SciLifeLab
UPPSALA

Linux Introduction

2022-03-28

Martin Dahlö
martin.dahlo@uppmax.uu.se

Enabler for Life Sciences

SciLifeLab

Uppsala Multidisciplinary Center for Advanced Computational Science
UPPMAX

UPPNEX

UPPSALA UNIVERSITET

SciLifeLab
UPPSALA

Linux **Introduction**

Look up the links from Pre-course material, use Google, and ...

Learn by practice and repetition!!!

Enabler for Life Sciences

SciLifeLab
UPPSALA

UPPMAX

- Uppsala Multidisciplinary Center for Advanced Computational Science
  - (Uppsala supercomputer center)
- Clusters
  - Rackham
  - Bianca
  - Snowy
- Uses Linux

SciLifeLab UPPSALA

UPPMAX

- Uppsala Multidisciplinary Center for Advanced Computational Science
  - (Uppsala supercomputer center)
- Clusters
  - **Rackham**
  - Bianca
  - Snowy
- Uses Linux

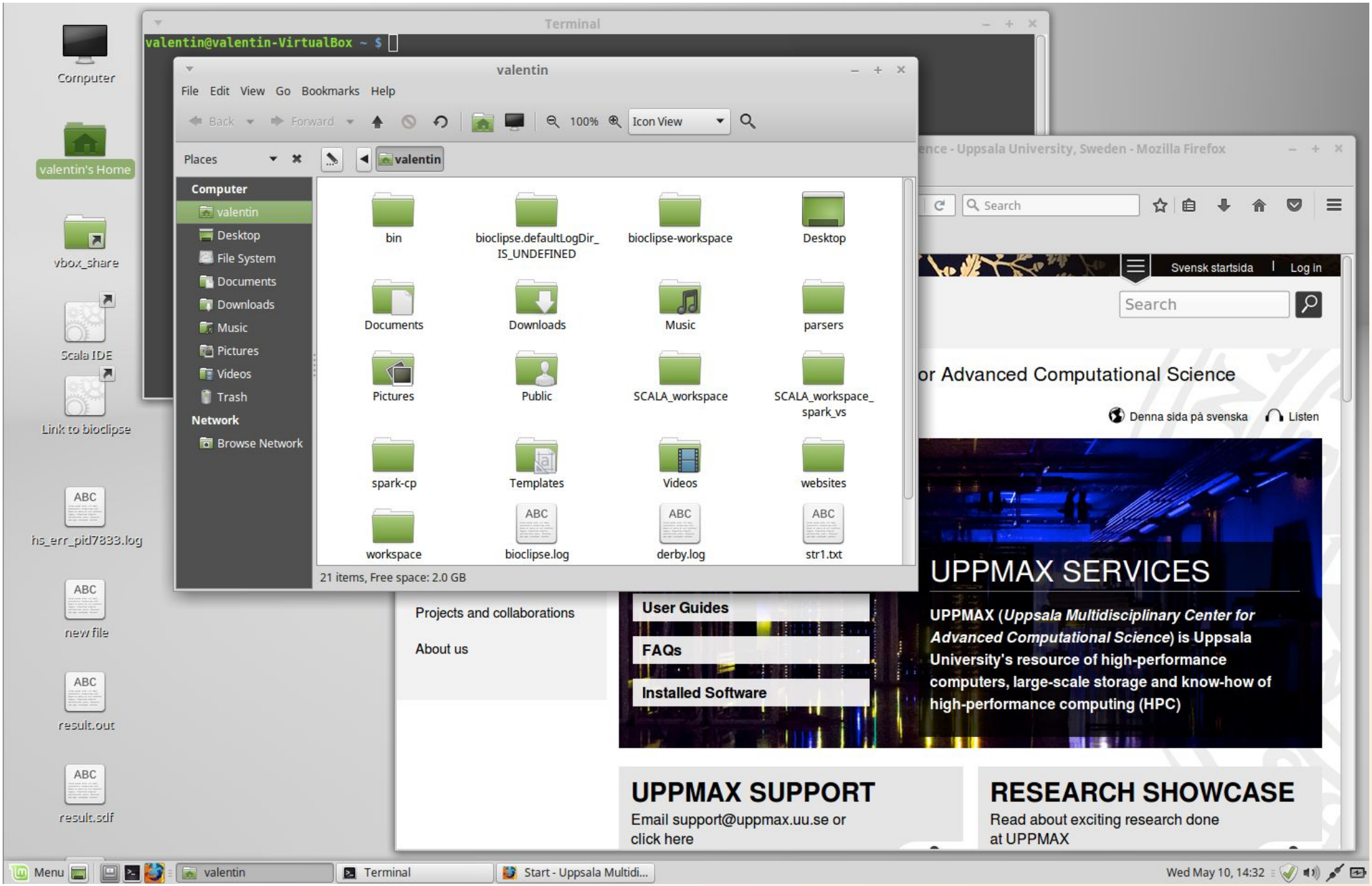
SciLifeLab UPPSALA

Linux

- Why Linux?
  - A powerful command-line interface
  - Built for multi-user systems.
  - An enormous amount of software is freely available

SciLifeLab
UPPSALA

Linux



SciLifeLab
UPPSALA

Linux

```
-rw-r--r--  1 valentin valentin  51709 Oct 12  2015 str1.txt
-rw-r--r--  1 valentin valentin 126832 Oct 12  2015 str2.txt
drwxr-xr-x  2 valentin valentin   4096 Sep  1  2015 Templates
-rw-r-----  1 valentin valentin      5 May 10 14:29 .vboxclient-clipboard.pid
-rw-r-----  1 valentin valentin      5 May 10 14:29 .vboxclient-display.pid
-rw-r-----  1 valentin valentin      5 May 10 14:29 .vboxclient-draganddrop.pid
-rw-r-----  1 valentin valentin      5 May 10 14:29 .vboxclient-seamless.pid
drwxr-xr-x  2 valentin valentin   4096 Sep  1  2015 Videos
-rw-------  1 valentin valentin   4798 Feb 15  2016 .viminfo
drwxr-xr-x  3 valentin valentin   4096 Jan 11  2016 websites
drwxr-xr-x  3 valentin valentin   4096 Jun  8  2016 workspace
-rw-------  1 valentin valentin    130 May 10 14:29 .Xauthority
-rw-r--r--  1 valentin valentin    131 Sep  2  2015 .xinputrc
-rw-r--r--  1 valentin valentin   3197 May 10 14:31 .xsession-errors
valentin@valentin-VirtualBox ~ $ ll
total 780
drwxr-xr-x 35 valentin valentin   4096 May 10 14:30 ./
drwxr-xr-x  3 root     root       4096 Sep  1  2015 ../
drwx------  3 valentin valentin   4096 Sep  2  2015 .adobe/
-rw-------  1 valentin valentin   6412 Dec 10 11:48 .bash_history
-rw-r--r--  1 valentin valentin    220 Sep  1  2015 .bash_logout
-rw-r--r--  1 valentin valentin    305 Feb 15  2016 .bashrc
drwxr-xr-x  8 valentin valentin   4096 Sep  2  2015 bin/
drwxr-xr-x  2 valentin valentin   4096 Nov  3  2016 bioclipse.defaultLogDir_IS_UNDEFINED/
-rw-r--r--  1 valentin valentin 366894 Jun 15  2016 bioclipse.log
drwxr-xr-x  9 valentin valentin   4096 Nov  3  2016 bioclipse-workspace/
drwxr-xr-x  9 valentin valentin   4096 Sep  2  2015 .cache/
drwxr-xr-x 17 valentin valentin   4096 Sep  8  2015 .config/
drwx------  3 valentin valentin   4096 Sep  1  2015 .dbus/
-rw-r--r--  1 valentin valentin    709 Sep  2  2015 derby.log
drwxr-xr-x  2 valentin valentin   4096 Oct 12  2015 Desktop/
-rw-------  1 valentin valentin      2 May 10 14:29 .dmrc
drwxr-xr-x  2 valentin valentin   4096 Sep  1  2015 Documents/
drwxr-xr-x  3 valentin valentin   4096 Nov  3  2016 Downloads/
drwx------  3 valentin valentin   4096 May 10 14:29 .gconf/
-rw-r--r--  1 valentin valentin     74 Sep  2  2015 .gitconfig
-rw-r-----  1 valentin valentin      0 Sep  1  2015 .gksu.lock
drwx------  3 valentin valentin   4096 Sep  1  2015 .gnome/
drwx------  4 valentin valentin   4096 Jun 15  2016 .gnome2/
drwx------  2 valentin valentin   4096 Sep  1  2015 .gnome2_private/
-rw-r--r--  1 valentin valentin     37 Jan 11  2016 .httrack.ini
-rw-------  1 valentin valentin  15540 May 10 14:29 .ICEauthority
drwxr-xr-x  4 valentin valentin   4096 Sep  7  2015 .java/
-rw-------  1 valentin valentin     35 Sep  2  2015 .lesshst
drwxr-xr-x  4 valentin valentin   4096 Sep  1  2015 .linuxmint/
drwx------  3 valentin valentin   4096 Sep  1  2015 .local/
drwxr-xr-x  3 valentin valentin   4096 Sep  1  2015 .m2/
drwx------  3 valentin valentin   4096 Sep  2  2015 .macromedia/
drwxr-xr-x  4 valentin valentin   4096 Sep  1  2015 .mozilla/
drwxr-xr-x  2 valentin valentin   4096 Sep  1  2015 Music/
-rw-r--r--  1 valentin valentin    213 Sep  2  2015 .pam_environment
drwxr-xr-x  4 valentin valentin   4096 Sep  2  2015 parsers/
```

