WORKLOAD MANAGEMENT FOR EXASCALE COMPUTING

Exascale means massive computational power; think of a system capable of a quintillion calculations per second — that's the power of exascale. Altair is at the forefront of the exascale transformation, exploring the next level of high-performance computing (HPC). In this new exascale era, we're pioneering tools that scale, running on next-generation systems and supporting increasingly complex HPC requirements in areas like machine learning, deep learning, and multiphysics.

Exascale Makes Research and Innovation Faster Than Ever

The power of exascale is scaling up discovery and speeding innovation. Exascale computing is enabling new insight in areas like weather prediction, climate modeling, drug discovery, precision medicine, aeronautics, and space science, just to name a few.

Making History with Argonne's Aurora Supercomputer

The Aurora exascale computer at Argonne National Laboratory's Argonne Leadership Computing Facility (ALCF) was built to enable transformative science on an unparalleled scale, and it's capable of performing two quintillion — a billion billion, visualized as 1,000,000,000,000,000,000 — calculations per second. Workload management on Argonne's Aurora and Polaris supercomputers is powered by Altair® PBS Professional®. Researchers from Princeton University are using both systems to simulate supernovas, a complex process that's not well understood. The project's results will ultimately advance efforts to determine the origin of elements in the universe.

HPC – Only as Powerful as the Software That Runs It

Powerful computing hardware requires powerful software tools, and with exascale it's more critical than ever to manage workloads efficiently. PBS Professional delivers automated job scheduling, management, monitoring, and reporting, and it runs big — 50,000 nodes in one cluster, 10,000,000 jobs in a queue, and 1,000 concurrent active users. It also runs fast — 10,000,000 jobs per hour end-to-end throughput and 10-second end-to-end run for a single 4,000+ node job. Many of the world's biggest computing systems rely on PBS Professional to manage complex, demanding workloads.

Leading Exascale

Supercomputers are critical to the future and we're helping shape the U.S. exascale ecosystem as a member of the Department of Energy's Exascale Computing Project (ECP) Industry Council. We're honored to collaborate and help better simulate the processes behind precision medicine, additive manufacturing, biofuels, and more.

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> Trying to simulate the last seconds in the life of a massive star is a great drama at the confluence of nuclear and particle physics, statistical physics, and the computational arts. Big iron HPC resources such as Polaris and Aurora are central to our ability to simulate this complicated problem.
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> Adam Burrows, Astrophysicist, Princeton University

PBS Professional
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