Research Presentation

History of Intel CPUs

Video: https://www.youtube.com/watch?v=FPks89DvOms

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“Access to computers and the Internet has become a basic need for education in our society” (Kent Conrad). Intel has played a big role in computers and technology from their first products which was memory chips. Intel was first found in July 1968 by American engineers Robert Noyce and Gordon Moore, These engineers started their company from a garage. By the help of Arthur Rock, Intel opened its doors with a $2.5 million in fundings. And from that point Intel started producing products that we now use to run our computers and to configure our computers. Intel’s CPUs made Intel the most powerful company in the PC section, releases such as Intel 4004,

It started with Intel’s first release, the Intel 4004 in 1971. It was designed by Ted Hoff and Stanley Mozar. Also were assisted by Masatoshi Shima and Federico Faggin with their experience in silicon technology. It was a breakthrough in computer science since it was able to fit a server room full of performance into one chip. The Intel 4004 was built on 10 µm process node on a 12mm² die which allows it to have 2,300 transistors fit in. It was clocked at 740 kHz, had a instruction cycle time of 10.8 µs, and had a instruction execution time of one or two machine cycles (46250 to 92500 instructions per second). It also had a separate program and data storage and used a single multiplexed 4-bit. It was able to access 640 bytes of RAM and contained 46 instructions. It also came in different packaging and was discontinued in 1981, ten years after its release.

Next, the Intel 8086 was released in 1978 by Intel. Its most important feature was that it was the first 8-bit microprocessor and it uses Intel’s most popular x86 architecture that is also used on all modern CPUs. It could be clocked anywhere from 5 MHz and up to 10 MHz in a commercial environment. It was built on a 3 µm process node packing in 29,000 transistors. It was on the DIP40 socket and had a 16-bit data bus and a 20-bit address bus. It also came in different packaging and was discontinued in 1998, twenty years after its release.

The Intel 80286 which was another CPU of Intel made a long time ago had 16 microprocessors it was introduced on Feb 1 1982. It was first 8086 based CPU with separate non-multiplexed addresses as well as data buses. This CPUs first chips specified for a maximum clock rate of 4, 6 or 8 MHz and later releases for 12.5 MHz. The 80286 was reportedly measured to have a speed of about 0.21 instructions per clock on typical programs although it could be significantly faster on optimized code and in tight loops, as many instructions could execute in 2 clock cycles each. The 6 MHz, 10 MHz and 12 MHz models were reportedly measured to operate at 0.9 MIPS, 1.5 MIPS and 2.66 MIPS respectively. Later the E-level of this CPU was free of the several significant errata that caused problems for programmers and operating-system writers in the earlier B-step and C-step CPUs

This CPU was designed for multi-user systems with multitasking applications, including communications such as automated PBXs and real-time process control. It had 134,000 transistors and consisted of four independent units. The performance increase of this CPU vs the 8086 could be more than 100% per clock cycle in many programs. This was a large increase, fully comparable to the speed improvements around a decade later when the i486 (1989) or the original Pentium (1993) were introduced.

The 80286 also included in addition to all of the 8086 instructions, all of the new instructions of the 8018. It also had a 24-bit address bus and was able to address up to 16 MB of RAM, compared to the 1 MB addressability of its predecessor. However, memory cost and the initial rarity of software using the memory above 1 MB meant that 80286 computers were rarely shipped with more than one megabyte of RAM.

Core i9 first introduced in 2017, the Core i9 is Intel’s (and the world’s) fastest consumer processor yet, it is the top model in Core “i” series. It features four channels of DDR4 RAM and 44 lanes of PCI Express (compared with 28 in the i7). Apart from more raw speed, the Core i9 series makes small changes under the hood. It rebalances the cache hierarchy, introduces a new Turbo Boost, adds 4-channel DDR4 RAM, and Intel’s Optane Memory. Put together, this speeds up the whole performance.

Right now, the Core i9 processors are largely available on desktops, not as much on laptops. With their high number of cores, high power draw, high thermal output, high performance, and unique desktop socket, LGA 2066, they are intended to be used by enthusiasts. Preorders for the 9th Gen chips open today, with the processors set to ship on October 19th. The chips are priced far more modestly than Intel’s pricier Core X, too: the Core i9-9900K is set to cost $488, the i7-9700K will cost $373, and the i5-9600K will set you back $262. The Core i9 CPUs are more powerful in some ways, but they do cost a lot more for it.

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