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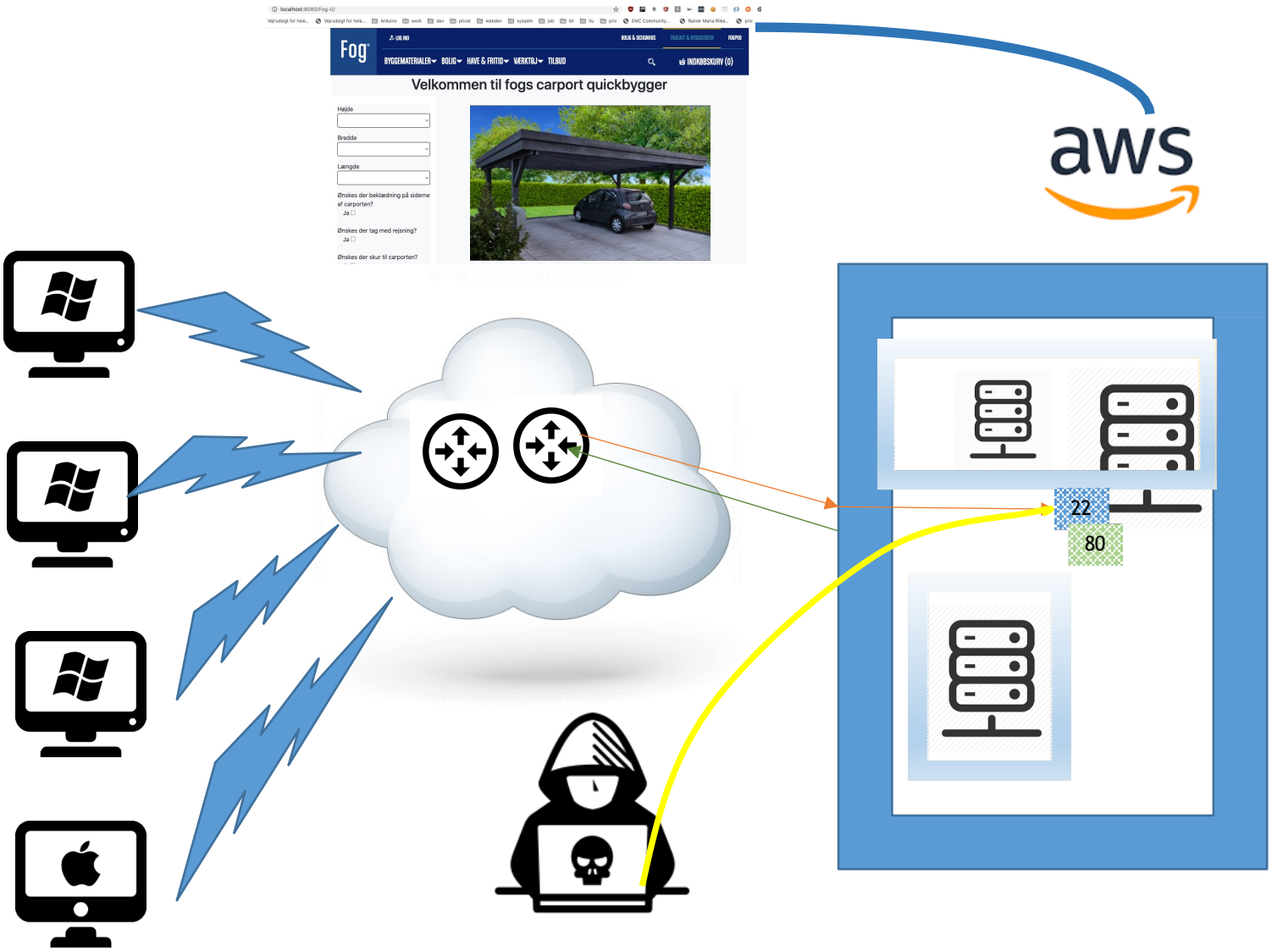
