

Introducción a la administración de sistemas UNIX/Linux

Goals

- To get use to the command line
- To know and achieve skills with the system shell
- To understand some of the basic tools of system administration
- To start using Shell scripts for task automation.
- **To keep record of all the steps followed to solve these practices**

Part 1: command line

- 1) Using the system manual (`$ man`)
 - a) Log in the system “guest” as user `test`.
 - b) Write `man man` to obtain the help page of `man`.
 - c) Press ‘h’ to obtain the “less” pager help.¹
 - d) Exit the manual
 - e) Enter the manual again and try:
 - i) Go to the beginning/end of the page
 - ii) Move up and down one line and one screen
 - iii) Look for a string, for example “word”. Search next and previous appearances.
 - iv) Go to some specific line of the manual.
- 2) Inside the user directory, create one directory named `SI`. Go inside it and check the absolute `PATH` of where it is (there is a correct command for this). Use the command `cal` (calendar) and redirect its standard output to a text file. Check if that file has been created.
 - a) Check the content of the new file with the corresponding command. Copy that file to the personal user directory (`$HOME`). Remember that in the shell these commands can be edited.
 - b) Once copied, delete original file and the directory previously created. Remember that the command line can be autocompleted with the appropriate key.
 - c) Go to the user directory (`$HOME`) and list (in extended format, `-l`) the directories and files included. Pipe the output to the `cat` and `tee` commands finding their differences (if they exist).
 - d) List the 5 newest files (recently modified) in the `/etc` directory.

¹ Must install less if not in the system (*)

- e) Find which file is the most recent of the system.
- f) Change the permission of the previously created file so that only you can access it in read and write mode.
- g) Avoid any other user accessing our personal directory.
- h) See how many users are in the system and check which one is yours.
- i) Check when was the last time you access the system and from where.
- j) Analyze `finger` command using it with the 'test' user.
- k) Create a `.plan` file (`$HOME/.plan`), indicating some kind of personal information. Check this information with the `finger` command.
- l) Check if the 'root' user has unread mail and when was the last time that he/she accessed the system. Repeat with the 'test' user.
- m) Execute the `vi` editor. Practice with it. Create a new file and write in it the following lines:

```
echo -n Date:\
`date` | cut -f1,3,2,6 -d" "
echo -n I am:" "
whoami | cut -f1 -d " "
```

This file will be a "shell script" and it might be executed in two ways: either through a Shell or directory (`./`) changing its execution permissions.

- 3) Open `vi` with no file. What does it show?
 - a) Exit. Copy `/etc/passwd` file in `$HOME`
 - b) Edit `$HOME/passwd` file.
 - c) Use this file to practice the main basic and advanced commands to move around a file. (hjkl and others).
 - d) Start with a file named 'vi_test'. It must be created again.
 - e) Write your name in the file. Save and exit.
 - f) Open the file again and check its content.
 - g) Add more names to the file. Move to the middle of the file and add a name upper line and another one in the lower line.
 - h) Check combined movement (combined prefix)
 - i) Move 3 lines down in a single movement
 - i) Try to delete a character, a line and a word of the file
 - j) Repeat the previous step with numerical prefixes.
 - i) Delete until the end of a line.
 - ii) Delete from the beginning of a line.
 - iii) Delete two lines at a time.
 - iv) Delete two words at a time.
 - k) Repeat the previous step but change instead of delete.
 - l) Cut the first line of the file and paste it at the end of the file.
- 4) Applications and commands in text mode:

