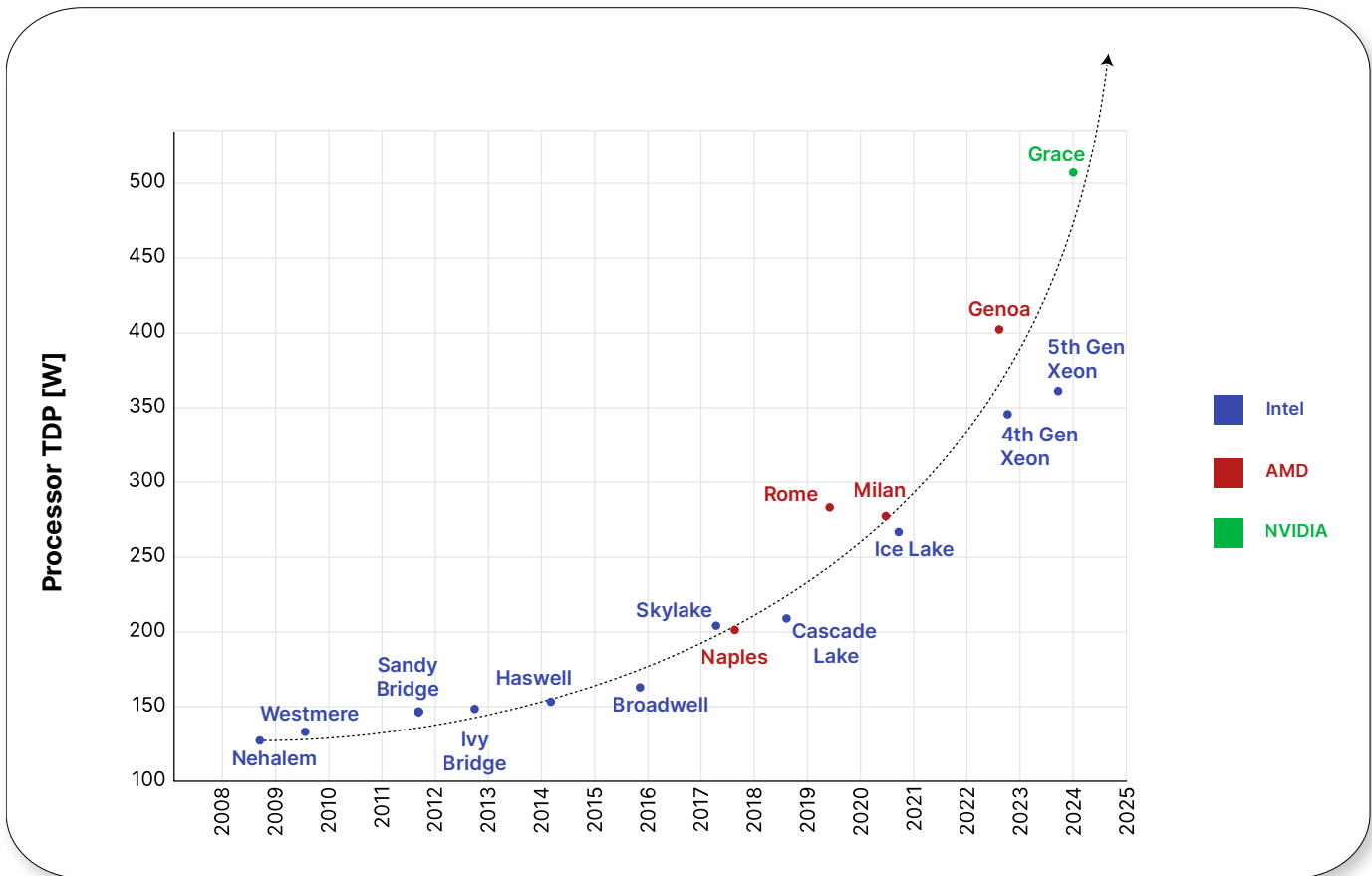# Crafting On-Premises AI Solutions

AMAX + Intel Better Together

The Future of AI Data Centers

As AI-driven enterprises expand, so does the demand for advanced computing power. The pursuit of superior processing has led to a marked increase in processor TDP (Thermal Design Power). This shift underscores the importance of robust on-premises AI solutions, providing the necessary infrastructure and cooling to support the higher thermal and power requirements of cutting-edge processors.

