

Aurora for Life Sciences

With Universities, pharmaceutical companies, healthcare organisations and biotech that aim to accelerate discoveries, stay competitive and improve the effectiveness of clinical treatments, simulation, molecular modelling, data management, next generation sequencing are increasingly common in life science disciplines

These techniques rely on a robust combination of big data analytics and high performance computing (HPC)

Aurora Bioaccelerate: a supercomputing solution life sciences

The Eurotech Aurora Bioaccelerate solution for life sciences leverages the Eurotech Aurora 3 different families of innovative and advanced HPC systems .

- **Aurora supercomputers**, a range of scalable, energy efficient, direct liquid cooled HPC systems that pack the highest number of CPU cores per standard rack.
- **Aurora Tigon supercomputers**, a family of advanced, robust, direct liquid cooled, high density HPC systems, which deliver the best energy efficiency in the market.
- **Aurora Hi/e supercomputers**, the “extreme” variety of the Aurora offering, ideally suited for acceleration, featuring the next generation of Aurora Direct Hot Liquid Cooling and pushing the energy efficiency beyond the 5GFlops/watt threshold.



HPC users in life science sectors can leverage the following Aurora solutions advantages to reach better results faster:

Acceleration – Aurora Bioaccelerate centrepiece is a HPC system that is designed for acceleration. With Aurora, the life science applications using GPU and coprocessors are propelled to level of sustained performance rarely seen before. The solution is complemented by more traditional architecture to extend compatibility to virtually any application.

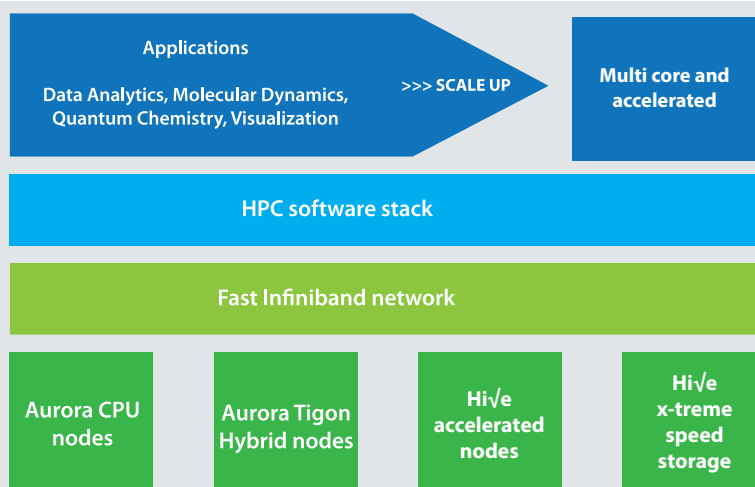
Scalability – the Aurora systems can scale from few hundreds cores to tens of thousands of cores, reducing processing time on many life sciences applications. Scalability means also upgradability: Aurora systems are designed to be offered in compact departmental independently liquid cooled small clusters, scaling up to large installation following the growth of the business.

Reliability – Aurora systems are the best in class for reliability. Robust and high quality, they leverage liquid cooling, which reduces compo-

nent faults by eliminating fans, hot spots and vibrations. The soldered down memory inherited from embedded design, the sensor networks and the resiliency created via software stack give to Aurora an edge in guaranteeing business continuity.

Energy efficiency – Eurotech is a pioneer of Green HPC. The result of several years of research in energy efficient platforms, the experience gained from the embedded electronics background of the company and the past and outgoing collaboration with important research institutes have allowed Eurotech to design and manufacture the most energy efficient systems in the market.

Expertise – Eurotech Aurora can leverage 17 years of experience in delivering HPC systems and solutions to customers. Eurotech is one of the few companies in the world able to design and manufacture advanced supercomputers. This expertise is complemented by the in-house and partners systems integration competences, which Eurotech leverages to provide turnkey solutions to customer in various market sectors.



Aurora Bioaccelerate HPC solution brings to the life science applications a new boost. The core of the solution is based on Hi/e (High Velocity) accelerated nodes. The same physical rack can contain computation and fast storage nodes, performing accelerated data analytics and simulation. Aurora Tigon nodes may extend the solution for those applications that scale better on CPU cores or make more limited use of accelerators and co-processors.

Graphic card servers, coupled to the system, allow for the best remote visualization experience in order to visualize, manipulate and understand life science and bio-medical data.

Software

Aurora systems are tested on a variety of life science applications like Gromacs, Amber, Namd, Gaussian, Lammmps, Quantum Espresso, Acemd and others.

From Department to Data Centre

The Aurora HPC systems are made by building blocks that can be packaged in different solutions. The Aurora G-Station and Cube provide all computational power a department needs in a compact and silent way. The G-Station and Cube have a standalone direct liquid cooling system that allows up to 30 TFlop/s to be stored under a desk, producing no noise and heat at all.

These products can be upgraded to a data center rack, packed in solutions that scale up delivering petascale performance. Aurora Tigon and Aurora Hi/e can respond effectively to very demanding workloads with industry leading energy efficiency and proven reliability.

Technical Specifications

AURORA Hi/e SYSTEM

ARCHITECTURE	8, 16, 64 or 128 nodes per rack interconnected by 2 x FDR InfiniBand (112 Gbit/s)
NODE	An assembly of 1 CPU card + 5 submodule PCIe cards providing different functionality
PROCESSING UNITS	Intel® E3-12xx v3 + Nvidia Tesla™ K40, K80 GPU or Intel Xeon Phi™ 7120x
COOLING	Aurora Direct Liquid Cooling
PERFORMANCE	6 TFlop/s per node, 0.77 PFlop/s per rack

AURORA TIGON SYSTEM

ARCHITECTURE	128 or 256 node per rack . 8 or 16 nodes per mini rack (G-Station) - InfiniBand QDR
NODE	2 x CPU or 2 x CPU + 2 x GPU
PROCESSING UNITS	Intel Xeon E5 series + Nvidia Tesla K40 or Intel Xeon Phi 5120D
COOLING	Aurora Direct Liquid Cooling
PERFORMANCE	1300 W

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