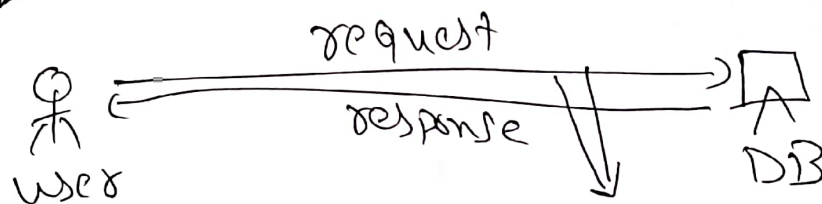
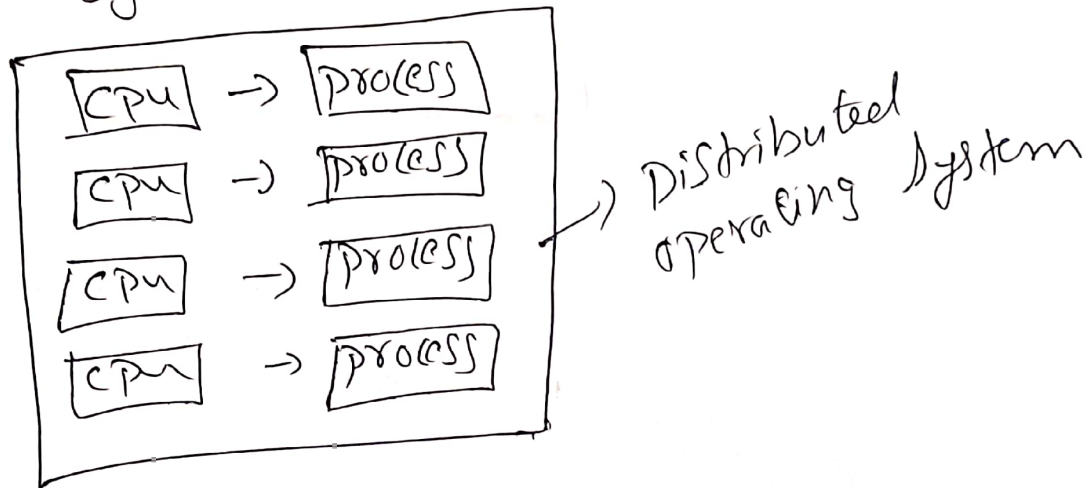


Om Namaha Shivaya
Om Sai Ram

① Introduction to Distributed operating system:-

CPU \rightarrow process \Rightarrow This one CPU cannot manage all the things.

\therefore The above drawback can be managed by or solved by below fig.

