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Intel Unveils Panther Lake Architecture: First AI PC Platform Built on 18A

Panther Lake will enter high-volume production at Intel's newest fab in Arizona later this year as company invests in strengthening U.S. technology and manufacturing leadership.

NEWS HIGHLIGHTS

- Intel previews Intel® Core™ Ultra series 3 processors, (code-named Panther Lake) - the first client SoCs built on Intel 18A.
- Panther Lake is already in production, on track to meet customer commitments, and poised to become the industry's most widely adopted PC platform.
- First look at Intel® Xeon® 6+ (code-named Clearwater Forest), Intel's next-gen server product on 18A, is delivering major power and performance gains.
- Intel 18A is the most advanced semiconductor node developed and manufactured in the United States.
- Arizona's Fab 52 is fully operational and set to reach high-volume production using Intel 18A later this year, strengthening U.S. technology and manufacturing leadership.

CHANDLER, Ariz.--(BUSINESS WIRE)-- Today Intel revealed the architectural details for the company's next generation client processor Intel Core Ultra series 3 (code-named Panther Lake) which is expected to begin shipping later this year. Panther Lake is the company's first product built on Intel 18A, the most advanced semiconductor process ever developed and manufactured in the United States.

This press release features multimedia. View the full release here: https://www.businesswire.com/news/home/20251009013156/en/

Intel CEO Lip-Bu Tan holds a wafer of CPU tiles for the Intel Core Ultra series 3, code-named Panther Lake, outside the Intel Ocotillo campus in Chandler, Arizona. Panther Lake is the first client system-on-chips (SoCs) built on the Intel 18A process node. (Credit: Intel Corporation)

Intel also previewed Xeon 6+ (code-named Clearwater Forest), its first Intel 18A-based server processor, which is expected to launch in the first half of 2026. Both Panther Lake and Clearwater Forest, as well as multiple generations of products built on Intel 18A, are being manufactured at Fab 52, Intel's new, state-of-the-art factory in Chandler, Arizona – a key milestone as Intel invests in strengthening American technology and manufacturing leadership and building a resilient semiconductor supply chain.

"We are entering an exciting new era of computing, made possible by great leaps forward in semiconductor technology that will shape the future for decades to come," said Intel CEO Lip-Bu Tan. "Our next-gen compute platforms, combined with our leading-edge process technology, manufacturing and advanced packaging capabilities, are catalysts for innovation

across our business as we build a new Intel. The United States has always been home to Intel's most advanced R&D, product design and manufacturing – and we are proud to build on this legacy as we expand our domestic operations and bring new innovations to the market."

Panther Lake: Scalable AI PC Performance Built on 18A

Set to power a broad spectrum of consumer and commercial AI PCs, gaming devices and edge solutions, Intel Core Ultra series 3 processors are the first client system-on-chips (SoCs) built on Intel 18A. Panther Lake introduces a scalable, multi-chiplet architecture that offers partners unprecedented flexibility across form factors, segments and price points.

Highlights include:

- Lunar Lake-level power efficiency and Arrow Lake-class performance.[1]
- Up to 16 new performance-cores (P-cores) and efficient-cores (E-cores) delivering more than 50% faster CPU performance vs. previous generation.[2]
- New Intel® Arc™ GPU with up to 12 Xe cores delivering more than 50% faster graphics performance vs. previous generation.[3]
- Balanced XPU design for next-level AI acceleration with up to 180 Platform TOPS (trillions of operations per second).[4]

Beyond the PC, Panther Lake will extend to edge applications including robotics. A new Intel Robotics AI software suite and reference board enables customers with sophisticated AI capabilities to rapidly innovate and develop cost-effective robots using Panther Lake for both controls and AI/perception.

Panther Lake will begin ramping high-volume production this year, with the first SKU slated to ship before the end of the year and broad market availability starting January 2026.

Clearwater Forest: Efficiency and Scale for the Modern Data Center

Clearwater Forest is Intel's next generation E-core processor. Branded Intel Xeon 6+, this processor is the most efficient server processor the company has ever created and is built on Intel 18A. Intel plans to launch Xeon 6+ in the first half of 2026.

Highlights include:

- Up to 288 E-cores.
- 17% Instructions Per Cycle (IPC) uplift over prior generation.
- Considerable gains in density, throughput and power efficiency.

Tailored for hyperscale data centers, cloud providers, and telcos, Clearwater Forest enables organizations to scale workloads, reduce energy costs, and power more intelligent services.

Intel 18A: U.S. Technology Setting New Industry Standards

Intel 18A is the first 2-nanometer class node developed and manufactured in the United States, delivering up to 15% better performance per watt and 30% improved chip density compared to Intel 35. The node was developed, qualified for manufacturing and began early

production at the company's Oregon location and is now ramping toward high-volume production in Arizona.

Key innovations on Intel 18A include:

- RibbonFET: Intel's first new transistor architecture in over a decade, enabling greater scaling and more efficient switching for improved performance and energy efficiency.
- PowerVia: A groundbreaking backside power delivery system, enhancing power flow and signal delivery.

Additionally, Foveros, Intel's advanced packaging and 3D chip stacking technology, enables the stacking and integration of multiple chiplets into advanced SoC designs, delivering flexibility, scalability and performance at the system level.

Intel 18A forms the foundation for at least three upcoming generations of Intel's client and server products.

Fab 52: Building on Intel's Five Decades of U.S. R&D and Manufacturing Investment

Fab 52 is Intel's fifth high-volume fab at its Ocotillo campus in Chandler, Arizona. This facility produces the most advanced logic chips in the United States and is part of the $100 billion Intel is investing to expand its domestic operations.

