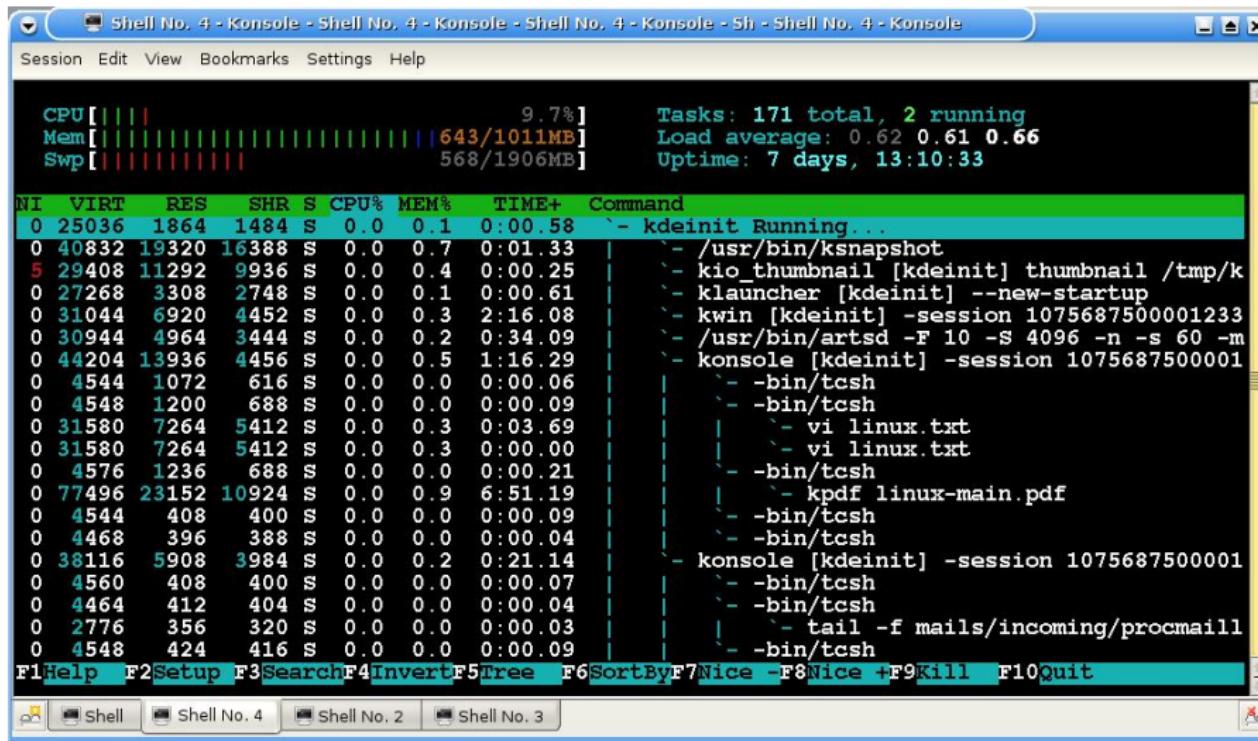
Working on a command line

Usefull commands: htop - basic view



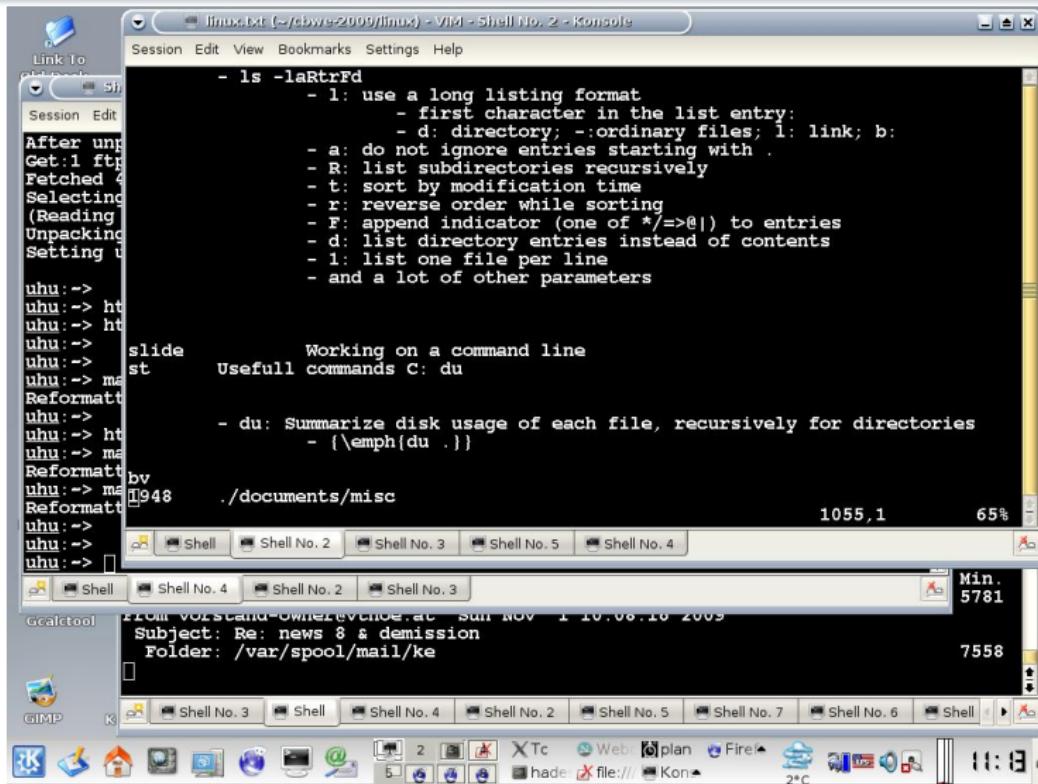
Working on a command line

Usefull commands: htop - tree view of processes



Working on a command line

Working environment of KE:



Working on a command line

Usefull commands: ps - the help page of ps

The screenshot shows a KDE desktop environment with a Konsole window titled "Shell No. 2 - Konsole". The window contains the help output for the ps command, which is organized into several sections:

- simple selection**:
 - A all processes
 - N negate selection
 - a all w/ tty except session leaders
 - d all except session leaders
 - e all processes
 - T all processes on this terminal
 - a all w/ tty, including other users
 - g OBSOLETE -- DO NOT USE
 - r only running processes
 - x processes w/o controlling ttys
- output format**:
 - o,o user-defined
 - j,j job control
 - O,O preloaded
 - l,l long
 - F extra full
- misc options**:
 - V,V show version
 - m,m,-L,-T,H threads
 - M,Z security data
 - w,w wide output
- selection by list**:
 - C by command name
 - G by real group ID (supports names)
 - U by real user ID (supports names)
 - g by session OR by effective group name
 - p by process ID
 - s processes in the sessions given
 - t by tty
 - u by effective user ID (supports names)
 - U processes for specified users
 - t by tty
- long options**:
 - Group
 - User
 - pid
 - cols
 - ppid
 - group
 - user
 - sid
 - rows
 - info
 - cumulative
 - format
 - deselect
 - sort
 - tty
 - forest
 - version
 - heading
 - no-heading
 - context

At the bottom of the help output, there is a line: "uhu:~> █".

The Konsole window has tabs at the bottom labeled "Shell", "Shell No. 3", and "Shell No. 2". The "Shell No. 2" tab is currently active.



Working on a command line

Usefull commands: ps - an example

ps auxw: To see every process on the system (BSD like format)

USER	PID	%CPU	%MEM	VSZ	RSS	TTY	STAT	START	TIME	COMMAND
craab	9840	2.4	9.9	186784	103100	pts/1	S1	Oct29	110:17	/zvol/mathematica/mathematica-7.0/SystemFiles/FrontEnd/Binaries/Li
root	4197	0.0	0.0	8736	828	?	Ss	Oct29	0:05	sendmail: MTA: accepting connections
craab	14143	0.2	0.1	2480	1204	pts/1	S+	Oct29	10:36	top

ps auxw | grep sysadmin

root	27329	0.0	0.2	9372	2972	?	Ss	12:35	0:00	sshd:
sysadmin	27336	0.0	0.1	9372	1612	?	S	12:35	0:00	sshd:
sysadmin	27337	0.0	0.2	4644	2328	pts/2	Ss	12:35	0:00	-tcsh
sysadmin	27494	0.0	0.0	2396	952	pts/2	R+	12:50	0:00	ps aux
sysadmin	27495	0.0	0.0	1832	540	pts/2	S+	12:50	0:00	grep s

Working on a command line

Usefull commands: kill

Terminate processes: kill, killall (/bin/kill)

- kill -TERM proc-ID (sends the terminate signal)
- kill -KILL proc-ID (sends the KILL signal)
 - this signal may not be blocked
- KILL or 9 (numeric values available)
- /bin/kill is the path for this program

shell builtin command: kill [-s signal] job | pid

- signals are identical of the /bin/kill program
- you can kill jobs, too.
- default signal is TERM (terminate)
- examples:
 - kill %1; kill PID; kill -9 PID

Working on a command line

Usefull commands: kill - how to kill jobs

```
uhu:~/cbwe-2009/linux> kpdf linux-main.pdf &
[1] 14338
uhu:~/cbwe-2009/linux>
uhu:~/cbwe-2009/linux> kpdf ~/CBWE-certificatespdfpreview.pdf
```

Suspended

```
uhu:~/cbwe-2009/linux> bg
[2]    kpdf ~/CBWE-certificatespdfpreview.pdf &
uhu:~/cbwe-2009/linux>
uhu:~/cbwe-2009/linux> jobs
[1] + Running                      kpdf linux-main.pdf
[2]    Running                      kpdf ~/CBWE-certificatespdfpreview.pdf
uhu:~/cbwe-2009/linux>
uhu:~/cbwe-2009/linux> kill %2
uhu:~/cbwe-2009/linux>
[2]    Terminated                  kpdf ~/CBWE-certificatespdfpreview.pdf
uhu:~/cbwe-2009/linux>
```

