Lab 10

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1. **A clean setup**
- Where to copy the dice module for it to be officially known to the kernel?
  /lib/modules/$(uname -r)

- What command to run in order to generate the modules.dep and map files?
  sudo depmod -a

- How to ensure the dice module is loaded at boot time, and how to pass it options?
  Add the dice module name to **"/etc/modules-load.d/modules.conf**" or create another .conf file under the directory of "**/etc/modules-load.d/"**.

  To allow arguments to be passed to your module, declare the variables that will take the values of the command line arguments as global and then use the module_param() macro, (defined in linux/moduleparam.h) to set the mechanism up. At runtime, insmod will fill the variables with any command line arguments that are given, like ./insmod mymodule.ko myvariable=5. The variable declarations and macros should be placed at the beginning of the module for clarity.

- How to create a new friends group and add grandpa and his friends to it?
  Cretate agroupadd   groupname
  usermod -a -G group1,group2 username

- What is udev and how to define rules such that the group and permissions are automatically setup at device creation?
  - **udev (userspace /dev)** is a device manager for the Linux kernel. As the successor of devfsd and hotplug, udev primarily manages device nodes in the /dev directory. At the same time, udev also handles all user space events raised when hardware devices are added into the system or removed from it, including firmware loading as required by certain devices.
  - We can modify the rules in "**etc/udev/rules.d/70-snap.snapd.rules**".

2. **A discreet gambling setup**
- How adjust the PATH, ensure its new version is loaded but then forgotten?
  Temporary change: **export PATH = "/home/ubuntu:$PATH"**

- What is the exact behaviour of su when wrong password is input?
  The terminal will prompt user name again.

- When using the read command how to hide the user input?
  read -s PASSWORD
  The "-s" ensures the input will not displayed on the terminal.

- How to send an email from the command line?
  sendmail user@example.com   < /tmp/email.txt

3. Automatic setup
- What is systemd, where are service files stored and how to write one?
  - **systemd** is a basic building block of a linux system. It provides a system and service manager that runs as PID 1 and starts the rest of the system
  - /etc/systemd/system
    Create a file named your-service.service under the directory
    [Unit]
    Description=<description about this service>

    [Service]
    User=<user e.g. root>
    WorkingDirectory=<directory_of_script e.g. /root>
    ExecStart=<script which needs to be executed>
    Restart=always

    [Install]
    WantedBy=multi-user.target
- How to get a systemd service to autostart?
  sudo systemctl enable your-service

- What is the difference between running tmux from the system service or from the gp-2.10 daemon
  The system service is a wrapper script that allows **system administrators** to start, stop, and check the status of services without worrying too much about the actual init system being used.
- What is dbus and how to listen to all the system events from the command line?
  D-bus is a message bus system , a simple way for aplications to talk to another
  dbus-monitor –system

- What is tmux, when is it especially useful, and how to run a detached session?
  tmux is a terminal multiplexor
  tmux new -s   session-name
  It's useful because it allows you to run commands separately in a dufferent window.

- What is tripwire, what are some alternatives, and why should the configuration files also be encrypted and their corresponding plaintext deleted?
  - Tripwire is an intrusion detection system (IDS), which, constantly and automatically, keeps your critical system files and reports under control if they have been destroyed or modified by a cracker (or by mistake). It allows the system administrator to know immediately what was compromised and fix it
  - In case the hacker decode the file from the configuration file.

- What is cron and how to use it in order to run tasks at a specific time?
  - The Cron daemon is a built-in Linux utility that runs processes on your system at a scheduled time. Cron reads the crontab (cron tables) for predefined commands and scripts. By using a specific syntax, you can configure a cron job to schedule scripts or other commands to run automatically.
  - Crontab –e
  - Syntax: a b c d e /directory/command output