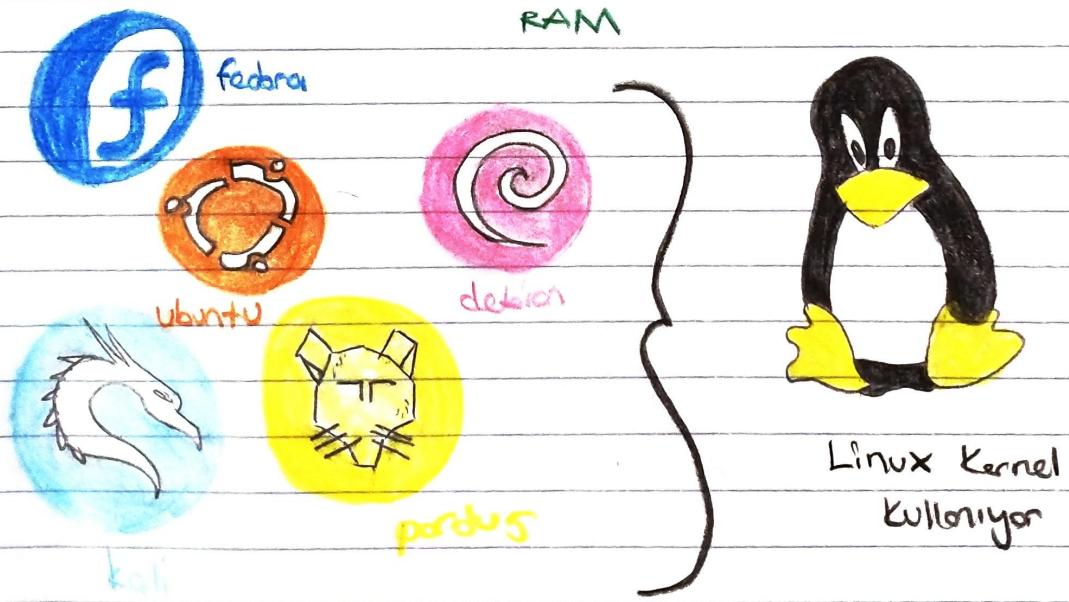
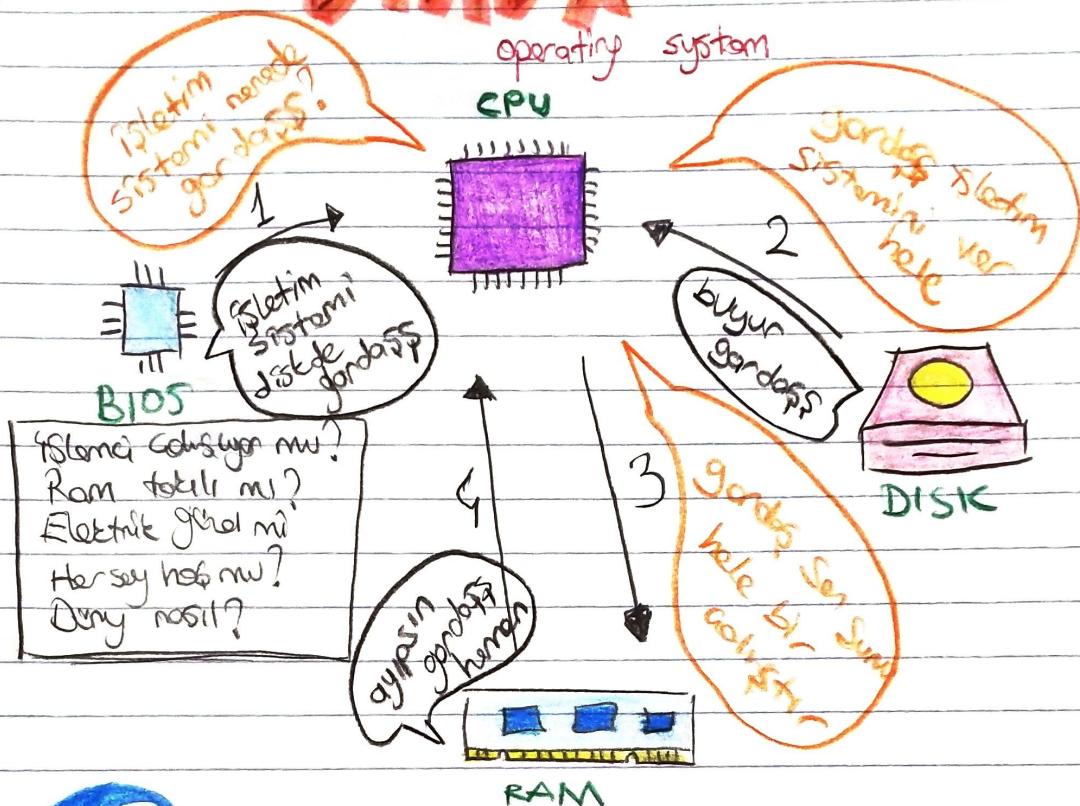


~~KONU 4:~~

LINUX

kernel



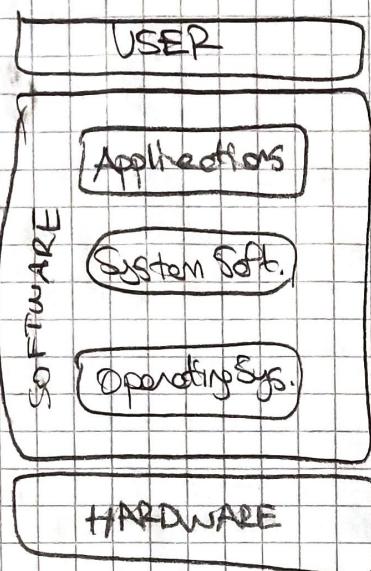
DISTRO

GNU/Linux

KERNEL

- Open Source
- CLI is very powerful
- More control over the OS
- better network communication control