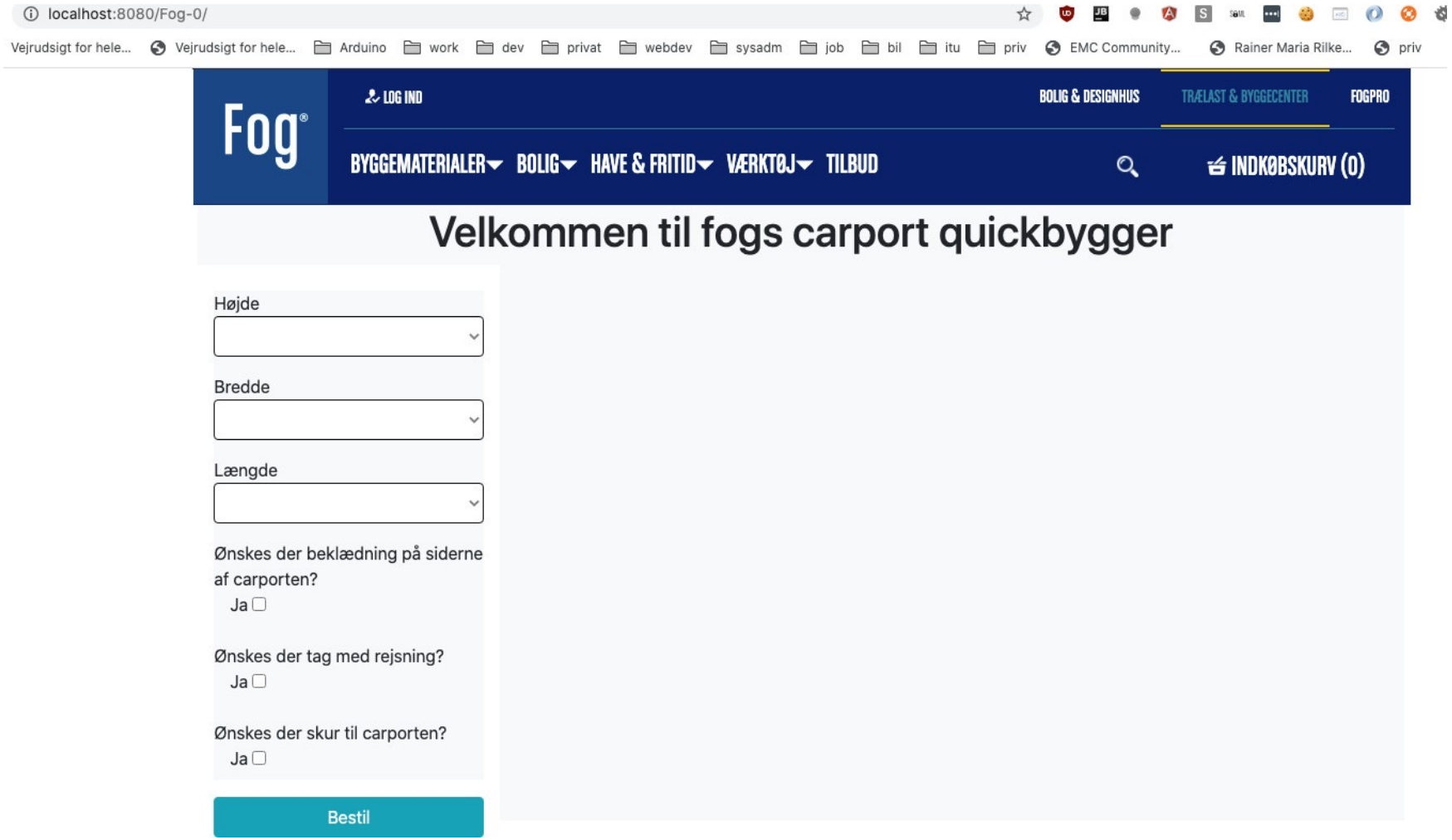
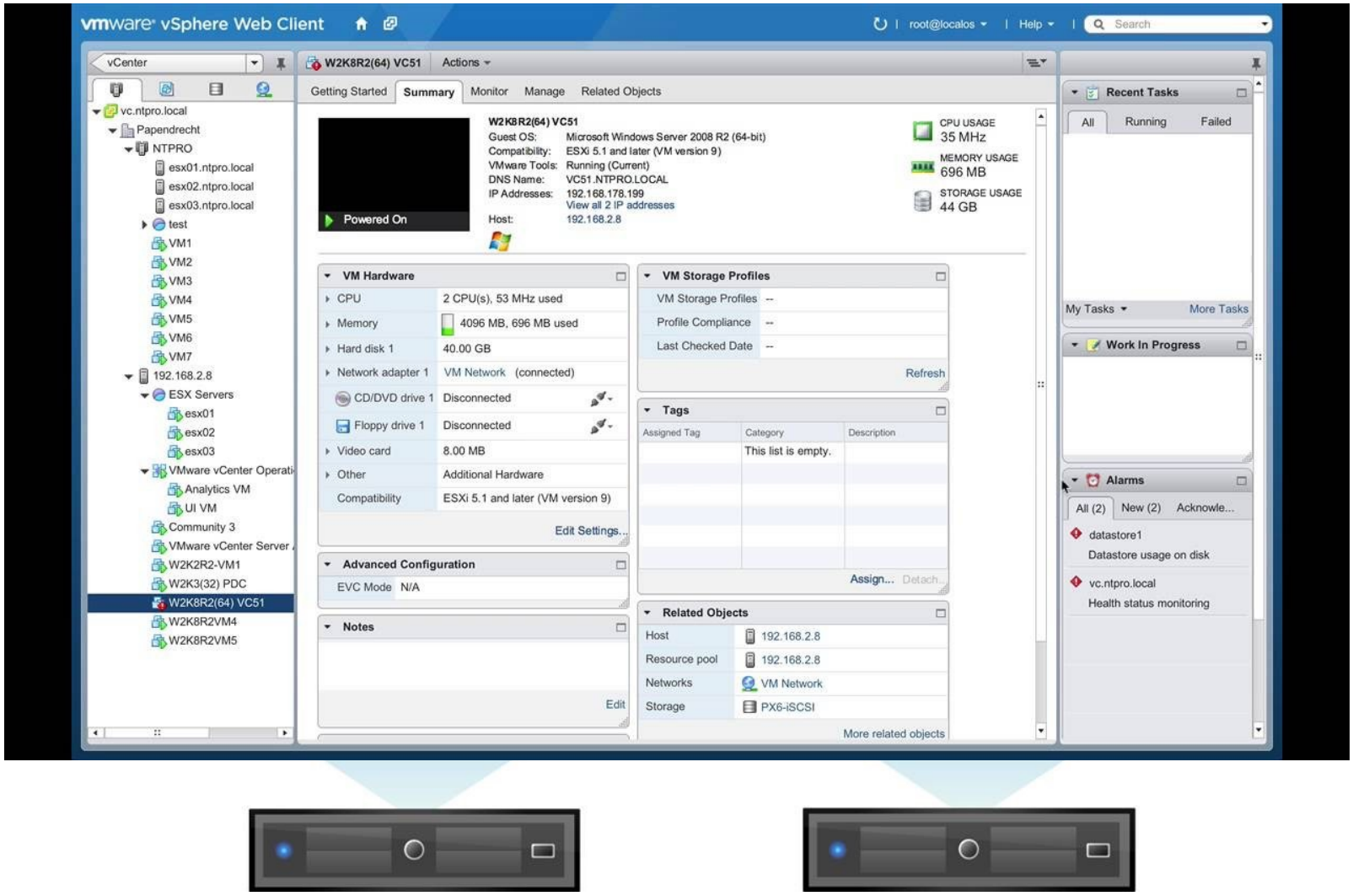
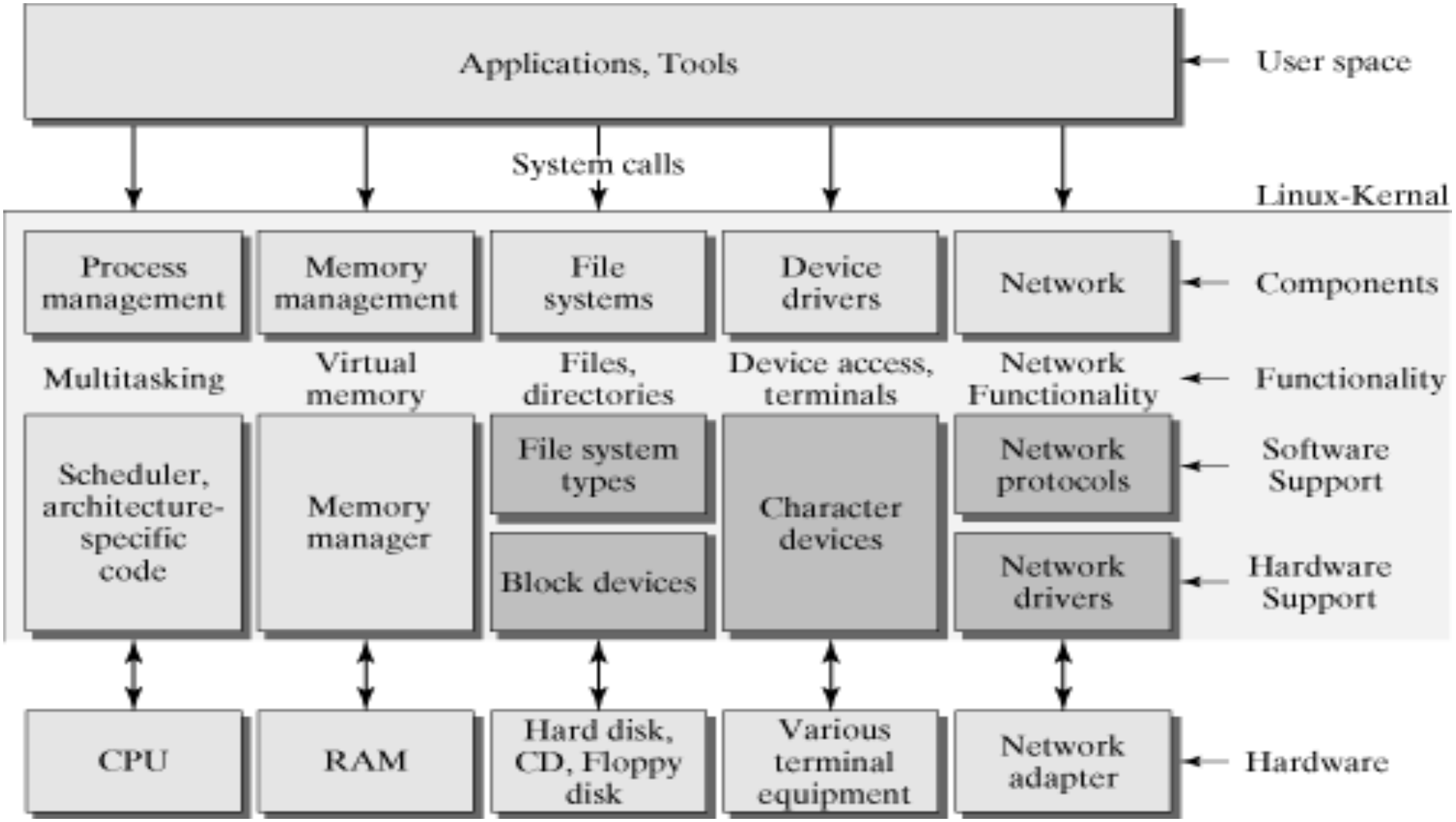
1. Linux
    1. EC2 med ubuntu
    2. Linux filbaseret OS
    3. Bash crashcourse
2. Regulære udtryk

