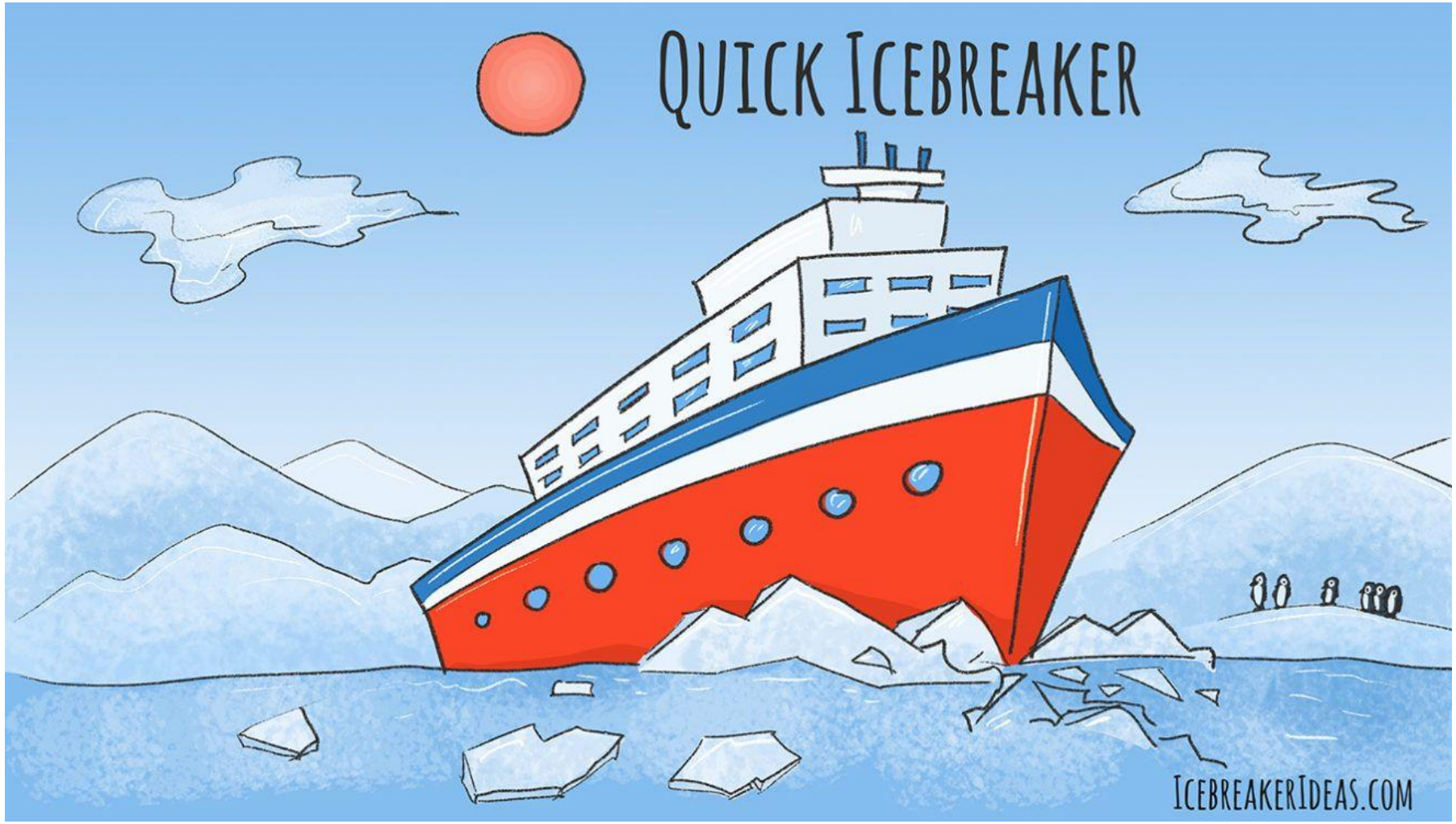
ASTERISK

Linux

Contenido

- Tendencias
- Intro a Docker
- Usando imágenes Asterisk para Docker
- Intro a Linux
- Instalando Linux

Rompamos el hielo…



Teknowlogic
The Power of Knowledge

Me presento, soy ALFONSO AYALA PALOMA

MAGISTER EN INGENIERÍA – AREA SISTEMAS Y COMPUTACIÓN

RESUMEN – HOJA DE VIDA (PERFIL PROFESIONAL)

Magíster en Ingeniería en el área de Sistemas y computación de la Universidad Nacional de Colombia. Especialista en Seguridad de la Información de la Universidad de los Andes, Especialista en Docencia Universitaria de la Universidad Cooperativa, Profesional en Ingeniería de Sistemas de la Universidad Nacional de Colombia. Catedrático en las Universidades Cooperativa y del Tolima. Amplia experiencia en proyectos de desarrollo de sistemas de información, herramientas de soporte a toma de decisiones, proyectos Asterisk * y coaching de Innovación.