SciLifeLab UPPSALA

Directory tree

Name	Size	Type	Date Modified
annotations	--	folder	2011-05-18 15:34:34
annovar	--	folder	2011-05-18 15:34:31
annovarFiles	--	folder	2011-05-18 15:34:05
compare	--	folder	2011-05-18 15:34:29
prepStat	--	folder	2011-05-18 15:34:29
statFiles	--	folder	2011-05-18 15:34:06
summarizePerGene	--	folder	2011-05-18 15:34:31
data	--	folder	2011-05-18 15:34:31
1.annovar	1.4 MB	unknown	2011-05-18 15:34:30
1.annovar.alleleFreq.pdf	895 bytes	PDF document	2011-05-18 15:34:30
1.annovar.exonic_variant_function	242.9 KB	unknown	2011-05-18 15:34:30
1.annovar.hg19_snp131_dropped	837.2 KB	unknown	2011-05-18 15:34:30
1.annovar.hg19_snp131_filtered	905.6 KB	unknown	2011-05-18 15:34:30
1.annovar.log	725 bytes	application log	2011-05-18 15:34:30
1.annovar.stat	938 bytes	unknown	2011-05-18 15:34:30
1.annovar.variant_function	2.3 MB	unknown	2011-05-18 15:34:31
1.non_sym_gene_list	94.3 KB	unknown	2011-05-18 15:34:31
1.non_sym_gene_list_not_in_dbsnp	78.8 KB	unknown	2011-05-18 15:34:31
1.stop_gain_gene_list	4.4 KB	unknown	2011-05-18 15:34:31
1.stop_gain_gene_list_not_in_dbsnp	4.3 KB	unknown	2011-05-18 15:34:31
1.sym_gene_list	51.4 KB	unknown	2011-05-18 15:34:31
1.sym_gene_list_not_in_dbsnp	34.3 KB	unknown	2011-05-18 15:34:31
test.out	2.7 MB	out document	2011-05-18 15:34:31
all.plot	500 bytes	unknown	2011-05-18 15:34:30
summary.ods	23.2 KB	OpenDocument Spreadsheet	2011-05-18 15:34:31

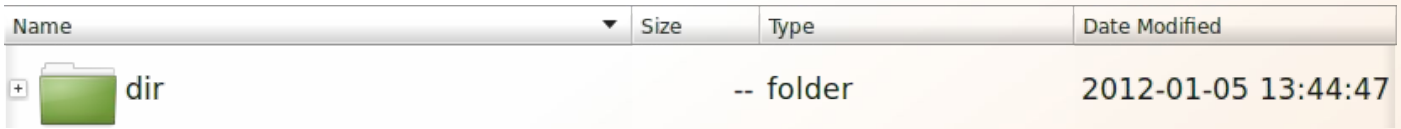
Navigation Commands

- `ls` – list the content of a directory

Navigation Commands

- **`ls`** – list the content of a directory

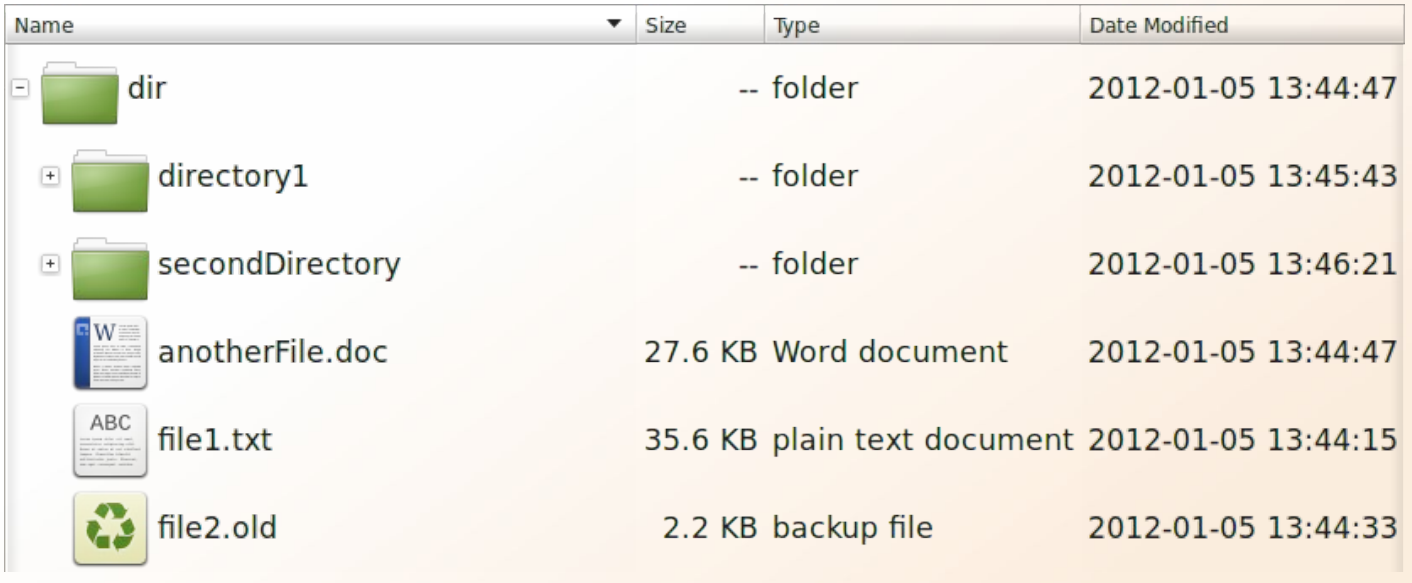
```
[dahlo@kalkyl4 dir]$
```



Navigation Commands

- `ls` – list the content of a directory

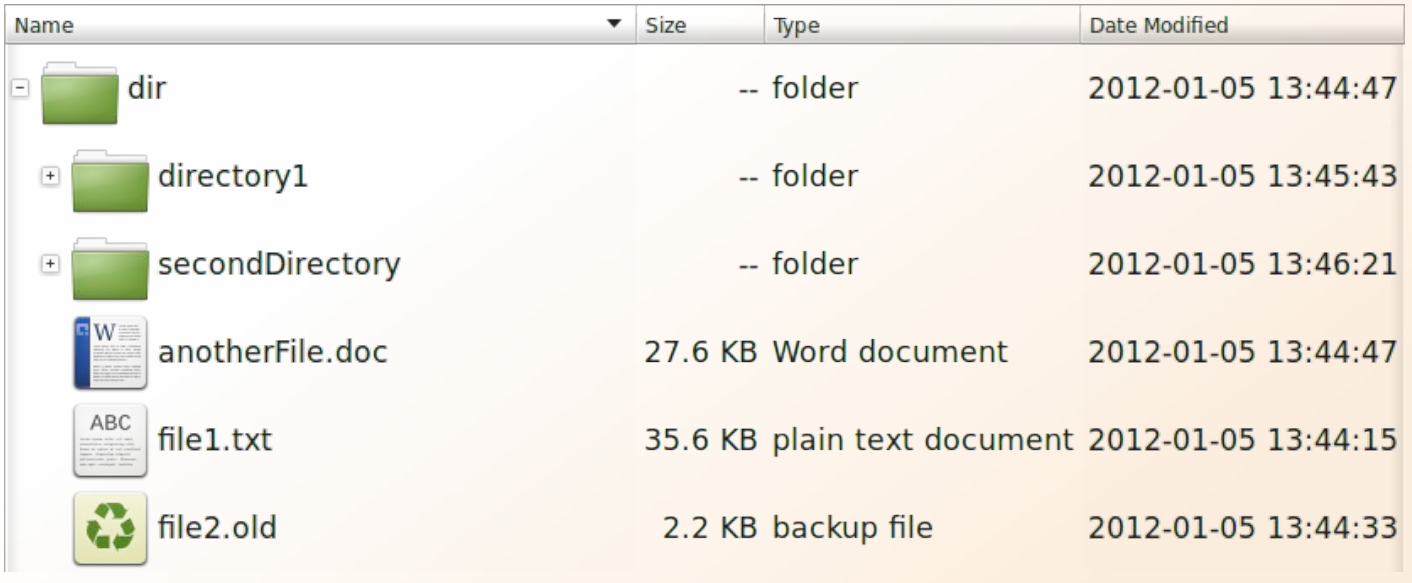
```
[dahlo@kalkyl4 dir]$ ls
anotherFile.doc  directory1  file1.txt  file2.old  secondDirectory
```