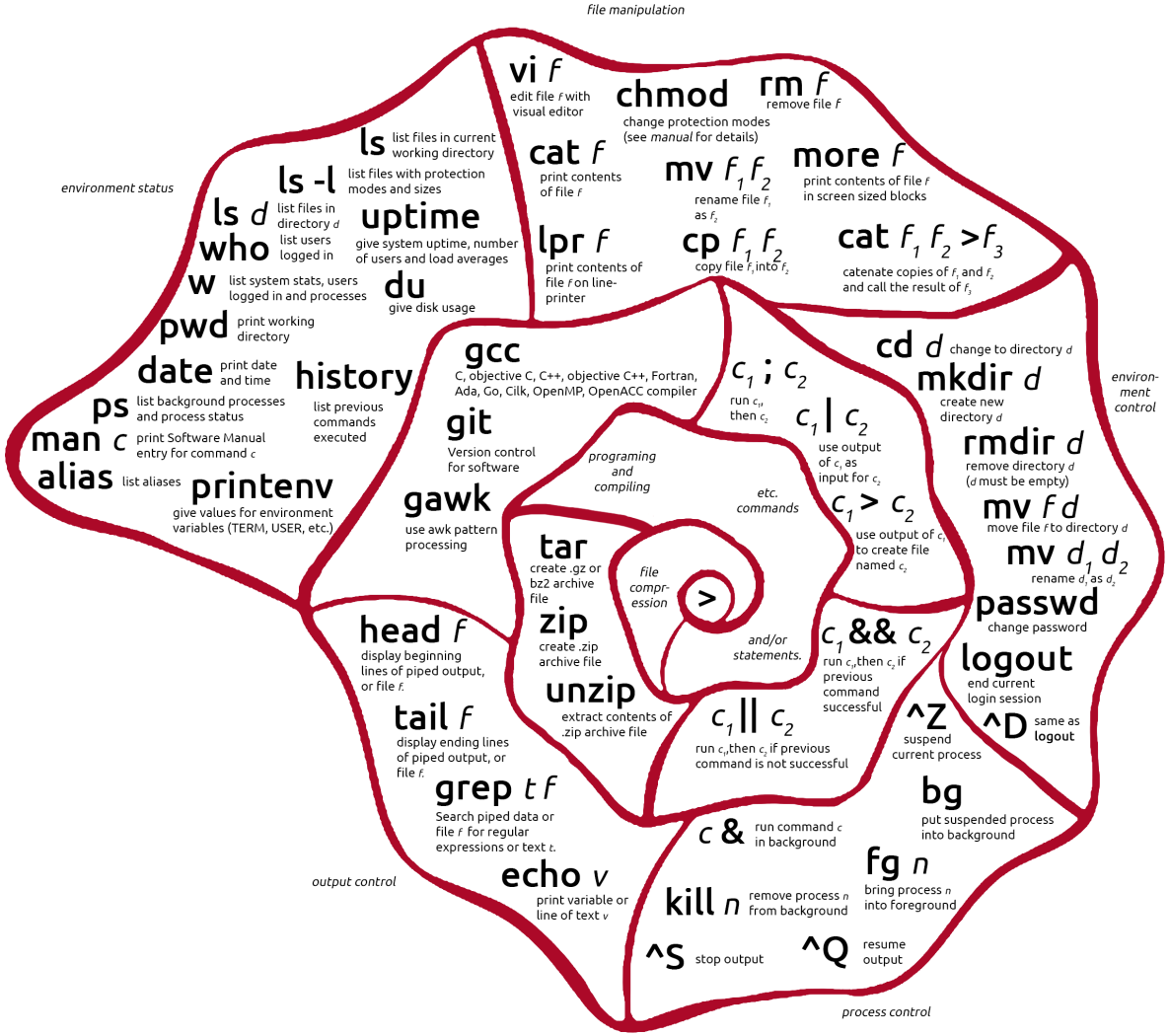

Fog
Velkommen til fogs carport quickbygger
aws
22
80


localhost:8080/Fog-0/
Vejrudsigt for hele...
Vejrudsigt for hele...
Arduino
work
dev
privat
webdev
sysadm
job
bil
itu
priv
EMC Community...
Rainer Maria Rilke...
priv
Fog
LOG IND
BOLIG & DESIGNHUS
TRÆLAST & BYGGECENTER
FOGPRO
BYGGEMATERIALER
BOLIG
HAVE & FRITID
VÆRKTØJ
TILBUD
INDKØBSKURV (0)
Velkommen til fogs carport quickbygger
Højde
Bredde
Længde
Ønskes der beklædning på siderne af carporten?
Ja
Ønskes der tag med rejsning?
Ja
Ønskes der skur til carporten?
Ja
Bestil

