



The Principle of Semiconductor

The History of Semiconductor

How Semiconductor is made

Semiconductor Glossary

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The Principle of Semiconductor
Great Wisdom Crystallized in Tiny Devices

What Is a Microprocessor?

What is a Microprocessor

A microprocessor is a single semiconductor chip that integrates the main five functional units of a computer: arithmetic/logical, control, storage, input, and output. It serves as the “superintendent,” or central processing unit (CPU), of the computer.



Software programs in a computer serve as "work orders" for the hardware, and are usually stored in the memory. A computer processor serves as a "superintendent," reading the work orders line by line and ensuring all instructions are executed properly. It will be problematic if the processor fails to interpret the work order.

To prevent such an event, the processor's capabilities are defined beforehand in the form of instruction sets, and the work orders are rigorously written as combinations of the instruction sets. In the earlier days, a processor (or central processing unit: CPU) consisted of a number of IC chips, though the advancements in chip scaling technologies soon enabled all necessary components to be packed onto a single semiconductor chip, leading to the birth of the microprocessor.

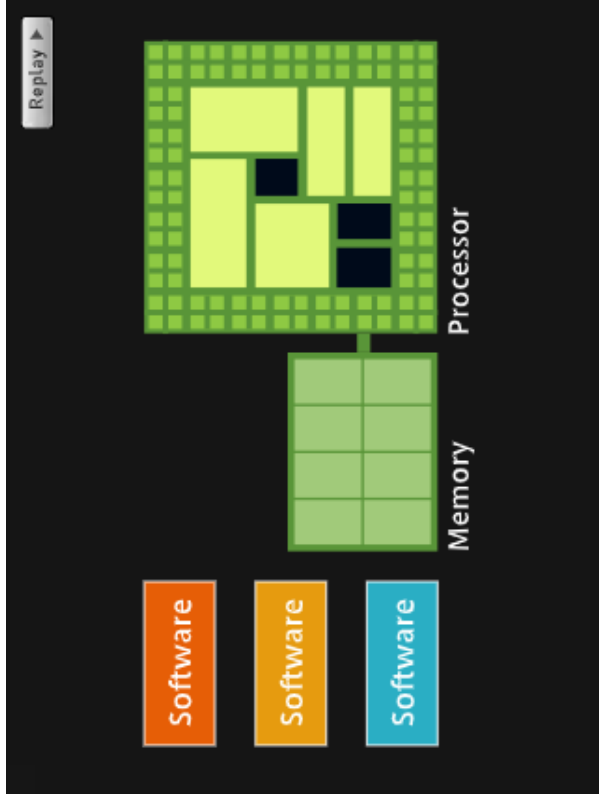
CPU on a chip

From the 1960s onward, various kinds of application-specific semiconductor circuits came to be produced along with simpler electronic circuits for TVs and radios. As the distinction between applications and physical circuitry became more pronounced, the concept of software and hardware took hold of the computer industry, leading to the birth of general-purpose computers. At the same time, semiconductor ICs reached a stage where general-purpose circuits were favored over application-specific chips.

The most prominent example was the industry's efforts to integrate the entire computer CPU on a single chip, which resulted in the CPU-on-a-chip, or the microprocessor. Today, the word CPU is virtually synonymous with microprocessor.



For almost half a century, computers typically had five functional units: arithmetic/logical, control, storage, input, and output. And the computer architecture has not changed much at its core. Still, some features of computers have changed dramatically. With the emergence of semiconductor devices, the processing speed increased spectacularly, and the components became smaller by orders of magnitude. The arithmetic/logical unit and the control unit were integrated into a group of semiconductor chips (and then into a single chip) called the CPU. This is the heart of the computer where a series of operations is undertaken, including the control of peripherals, data acquisition, calculation and processing, data storage, and output to peripherals.



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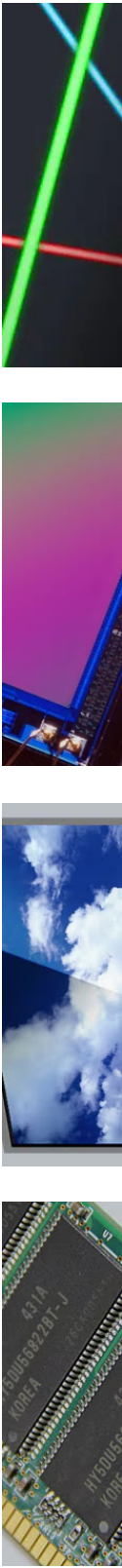
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