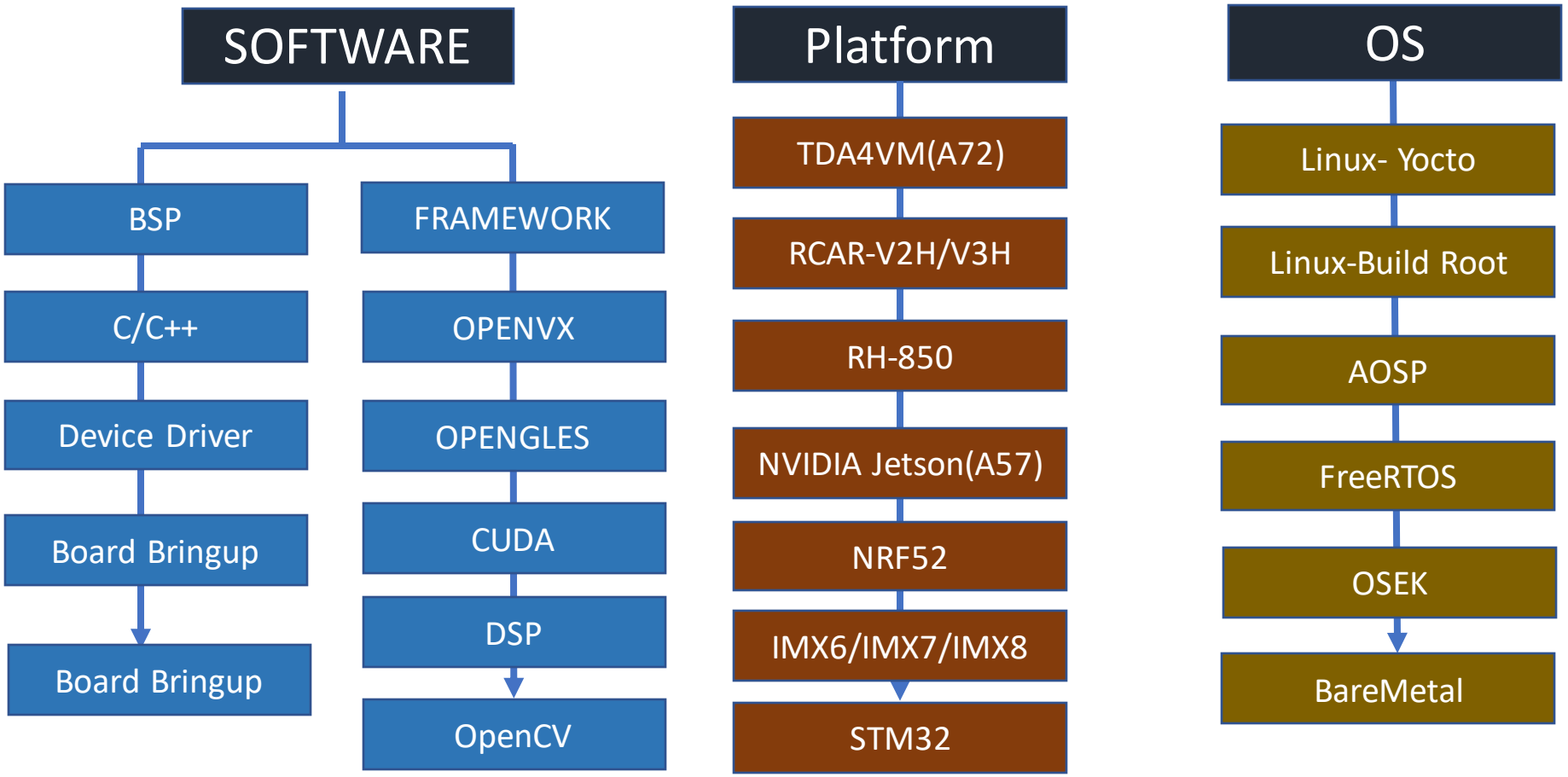
Embedded Linux
Day-1

Contents

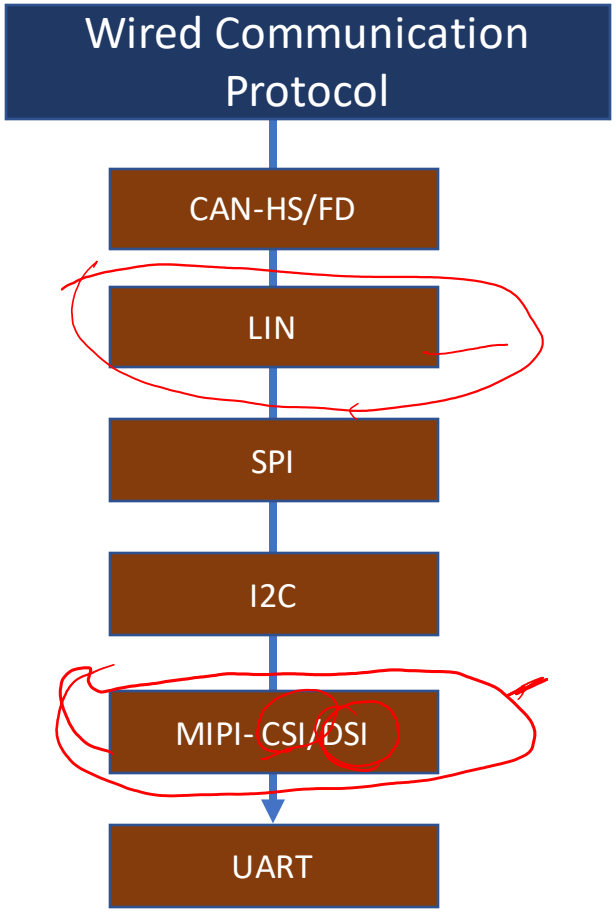
Introduction