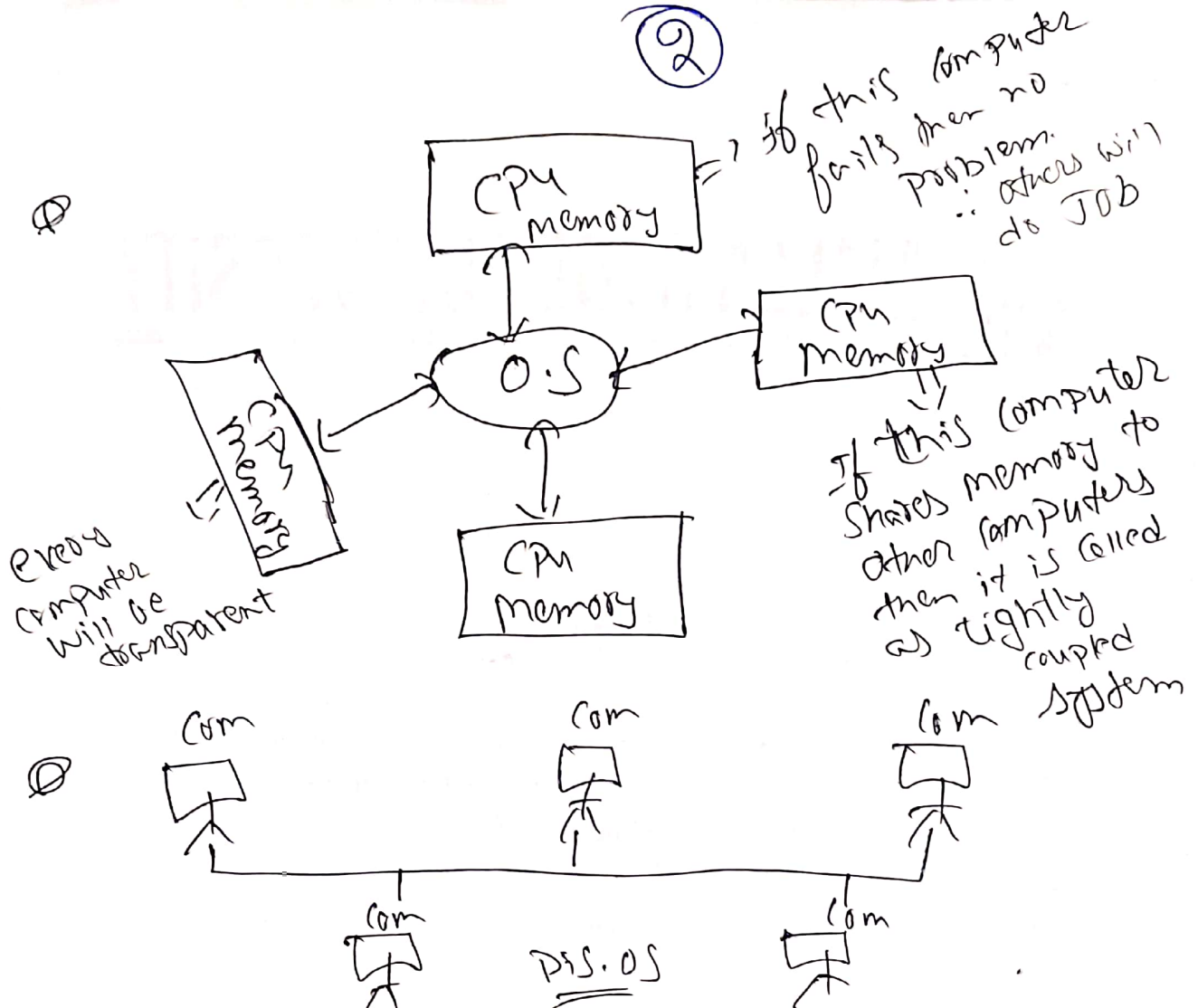


req & response will travelled through n/w & several distributed operating system.

Defination of Distributed operating system:-

\rightarrow A distributed OS is the SW over a collection of independent, networked, communicating & physically separate computational nodes.

②



- 1) Above ^{each} computers having own memory
- 2) Connected in local area n/w & wide area n/w & metropolitan area n/w.
- 3) All computers are independent connective.
- 4) Physically separate
- 5) All computers will communicate each other

Dis OS ~~is~~ done

→ collaborating in work

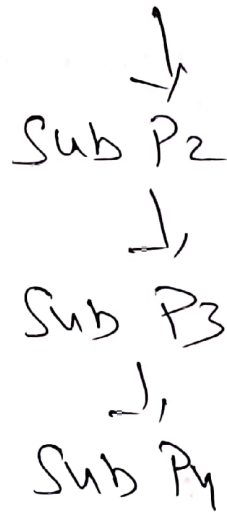
→ sharing the work

Advantages of Dis. OS:-

(3)

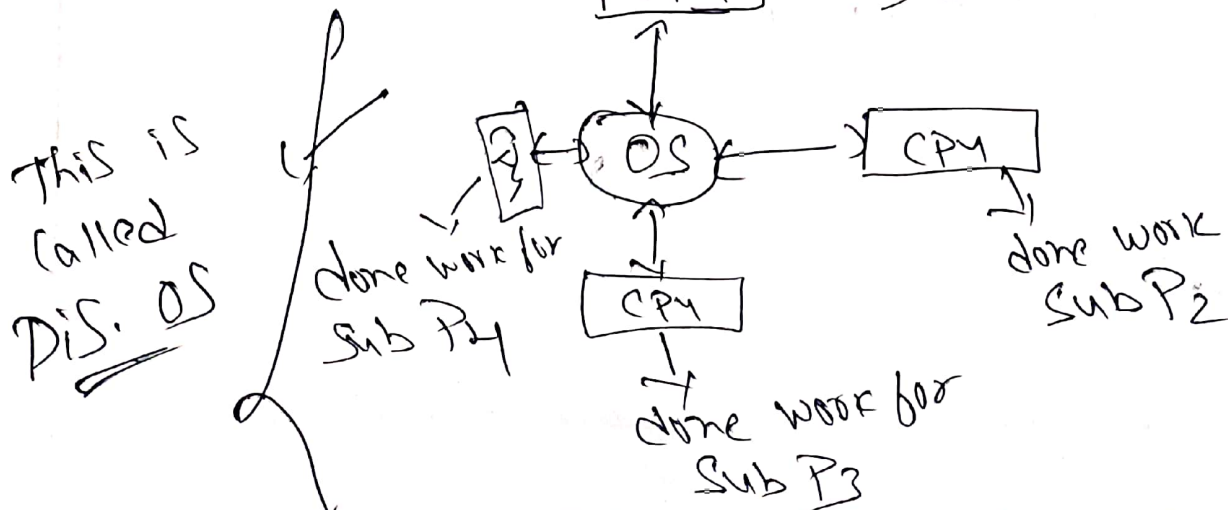
- 1) Response time
- 2) output speed
- 3) memory utilization
- 4) N/w utilization.