TKL Teknowlogic
The Power of Knowledge

TENDENCIAS

O para donde van las cosas

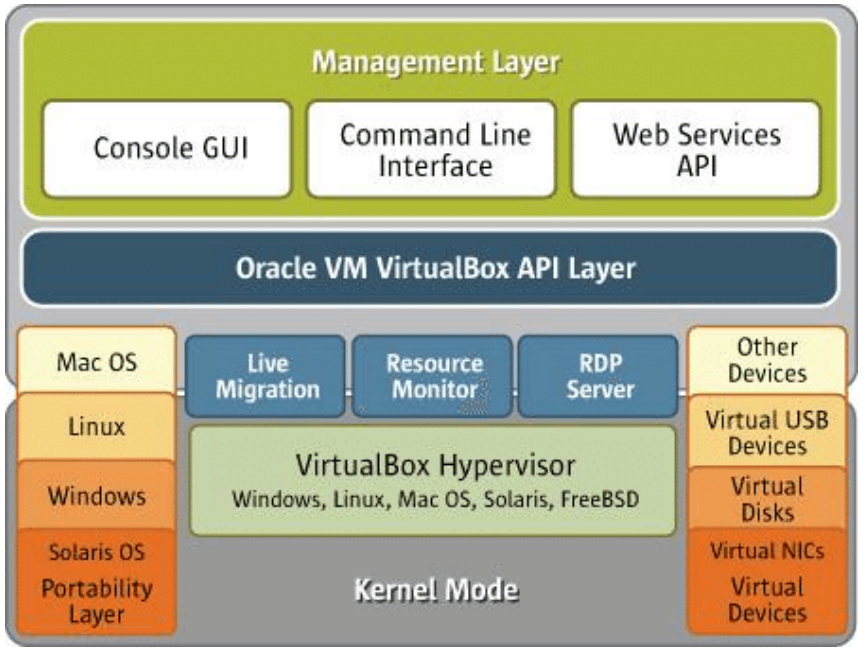
Algunas tendencias

- Virtualización
- Contenedores
- Cloud

Virtualización

- Software que crea y corre VM (virtual machines), un hypervisor permite a un computador host soportar múltiples VM guest compartiendo sus recursos como memoria y procesador virtualmente.

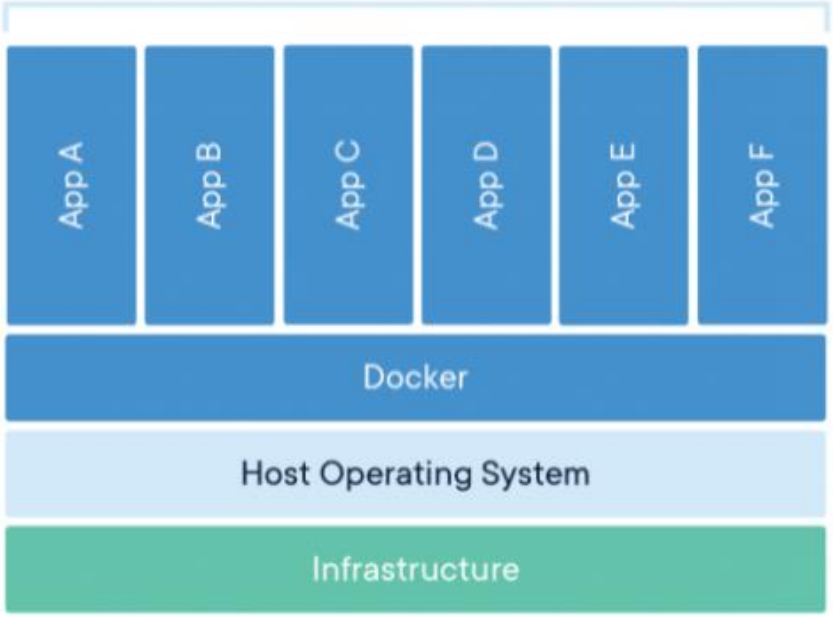
- Una maquina simula muchas maquinas



Contenedores

- Software que permite correr una aplicación incluyendo todos sus prerrequisitos. Puede intercambiarse entre maquinas

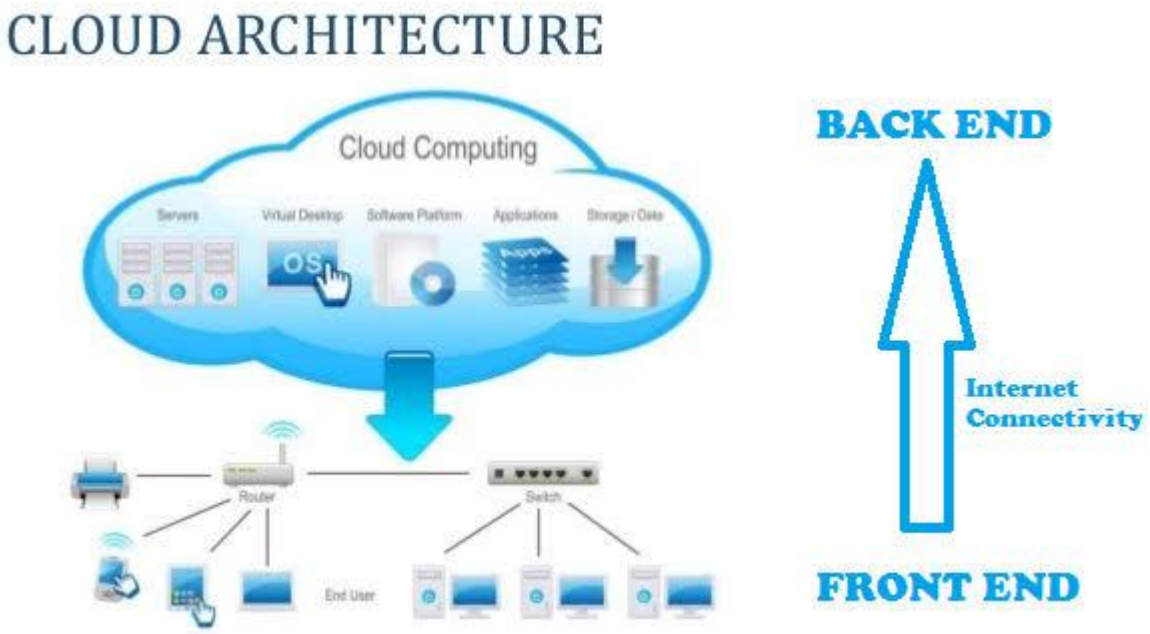
- Una maquina sostiene muchos contenedores



Cloud

- Localización remota de la infraestructura de cómputo.

