

DT149G Administration of UNIX-like systems  
Laboratory Assignment— System Administration  
I

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## 1 Introduction

This lab will cover process management, scheduling and log files.

## 2 Aim

After completion of this assignment you will have:

- Become familiar with process handling, priorities and scheduling.
- Knowledge how logging works in a UNIX-like system.

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## 3 Reading instructions

Before starting this assignment you should have read Nemeth et al., 2017, chapters 4, 10, 29

## 4 Tasks

Perform the following tasks and document all the steps taken to complete the tasks.

### 4.1 Process management

Before starting this task you should become familiar with the following commands: `ps (1)`, `nice (1)`, `renice (1)`, `nohup (1)` and `kill (1)`

You should also create a simple script that contains an infinite loop that you can use to run the commands against e.g.

```
#!/bin/bash
while true
do
    echo a > /dev/null
done
```

Give the script executable rights and start it in a new terminal

- With the help of `ps (1)` identify what process ID your newly created script got.
- Write down the priority and nice value of the process,
- restart the script with a lower priority, check what priority and nice value the process have now.
- now increase the scripts priority without restarting it:
  - without using `sudo`, how highly will you be able to prioritize the process?
  - with `sudo`, how highly will you be able to prioritize the process?
- now stop your script using `kill (1)` and `pkill (1)`
- start the script with the `nohup (1)` command after which you close the terminal. Using another terminal check to see if the script is still running.
- kill the script and rerun it using the `&` character, e.g.

```
firefox&
```

What happens?

- Once more rerun the script and suspend it using `<CTRL>-Z`. Now with the help of the commands `jobs (1)`, `bg (1)` and `fg (1)`, start the script in the foreground, then once again suspend the process and start the script in the background.

**To answer in your report** For this task, answer the following questions in your report:

- Explain the relationship between nice-value and priority
- What is the highest and lowest priority a user can set on a process?
- With a few sentences, describe the different ways of running a script in the background, bringing it to the front.
- Give a practical use-case of the `nohup` (1) command.

## 4.2 Scheduling

Before starting this section you should get acquainted with `crontab` (1), `at` (1) and `find` (1)

1. Create a script that removes all files in `/tmp` that haven't been access in the last two days. If you do not have a file that meet this criteria, you can change the timestamp with the help of `touch` (1).
2. Configure `crontab` (1) to run your script every evening at 23:50.
3. Run the script 21:30 this evening.

**To answer in your report** For this task, answer the following questions in your report:

- What is the difference between running something with `Crontab` (1) and with `at` (1)?
- Include a screenshot of your modified crontab configuration file.

## 4.3 System statistics

Before starting this task you should see the man pages for `vmstat` (8), `top` (1), `last` (1), `w` (1) and `uptime` (1).

1. Try `vmstat` (8), What can you find?
2. Try `top` (1), what information are you able to retrieve?
3. How much memory and swap is used / configured on your machine?
4. Name the 10 users that last logged in on your machine.
5. Use `w` (1), who is currently logged in on your machine?
6. What information are you able to retrieve with the `uptime` (1) command.

**To answer in your report** For this task, answer the following questions in your report:

- What is the difference between `vmstat` and `top`? What information can be found using both tools, and what information is unique for each of the tools?
- What is the difference between the three load-average values that are given with the `uptime`-command?
- Add a screenshot showing the last 10 users logged in on your system.

#### 4.4 Log files

The following man pages should be read before starting this task, `dmesg` (1), `logger` (1) and `rsyslogd` (8)

1. What information can be retrieved using `dmesg` (1)
2. Enter `/var/log/` and go through the different log files, see `rsyslog.conf` (5) for more information about the different log files.
3. Use `logger` (1) send a message to syslog at a facility.level for example `lpr.notice`, verify that your message is visible in the syslog.

**To answer in your report** For this task, answer the following questions in your report:

- What is the difference between syslog and `dmesg`?
- Add a screenshot showing the logmessage that you sent to syslog with `logger` (1).

## 5 Examination

Hand in a report containing all your solutions to the questions in Section 4. *Remember that you must include references to the given reading instructions, alternatively to the laboratory work you have done*

## References

Nemeth, E., Snyder, G., Hein, T. R., Whaley, B., & Mackin, D. (2017). *Unix and linux system administration handbook* (Fifth edition.). Addison-Wesley/Pearson.