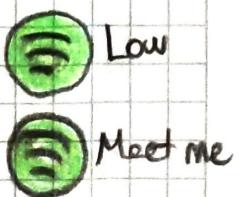
Linux Essential



MAJOR OPERATING SYSTEMS

Microsoft Windows
Apple Mac OS
GNU

→ Powerful CLI



Linux Distributions

Red Hat
(Red Hat Package Manager)
- RHEL
- Fedora
- CentOS
- Scientific Linux

Raspbian

SUSE
(Slackware)
openSUSE

Debian
- Ubuntu
- Canonical
- Linux Mint

Android

Also, Mostly embedded
systems has
Linux

CLI (Command Line Interface)

If you have GUI (graphical user interface) you have already Terminal on your Desktop.

Terminal

x-term



② Deadcrush

- You can use Linux with only Terminal, so this is very good for remote control

Linux Software

Desktop Application

- Web browser
- Text editor
- Music player
- other known applications

Server Application

- No direct interaction with monitor and keyboard.
- It's running on your computer on their background in silence

④ Web Servers

- ④ HyperText Transfer Protocol (HTTP)
- ④ HyperText Transfer Protocol Secure (HTTPS)
- ④ Apache
- ④ NGINX

① Email Applications

- ④ Thunderbird
- ④ Evolution
- ④ KMail

④ Creative Applications

- ④ Blender
- ④ GIMP
- ④ Audacity

④ Productivity

- ④ LibreOffice
- ④ OpenOffice
- ④ Adobe Portable Document Format

④ Web Browser

- ④ Mozilla Firefox
- ④ Google Chrome

④ File Sharing Server

- ④ NFS (Network File System)
- ④ Domain Name System (DNS)
- ④ LDAP (Lightweight Directory Access Protocol)
- ④ DHCP (Dynamic Host Control Protocol)

④ Private Cloud Servers

- ④ ownCloud
- ④ NextCloud

④ Database Servers

- ④ MariaDB
- ④ MySQL
- ④ PostgreSQL
- ④ Firebird

④ Email Server

- ④ Mail Transfer Agent (MTA)
- ④ Mail Delivery Agent (MDA)
- ④ POP/IMAP server

Tools

① Shells

- ⊕ Bourne Shell (sh)
- ⊕ C shell
- ⊕ Bourne Again Shell (bash)
- ⊕ Korn Shell (ksh)
- ⊕ Z shell (zsh)

② Text Editors

- ⊕ vi
- ⊕ vim
- ⊕ EMACS
- ⊕ Pico
- ⊕ Nano

~~NOTE~~
History command shows which united past

PACKAGE MANAGEMENT

Debian Package Management

- ⊕ dpkg
- ⊕ apt-get
- ⊕ aptitude

RPM Package Management

- ⊕ rpm
- ⊕ yum
- ⊕ up2date
- ⊕zypper

CL (Let's Examine)

sysadmin @localhost:~\$

~~~~~

~~~~~

Username Systemname

~~~~~

~~~~~

Systemname → current directory

ls (list files and directories)

command [options] [arguments]

~~~~~

~~~~~

ls -l

(long listing)

ls -r

(reverse alphabetical)

ls -h

(human readable)

options can be used with commands to expand or modify the way a command behaves

ls -l

long listing

kerntut@kerntut:~/bin

ls -l

ls -l

ls -l

ls -l

ls -l

ls -l

Specify something for the command to act upon

ls /home/kerntut

Local Variable

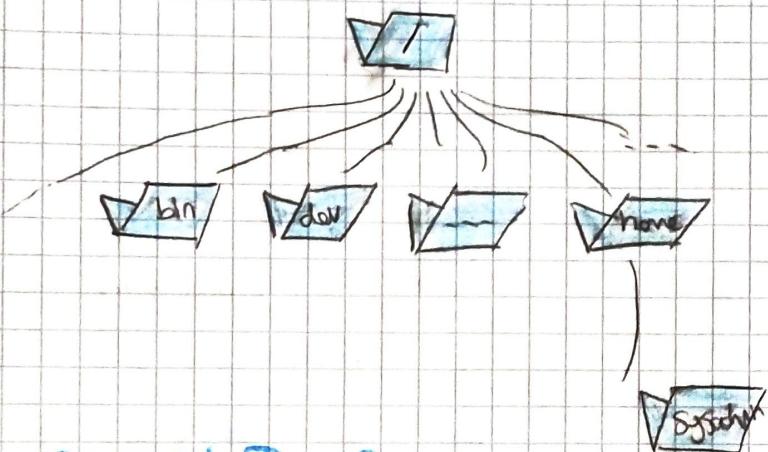
Variable = 'Something'

local variable → value

echo \$variable

variable name
command for writing (printing)

PATH variable



Command Types

type command

determine information about command type

internal commands (built-in commands)
external commands
Aliases
Functions

Internal Command

Are built into the shell itself
cd (change directory) command
as it is the part of the Bash Shell
Bash shell already know how it
interpret.

