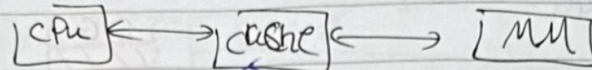


Page:

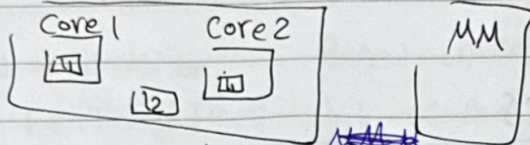
Date: / /

cache → SRAM



Hit if found  
miss if not

MPU

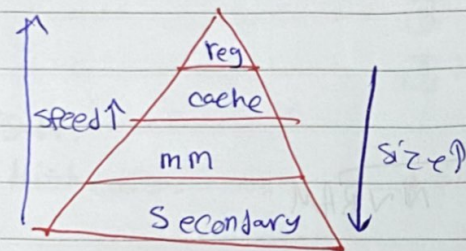


core 1 و core 2 في ال cache و ال cache ده بيت موجود في ال core 1

التي بيت في ال core 1 و ال core 2

Cache Coherence

لو كان في ال cache التي بيت في ال core 1 و ال core 2

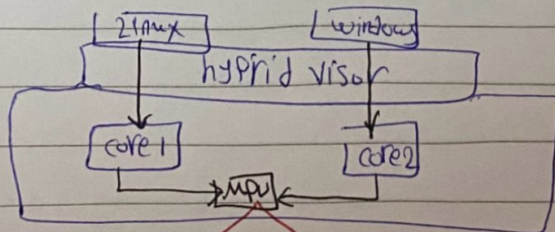
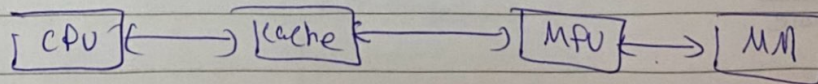


FPU : MPU - MMU :

FPU (Floating Point Unit):

floating point numbers

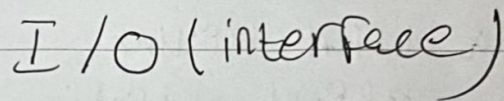
MPU (Micro Processor Unit): ال MPU ده بيت موجود في ال core 1 و ال core 2 و ال MPU ده بيت موجود في ال RAM



Linux Windows RAM



MMU (memory management unit):



IN/OUT



Page:

Date: / /

pipe line

inst 1	f	d	e
inst 2		f	d e
inst 3			f d e
inst 4			

van-nu: can support Pipeline

harvard: can support Pipeline

RISC: can support Pipeline (sub clock cycle instructions)

CISC: can't support Pipeline (clock cycle instructions)

\* if CLK = 8 MHz

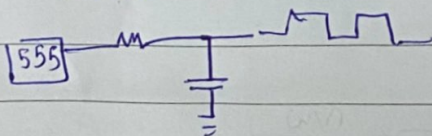
RISC → 1 inst → 1 cycle

∴ 8 MHz

8 Mcycles/s → 8M instruction per second = 8 MIPS

### Clock systems

electrical  
RC oscillator

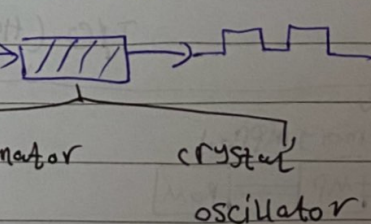


mechanical  
material

electric  
Power

ceramic resonator

crystal  
oscillator



RC

ceramic

crystal

Cost

↓

in between

↑

accuracy

↓

in between

↑

settling

↑

in between

↓

time  
الوقت  
clock  
الساعة  
نظام

Noise imm

temp ↓  
EMI ↓  
vibration ↑

↑  
↑  
↓

↑  
↑  
↓