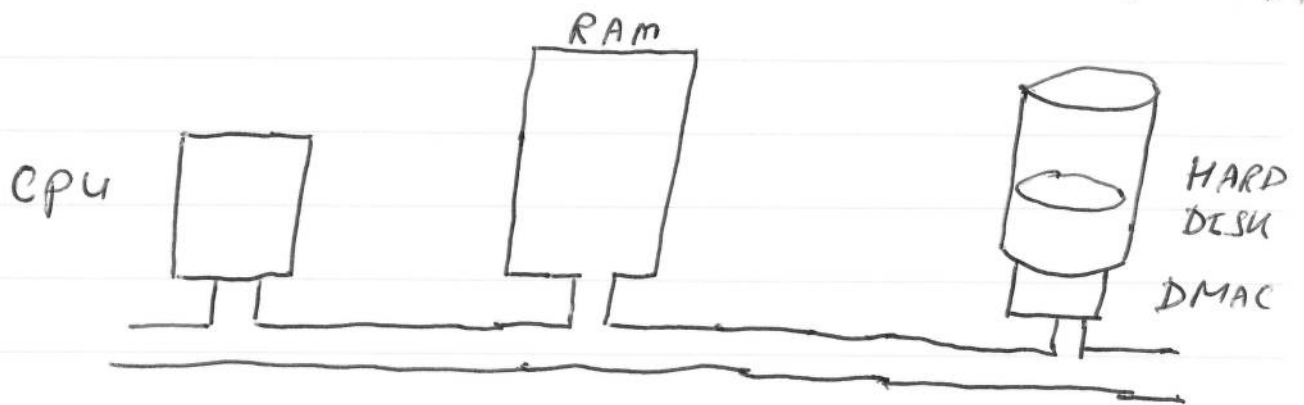


(1)

DMA - DIRECT MEMORY ACCESS

DIRECT MEMORY ACCESS (DMA) IS A TECHNIQUE THAT ALLOWS AN INPUT/OUTPUT (IO) DEVICE TO SEND OR RECEIVE DATA DIRECTLY TO OR FROM THE MAIN MEMORY (RAM).

THE IO DEVICE BYPASSES THE CPU TO SPEED UP MEMORY OPERATIONS. THE PROCESS IS MANAGED BY A CHIP KNOWN AS A DMA CONTROLLER (DMAC).