Navigation Commands

- **`ls`** – **lis**t the content of a directory

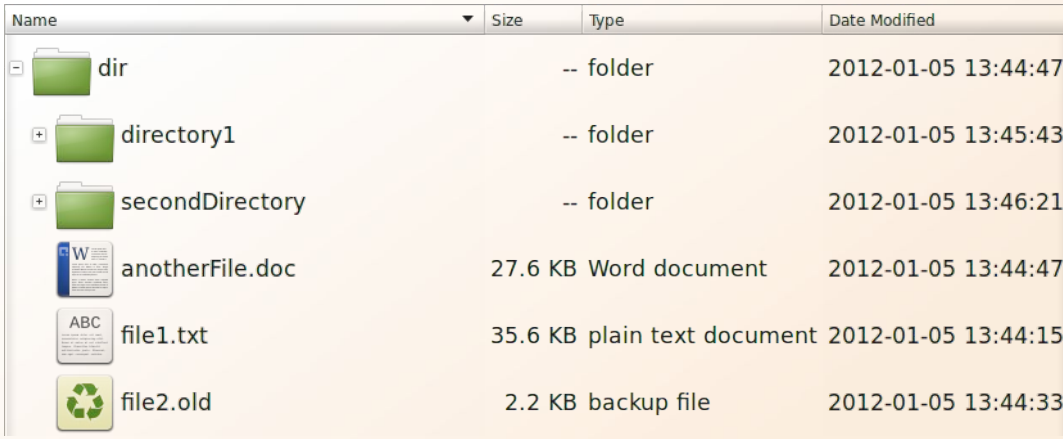
```
[dahlo@kalkyl4 dir]$ ls -l
total 192
-rw-r--r-- 1 dahlo uppmax 28214 Jan  5 13:44 anotherFile.doc
drwxr-xr-x 2 dahlo uppmax  4096 Jan  5 13:45 directory1
-rw-r--r-- 1 dahlo uppmax 36458 Jan  5 13:44 file1.txt
-rw-r--r-- 1 dahlo uppmax  2273 Jan  5 13:44 file2.old
drwxr-xr-x 2 dahlo uppmax  4096 Jan  5 13:46 secondDirectory
```



Navigation Commands

- **cd** – **c**hange working **d**irectory
  - `cd <directory name>` = down
  - `cd ..` = up

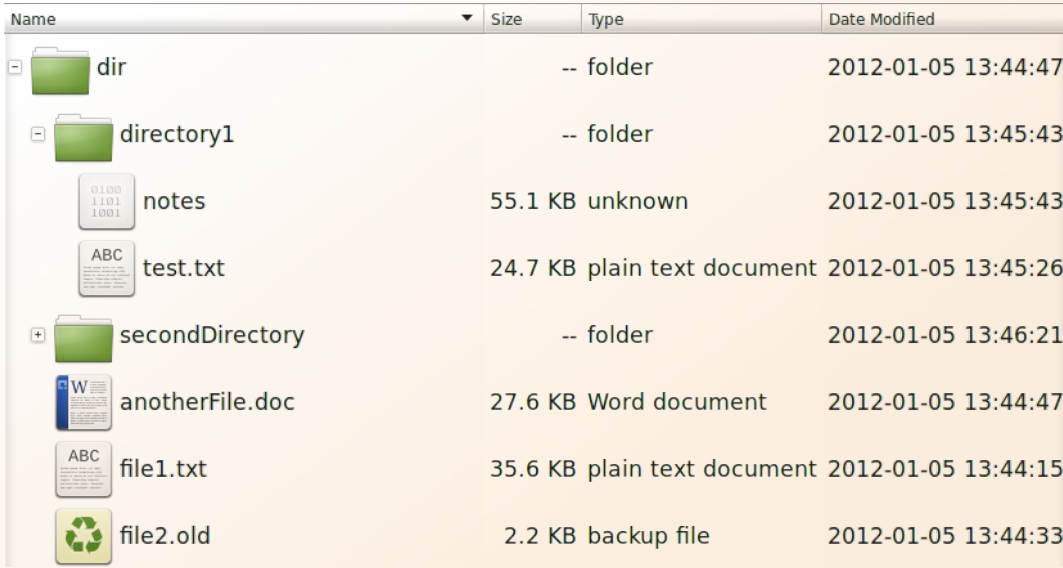
```
[dahlo@kalkyl4 dir]$ cd directory1
[dahlo@kalkyl4 directory1]$
```



Navigation Commands

- **cd** – **c**hange working **d**irectory
  - `cd <directory name>` = down
  - `cd ..` = up

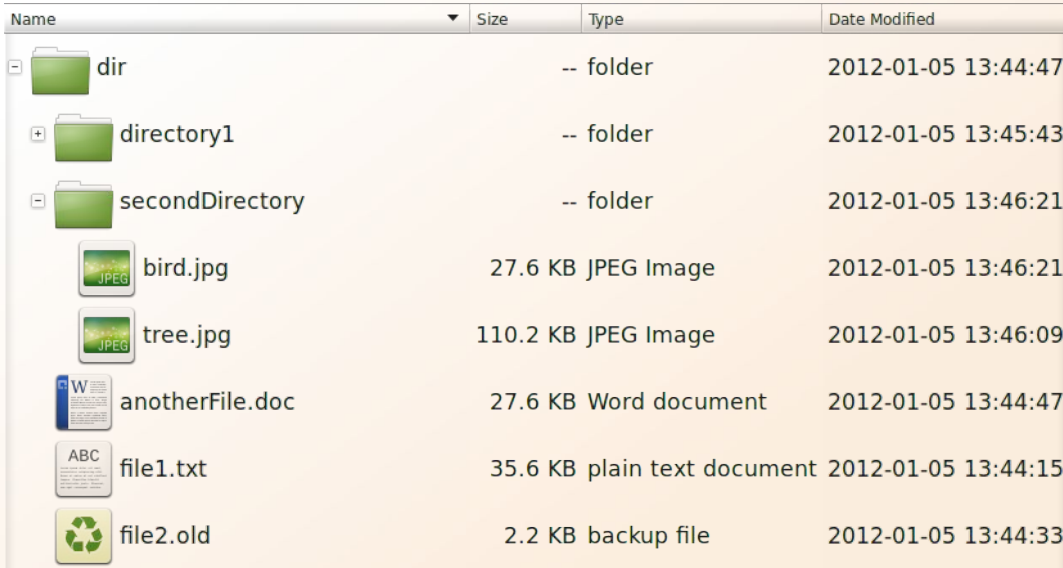
```
[dahlo@kalkyl4 dir]$ cd directory1
[dahlo@kalkyl4 directory1]$ ls -l
total 184
-rw-r--r-- 1 dahlo uppmax 56427 Jan  5 13:45 notes
-rw-r--r-- 1 dahlo uppmax 25301 Jan  5 13:45 test.txt
```



Navigation Commands

- **cd** – **c**hange working **d**irectory
  - `cd <directory name>` = down
  - `cd ..` = up

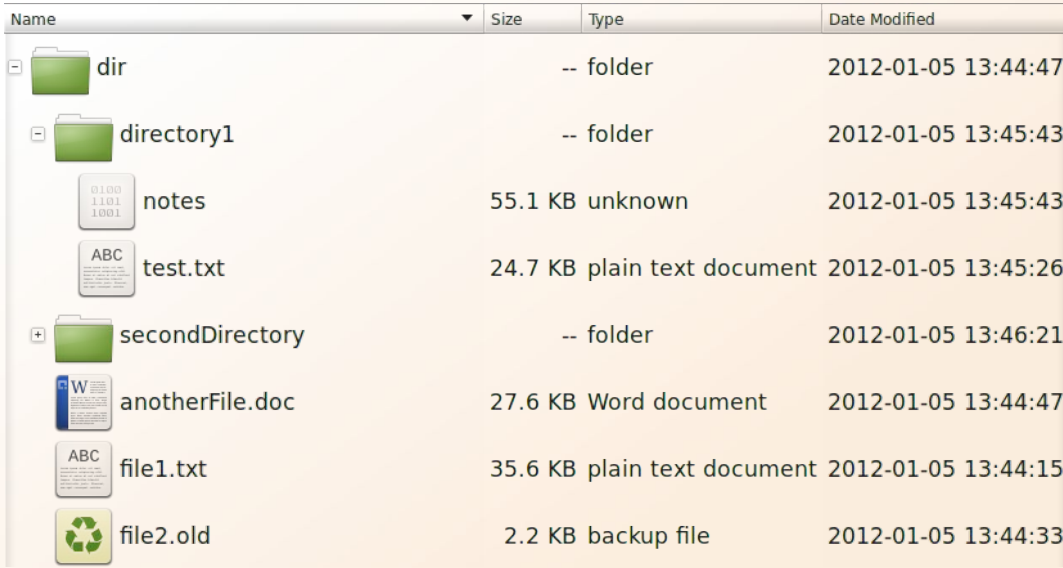
```
[dahlo@kalkyl4 directory1]$ cd ../secondDirectory
[dahlo@kalkyl4 secondDirectory]$ ls -l
total 252
-rw-r--r-- 1 dahlo uppmax  28214 Jan  5 13:46 bird.jpg
-rw-r--r-- 1 dahlo uppmax 112853 Jan  5 13:46 tree.jpg
```



Navigation Commands

- **cd** – **c**hange working **d**irectory
  - `cd <directory name>` = down
  - `cd ..` = up

```
[dahlo@kalkyl4 secondDirectory]$ ls -l ../directory1/
total 184
-rw-r--r-- 1 dahlo uppmax 56427 Jan  5 13:45 notes
-rw-r--r-- 1 dahlo uppmax 25301 Jan  5 13:45 test.txt
```



