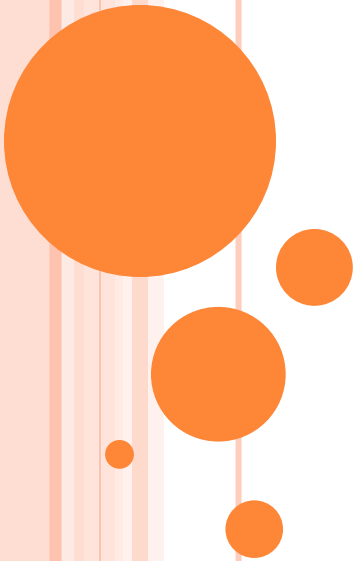

Session 5

- Google group: aut-oslab-93
- Common folder: OSLab\Roshany
  - Slides are not perfect and descriptive, so don’t consider them as the ultimate resource.

Contents

- File System Table
- Working with File Permissions
- Manual Pages
- Vi Editor
- Create/Delete/Rename/Copy/Cut Files
- Finding Files

FSTAB STRUCTURE

- Each line has six fields:
  - **1'st field**: indicates the block device or remote File System that will be mounted.
  - **2'nd field**: identifies the mount point the local system where the File System will be mounted.
  - **3'rd field**: File System type
  - **4'th field**: list of mount options
  - **5'th field**: it is used by dump (a backup program) to determine whether the File System should be dumped (1:yes, 0:no).
  - **6'th field**: it is used by fsck (0:never run, 1:run on the drive at predetermined, 2:it is recommended for non root File System so that fsck isn't run on them as frequently).

```
# <file system> <mount point>   <type>  <options>       <dump>  <pass>
/dev/mapper/vg-root /                   ext4    errors=remount-ro 0       1
UUID=847ece1b-c134-43ef-904d-57ea8702311d /boot           ext3    defaults
0       2
/dev/mapper/vg-home /home           ext4    defaults        0       2
/dev/mapper/vg-user /usr            ext4    defaults        0       2
/dev/mapper/vg-var /var             ext4    defaults        0       2
/dev/mapper/vg-vbox /vbox           ext4    defaults        0       2
UUID=ebde8c4b-0c54-44a2-984a-4c40cca95bc5 none            swap    sw
0       0
```

Change File Permissions

- -,---,---,---
- To display: ls –l file

To set:

- chmod 644 file
- chmod u=rw,g=r,o=r file
- Both set permissions to rw-r--r--

To add/remove:

- chmod u+rw,g+r,o-wx file

Change File Owner/Group

- File owner
- File group
  - when set?
- ls -l to show

Set:

chown user file

chown user:group file

chown -R user:group dir

دستور کار 1 - کار با مجوزها

1. در مسیر /tmp یک پوشه به نام labtest ساخته و داخل آن فایلی به نام testfile بسازید. با استفاده از دستور adduser user2 کاربر user2 را ساخته و در ترمینالی دیگر با استفاده از دستور su user2 به آن سوئیچ کنید.
   a) آیا کاربر user2 می‌تواند فایل testfile را بخواند؟
   b) آیا می تواند در آن بنویسد؟
   c) مجوزهای testfile را طوری تغییر دهید که کاربر user2 مجوز خواندن و نوشتن روی testfile را نداشته باشد.
   d) آیا user2 می‌تواند testfile را حذف کند؟ چرا؟
   e) کاری کنید که user2 بتواند testfile را حذف کند.
2. مالک پوشه‌ی labtest و محتویات آن را به user2 تغییر دهید. و سپس نشان دهید که user2 به testfile دسترسی کامل دارد.

Listing Dirs

- ls: shows contents of current dir
- ls dir: shows contents of dir
- ls -l: long list -> ls -l or ls -l dir
- ls -ld dir: long list of dir
- ls -1: one file per line
- ls -ct or ls -lct: sort in terms of modification time

Show File Contents

- cat
- more
- less
  - enter, space, q, /regex, ?regex, pageup/down, q, v
- head
  - head -10
- tail
  - tail -20

File System Navigation

- pwd
- cd
  - cd -> goes to home dir
  - cd .. -> to parent dir
  - cd - -> to previous dir
- pushd/popd
- Special dirs
  - .., .
  - ~: home dir
    - cp /tmp/pic1 ~/MyPictures/

Command History

- Using arrow keys
- Ctrl-R to search history
- history command

Linux Help Manual

- Manual Sections
- 1.User commands that may be started by everyone.
- 2.System calls, that is, functions provided by the kernel.
- 3.Subroutines, that is, library functions.
- 4.Devices, that is, special files in the /dev directory.
- 5.File format descriptions, e.g. /etc/passwd.
- 6.Games, self-explanatory.
- 7.Miscellaneous, e.g. macro packages, conventions.
- 8.System administration tools that only root can execute.
- …

- Example:
  - man kill (= man 1 kill)
  - man 2 kill
- Browse using *less* if installed, otherwise *more*.