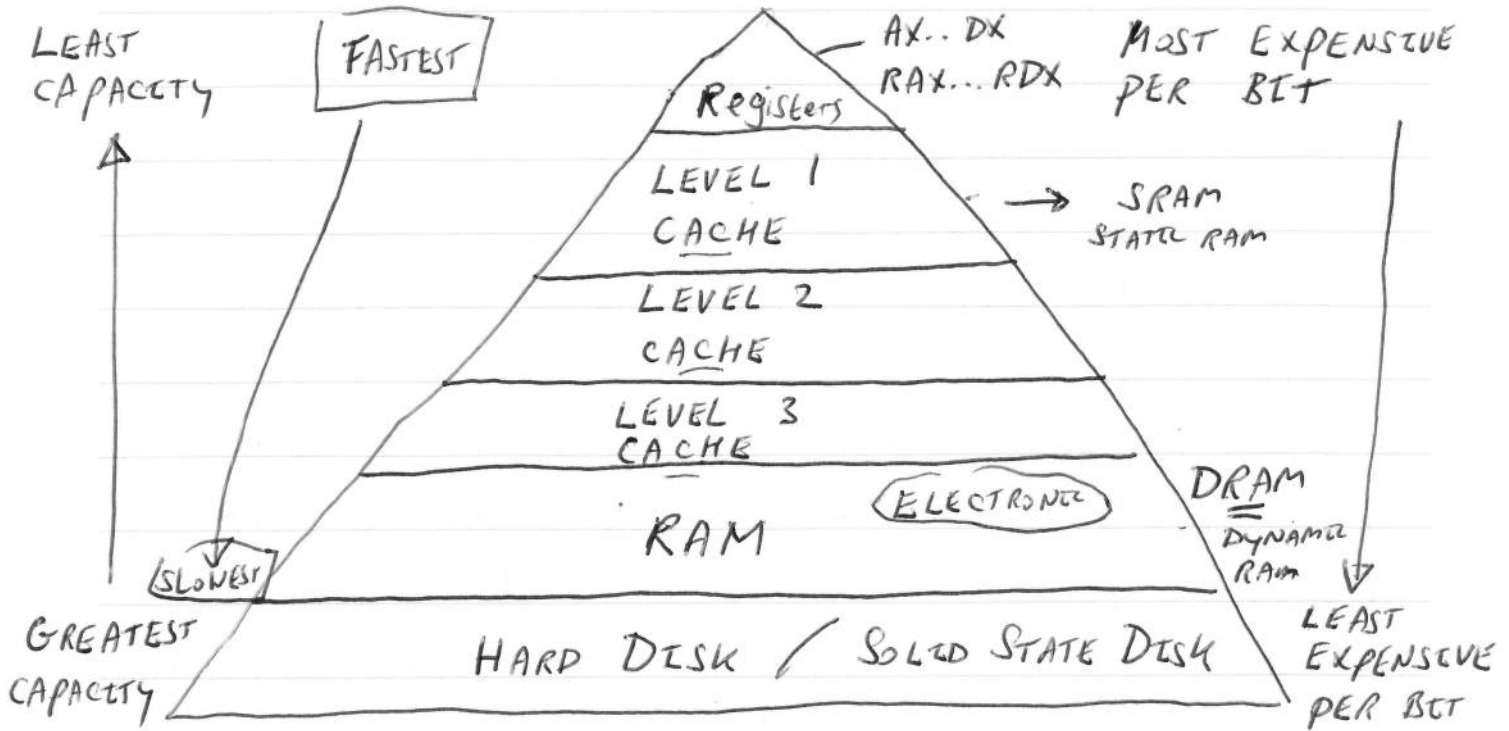


HARD DISK }
NETWORK CARD } DMA CONTROLLER

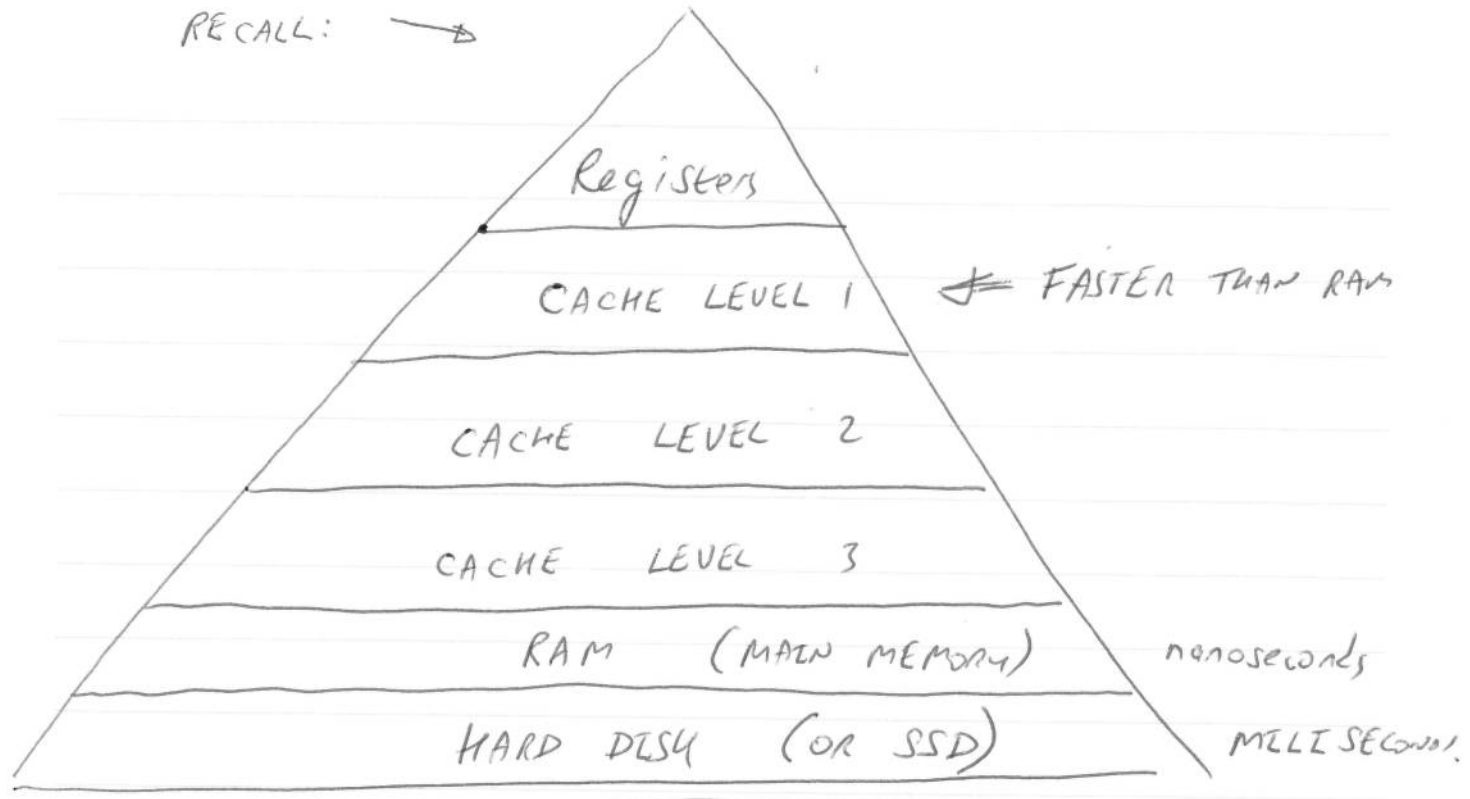
THIS WILL HELP SPEED UP I/O OPERATIONS

(2)

STORAGE HIERARCHY / MEMORY HIERARCHY

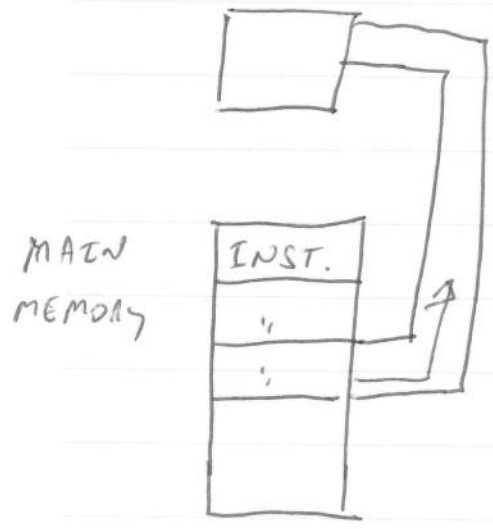


RECALL: →



CPU CAN CACHE INSTRUCTIONS

CPU



CPU FETCHING INSTRUCTIONS FROM RAM.
 (BUT IT WON'T ACTUALLY DO THAT)

→ HERE CPU IS ACCESSING INSTRUCTIONS FROM RAM. THIS IS SLOW COMPARED WITH ~~OF REFERENCE~~ CACHE.

LOCALITY

- TEMPORAL LOCALITY
- SPATIAL LOCALITY

② ④

CPU CACHING INSTRUCTIONS IN LEVEL 1 CACHE

CPU



CACHE HIT : INST. 2
ITEM OF DATA
FOUND IN CACHE

INST. 4 → CACHE MISS

ITEM OF DATA
NOT FOUND IN CACHE

Block
=

RAM