Navigation Commands

- **pwd** – **p**rint **w**orking **d**irectory

```
[dahlo@kalkyl4 dir]$ pwd
/home/dahlo/glob/work/testarea/temp/dir
```

Navigation Commands

- **`pwd`** – **p**rint **w**orking **d**irectory

```
[dahlo@kalkyl4 dir]$ pwd
/home/dahlo/glob/work/testarea/temp/dir

[dahlo@kalkyl4 dir]$ cd directory1/
[dahlo@kalkyl4 directory1]$ pwd
/home/dahlo/glob/work/testarea/temp/dir/directory1
```

Absolute/Relative paths

- Absolute paths
  - Starts with a /
  - Defined from the root of the file system

```
/home/dahlo/documents/results.csv

/proj/g2019031/nobackup/
```

Absolute/Relative paths

- Absolute paths
  - Starts with a /
  - Defined from the root of the file system

```
/home/dahlo/documents/results.csv
```

```
/proj/g2019031/nobackup/
```

  - Like an address

    Husargatan 3, Uppsala, Sweden

Absolute/Relative paths

- Relative paths
  - Does not starts with a /
  - Relative to where you are when using it

```
../documents/results.csv

nobackup/dahlo/linux_into/files.zip
```

Absolute/Relative paths

- Relative paths
  - Does not starts with a /
  - Relative to where you are when using it

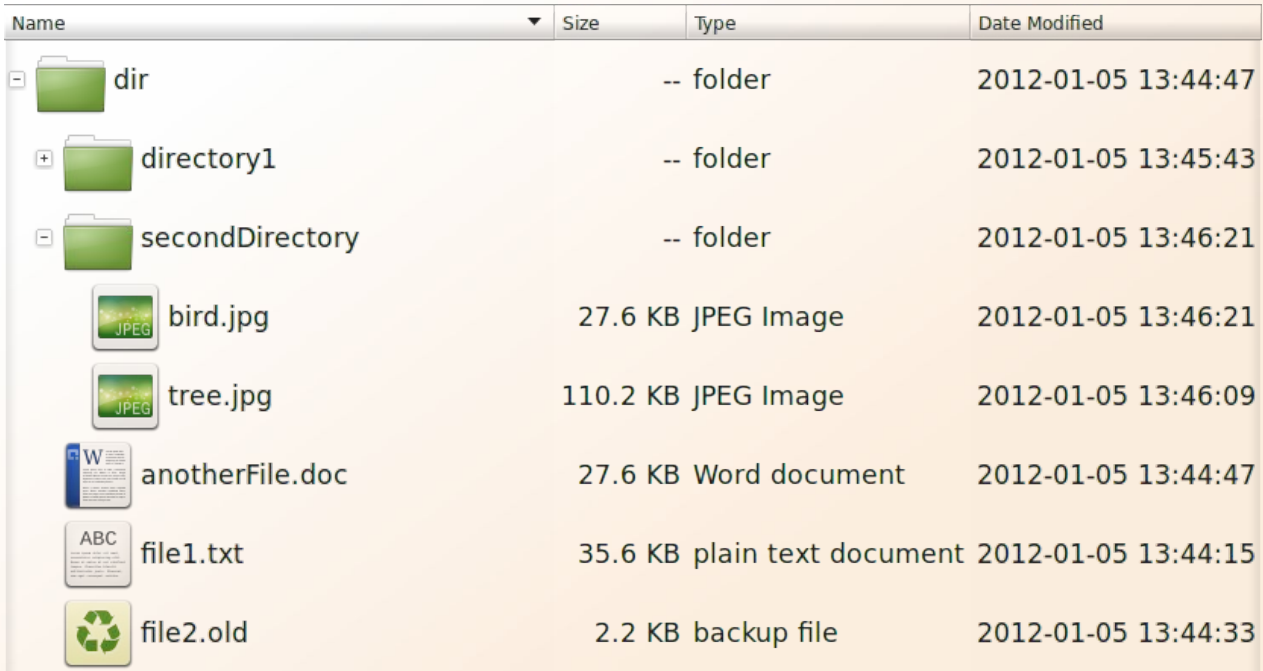
```
../documents/results.csv

nobackup/dahlo/linux_into/files.zip
```

  - Like a direction

```
4 blocks to the right, 2nd house
```

Navigation Commands

- Summary
  - **`ls`** – **l**i**s**t content of directory
  - **`cd`** – **c**hange working **d**irectory
  - **`pwd`** – **p**rint **w**orking **d**irectory
  - Use them to explore absolute/relative paths



SciLifeLab UPPSALA

Interaction Commands

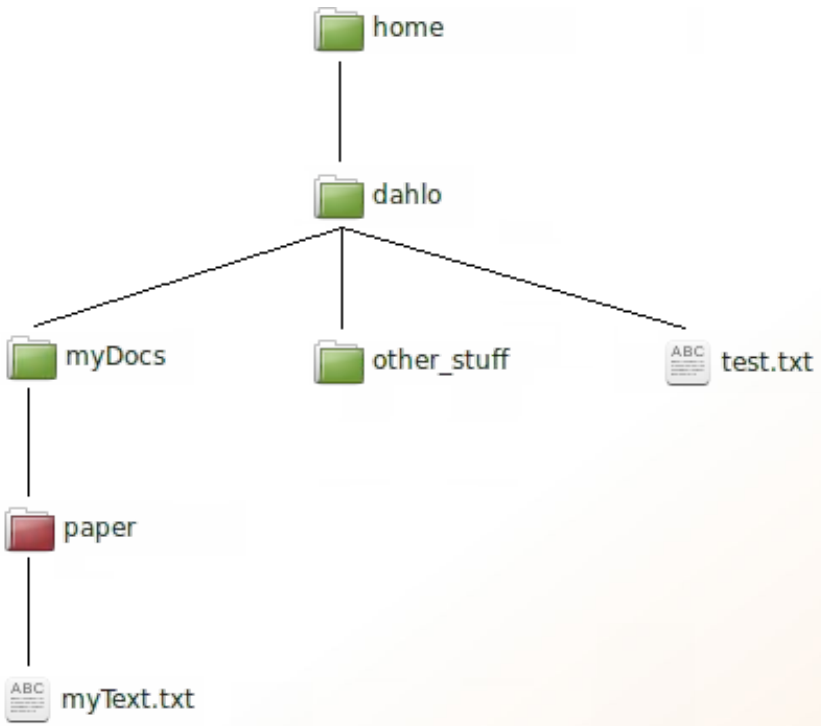
cp - copy a file

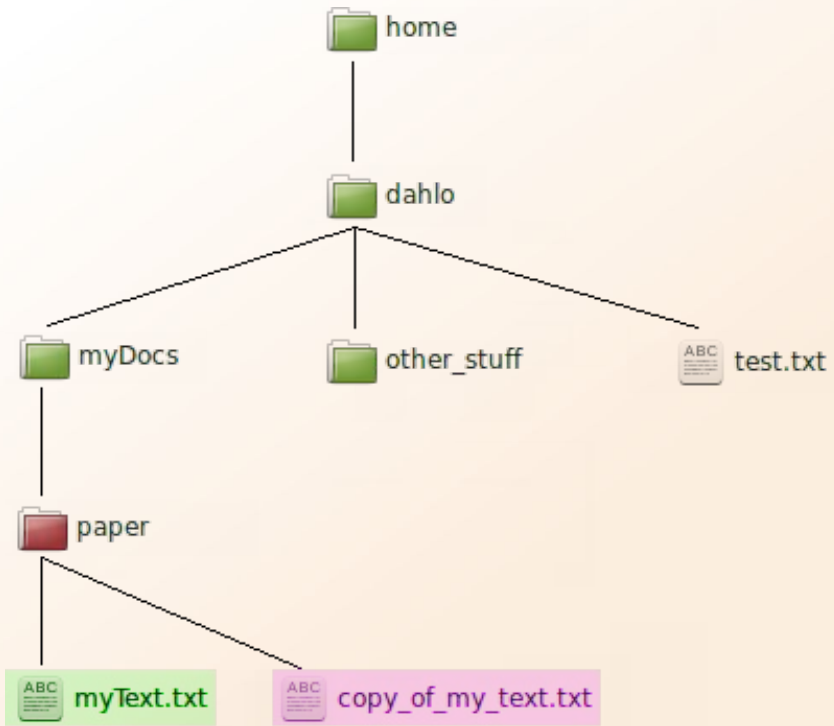
```
cp  <name of original>  <name of copy>
```

Interaction Commands

cp - copy a file

```
cp  <name of original>  <name of copy>

cp  myText.txt  copy_of_my_text.txt
```