System landskab - Hypervisor og virtuelle maskiner




Applications, Tools
User space
System calls
Linux-Kernal
Process management
Memory management
File systems
Device drivers
Network
Components
Multitasking
Virtual memory
Files, directories
Device access, terminals
Network Functionality
Functionality
Scheduler, architecture-specific code
Memory manager
File system types
Block devices
Character devices
Network protocols
Network drivers
Software Support
Hardware Support
CPU
RAM
Hard disk, CD, Floppy disk
Various terminal equipment
Network adapter
Hardware


file manipulation
vi f
edit file f with visual editor
chmod
change protection modes (see manual for details)
rm f
remove file f
ls
list files in current working directory
cat f
print contents of file f
mv f1 f2
rename file f1 as f2
more f
print contents of file f in screen sized blocks
environment status
ls -l
list files with protection modes and sizes
ls d
list files in directory d
uptime
who
list users logged in
give system uptime, number of users and load averages
lpr f
print contents of file f on line-printer
cp f1 f2
copy file f1 into f2
cat f1 f2 >f3
catenate copies of f1 and f2 and call the result of f3
w
list system stats, users logged in and processes
du
give disk usage
pwd
print working directory
cd d
change to directory d
gcc
C, objective C, C++, objective C++, Fortran, Ada, Go, Cilk, OpenMP, OpenACC compiler
c1 ; c2
run c1, then c2
mkdir d
create new directory d
environ-ment control
date
print date and time
history
list previous commands executed
ps
list background processes and process status
git
Version control for software
c1 | c2
use output of c1 as input for c2
rmdir d
remove directory d (d must be empty)
man c
print Software Manual entry for command c
programing and compiling
etc. commands
c1 > c2
use output of c1 to create file named c2
mv f d
move file f to directory d
alias
list aliases
printenv
give values for environment variables (TERM, USER, etc.)
gawk
use awk pattern processing
mv d1 d2
rename d1 as d2
tar
create .gz or bz2 archive file
file compr-ession
>
passwd
change password
head f
display beginning lines of piped output, or file f.
zip
create .zip archive file
c1 && c2
run c1, then c2 if previous command successful
and/or statements.
logout
end current login session
unzip
extract contents of .zip archive file
c1 || c2
run c1, then c2 if previous command is not successful
^Z
suspend current process
^D
same as logout
tail f
display ending lines of piped output, or file f.
grep t f
Search piped data or file f for regular expressions or text t.
bg
put suspended process into background
c &
run command c in background
fg n
bring process n into foreground
output control
echo v
print variable or line of text v
kill n
remove process n from background
^S
stop output
^Q
resume output
process control