External Command

External commands are binary
executables where stored in
directories that are searched
by the shell.
If a user write ls command,
then the shell searches in the
directories where that are listed
in PATH variable. After find
the ls command, it can execute

which command

Search locations the commands in the
PATH variable

Aliases

Aliases can be used to
map longer commands
to shorter key
sequences

For example

ls -alF ↪ ↪ ll
ls -A ↪ ↪ la

All commands
in some time

Environment Variables (Global Variable)

Available system-wide

Examples: PATH

HOME

HISTSIZE

how many previous
commands to store
in history list

env

Show list of environment
variable

export variable

turn a local variable to
global variable

unset variable

remove variable

Functions

Functions can also be built
using existing commands to
either create new commands
or to override commands

function_name () {

> ls-a
> date
> echo "Documents and"
> }

\$ function_name()

Quoting (Tırnak İşlemleri)

Double Quotes (" ")

echo "Ganal Karakterler *, ? ve [] dir."
Ganal Karakterler *, ? ve [] dir.

echo "The path is \$PATH"
The path is /usr/bin/custom/usr/bin/-----

Single Quotes (' ')

echo The car cost \$100
The car cost 00

echo 'The car cost \$100'
The car cost \$100

BACKSLASH

echo "Abc \\$1 SPATH"
Abc /usr/bin/-----

echo 'Abc \\$1 SPATH'
Abc \\$1 SPATH

echo Abc \\$1 SPATH
Abc \\$1 /usr/bin/-----

BACK QUOTES

echo Today is `date`
Today is Mon Nov 4 -----

Semicolon

command1; command2; command3

→ Sıra sıra komutları çalıştırır

Double Ampersand

command1 && command2

→ Eğer 1. komut çalışsa 2. komut çalıştır
• logical 'AND'

Double Pipe

command1 || command2

→ eğer 1. komut çalışmaz 2. komut çalıştırır
as gelicek çalışmaz 2. komut çalıştırılır

HELP

MAN PAGES

man pages (Kullanım kılavuzu)
Man Pages

man command (for exit press Q)

↳ shows manuel pages

list the files that are
associated with the
command as well as
a description
of how they are used

more detailed
description

other
infos

Author
Reporting
Copyright
Bugs
CC-BY-SA

MAN PAGES SECTIONS

NAME

SYNOPSIS

how to
command
is executed

DESCRIPTION

list of
options

OPTIONS

Created
person

FILES

how to
report
prob.

AUTHOR REPORTING BUGS COPYRIGHT CC-BY-SA

Searching in the MAN PAGES

Type /
enter the searching term such as "variable"
press **ENTER**

} Anadığın kelimayı
bu Satitude
bulabilmisin

Daha sonra "n" tuşu ile bir sonraki bilinen efsayı gösterilebilirsiniz.

.MAN PAGES CATEGORIZED BY SECTION

- 1 - General Command
 - 2 - System calls
 - 3 - Library calls
 - 4 - Special Files
 - 5 - File Format and Conventions
 - 6 - Games
 - 7 - Miscellaneous
 - 8 - System Administrator Commands
 - 9 - Kernel Routines

locote gShadow

→ Search a database of all files and directories that were on the system when the database was created.

proper.) fin kontroller

apropos -5 3 .) film ketchup
gezüller

mon - k .) En konstnär författat

what is 15

like man-f

- return - what section a man page is stored in
 - Is the file from Manual say following address

where's 15

→ Search for commands
Source files and novel genes
in specific location where those
files are typically stored.

GO INFO DOCUMENTATION GO

Info command

→ display the info page

② USING HELP OPTIONS ③

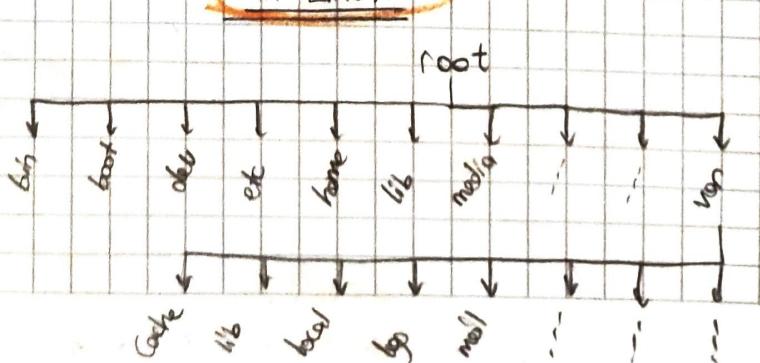
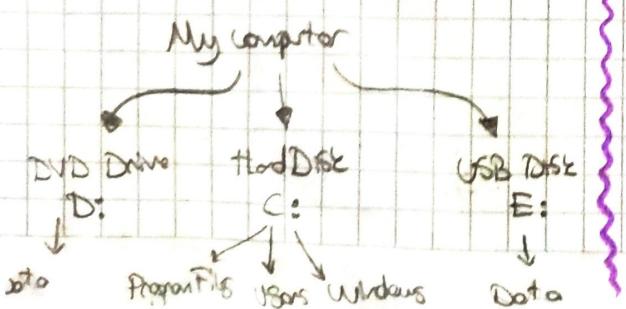
command --help

gordim belgesini okur.



The File System

In windows



Home directory

/home/sysadmin
 ↘
 -> kullanıcı
 -> home directory
 -> root (kök) directory

PATHS

Yardımcı
yolculuk

Absolute Path

Bir dosyanın tam
konumu, kırıltı
başlayıp ulaşırıfı
yere kadar.

cd /home/sysadmin

Relative Path

Göçmen sitiinden
ittibaren baslayıp
çıldıktan yine kadar
gidebil yoldur.

cd Documents

ls [options] [File]

list

list home
secondeler
görünür

dosya veya
klassının içinde
görünürler
təsvifimizde
görünür.

ls -a

zählə dosyaları ve
klassları listələyin
option(secondeler)

lg -l

uzun listeləmə yapın
(long listing)

File type

d	directory
-	regular file
l	symbolic link
s	socket
p	pipe
b	block file
c	character file

ls -h

log list human
readable

ls -R

recursive listing

İndirim işlədildikdən sonra birləşdiriləcək

pwd

print working directory
sunucuda olduğumuz klasörün gösterili.

cd [options] [path]

change
directory

Sənədlik
görmək istəyin
gözəyin2.

