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Timeline of Microprocessor Evolution

- **1945**: **ENIAC Developed** - The Electronic Numerical Integrator and Computer, the first digital computer, is built by the U.S. Army, outperforming mechanical computers and marking the start of the digital revolution.
- **1947**: **Invention of Transistors** - Transistors are invented, replacing unreliable vacuum tubes. The Manchester Transistor Computer demonstrates their potential, using 250 transistors and consuming only 150 watts.
- **1959**: **MOSFET Revolution** - The Metal Oxide Silicon Field Effect Transistor (MOSFET) is created, enabling high-density integrated circuits. This leads to advancements like the IBM System/360 family.
- **1960s**: **Rise of Mini Computers** - The IBM System/370 and DEC PDP-5 use monolithic integrated circuits, making computing more accessible with lower costs and smaller sizes.
- **1971**: **Birth of Microprocessors** - Intel's 4004, the first commercial microprocessor, is developed for Busicom. It is also used in the F-14 Tomcat fighter jet, marking the start of microprocessor applications.
- **1974**: **Altair 8800 Launched** - Powered by the Intel 8080, the Altair 8800 becomes the first commercially successful personal computer, spurring the development of home computers like the Apple II and Commodore PET.
- **Mid-1970s**: **Microprocessor Competition** - The Zilog Z80 and Motorola 6502 challenge Intel. The 6502 powers home computers and video games, while the Z80 runs the CP/M operating system.
- **1980**: **Motorola 68000 Introduced** - The 32-bit Motorola 68K excels in graphics-heavy workloads, powering the Apple Macintosh, Commodore Amiga, and Atari ST.
- **1987**: **IBM PS/2 Series** - IBM introduces the PS/2 series with the Intel 80386 and Micro Channel Architecture, aiming to replace the ISA bus but facing resistance due to licensing fees.

- **Late 1980s - Early 1990s**: **Multimedia and CD-ROM Era** - The rise of multimedia and CD-ROMs increases computing power demands. Intel's 80486 and Motorola's 68040 dominate, while IBM's influence declines.
- **1993**: **Intel Pentium Launched** - The Pentium revolutionizes the market with its speed, though high costs limit adoption initially.
- **Mid-1990s**: **Competition Intensifies** - AMD and Cyrix release the AM486 and Cx486, offering Pentium-like performance at lower prices. The Power PC architecture (Apple, IBM, Motorola) challenges Intel.
- **1996**: **Quake Highlights Performance Needs** - The game Quake emphasizes floating-point performance, exposing weaknesses in AMD and Cyrix processors compared to Intel's Pentium.
- **Mid-1990s - Late 1990s**: **Pentium Pro and Pentium 3 Era** - Intel's Pentium Pro and Pentium 3 aim to maintain dominance, but AMD's K6 and Athlon outperform in some areas.
- **Late 1990s - Early 2000s**: **Athlon vs. Pentium 4** - AMD's Athlon surpasses Intel's troubled Pentium 4. Power PC's G4 adds pressure on Intel.
- **2006**: **Core 2 Duo Revolution** - Intel's Core 2 Duo delivers superior performance, reasserting dominance over AMD.
- **Late 2000s - Early 2010s**: **Bulldozer Struggles** - AMD's Bulldozer fails to compete with Intel's Sandy Bridge and Ivy Bridge, solidifying Intel's market lead.
- **2017**: **AMD Zen Architecture** - AMD's Ryzen, based on the Zen architecture, disrupts Intel's dominance with multi-core designs and competitive pricing.
- **2018-2020**: **Processor Advancements** - AMD leverages TSMC's 7nm process, gaining an edge over Intel, which struggles with its 10nm transition.
- **2020**: **ARM Revolution and Apple's Shift** - Apple transitions its Mac lineup to ARM architecture, signaling a potential shift in desktop computing. ARM's efficiency gains prominence in mobile and laptop markets.
- **Early 2020s**: **Current Landscape** - AMD's Ryzen and EPYC challenge Intel, revitalizing the CPU market. The industry stands at a crossroads with ARM challenging x86 dominance.