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Working on a command line

Usefull commands: find - the help page

```
Shell - Konsole - Shell - Konsole - Shell - Konsole - Shell - Konsole - Sh - Shell - Konsole
Session Edit View Bookmarks Settings Help
Usage: find [path...] [expression]

default path is the current directory; default expression is -print
expression may consist of: operators, options, tests, and actions:

operators (decreasing precedence; -and is implicit where no others are given):
  ( EXPR )    ! EXPR    -not EXPR    EXPR1 -a EXPR2    EXPR1 -and EXPR2
  EXPR1 -o EXPR2    EXPR1 -or EXPR2    EXPR1 , EXPR2

normal options (always true, specified before other expressions):
  -depth --help -maxdepth LEVELS -mindepth LEVELS -mount -noleaf
  --version -xdev -ignore_readdir_race -noignore_readdir_race

tests (N can be +N or -N or N):
  -amin N -anewer FILE -atime N -cmin N
  -cnewer FILE -ctime N -empty -false -fstype TYPE -gid N -group NAME
  -ilname PATTERN -iname PATTERN -inum N -iwholename PATTERN -iregex PATTERN
  -links N -lname PATTERN -mmin N -mtime N -name PATTERN -newer FILE
  -nouser -nogroup -path PATTERN -perm [+|-]MODE -regex PATTERN
  -wholename PATTERN -size N[bckwMG] -true -type [bcdpfslD] -uid N
  -used N -user NAME -xtype [bcdpfsl]

actions: -delete -print0 -printf FORMAT -fprintf FILE FORMAT -print
        -fprint0 FILE -fprint FILE -ls -fls FILE -prune -quit
        -exec COMMAND ; -exec COMMAND {} + -ok COMMAND ;
        -execdir COMMAND ; -execdir COMMAND {} + -okdir COMMAND ;
uhu:~> █
```

Working on a command line

Usefull commands: find

find command

- By default, find returns all files below the current directory
- allows user to specify an action to be taken on each matched file
- extremely powerful program for applying actions to many files

find [-H] [-L] [-P] [path...] [expression]

- At least one path must precede the expression
- capable of interpreting wildcards internally
- commands must be constructed carefully in order to control shell globbing
- supports regex matching; expression elements are whitespace-separated and evaluated from left to right
- by default, find executes the '-print' action
- The GNU find has a large number of additional features not specified by POSIX.

Working on a command line

Usefull commands: examples of find

```
find . -name "*mp3"
```

```
./mp3-what/csendes.mp3  
./.gnome/Gnomp3  
./private/DanielGerard-Butterfly.mp3
```

- searches current directory (represented by a period) and below it
- the quotes avoid the shell expansion

```
find . -size 15M
```

```
./skype-debian_2.0.0.72-1_i386.deb  
.mails-mails-lists/2006/greifvoegel-1  
.mails/spam-last-part  
.nature-docs/at/arge-orni/00e-BVAtlas-methode.pdf
```

Working on a command line

Usefull commands: examples of find

```
find . -size 15M -exec ls -l {} \;
```

```
-rw-r--r-- 1 ke ke 15504764 2009-08-27 10:45 ./skype-debian_2.0.0.72-1_
-rw-rw-r-- 1 ke ke 15037423 2006-12-31 23:32 ./mails/mail-lists/2006/g
-rw-r--r-- 1 ke ke 14970181 2007-03-30 10:14 ./mails/spam-last-part
-rw----- 1 ke ke 14965394 2005-06-14 11:41 ./nature-docs/at/arge-orni
```

parameter

- {} means: replacing {} with the name of the file
- the semicolon indicates the end of the command
 - backslashed to avoid the shell interpreting it as a command separator

find

```
find /scratch/ke -name "*.mp3" -type f -exec chmod 400 {} \;
```

Working on a command line

Usefull commands: examples of find

```
uhu:~/cbwe-2009/linux> find . -name "*toc" -print  
./linux-2-main.toc  
./linux-main.toc  
uhu:~/cbwe-2009/linux>
```

```
uhu:~/cbwe-2009/linux> find . -name "*toc" -exec ls -l {} \;  
-rw-r--r-- 1 ke ke 267 2009-11-02 12:03 ./linux-2-main.toc  
-rw-r--r-- 1 ke ke 388 2009-11-13 20:41 ./linux-main.toc  
uhu:~/cbwe-2009/linux>
```

```
uhu:~/cbwe-2009/linux> find . -name "*toc" -exec ls {} \;  
./linux-2-main.toc  
./linux-main.toc  
uhu:~/cbwe-2009/linux>
```

Working on a command line

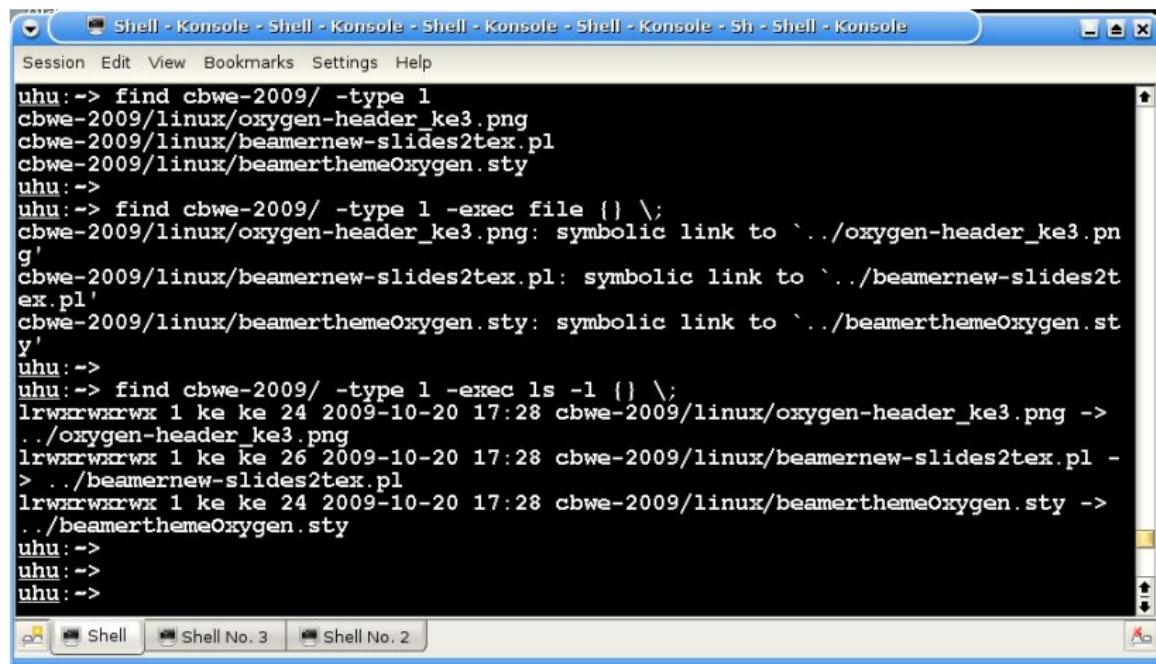
Usefull commands: examples of find

```
uhu:~/cbwe-2009/linux> find . -name "*toc" -exec ls \;
archive                      linux-2-main.tex    linux-main.tex
beamernew-slides2tex.pl      linux-2-main.toc   linux-main.toc
beamertHEMEoxygen.sty        linux-2-main.vrb   linux-main.vrb
cancelled-parts.txt          linux-2.tex       linux.tex
compile                       linux-2.txt       linux.txt
compile-2                     linux-body.tex   oxygen-header_ke3.png
linux-2-main.nav              linux-main.nav   pictures
linux-2-main.pdf              linux-main.pdf   twocol
linux-2-main.snm              linux-main.snm
archive                      linux-2-main.tex    linux-main.tex
beamernew-slides2tex.pl      linux-2-main.toc   linux-main.toc
beamertHEMEoxygen.sty        linux-2-main.vrb   linux-main.vrb
cancelled-parts.txt          linux-2.tex       linux.tex
compile                       linux-2.txt       linux.txt
compile-2                     linux-body.tex   oxygen-header_ke3.png
linux-2-main.nav              linux-main.nav   pictures
linux-2-main.pdf              linux-main.pdf   twocol
linux-2-main.snm              linux-main.snm
```

Working on a command line

Usefull commands: examples of find

```
find cbwe-2009/ -type l -exec file {} \;
```



The screenshot shows a terminal window titled "Shell - Konsole". The window contains the following text:

```
Session Edit View Bookmarks Settings Help
uhu:~> find cbwe-2009/ -type l
cbwe-2009/linux/oxygen-header_ke3.png
cbwe-2009/linux/beamernew-slides2tex.pl
cbwe-2009/linux/beamerthemeOxygen.sty
uhu:~>
uhu:~> find cbwe-2009/ -type l -exec file {} \;
cbwe-2009/linux/oxygen-header_ke3.png: symbolic link to `../oxygen-header_ke3.png'
cbwe-2009/linux/beamernew-slides2tex.pl: symbolic link to `../beamernew-slides2tex.pl'
cbwe-2009/linux/beamerthemeOxygen.sty: symbolic link to `../beamertHEMEoxygen.sty'
uhu:~>
uhu:~> find cbwe-2009/ -type l -exec ls -l {} \;
lrwxrwxrwx 1 ke ke 24 2009-10-20 17:28 cbwe-2009/linux/oxygen-header_ke3.png ->
./oxygen-header_ke3.png
lrwxrwxrwx 1 ke ke 26 2009-10-20 17:28 cbwe-2009/linux/beamernew-slides2tex.pl ->
./beamernew-slides2tex.pl
lrwxrwxrwx 1 ke ke 24 2009-10-20 17:28 cbwe-2009/linux/beamertHEMEoxygen.sty ->
./beamertHEMEoxygen.sty
uhu:~>
uhu:~>
uhu:~>
```

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Working on a command line

Usefull commands: du

du: Summarize disk usage of each file, recursively for directories

- **du .** (for the current directory)

```
1948    ./documents/misc
1572    ./documents/bva-docs
38524   ./documents/books/from-GG
2820    ./documents/books/linux
120     ./documents/books/digi-foto/macro_files
```

- **du -s path**

- display only a total for each argument (., *, name)

```
uhu:~> du -s documents/
481452  documents/
uhu:~>
```

- **du -s .***

- display total for the hidden dot-directories (.?* .??*)

Working on a command line

Usefull commands: df - report file system disk space usage

```
hades:sysadmin!5> df
```

Filesystem	1K-blocks	Used	Available	Use%	Mounted on
/dev/hda1	14421344	11933544	1755240	88%	/
tmpfs	513564	0	513564	0%	/lib/init/rw
udev	10240	716	9524	7%	/dev
tmpfs	513564	0	513564	0%	/dev/shm
/dev/hda5	22643764	20763036	730476	97%	/zlocal/hda5
atlantis:/zlocal/sdb7/sysadmin	15377920	12132608	2464256	84%	/home/sysadmin
atlantis:/zlocal/sda8/maple	15377920	10851840	3745024	75%	/zvol/maple
atlantis:/zlocal/sda6/mathematica	15377920	11300864	3296000	78%	/zvol/mathematica
hades:sysadmin!6>					

