

hw1

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1.16

(a)

CPU connect DMA DMA connect devices if I/O need to transfer data I/O send request to DMA, CPU no need to join the I/O

(b)

DMA will send signal to CPU when I/O. if CPU no receive signal, CPU know operation is complete.

(c)

- if CPU and DMA use same resource, they will interference.

2.15

- shared memory model
 - strengths
 - efficiency: shared memory is faster
 - low price: use memory is lower price than message
 - flex: no need to serialize and deserialize
 - weakness
 - sync: need signal to limit memory access or race
 - limited scalability: the shared memory is limit by available memory
 - security risks: shared memory will cause a process access or break other process
- message passing model
 - strengths
 - safety: message passing provides more safe communication
 - modularity: can setting api and use api to extend
 - ability of extend: every process have own memory to message queue
 - weakness
 - weak efficiency: need to serialize large data spend many time
 - complexity: message passing require complex system to implement it

2.19

advantage of the microkernel

modularity can updated without affecting the entire system if service is broken, the error will not affect other service it change easy, that can fit changing requirements

disadvantages of the microkernel

the performance will waste on communication between service design the system will more complexity the hardware design implement will be more hard

the user program and system service interact

user program send request to the service through IPC the service get request and access hardware or something when process done, response result to user program

3.12

CPU save currently process state to PCB1 load state of other process from PCB2 excute until process switch save state to PCB2 reload state from PCB1

3.18

ordinary pipes are more suitable than named pipes

when child and parent process communicate, ordinary pipes is more suitable than named pipes

named pipes are more suitable than ordinary pipes

when communication between persistent process, named pipes are more suitable than ordinary pipes