Operating System fundamentals

Repetition and exam procedure

KdG Karel de Grote Hogeschool

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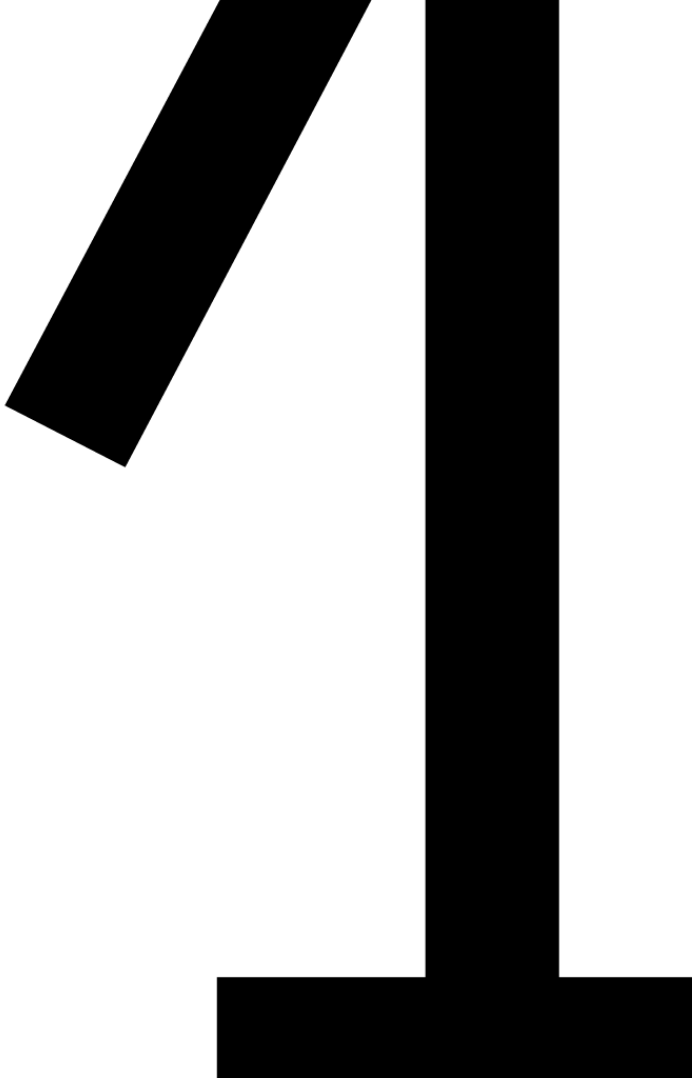
Repetition



Scripting

- No interactive commands
- Shebang
- Use of variables
- Standard variables: $#, $1, $2, ...
- Use of redirecting > and >>, use of /dev/null
- ‘back quotes’: $(...)
- calculations: $((...))
- exit codes
- IF
- WHILE, UNTIL
- FOR

Local users and groups

- Types of users (service, regular, root)
- Files (passwd, shadow, group)
- Request information (whoami, id, groups)
- Primary and secondary groups
- Change user (su, sudo)
- Arrange sudo access (/etc/sudoers)
- Add, modify, delete users
- Add, modify and delete groups
- Change passwords

Access control

- Querying and interpreting permissions
  - Regular Linux permissions
  - Special permissions
- Customizing owning user and group
- Changing permissions
- Umask

Process management

- Process states
- Making processes visible (pstree, ps)
- Jobs: background and foreground
- Process signal (SIGTERM, SIGKILL, SIGHUP)
- kill, killall, pkill, pgrep
- View and interpret processor load
- Scheduling van processes (at and crontab)

Software Management

- Packages and repositories
- Package manager (dnf)
- dnf update, install, remove, list, list installed, info, search, history
- rpm -i, rpm -e, rpm -qf

Services and Daemons

- Services and Daemons, systemd
- systemctl list-units, status, is-active, is-enabled, start, stop, restart, reload, reload-or-restart, enable, disable

Configure and secure SSH

- Using and understanding SSH and encryption
- Files ~/.ssh/known_hosts, /etc/ssh/sshd_config
- Key based authentication
  - Generate keys
  - Copy key to remote server