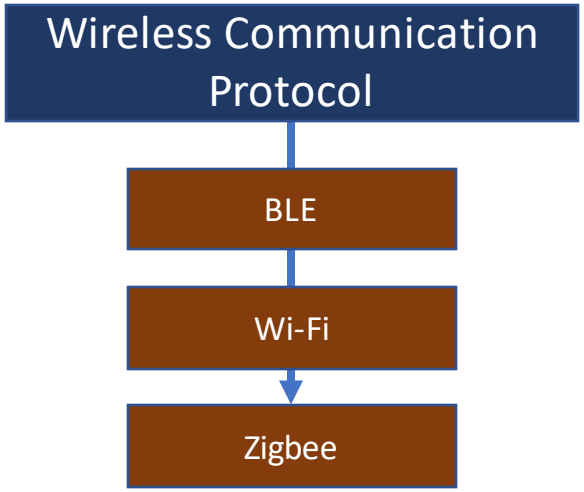
Execution Model

Software/Hardware Skill Set

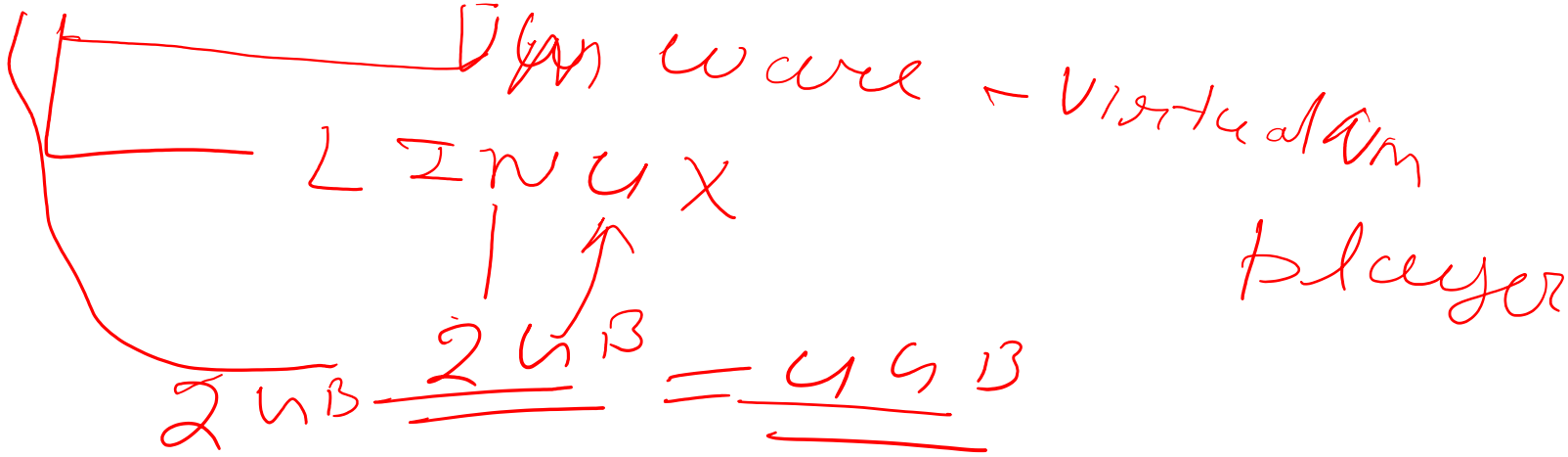