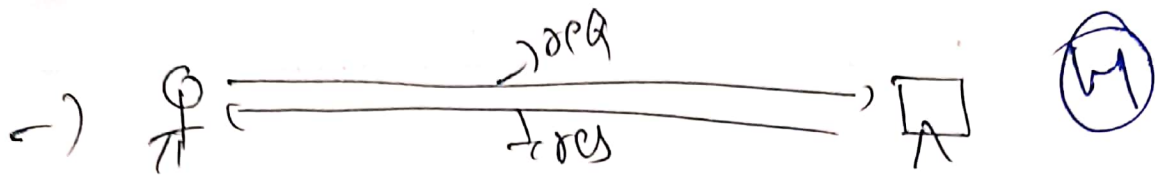
process will be divided into Sub (P_1)



This is
Dis. OS

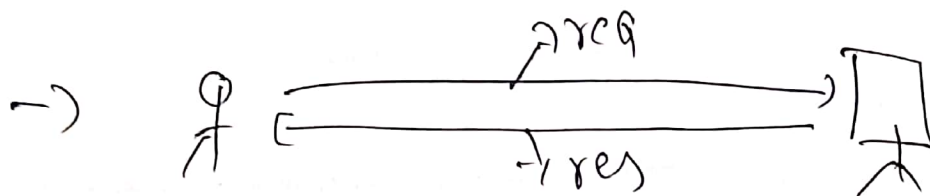
Sub P_2 work done by computer 1
Sub P_3 work done by computer 2
Sub P_4 work done by computer 3





- 1) Single Computer
- 2) Single CPU
- 3) Small network

→ ~~can't~~ Server can't take req & response.
 ∴ No result



- 1) more computers
- 2) more CPU
- 3) Big N/W

→ Server can handle req & response
 ∴ Good result in short period of time.

→ multiple CPUs

↓
 multiple process
 ↓
 work completed

→ Dis. DS

→ one computer depends upon
 ↓
 another computer

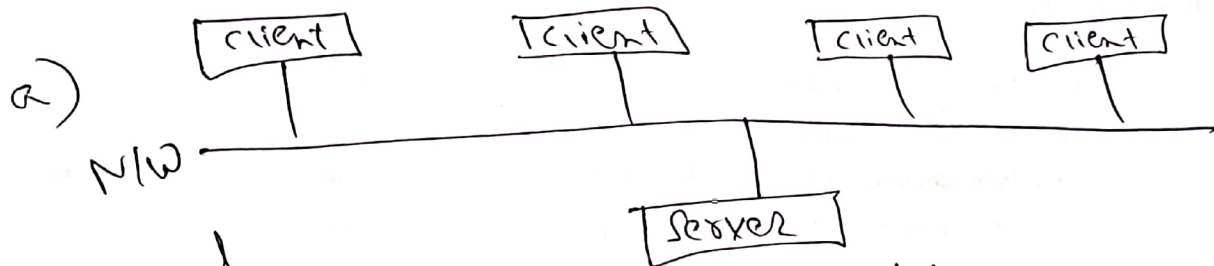
→ tightly coupled.

??

Examples of dis. OS:-

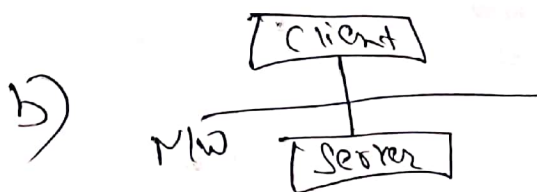
5

- a) Telephone
- b) Internet
- c) ATM machine
- d) mobiles usage



This is also called as client-server system.