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AWS, SSH og nøgler

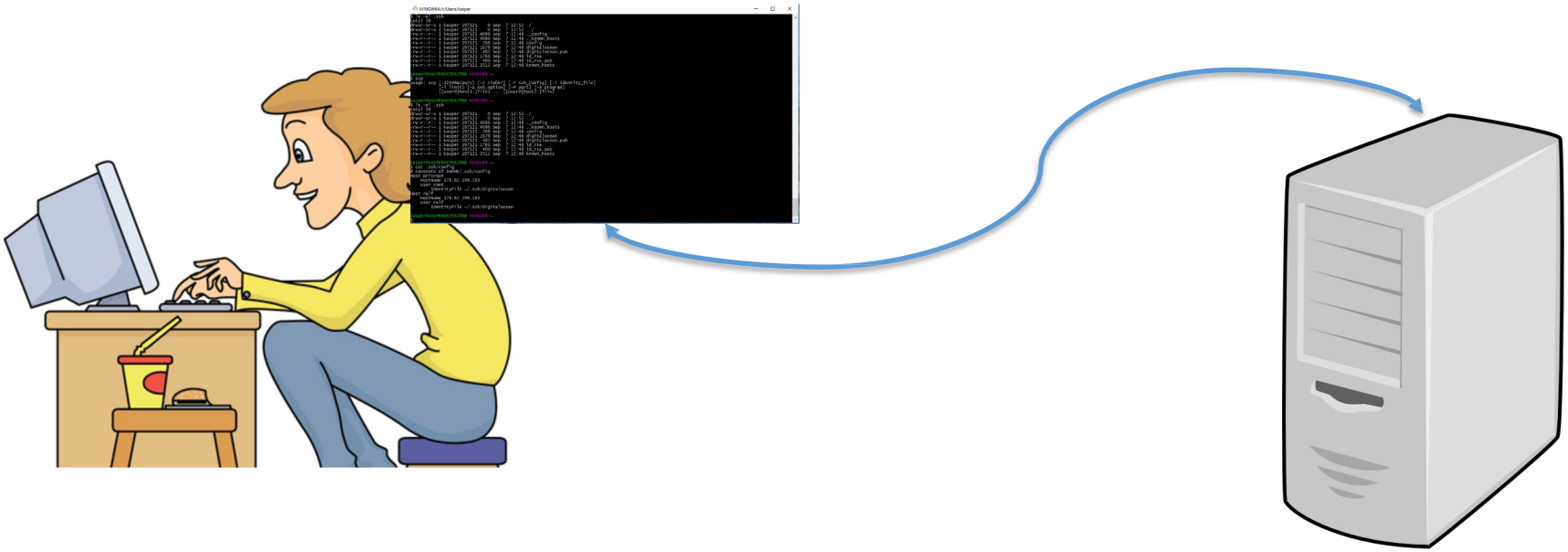
Linux in the cloud

Connecting to a linux server

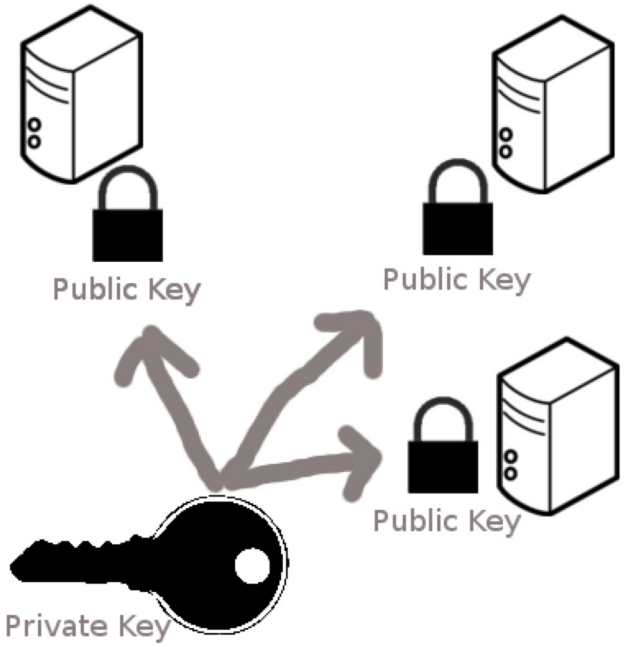
Connecting to a server using ssh is a two step procedure.

First you run the git-bash program to allow you to have a “shell” program to work on your own computer using a text-only interface

Second, you use the shell to connect to the digitalocean server – the command to do this is called ssh (secure shell).



Public and private key



- You store the private key on **your** computer
  - The typical place is in your root directory in the folder named ".ssh".
  - The private key is normally called id_rsa, and the public one called id_rsa.pub
- The public key is placed on the **remote** computer
  - The public key is placed in the .ssh/authorized_keys
- You can place the public key on many computers

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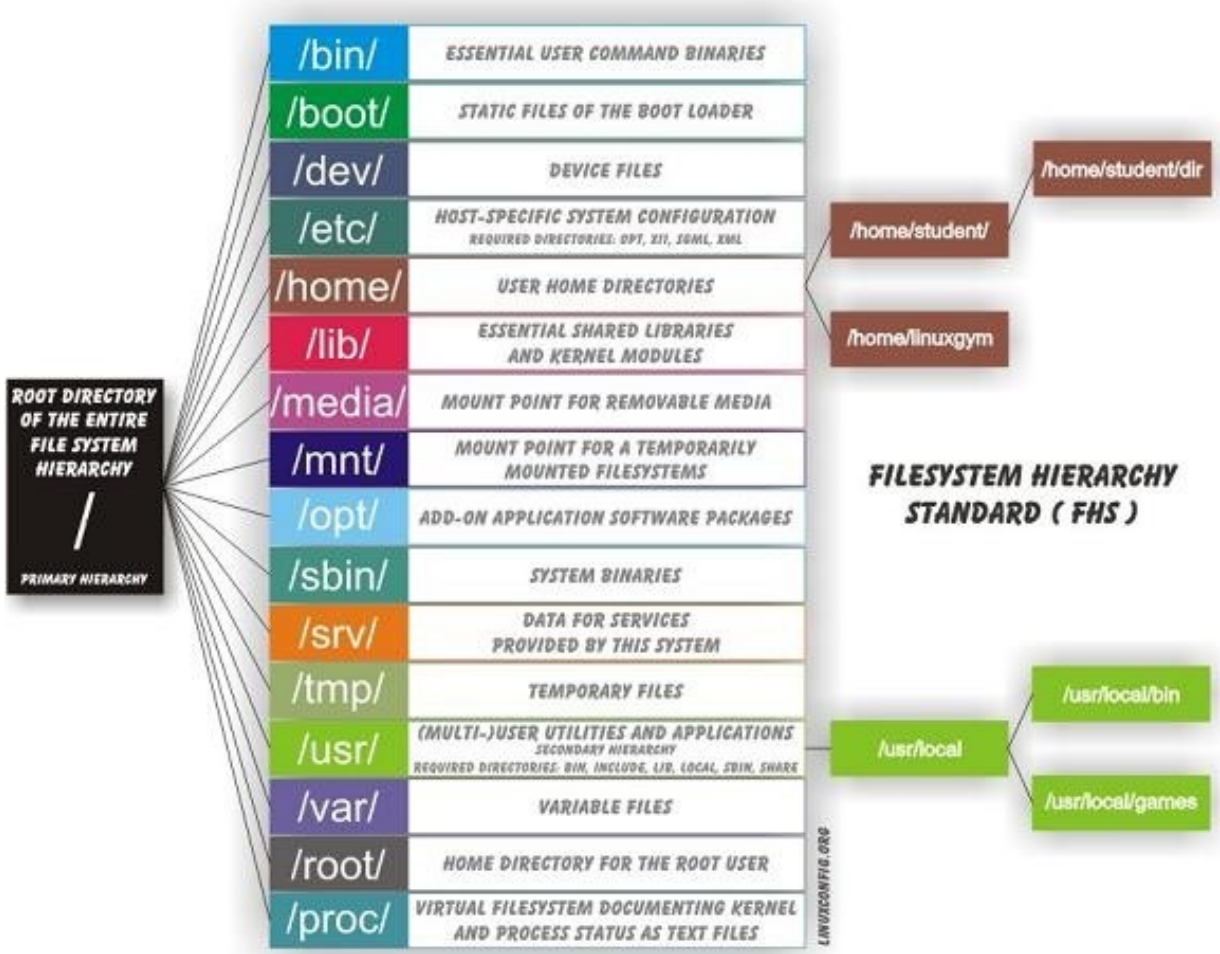
Linux