Protocol Knowledge

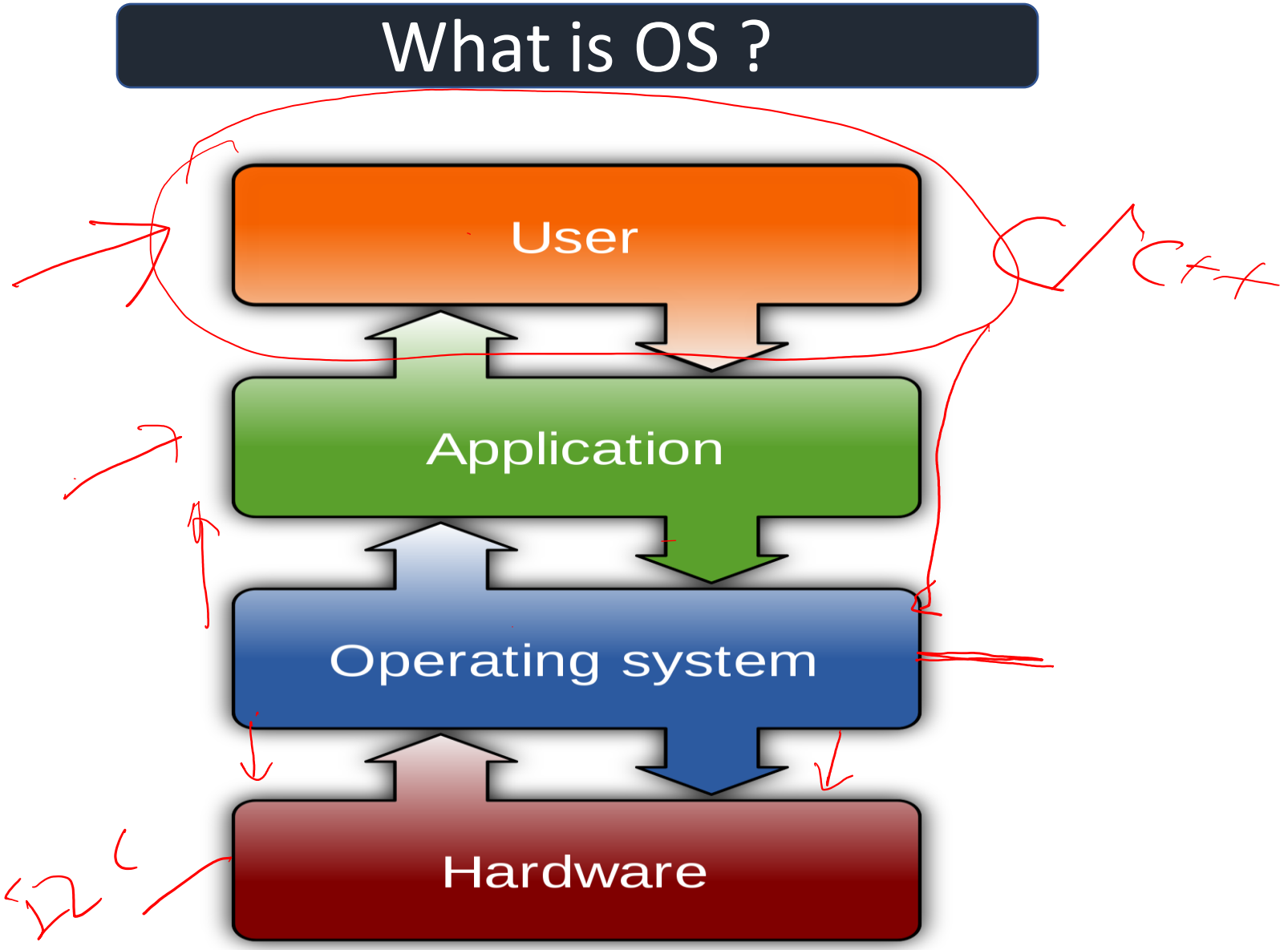




Windows — 4 GB RAM



What is Linux 3-1 ?