1)
→ Need Dis. OS
→ If no Distributed OS is used here then client have to wait for long period of time & this results late o/p.



⇒ Here no dis. OS is required
⇒ one server can easily respond to single client

DS is loosely coupled

⑥

→ No shared memory

Advantages of Dis. OS:-

1) Resource Sharing

2) Computation Speed up

3) Reliability

↳ Communication

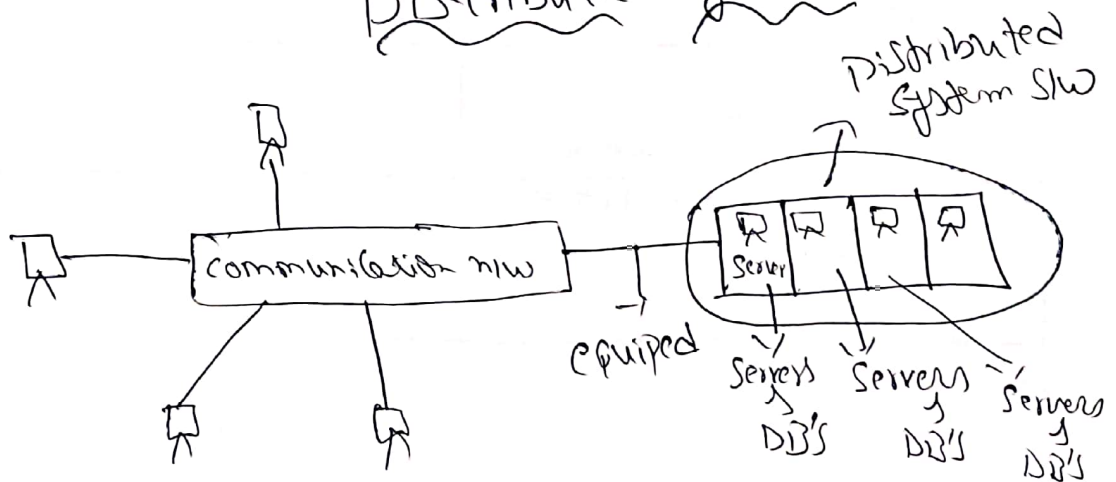
5) Quickly responses

6) Client no need to wait

7) Extensibility

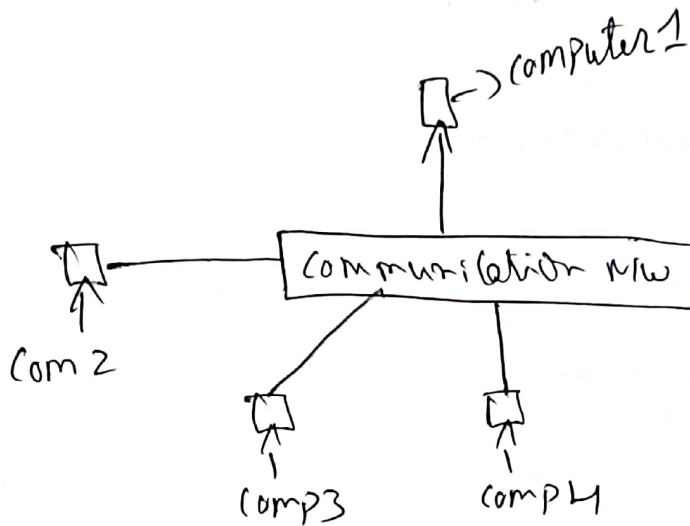
8) Cloud concepts completely depends upon Dis. OS

Distributed system



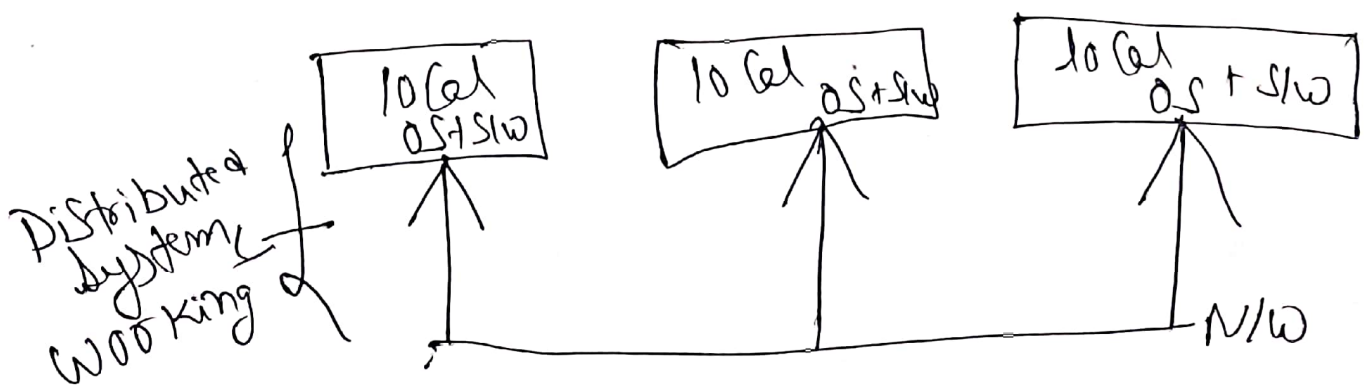
→ Distributed system:- it is a collection of computers linked by a communication net & equipped with distributed system SW.