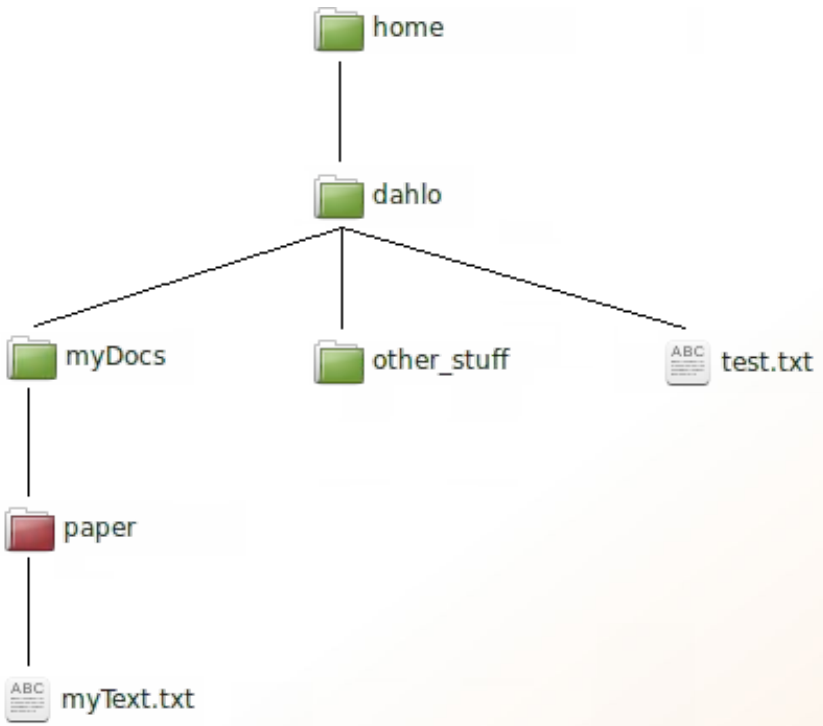


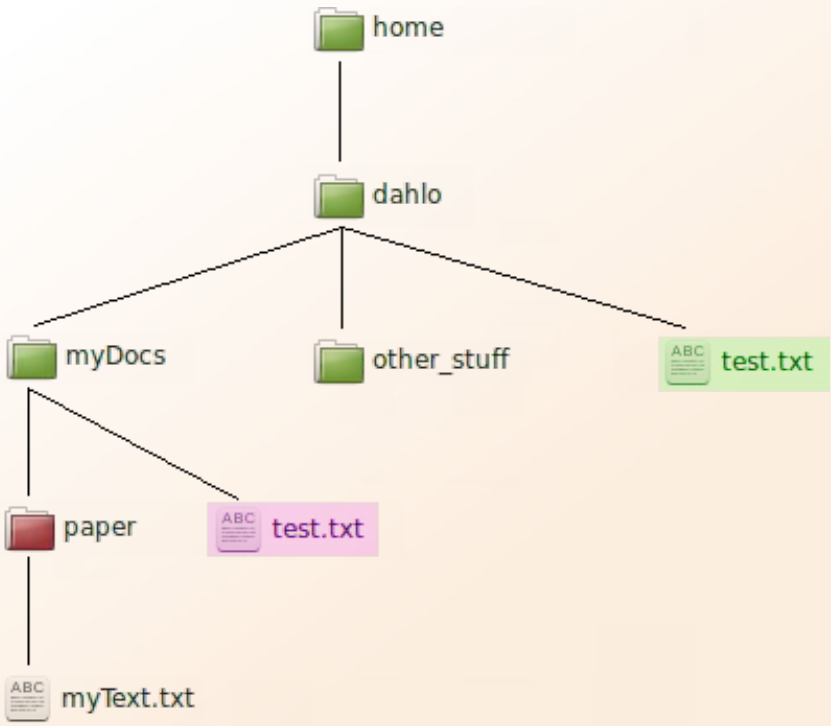


Interaction Commands

cp - copy a file

```
cp  <name of original>  <name of copy>

cp  /home/dahlo/test.txt  ../
```

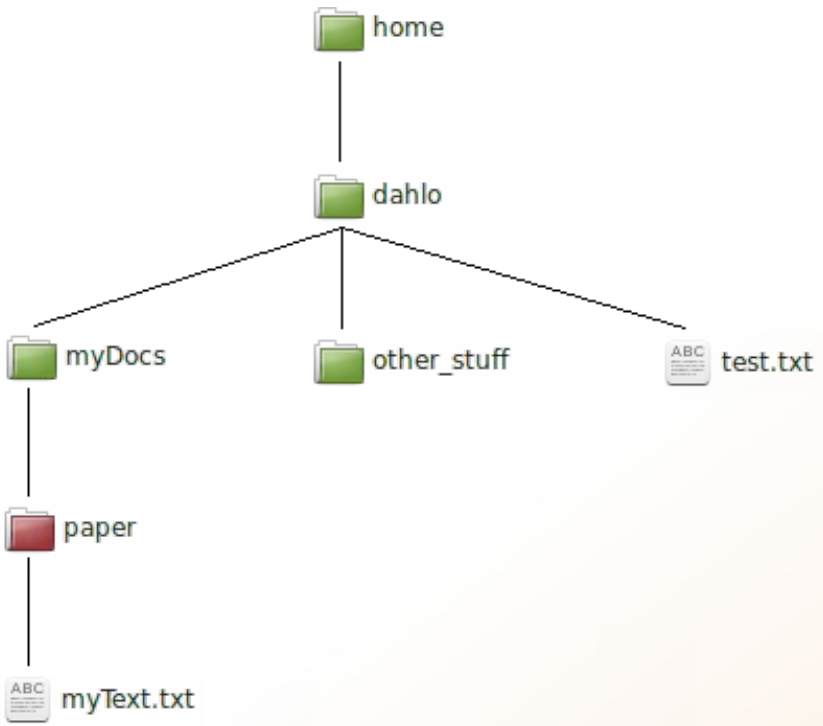


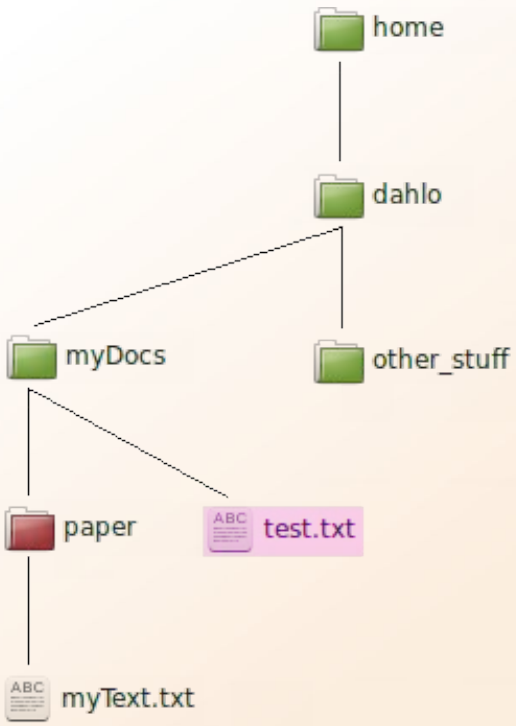


Interaction Commands

mv - move a file

```
mv <name of the file> <name of the "copy">

mv  /home/dahlo/test.txt  ../../myDocs/
```

