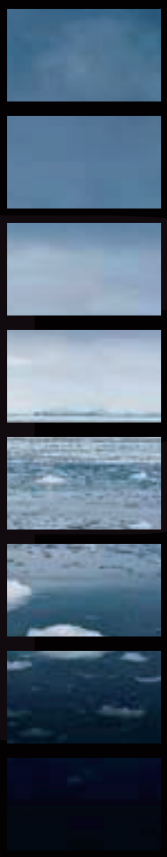
AURORA | EUROTECH
Digital technologies for a better world

Aurora. Some have more power™



HPC

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Intelligent Performance

Intel® Xeon® 5500 series CPUs – Solid State Disk – On-node Programmable Accelerator

Each Aurora node card provides two Intel® Xeon® 5500 series processors and up to 24GB of DDR3 memory and a performance of up to 100GFLOPS.
An Intel® Solid State Disk with up to 160GB provides local storage for the fastest and most reliable check-pointing and application I/O. Extra acceleration and customization is possible thanks to the on-node, high performance programmable accelerator.

Aurora has a modular design: one rack delivers 24TeraFLOPS and consists of 8 chassis, each delivering 3TeraFLOPS. The exceptional computational density of Aurora permits the deployment of very large systems with a very small footprint: for instance a 1PetaFLOPS installation requires just 42 Aurora racks.

Scalability

100GFLOPS/Node – 24TeraFLOPS/rack – 1PetaFLOPS in just 42 racks

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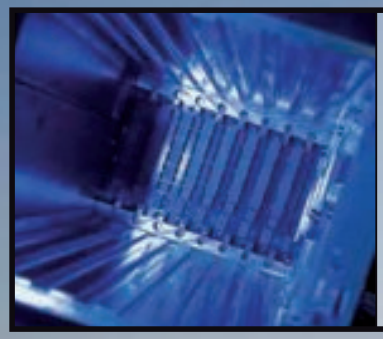
Unified Network Architecture

60Gbps 3D torus – QDR Infiniband® – Sub μs memory to memory latency

The Unified Network Architecture merges a 60Gbps 3D torus with a 40Gbs switched topology. The key components are the programmable network processor for the 3D torus and the Infiniband® adapter for the switched, QDR network.
The Unified Network Architecture permits automatic or user-optimized traffic routing of MPI traffic and the offloading of dedicated protocols (such as SAN, monitoring).



Three independent synchronization networks (system, sub-domain and local) preserve efficiency at Petascale by guaranteeing that the communications and the scheduling of all nodes are automatically handled.
The reconfigurable network processor allows alternative communication protocols and routing schemes.

Computational Efficiency

Synchronization networks – Reconfigurable network processor

Energy Efficiency

Liquid cooling – As much 60% energy savings

All Aurora modules (node cards, power infrastructure, controller modules) are liquid cooled, permitting a very high computational density and dramatically lowering the total cost of ownership. Direct liquid cooling cuts operating costs being much more efficient and compact compared to traditional air and air-liquid hybrid approaches. Aurora liquid cooling infrastructure is fully integrated, for the highest level of compatibility with existing data centers.

Aurora minimizes porting time and costs by providing full x86 compatibility thanks to the adoption of the Intel® Xeon® 5500 series CPUs. Aurora supports the full set of MPI libraries: most HPC codes compile and execute at very high efficiency even without system specific optimization.

Compatibility

Full x86 compatibility – Optimized MPI libraries

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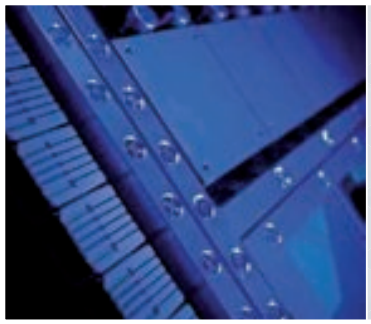
Reliability

ServNet® – No moving parts



Aurora has been designed to provide the highest level of reliability: all critical system components are redundant. Liquid cooling and solid state storage eliminate vibrations and moving parts. Temperature of components is finely controlled and kept within optimal range for maximum reliability.

Petascale installations must comply with the highest levels of availability. Aurora provides fine control and predictive capabilities over component behavior with dedicated and standard interfaces (IPMI, ServNet®). ServNet® provides a fully independent system monitoring and control infrastructure.
Nodes support Zero Knowledge Replacement, where stateless nodes are automatically configured by location (slot) aware user-programmable logic. The physical substitution of nodes is a snap thanks to hot-swap capabilities.

Availability

Redundant – Hot Swap – Zero Knowledge Replacement

design: Altrementi/Portfolio

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