(7)

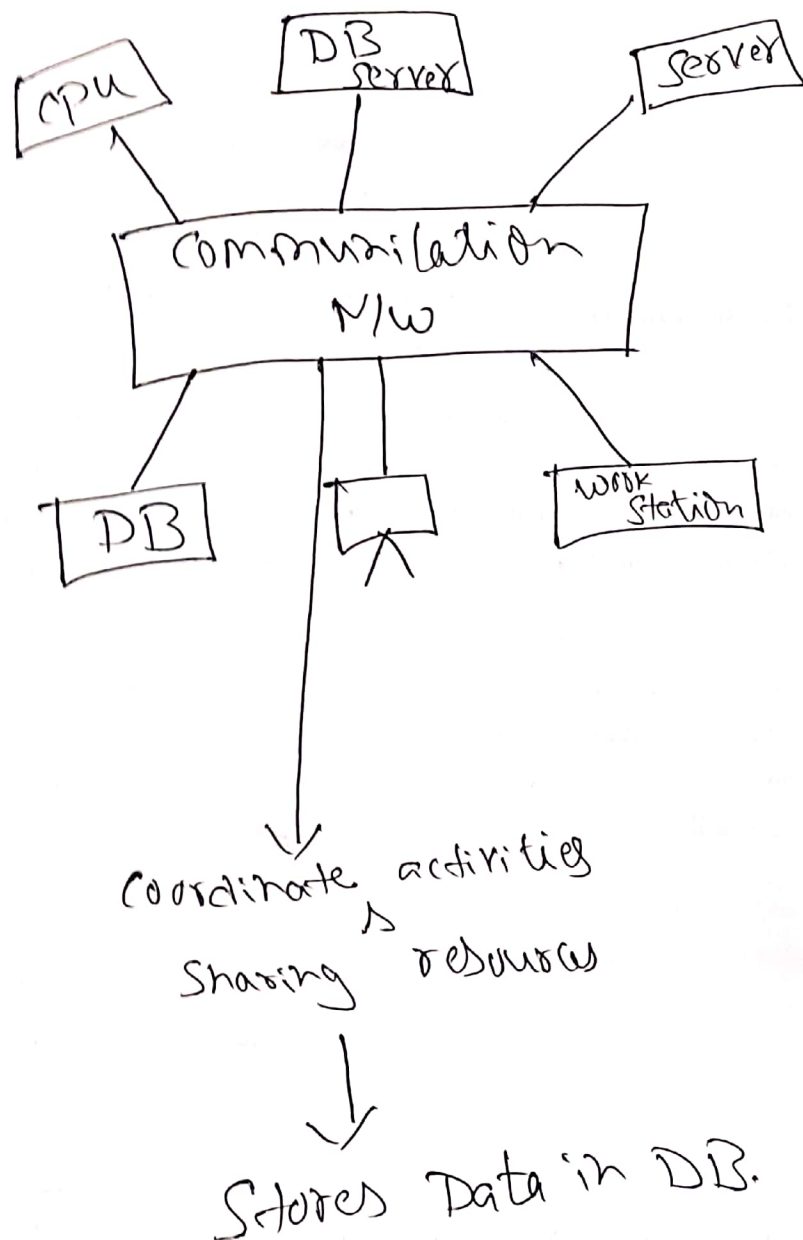


- coordinate all 4 computer activities
- coordinate all 4 computer works
- Sharing resources among 4 computers.
- Sharing sw's among 4 computers
- Sharing data among 4 computers

for successful completion of all above things we need Distributed operating system
The concept is called as Distributed System.



