

## ORGANIZATION OF CPU OF ARM PROCESSOR

**Advanced RISC Machine (ARM)** Processor is considered to be a family of Central Processing Units that are used in music players, smartphones, wearables, tablets, and other consumer electronic devices.

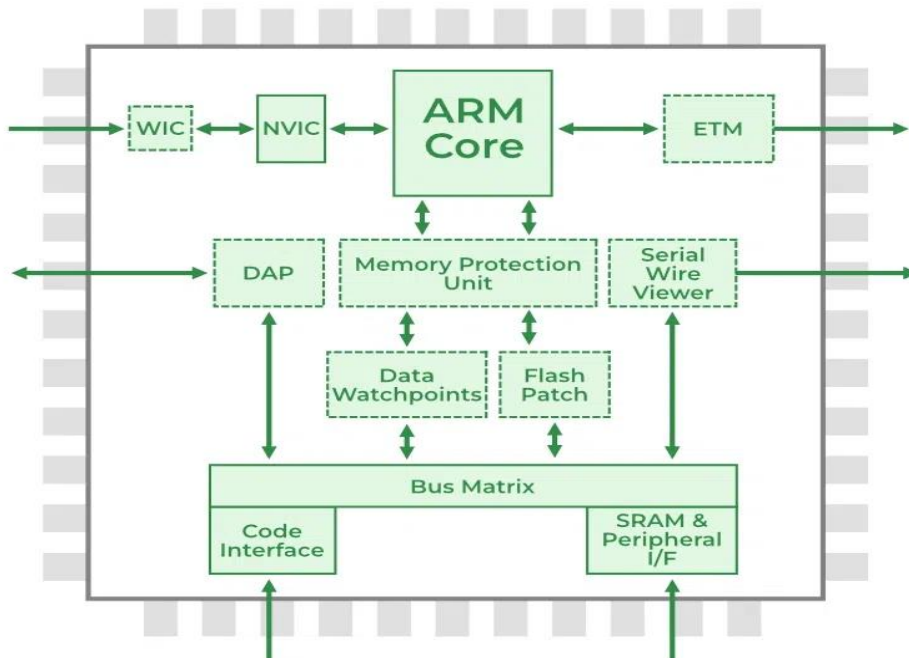
Advanced RISC Machines create the ARM processor architecture, hence the name ARM. This needs very few instruction sets and transistors. It has very small in size. This is the reason that it is a perfect fit for small-size devices. It has less power consumption along with reduced complexity in its circuits.

They can be applied to various designs such as 32-bit devices and embedded systems. They can even be upgraded according to user needs.

### ARM Started With Microcomputing

The applications of the ARM Process start with getting knowledge of the ARM Processor's history. Before ARM, x86 processors were used, which were launched in 1978. Whenever we remove the predefined instructions like complex instructions and hard-to-implement instructions, the remaining instructions take less power and pace and run faster, this is called Reduced Instruction Set Computer (RISC) Architecture. x86 is a Complex Instruction Set Architecture (CISC).

#### *Advanced RISC Machine (ARM)*



### Features of ARM Processor

- Multiprocessing System
- Tightly Coupled Memory
- [Memory Management](#)
- Thumb-2 Technology

- One-Cycle Execution Time
- [Pipelining](#)
- A large number of Registers

**1. Multiprocessing Systems:** ARM processors are designed to be used in cases of multiprocessing systems where more than one processor is used to process information. The First AMP processor introduced by the name of ARMv6K could support 4 CPUs along with its hardware.

**2. Tightly Coupled Memory:** The memory of ARM processors is tightly coupled. This has a very fast response time. It has low latency (quick response) that can also be used in cases of cache memory being unpredictable.

**3. Memory Management:** ARM processor has a management section. This includes Memory Management Unit and Memory Protection Unit. These management systems become very important in managing memory efficiently.

**4. Thumb-2 Technology:** Thumb-2 Technology was introduced in 2003 and was used to create variable-length instruction sets. It extends the 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 the CPU. Each instruction is of a fixed length that allows time for fetching future instructions before executing the present instructions. 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 channel advances one step at a time to increase throughput (rate of processing).

**7. A large number of Registers:** A large number of registers are used in ARM processors to prevent large amounts of memory interactions. Records contain data and addresses. These act as a local memory store for all operations.

## Advantages of ARM Processor

- ARM processors deal with a single processor at a time, which makes it faster and it also consumes lesser power.
- ARM processors work in the case of a multiprogramming system, where more than one processor is used to process information.
- ARM processors are cheaper than other processors, which makes them usable in mobile phones.
- ARM processors are scalable, and this feature helps it in using a variety of devices.

## Disadvantages of ARM Processor

- ARM processors are not stable with x86 processors, and due to this, they cannot be used in Windows Systems.
- ARM processors are not capable of very high performance, which limits them to a variety of applications.
- ARM processor execution is a little hard, which requires skilled programmers to use it.
- ARM processor is inefficient in handling Scheduling instructions.