- Una nube sostiene muchas maquinas/contenedores



Intro a Docker

Docker

- docker pull christoofar/asterisk
- docker run -p 5060:5060/udp -p 4569:4569/udp --name asterisk christoofar/asterisk
- docker exec -it asterisk asterisk –rvvvvv
- Docker ps
- Docker images

Intro a Linux

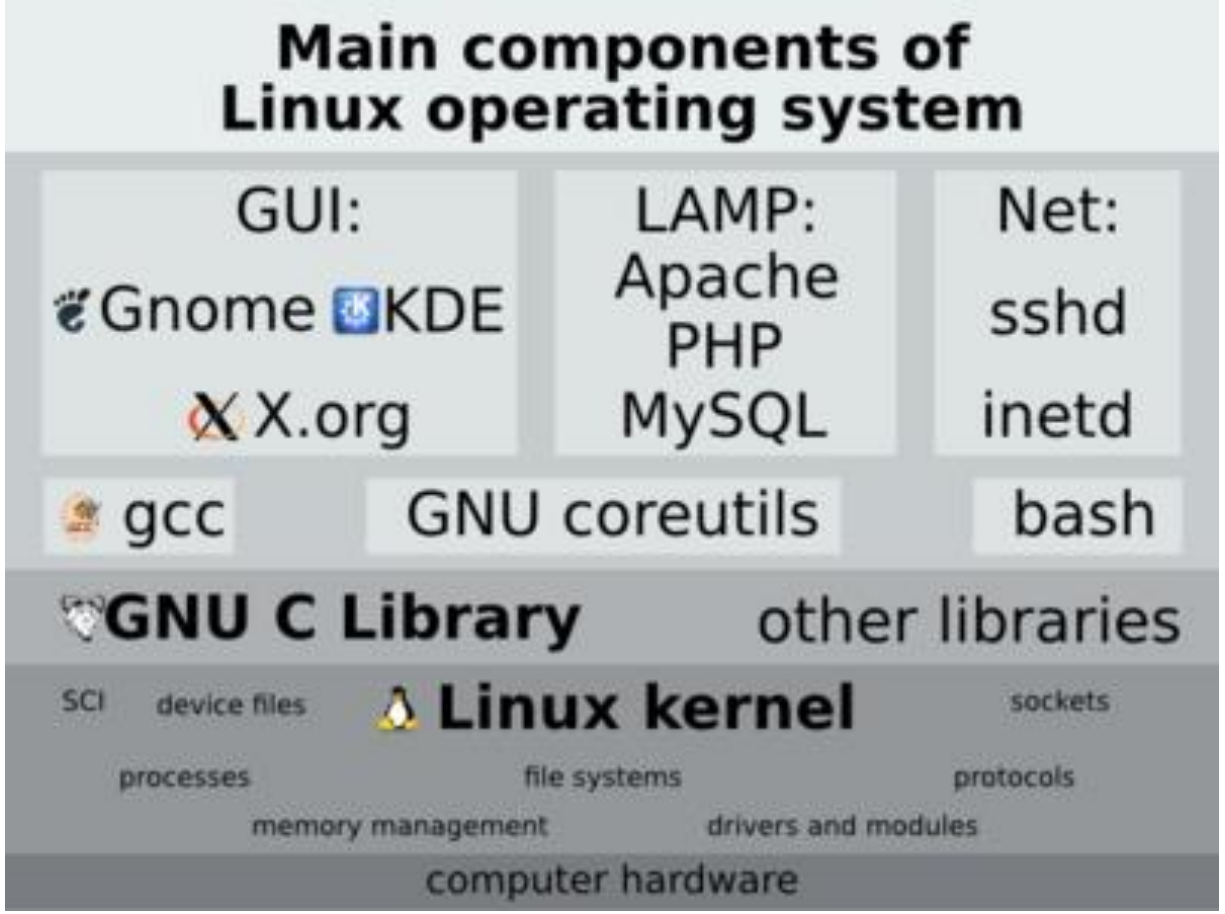
Linux

Teknowlogic
The Power of Knowledge

Qué es?

- Sistema Operativo. Android se mueve gracias a Linux.
- Un OS es un software que administra todos los recursos de hardware asociados con la maquina.
- El OS administra la configuración entre el software y el hardware

Componentes



Distribuciones

Clientes SSH

- PUTTY
- MobaXterm

Linux components

- Bootloader: (GRUB Grand unified bootloader)
- Kernel: manages hardware
- Init System: bootstraps the user space, charges daemons
- Daemons: Background procesess/services
- Graphical Server: X
- Desktop Environment: (GNOME, Cinnamon, Mate, Pantheon, Enlightenment, KDE, Xfce, etc.)
- Applications: Other software.