Linux file system layout

This is a layout from a **Ubuntu** system.

Depending on the system admin, the operating system and the mission of the UNIX machine, the structure may vary, and directories may be left out or added at will.



Subdirectories of the root directory

Directory	Content
/bin	Common programs, shared by the system, the system administrator and the users.
/boot	The startup files and the kernel, vmlinuz. In some recent distributions also grub data. Grub is the GRand Unified Boot loader and is an attempt to get rid of the many different boot-loaders we know today.
/dev	Contains references to all the CPU peripheral hardware, which are represented as files with special properties.
/etc	Most important system configuration files are in /etc, this directory contains data similar to those in the Control Panel in Windows
/home	Home directories of the common users.
/initrd	(on some distributions) Information for booting. Do not remove!
/lib	Library files, includes files for all kinds of programs needed by the system and the users.
/lost+found	Every partition has a lost+found in its upper directory. Files that were saved during failures are here.
/misc	For miscellaneous purposes.
/mnt	Standard mount point for external file systems, e.g. a CD-ROM or a digital camera.
/net	Standard mount point for entire remote file systems
/opt	Typically contains extra and third party software.
/proc	A virtual file system containing information about system resources. More information about the meaning of the files in proc is obtained by entering the command man proc in a terminal window. The file proc.txt discusses the virtual file system in detail.
/root	The administrative user's home directory. Mind the difference between /, the root directory and /root, the home directory of the root user.
/sbin	Programs for use by the system and the system administrator.
/tmp	Temporary space for use by the system, cleaned upon reboot, so don't use this for saving any work!
/usr	Programs, libraries, documentation etc. for all user-related programs.
/var	Storage for all variable files and temporary files created by users, such as log files, the mail queue, the print spooler area, space for temporary storage of files downloaded from the Internet, or to keep an image of a CD before burning it.

File Management

In Linux are three basic types of files

- **Ordinary Files** – An ordinary file is a file on the system that contains data, text, or program instructions. In this tutorial, you look at working with ordinary files.
- **Directories** – Directories store both special and ordinary files. For users familiar with Windows or Mac OS, UNIX directories are equivalent to folders.
- **Special Files** – Some special files provide access to hardware such as hard drives, CD-ROM drives, modems, and Ethernet adapters. Other special files are similar to aliases or shortcuts and enable you to access a single file using different names.

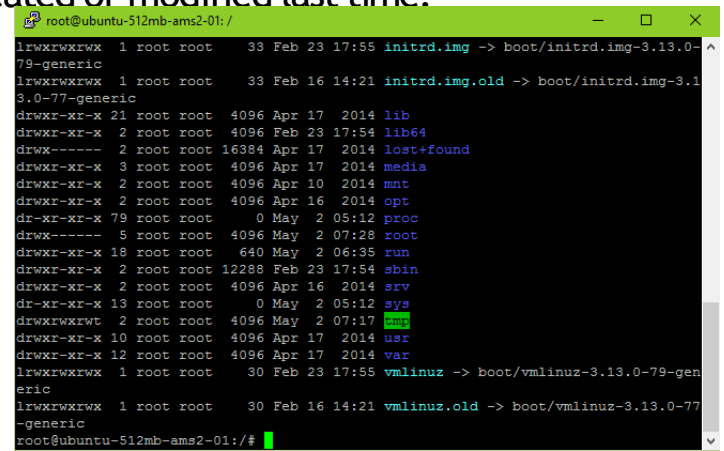
File Management - Listing files

To list the files and directories stored in the current directory.

Use this command - **ls**

Here is the information about all the listed columns

- **First Column**: represents file type and permission given on the file. Below is the description of all type of files.
- **Second Column**: represents the number of memory blocks taken by the file or directory.
- **Third Column**: represents owner of the file. This is the Unix user who created this file.
- **Fourth Column**: represents group of the owner. Every Unix user would have an associated group.
- **Fifth Column**: represents file size in bytes.
- **Sixth Column**: represents date and time when this file was created or modified last time.
- Seventh Column: represents file or directory name.