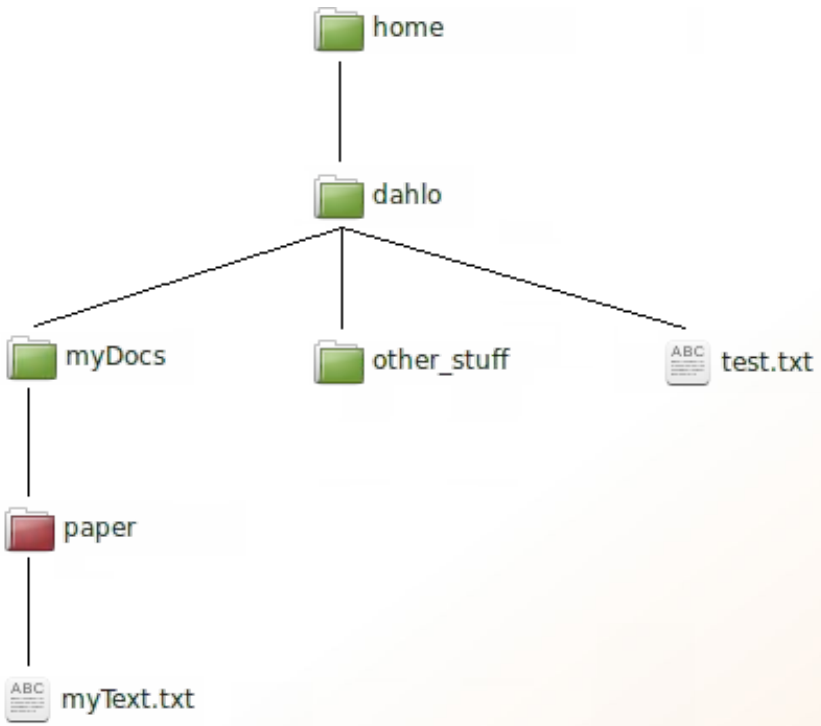


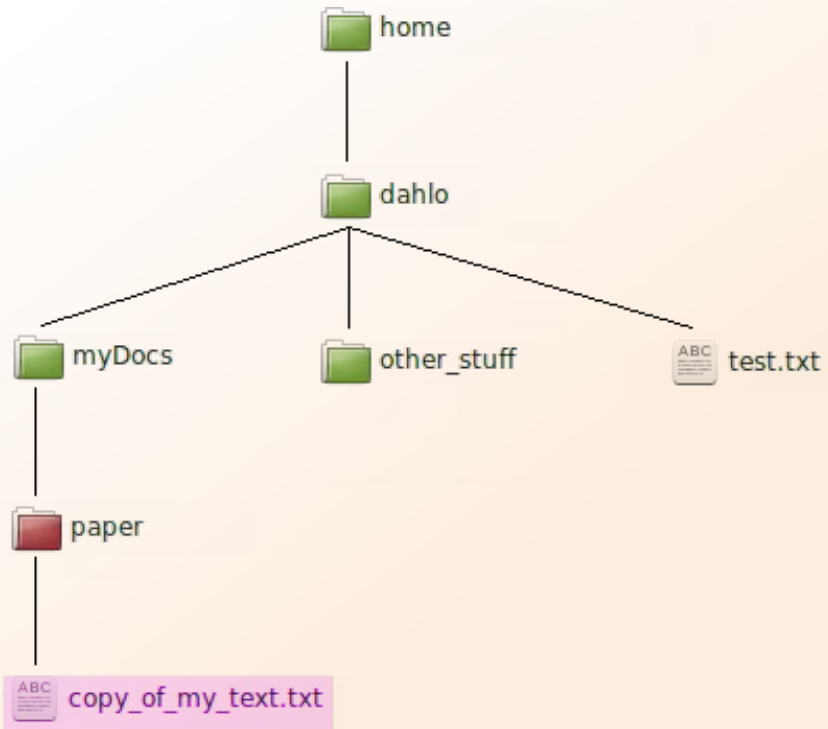


Interaction Commands

mv - rename a file

```
mv  <original name>  <new name>

mv  myText.txt  copy_of_my_text.txt
```

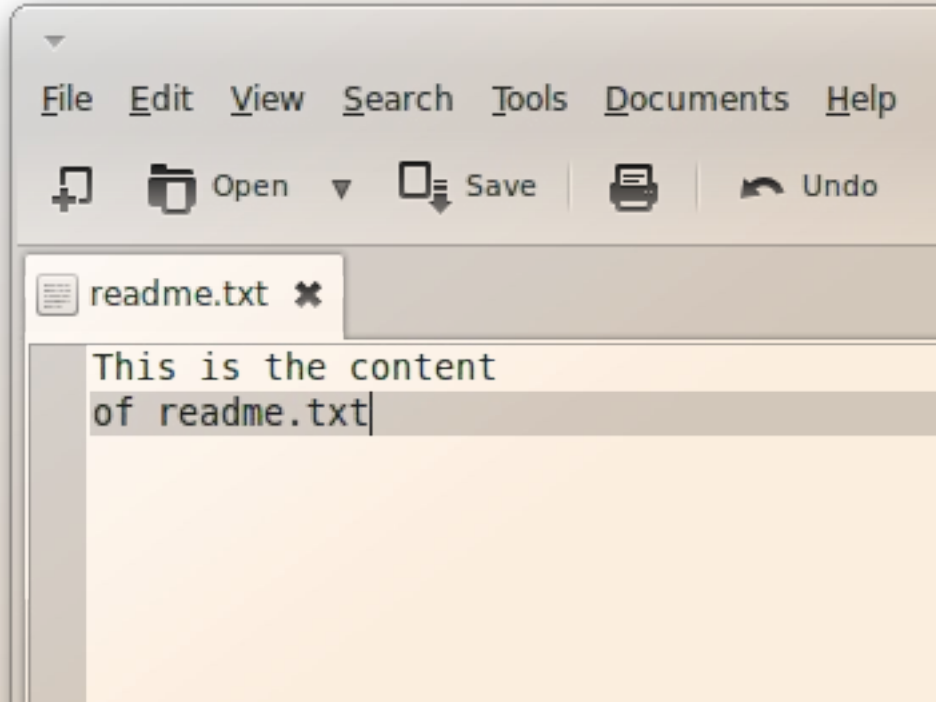




Interaction Commands

`less` - view content of a file

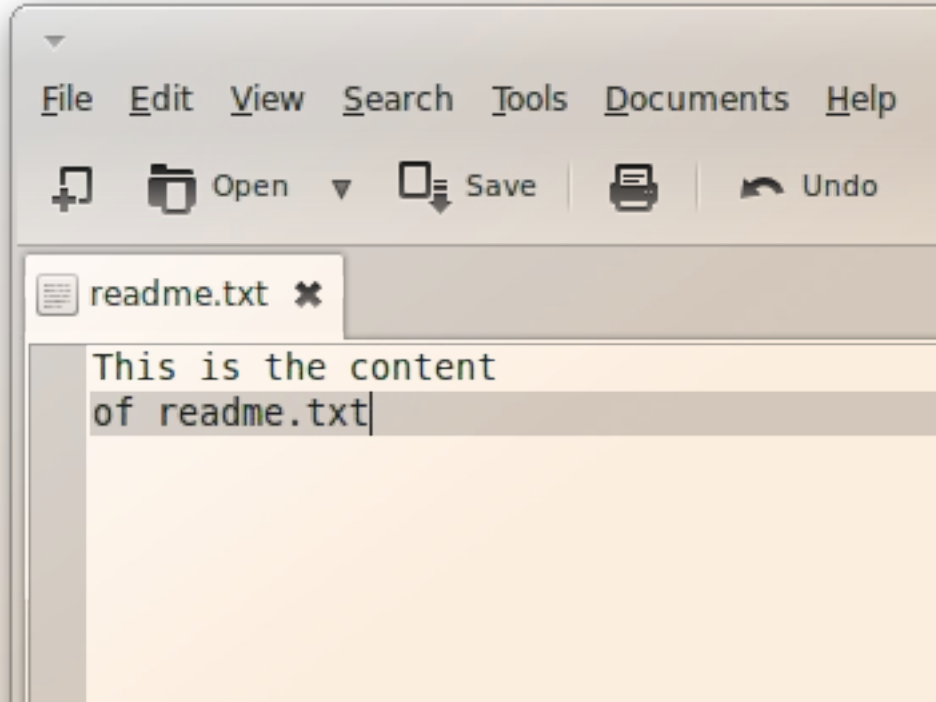
```
less <file name>

less readme.txt
```



Interaction Commands

`less` - view content of a file

```
less <file name>

less readme.txt
```

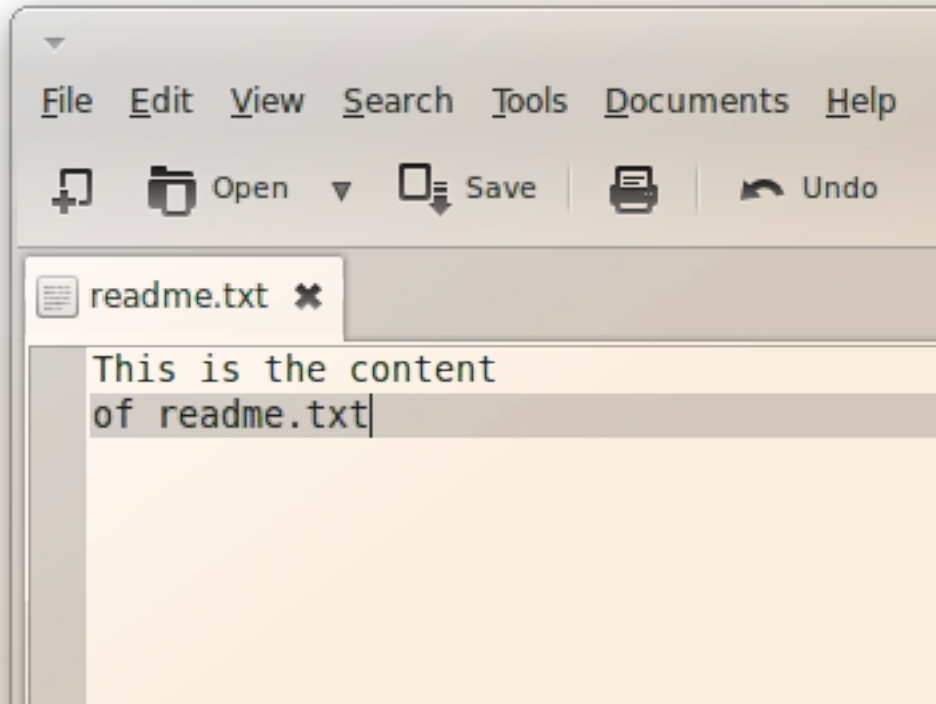


Interaction Commands

`less` - view content of a file

```
less <file name>

less readme.txt
```

press **Q** to exit less



Head

`head` - view the first rows of a file

```
head <filename>
```

```
[dahlo@dahlo dahlo]$
```

Head

`head` - view the first rows of a file

```
head <filename>
```

```
[dahlo@dahlo dahlo]$ ls -l
total 57
drwxrwxrwx 1 root root  4096 2012-09-14 10:16 .
drwxrwxrwx 1 root root     0 2012-01-17 08:28 ..
drwxrwxrwx 1 root root     0 2012-01-28 21:41 glob
drwxrwxrwx 1 root root     0 2012-08-22 17:06 myDocs
drwxrwxrwx 1 root root     0 2012-01-29 01:10 other_stuff
-rwxrwxrwx 1 root root    36 2012-09-13 15:16 readme.txt
-rwxrwxrwx 1 root root 53027 2012-09-12 10:31 test.txt
[dahlo@dahlo dahlo]$
```

