Ampere's Power Efficient Processors Leave x86 Behind

Ampere Cloud Native Processors

Less power is the new power

Ampere® Altra® processors bring more to embedded

- **More Cores** 32 to 128 cores
- **More Efficiency** up to 5.5x better than Xeon D
- **More Lanes** 128 PCIe Gen4 lanes

Cloud Native Processors help solve your Size, Weight and Power SWaP challenges:

Processor	Cores	Performance*	Power	Perf/Watt
Xeon D-2712T	4	28	65 W	0.43
Altra 32c 1.7GHz	32	94 **3.4x**	40 W	2.35 **5.5x**
Xeon D-2776NT	16	107	117 W	0.9
Altra 64c 2.2GHz	64	201 **1.9x**	69 W	2.9 **3.2x**
Altra 96c 2.8GHz	96	299 **2.8x**	128 W	2.3 **2.5x**
Altra 128c 2.6GHz	128	333 **3.1x**	124 W	2.7 **3.0x**

- **AI inference** including PyTorch, TensorFlow, or YOLOv5 doing 8x 30fps video streams.
- **NVIDIA GPU** support, used in NVIDIA Arm HPC Dev Kit developer.nvidia.com/arm-hpc-devkit
- **128 PCIe lanes** to attach GPUs, accelerators, expansion, and (computational) storage.
- **Powerful as 100x Raspberry Pi 4s** and **22% more energy efficient** youtu.be/UT5UbSJOyog
- "**Arm Native**" scale up, scale out arm64 applications including Android Gaming.
- **Applications**: robotics, computer vision, sensor fusion, 5G networks, CDNs, Software-Defined Vehicle SOAFEE, arm64 DevOps, NAS, agriculture, clean energy, UAVs, satellites, Windows on Arm PC with NVIDIA GPU.
- **Customers:** Google, Microsoft Azure, Oracle, HPE, Supermicro, GM's Cruise, Hetzner, Gigabyte, Equinix, Wiwynn, Cloudflare, Scaleway, Foxconn, ADLINK.

Embedded World`23 Find demos with **Ampere Altra** cloud native processor at booths Ampere & 7StarLake 1-280, ADLINK 3-147, Arm 4-504, AWS Automotive 4-550, Lattice 4-528 & 4-630.

*Performance and usage power data are based on estimated SPECrate®2017_int_base (GCC10) and are subject to change based on system configuration and other factors. Usage Power is defined as average power consumed over time by a given workload. Ampere Altra as compared to Xeon D per https://www.intel.com/content/www/us/en/products/sku/226233/intel-xeon-d2712t-processor-15m-cache-up-to-3-00-ghz https://www.intel.com/content/www/us/en/products/sku/226239/intel-xeon-d2776nt-processor-25m-cache-up-to-3-20-ghz https://www.spec.org/cpu2017/results/res2022q4/cpu2017-20221010-32556.html https://www.spec.org/cpu2017/results/res2022q4/cpu2017-20221010-32558.html

Ampere® Altra® Specifications:

- **Ampere Altra** processor with 32, 64, 96, 128 cores.
- **Arm v8.2+** with **1MB L2 cache per core**.
- **128 PCIe Gen4 lanes** for 252 GB/s total throughput.
- **8 memory channels** up to 16 DDR4-3200 DIMMs for 4TB total. Soldered is supported.
- **I/O** SPI, I^2C, GPIO, and more.
- **ML inference** with 2x 128b SIMD Vector Units.
- **Packaging**: LGA socket.
- **Process** 7nm TSMC N7 process.
- **Thermal** 0°C to 110°C junction temperature. Users include vehicles and space satellites.

Ampere Altra Supports:

- **NVIDIA GPUs** including RTX A4500, RTX 3070 Ti, RTX 3060, GTX 1050, A100, A16, A30, A10.
- **Accelerators** for 5G RAN, core network, et al. available on Arm include NVIDIA Converged A30x/A100x BlueField-2 DPU, Xilinx T2, Qualcomm 5G X100, Marvell OCTEON Fusion, EdgeQ, Genevisio PAC-010 DU.
- **Operating Systems**: AlmaLinux, CentOS, Debian, Fedora, Oracle Linux, Red Hat, Rocky Linux, SUSE, Ubuntu, FreeBSD. Windows 11 also runs.

Ampere Altra Deep Dive:

- **Detailed** information amperecomputing.com/processors/ampere-altra
- **Software** compatibility and regression testing nightly amperecomputing.com/solution
- **Technical docs**, tech support and Customer Reference Board CRB files (schematics, BOM, Gerber, .BRD, ProE CAD) for anyone to make amperecomputing.com/customer-connect
- **Ampere Altra Dev Kit** and developer workstation ADLINK 3-147 https://ipi.wiki/ampere

About Ampere Computing

Ampere is a modern semiconductor company designing the future of cloud computing with the world's first Cloud Native Processors. Built for the sustainable Cloud with the highest performance and best performance per watt, Ampere processors accelerate all computing applications. Ampere Cloud Native Processors provide industry-leading cloud performance, power efficiency and scalability. For more information visit amperecomputing.com.

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