üzənmək istədiğiniz
directory(klasör)

klasör deyirir

Shortcuts

..

cd .. (Bir üsttəki sənədi təmsil edir)

```
/home/sysadmin
cd ..
/home
```

.

cd . (Sunucu bulunduğu dizini təmsil edir)

```
/home/sysadmin
cd .
/home/sysadmin
```

file size

HardLink
Count

group
owner

file owner

file size

1 root root 15322 Dec 10 21:33 musat.txt

Timestamp

Permission

r	readable (okunuslu)
w	writable (yazılabilir)
x	executable (çalışdırılabilir)

ls -s

sort listing

Ən azı 2 iddai birşəhər
Şəhəyənək göstər

MANAGING Files and Directories

* Asterix Charakter

echo /etc/tt*

*d

Die beiden
neuen Orte
gibst du

birinci ne dursa olsun
uzaktısi "d" olsa doğrulan göster

? Question Mark Character

`echo /etc/t???`

*33

t ile başlayan
ve re akısu olan
7 karditor doktor isimleri
daşıyalarına göster

- həqiqətər təkərləşmə
təkərləşmənə təpəlm 3 təkərləşmə
desipləri göstər

[] Bracket Characters

`echo /etc/[gu]*`

$$[a-d]^*$$

"g" ve "u" harfi ile
başlayıp ne olursa olsun
göster.

"a, b, c, d" harflerinin karşılıklı
bindeki yerlerde ne durum olursa
oystar.

! Exclamation Point Character

echo /etc/[ad]*

→ ierstude en or blr say
iceren no dwse dgn gftet

→ a way of life best known
as ours also often gather.

`cp [source] [destination]`

-i (interactive) Ask if a file is to be overwritten

`mv [source] [destination]`

-> (nolobber) Do not overwrite the destination file

touch sample

$\rightarrow V$ (Verbos) show the result

→ sample frame design
distortion.

Klasör Silenten -c parametresini
növeştire.

(m) **EBD** ^{dustans} → deep silver

- "factory zone

→ Klasse aufsteuern

ARCHIVING and COMPRESSION

Archiving: Combines multiple files into one, which eliminates the overhead in individual files makes the file easier to transmit.

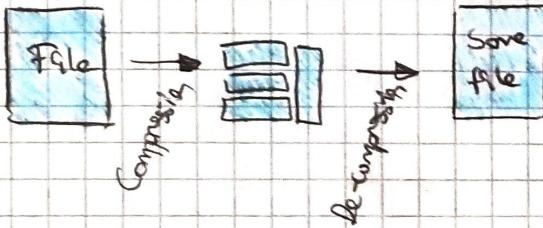
Compression: Makes the files smaller by removing redundant information.

Two types of compression

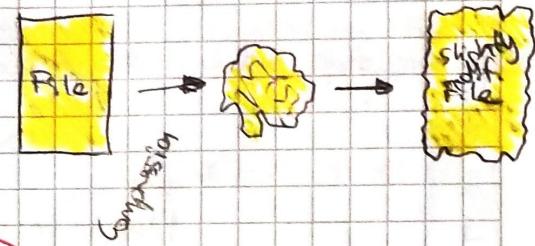
Lossy (JPEG)

Lossless (ZIP/PDF)

No information is removed from the file



Information might be removed from the file
Final result is slightly different



ls -l longfile.txt

-rw-r--r-- 1 sysadmin sysadmin 66540 Feb 8 2021 longfile.txt	(66540)
gzip longfile.txt	341
ls -l longfile.txt.gz	Feb 8 2021 longfile.txt.gz
-rw-r--r-- 1 sysadmin sysadmin 341 compressed	uncompressed ratio
66540	99.5
gunzip longfile.txt.gz	uncompressed name
ls -l longfile.txt	longfile.txt
-rw-r--r-- 1 sysadmin sysadmin 66540 Feb 8 2021 longfile.txt	(66540)

gzip gunzip (Lempel-Ziv) data compression algorithm

bzip2 bzip2 (Burrows-Wheeler) algorithm

xz unxz (Lempel-Ziv-Markov (LZMA) algorithm

Traditional UNIX utility "tar" [Tape archive].

The "tar" command takes in several files and creates a single output file that can be split up again into the original files on the other end of transmission.

tar -- Create (Make a new archive)

tar -- Extract (Put one or more files)

tar -- List (Show the contents of the archive)

CREATE CREATE

tar -c [-F ARCHIVE] [OPTIONS] [FILE]

↳ use archive files

The argument ARCHIVE will be the name of resulting archive file

tar -cf alpha_files.tar alpha*

↳ creates alpha_files.tar ARCHIVE includes all alpha* files

tar -czf alpha_files.tar alpha*

↳ create alpha_files.tar.gz with compression for all alpha* files

-z option compress with gzip

-J option compress with bzip2

LIST LIST

tar -t [-F ARCHIVE] [OPTIONS]

↳ list the files in an archive
operate the given ARCHIVE

EXTRACT

tar -tf folders.tbz

School/
School / Engineering/
School / Engineering / hello.sh
School / Art
School / Art / Linux.txt

tar -x [-F ARCHIVE] [OPTIONS]

↳ extract file from ARCHIVE

-v → Verbosity list the files processed (Tolvan dosyaları ayırt etmek istedim)

ZIP files

The archiving utility in Microsoft is the ZIP file.

ZIP is not as prevalent in Linux, but is well supported by the

ZIP UNZIP

zip [OPTIONS] [zipfile [file]]

zip alpha_files.zip alpha*

adding: alpha-first.txt

adding: alpha-second.txt

adding: alpha-third.txt

zip -r School.zip School

extra doses eklenir ve gerekliye yarar ıda bulunur.

unzip -l School.zip

get directory tree

Working with TEXT

Viewing Files in Terminal

`cat food.txt`

Food is good

↳ Viewing small files with "cat" command.