Q) Distributed operating system diagram (8)



→ Multiple entities (more users can send a request)

↓
This can be done by many nodes
∴ the above is called Dis. OS

Hardware concepts in Dis. OS:-

9

① Hardware Concepts

- ① Multiprocessor bus based
- ② Multiprocessor Switch based

② S/W Concepts

- ① Distributed operating system
- ② n/w OS
- ③ Middleware OS

Hardware concepts in Dis. system:-

Shared memory bus based

Private memory bus based

Shared memory Switch based

~~Shared~~ private memory Switch based

SI

Bus Based

Shared memory

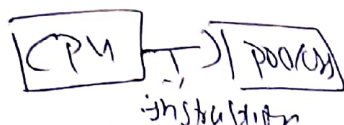
private memory

Switch Based

Shared memory

private memory.

SISD → Single instruction Single Data



SIMD → Single instruction multiple Data

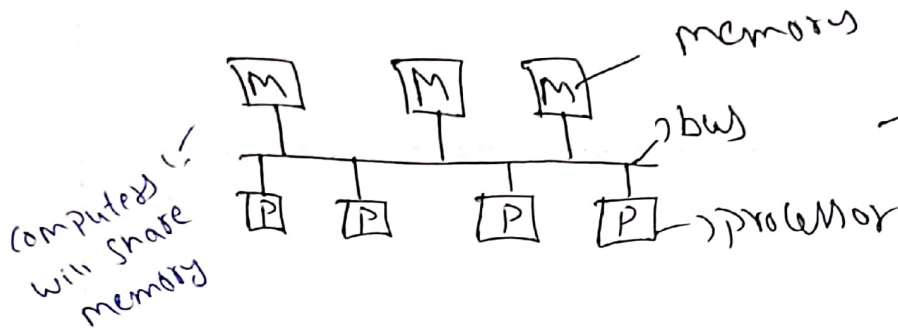
MIMD → multiple

111 11



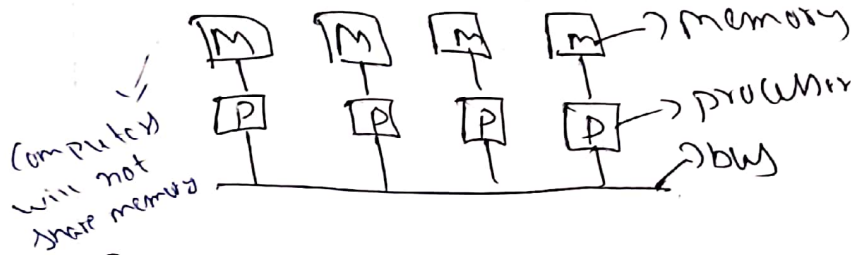
Shared memory Bus-based

10



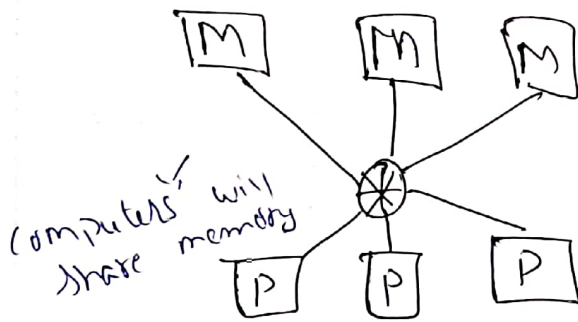
→ In Dhullapally bus stop all can go & travel in Telangana buses (etc)

Private memory Bus-based



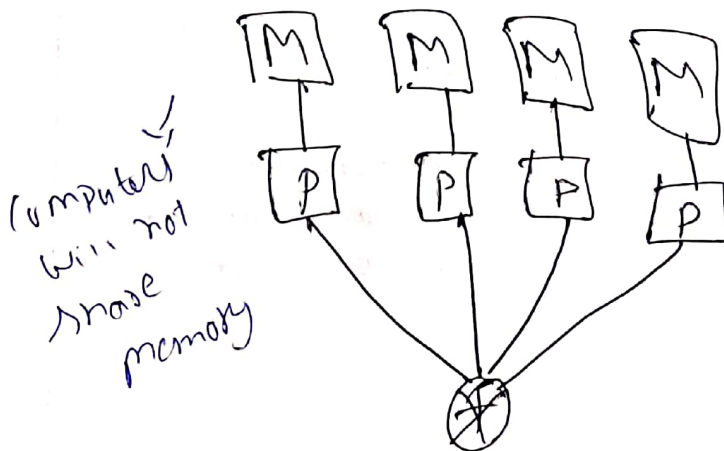
→ In Dhullapally bus stop, only Moun students will travel in moun buses.