With advanced R&D and production in Oregon, high-volume fabrication in Arizona, and packaging operations in New Mexico, Intel is uniquely positioned to support key national priorities and provide strategic capacity for Intel Foundry customers. Fab 52 builds upon Intel's 56 years of U.S. R&D and manufacturing advancement and marks a major milestone as the company builds a trusted leading-edge U.S. foundry for the AI era.

More Context: What is x86 Architecture? A Primer to the Foundation of Modern Computing

For all claims, see intel.com/performanceindex for additional details. Results may vary.

1 As estimated by SPECrate®2017_int_base (n copies) for long-term expected steady state processor power consumption. As of September 2025. Results may vary. See intel.com/performanceindex for details.

2 As estimated by SPECrate®2017_int_base (n copies). As of September 2025. Results may vary. See intel.com/performanceindex for details.

3 As measured on Panther Lake reference validation platform measurement vs Lunar Lake and Arrow Lake-H reference validation platforms as measured by 3Dmark Solar Bay, Cyberpunk 2077 and Borderlands 3.

4 Based on product specification. See ark.intel.com for more information.

5 Based on Intel internal analysis comparing Intel 18A to Intel 3 as of February 2024. Results may vary. https://www.intel.com/content/www/us/en/foundry/process/18a.html

Forward-Looking Statements

This release contains forward-looking statements that involve a number of risks and uncertainties. Words such as "accelerate", "achieve", "aim", "ambitions", "anticipate",

"believe", "committed", "continue", "could", "designed", "estimate", "expect", "forecast", "future", "goals", "grow", "guidance", "intend", "likely", "may", "might", "milestones", "next generation", "objective", "on track", "opportunity", "outlook", "pending", "plan", "position", "possible", "potential", "predict", "progress", "ramp", "roadmap", "seek", "should", "strive", "targets", "to be", "upcoming", "will", "would", and variations of such words and similar expressions are intended to identify such forward-looking statements, which may include statements regarding:

- Our Intel® Core™ Ultra processors series 3 (code-named Panther Lake) and Intel® Xeon® 6+ processors (code-named Clearwater Forest), including expected timing, industry adoption and applicability, architecture, specifications, power usage, efficiency, performance, and capabilities; and
- Our Intel 18A process node and high-volume production of such node at Arizona Fab 52, including expected timing, performance-per-watt, chip density, energy efficiency, process leadership, usage for future client and server products, and domestic manufacturing investments.

Such statements involve many risks and uncertainties that could cause our actual results to differ materially from those expressed or implied, including those associated with:

- The high level of competition and rapid technological change in our industry;
- The significant long-term and inherently risky investments we are making in R&D and manufacturing facilities that may not realize a favorable return;
- The complexities and uncertainties in developing and implementing new semiconductor products and manufacturing process technologies;
- Our ability to time and scale our capital investments appropriately and successfully secure favorable alternative financing arrangements and government grants;
- Implementing new business strategies and investing in new businesses and technologies;
- Changes in demand for our products;
- Macroeconomic conditions and geopolitical tensions and conflicts, including geopolitical and trade tensions between the U.S. and China, the impacts of Russia's war on Ukraine, tensions and conflict affecting Israel and the Middle East, and rising tensions between mainland China and Taiwan;
- The evolving market for products with AI capabilities;
- Our complex global supply chain supporting our manufacturing facilities and incorporating external foundries, including from disruptions, delays, trade tensions and conflicts, or shortages;
- Recently elevated geopolitical tensions, volatility and uncertainty with respect to international trade policies, including tariffs and export controls, impacting our business, the markets in which we compete and the world economy;
- Product defects, errata and other product issues, particularly as we develop next-generation products and implement next-generation manufacturing process technologies;
- Potential security vulnerabilities in our products;
- Increasing and evolving cybersecurity threats and privacy risks;
- IP risks including related litigation and regulatory proceedings;
- The need to attract, retain, and motivate key talent;
- Strategic transactions and investments;

- Sales-related risks, including customer concentration and the use of distributors and other third parties;
- Our significantly reduced return of capital in recent years;
- Our debt obligations and our ability to access sources of capital;
- Complex and evolving laws and regulations across many jurisdictions;
- Fluctuations in currency exchange rates;
- Changes in our effective tax rate;
- Catastrophic events;
- Environmental, health, safety, and product regulations;
- Our initiatives and new legal requirements with respect to corporate responsibility matters; and
- Other risks and uncertainties described in this release, our 2024 Form 10-K, our Q1 2025 Form 10-Q, our Q2 2025 Form 10-Q, and our other filings with the SEC.

Given these risks and uncertainties, readers are cautioned not to place undue reliance on such forward-looking statements. Readers are urged to carefully review and consider the various disclosures made in this release and in other documents we file from time to time with the SEC that disclose risks and uncertainties that may affect our business.

The forward-looking statements in this release are based on management's expectations as of the date of this release, unless an earlier date is specified, including expectations based on third-party information and projections that management believes to be reputable. We do not undertake, and expressly disclaim any duty, to update such statements, whether as a result of new information, new developments, or otherwise, except to the extent that disclosure may be required by law.

About Intel

Intel (Nasdaq: INTC) designs and manufactures advanced semiconductors that connect and power the modern world. Every day, our engineers create new technologies that enhance and shape the future of computing to enable new possibilities for every customer we serve. Learn more at intel.com.

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