



**CHALMERS**  
UNIVERSITY OF TECHNOLOGY

## ASSIGNMENT #3

# Introduction to Linux

## 1. Monitoring processes

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(Adapted from “Introduction of Linux” by Dr. M. Garrels, chapter 4.)

Run `top` in one terminal while you do the following exercises in another terminal window.

Run the `ps` command. What processes are shown? What is the PID of the shell that you are using right now? To which terminal is the shell connected? Find a way to display all processes with `ps`. Which process has PID=1? Display the process tree.

Run the command `find /` (what does this do?). What effect does it have on system load? Stop this command.

Start the `xclock` program in the foreground. Then let it run in the background. Start `xeyes` directly in the background. Bring `xclock` back to the foreground. Kill both `xeyes` and `xclock` from the same terminal.

What does `kill` do? What does `kill -9` do? When would you use these two commands in different circumstances?

Open two new terminals and use `write` to send a message from one terminal to the other.

Issue the `dmesg` command. What does it tell?

How long does it take to execute `ls` in your home directory? And in the root directory?

How long has your system been running? What is your current TTY?

Name 3 standard Linux commands that use the SUID mode. Explain why they need so.

Find the processes that are causing the highest load on your system.

## 2. Boot process, run levels

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(Adapted from “Introduction of Linux” by Dr. M. Garrels, chapter 4.)

Try to reboot the system from the terminal. Can you reboot the system as a normal user? Why is that?

Use `service` to create a list of all the services and daemons that are started up when your system has booted.

## 3. Scheduling

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(Adapted from “Introduction of Linux” by Dr. M. Garrels, chapter 4.)

Use `sleep` to display a message in 3 minutes. Can you run other commands (in the same terminal) while you are waiting for the message to appear?

*(The following two exercises (at and cron) may not work on the computers at Chalmers.)*

Create an `at` job that copies all files from your `linuxcourse` directory to `linuxcourse2`. List your pending `at` jobs. Verify that the files are copied after the scheduled time.

Make a `cron` job that does the same on Wednesday evenings. Check that it works. Remove the `cron` job. Where does output from the job go?

## 4. Remote login

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Often you have no physical access to a system that you administer. In that case, you can remote login with SSH:

```
ssh username@remote11.chalmers.se
```

The first time you connect to a server, `ssh` will ask you to verify the fingerprint of the server, which you can do here:

<https://student.portal.chalmers.se/en/contactservice/ITServices/self-administered/windows/remote/Sidor/ssh.aspx>

Run a simple command that creates a file with a few minutes delay. Log out from the `ssh` session. Log in again after the delay has expired. Is the file created? Why?

Now start a `screen` session. Run the same command that creates a file with a few minutes delay. Detach from `screen` and log out from the `ssh` session. Log in again after the delay has expired. Is the file created? Why?

Detach from `screen` and study the parent process and the TTY of `screen` and commands you run in a `screen` session.

Exit the `screen` session and log out from `remote11.chalmers.se`.