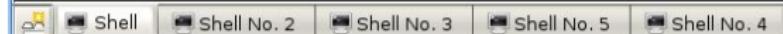
Working on a command line

Usefull commands: df - the help page

```
Shell - Konsole <2>
Session Edit View Bookmarks Settings Help
uhu:~/cbwe-2009/org> df --help
Usage: df [OPTION]... [FILE]...
Show information about the file system on which each FILE resides,
or all file systems by default.

Mandatory arguments to long options are mandatory for short options too.
-a, --all           include dummy file systems
-B, --block-size=SIZE use SIZE-byte blocks
-h, --human-readable print sizes in human readable format (e.g., 1K 234M 2G)
-H, --si            likewise, but use powers of 1000 not 1024
-i, --inodes        list inode information instead of block usage
-k                  like --block-size=1K
-l, --local         limit listing to local file systems
--no-sync          do not invoke sync before getting usage info (default)
-P, --portability   use the POSIX output format
--sync              invoke sync before getting usage info
-t, --type=TYPE     limit listing to file systems of type TYPE
-T, --print-type    print file system type
-x, --exclude-type=TYPE limit listing to file systems not of type TYPE
-v                  (ignored)
--help              display this help and exit
--version           output version information and exit

SIZE may be (or may be an integer optionally followed by) one of following:
KB 1000, K 1024, MB 1000*1000, M 1024*1024, and so on for G, T, P, E, Z, Y.
```



Working on a command line

Usefull commands: examples of **df**

```
hades:sysadmin!6> df -l
```

Filesystem	1K-blocks	Used	Available	Use%	Mounted on
/dev/hda1	14421344	11933544	1755240	88%	/
tmpfs	513564	0	513564	0%	/lib/init/rw
udev	10240	716	9524	7%	/dev
tmpfs	513564	0	513564	0%	/dev/shm
/dev/hda5	22643764	20763036	730476	97%	/zlocal/hda5

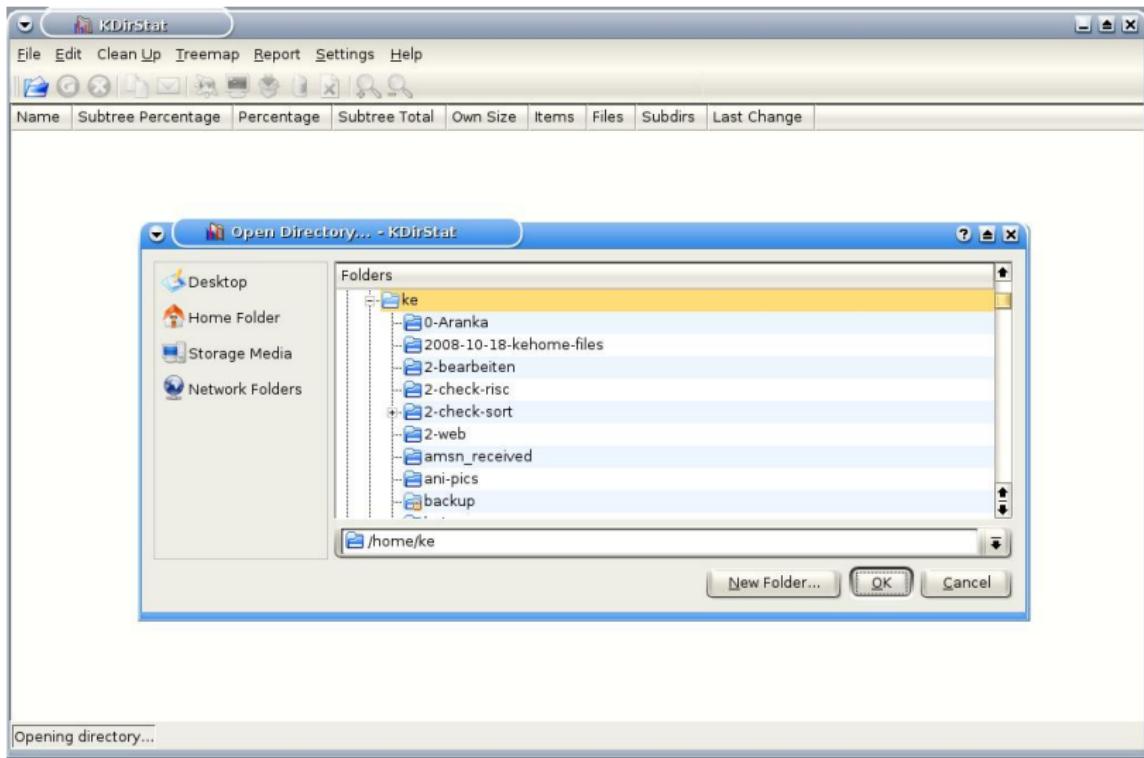
```
hades:sysadmin!7> df -l -h
```

Filesystem	Size	Used	Avail	Use%	Mounted on
/dev/hda1	14G	12G	1.7G	88%	/
tmpfs	502M	0	502M	0%	/lib/init/rw
udev	10M	716K	9.4M	7%	/dev
tmpfs	502M	0	502M	0%	/dev/shm
/dev/hda5	22G	20G	714M	97%	/zlocal/hda5

```
hades:sysadmin!8>
```