Linux commands

Linux test

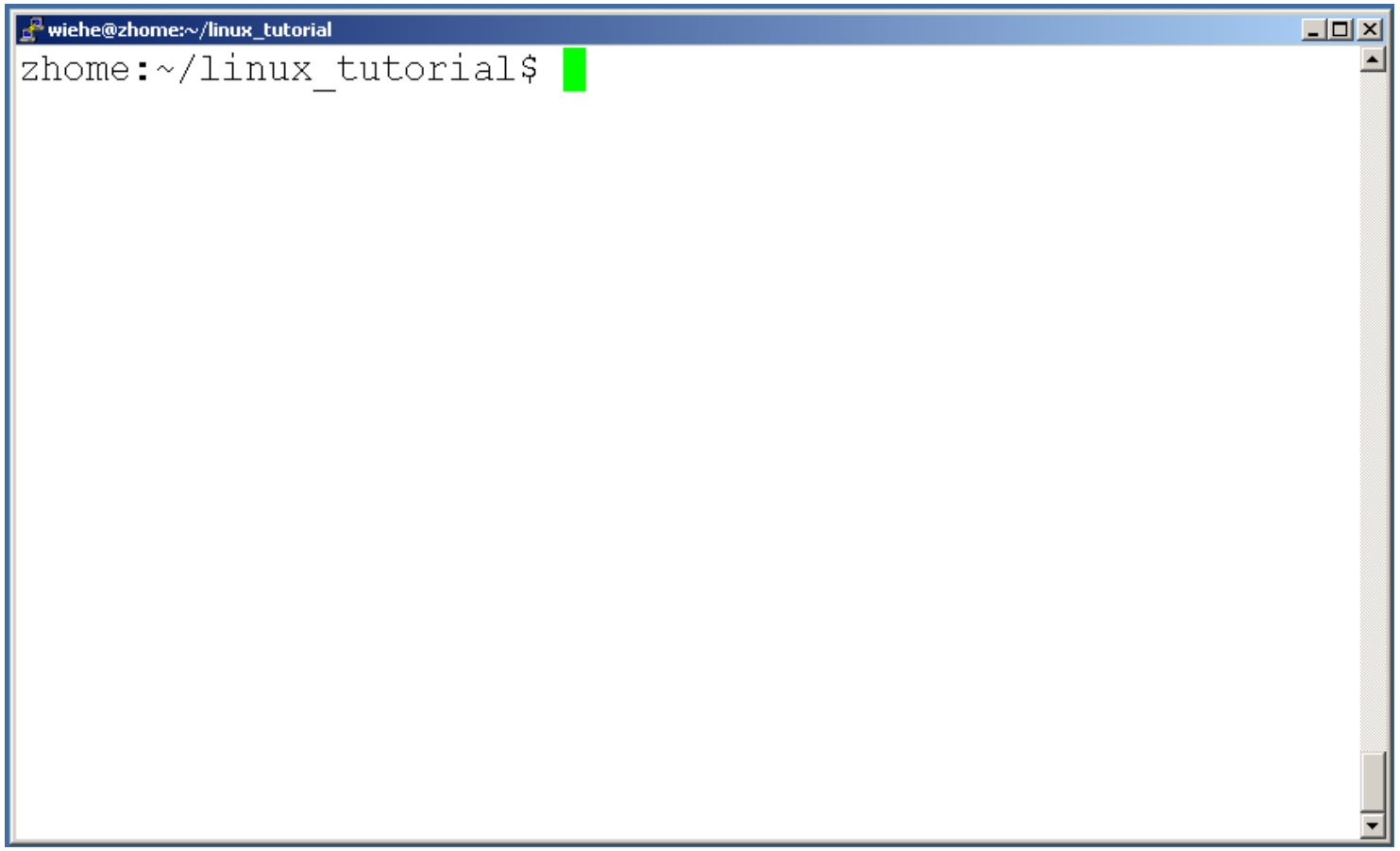
- https://create.kahoot.it/details/ae07a5f7-e7fc-4e94-958b-5d3d6266a175

Linux particularities

- Root : only one who modifies the root directory
- Sudo : superuser
- Ps : process status
- Kill: terminate a process
- Tar: tape archive
- Make: build from sourcecode
- Yum: Yellowdog updater modified (uses RPMs)
- RPM: RPM Package Manager (recursive acronym)
- Pipe: Connect a process output with another input