Head

`head` - view the first rows of a file

```
head <filename>
```

```
[dahlo@dahlo dahlo]$ ls -l
total 57
drwxrwxrwx 1 root root  4096 2012-09-14 10:16 .
drwxrwxrwx 1 root root     0 2012-01-17 08:28 ..
drwxrwxrwx 1 root root     0 2012-01-28 21:41 glob
drwxrwxrwx 1 root root     0 2012-08-22 17:06 myDocs
drwxrwxrwx 1 root root     0 2012-01-29 01:10 other stuff
-rwxrwxrwx 1 root root    36 2012-09-13 15:16 readme.txt
-rwxrwxrwx 1 root root 53027 2012-09-12 10:31 test.txt
[dahlo@dahlo dahlo]$
[dahlo@dahlo dahlo]$ head test.txt
```

SciLifeLab UPPSALA

Head

`head` - view the first rows of a file

```
head <filename>
```

```
[dahlo@dahlo dahlo]$ ls -l
total 57
drwxrwxrwx 1 root root  4096 2012-09-14 10:16 .
drwxrwxrwx 1 root root     0 2012-01-17 08:28 ..
drwxrwxrwx 1 root root     0 2012-01-28 21:41 glob
drwxrwxrwx 1 root root     0 2012-08-22 17:06 myDocs
drwxrwxrwx 1 root root     0 2012-01-29 01:10 other_stuff
-rwxrwxrwx 1 root root    36 2012-09-13 15:16 readme.txt
-rwxrwxrwx 1 root root 53027 2012-09-12 10:31 test.txt
[dahlo@dahlo dahlo]$
[dahlo@dahlo dahlo]$ head test.txt
This file contains any messages produced by compilers while
running configure, to aid debugging if configure makes a mistake.

It was created by PSNC DRMAA for SLURM configure 1.0.5, which was
generated by GNU Autoconf 2.67.  Invocation command line was

  $ ./configure --with-slurm-inc=/usr/include/slurm --with-slurm-lib=/usr/lib64/slurm --prefix=/bubo/sw/apps/build/slurm
-drmaa/1.0.5

## --------- ##
## Platform. ##
[dahlo@dahlo dahlo]$
```

Head

`head` - view the first rows of a file

```
head -n <nr of lines> <filename>
```

```
[dahlo@dahlo dahlo]$ ls -l
total 57
drwxrwxrwx 1 root root  4096 2012-09-14 10:16 .
drwxrwxrwx 1 root root     0 2012-01-17 08:28 ..
drwxrwxrwx 1 root root     0 2012-01-28 21:41 glob
drwxrwxrwx 1 root root     0 2012-08-22 17:06 myDocs
drwxrwxrwx 1 root root     0 2012-01-29 01:10 other_stuff
-rwxrwxrwx 1 root root    36 2012-09-13 15:16 readme.txt
-rwxrwxrwx 1 root root 53027 2012-09-12 10:31 test.txt
[dahlo@dahlo dahlo]$
[dahlo@dahlo dahlo]$ head -n 3 test.txt
This file contains any messages produced by compilers while
running configure, to aid debugging if configure makes a mistake.

[dahlo@dahlo dahlo]$
```

Tail

`tail` - view the last rows of a file

```
tail <filename>
```

```
[dahlo@dahlo dahlo]$ ls -l
total 57
drwxrwxrwx 1 root root  4096 2012-09-14 10:16 .
drwxrwxrwx 1 root root     0 2012-01-17 08:28 ..
drwxrwxrwx 1 root root     0 2012-01-28 21:41 glob
drwxrwxrwx 1 root root     0 2012-08-22 17:06 myDocs
drwxrwxrwx 1 root root     0 2012-01-29 01:10 other stuff
-rwxrwxrwx 1 root root    36 2012-09-13 15:16 readme.txt
-rwxrwxrwx 1 root root 53027 2012-09-12 10:31 test.txt
[dahlo@dahlo dahlo]$
[dahlo@dahlo dahlo]$ tail test.txt
#define HAVE_STRCASECMP 1
#define HAVE_STRCHR 1
#define HAVE_STRDUP 1
#define HAVE_STRERROR 1
#define HAVE_STRNDUP 1
#define HAVE_STRSTR 1
#define HAVE_STRTOL 1
#define HAVE_VASPRINTF 1

configure: exit 0
[dahlo@dahlo dahlo]$
```

SciLifeLab UPPSALA

Tail

`tail` - view the last n rows of a file

```
tail -n <nr of lines> <filename>
```

```
[dahlo@dahlo dahlo]$ ls -l
total 57
drwxrwxrwx 1 root root  4096 2012-09-14 10:16 .
drwxrwxrwx 1 root root     0 2012-01-17 08:28 ..
drwxrwxrwx 1 root root     0 2012-01-28 21:41 glob
drwxrwxrwx 1 root root     0 2012-08-22 17:06 myDocs
drwxrwxrwx 1 root root     0 2012-01-29 01:10 other_stuff
-rwxrwxrwx 1 root root    36 2012-09-13 15:16 readme.txt
-rwxrwxrwx 1 root root 53027 2012-09-12 10:31 test.txt
[dahlo@dahlo dahlo]$
[dahlo@dahlo dahlo]$ tail -n 3 test.txt
#define HAVE_VASPRINTF 1

configure: exit 0
[dahlo@dahlo dahlo]$
```

Interaction Commands

`nano` - edit content of a file

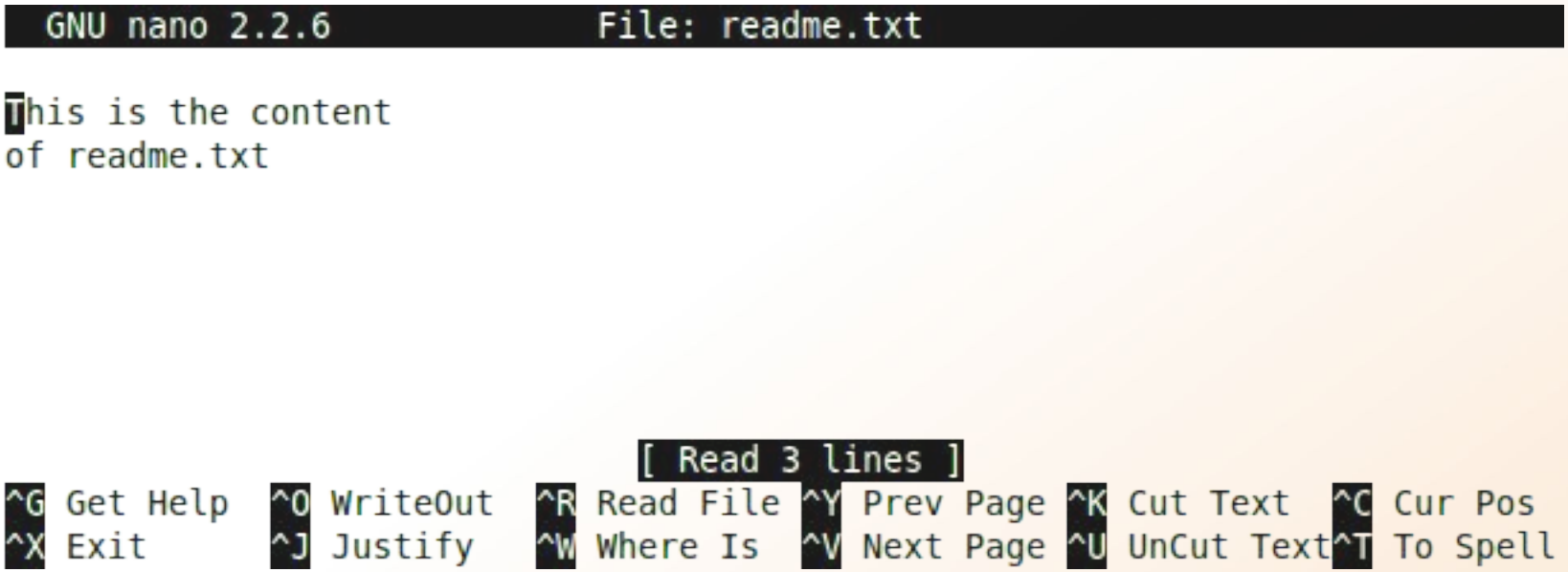
```
nano <file name>

nano readme.txt
```

Interaction Commands

`nano` - edit content of a file

```
nano <file name>
nano readme.txt
```

^ = ctrl



Interaction Commands

`rm` - remove a file

There is no trash bin in CLI! Gone is gone..

```
rm <file name>
```

Ex.

```
rm readme.txt
rm ../../../file1.txt
rm /home/dahlo/test.txt
```

SciLifeLab UPPSALA

Wildcards

*

```
[dahlo@dahlo dir]$ ls -l
total 68
-rwxrwxrwx 1 root root 28214 2012-01-05 13:44 anotherFile.doc
drwxrwxrwx 1 root root     0 2012-01-17 08:28 directory1
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
-rwxrwxrwx 1 root root  2273 2012-01-05 13:44 file2.old
drwxrwxrwx 1 root root     0 2012-01-17 08:28 secondDirectory
[dahlo@dahlo dir]$
```