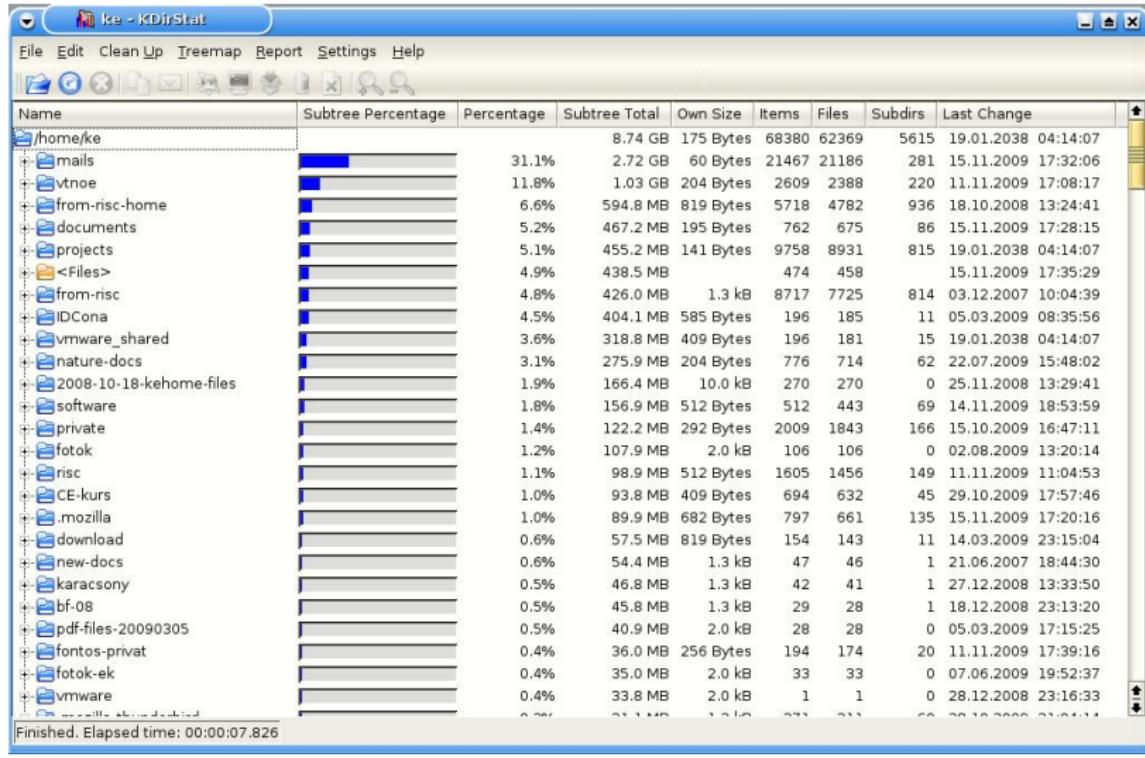
Working on a command line

Kdirstat - graphical view of the disk usage - the start screen



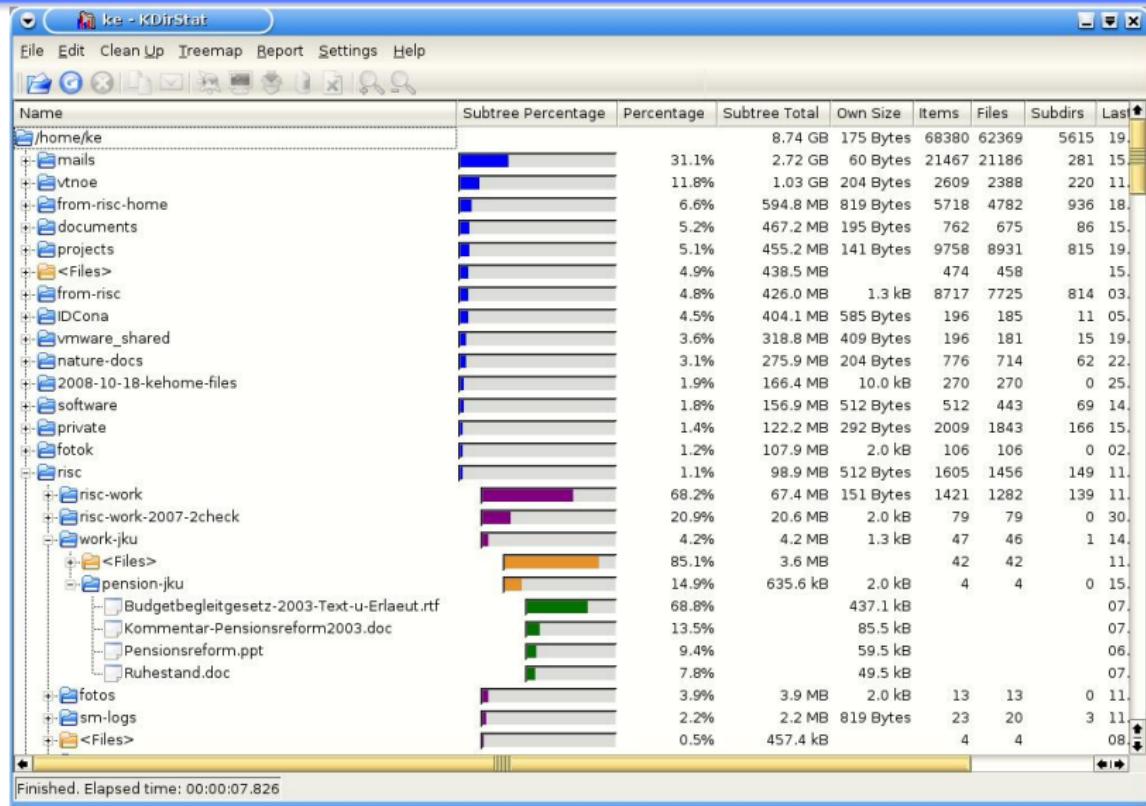
Working on a command line

Kdirstat



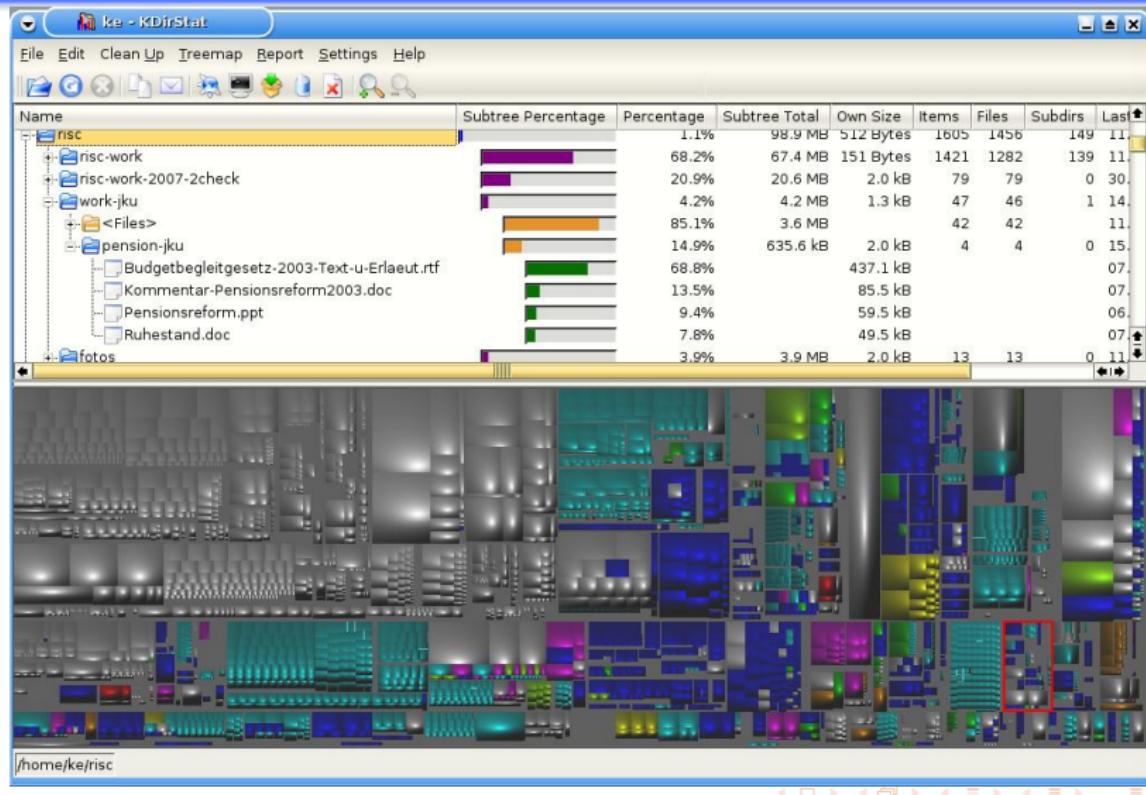
Working on a command line

Kdirstat



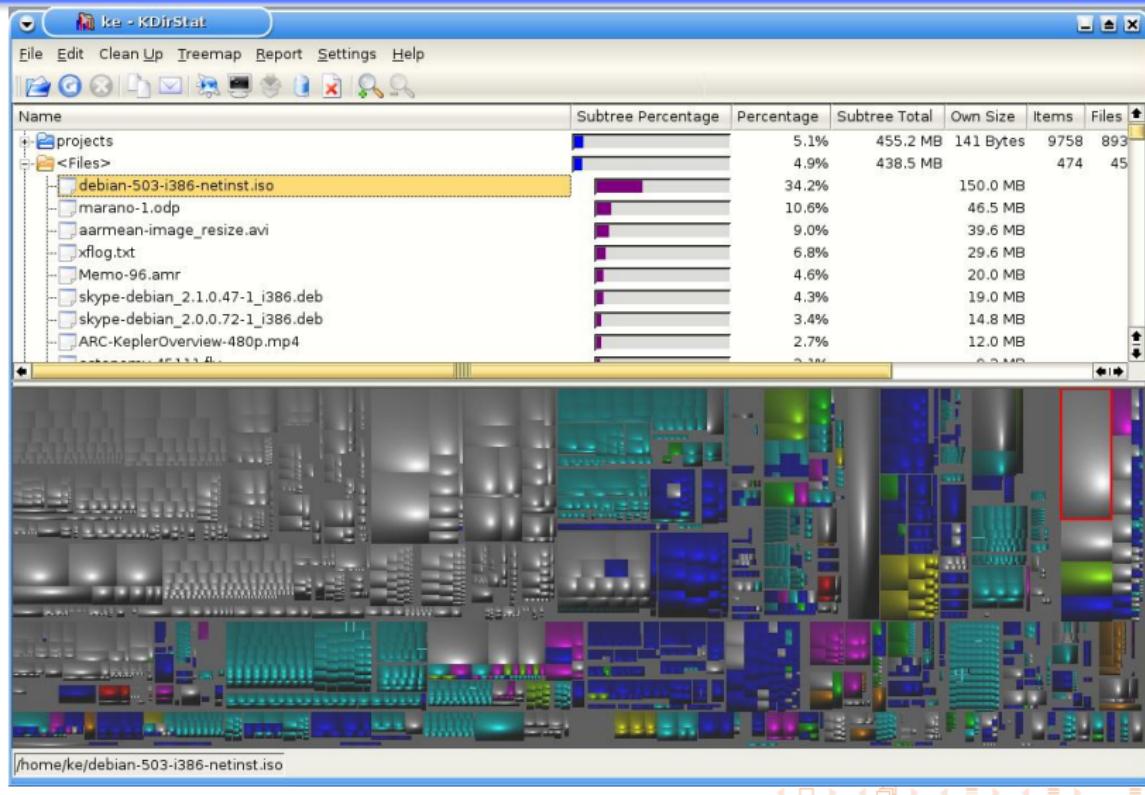
Working on a command line

Kdirstat



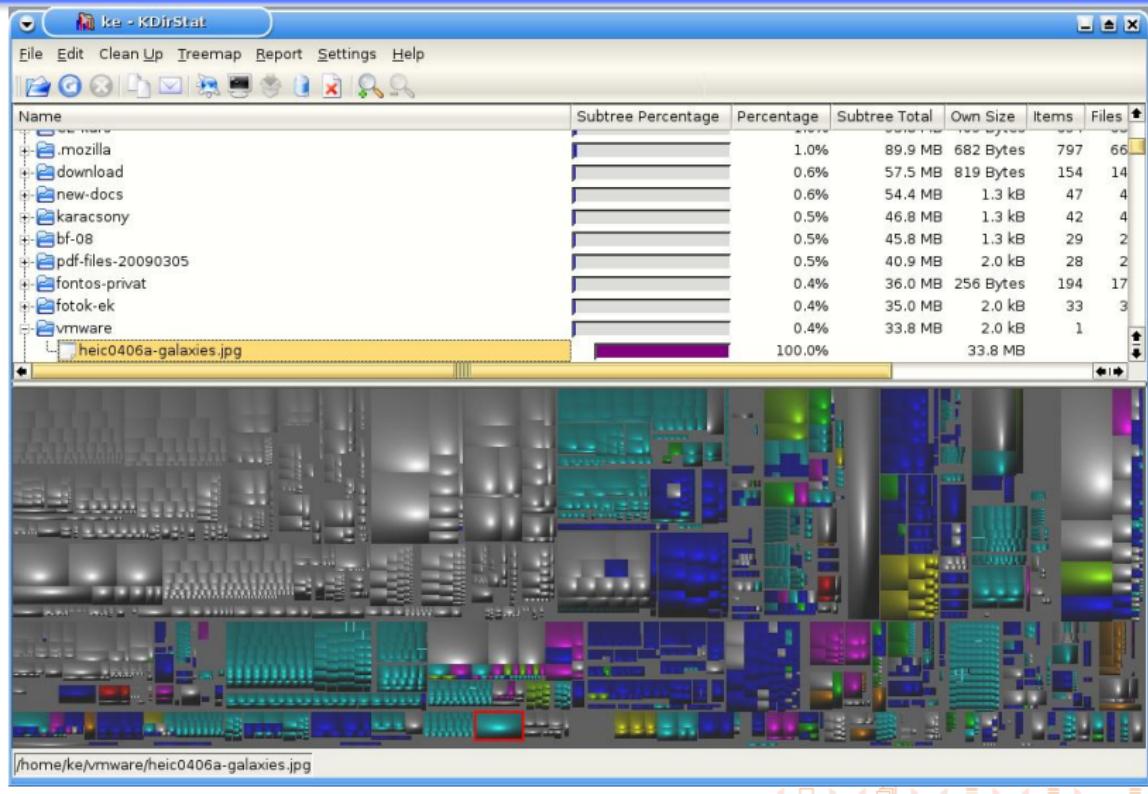
Working on a command line

Kdirstat



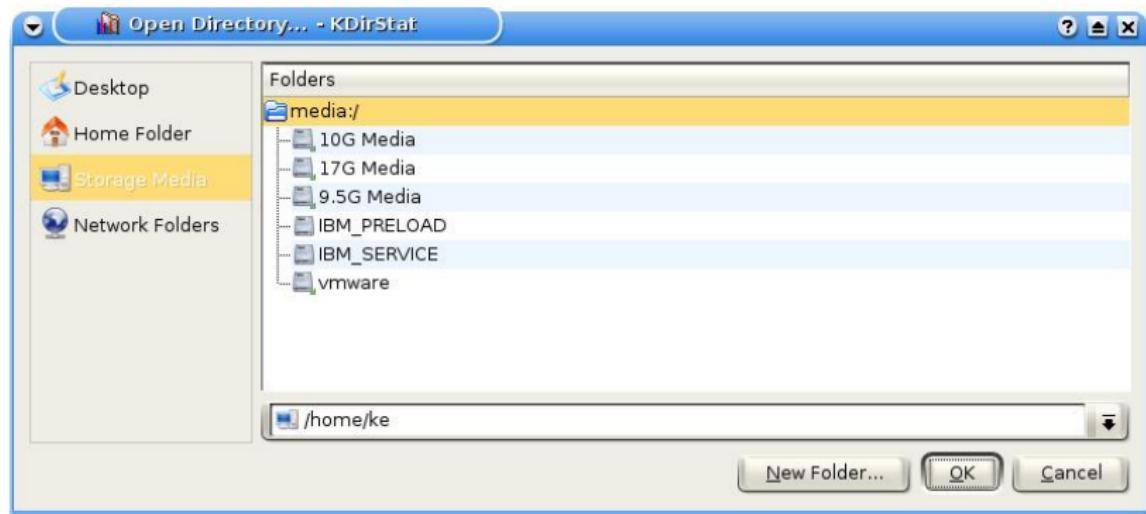
Working on a command line

Kdirstat



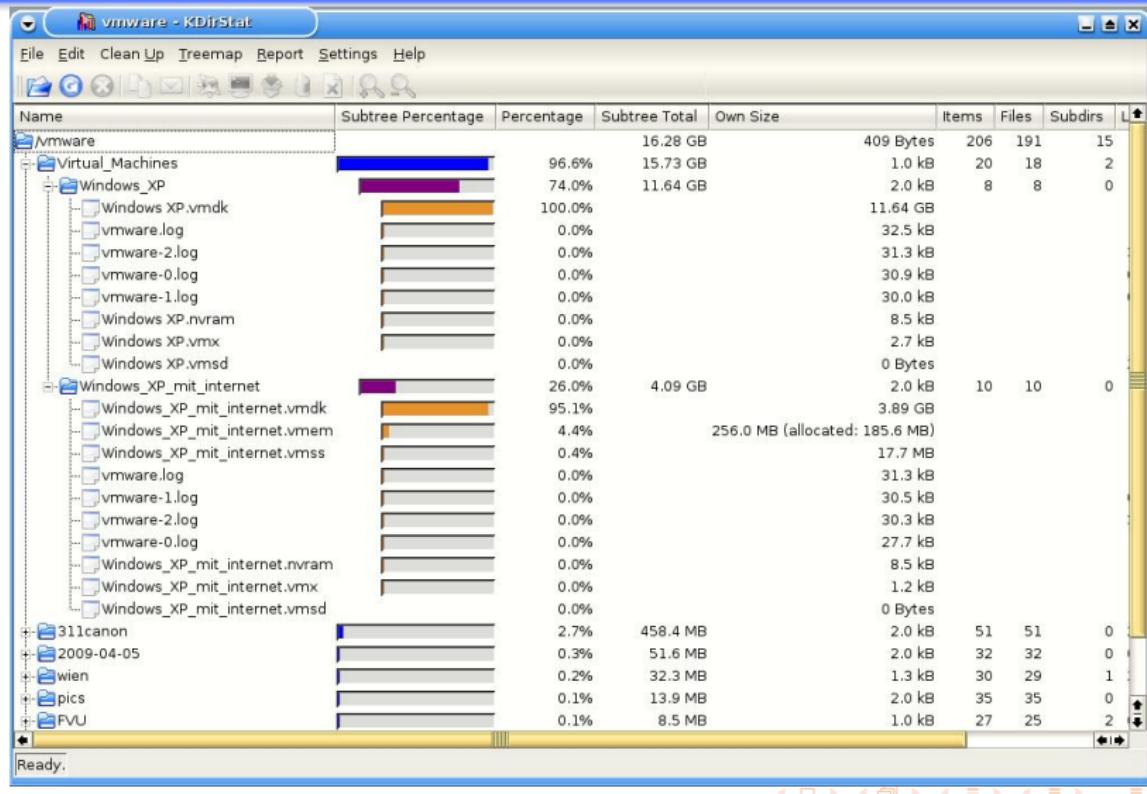
Working on a command line

Kdirstat



Working on a command line

Kdirstat



Agenda

1 General

2 man

3 ps-top

4 find

5 du/df

6 user-env

7 dpkg

8 account

Working on a command line

Commands in the user environment

The commands: finger and id

■ finger [username][host]

- without arguments, prints an entry for each user currently logged in

```
uhu:~> finger
```

Login	Name	Tty	Idle	Login Time	Office
ke	Karoly Erdei	*:0		Nov 19 12:19	
ke	Karoly Erdei	pts/19		Nov 22 19:41	(:0.0)

■ id [username] (print user identity)

```
hades:sysadmin!15> id cdoench
```

```
uid=10256(cdoench) gid=10020(risc) groups=10020(risc)
```

```
hades:sysadmin!16> id doench
```

```
uid=13144(doench) gid=13144(doench) groups=13144(doench),  
10030(student)
```

```
hades:sysadmin!17> id
```

```
uid=10030(sysadmin) gid=10017(sysadmin) groups=4(adm),  
10017(sysadmin),10019(webadmin),10020(risc),10060(software),  
10080(info),10738(webpr),10745(sag),10746(video)
```

```
hades:sysadmin!14>
```



Working on a command line

Commands in the user environment

Commands: uptime and who

- **uptime** - Tell how long the system has been running

```
uhu:~> uptime
19:51:40 up 3 days, 7:33, 2 users, load average: 0.11, 0.16, 0.
uhu:~>
```

- **who** - show who is logged on

```
gonzales:sysadmin!2> who
cschneid pts/1          Nov 18 11:58 (ozelot.risc.uni-linz.ac.at)
cschneid pts/0          Nov 18 12:06 (ozelot.risc.uni-linz.ac.at)
cschneid pts/2          Nov 18 12:11 (ozelot.risc.uni-linz.ac.at)
cschneid pts/3          Nov 19 15:33 (ozelot.risc.uni-linz.ac.at)
cschneid pts/4          Nov 18 13:52 (ozelot.risc.uni-linz.ac.at)
cdoench pts/5          Nov 20 09:50 (dog.risc.uni-linz.ac.at)
mkauers pts/6          Nov 21 12:01 (fennek.risc.uni-linz.ac.at)
fstan pts/7          Nov 22 11:30 (ap164144.wlan.jku.at)
cschneid pts/8          Nov 22 15:21 (ozelot.risc.uni-linz.ac.at)
sysadmin pts/9          Nov 22 19:54 (hades.risc.uni-linz.ac.at)
gonzales:sysadmin!3>
```



Working on a command line

Commands in the user environment - the help page of who

The screenshot shows a terminal window titled "shell No. 2 - Konsole". The window contains the help output for the "who" command. The text is as follows:

```
uhu:~> who --help
Usage: who [OPTION]... [ FILE | ARG1 ARG2 ]
-a, --all           same as -b -d --login -p -r -t -T -u
-b, --boot          time of last system boot
-d, --dead          print dead processes
-H, --heading       print line of column headings
--ips              print ips instead of hostnames. with --lookup,
                  canonicalizes based on stored IP, if available,
                  rather than stored hostname
-l, --login         print system login processes