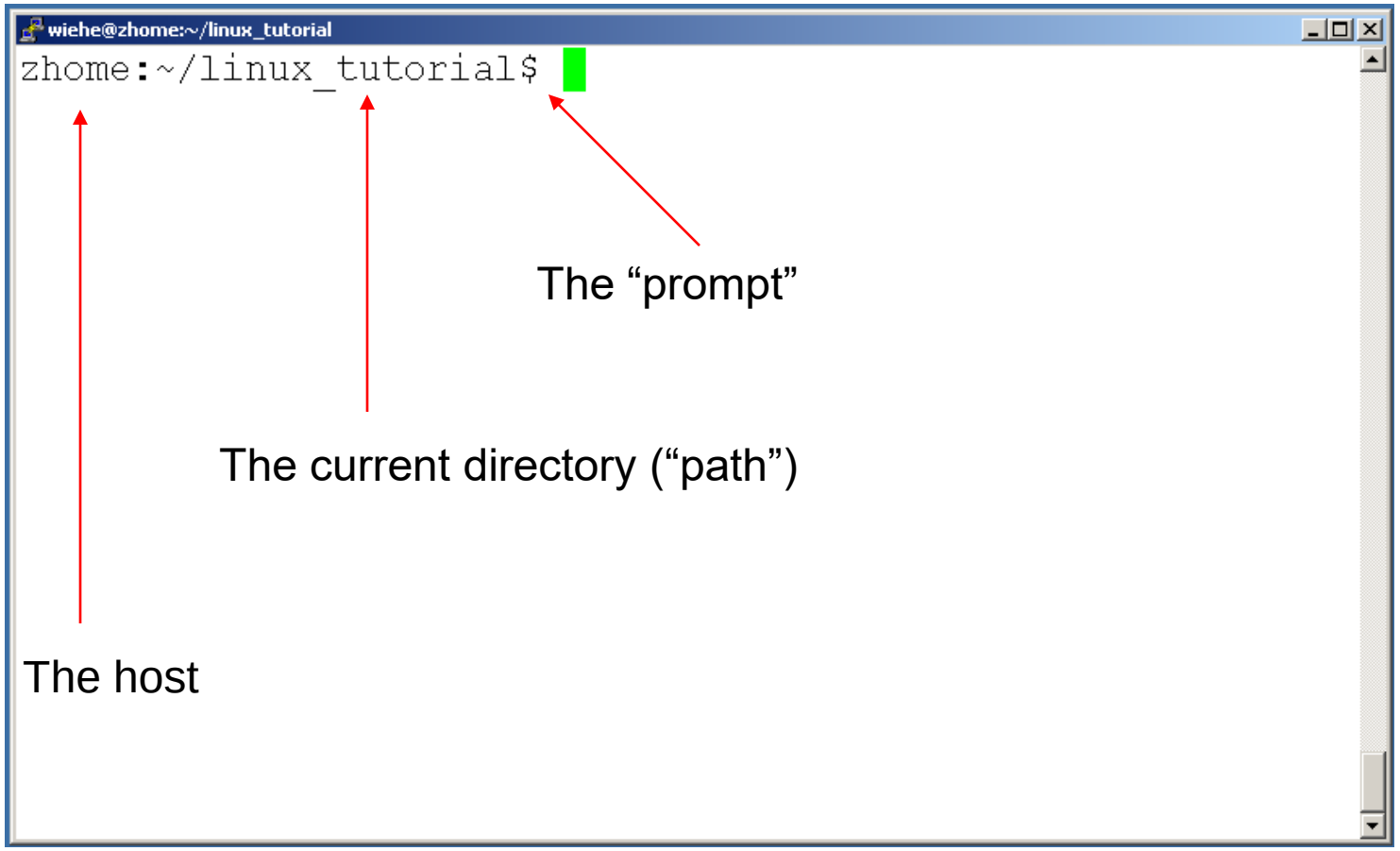
Connecting to a Unix/Linux system

- Open up a terminal:



Connecting to a Unix/Linux system

- Open up a terminal:



What exactly is a “shell”?

- After logging in, Linux/Unix starts another program called the **shell**
- The shell interprets commands the user types and manages their execution
  - The shell communicates with the internal part of the operating system called the **kernel**
  - The most popular shells are: tcsh, csh, korn, and bash
  - The differences are most times subtle
  - For this tutorial, we are using bash
- Shell commands are **CASE SENSITIVE!**

Help!

- Whenever you need help with a command type “man” and the command name

Help!

```
wiehe@zhome:~/linux_tutorial
zhome:~/linux_tutorial$ man
What manual page do you want?
zhome:~/linux_tutorial$ man echo
zhome:~/linux_tutorial$
```

Help!

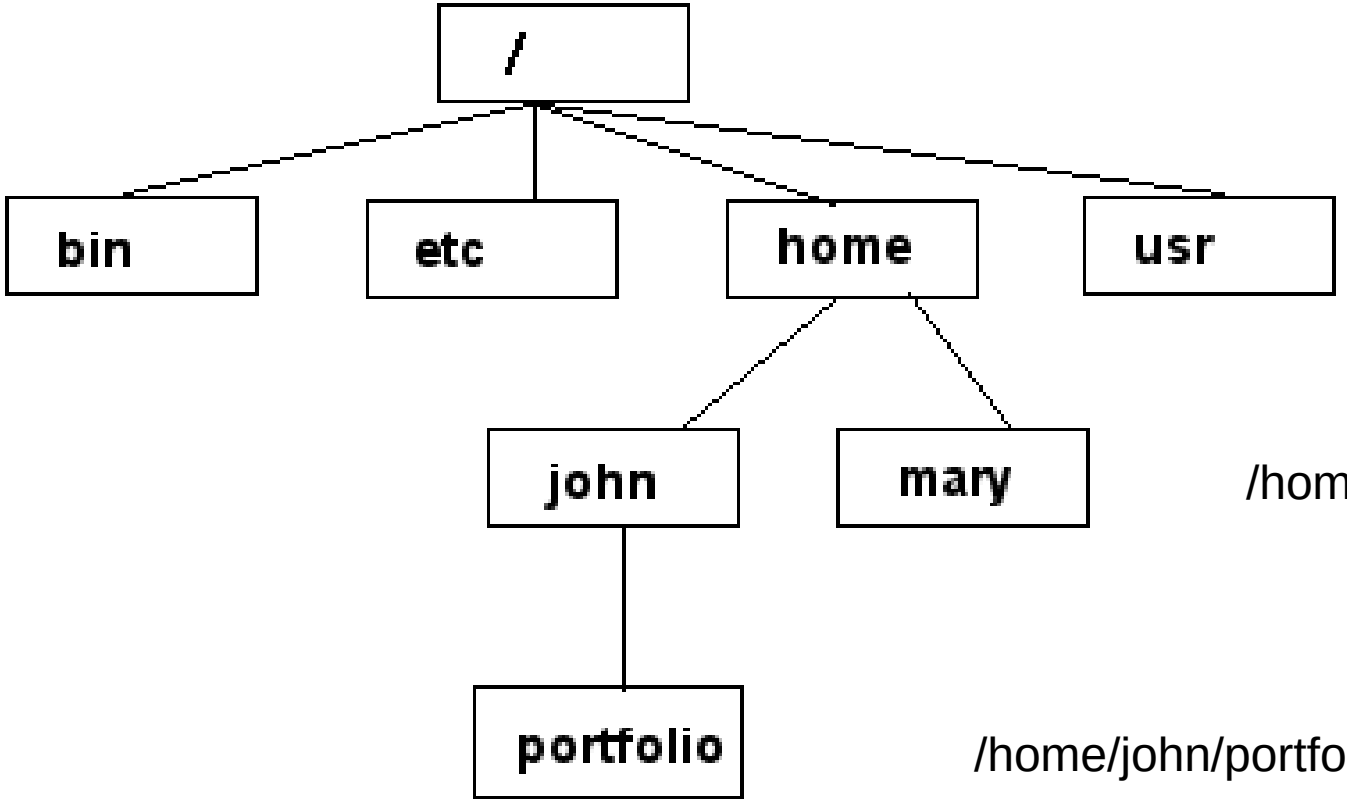
```
wiehe@zhome:~
ECHO(1)                    User Commands                    ECHO(1)

NAME
       echo - display a line of text

SYNOPSIS
       echo [OPTION]... [STRING]...

DESCRIPTION
       NOTE: your shell may have its own version of echo
       which will supercede the version described  here.
       Please  refer  to  your shellâs documentation for
       details about the options it supports.

       Echo the STRING(s) to standard output.

       -n     do not output the trailing newline
lines 1-19
```