- a) Compress in a `.tar.gz` file the `/var` file. Place the created file in your `$HOME`. Check that this was done correctly uncompressing it in `/tmp`.
 - b) As root, look for all the files property of the 'test' user in the system (`/`) and list them in extended way. Do all this in the same command.
 - c) As root again, show the last 30 lines of the `/var/log/syslog` file.
- 5) Download the file www.atc.unican.es/SI/grepdata.txt
- a) Once you have the file, write a series of grep statements that do the following:
 - i) Print all lines that contain a phone number with an extension (the letter x or X followed by four digits).
 - ii) Print all lines that begin with three digits followed by a blank.
 - iii) Print all lines that contain a date. Hint: this is a very simple pattern. It does not have to work for any year before 2000.
 - iv) Print all lines containing a vowel (a, e, i, o, or u) followed by a single character followed by the same vowel again. Thus, it will find "eve" or "adam" but not "vera".
Hint: `\(` and `\)`
 - v) Print all lines that do not begin with a capital S.
 - b) Write grep statements that use command-line options along with the pattern to do the following:
 - i) Print all lines that contain CA in either uppercase or lowercase.
 - ii) Print all lines that contain an email address (they have an `@` in them), preceded by the line number.
 - iii) Print all lines that do not contain the word Sep. (including the period).
- 6) Execute in background the command that allows to see all the files inside a directory recursively. Do it for the root directory `/` and its output will be redirected to a file name 'temp'. If you need any help, remember to use the `man` command.
- a) Check if the process really exists. If it does kill it.
 - b) Repeat the previous steps, but executing in the foreground. Stop the process. Then move the job to foreground again. Suspend it. Move it to the background. Finally kill it.
 - c) Try to kill the INIT process.
 - d) Look for all the process in the system for which we are owners.
 - e) Look for all the process in the system for which neither us nor root are the owners.
- 7) Advanced commands:
- a) List the content of `/etc/` directory and redirect stdout to a file called `contetc.txt`
 - b) Perform the following tasks:
 - i) Create a reduced version of `contetc.txt` file, containing the following info for each line: `[file/dir name] [size] [owner]`
 - ii) Sort the contents of the new file according to the field `[name]` and write result to file `alphasorted.txt`. Repeat the process in reverse order (`antialphasorted.txt`)
 - iii) Now sort contents according to the field `[size]` (`numsorted.txt`)

- iv) Finally, create a new file containing the first three characters of each file/directory name.
 - c) Download the text file www.atc.unican.es/SI/AboutWeb.txt
 - d) Perform the following modifications (through command line, do not use vi)
 - i) Lines with <article> and </article> should be deleted.
 - ii) Replace <title> with Title:, and replace </title> with nothing.
 - iii) Replace all <para> and </para> tags with the null string. If the resulting line is empty, delete the line. (You may need to use curly braces to make this happen.)
 - iv) Replace all <emphasis> and </emphasis> tags with asterisks.
 - v) Replace the word web with Web everywhere.
 - vi) Replace lines starting with <listing> by ---begin listing
 - vii) Replace lines starting with </listing> by ---end listing
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Part 2: Shell Scripting

1. Write a Shell script called lsdirs.sh, which lists just the directories in the current directory.
2. Write a Shell script called see.sh taking a filename name as argument which uses 'ls' if the file is a directory and 'more' if not.
3. Write a script that asks the user to type a Word and then tells the user how long that Word is.
4. Write a script that asks the user to type a Word and checks if that is an available user command or not.
5. We will start this section creating a Shell script able to create a directory named "trial", cd into it and then create 100 files named fich<num>.txt (where num is a number between 0 and 99).
6. Extend your script, making that the content of each file created corresponds to the n-th line of ls command manual (fich57.txt has the 57th line of 'man ls')
7. Create a script able to change the extension of all .txt files to .t
8. Create a script which takes an undefined number of parameters [0-9] and removes the file corresponding to the sum of all parameters. Example: borra.sh 1 3 5 6 2 removes the file fich17.txt (1+3+5+6+2=17)
9. Write a Shell script called sorter.sh that sorts the /etc/passwd file content using one of the following id as the key; Username, UID or GID. The identifier must be passed by command line.
10. Suppose that you want to write the same letter to many people (but personalized addressing). Write a file with all the desired recipients (one per line). Create a template textfile which has NAME wherever you want the person's name to appear. Create a mailmerge script that produces a personalized letter for each person in the list.