EXAMPLE: THE COMMAND CAT

$ man cat

CAT(1) User Commands CAT(1)

NAME
cat - concatenate files and print on the standard output

SYNOPSIS
cat [OPTION] [FILE]...

DESCRIPTION
Concatenate FILE(s), or standard input, to standard output.

-A, --show-all
equivalent to -vET

-b, --number-nonblank
number nonblank output lines

-e equivalent to -vE

-E, --show-ends
display $ at end of each line

-n, --number
number all output lines

-s, --squeeze-blank
never more than one single blank line

-t equivalent to -vT

-T, --show-tabs
display TAB characters as ^I

-u (ignored)

-v, --show-nonprinting
use ^ and M- notation, except for LFD and TAB

--help display this help and exit

--version
output version information and exit

With no FILE, or when FILE is -, read standard input.

AUTHOR

Written by Torbjorn Granlund and Richard M. Stallman.

REPORTING BUGS

Report bugs to <bug-textutils@gnu.org>.

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SEE ALSO

The full documentation for cat is maintained as a Texinfo manual. If the info and cat programs are properly installed at your site, the command *info cat* should give you access to the complete manual.

- Man & info pages?

MANUAL PAGES - 2 دستور کار

1. صفحه ی راهنمای دستور du را باز کنید.
   a. این دستور متعلق به چه Section ی از صفحات راهنماست؟
   b. با توجه به خلاصه گفته شده در ابتدای راهنما، بگویید که این دستور چه کارکردی دارد؟
   c. آپشن L- را جستجو کرده و کارکرد آن را توضیح دهید (در یک ترمینال دیگر به صورت عملی کارکرد آن را نشان دهید).
   d. وظیفه آپشن x- چیست؟
   e. وظیفه آپشن h- چیست؟ به صورت عملی نشان دهید.
   f. نسخه‌ی دستور du ی مورد استفاده چند است؟
   g. آیا دستور ls خروجی مشابه du تولید نمی‌کرد؟ تفاوت این دو دستور چیست؟

What is vi ?

- The *visual editor* on the Unix.
- The vi editor is not a text formatter (like MS Word, Word Perfect, etc.)
  - you cannot set margins
  - center headings
  - etc.

Editors

- emacs
  - Old and very user friendly
  - Menu based
- mcedit
  - A part of the midnight commander
  - Menu based, easy to use
- vi & vim (vi improved)
  - Difficult
  - Editor for programmers
  - Minimalist interface, Very little info displayed
  - Powerful shortcuts and commands

Vim equals Vi

- The current iteration of **vi** for Linux is called **vim**
  - **Vi** I**m**proved
  - http://www.vim.org

Starting vi

- Type **vi** <filename> at the shell prompt
- After pressing enter the command prompt disappears and you see tilde(~) characters on all the lines
- These tilde characters indicate that the line is blank

Vi modes

- There are two modes in vi
  - Command mode
  - Input mode
- When you start vi by default it is in command mode
- You enter the input mode through various commands
- You exit the input mode by pressing the Esc key to get back to the command mode

How to exit from vi (comand mode)

- **:q** <enter> is to exit, if you have not made any changes to the file
- **:q!** <enter> is the forced quit, it will discard the changes and quit
- **:wq** <enter> is for save and Exit
- **:x** and **ZZ** equivalent to :wq
- The **!** Character forces over writes, etc. **:wq!**

Moving Around

- You can move around only when you are in the command mode
  - not the case in vim
- Arrow keys usually works(but may not)
- The standard keys for moving cursor are:
  - **h** - for left
  - **l** - for right
  - **j** - for down
  - **k** - for up

Moving Around

- **$** - takes you to the end of line
- ^ or 0 takes you to the head of line
- <**enter**> takes the cursor the the beginning of next line
  - Again Home and End keys may not work if not vim.
- **w** - to move one word forward
- **b** - to move one word backward

- Some shortcuts to move across sentences, paragraphs, ...

