History of Computer

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We have learned the simple history facts from Chapter 2 about the evolution of computer in last class. Since then, I read more materials about the features and changes in each generation, which makes me more clear about the concept of computer architecture.

First Generation

The first generation of computer is from 1946 to1958. The most distinguishing feature of the first generation computers is the use of electronic valves, most importantly, vacuum tubes.

For the architecture wise, the most fundamental fact is the design of IAS computer, which is well-known as the first stored program computer, includes the design of general purpose registers. This architecture is more well-known as the Von Neumann Architecture, named by the mathematics professor Von Neumann at both Princeton University and IAS. Von Neumann showed how the combination of instructions and data in one memory could be used to implement loops, by modifying branch instructions.

By the end of 1958, there were about 2,500 first generation computers were installed world-wide.

Second Generation

The first computer using transistor was invented at Bell Labs in 1947. The widespread use of transistor started from 1950 and replace the vacuum tubes in the design of computer. Transistor is superior to the vacuum tube in many physical features, which makes the computer become smaller, cheaper, faster and more reliable than the first generation.

The hardware evolution also promote the revolution of software. Since then, the second generation computers started to using symbolic language (assembly language) instead of binary machine code to develop computer software. Moreover, the first generation of high-level programming language such as FORTRAN was also developed at this time.

Third and Later Generation

The development of the integrated circuit, first invented by TI in 1958, was the hallmark of the third generation of computers. Since transistors could be miniaturized and integrated on a single silicon chip, it drastically improved the performance and efficiency both in computer and computer manufacture. Furthermore, computer became accessible to massive people since they were smaller and cheaper than their predecessors.

At the same time, operation system was widely development and integrated with computers. It drastically promoted the development of software. Since then, modern operation systems were more and more complex, intelligent and capable of handling massive requests and applications in real-time.

As the development of new generations of technologies, such as microprocessor and artificial intelligence, the fourth and fifth generation of computer are even more powerful and more highly-integrated.