A history of Intel vs. AMD desktop performance, with CPU charts galore

Enlarge / Spoiler: When it comes to performance over the years, Intel is the slow and steady tortoise to AMD’s speedy-but-intermittent hare.

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The comment wars between Intel and AMD fans have been hot for the last few release cycles, with a lot of digital ink spilled about which company has—or has not—improved significantly over the years. There’s been no shortage of opinions about the current raw performance of each company’s fastest processors, either. We thought it would be interesting to dive into archived performance benchmarks of the fastest desktop/enthusiast CPUs for each company to get a good overview of how each has really done over the years—and perhaps to even see if there are patterns to be gleaned or to make some bets about the future.

Before we dive into charts, let’s start out with some tables—that way, you can see which CPUs we’re using as milestones for each year. While we’re at it, there are a couple of irregularities in the data; we’ll discuss those also and talk about the things that a simple chart won’t show you.

Twenty years of enthusiast computing

Year	Intel Model	AMD Model	Notes
2001	Pentium 4 2.0GHz (1c/1t)	Athlon XP 1900+ (1c/1t)	
2002	Pentium 4 2.8GHz (1c/2t)	Athlon XP 2800+ (1c/1t)	Intel introduces hyperthreading
2003	Pentium 4 Extreme 3.2GHz (1c/2t)	Athlon XP 3200+ (1c/1t)	
2004	Pentium 4 3.4GHz (1c/2t)	Athlon 64 FX-55 (1c/1t)	
2005	Pentium 4 3.8GHz (1c/2t)	Athlon 64 X2 4800+ (2c/2t)	
2006	Pentium Extreme 965 (2c/4t)	Athlon 64 X2 5000+ (2c/2t)	Intel takes the undisputed performance lead here—and keeps it for a decade straight.
2007	Core 2 Extreme QX6800 (4c/4t)	Phenom X4 9600 (4c/4t)	Intel and AMD both launch the first true quad-core desktop CPUs
2008	Core 2 Extreme X9650 (4c/4t)	Phenom X4 9950 (4c/4t)	
2009	Core i7-960 (4c/8t)	Phenom II X4 965 (4c/4t)	

2010	Core i7-980X (6c/12t)	Phenom II X6 1100T (6c/6t)	Intel and AMD both introduce hex-core desktop CPUs
2011	Core i7-990X (6c/12t)	FX-8150 (8c/8t)	
2012	Core i7-3770K (4c/8t)	FX-8350 (8c/8t)	Intel abandons hex-core desktop CPUs—but few miss them, due to large single-threaded gains
2013	Core i7-4770K (4c/8t)	FX-9590 (8c/8t)	AMD's underwhelming FX-9590 launches—and it's Team Red's last enthusiast CPU for four long years
2014	Core i7-4790K (4c/8t)	FX-9590 (8c/8t)	Intel's 5th generation Core dies stillborn. AMD releases low-power APUs, but no successor to FX-9590
2015	Core i7-6700K (4c/8t)	FX-9590 (8c/8t)	
2016	Core i7-7700K (4c/8t)	FX-9590 (8c/8t)	Strictly speaking, 2016 was an Intel whiff—Kaby Lake didn't actually launch until January 2017
2017	Core i7-8700K (6c/12t)	Ryzen 7 1800X (8c/16t)	Launch of AMD's Zen architecture, return of the Intel hex-core desktop CPU
2018	Core i9-9900K (8c/16t)	Ryzen 7 2700X (8c/16t)	

2019	Core i9-9900KS (8c/16t)	Ryzen 9 3950X (16c/32t)	AMD’s Zen 2 architecture launches, Intel whiffs hard in the performance segment
2020	Core i9-10900K (10c/20t)	Ryzen 9 5950X (16c/32t)	AMD’s Zen 3 finally crushes Intel’s long-held single-threaded performance record

Although both Intel and AMD obviously launch a wide array of processors for different price points and target markets each year, we’re limiting ourselves to the fastest desktop or “enthusiast” processor from each year. That means no server processors and no High-End Desktop (HEDT) processors either—so we won’t be looking at either Threadrippers or the late model XE series Intel parts.

Even for someone like myself who lived through this entire period as a system builder, it’s a giant pain in the butt assembling a list like this—let alone matching test results. It’s especially difficult on the AMD side, where there’s no real equivalent to Intel’s Ark providing a single list of processors, sortable by generation, type, and launch date. If you think I picked the wrong “top processor” for a year, let me know in the comments.

We should address a couple of anomalies in the charts right off the top—first of all, no, the absence of a new AMD performance CPU in 2014, 2015, and 2016 is not an oversight. 2013’s FX-9590—widely (and deservedly) panned for its monstrous-for-the-time 225W TDP and unimpressive performance—was Team Red’s fastest CPU for four years running. During that time, AMD launched several generations of low-power, inexpensive desktop APUs—none of which outperformed the FX-9590.

Intel also had a couple of stumbles during 2013-2017, though none so serious or for so long. The fifth-generation Core

series was basically stillborn in 2014, although a refresh of the fourth-generation Core i7 series did provide a significant performance boost. Two years later was technically another whiff—Kaby Lake, with the Core i7-7700K, didn't actually launch until January 2017. We fudged a little and allowed Kaby Lake in 2016's row, because otherwise it would disappear entirely—Coffee Lake, and the i7-8700K, appeared later the same year.

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