Entering text

- To enter the text in vi you should first switch to input mode
  - To switch to input mode there are several different commands
  - **a** - Append mode places the insertion point after the current character
  - **i** - Insert mode places the insertion point before the current character
  - **R** - starts the replace(overwrite) mode
  - **o** - is for open mode and places the insertion point after the current line

Editing text

- **x** - deletes the current character -> Del key may not work
- **d** - is the delete command but pressing only d will not delete anything you need to press a second key
  - **dw** - deletes to end of word
  - **dd** - deletes the current line
  - **d0/d$** - deletes to beginning/end of line
- There are many more keys to be used with delete command

Structure of vi command

- The vi commands can be used followed by a number such as

  n<command key(s)>

  - For example **dd** deletes a line **5dd** will delete five lines.
- This applies to almost all vi commands

Undo and repeat command

- **u** - undo the changes made by editing commands
- **.** (dot or period) repeats the last edit command
- ^R- Redo

Copy, cut and paste in vi

- **yy** - (yank) copy current line to buffer
- **nyy** - Where **n** is number of lines

- **p** - Paste the yanked lines from buffer to the line below
  - **P** - Paste the yanked lines from buffer to the line above

(the paste commands will also work after the **dd** or **ndd** command)

Other Vim Tips

- Hit / to search,
  - n/N: next/previous match
  - Prepend search string with \c for case-insensitive search,
- Ctrl-G to see current opened file,
- :%s/pattern/replacement/g
- -o and -O for split views,
- Syntax highlighting,
- :! somecommand
- . (dot) to repeat last command

- Has many more advanced features, specially for programmers
  - Auto-completion, code browsing, …

دستور کار 3 - ویرایشگر VIM

1. فایل /usr/share/doc/coreutils/copyright را به دایرکتوری خانگی کپی کنید:

```
cp /usr/share/doc/coreutils/copyright ~/
```

و با استفاده از ویرایشگر vim آن را باز کرده و تمامی دستورات گفته شده را روی آن اجرا کنید.

Create Files and Directories

Create empty files:

- touch file
- >file

Create files with text:

cat >file

123

^D

Using editors: nano, vi…

mkdir dir

Copy/Cut/Rename/Remove Files/Directories

- rm file
- rmdir dir -> dir must be empty
- rm options:
  - -r (*recursive)*: removes the contents of directories recursively
  - -i (*interactive*): prompts whether to remove each file
  - -f (*force*): forces rm to remove files independently from the permissions
- rm -r dir
- rm -rf dir -> dangreous!
  - no recycle bin!

- cp options file1 file2
  - file or dir, -r to copy dir recursively, copy multiple sources,
- If file2 does not exist, then cp creates it; otherwise cp overwrites it
- If file2 is a directory, cp makes a copy of file1 in the directory
  - `$ cp pippo ~/articoli`
  - `$ cp /etc/passwd .`

- mv file1 file2
- mv dir1 dir2
  - to rename, to cut, no -r, cut multiple files/dirs

Move

- `$ mv olddirectory newdirectory` (renames directory oldname to newname)
  - If `newdirectory` already exists mv moves `olddirectory` into the new one
- `$ mv oldname newname` (renames file oldname to newname)
  - If `newname` already exists mv writes `oldname` over `newname`
- mv options:
  - **-i** prompt before overwriting existing file
  - **-f** forces mv to replace reserve permissions
- `$ mv file path` (moves file in current directory to new directory)
  - `$ mv chap[1,3,7] book` (moves files chap1, chap3, and chap7 to directory book)
  - `$ mv chap[1-5] book` (moves files chap1 to chap5 to directory book)

دستور کار 4 - CP/RM/MV

1. کل پوشه‌ی /etc/network را با استفاده از یک دستور به دایرکتوری خانگی کپی کنید.
2. نام پوشه ی کپی شده را به mynetwork تغییر دهید.
3. پوشه‌ی mynetwork/if-up.d را به همراه محتویات آن حذف کنید.
4. فایل mynetwork/interfaces و پوشه‌ی mynetwork/if-down.d را با استفاده از فقط یک دستور به /tmp کپی کنید.
5. دو پوشه‌ی if-down.d و if-pre-up.d را به دایرکتوری خانگی cut کنید.

Finding Files

- find
  - no db/indexing; slow
  - powerful
  - find /etc/ -iname “*host*”
- locate
  - fast, has its own db
  - regularly run *updatedb* to update its db
  - incremental database
  - locate hello.c

دستور کار 5 - FIND/LOCATE

1. با استفاده از دستور find در مسیر /etc :
   a) فایل/دایراکتوری هایی را که نام آنها حاوی کلمه ی interface است پیدا کنید.
   b) فایل/دایراکتوری هایی را که اندازه‌ی آنها از 50 کیلوبایت بیشتر است پیدا کنید (راهنمایی: در صفحه ی راهنمای find کلمه ی size را جستجو کنید).
   c) فایل‌هایی را که نام آنها با p شروع شده و از نوع symbolic links هستند، پیدا کنید (راهنمایی: در صفحه ی راهنمای find آپشن type- را جستجو کنید).
2. در دایرکتوری خانگی فایلی به نام xyz123 ایجاد کنید.
   a) آیا دستور locate این فایل را پیدا می‌کند؟
   b) پایگاه داده locate را بروز کرده و دوباره دستور مورد قبل را تکرار کنید.
   c) آپشن c- در دستور locate چه کارکردی دارد؟