ADLINK
LEADING EDGE COMPUTING



ADLINK Harnesses the Arm SystemReady-Compliant Ampere® Altra® Module, Pushing COM-HPC to New Heights

Solution Brief

ADLINK's Ampere Altra COM-HPC Module brings Arm SystemReady compliance to Edge & Embedded Markets



COM-HPC is a relatively new computer-on-module (COM) standard for high-performance embedded computing. Officially released in 2021, the standard was developed by representatives from congatec, Kontron, and ADLINK Technology under the auspices of PICMG. COM-HPC promises higher performance than the previous standards it was based on, in addition to an increased number of interfaces, multiple modules sizes, and different configurations, including options for both client- and server-type modules.



The COM-HPC server specification targets high-end embedded servers that require compute-intensive CPU capability, large memory capacity, and lots of high-bandwidth I/O.

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Ampere Altra Arm-based Server for the High End

Until now, most of the COM-HPC products released have been based on Intel microprocessors or some other x86 variant, mainly due to familiarity with the Intel architecture for higher end applications, and have only supported the Windows operating system (OS). That's about to change with the introduction of ADLINK's COM-HPC Ampere Altra server module that's designed with the Ampere® Altra® 80-core SoC. The processor is based on Armv8.2+ 64-bit CPU cores, running at a maximum frequency of 2.8 GHz, and Arm's N1 Neoverse architecture.

While such performance levels may be available in upcoming x86-based CPUs, the Ampere processor can provide this level of performance today. Other features include an increased number of interfaces, lower power consumption, and a lower total cost of ownership, thanks to the higher performance and energy efficiency.

The Arm-based processor is well suited to a Linux OS environment. And there is now a higher level of confidence that Linux can be deployed in high-performance-computing (HPC) applications. The required security is there, providing the necessary confidence in such configurations.



The 80 core Ampere® Altra® in the COM-HPC module deployed by ADLINK provides the performance required by developers of cloud and edge infrastructure applications.

The Ampere processor selected for the ADLINK COM-HPC Ampere Altra module is the Ampere Altra Q80-28, with 80 cores, a maximum clock frequency of 2.8 GHz and 175 W total power dissipation. This level of performance makes ADLINK's COM-HPC Ampere Altra module a perfect fit for modern datacenters and autonomous drive applications. It also offers the power efficiency needed in these applications, where data is being driven from the edge to the cloud and back. Specific workloads could include data analytics, artificial intelligence (AI), database storage, edge computing, and video broadcasting.

Arm SystemReady Compliance

Operating-system porting can be verified by adhering to Arm's SystemReady program. SystemReady is a compliance certification program that's based on a pre-defined set of hardware and firmware standards, including the base system architecture (BSA) and base boot requirements (BBR). The SystemReady standards ensure that Arm-based servers, infrastructure edge, and embedded IoT systems are designed to specific requirements, enabling generic off-the-shelf operating systems to operate as expected out of the box. This includes the operating system, all associated drivers, and all the hardware, with compliance given only after thorough testing.



Another key advantage to the SystemReady initiative is instant compatibility with any other products that comply with the initiative. Hence, any products that comply can use unmodified mainstream OS distributions, usually in their off-the-shelf state. This essentially solves the Linux porting issues that can occur, particularly with entry-level products designed for Arm. And it simplifies the task for developers, removing many of the configuration hurdles that have plagued system integration in the past. Such an advantage was exclusively available—for decades in some cases—to products based on the x86 architecture. An added benefit of the SystemReady program is that it will enable and grow the community of Arm native developers, so all sides will benefit.

Arm-based products are appearing in the market for high-performance computing applications. Developers are comfortable writing code that works with the Arm architecture, so system maintenance is less challenging. Systems based on Arm processor cores also tend to consume less power, and thereby run cooler. This is significant for larger, cloud-based systems, where power consumption can grow quickly when a higher number of systems is needed.



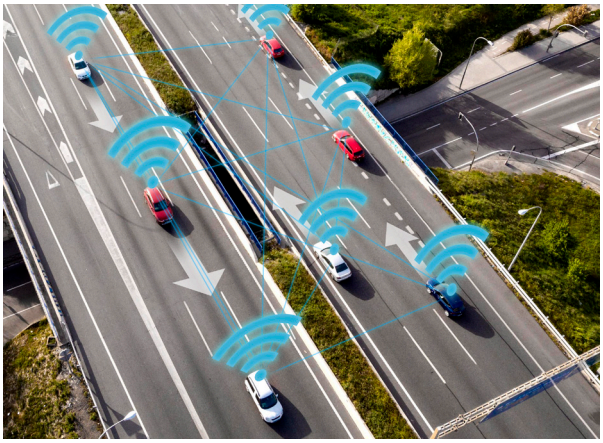
Shown is an AVA Developer Platform based on ADLINK's 32-core COM-HPC Ampere Altra module.

Ampere works with Canonical to streamline the certification for high performance Ampere-based systems, particularly when it comes to Ubuntu platforms to satisfy the demands of at-scale Ubuntu application streaming. This allows SIs to deploy a host of high-performance mobile and IoT applications that need the performance and scale of cloud-hosted Ubuntu services. The Ampere Altra CPU fits the bill with its SystemReady compliance and is one of the only devices available that delivers this abstraction, up to the highest possible levels. As a result, a developer can simply download a stock 64-bit extension and do an install through a live (completely bootable) OS image directly onto the target module. This is a convenience that developers are now accustomed to.

Note that the Ampere processors allow ADLINK to future-proof its own product lines thanks to the performance offered by the Ampere Altra as well as its I-Pi wiki support. And ADLINK can easily migrate to a higher performing Ampere Altra based on customers demand.

No Fear when Developing for Autonomous Driving and AI

Autonomous driving systems are another application ideal for a module like the ADLINK COM-HPC Ampere Altra, as it can meet the needs for maximum performance, particularly on prototyping systems used for software development. Earlier hesitancy to deploy an Arm-based platform for such a system has now been removed. AI applications are also a natural fit for the ADLINK COM-HPC Ampere Altra, thanks to its superior performance.



Armed with the advantages of SystemReady compliance as well as the performance derived from the Ampere Altra processor, ADLINK's COM-HPC Ampere Altra module will hit new heights in the latest HPC applications.

To learn more about ADLINK's COM-HPC Server Type modules, please visit the ADLINK website.

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