Shared memory Switch based:-



→ All concepts in Dist. DS

Private memory Switch based:-

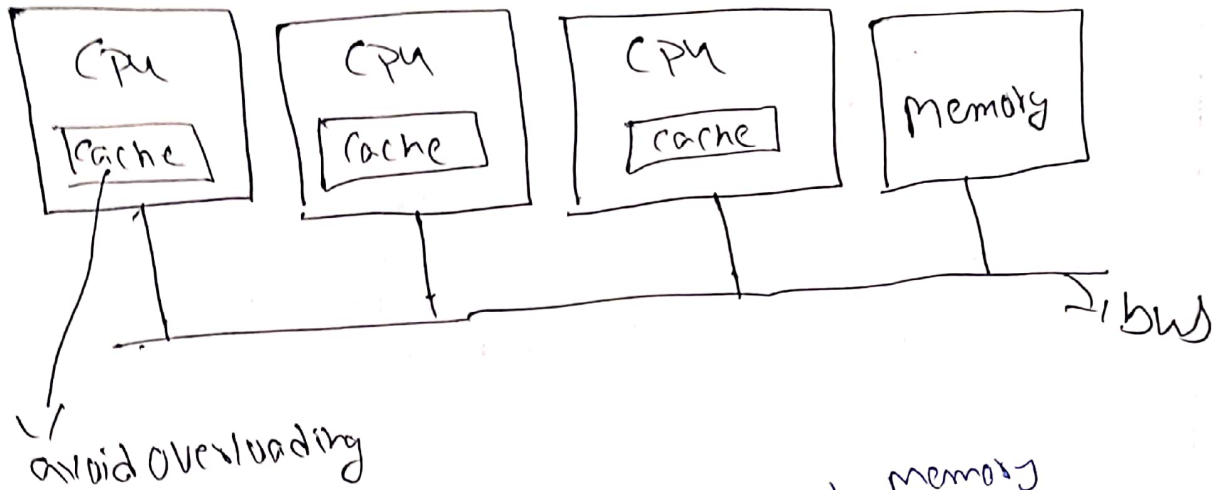


→ In fixed point all can travel in Telangana buses

→ In fixed point, only Moun students will travel in moun buses.

* Multiprocessors Bus Based → Shared memory (11)

- limited Scalability (if memories are filled then no chance to get another memory in bus)
- avoid overloading