--lookup           attempt to canonicalize hostnames via DNS
-m                only hostname and user associated with stdin
-p, --process      print active processes spawned by init
-q, --count         all login names and number of users logged on
-r, --runlevel     print current runlevel
-s, --short         print only name, line, and time (default)
-t, --time          print last system clock change
-T, -w, --mesg     add user's message status as +, - or ?
-u, --users         list users logged in
--message          same as -T
--writable         same as -T
--help             display this help and exit
--version          output version information and exit
If FILE is not specified, use /var/run/utmp. /var/log/wtmp as FILE is common.
If ARG1 ARG2 given, -m presumed: 'am i' or 'mom likes' are usual.
```

The window has multiple tabs at the bottom: "Shell No. 3", "Shell No. 2", "Shell", and "Shell No. 4". The "Shell No. 2" tab is currently active. At the bottom right, there are several small icons for navigating between tabs and windows.

Working on a command line

Commands in the user environment

w - Show who is logged on and what they are doing

```
gonzales:sysadmin!1> w
```

USER	TTY	FROM	LOGIN@	IDLE	JCPU	PCPU	WHAT
cschneid	pts/1	ozelot.risc.uni-	Wed11	32:45	2:54m	3.96s	top
cschneid	pts/0	ozelot.risc.uni-	Wed12	24:29m	13:44	0.06s	-tcsh
cschneid	pts/2	ozelot.risc.uni-	Wed12	24:32m	33:40	0.12s	-tcsh
cschneid	pts/3	ozelot.risc.uni-	Thu15	2:23m	4:35m	0.32s	tail -f
cschneid	pts/4	ozelot.risc.uni-	Wed13	24:27m	4:41m	0.68s	-tcsh
cdoench	pts/5	dog.risc.uni-lin	Fri09	2days	0.20s	0.20s	-tcsh
mkauers	pts/6	fennek.risc.uni-	Sat12	31:52m	1:25	1:24	top
fstan	pts/7	ap164144.wlan.jk	11:30	50:48	50.24s	50.22s	top
cschneid	pts/8	ozelot.risc.uni-	15:21	4:16m	4:17m	0.16s	-tcsh
sysadmin	pts/9	hades.risc.uni-l	19:54	0.00s	0.02s	0.00s	w

```
gonzales:sysadmin!2>
```

Working on a command line

Hardware information - lsusb

lsusb - list USB devices

```
gonzales:sysadmin!5> lsusb
Bus 005 Device 004: ID 04b4:6560 Cypress Semiconductor Corp. CY7C65640
Bus 005 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 003 Device 004: ID 046d:c03f Logitech, Inc. UltraX Optical Mouse
Bus 003 Device 003: ID 413c:2003 Dell Computer Corp. Keyboard
gonzales:sysadmin!6>
```

Working on a command line

Hardware information - lspci

lspci - list all PCI devices (Peripheral Component Interconnect)

```
gonzales:sysadmin!6> lspci
```

```
.....
```

```
00:00.0 Host bridge: Intel Corp. 5000X Chipset Memory Controller Hub
00:02.0 PCI bridge: Intel Corp. 5000 Series Chipset PCI Express x4 Port
00:16.0 Host bridge: Intel Corp. 5000 Series Chipset FBD Registers
00:1c.0 PCI bridge: Intel Corp. 631xESB/3100 Chipset PCI Express Root P
00:1d.0 USB Controller: Intel Corp. 631xESB/3100 Chipset UHCI USB Contr
00:1e.0 PCI bridge: Intel Corp. 82801 PCI Bridge
00:1f.2 IDE interface: Intel Corp. 631xESB/3100 Chipset SATA IDE Contro
01:00.0 RAID bus controller: LSI Logic / Symbios Logic MegaRAID SAS 107
04:00.3 PCI bridge: Intel Corp. 6311ESB/6321ESB PCI Express to PCI-X Br
0b:00.0 Ethernet controller: Broadcom Corp. NetXtreme BCM5721 Gigabit E
0e:0d.0 VGA compatible controller: ATI Technologies Inc ES1000 (rev 02)
```

```
.....
```