Help!

```
wiehe@zhome:~/linux_tutorial
zhome:~/linux_tutorial$ man
What manual page do you want?
zhome:~/linux_tutorial$ man echo
zhome:~/linux_tutorial$ echo hello world
hello world
zhome:~/linux_tutorial$
```

Unix/Linux File System

NOTE: Unix file names are **CASE SENSITIVE!**



/home/mary/

/home/john/portfolio/

The Path

Command: pwd

- To find your current path use “pwd”

```
wiehe@zhome:~/linux_tutorial
zhome:~/linux_tutorial$ pwd
/fs/zhome05/wiehe/linux_tutorial
zhome:~/linux_tutorial$
```

Command: cd

- To change to a specific directory use “cd”

wiehe@zhome:~/linux_tutorial

```
zhome:~$ pwd
/fs/zhome05/wiehe
zhome:~$ cd /fs/zhome05/wiehe/linux_tutorial/
zhome:~/linux_tutorial$ pwd
/fs/zhome05/wiehe/linux_tutorial
zhome:~/linux_tutorial$
```

Command: cd

- "~" is the location of your home directory

```
wiehe@zhome:~
zhome:~/linux_tutorial$ pwd
/fs/zhome05/wiehe/linux_tutorial
zhome:~/linux_tutorial$ cd ~
zhome:~$ pwd
/fs/zhome05/wiehe
zhome:~$
```

Command: cd

- “..” is the location of the directory below current one

```
wiehe@zhome:~
zhome:~/linux_tutorial$ pwd
/fs/zhome05/wiehe/linux_tutorial
zhome:~/linux_tutorial$ cd ..
zhome:~$ pwd
/fs/zhome05/wiehe
zhome:~$
```

Command: ls

- To list the files in the current directory use “ls”

```
wiehe@zhome:~/linux_tutorial
zhome:~/linux_tutorial$ ls
aa_sequence.pl  data.dat        output.txt
ACTG.pl         hello_world.pl
zhome:~/linux_tutorial$
```

Command: ls

- ls has many options
  - -l long list (displays lots of info)
  - -t sort by modification time
  - -S sort by size
  - -h list file sizes in human readable format
  - -r reverse the order
- “man ls” for more options
- Options can be combined: “ls -ltr”

Command: ls -ltr

- List files by time in reverse order with long listing

```
wiehe@zhome:~/linux_tutorial
zhome:~/linux_tutorial$ ls -ltr
total 20
-rw-rw-r--  1 wiehe wiehe  92 Aug 30 11:54 ACTG.pl
-rw-rw-r--  1 wiehe wiehe 169 Aug 30 12:20 aa_sequence.pl
-rw-rw-r--  1 wiehe wiehe  42 Aug 30 12:22 hello_world.pl
-rw-rw-r--  1 wiehe wiehe  24 Aug 30 12:23 output.txt
-rw-rw-r--  1 wiehe wiehe  21 Aug 30 12:23 data.dat
zhome:~/linux_tutorial$
```

General Syntax: *

- "*" can be used as a wildcard in unix/linux

wiehe@zhome:~/linux_tutorial

```
zhome:~/linux_tutorial$ ls *.pl
aa_sequence.pl  ACTG.pl  hello_world.pl
zhome:~/linux_tutorial$
```

Command: mkdir

- To create a new directory use “mkdir”

```
wiehe@zhome:~/linux_tutorial
zhome:~/linux_tutorial$ ls
aa_sequence.pl  data.dat        output.txt
ACTG.pl         hello_world.pl
zhome:~/linux_tutorial$ mkdir new_directory
zhome:~/linux_tutorial$ ls
aa_sequence.pl  data.dat        new_directory
ACTG.pl         hello_world.pl  output.txt
zhome:~/linux_tutorial$
```

Command: rmdir

- To remove and empty directory use “rmdir”

```
wiehe@zhome:~/linux_tutorial
zhome:~/linux_tutorial$ ls
aa_sequence.pl  data.dat        new_directory
ACTG.pl         hello_world.pl  output.txt
zhome:~/linux_tutorial$ rmdir new_directory/
zhome:~/linux_tutorial$ ls
aa_sequence.pl  data.dat        output.txt
ACTG.pl         hello_world.pl
zhome:~/linux_tutorial$
```

Displaying a file

- Various ways to display a file in Unix
  - cat
  - less
  - head
  - tail

Command: cat

- Dumps an entire file to standard output
- Good for displaying short, simple files

Command: less

- “less” displays a file, allowing forward/backward movement within it
  - return scrolls forward one line, space one page
  - y scrolls back one line, b one page
- use “/” to search for a string
- Press q to quit

Command: head

- “head” displays the top part of a file
- By default it shows the first 10 lines
- -n option allows you to change that
- “head -n50 file.txt” displays the first 50 lines of file.txt