Multiprocessors Switch Based → Shared memory

Different CPUs

↓ can access

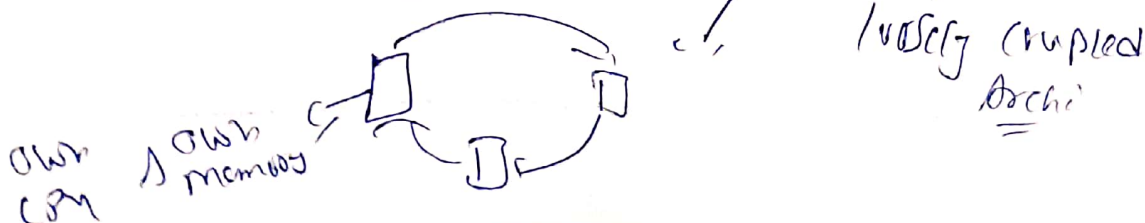
Different memories

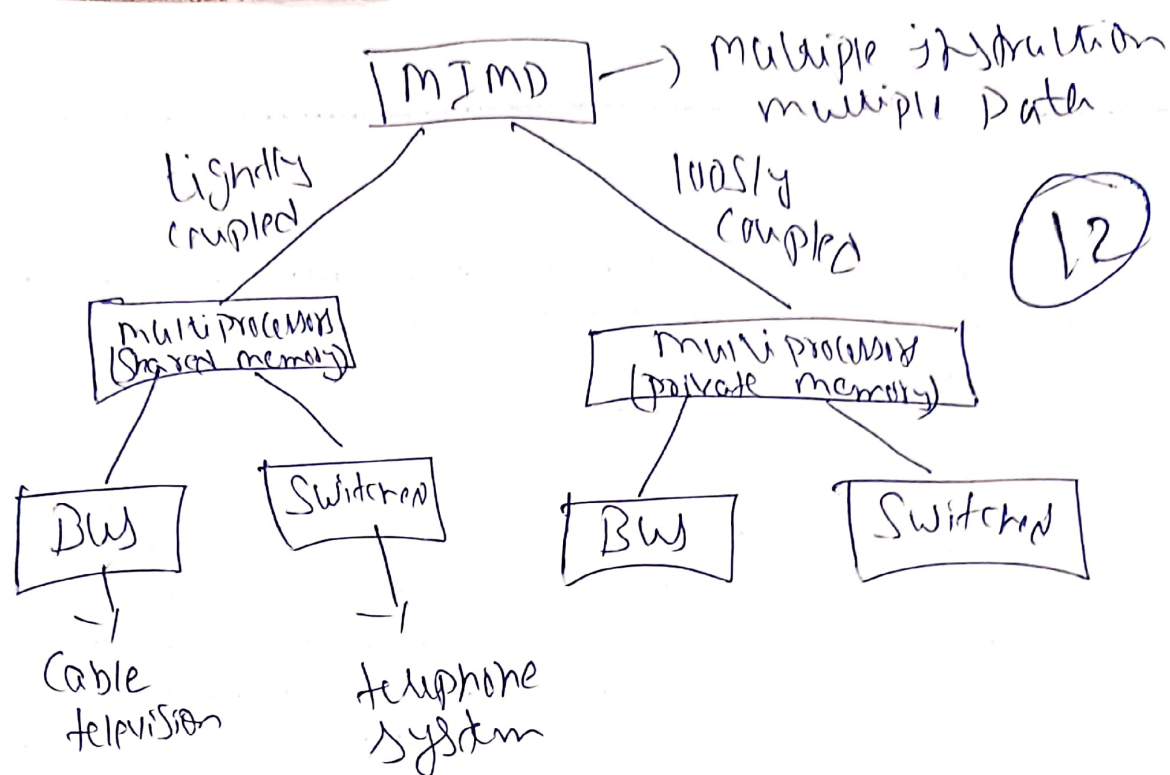
} Simultaneously

Multiprocessors means → shared memory

* SW Concepts in Dis OS:-

- internet connection in labs → new Dis OS
- usage of internet + phone calls → Dis OS
- Middle Ware OS





* Issues of in distributed OS:-

- ① global knowledge
- ② Naming
- ③ Scalability
- ④ Compatibility
- ⑤ process synchronisation
- ⑥ Resource management
- ⑦ Security
- ⑧ Structure of OS
- ⑨ client server computing model.

* Challenges of DS:-

13

- more CPUs
 - more servers
 - more req
 - more response

doing Manage for all this
CPU → servers → req →
response is very tough.

↑↓
So Cant decrease complex

- Cant send sms for failure tasks. if one task is failure then we cant able to update the news of failure task to others

- migration

- load balancing

- openness (like auto to drop out from auto no place)

- Scalability

- security

UNIT-2

14

Communication in Distributed System:

Issues in Communication.

- ① Message oriented communication
- ② Remote procedure call (RPC)
- ③ Remote method invocation (RMI)

↓
RMI is also RPC but specific to remote obj

- ④ Stream oriented communication

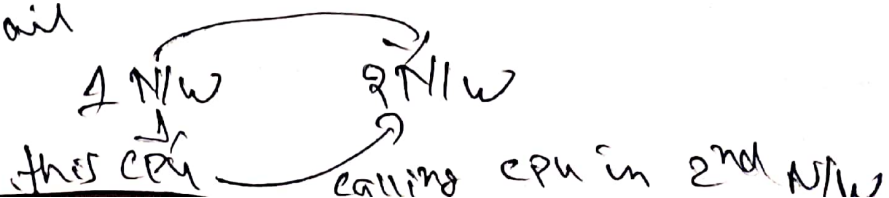
↓
group of people in interview room. one man will come and call for interview.

→ transferring set of data from sender to receiver

⑨ Remote procedure call:-

→ calling a CPU or server which is present on another NW by remote way is called Remote procedure call

→ Ex: gmail



Client $\xrightarrow[\text{req}]{\text{RPC}}$ Server

15

Client \rightarrow Client Stub \rightarrow RPC \rightarrow Server
Packing (req)
Unpacking (res)

Client \rightarrow Client Stub \rightarrow RPC \rightarrow Server
(req pack)

Client \leftarrow Client Stub \leftarrow RPC \leftarrow Server
(res pack)