Agenda

1 General

2 man

3 ps-top

4 find

5 du/df

6 user-evn

7 dpkg

8 account

Working on a command line

Installing Debian packages

Debian package system

- package structure: main contrib non-free
 - (file name of package ends: **.deb**)
- <http://www.at.debian.org/distrib/packages/>
- <http://packages.debian.org/stable/>
 - get the file: (compact compressed textlist) - allpackages.htm
 - search it with **grep** by keywords for topics

Installing Debian packages (command line)

- apt-get install package-name (as root !)
- use the **aptitude** command (for advanced user)
 - sudo aptitude install package-name (will use a graphical terminal)
- sudo apt-get install searchmonkey

Working on a command line

Installing Debian packages - dpkg - options summary

Install a Debian package: -i

- `sudo dpkg -i skype-debian_2.1.0.47-1_i386.deb`

Search for package name: -s

- `dpkg -s searchmonkey`

Search for file name in all Debian packages: -S

- `dpkg -S /usr/bin/searchmonkey`

List the contents of a Debian package : -L

- `dpkg -L searchmonkey`

List package names: -l

- `dpkg -l "browser"`

Working on a command line

Installing Debian packages - search for a package name

```
Session Edit View Bookmarks Settings Help
uhu:~> dpkg -s searchmonkey
Package: searchmonkey
Status: install ok installed
Priority: optional
Section: utils
Installed-Size: 280
Maintainer: Varun Hiremath <varunhiremath@gmail.com>
Architecture: i386
Version: 0.7.1-1
Depends: libatk1.0-0 (>= 1.12.2), libc6 (>= 2.3.6-6), libcairo2 (>= 1.2.4), libfontconfig1 (>= 2.4.0), libglib2.0-0 (>= 2.12.0), libgtk2.0-0 (>= 2.8.0), libpango1.0-0 (>= 1.14.7), libx11-6, libxcursor1 (>> 1.1.2), libxext6, libxfixes3 (>= 1.4.0.1), libxi6, libxinerama1, libxrandr2, libxrender1
Description: search files using regular expressions aiming to replace find/grep tools
SearchMonkey is a light-weight Gtk application that aims to replace the cumbersome find/grep with a slick user interface that quickly provides a mark-up showing locations and quantity of text matches.
The goal is to provide a simple to use and accessible search tool for end-users, and software developers alike.
Homepage: http://sourceforge.net/projects/searchmonkey/
uhu:~>
uhu:~> [ ]
```



Working on a command line

Installing Debian packages - L list contents, -S search for name

```
uhu:~> dpkg -L searchmonkey
/.
/usr
/usr/bin
/usr/bin/searchmonkey
/usr/share
/usr/share/searchmonkey
/usr/share/searchmonkey/pixmaps
/usr/share/searchmonkey/pixmaps/searchmonkey-32x32.png
/usr/share/doc
/usr/share/doc/searchmonkey
/usr/share/doc/searchmonkey/README
/usr/share/doc/searchmonkey/copyright
/usr/share/doc/searchmonkey/changelog.Debian.gz
/usr/share/man
/usr/share/man/man1
/usr/share/man/man1/searchmonkey.1.gz
uhu:~>
uhu:~>
uhu:~> dpkg -S /usr/bin/searchmonkey
searchmonkey: /usr/bin/searchmonkey
uhu:~>
uhu:~>
uhu:~>
uhu:~> █
```

Working on a command line

Installing Debian packages - list packages

The screenshot shows a terminal window titled "Shell - Konsole - Shell - Konsole - Shell - Konsole - Shell - Konsole - Sh - Shell - Konsole". The window contains the output of the command `dpkg -l "*browser*"`. The output lists various browser-related packages with their status, version, and description. Many packages are marked as having no description available.

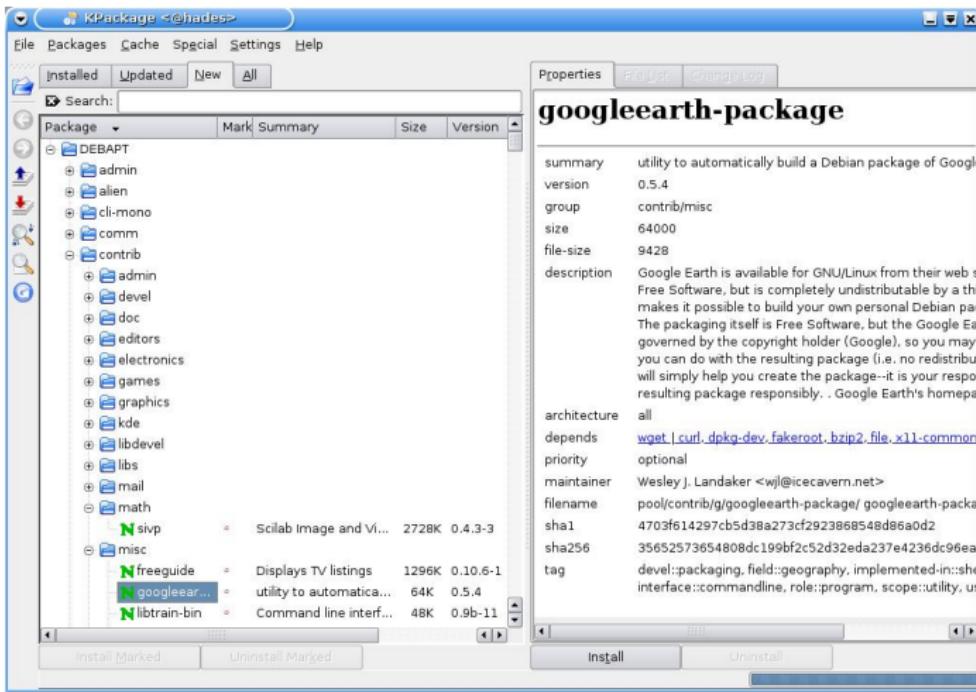
```
usu:~> dpkg -l "*browser*"
Desired=Unknown/Install/Remove/Purge/Hold
| Status=Not/Installed/Config-files/Unpacked/Failed-config/Half-installed
|/ Err?=(none)/Hold/Reinst-required/X=both-problems (Status,Err: uppercase=bad)
||/ Name          Version       Description
+++-+-----+-----+-----+
pn  browser-histor <none>        (no description available)
pn  cbrowser        <none>        (no description available)
ii  epiphany-brows  2.14.3-8     Intuitive GNOME web browser
pn  epiphany-brows <none>        (no description available)
pn  gimp-helpbrows <none>        (no description available)
un  gnome-www-brow <none>        (no description available)
ii  iceape-browser   1.0.13-pre0806 Iceape Navigator (Internet browser) and Comp
un  info-browser    <none>        (no description available)
un  infobrowser     <none>        (no description available)
un  java-browser-p  <none>        (no description available)
pn  libhttp-browse  <none>        (no description available)
un  man-browser     <none>        (no description available)
un  midbrowser      <none>        (no description available)
pn  monodoc-browse  <none>        (no description available)
ii  mozilla-browse  1.8+1.0.13-pre Transition package for Iceape Navigator and
un  mozilla-browse  <none>        (no description available)
ii  mysql-query-br   1.2.5beta-3  Official GUI tool to query MySQL database
ii  mysql-query-br   1.2.5beta-3  Architecture independent files for MySQL Que
un  mythbrowser     <none>        (no description available)
```

At the bottom of the terminal window, there are three tabs labeled "Shell No. 3", "Shell No. 2", and "Shell".

Working on a command line

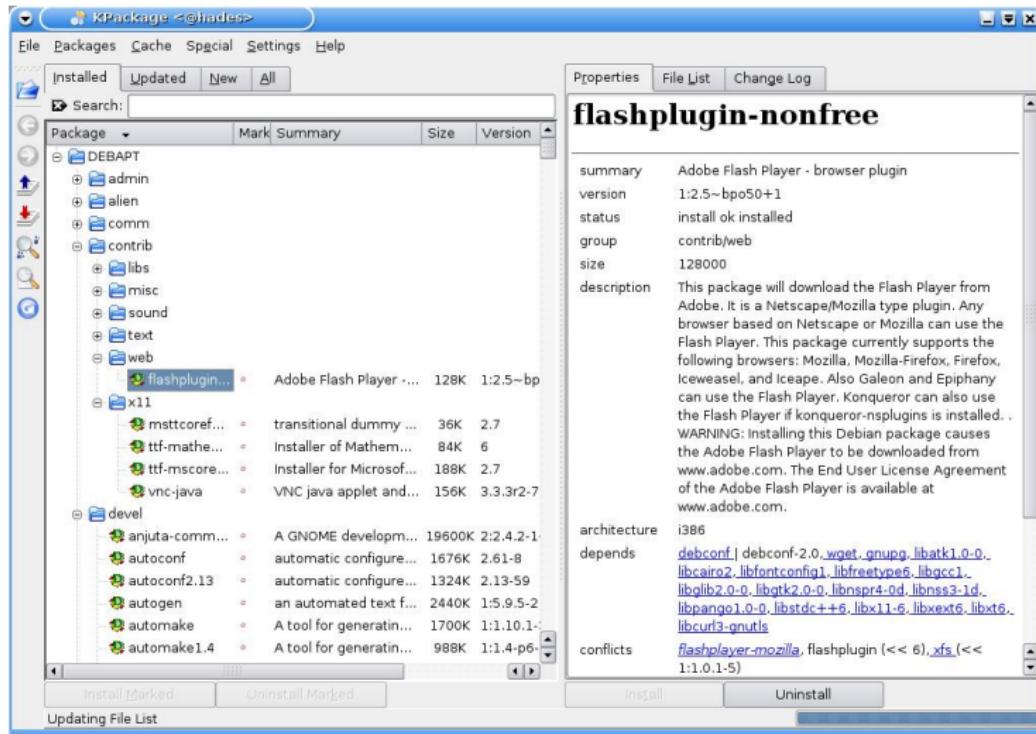
Installing Debian packages with KDE Kpackager

KDE menu -> System -> Package manager (Kpackage)