Disk and partition management

- Block devices
- devices in /dev (lsblk), UUID
- Partitions (fdisk/gdisk)
- file systems (mkfs)
- mounting (mount, lsof)
- Disk Usage (du)
- Disk Free (df)

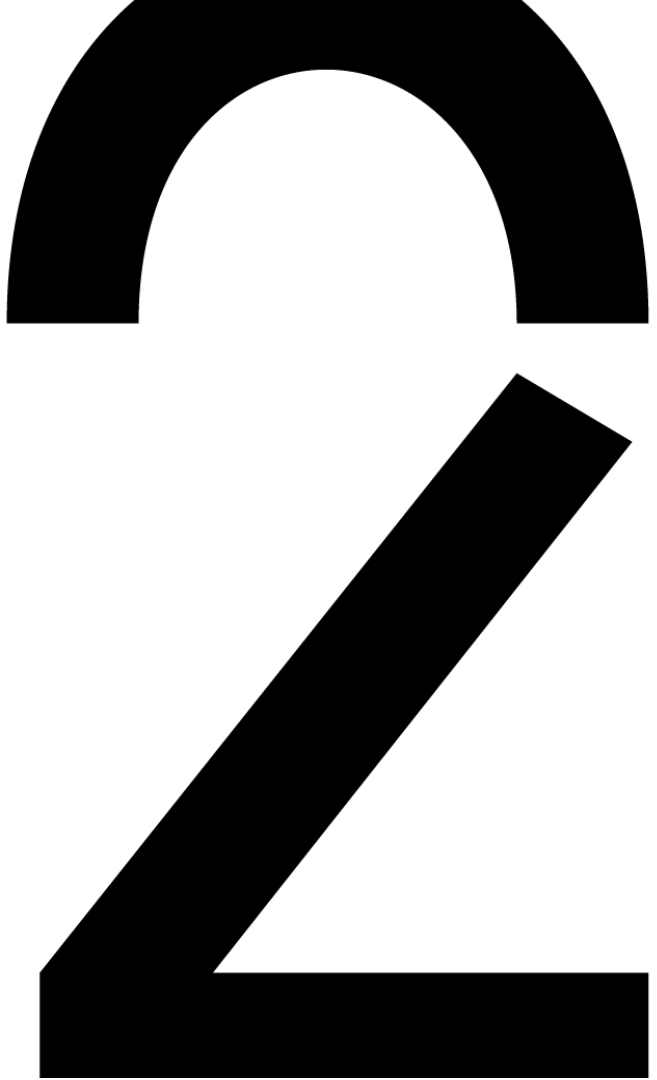
Containers with Docker

- images and containers
- image registries
- docker pull, run, ps, rm, images, rmi
- tags, interactive containers, detaching, port mapping, volumes

More networks

- IP addresses, DNS
- Network adapters (links): NMTUI, NMCLI
- Understand output of "ip a"
- DHCP
- DNS: /etc/resolv.conf, /etc/hosts, nslookup
- Types of networks: NAT, host only, bridged
- firewalls: firewall-cmd
- extra’s: ss, tcpdump, tracepath, mtr

Exam procedure



General

- Be sure to arrive on time! (at least 15 min in advance)

Exam T1

- 6/01/2026 8:30, 90 minutes
- Repetition of Exam T1
- You can choose whether you want to participate, highest score counts
- Schoolyear, multiple choice, closed book
- Represents 30% of the total

Exam T2

- 9/01/2026 8:30, 90 minutes
- Subject matter of T2
- Schoolyear, closed book
- Not just multiple choice! Fill-in questions
  - practical questions (give command to ...)
  - theoretical questions (which file, what is, what is for what, ...)
- Stands at 50% of the total

T2 Scripting Exam

- 09/01/2026 11:30, 60 minutes
- Write a script
  - consists of several steps
- open book with XMON
- You can use anything that's on your laptop, books, notes, VMs
- No internet, Bluetooth, AI, smartphones, smartwatches, ...
- Stands at 20% of the total

Exam OC operating systems

- 09/01/2026 14:15, 120 minutes
- RedHat course subject matter of T1 and T2 (see canvas)
- open book with XMON
- You can use anything that's on your laptop, books, notes, VMs
- No internet, Bluetooth, AI, smartphones, smartwatches, ...
- with AlmaLinux
- Stands at 100% of the total

Questions???

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