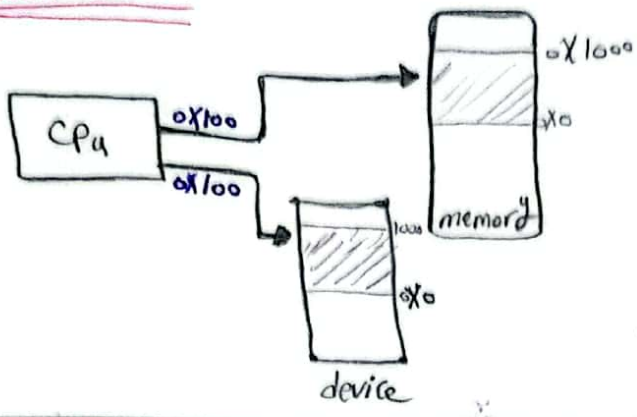
"lesson Two-unit 6"

Memory MAP - Port map :-

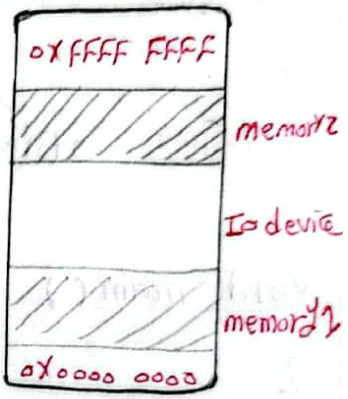
- CPu in our Pc may have 2 the same Address Range
- CPu use special instruction which are assigned specially for I/O operation.
- each device is assigned one ormore unique Port number.

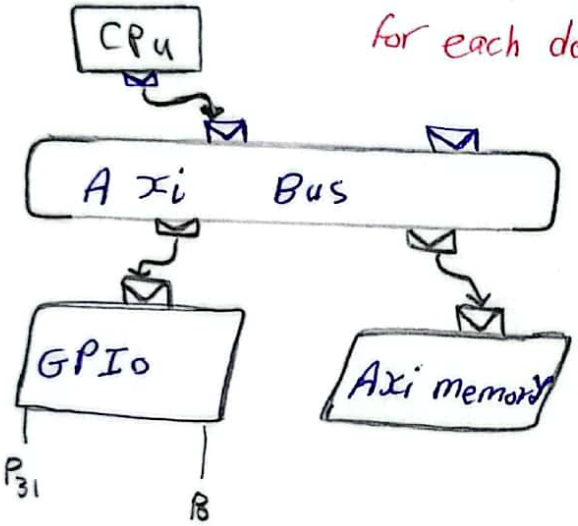
A Port map I/O :-



B memory map I/O :-

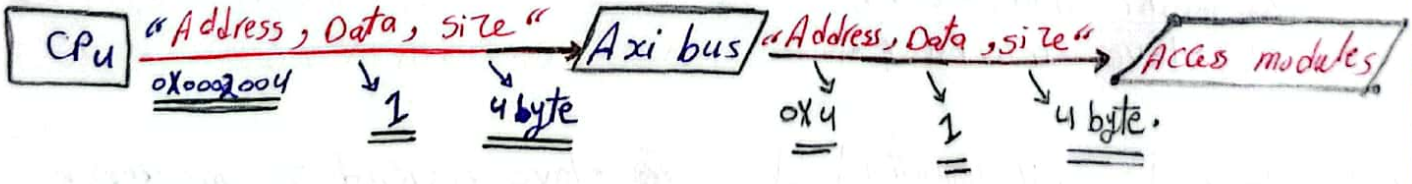
- Axi Bus have unige address range for each device or modules.



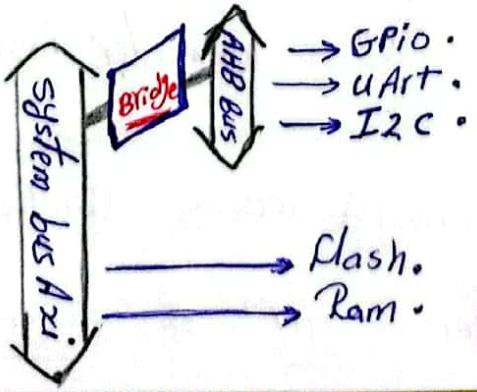


- Axi bus access Pin or module by "Base Address + offesset size"
- doesn't need any ~~physical~~ special instruction

issue transaction write :-



Bus Bridges :-



Write 1 on Bit 16 on ODR register by use structure and Pinter for All registers in GPIO PrePheral :-

```
*Pragma Pack ( )
struct SGPIo
{
    volatile uint32_t MODER;
    volatile uint32_t ODR;
    volatile uint32_t ASCR;
    volatile uint32_t IDR;
};
#define GBioA ((struct SGPio *) 0x4800 0000)
```

alias — TypeDef — Base-Address

```
void main ()
{
    GBioA -> ODR = (1ul << 16);
  // GBioA-init (GBIo A);
  // GBioB-init (GBIoB);
}
```

MCU Bus interface :-

*① master interface .: • "init" يعمل master Port الـ لازم
*② slave interface .:- • لا يستطيع انه يبعت من نفسه

slave respond to master.
master issue transaction to slave.

Dma :- Direct memory access Controller.

↳ have 2 Register "SAr" & "DAr" have master + slave.

Note system bus can handle time Policy and Arbitration if there are 2 master Port from 2 CPu issue transaction read or write at the Address simultaneously.

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understanding AMBA Bus Architecture and Protocol :-

→ two main characteristics of bus interface Performance are bandwidth and latency.

→ Traditional AMBa :-

* AHB. " Advanced High Performance "
* ASB. " " system Bus "
* APB. " " Peripheral Bus "

Axi channel :-

"issue" "write"

① write Address channel
② write data channel
③ write response channel

"issue" "read"

① read address channel
② read data channel

Note :- every channel is a signal.
Note :- every signal is a group of wires.

[info]

* Byte :- 8 bits
* Halfword :- 16 bits - 2 Byte
* word :- 32 bits - 4 Byte
* Double-word :- 64 bits - 8 Byte.
* nibbles :- 4 bits - ½ Byte.

Big indian & Little indian :-