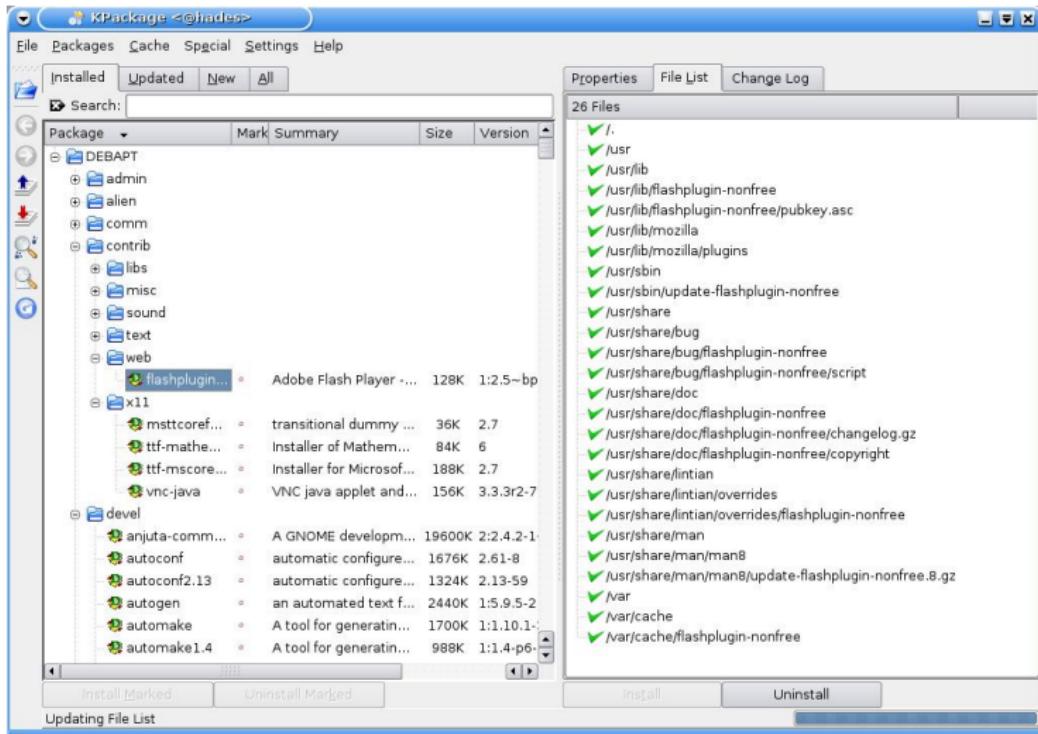
Working on a command line

Using Kpackage - installed package - Overview



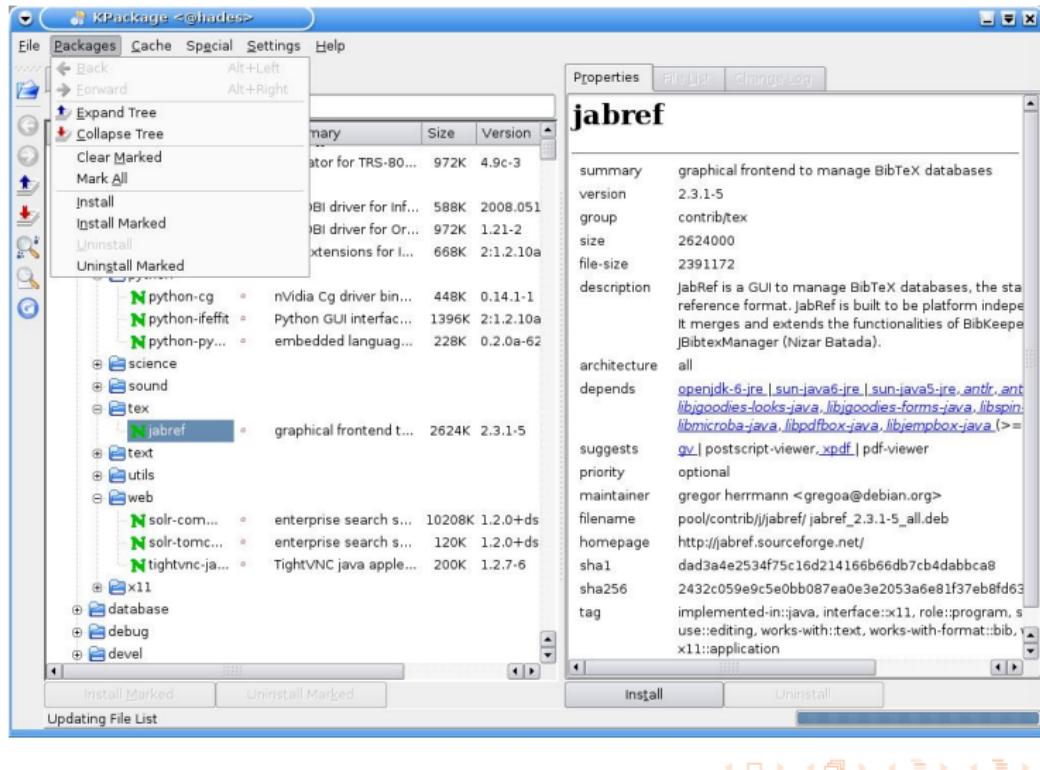
Working on a command line

Using Kpackage - installed package - List of files



Working on a command line

Using Kpackage - List of New packages and how to install



Agenda

1 General

2 man

3 ps-top

4 find

5 du/df

6 user-evn

7 dpkg

8 account

Working on a command line

Changing a user account by commands

chfn; chsh: change real user name and information; login shell

- chfn -f fullname -r roomno -w workph -h homeph -o other user
- chsh -help -shell SHELL [LOGIN]

YP Commands: yp passwd, ypchfn, ypchsh, ypcat, ypwhich, ypmatch

- yp passwd [-f] [-l] [-p] [user]

- -p passwd; -l login shell; -f login data
- ypchfn [user]; ypchsh [user] (is a link to yp passwd)

- hades 4> yp passwd -l ke

Changing NIS account information for ke on atlantis.risc.uni-linz.ac.at

Please enter password:

Changing login shell for ke on atlantis.risc.uni-linz.ac.at.

To accept the default, simply press return. To use the system's default shell, type the word "none".

Login shell [/bin/bash]: /bin/tcsh

The login shell has been changed on atlantis.risc.uni-linz.ac.at.
hades:5>



Working on a command line

Creating a user account by commands

NIS, YP files: passwd, group

```
ypcat passwd | head -3; ypcat group | head -3
```

```
ariese:sxVnfdkQUONhI:10212:10020:Axel Riese:/home/ariese:/bin/tcsh
mshalaby:Q1T8bz7IQysCY:10253:10020:Mohamed Shalaby:/home/mshalaby:/bin/
wiesinge:Fusb8x9TDxDuc:13145:13145:Manuela Wiesinger-Widi:/home/wiesing
wiesinge:*:13145:ke
fg:*:10739:winkler,hemmecke,gland
info:*:10080:ke,buchberg,lichtenb,ppaule,wwindste,sysadmin,schreine,
tjebelea,jschicho,ppau,hemmecke,ariese,burki,gbodnar,marcus,tbeck,kbosa
```

how to create an account:

- adduser program
- adduser -h

```
adduser [--home DIR] [--shell SHELL] [--uid ID]
[--ingroup GROUP | --gid ID] USER
Add a normal user
```

Kuser - User properties main window

KDE User Manager - KUser

File User Group Settings Help

ADD EDIT DEL | ADD EDIT DEL |

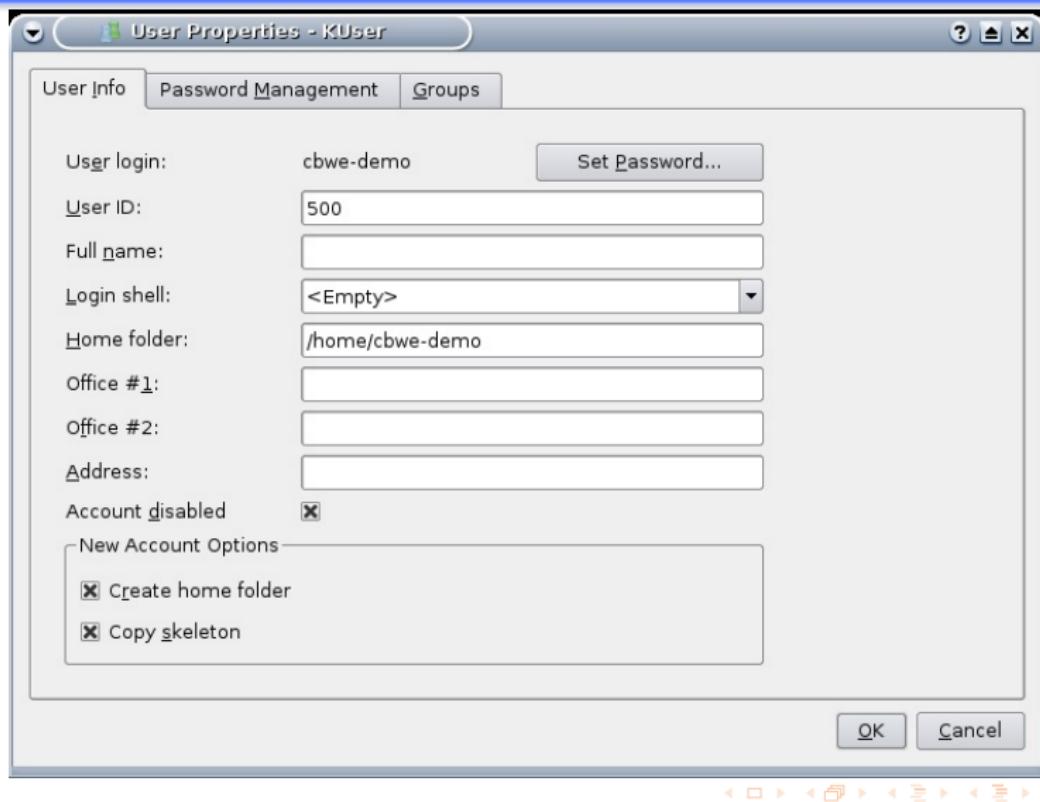
Users Groups

UID	User Login	Full Name	Home Directory	Login Shell
102	identd		/var/run/identd	/bin/false
103	messagebus		/var/run/dbus	/bin/false
104	avahi	Avahi mDNS daemon	/var/run/avahi-daemon	/bin/false
105	haldaemon	Hardware abstraction layer	/home/haldaemon	/bin/false
106	gdm	Gnome Display Manager	/var/lib/gdm	/bin/false
107	hplip	HPLIP system user	/var/run/hplip	/bin/false
108	sshd		/var/run/sshd	/usr/sbin/nologin
109	fetchmail		/var/lib/fetchmail	/bin/sh
110	saned		/home/saned	/bin/false
111	mysql	MySQL Server	/var/lib/mysql	/bin/false
112	logcheck	logcheck system account	/var/lib/logcheck	/bin/false
113	smtma	Mail Transfer Agent	/var/lib/sendmail	/bin/false
114	smmsp	Mail Submission Program	/var/lib/sendmail	/bin/false
115	smsd		/home/smsd	/bin/false
1000	sysadmin	sysadmin at risc	/home/sysadmin	/bin/bash
1001	ke	Karoly Erdei	/home/ke	/bin/tcsh
65534	nobody	nobody	/nonexistent	/bin/sh