"Cat" komutu büyük dosyalar için uygun değil.

Head and Tail

* Böş

Kısmak

head ve tail komutları da
özel parametre kullanılarak
ilk ve son 10 satırın görüntülenmesi.

`ls /home/sysadmin | n`

↳ number line

gösterilen listeden sıra sıra satır numaraları.

Input / Output Redirection

STDIN (Standard Input) - Normalde girdiler terminalin tuşundan klavye ile giriliyor. Ama kodda farklı şekilde input yapmayı destekler.

STDOUT (Standard Output) - Bir program hatalı çalışırsa output değerleri döndürür. (STREAM) (CHANNEL #1)

STDERR (Standard Error) - Komutları terminalden çıkışları hata mesajlarıdır. Genellikle terminalde görünen mesajlardır. (STREAM) (CHANNEL #2)

STDOUT

`echo "Line1"`

Line1

`echo "Line1" > example.txt`

redirection in example.txt

`echo "Newline1" >> example.txt`

dosyayı ikiinci yazmak, son satırın devam etmesi.

STDERR

`ls fake`

ls: cannot access /fake
No such file or directory

`ls fake > example.txt`

bu komutunuza

`ls fake 2> example.txt`

hata mesajını example.txt dosyasına gönderdi.

ls /fake /etc/ppp

ls: cannot access /fake: No such directory or file

/etc/ppp:

'ip-down.d' 'ip-up.d'

Sadece dosya, hata döndürmeyecek türde dosyalar istenilen dosyalardır.

ls /fake /etc/ppp > example.txt

ls: cannot access /fake: No such file or directory

cat example.txt

Sadece hata döndürmenek türde dosyalar istenilen dosyalardır.

/etc/ppp

'ip-down.d'

'ip-up.d'

Sadece hata döndürmenek türde dosyalar istenilen dosyalardır.

ls /fake /etc/ppp 2> example.txt

/etc/ppp:

'ipdown.d'

'ip-up.d'

cat example.txt

Hata çalışmıyorken alttakileri hata de hata döndürmenek türde dosyalar istenilen dosyalardır.

ls: cannot access /fake: No such file or directory

ls /fake /etc/ppp 8> example.txt

cat example.txt

ls: cannot access /fake

/etc/ppp

'ip-down.d'

'ip-up.d'

STDIN

cat

Mehmet
Mehmet

Ben Musa
yazdığım

Mehmet

Yazdığını tekrar
bunu gösterdi

Mehmet

bunu gösterdi

cat > new.txt

Mehmet

Ben Musa

} Dosyanın içinde
yazısı

cat new.txt

Mehmet

Ben Musa

} Dosyanın içinden
çıktı

tr 'a-z' 'A-Z'

merhaba Ben Musa
MEHMET BEN MUSA

tr 'a-z' 'A-Z' < example.txt

/ETC/PPP

IP-DOWN.D

IP-UP.D

translation

a-z kırakterini

A-Z kırakterlerine

dönüştürdü.

dosyaları içinde
veriyi çıktı

Veriyi çıktı

tr 'a-z' 'A-Z' < example.txt > output.txt

cat output.txt

/ETC/PPP

IP-DOWN.D

IP-UP.D

example dosyasından
veriyi çıktı

output dosyasına
veriyi verdi

Sorting Files or Input

`sort [options] [files]` Alphabetical sorting keyer.

INPUT OR FILES SORTING

-t if the file or input is separated by a delimiter other than whitespace, for example a comma or colon the "-t" option will allow for another field separator to be specified as an argument

-k specifies the field number, Hangi sıradakini sıralayacak mısın.

-n This option specify the sort type
Numeric sort

`Sort -t: -n -k3 /etc/passwd`

↳ input

Alıcı notatörlerinim kusmalarını 3.kusmum yolda MR.

↳ numeric sort yaptırmır

sortlendeti : yeterlik gibi oyuncu yapar.

Viewing File Statistics

`wc [option] [file]`

provides the number of lines, words and bytes for a file, and a total line count if more than one file is specified

VIEWING FILE STATISTICS

`wc /etc/passwd /etc/passwd -`
35 56 1710
34 55 1665
69 121 3375
/etc/passwd
/etc/passwd -
total

↳ file name

↳ number of bytes

↳ number of words

↳ number of lines

-l just the number of lines

-w just the number of words

-c just the number of bytes

Filter File Sections

`cut [option] [file]`

Cut command expects its input to be separated by the tab character

but **-d** option can specify alternative delimiters

-f can specify which fields to display either as a hyphenated range or a comma separate list

`cut -d: -f1,5-7 /etc/passwd`

↳ 1, 5, 6, 7.
olar yoldan delomboklu
aynica döşen
biriken fesihen

↳ 1, 5, 6, 7.
olar yoldan delomboklu
aynica döşen
biriken fesihen

FILTER FILE CONTENTS

The **grep** command can be used to filter lines in a file or the output of another command that matches a specified pattern.

grep bash /etc/passwd (etc/passwd dosyasının içinde "bash" geçen tüm satırı ekrana yazdır)

-c provides the count of how many lines match (kaç satır eşleştiğini söyle)

grep -c bash /etc/passwd (2 satır eşleşti)

2

-n display original line number in file.

grep -n bash /etc/passwd

1: root:x:0:0:root:/root:/bin/bash

27: sysadmin:x:1001:1001:System Administrator,,,:/home/sysadmin:/bin/bash

-v invert the match, outputting all lines do not contain the pattern

grep -v nologin /etc/passwd

↳ 'i' weisinde "nologin" (ignorer你不理睬).

