ALTAIR® PBS PROFESSIONAL® FOR NEC SX-AURORA TSUBASA SYSTEMS

NEC is an Altair global authorized reseller, offering Altair® PBS Professional® on NEC SX-Aurora TSUBASA systems. The SX-Aurora TSUBASA architecture is built on NEC's Vector Engine (VE), integrated transparently into the Linux software environment for top application performance. Each VE integrates 8 or 10 vector cores and 48GB of high-bandwidth memory for peak performance up to 3.07 teraflops, giving scientists and engineers real value with performance, usability, and efficiency.

About PBS Professional

PBS Professional is a fast, powerful workload manager designed to improve productivity, optimize utilization and efficiency, and simplify administration for clusters, clouds, and supercomputers — from the biggest HPC workloads to millions of small, high-throughput jobs. PBS Professional automates job scheduling, management, monitoring, and reporting, and it's the trusted solution for complex Top500 systems as well as smaller clusters, proven for over a decade at thousands of customer sites.

NEC Vector Engine processors deliver efficient performance

Benefits for NEC Administrators and Users

With PBS Professional, NEC users and admins get industry-leading job scheduling and workload management, scalability to millions of cores, seamless integration with NEC SX-Aurora TSUBASA systems, and unparalleled power management capabilities. Altair provides unbeatable global service and support with local experts in over 25 countries. NEC and Altair collaborate closely for tight, seamless implementation and performance tuning.

Unparalleled security with EAL3+ certification

Superior Job Scheduling and Workload Management – PBS Professional drives optimal Vector Engine processor performance by efficiently distributing workloads across SX-Aurora TSUBASA computing platforms. PBS Professional supports multiple users and applications with an efficient queue management system that allows NEC administrators to track usage and set user priorities and policies. Features include Vector Engine device/HCA auto detection and configuration, topology-aware scheduling, deep integration with the NEC MPI, and integration with NEC accounting software. VE devices are represented as consumable PBS Professional resources.

Industry-leading Scalability – PBS Professional scales easily to millions of cores.

Seamless Deployment and Integration – PBS Professional is optimized for use with NEC SX-Aurora TSUBASA computing systems.

Expert Support – Altair supports NEC customers through a network of global experts. This close business collaboration means users can expect high-value, seamless deployments.

Unparalleled Security – PBS Professional is the only workload manager with EAL3+ security certification.

Comprehensive Cloud Readiness – PBS Professional comes with a built-in GUI that enables administrators to extend HPC resources to public and private clouds including Oracle Cloud Infrastructure, Google Cloud Platform, Microsoft Azure, and Amazon Web Services (AWS). Dynamic bursting makes it easy to manage peak-time workloads.

Allocation and Budget Management – Manage budgets across an entire enterprise and for multiple clusters by allocating users credits for PBS Professional workloads. Credits can be provided in one or more customizable currencies. For visibility into HPC usage, PBS Professional includes full reporting of credit consumption by groups and by individual users.

Forecasting and Simulation – The simulator included with PBS Professional helps admins understand in detail and quickly evaluate situational issues and potential policy changes on workload execution.

NEC SX-Aurora TSUBASA rackserver with 8 tightly integrated Vector Engines

Key Features
- Vector Engine device/HCA auto-detection and configuration respecting NUMA node boundaries
- Best-effort, topology-aware scheduling by grouping job processes on Vector Engines in a way that produces the lowest communication overhead
- VE devices are represented as consumable PBS Professional resources, so powerful PBS Professional capabilities like fine-grained limits and prioritization can be used with them
- Deep integration with NEC MPI allows users to specify how their job processes should be distributed among standard host processors vs. specific VE devices allocated to the job
- Supports all application execution models: OS offload, VH call, and VE offload
- Integration with NEC accounting software exposes Vector Engine cputime and memory usage alongside standard PBS Pro accounting metrics
- Estimated job-start times enable you to plan your workflows and meet deadlines
- Submission filtering "hooks" to change/augment capabilities on-site, on-the-fly
- Shrink-to-fit jobs boost utilization, especially before planned system outages
- Job arrays allow for max throughput to schedule, execute, and manage unlimited jobs
- User, group, and project limits to implement fine-grained policy adjustments
- Advance resource reservations guarantee resources for recurring needs
- Python is available everywhere, allowing one script to be used across all architectures
- Preemption and checkpointing allows you to immediately run high-priority work
- Efficient workload distribution for maximum return on investment (ROI)

NEC and Altair: Leaders in HPC
Building on the successful evolution of its SX-series vector supercomputers, NEC has combined the flexibility of a cluster with the raw power of the NEC Vector Engine processor. VE processors form the basis of the powerful NEC SX-Aurora TSUBASA architecture. This latest-generation architecture focuses on efficient performance and brings the powerful computing of NEC SX-series systems, previously available only to large corporations and compute centers, to engineers and HPC enthusiasts all over the world.

Altair has served the HPC market for decades with award-winning workload management, engineering, and cloud computing software. The joint NEC-Altair solution provides a superior option for users seeking a reliable cluster stack supported by proven HPC experts.