Command: head

- Here's an example of using "head":

```
wiehe@zhome:~/linux_tutorial
zhome:~/linux_tutorial$ head lines.txt
a
b
c
d
e
f
g
h
i
j
zhome:~/linux_tutorial$
```

Command: tail

- Same as head, but shows the last lines

```
wiehe@zhome:~/linux_tutorial
zhome:~/linux_tutorial$ tail lines.txt
p
q
r
s
t
u
v
x
y
z
zhome:~/linux_tutorial$
```

File Commands

- Copying a file: cp
- Move or rename a file: mv
- Remove a file: rm

Command: cp

- To copy a file use “cp”

```
wiehe@zhome:~/linux_tutorial
zhome:~/linux_tutorial$ ls
aa_sequence.pl  data.dat        lines.txt
ACTG.pl         hello_world.pl  output.txt
zhome:~/linux_tutorial$ cp data.dat data2.dat
zhome:~/linux_tutorial$ ls
aa_sequence.pl  data2.dat  hello_world.pl  output.txt
ACTG.pl         data.dat   lines.txt
zhome:~/linux_tutorial$
```

Command: mv

- To move a file to a different location use “mv”

```
wiehe@zhome:~/linux_tutorial/new_directory
zhome:~/linux_tutorial$ ls
aa_sequence.pl  data2.dat  hello_world.pl  output.txt
ACTG.pl         data.dat   lines.txt
zhome:~/linux_tutorial$ mkdir new_directory
zhome:~/linux_tutorial$ ls
aa_sequence.pl  data2.dat  hello_world.pl  new_directory
ACTG.pl         data.dat   lines.txt       output.txt
zhome:~/linux_tutorial$ mv data2.dat ./new_directory/
zhome:~/linux_tutorial$ cd new_directory/
zhome:~/linux_tutorial/new_directory$ ls
data2.dat
zhome:~/linux_tutorial/new_directory$
```

Command: mv

- mv can also be used to rename a file

```
wiehe@zhome:~/linux_tutorial
zhome:~/linux_tutorial$ ls
aa_sequence.pl  data.dat        lines.txt      output.txt
ACTG.pl         hello_world.pl  new_directory
zhome:~/linux_tutorial$ mv output.txt input.txt
zhome:~/linux_tutorial$ ls
aa_sequence.pl  data.dat        input.txt  new_directory
ACTG.pl         hello_world.pl  lines.txt
zhome:~/linux_tutorial$
```

Command: rm

- To remove a file use “rm”

```
wiehe@zhome:~/linux_tutorial/new_directory
zhome:~/linux_tutorial$ cd new_directory/
zhome:~/linux_tutorial/new_directory$ ls
data2.dat
zhome:~/linux_tutorial/new_directory$ rm data2.dat
zhome:~/linux_tutorial/new_directory$ ls
zhome:~/linux_tutorial/new_directory$
```

Command: rm

- To remove a file “recursively”: rm –r
- Used to remove all files and directories
- Be very careful, deletions are permanent in Unix/Linux

File permissions

- Each file in Unix/Linux has an associated permission level
- This allows the user to prevent others from reading/writing/executing their files or directories
- Use “ls -l *filename*” to find the permission level of that file

Permission levels

- “r” means “read only” permission
- “w” means “write” permission
- “x” means “execute” permission
  - In case of directory, “**x**” grants permission to list directory contents

File Permissions

wiehe@zhome:~/linux_tutorial

```
zhome:~/linux_tutorial$ ls -l
total 28
-rw-rw-r--  1 wiehe wiehe  169 Aug 30 12:20 aa_sequence.pl
-rw-rw-r--  1 wiehe wiehe   92 Aug 30 11:54 ACTG.pl
-rw-rw-r--  1 wiehe wiehe   21 Aug 30 12:23 data.dat
-rw-rw-r--  1 wiehe wiehe   42 Aug 30 12:22 hello_world.pl
-rw-rw-r--  1 wiehe wiehe   24 Aug 30 12:23 input.txt
-rw-rw-r--  1 wiehe wiehe   50 Aug 30 13:13 lines.txt
drwxrwxr-x  2 wiehe wiehe 4096 Aug 30 13:19 new_directory
zhome:~/linux_tutorial$
```

User (you)

File Permissions

wiehe@zhome:~/linux_tutorial

```
zhome:~/linux_tutorial$ ls -l
total 28
-rw-rw-r--  1 wiehe wiehe  169 Aug 30 12:20 aa_sequence.pl
-rw-rw-r--  1 wiehe wiehe   92 Aug 30 11:54 ACTG.pl
-rw-rw-r--  1 wiehe wiehe   21 Aug 30 12:23 data.dat
-rw-rw-r--  1 wiehe wiehe   42 Aug 30 12:22 hello_world.pl
-rw-rw-r--  1 wiehe wiehe   24 Aug 30 12:23 input.txt
-rw-rw-r--  1 wiehe wiehe   50 Aug 30 13:13 lines.txt
drwxrwxr-x  2 wiehe wiehe 4096 Aug 30 13:19 new_directory
zhome:~/linux_tutorial$
```

Group

File Permissions

wiehe@zhome:~/linux_tutorial

```
zhome:~/linux_tutorial$ ls -l
total 28
-rw-rw-r--  1 wiehe wiehe  169 Aug 30 12:20 aa_sequence.pl
-rw-rw-r--  1 wiehe wiehe   92 Aug 30 11:54 ACTG.pl
-rw-rw-r--  1 wiehe wiehe   21 Aug 30 12:23 data.dat
-rw-rw-r--  1 wiehe wiehe   42 Aug 30 12:22 hello_world.pl
-rw-rw-r--  1 wiehe wiehe   24 Aug 30 12:23 input.txt
-rw-rw-r--  1 wiehe wiehe   50 Aug 30 13:13 lines.txt
drwxrwxr-x  2 wiehe wiehe 4096 Aug 30 13:19 new_directory
zhome:~/linux_tutorial$
```