What is Linux 3-2 ?

What are the different types?

Linux is a Unix-like computer operating system assembled under the model of free and open source software development and distribution.

Mac OS is a series of graphical user interface-based operating systems developed by Apple Inc. for their Macintosh

Microsoft Windows is a series of graphical interface operating systems developed, marketed, and sold by Microsoft.

iOS (previously **iPhone OS**) is a mobile operating system developed and distributed by Apple Inc. Originally unveiled in 2007 for the iPhone, it has been extended to support other Apple devices such as the iPod Touch

Android is a Linux-based operating system designed primarily for touchscreen mobile devices such as smartphones and tablet computers. Initially developed by Android, Inc.

BSD/OS had a reputation for reliability in server roles; the renowned Unix programmer and author W. Richard Stevens used it for his own personal web server for this reason.

What is Linux 3-3 ?

Linux Background

Linux was created in 1991 by Linus Torvalds

What is Linux

Linux is an open source operating system which can be customize as per the product requirements

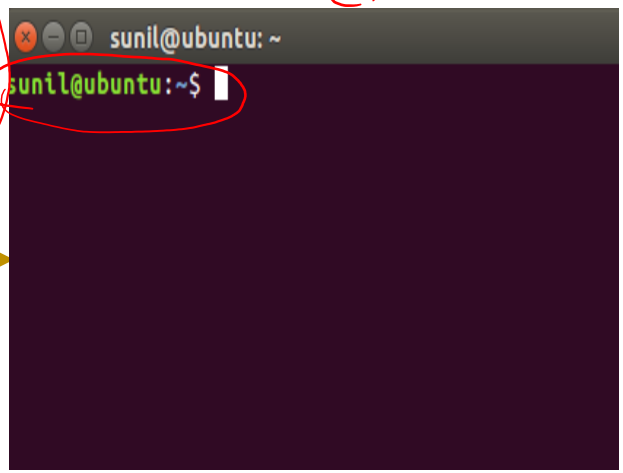
Linux Distributions

Ubuntu is a Debian Based OS	Fedora is a community based project by Redhat.	Yocto is fully customizable operating system.
Ubuntu was initially released in October 2004.	Fedora was initially released in November 2003	Yocto was initially released in November 2006
Ubuntu uses Ubiquity installer for installing Ubuntu.	Fedora uses anaconda installer for installing Fedora	Yocto is commands based and use uboot bootloader
Ubuntu has 2 forums for duscussion ubuntuforums.org and askubuntu.com	Fedora has only 1 forum for discussions which is ask.fedoraproject.org	Yocto has good documentation support: https://wiki.yoctoproject.org/wiki/Main_Page

What is Linux 3-3 ?

Linux Shell

A Unix shell is a command-line interpreter or shell that provides a command line user interface for linux operating systems.
The shell is both an interactive command language and a scripting language, and is used by the operating system to control the execution of the system using shell scripts



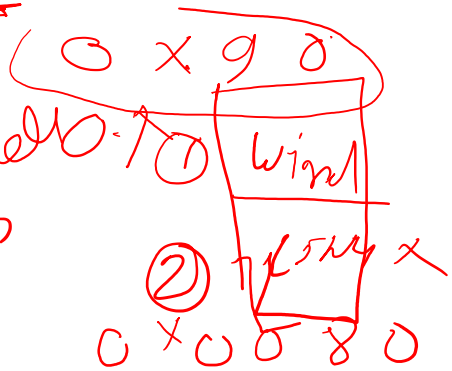
ALT+CTL+T

Primary Component of OS

→ Bootloader

→ kernel → hello.txt

→ file System



Linux Commands

System Commands

Command	Description
uname	Displays Linux system information
uname -r	Displays kernel release information
uptime	Displays how long the system has been running including load average
hostname	Shows the system hostname
hostname -i	Displays the IP address of the system
last reboot	Shows system reboot history
date	Displays current system date and time
cal	Displays the current calendar month and day
whoami	Displays who you are logged in as