Processor TDP Over Time (2008-2025)
(*Data from Intel, NVIDIA, and AMD data sheets, AMAX 2023*)

Going On-Prem with AMAX

At AMAX, our AI solutions powered by Intel® are custom-designed for your enterprise's specific AI and deep learning needs, ensuring efficient management and real-time tuning of AI hardware resources. Our on-premises infrastructure reduces data transport costs and network congestion, enhancing the efficiency of your AI workloads. Prioritizing security, our systems process sensitive data within the secure confines of your local network, safeguarding your proprietary information.

Intel® Xeon® Next-Gen Processors

The Intel® Xeon® Next-Gen Processors, with built in AI accelerators and enhanced performance cores, promises a transformation in data center capabilities, particularly for AI computing. Given the increased heat output from these cores, AMAX's advanced liquid cooling technology is vital for maintaining optimal performance. Mohan Kumar, Fellow, Data Center and AI Group, Intel Corporation, adds, "Liquid cooling technologies provide the capability to keep processors and accelerators running optimally. These solutions enable not just thermal advantages but also DC energy savings and sustainability benefits."

Advanced Liquid Cooling for AI

The evolution of chipsets with increasingly powerful processors such as the Intel® Xeon® Next-Gen Processors, demands an escalation in wattage which in turn generates significantly more heat during operations. The intricacies of handling increased thermal output are critical to maintain the performance and longevity of these processors.

AMAX's advanced liquid cooling offers an innovative solution to the excess heat modern processors generate. Our thermal engineers excel at customizing systems for Direct-to-Chip (D2C) cooling and immersion cooling, tailoring thermal management solutions to meet the specific needs of your on-premises AI infrastructure. Advanced cooling solutions not only addresses thermal challenges but also augments the overall performance and reliability of the system. By pairing AMAX's custom liquid cooling design with the AI optimized Intel processors, a foundation for a high-performance, reliable on-premises AI infrastructure is established.

AMAX engineers working on an immersion cooling solution

Getting Started with AI

Initiating your on-premises AI deployment begins with a detailed consultation and assessment by AMAX. Our solution architects dive into your enterprise's specific needs to facilitate a smooth transition to a custom AI infrastructure, considering space, compute, networking, and any additional requirements. The assessment covers data volume, processing capabilities, and security protocols, shaping the blueprint of your on-premises AI solution.

Enterprises looking for a more tailored AI experience can benefit from implementing Retrieval-Augmented Generation (RAG) on-premises. RAG) combines the capabilities of generative AI with advanced embedding techniques to search an external dataset for relevant information. It leverages a pre-trained Large Language Model (LLM) to refine the extracted data into precise, tailored responses.

RAG acts as an extension to your LLM, securely fed with your business's internal documents. When you pose a query to the RAG system that's specific to your business, products, or services it draws from those provided documents to deliver accurate and relevant responses that standard pre-trained models cannot offer. With an on-premises RAG solution, your queries and data remain securely within your local infrastructure, ensuring they are not released to the cloud.

About Us

At AMAX, we are passionate about bringing innovative design and engineering solutions for high performance computing needs to your business. With a special focus on Artificial Intelligence, Machine Learning, High-Performance Computing, Liquid Cooling, we have over 40 years of experience engineering custom solutions for our partners. Our journey spans various sectors including energy, semiconductor, healthcare, federal, security, higher education, and life sciences, offering carefully built systems that meet the unique needs of each industry.

AMAX®

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