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→ Brief History of ARM

- ARM stands for Advanced RISC Machine.
- The First ARM processor was produced by Acron Group of Computers in year 1985.
- Known as Computer manufacturer before becoming ARM.

→ ARM Architecture

ARM is a 16-bit / 32-bit RISC processor core (32-bit instructions).
The main features of ARM processor are:

1. Multiprocessing Systems-
ARM processors are designed so that they can be used in cases of multiprocessing systems where more than one processors are used to process information First AMP processor introduced by name of ARMv6K had ability to support 4 CPUs along with its hardware.

2. Tightly coupled Memory Mgt:
Memory of ARM processors is tightly coupled. This has very fast response time. It has low latency (quick response) that can also be used in cases of cache memory before predictable.

3. Memory Management:

ARM processor has management section. This includes Memory management unit and Memory protection unit. These mgt. systems become very important in managing memory efficiently.

4. Thumb-2 Technology:

It was introduced in 2003 and was used to create variable length instruction set. It extends 16-bit instructions of initial Thumb technology to 32-bit instructions. It has better performance than previously used Thumb technology.

5. One Cycle Execution Time:

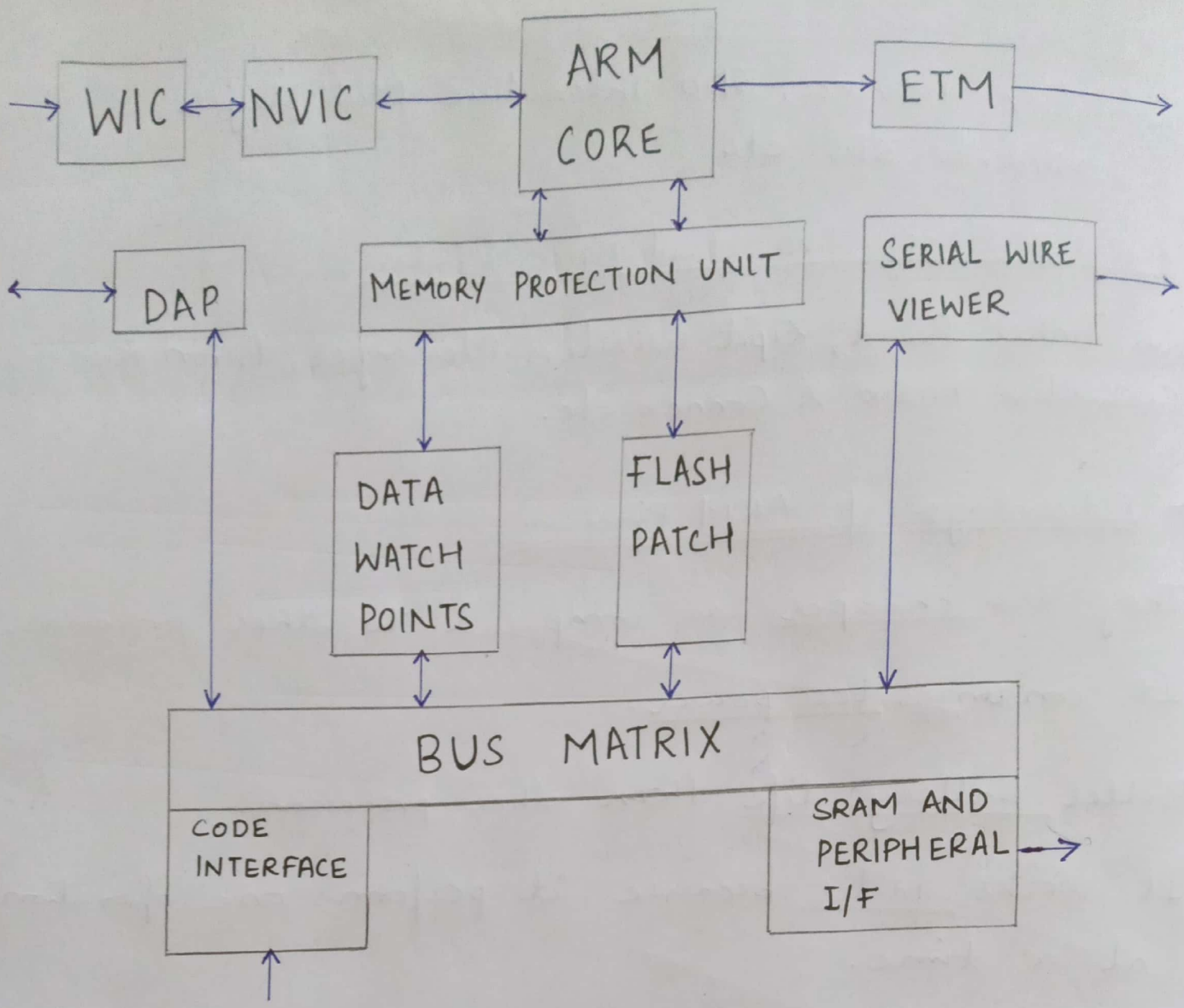
ARM processor is optimized for each instruction on CPU. Each instruction is of fixed length that allows time for fetching future instructions before executing present instruction. ARM has CPI (Clock Per Instruction) of one cycle

6. Pipelining:

Processing of instructions is done in parallel using pipelines. Instructions are broken down and decoded in one pipeline stage. The pipeline advances one step at a time to increase throughput (rate of processing).

7. Large number of Registers:

They are used in ARM processor to prevent large amount of memory interactions. Registers contain data and addresses. These act as local memory store for all operations.



* ARM BLOCK DIAGRAM

→ ARM Applications :

1. Portable Media Players, Camcooders: Apple iPod Nano, original Zune 30 GB, Juice Box, Empeg Car, M6 Mini Player

2. Mobile Phone, PDAs, Cameras:

Nokia N93, Samsung Moment, Sony CLIE NX60, Canon, PowerShot A470 etc.

3. GPS Navigation Systems:

Tom Tom 300, Zarlink GPS receiver, Sun SPOT, Garmin Navigation devices etc.

4. Portable Games Consoles:

GameBoy Advance, 3DO Interactive Multiplayer, Nintendo 3DS etc

5. Set Top Boxes, TVs, Hard Discs, Routers:

Asus Tinker Board, Zipit Wireless Messenger, Acron Risc Pc, Gumstix basix & Connex etc.

→ Advantages of ARM Processor:

1) They are cheaper as compared to other processors.

2) It consumes Less power.

3) Better battery life than other processors.

4) It works faster because it performs one operation at a time.

5) Users choose ARM processor because of availability and applications support.

→ Disadvantages of ARM processor:

1) Cannot run windows on it very soon because it is not binary compatible with X86.

2) The speeds and memory bandwidths are limited in such cases because of ARM processor's clock frequencies.

3) Debugging is difficult because of scheduling of instructions.

4) The performance of these processors totally depend on execution so if programmer does not execute it properly then it can take a long time to work properly.