-i (ignore the case) büyük küçük harf durumunu ignorer

grep -i the newhome.txt

↳ newhome.txt dosyasının içinde

the kelimeini arla
büyük küçük harf durumunu

-w only returns lines which contain matches that from whole word.
satırda tam kelimeyi speren tek bir şablon gösterir.

grep -w are newhome.txt

There are three bathroom.

Bellow are of the ghost in the bedroom.

grep -w are newhome.txt

There are three bathroom.

REGULAR EXPRESSION Basic

- Any single character

[] A list of range of characters to match one character

[^] A list of range of characters to don't match one character

***** The previous character repeated zero or more times

^ if first character - it must match, otherwise just a literal

\$ if the last character - it must be at the end of line, otherwise just a literal

Tableaux

red
Reef
rot
reed
rd
rod
roof
reed
root
real
read

Youmiz

Hello my name is Joe.
I am 37 years old.
3121911
My favorite food is avocados.
I have 2 dogs.
123456789101112

grep 'r...f' table

reef
root

grep '...t' table

red
cat
rod

grep '[a-g]' you

I am 37 years old
3121911

I have 2 dogs
123456789101112

grep '[d-a]' you

→ wrong order
it should be a-d

grep 'reed' table

red
reed
reed
rd
reed
reed
reed
reed
reed
reed
reed

grep 'r[a-e]*d' table

red
reed
rd
rod
reed

grep '^a-g' you

Hello my name is Joe.
I am 37 years old.
My favorite food is avocados.
I have 2 dogs.

Basic SCRIPTING

A shell script is a file of executable commands that has been stored in a text file. When the file is run each command is executed. Shell scripts have access to all command of the shell including logic.

command1
command2
—
—
commands
—
—

echo "Hello"

test.sh

sh test.sh

Hello

/test.sh

Permission Denied

chmod +x .test.sh

/test.sh

Hello

command.txt → command.sh (calvinmloblin script own)

VARIABLES

```
#!/bin/bash  
echo "Hello"
```

```
#!/bin/sh  
echo "Hello"
```

Shebang
Variables
temporary information in script

Conditionals Loops

Variables is a key part of the programming language

```
#!/bin/bash }
```

dollar sign means that equals

ANIMAL = "penguin"

echo "My favorite animal is \$ANIMAL"

Variable name is ANIMAL and equals sign assigns the string "penguin"

```
#!/bin/bash
```

ANIMAL definition inside penguin definition after

ANIMAL = "penguin"

SOMETHING = \$ANIMAL

echo "My favorite animal is \$SOMETHING"

SOMETHING definition \$ANIMAL yet penguin definition after.

My favorite animal is penguin

read komutuza kullaniciyi verdi okuyulabilir

```
#!/bin/bash
```

echo "What is your name?"

read NAME

echo "Hello \$NAME"

What is your name?

Musa

Hello Musa

```
#!/bin/bash
```

echo "Hello \$1"

} A dollar (\$) sign followed by a number N corresponds a Nth argument passes to the script.

./test.sh Musa

Hello Musa

grep -q "Musa" /etc/passwd

if user is in /etc/passwd

echo \$?

\$? bir tane konutun sonucunu verir.

return value of some command

```
#!/bin/bash
```

Something has happened

exit(1)

is a comment line
whatever you write after # ignored

CONDITIONALS

A basic if statement looks like this:

**if some command; then
do this if some command has an exit code of 0**

fi

"if" command works until the closing "fi"
#!/bin/bash
if grep -q root /etc/password; then
echo root is in the password file
else
echo root is missing from the password file
fi.

if statement

The "case" statement provides a different way of making multiple test easier.

#!/bin/bash
case "\$1" in
hello|hi) echo "Hello or hi"
echo "Hello yourself!"
;;
goodbye) echo "If goodbye"
echo "Nice to have met you!"
;;
*) echo "I did not understand"
esac

case statement

Loops allow code to be executed repeatedly. It can be useful in numerous situations. There are two main loop statements "for and while".

#!/bin/bash

for NAME in Muhs Rumi Bayz; do
echo "Hello \$NAME"
done

Hello Muhs
Hello Rumi
Hello Bayz

#!/bin/bash

for S in *; do
echo "\$S"
done

Desktop
Downloads
Templates

} Current
directory
file
names

#!/bin/bash
i=0
while [\$i -lt 10]; do
echo \$i
i=\$((i+1))
done

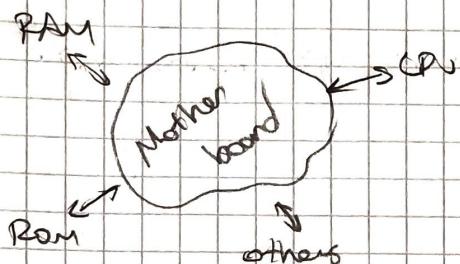
\$((arithmetic))

0
1
2
3
4
5
6
7
8
9

COMPUTER HARDWARE

Motherboards

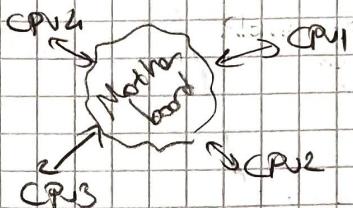
The motherboard or system board is the main hardware board in the computer through which the CPU (central process unit), RAM (random access memory) and other components are all connected.



Processors

Central Processing Unit (CPU) (processor)
Most critical hardware components
Brain of the computer
Execution of codes takes place } in the processors
Calculations done

Multiprocessors System



Multi-core Processors



arch → which family CPU

x86-64

lscpu → more information about CPU

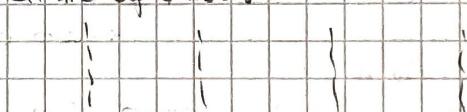
Architecture : x86-64

CPU op modes: 32-bit 64-bit

Byte order: Little Endian

CPU(s) : 4

On line CPU(s) list: 0-3



BUSES

High speed connection to communication between computers or the components inside a computer

Peripheral Component Interconnect (PCI)

Peripheral Devices are component connected to a computer that allow input, output or data storage.

