



Shell commands for process management

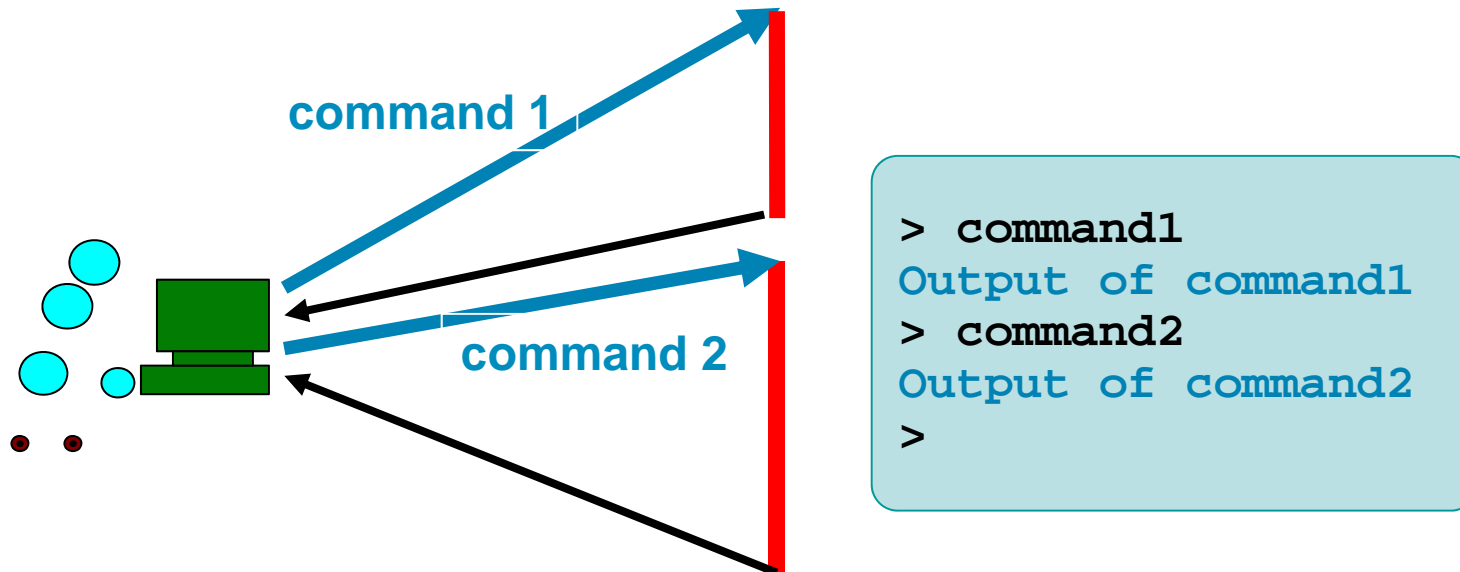
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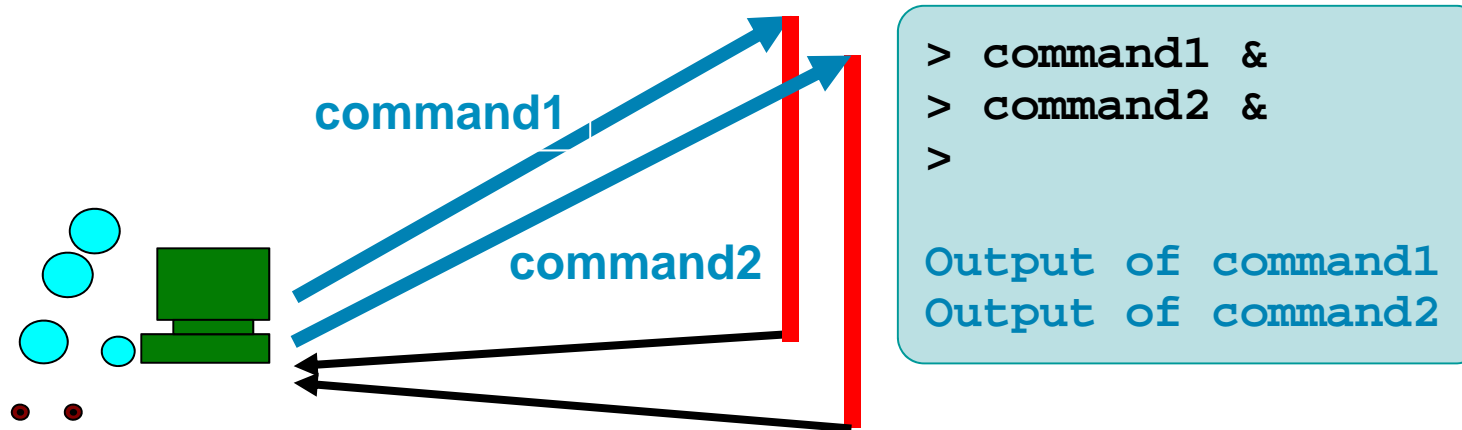
Foreground execution

- ❖ The standard shell commands
 - Allow executing processes **sequentially**
 - Each process is executed in **foreground**, i.e., using the control terminal



Background execution

- ❖ The shell interpret character & as an indication to run the command in **background**
 - The process is executed in concurrency with the shell. It loses the control terminal input
 - The shell outputs immediately a new prompt
 - It is possible to run several processes in parallel



Process status commands

❖ Two main commands

➤ **ps (process status)**

ps <options>

- List active processes and some related information li
- Options
 - -e (or -A) List all processes
 - -f Extended format
 - r (not -r) Shows only the “running” processes
 - -u <user> Shows only the <user> processes

Process status commands

➤ **Command top**

- Display and updates information about the system used resources, and the active processes

```
user@mahine:~/$ top
```

```
top - 10:26:58 up 57 min,  3 users,  load average: 0.00, 0.01, 0.05
Tasks: 152 total, 2 running, 150 sleeping, 0 stopped, 0 zombie
%Cpu(s): 4.0 us, 0.6 sy, 0.4 ni, 93.5 id,  1.4 wa, 0.0 hi, 0.0 si, 0.0 st
KiB Mem:  8177092 total, 1382976 used, 6794116 free,  174096 buffers
KiB Swap: 10482684 total,          0 used, 10482684 free.  544664 cached Mem
```

[illegible]

kill command

- ❖ **kill** allows sending signal from the shell
- ❖ **Format**
 - **kill** [**-sig**] **pid**
 - Sends signal **sig** to process with PID=**pid**
 - Option **sig** indicates the signal code
 - **pid** is the process identifier (PID) of the target process
 - The default signal of **kill** is **SIGTERM**, the standard termination command

kill command

- ❖ A signal **sig** can be indicated by means of its name or by its corresponding number
 - The list of the available signals can be obtained using the **-l** option
 - `SIGKILL = KILL = 9`
 - `SIGUSR1 = USR1 = 10`
 - `SIGUSR2 = USR2 = 12`
 - `SIGALRM = ALRM = 14`
 - etc.

kill command

❖ Examples

- `kill -l`
- `kill -9 10234`
- `kill -SIGKILL 10234`
- `kill -KILL 10234`

List available signals

Three commands to terminate process with PID 10234

❖ Shell command `killall` terminates all process with a specified name

- `killall -9 name`
- Useful to terminate all processes generated by the same program avoiding to specify their PIDs