Linux Commands

Hardware Commands

Command	Description
dmesg	Displays bootup messages
cat /proc/cpuinfo	Displays more information about CPU e.g model, model name, cores, vendor id
lshw	Displays information about system's hardware configuration
lsblk	Displays block devices related information
free -m	Displays free and used memory in the system (-m flag indicates memory in MB)

Linux Commands

File Commands

Command	Description
ls -al	Lists files - both regular & hidden files and their permissions as well.
pwd	Displays the current directory file path
mkdir 'directory_name'	Creates a new directory
rm file_name	Removes a file
rm -f filename	Forcefully removes a file
rm -r directory_name	Removes a directory recursively
rm -rf directory_name	Removes a directory forcefully and recursively
cp file1 file2	Copies the contents of file1 to file2
cp -r dir1 dir2	Recursively Copies dir1 to dir2. dir2 is created if it does not exist
mv file1 file2	Renames file1 to file2
touch file_name	Creates a new file
head file_name	Displays the first 10 lines of a file
tail file_name	Displays the last 10 lines of a file
wc	Prints the number of bytes, words and lines in a file

Linux Commands

Directory Commands

Command	Description
cd ..	Move up one level in the directory tree structure
cd	Change directory to $HOME directory
cd /test	Change directory to /test directory

Linux Commands

Process Commands

Command	Description
ps	Display currently active processes
ps aux | grep 'telnet'	Searches for the id of the process 'telnet'
pmap	Displays memory map of processes
top	Displays all running processes
kill pid	Terminates process with a given pid
killall proc	Kills / Terminates all processes named proc
pgrep firefox	find Firefox process ID
pstree	visualizing processes in tree model

Linux Commands

Network Commands

Command	Description
ip addr show	Displays IP addresses and all the network interfaces
ip address add 192.168.0.1/24 dev eth0	Assigns IP address 192.168.0.1 to interface eth0
ifconfig	Displays IP addresses of all network interfaces
ping host	ping command sends an ICMP echo request to establish a connection to server / PC
whois domain	Retrieves more information about a domain name
dig domain	Retrieves DNS information about the domain
hostname -i	Displays local IP address
wget file_name	Downloads a file from an online source
netstat -pnltu	Displays all active listening ports

Linux Commands

Network Commands

Command	Description
ip addr show	Displays IP addresses and all the network interfaces
ip address add 192.168.0.1/24 dev eth0	Assigns IP address 192.168.0.1 to interface eth0
ifconfig	Displays IP addresses of all network interfaces
ping host	ping command sends an ICMP echo request to establish a connection to server / PC
whois domain	Retrieves more information about a domain name
dig domain	Retrieves DNS information about the domain
hostname -i	Displays local IP address
wget file_name	Downloads a file from an online source
netstat -pnltu	Displays all active listening ports

Linux Commands

Compression Commands

Command	Description
tar -cf home.tar home<:code>	Creates archive file called 'home.tar' from file 'home'
tar -xf files.tar	Extract archive file 'files.tar'
tar -zcvf home.tar.gz source-folder	Creates gzipped tar archive file from the source folder
gzip file	Compression a file with .gz extension

Linux Commands

Search Commands

Command	Description
grep 'pattern' files	Search for a given pattern in files
grep -r pattern dir	Search recursively for a pattern in a given directory
locate file	Find all instances of the file
find /home/ -name "index"	Find file names that begin with 'index' in /home folder
find /home -size +10000k	Find files greater than 10000k in the home folder

Linux Commands

Disk Commands

Command	Description
df -h	Displays free space on mounted systems
df -i	Displays free inodes on filesystems
fdisk -l	Shows disk partitions, sizes, and types
du -sh	Displays disk usage in the current directory in a human-readable format
df -h	Displays free space on mounted systems

Linux Commands

Login Commands

Command	Description
ssh user@host	Securely connect to host as user
ssh -p port_number user@host	Securely connect to host using a specified port
ssh host	Securely connect to the system via SSH default port 22
telnet host	Connect to host via telnet default port 23
ssh user@host	Securely connect to host as user
scp file1.txt server2/tmp	Securely copy file1.txt to server2 in /tmp directory
rsync -a /home/apps /backup/	Synchronize contents in /home/apps directory with /backup directory

Linux Commands

VI Commands

Command	Description
Vi filename	Used to create file
:wq	Save the file
:q!	Close file without Saving
dd	Delete the line
pp	Paste the line
n	Go to next search

Linux File System