- Keyboards, mice, monitors, printers and hard disks

lspci

To view of all connected devices by the PCI busses

Universal Serial Bus (USB)

For external devices or connected with USB
internal devices cold-plug

System must be restart for connection

USB devices are

hot-plug
can connect or
disconnect while
System is running

lsusb

Hard Drive **HDD**

- Also called hard disk, disk devices, storage devices
- Hard drives are divided into one or more partitions. A partition is a logical division of a harddrive, doesn't do take a large amount of available storage and break it up into smaller areas.
- Some harddrives make use of partition technology called **Master Boot Record (MBR)** while others make use a partition type called **GUID partition GPT**

THE MBR type of partitioning has been used since the early days of PC and GPT has been available since the year 2000

fdisk, **cfdisk**, **sfdisk** commands which are tools for working with MBR partitioning

GPT systemin NBS sisteminin destekleyenin kodları disk bilgilerini ve bir GPT tabloya atanmış olmak üzere sabit birdeki bilgileri tutar. MBR buna yapar.

gdisk, **cgdisk**, **Sgdisk**

There is also family of tools that attempt to support both MBR and GPT type disks **Parted** and graphical parted (**gparted**)

Hard drives associated with file names **/dev** directory. Each device filerome is made up multiple parts.

File Type

IDE (Intelligent Drive Electronics) begin with **hd**

USB, **SATA** (Serial Advanced Technology Attachment)

SCSI (Small Computer System Interface) begin with **sd**

Device Order (unique alphabetic character)

IDE hard drives → /dev/hda
/dev/hdb
/dev/hdc

SCSI harddrives → /dev/sda
/dev/sdb
/dev/sdc

Partition (unique numeric character)

IDE hard drive → /dev/hda1
/dev/hda2

SCSI harddrives: /dev/sda1
/dev/sda2

fdisk -l /dev/sda

Solid State Disk (SSD)

- Difference between a traditional spinning platter hard disk and a SSD thumb drives
- Solid state disk are essentially larger capacity USB thumb drives in construction and function

Optical Drive CD-RW/Ds DVDs Blu-Ray

CD-R, CD+R, DVD+RW, DVD-RW

Video Display Devices

15-pin Video Graphics Array (VGA)
29-pin Digital Visual Interface (DVI)
High-definition Multimedia Interface (HDMI)

HARDWARE COMMANDS

lscpu - determine the type of CPU

Architecture:

;

CPU(s):

;

Socket:

;

BiSSNC b7g

free -m — megabytes diskdurom (kilometer) gösterir
free -g — gigabytes diskdurom (kilometer) gösterir

lspci — partial output, tüm belli Ethernet listeler

lspci -k — show devices along with the kernel driver and modules used.

lsusb — attempt to list the USB devices

lsmod — view the current load modules:

Module

Module	Size	Used by

cat /proc/cpuinfo

Sistem hattında dene deðeri
b7g verdi

Where DATA IS STORED

Active Processes through a pseudo filesystem under the
Hardware devices are made available through special file
Information about those devices can be found in another pseudo

/proc
/dev
/sys

/Proc

- Running processes, information about the system hardware and current kernel configuration.

Is /proc output shows a variety of named and numbered directories
directory matches with PID (process ID) number.

/proc/cmdline

- Information that was passed to the kernel when it was first started, such as command line parameter and special instructions.

/proc/meminfo

- information about the use of memory by the kernel

/proc/modules

- a list of module currently loaded into the kernel to add extra functionality

Gök Önemli not:

/proc/sys dizini - Sadece root
tarafından değiştirilebilen bir alan. Eger bu dosyaların
biner deşifre edilebilir, Linux kernel tarzı deşifre edilebilir.

ÖRNEĞİN /proc/sys/net/ipv4/icmp_echo_ignore_all deşifre ederinde "0" olursa hedefin icmp traffic engelleme özelliğini, yoksa "1" versa icmp echo request yapanı.

PROCESS HIERARCHY

Boot işlemi sırasında kernel yüklenirken birlikte sona, bir init işlemi başlar ve PID'sine 1 atanır. Bu işlem de sona kadar sistem işlerkenin çalıştırır. (Atanılmış PID numarası sınırsızdır)

- Bir işlemde başka bir işlem görevlendirse, odağın işlem parent adı ile, odağına işlem ise child olarak adını verilir.

Uzun süre çalışan sonucunda /proc/sys/kernel/pid_max deşifre edilebilir. Maksimum pid deşifre edilebilir. Sonra sistem diğer "calls over" ve kaldığı yerden devam eder.

pstree komutu işlerken oyu yapsı şekilde
göstermeye yarar.

PPID
Parent PID

Snapshot

ps command shows only currently running processes

ps --forest command like pstree command, shows like tree

ps aux yada **ps -ef** view all processes on the system.

ps -U <username> Shows all the processes of a user.

Viewing Processing In Real Time

top - dynamic / screen-based interface that regularly updates
- sorted by percentage % of the CPU time that each process is currently using.

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	DNEY	COMMAND

Soyta oaktion K tuzura beszorozza PID gincek iskolai felhasznaloit.

Load average (First line of the top) indicate how busy the system has been during the last one, five and fifteen minute.

Cart /proc/loadavg

0,11 0,40 0,25
Lost one minute average Lost five minute average Lost fifteen minute average

1/254
Number of processes

3052
Lost PID

free - display statistic for how overall memory usage in real time

Viewing Memory

free - provides snapshot the memory being used at that moment

free -s 10
every 10 second refresh
-m (megabyte)
-g (gigabyte)

total	used	free	shared	buff/cache	available
Mem:					
swap:					

LOG FILES

SYSLOG

is a term that is used almost generically to describe logging in Linux system.