“The World”

Command: chmod

- If you own the file, you can change it's permissions with "chmod"
  - Syntax: chmod [**u**ser/**g**roup/**o**thers/**a**ll]+[permission] [file(s)]
  - Below we grant execute permission to all:

```
wiehe@zhome:~/linux_tutorial
zhome:~/linux_tutorial$ ls -l hello_world.pl
-rw-rw-r--  1 wiehe wiehe 42 Aug 30 12:22 hello_world.pl
zhome:~/linux_tutorial$ chmod a+x hello_world.pl
zhome:~/linux_tutorial$ ls -l hello_world.pl
-rwxrwxr-x  1 wiehe wiehe 42 Aug 30 12:22 hello_world.pl
zhome:~/linux_tutorial$
```

Command: ps

- To view the processes that you're running:

```
wiehe@zhome:~/linux_tutorial
zhome:~/linux_tutorial$ ps -u wiehe
  PID TTY          TIME CMD
 1194 ?        00:00:00 sshd
 1196 pts/2    00:00:00 bash
 1255 pts/2    00:00:01 ACTG.pl
 1270 pts/2    00:00:00 ps
zhome:~/linux_tutorial$
```

Command: top

- To view the CPU usage of all processes:

```
wiehe@zhome:~/linux_tutorial
top - 13:46:33 up 50 days,  4:26,  2 users,  load avera
Tasks:     total,     running,     sleeping,     stoppe
Cpu(s):       us,        sy,        ni,        id,        w
Mem:            total,            used,            free,
Swap:           total,            used,            free,

  PID USER      PR  NI  VIRT  RES  SHR S %CPU %MEM
 3403 root      15   0     0    0    0 S  0.7  0.0
    1 root      16   0  1604  324  292 S  0.0  0.0
    2 root      RT   0     0    0    0 S  0.0  0.0
    3 root      34  19     0    0    0 S  0.0  0.0
    4 root      RT   0     0    0    0 S  0.0  0.0
    5 root      34  19     0    0    0 S  0.0  0.0
    6 root      RT   0     0    0    0 S  0.0  0.0
    7 root      34  19     0    0    0 S  0.0  0.0
    8 root      RT   0     0    0    0 S  0.0  0.0
    9 root      34  19     0    0    0 S  0.0  0.0
```

Command: kill

- To terminate a process use “kill”

wiehe@zhome:~/linux_tutorial

```
zhome:~/linux_tutorial$ ps -u wiehe
  PID TTY          TIME CMD
 1194 ?        00:00:00 sshd
 1196 pts/2    00:00:00 bash
 1255 pts/2    00:00:01 ACTG.pl
 1287 pts/2    00:00:00 ps
zhome:~/linux_tutorial$ kill -9 1255
[1]+  Killed                  ./ACTG.pl
zhome:~/linux_tutorial$ ps -u wiehe
  PID TTY          TIME CMD
 1194 ?        00:00:00 sshd
 1196 pts/2    00:00:00 bash
 1289 pts/2    00:00:00 ps
zhome:~/linux_tutorial$
```

Input/Output Redirection (“piping”)

- Programs can output to other programs
- Called “piping”
- “program_a | program_b”
  - program_a’s output becomes program_b’s input
- “program_a > file.txt”
  - program_a’s output is written to a file called “file.txt”
- “program_a < input.txt”
  - program_a gets its input from a file called “input.txt”

A few examples of piping

```
wiehe@zhome:~/linux_tutorial
zhome:~/linux_tutorial$ ./aa_sequence.pl | less
```

A few examples of piping

```
wiehe@zhome:~/linux_tutorial
zhome:~/linux_tutorial$ ls
aa_sequence.pl  hello_world.pl  new_directory
ACTG.pl         input.txt
data.dat        lines.txt
zhome:~/linux_tutorial$ ./aa_sequence.pl > sequence.txt
zhome:~/linux_tutorial$ ls
aa_sequence.pl  hello_world.pl  new_directory
ACTG.pl         input.txt       sequence.txt
data.dat        lines.txt
zhome:~/linux_tutorial$ less sequence.txt
```

Command: wc

- To count the characters, words, and lines in a file use “wc”
- The first column in the output is lines, the second is words, and the last is characters

A few examples of piping

```
wiehe@zhome:~/linux_tutorial
zhome:~/linux_tutorial$ ./aa_sequence.pl | wc
      1       1     251
zhome:~/linux_tutorial$
```

Command: grep

- To search files in a directory for a specific string use "grep"

```
wiehe@zhome:~/linux_tutorial
zhome:~/linux_tutorial$ ls
aa_sequence.pl  hello_world.pl  new_directory
ACTG.pl         input.txt       sequence.txt
data.dat        lines.txt
zhome:~/linux_tutorial$ grep "hello world" *.pl
hello_world.pl:print "hello world.\n";
zhome:~/linux_tutorial$
```

Command: diff

- To compare to files for differences use “diff”
  - Try: diff /dev/null hello.txt
  - /dev/null is a special address -- it is always empty, and anything moved there is deleted

Retrospectiva – De-brief

QUÉ HICIMOS BIEN!

- Buen repaso
- Descripcion de componentes
- Drivers antes de asterisk
- Comandos basicos
- Muchos temas, entendibles.
- Explicación de licencias.

QUÉ PODEMOS MEJORAR

- Falta la practica
- Material
- No tanta teoría…
- Tener info del examen.