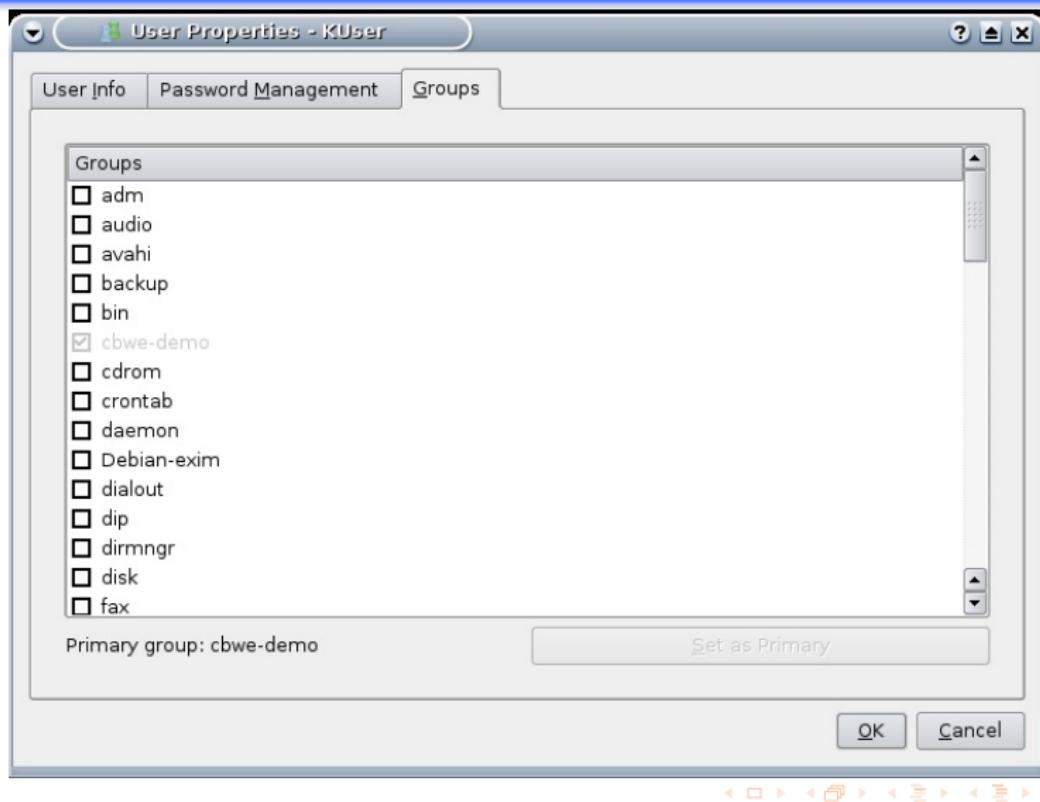
Ready

Navigation icons: back, forward, search, etc.

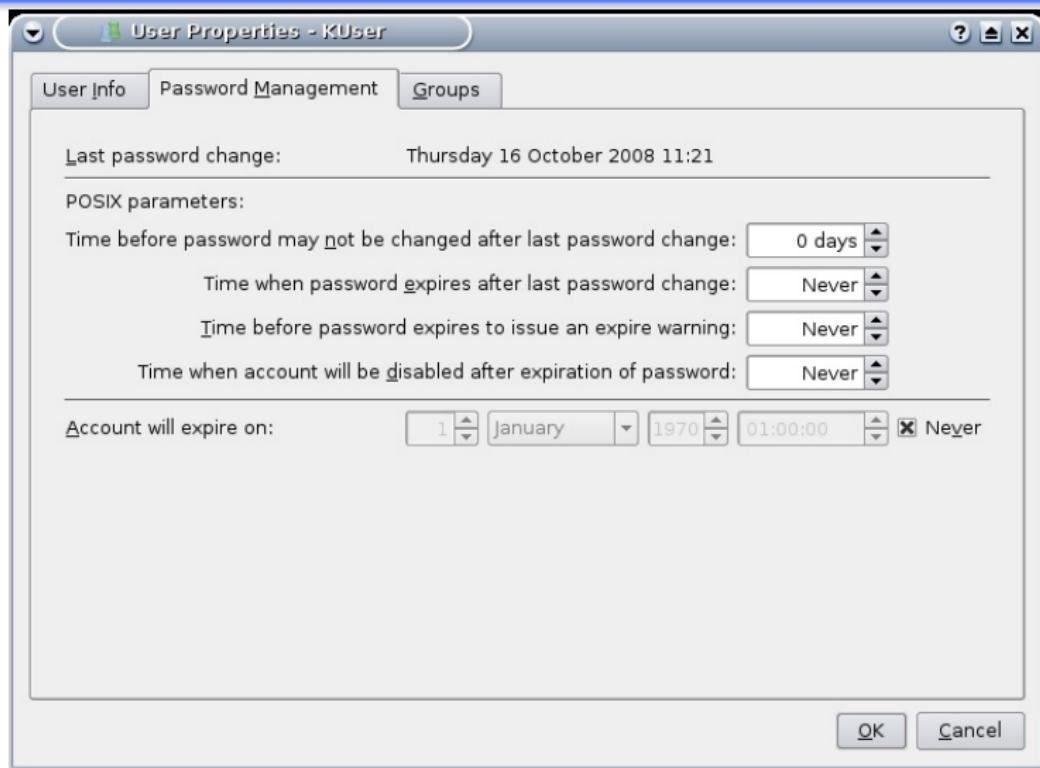
Kuser - User properties



Kuser - groups



Kuser - password



Agenda

1 General

2 man

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7 dpkg

8 account

The Shell - Main Features

The User Interface to the OS

Shell features

- an ASCII terminal window will be started
 - like in XP the DOS window (run - cmd)
- shell versions
 - sh, csh, bash, tcsh; others; see the man pages of the shells
 - at RISC default is the tcsh; echo \$SHELL
- miscellaneous parameters will be set per default
- environment variables: inherit values to sub-shells
 - list with printenv; set with setenv VARIABLE value
- local variables: scope only for the active shell
- lot of internal commands; invoking external (OS) commandos, too
- programing language: powerful shell scripting possible
- man sh: 4918 lines (80 pages)

The Shell - Redirection

Input/Output

Input/Output redirection

- standard input: console; standard output: display
- input output redirection:
 - `ls -l > junk`; (creates file **junk** and writes the output of `ls -l` in it)
 - `cat jj >> junk`; (appends the contents of the file **jj** to **junk**)
 - `grep "txt" < junk | wc`; (pipes the content of the file **junk** into the **grep** command and the output will be piped to the **wc** command (word count))
 - minus (-) means standard input/output
- pipeline connects output/input of two or more subsequent processes:
 - `ps auxw | grep sendmail | wc`; (counts how many sendmail processes are running)
 - more pipelines: `who | sort | lpr`; (prints a sorted list of the output of **who**)
 - processes executed parallel

The Shell - Redirection

Input/Output redirection - an example

tar - store and extract files from an archive file known as a tarfile

- `tar cf deepsky.tar deepsky/;` (creates the single file: `deepsky.tar`, as archive file)
- `tar cf - deepsky/ | (cd /scratch/ke/pictures/; tar xf -)`
 - the contents of `deepsky` directory (tree structure) will be archived as a single file and will be piped to the standard output
 - the brackets `()` create a single command
 - first the current directory will be changed to the given one
 - second the standard input will be piped to the `tar` command and the archive will be extracted. In this process the same directory tree will be created as the original one.
- `tar cf - deepsky/ | ssh bullfrog "(cd /scratch/ke/pics; tar xf -)"`
 - the first process is identical with the above one
 - the second process is an `ssh` command, logging in a remote host.
 - the `ssh` command reads as input the standard input, which will be piped to the `tar` command

The Shell - Processes

Process management

Commands for the Process management - background/foreground processes

- commands for listing/killing processes:
 - ps auxw ; ps auxw | grep pattern
 - jobs
 - kill -TERM process-number
 - kill -9 process-number
 - kill % number; killall
- starting a command in foreground / background
 - start in background: & (command line available)
 - start in the foreground: without & (command line is not available for work)
 - stop %job | number - stop the current job in foreground: ^Z
 - bg %job | number
 - fg %job | number

The Shell - Processes

Process management

Limit/change/set some resources

- **limit [-h] [resource [maximum-use]]**
 - limits the given resource for the (next) started processes
 - resources: cputime, memoryuse, filesize, concurrency, maxproc
 - maximum-use: floating point or integer number followed by a scale factor
 - scale factor: for cpu use: second; for all others: k(kilobyte), m(megabyte)
- **nice [+number] [command]**
 - run a program with modified scheduling priority
- **renice priority [[-p] pid ...] [[-u] user ...]**
 - alter priority of running processes

The Shell - Environment Variables

Builtin commands

Alias

- alias [name [wordlist]]
 - alias ar acroread
 - alias psh "ps auxw | grep ssh"

Commands for defining cycles

- foreach name (wordlist) ... end
 - foreach i (*)
 - echo \$i
 - end
- Lot of other commands are available:
 - while, break, continue, repeat, count etc.

The Shell - Builtin commands

if structures

```
if (expr) command
if (expr) then
...
else if (expr2) then
...
else
...
endif
```

```
while (expr) ... end
```

```
switch (string)
case str1:
...
breaksw
...
default:
...
breaksw
```

The Shell - Builtin commands

other commands

Variables, environment variables and commands on it

- **set** - manages local variables
 - set (print all values)
 - set name ... (delete value)
 - set name=word ... (assign value)
 - unset pattern (delete variable)
- **setenv** - manages environment variables
 - setenv [name [value]]
 - unsetenv pattern

Shell config file: `/home/username/.cshrc`

- .cshrc will be executed by starting a new shell
- add command here to simplify or define work
- activate changed .cshrc file
 - source filename; source .cshrc

The Shell - Environment Variables

List of the environment parameters

Environment variables

```
SHELL=/bin/tcsh
HOST=uhu
USER=ke
GROUP=ke
HOSTTYPE=i486-linux
PATH=/usr/local/bin:/usr/bin:/bin:/usr/bin/X11:
/zvol/timer/bin:/home/ke/bin:
DESKTOP-SESSION=kde
PWD=/home/ke
LANG=en-US.UTF-8
HOME=/home/ke
OSTYPE=linux
VENDOR=intel
LOGNAME=ke
MACHTYPE=i486
DISPLAY=:0
TERM=xterm
```

Working on a command line

Links to Wikipedia

Links to Wikipedia

- http://en.wikipedia.org/wiki/List_of_Unix_programs
- <http://www.think-lamp.com/2008/11/very-useful-linuxunix-commands/>

End of Working on a Command Line

Thanks for your attention !