→ they help troubleshoot the problem and determine whether or not unauthorized access has been attempted.

SYSLOG methods

Syslogd klogd

/var/log

directory structure

boot.log — bootup messages held by kernel, shutdown system log file.

crontab — cron system configuration and status log file.

dmesg — booting, active memory dump file by kernel.

maillog — e-mail service log file.

syslog/messages — kernel messages held by kernel log file.

secure — authentication errors upon login attempt log file.

Journal — log file

Kernel Messages

/var/log/dmesg — during system startup
 /var/log/messages

/etc/syslog.conf

/etc/ksyslog.conf

dmesg used to view the kernel ring buffer, which holds a large number of messages that are generated by the kernel.

Home

User Specific Bin

/home

/bin

/usr/bin

/user/local/bin

Root Restricted Bin

/sbin

(/usr/sbin)

/usr/local/hostos

LIBRARY DIRECTORY

/usr/bin

/usr/sbin

Software Application Directories

dpkg -L <package name>

rpm -ql <package name>

/usr/share

/usr/lib

/opt/application

/var/lib

NETWORK Configuration

Host is a computer. Host is any device that communicates via a network with another device.

Network is a collection of two or more hosts (computers) that are able to communicate with each other.

Internet is a example of network, publicly accessible network

Wi-Fi refers the wireless network

Server → A host provides a service to another host or client called "server"

Service A feature provided by a host is a service

Client is host that is accessing a server

Router Also called a gateway. A router is a machine that connects hosts from one network to another network.



Packet A network packet is used to send network communication information between hosts.

IP address An internet Protocol (IP) address is a unique number assigned to hosts on a network. Hosts uses these numbers to find other hosts and communicate to.

Mask Also called "netmask", "subnet mask", "mask", "network mask" is a number system that can be used to define which IP addresses are considered to be within a single network.

Hostname Each host on a network could have its own hostname because names are natural for humans to remember than numbers.

URL's A Uniform Resource Locator (URL) also called web address is used to locate a resource like a web page on the internet.

<https://www.netdevgroup.com>

https → protocol

www.netdevgroup.com → hostname

DHCP Hosts can be assigned hostnames, IP addresses and other network-related information by a DHCP (Dynamic Host Configuration Protocol) Server.

DNS Domain Name System (DNS) provides the service of translating domain names into IP addresses.

Ethernet wired network environment

TCP/IP Collection of protocols that are used to define how network communication

NAT Not Address Translation used a technique to provide more hosts access to the internet. In a nutshell a group of hosts is placed into a private network with no direct access to the internet.

Porting is switching over from one technology to another.

Primary IPv4 Configuration File /etc/sysconfig/network-scripts/ifcfg-eth0

Primary IPv6 Configuration File /etc/sysconfig/network-scripts/ifcfg-eth0

→ IPV6INIT = yes

IPV6ADDR = Brings IPv6 address up

IPV6_DEFAULTGW = Brings IPv6 gateway up

DHCPV6C = yes

/etc/sysconfig/network

→ NETWORKING_IPV6 = yes

Domain Name System /etc/hosts

/etc/hosts This file contains a table of hostnames to IP addresses

/etc/resolv.conf This file contains the IP addresses of the name servers the system should consult in any attempt to resolve names to IP addresses.

/etc/nsswitch.conf This file can be used to modify where hostnames lookups occur. It contains a particular entry that describes in what order name resolution sources are consulted.

hosts : files dns } files is searched first, dns second

hosts : dns files } DNS servers searched first, files second.

Network Files

NETWORK TOOLS

ifconfig (interface configuration) display network configuration information

ip [options] Object command

route To view a table that describes where network packages are sent, use the route command.

ping can be use to determine if another machine is reachable.

ping 192.168.1.10 (forever)

ping -c 10 192.168.1.10 (4 times)

Netstat is a powerful tool that provides a large amount of network information. It can be used to display information about network connections as well as display to routing table similar to the route command.

netstat -i (display statistic regarding network traffic)
Kernel Interface table

<u>Interface</u>	<u>MTU</u>	<u>Net</u>	<u>RXOK</u>	<u>RXERR</u>	<u>RXDRP</u>	<u>RXOVR</u>	<u>TXOK</u>	<u>TXERR</u>	<u>TXDRP</u>	<u>TXOVR</u>	<u>Flag</u>
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netstat -r (display routing information)
Kernel IP routing table

<u>Destination</u>	<u>Gateway</u>	<u>Mask</u>	<u>Flags</u>	<u>MSS</u>	<u>Window</u>	<u>MTU</u>	<u>Interface</u>
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netstat -tln (See a list of currently open ports
Active internet connections (only Servers))

<u>Proto</u>	<u>Recv-Q</u>	<u>Send-Q</u>	<u>Local Address</u>	<u>Foreign Address</u>	<u>State</u>
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-t (TCP) -l (listening) -n (show numbers not names)

ss (show sockets) what connection are currently established between their local machine and remote machines, statistics about those connections

ss

<u>NetId</u>	<u>State</u>	<u>Recv-Q</u>	<u>Send-Q</u>	<u>Local Address:Port</u>
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↓
Socket
type and
transport
protocol

↓
Connection or
Not connected
depending on
pretocol

Amount of
data queued up
being processed

► The address and ports of the
local hosts portion of the connection

Amount of
the data queued up
for being send

ss -s

Total loop (kernel 0)
TCP: 7 (----)

Transport Total

IP

IPv6

*	0	-	-
RAW	0	0	0
UDP	9	6	3
TCP	7	3	4
INET	16	9	7
FRAG	0	0	0

dig