SUPERMICRO GRACE SYSTEM DELIVERS 4X PERFORMANCE FOR ANSYS® LS-DYNA®

Supermicro Grace CPU Superchip Systems Deliver 4X Performance at Same Power Consumption

ARS-121L-DNR   **ARS-221GL-NR**

Executive Summary

Using the Supermicro system with a single Grace CPU Superchip, Ansys demonstrates 4X speedup vs a competitive system with a 36-core Intel processor[1]. This performance is achieved with the same power consumption level as a single-socket x86 system.

While LS-DYNA runs on x86 CPU-based systems, and customers now have

Ansys LS-DYNA	Designing airplanes, autos, infrastructures
	- Crashworthiness, occupant safety, airbag deployment in automobiles - Jet engine blade containment, bird strike simulation for airplanes - Earthquake simulation for concrete dams, nuclear power plants, bridges - Battery behavior in different situations - Concussion research in helmet design - Multiphysics simulation

another choice: a lower power consumption system that delivers greater performance. LS-DYNA is generally run in a server cluster with hundreds or more systems. Compared to a server cluster of single-socket x86 systems, one quarter of the Supermicro Grace CPU Superchip systems can achieve the same results using one quarter of the power. Using the 1U 2-node ARS-121-DNR, only one-eighth of the rack space is needed to achieve the same result, offering reduced management costs in the data center.

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[1] LS-DYNA ODB-10M benchmark model; Supermicro ARS-121L-DNR vs. AWS c5n.18xlarge instance.

Power of Grace

Supermicro Grace servers incorporate the NVIDIA Grace CPU Superchip, an ARM Neoverse V2 CPU with 144 cores and built-in fast 960 GB of LPDDR5X memory with ECC. Using only 500 watts for the CPU and memory, this system delivers 4X Ansys LS-DYNA performance of an x86 CPU system. The Supermicro Grace servers offer premium performance at significantly lower power consumption, delivering Supermicro's promise of Green Computing. Supermicro offers two Grace CPU Superchip nodes in 1U, further optimizing the space usage to deliver LS-DYNA performance.

ARS-221GL-NR	
	2U Rack server with/without GPU • Single Grace CPU Superchip, 144 ARM Neoverse v2 cores • 960GB LPDDR5X memory • PCIe Gen 5 • NVMe support • Support for GPU and networking options • Redundant power
ARS-121L-DNR	
	1U Rack server with/without GPU • 2-node Grace CPU Superchip, • Total 2x144 ARM Neoverse v2 cores • Total 2x960GB LPDDR5X memory • PCIe Gen 5 • NVMe support • Redundant power

Supermicro Grace Systems

Supermicro Grace servers come in 2 forms: a 2U system supporting various network and storage connections, and a 1U system with 2 Grace CPU Superchips operating as separate systems. This 1U server offers four times the compute density as the 2U server.

Supermicro Value

Supermicro systems offer great value to run LS-DYNA:

- State-of-the-art NVIDIA Grace Superchip system
- Half the rack space
- Building Block approach that delivers the latest technologies
- Green designs & liquid cooling options reduce power and increase performance

Sample Configuration

Supermicro Grace-Supermicro comes in several configurations. Below is a sample configuration for running LS-DYNA. Please consult with your Supermicro representative to get more details on specific configurations.

2U Grace System	Desc	QTY
ARS-221GL-NR	ARS-221GL-NR MBD-G1SMH-P 2U ARM 4GPU GEN5 PCIE CSE-GP20	1
HDS-SEN-MZTL23T8HCLSA7	PM9A3 3.84TB NVMe PCIe E1.S EDSFF 9.5mm (1DWPD) SED	1
HDS-MMN-MTFDKBA480TFR-15	Micron 7450 PRO 480GB NVMe PCIe 4.0 M.2 22x80mm TCG Opal	1
AOC-653105A-ECAT	1-port PCIe IB-HDR 100GbE QSFP56 Gen3.0/4.0 x16 CX-6 VPI---AOC-653105A-ECAT	1

Conclusion

Supermicro Grace Superchip servers offer 4X the performance running LS-DYNA of x86 system, using the same power consumption. By running a cluster of these servers, customers can solve bigger problems with significant power reduction. Please contact your Supermicro representative for more information.

For more information:

Supermicro Grace-Superchip System
Ansys LS-DYNA

SUPERMICRO

As a global leader in high performance, high efficiency server technology and innovation, we develop and provide end-to-end green computing solutions to the data center, cloud computing, enterprise IT, big data, HPC, and embedded markets. Our Building Block Solutions® approach allows us to provide a broad range of SKUs, and enables us to build and deliver application-optimized solutions based upon your requirements.

ANSYS

For more than 50 years, Ansys software has enabled innovators across industries to push boundaries with the predictive power of simulation. From sustainable transportation and advanced semiconductors, to satellite systems and life-saving medical devices, the next great leaps in human advancement will be powered by Ansys.