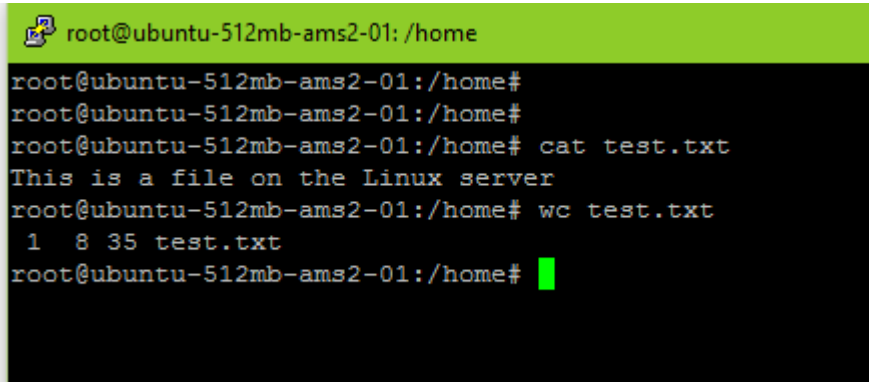
Display content of a file

You can use **cat** command to see the content of a file.

cat test.txt

Count the numbers of words in a file is very easy just use

wc test.txt

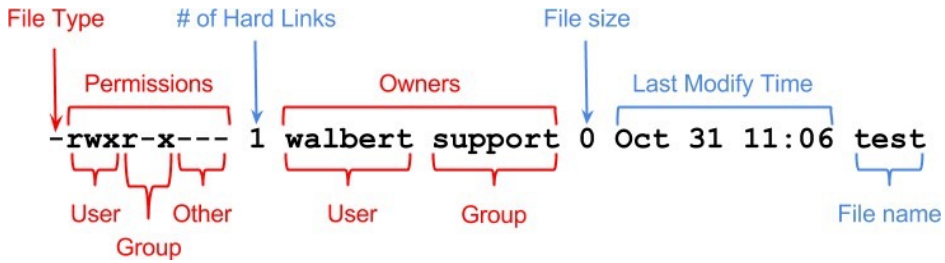


Directory Related Commands

- **cp** – Copy of file - cp source_file destination_file
- **mv** – Renaming - mv old_file new_file
- **rm** – Delete – rm filename
- **cd** – Change dir – cd~ (home dir) – cd- (last dir)
- **mkdir** – Create directory - mkdir dirname
- **rmdir** – Remove directory – rmdir dirname
- **pwd** – print working directory - pwd
- **cd** – Changing directory – cd dirname

File permissions

If the command ls -l is given, a long list of file names is displayed. The first column in this list details the permissions applying to the file.



The **chmod** command changes the permission on a given file or directory.

chmod sets permissions in two ways.

- Using symbols
- Using octal values

Octal	Symbol	Permission
0	---	No Permissions
1	--x	Execute
2	-w-	Write
3	-wx	Write and Execute
4	r--	Read
5	r-x	Read and Execute
6	rw-	Read and Write
7	rwx	Read, Write, and

Process Related Commands

- **ss**
  Obtain a listing of processes and their id's. Including the option aux will show all processes.
- **top**
  provides an ongoing look at processor activity in real time. It displays a listing of the most CPU-intensive tasks on the system, and can provide an interactive interface for manipulating processes.
- **netstat**
  Print network connections, routing tables, interface statistics, masquerade connections, and multicast memberships
- **pstree**
  shows running processes as a tree
- **kill**
  send signal to a process
- **who**
  who am I - Display information about the user

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Exercises

Exercises

- Opret en bin-folder i dithomedir
  - Lav en fil – test.sh - med følgende indhold
  - Hvad skal der til for at eksekvere filen?
  - Modificér så filnavnet kun bliver myFile.<dato>

```
echo date
sleep 3
echo `date`
echo `date +%d%m%y_%H%M`
myDate=`date +%d%m%y_%H%M%S`
echo "Today is $myDate"
echo "Today is $myDate" > myFile.$myDate
```

- Opret en "tmp"-folder i dithomedir
  - Hent cars.csv fra github.com/cphstud/20m9596V2-uge5
  - Flg kommando giver antal biler sorteret på bilmærke
    - cat cars.csv | cut -d\; -f2 | sort | uniq -c | sort -k1n
  - Modificer kommandoen så den i stedet sorterer på antal cylindre. Hvor mange biler har 6 cyl?
  - Brug grep til at finde ud af hvor mange Audi A6 der er i filen
  - Kan nogen forklare hvorfor grep "A6 3.0" cars.csv viser tre biler mens grep "A6 3.0 " kun viser to?
- Find ud af om du har en .bashrc fil i dit home-dir (og hvis ikke så lav en ny)
- Tør du https://gist.github.com/zachbrowne/8bc414c9f30192067831fafebd14255c ?
- Hvis ja ..
  - Så ændre/tilføj alias til find så den (grep) ignorerer case.
  - Find ud af hvorfor whatismyip ikke virker og få den til at virke.
- Hvis nej
  - tilføj et alias "lt" som udfører "ls -ltra"
  - Tilføj et alias "psg" som udfører "ps -aef | grep -i "
  - Tilføj et alias for history
  - Tilføj et alias som grepper i din history
- Gå ned i /var/log og "kig" i syslog. Find en "mystisk" ip-adresse og tjek den med whois.

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Resources

Resources - Lynda.com og cisco's netacad

Learn the Linux Command Line: The Basics

https://www.lynda.com/Linux-tutorials/Learn-Linux-Command-Line-Basics/435539-2.html

https://www.netacad.com/portal/learning