

## **RISC ARCHITECTURE**

A reduced instruction set computer is a computer that only uses simple commands that can be divided into several instructions that achieve low-level operation within a single CLK cycle, as its name proposes “Reduced Instruction Set”.

The RISC is a Reduced Instruction Set Computer microprocessor and its architecture includes a set of instructions that are highly customized. The main function of this is to reduce the time of instruction execution by limiting as well as optimizing the number of commands. So each command cycle uses a single clock cycle where every clock cycle includes three parameters namely fetch, decode & execute.

The kind of processor is mainly used to execute several difficult commands by merging them into simpler ones. RISC processor needs a number of transistors to design and it reduces the instruction time for execution. The best examples of RISC processors include PowerPC, SUN’s SPARC, RISC-V, Microchip PIC processors, etc.

### **RISC Architecture**

The term RISC stands for “Reduced Instruction Set Computer”. It is a CPU design plan based on simple orders and acts fast.

This is a small or reduced set of instructions. Here, every instruction is expected to attain very small jobs. In this machine, the instruction sets are modest and simple, which help in comprising more complex commands. Each instruction is of a similar length; these are wound together to get compound tasks done in a single operation. Most commands are completed in one machine cycle. This pipelining is a crucial technique used to speed up RISC machines.

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## What is CISC?

It was developed by the Intel Corporation and it is Complex Instruction Set Computer. This processor includes a huge collection of simple to complex instructions. These instructions are specified in the level of assembly language level and the execution of these instructions takes more time.

A complex instruction set computer is a computer where single instructions can perform numerous low-level operations like a load from memory, an arithmetic operation, and a memory store or are accomplished by multi-step processes or addressing modes in single instructions, as its name proposes "Complex Instruction Set".

So, this processor moves to decrease the number of instructions on every program & ignore the number of cycles for each instruction. It highlights to assemble complex instructions openly within the hardware as the hardware is always as compared with software. However, CISC chips are relatively slower as compared to RISC chips but utilize small instruction as compare with RISC. The best examples of the CISC processor include AMD, VAX, System/360 & Intel x86.

## CISC Architecture

The term CISC stands for "Complex Instruction Set Computer". It is a CPU design plan based on single commands, which are skilled in executing multi-step operations.

CISC computers have small programs. It has a huge number of compound instructions, which takes a long time to perform. Here, a single set of instructions is protected in several steps; each instruction set has additional than 300 separate instructions. Maximum instructions are finished in two to ten machine cycles. In CISC, instruction pipelining is not easily implemented.

## Characteristics

1. The main characteristics of the RISC processor include the following.
2. CISC may take more time to execute the code as compared with an only clock cycle.
3. CISC supports high-level languages for simple compilation and complex data structure.
4. It is collected with more addressing nodes, fewer registers normally from 5 to 20.
5. For writing an application, less instruction is required
6. The code length is very short, so it needs extremely small RAM.
7. It highlights the instruction on hardware while designing as it is faster to design than the software.
8. Instructions are larger as compared with a single word.
9. It gives simple programming within assembly language.

# Advantages

The **advantages of CISC** include the following.

- 1) This processor will create a procedure to handle the usage of power that regulates the speed of clock & voltage.
- 2) In the CISC processor, the compiler needs a small effort to change the program or statement from high-level to assembly otherwise machine language.
- 3) A single instruction can be executed by using different low-level tasks
- 4) It doesn't use much memory due to a short length of code.
- 5) CISC utilizes less instruction set to execute the same instruction as the RISC.
- 6) The instruction can be stored within RAM on every CISC

# Disadvantages

- The disadvantages of CISC include the following.
- The existing instructions used by the CISC are 20% within a program event.
- As compared with the RISC processor, CISC processors are very slow while executing every instruction cycle on every program.
- This processor use number of transistors as compared with RISC.
- The pipeline execution within the CISC will make it difficult to use.
- The machine performance reduces because of the low speed of the clock.