

UNIT - IV

ARM ARCHITECTURE

Topics to be covered :-

- ↳ ARM Processor Fundamentals
- ↳ ARM Architecture
- ↳ Register
- ↳ CPSR, Pipeline
- ↳ Exceptions and interrupts and Vector table.
- ↳ ARM Instruction set
- ↳ Data processing
- ↳ Branch Instructions
- ↳ Load Store Instructions
- ↳ Software Interrupt Instructions
- ↳ Program Status Register Instructions
- ↳ Loading Constants
- ↳ Conditional execution.
- ↳ Introduction to Thumb Instructions.

★ What is an ARM Processor?

→ An ARM Processor is one of a family of CPUs based on the RISC (Reduced Instruction Set Computer) architecture developed by Advanced RISC Machines.

ARM makes 32-bit and 64-bit RISC multi-core processors.

Features of ARM PROCESSORS

The ARM processors are based on RISC architectures and this architecture has provided small implementations, and very low power consumption. Implementation size, performance, and very low power consumption remain the key features in the development of the ARM devices.

The typical RISC architectural features of

ARM are:

→ A large uniform register file.

→ A load/store architecture, where

data-processing operations only operate on register contents, ~~and instruction fields~~ only not directly on memory contents.

→ Control over both the Arithmetic Logic Unit (ALU) and shifter in most data-processing instructions to maximize the use of an ALU and a shifter.

→ Auto Increment and auto-decrement addressing modes to optimize program loops.

→ Load and Store Multiple instructions to maximize data throughput.

→ Conditional execution of almost all instructions to maximize execution throughput.

there are three basic instruction sets for ARM

- ① A 32-bit ARM instruction set
- ② A 16-bit Thumb instruction set
- ③ The 8-bit Java Byte Code used as Jazelle state.