

EE 331

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The History of Intel's Microprocessors

Advances in the IC manufacturing technologies can summarize this history. These advances provide smaller and faster transistors, higher integration, and higher pin counts.

Year	Processor	ALU Width	Data Bus	Memory Size	Speed	Notes
1971	4004	4 bits	4 bits	4 K nibbles	50 KIPs	45 instrs., RTL, used in controllers and calculators
Later	4040	4 bits	4 bits	4 K nibbles	Higher	
1971	8008	8 bits	8 bits	16 KB	50 KIPs	48 instrs., RTL
1973	8080	8 bits	8 bits	64 KB	500 KIPs	More instrs., TTL
1974	MITS Altair 8800 1 st PC, BASIC interpreter by Bill Gates, Assembler by Digital Research Corp.					
1977	8085	8 bits	8 bits	64 KB	769 KIPs	246 instrs., higher integration.
	There exists ~ 700 million 8085 and Z-80 processors.					
1978	8086	16 bits	16 bits	1 MB	2.5 MIPs	>20,000 div, mul, CISC, more registers
1979	8088	16 bits	8 bits	1 MB		Low cost
1981	IBM adopted 8088 for its PCs, creating two computer giant companies.					
	80186	16 bits	16 bits	1 MB		Higher integration
1983	80286	16 bits	16 bits	16 MB	8 MHz, 4 MIPs	
1986	80386	32 bits	32 bits	4 GB		With MMU
	80386SX	32 bits	16 bits	16 MB		
1989	80486	32 bits	32 bits	4 GB	50 MHz	8-KB cache, integrated numeric coprocessor
1993	Pentium	32 bits	64 bits	4 GB	60, 66 MHz	16-KB cache, dual integer units
1995	Pentium Pro	32 bits	64 bits	64 GB	150, 166 MHz	3 IUs, 1 FPU, 8-KB I-L1, 8-KB D-L1, 256-KB L2, up to 3 IPC
1997	Pentium II	32 bits	64 bits	4 GB		MMX
1999	Pentium III	32 bits	64 bits	4 GB	500 MHz	SIMD
2001	Pentium 4	32 bits	64 bits	4 GB	1400 MHz	Hyper-pipelined
2001	Itanium	64 bits	≥ 64 bits	Up to 2 ⁶⁴	733 MHz	EPIC, Intel with HP

PC Busses

Name	Width	Speed	Notes
PC Bus	8 bits	4.77 MHz	PC, XT
ISA	16-bits	8 MHz	(Industry Standard Arch.) AT, BW = 6.5 MB/s
EISA	32 bits	8 MHz	(Extended ISA) 386DX, 486, BW = 25 MB/s
VESA	32 bits	μP clock	Local bus
Micro-channel	16 or 32 bits		IBM PS/2, BW 20 & 120 MB/s
PCI	32 or 64 bits	60 or 66 MHz	(Peripheral Control Interconnect), Pentium & Pentium Pro.