Wildcards

*

```
[dahlo@dahlo dir]$ ls -l
total 68
-rwxrwxrwx 1 root root 28214 2012-01-05 13:44 anotherFile.doc
drwxrwxrwx 1 root root     0 2012-01-17 08:28 directory1
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
-rwxrwxrwx 1 root root  2273 2012-01-05 13:44 file2.old
drwxrwxrwx 1 root root     0 2012-01-17 08:28 secondDirectory
[dahlo@dahlo dir]$
[dahlo@dahlo dir]$ ls -l *.txt
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
[dahlo@dahlo dir]$
```

SciLifeLab UPPSALA

Wildcards

*

```
[dahlo@dahlo dir]$ ls -l
total 68
-rwxrwxrwx 1 root root 28214 2012-01-05 13:44 anotherFile.doc
drwxrwxrwx 1 root root     0 2012-01-17 08:28 directory1
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
-rwxrwxrwx 1 root root  2273 2012-01-05 13:44 file2.old
drwxrwxrwx 1 root root     0 2012-01-17 08:28 secondDirectory
[dahlo@dahlo dir]$
[dahlo@dahlo dir]$ ls -l *.txt
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
[dahlo@dahlo dir]$
[dahlo@dahlo dir]$ ls -l file*
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
-rwxrwxrwx 1 root root  2273 2012-01-05 13:44 file2.old
[dahlo@dahlo dir]$
```

Wildcards

*

Works with most Linux commands

Ex:

```
cp  *.txt  directory1/
```

Wildcards

*

Works with most Linux commands

Ex:

```
rm   *.tmp
```

SciLifeLab UPPSALA

The most important thing

TAB COMPLETION

(try to) never type a path or filename without it!

SciLifeLab
UPPSALA

TAB COMPLETION

(try to) never type a path or filename without it!

```
[dahlo@dahlo-linux dir]$ ls -l
total 68
-rwxrwxrwx 1 root root 28214 2012-01-05 13:44 anotherFile.doc
drwxrwxrwx 1 root root     0 2012-01-17 08:28 directory1
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
-rwxrwxrwx 1 root root  2273 2012-01-05 13:44 file2.old
drwxrwxrwx 1 root root     0 2012-01-17 08:28 secondDirectory
[dahlo@dahlo-linux dir]$ nano fi
```

SciLifeLab
UPPSALA

TAB COMPLETION

(try to) never type a path or filename without it!

```
[dahlo@dahlo-linux dir]$ ls -l
total 68
-rwxrwxrwx 1 root root 28214 2012-01-05 13:44 anotherFile.doc
drwxrwxrwx 1 root root     0 2012-01-17 08:28 directory1
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
-rwxrwxrwx 1 root root  2273 2012-01-05 13:44 file2.old
drwxrwxrwx 1 root root     0 2012-01-17 08:28 secondDirectory
[dahlo@dahlo-linux dir]$ nano file
```

SciLifeLab
UPPSALA

TAB COMPLETION

(try to) never type a path or filename without it!

```
[dahlo@dahlo-linux dir]$ ls -l
total 68
-rwxrwxrwx 1 root root 28214 2012-01-05 13:44 anotherFile.doc
drwxrwxrwx 1 root root     0 2012-01-17 08:28 directory1
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
-rwxrwxrwx 1 root root  2273 2012-01-05 13:44 file2.old
drwxrwxrwx 1 root root     0 2012-01-17 08:28 secondDirectory
[dahlo@dahlo-linux dir]$ nano file
file1.txt  file2.old
[dahlo@dahlo-linux dir]$ nano file
```

SciLifeLab
UPPSALA

TAB COMPLETION

(try to) never type a path or filename without it!

```
[dahlo@dahlo-linux dir]$ ls -l
total 68
-rwxrwxrwx 1 root root 28214 2012-01-05 13:44 anotherFile.doc
drwxrwxrwx 1 root root     0 2012-01-17 08:28 directory1
-rwxrwxrwx 1 root root 36458 2012-01-05 13:44 file1.txt
-rwxrwxrwx 1 root root  2273 2012-01-05 13:44 file2.old
drwxrwxrwx 1 root root     0 2012-01-17 08:28 secondDirectory
[dahlo@dahlo-linux dir]$ nano file
file1.txt  file2.old
[dahlo@dahlo-linux dir]$ nano file1.txt
```

Good to Know Commands

top - how much is the computer working?

```
top
```

```
top - 21:27:48 up 37 days,  7:34,  2 users,  load average: 6.38, 6.09, 6.03
Tasks: 278 total,   4 running, 274 sleeping,   0 stopped,   0 zombie
Cpu(s): 73.5%us,  1.5%sy,  0.0%ni, 24.3%id,  0.6%wa,  0.0%hi,  0.0%si,  0.0%st
Mem:  24598372k total, 17703556k used,  6894816k free,    83596k buffers
Swap: 25165816k total,    29704k used, 25136112k free, 15403636k cached

  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM    TIME+  COMMAND
 5751 zhibing   20   0 1531m  45m 9492 S 100.0  0.2 679:58.20 invaperco
 5755 zhibing   20   0 1531m  43m 9492 S 100.0  0.2 679:49.38 invaperco
 5759 zhibing   20   0 1531m  43m 9480 S 100.0  0.2 679:56.71 invaperco
 5779 zhibing   20   0 1531m  44m 9492 S 100.0  0.2 679:21.84 invaperco
 6212 nicusor   20   0  451m 377m 3356 R 100.0  1.6 668:47.67 cretin
28221 roca      20   0 3114m  88m 4188 R 99.7  0.4   8:26.15 seward.exe
16870 root      20   0     0    0    0 S  0.7  0.0   0:13.69 flush-8:0
 1781 root      39  19     0    0    0 S  0.3  0.0  17:26.31 kipmi0
 1903 root      20   0     0    0    0 S  0.3  0.0   1:24.46 kpanfs_dispatch
28483 dahlo     20   0 13384 1292  884 R  0.3  0.0   0:00.03 top
    1 root      20   0 21416  652  448 S  0.0  0.0   0:01.70 init
    2 root      20   0     0    0    0 S  0.0  0.0   0:00.03 kthreadd
    3 root      RT   0     0    0    0 S  0.0  0.0   0:00.14 migration/0
    4 root      20   0     0    0    0 S  0.0  0.0   0:01.40 ksoftirqd/0
    5 root      RT   0     0    0    0 S  0.0  0.0   0:00.00 migration/0
```

Good to Know Commands

Instructions how to use programs

- Easy to forget syntax
- Manual pages

`man <program name>`

Ex.

`man ls`

(q to quit)

```
LS(1)                          User Commands                          LS(1)

NAME
       ls - list directory contents

SYNOPSIS
       ls [OPTION]... [FILE]...

DESCRIPTION
       List  information  about  the FILEs (the current directory by default).
       Sort entries alphabetically if none of -cftuvSUX nor --sort.

       Mandatory arguments to long options are  mandatory  for  short  options
       too.

       -a, --all
              do not ignore entries starting with .

       -A, --almost-all
              do not list implied . and ..

:
```

Good to Know Commands

How do I log out?

```
exit
```

Exits only the current terminal

Good to Know Commands

- Summary
  - `cp` – copy a file
  - `mv` – move a file
  - `less` – view a file
  - `nano` – view and edit a file
  - `rm` – remove a file
  - `head / tail`
  - `wildcards`
  - tab completion – use it!!!
  - `top` – see active processes
  - `man` – manual pages
  - `exit` – Log out current terminal

Google

how rename multiple files in linux

All Videos Images News Shopping More Settings Tools

About 581 000 results (0,79 seconds)

However, **renaming multiple** or group of **files** quickly makes it very difficult task in a terminal. **Linux** comes with a very powerful built-in tool called **rename**. The **rename** command is used to **rename multiple** or group of **files**, **rename files** to lowercase, **rename files** to uppercase and overwrite **files** using perl expressions. Oct 10, 2013

Rename – A Command Line Tool For Renaming Multiple Files in Linux

https://www.tecmint.com/rename-multiple-files-in-linux/

About this result Feedback

Howto: Linux Rename Multiple Files At a Shell Prompt – nixCraft

https://www.cyberciti.biz/tips/renaming-multiple-files-at-a-shell-prompt.html

Nov 26, 2005 - **Rename** command syntax. It is a faster way to group **rename files in Linux** or Unix-like system. Say hello to zmv for zsh. Say hello to mmv command. Examples: **Linux Rename Multiple Files** Using a Shell Script. POSIX shell **rename** all *.bak to *.txt. **Linux** Shell script to **rename files**. Perl Script To **Rename File**.

linux - How to rename multiple files in single command or script in ...

https://unix.stackexchange.com/.../how-to-rename-multiple-files-in-single-command-...

Connect to UPPMAX

ssh - Secure SHell connection (ssh)

```
ssh -Y <username>@rackham.uppmax.uu.se
```

Ex:

```
ssh -Y dahlo@rackham.uppmax.uu.se
```

Terminal in Linux and OS X

PowerShell in Windows

SciLifeLab
UPPSALA

Laboratory time!

https://uppsala.instructure.com/courses/58211/pages/linux-1-introduction-lab