



*"It was a clear choice to go with PBS Professional...It offers the most robust and flexible management of our diverse user policies and requirements, and it's simple to install and use."*

*In addition, Altair's expertise and dedication to implementation success is unbeatable."*

Dr. Mark Vilensky, Scientific Computing Manager, Chemical Physics Department, Weizmann Institute

Read about Altair's CMU PBS Professional Connector integration:

[www.pbsworks.com/cmupbs-datasheet](http://www.pbsworks.com/cmupbs-datasheet)

## PBS Professional® for HP

Optimized job scheduling and resource management for HPC

PBS Professional gives HP cluster users a **more efficient, reliable solution** for HPC workload management. As an **HP-integrated** product, PBS Professional optimizes job scheduling on HP Apollo systems and ProLiant clusters to achieve the **highest levels of system utilization**. PBS Professional is also integrated with HP's Insight Cluster Management Utility (CMU), ensuring **easier cluster deployment and management** for users.

### HP Cluster Users Gain:

- **Superior Job Scheduling:** PBS Professional efficiently distributes workload across HP platforms, from clusters to the largest supercomputing systems – the #1 HP system on the Top500 runs PBS Professional.
- **Industry-leading Scalability:** PBS Professional scales easily to millions of cores, supporting HP users as computing moves to exascale.
- **Seamless Deployment:** HP resells PBS Professional on all HPC systems.
- **Enhanced Cluster Lifecycle Management:** PBS Professional is integrated with HP Insight Cluster Management Utility (CMU) with support for OS provisioning, enhanced power management and seamless upgrades.
- **Comprehensive Cloud Readiness:** Proven as the backbone for multiple HPC cloud services, Altair's software stack for physical and virtual cloud appliance computing (featuring HyperWorks and PBS Works) combined with HP's CMU offers HP customers a complete solution for HPC on the cloud.
- **Green Provisioning™:** Monitor, shutdown, and restart resources based on your workload requirements to support energy conservation initiatives. Validated by several leading sites, Altair has lowered customer energy use by up to 30 percent.

### Ideal for HP Customers Who Seek To:

- **Maximize** value from HP Apollo, ProLiant or other cluster investments
- **Improve** end-user productivity and decision making, ensuring you are meeting service level objectives
- **Increase** workload security and reliability (PBS Professional is the only workload manager with EAL3+ certification and SELinux support)
- **Implement** business priorities by ensuring high-priority work runs first and completes on-time
- **Reduce** costs by minimizing wasted hardware, software, and electrical power
- **Ensure** support for cloud (no other vendor offers proven capabilities in all major cloud areas – applications supplier, middleware supplier, SaaS offering, and HPC user)



## Why PBS Professional on HP?

- Industry-leading cluster workload management
  - The #1 HP system (Tsubame 2.5 at Tokyo Tech) runs PBS Professional
  - Proven for over a decade at thousands of customer sites
  - Scalability to millions of cores
- Global support with local experts in 23 countries
- Comprehensive cloud capabilities
- Topology-aware scheduling
- Tight HP collaboration
  - Available directly from HP
  - Featured option for HP Cluster Platforms
- Integration with HP Insight CMU – read the data sheet: [www.pbsworks.com/cmupbs-datasheet](http://www.pbsworks.com/cmupbs-datasheet)

## Key Features & Benefits

- GPU / co-processor scheduling prioritizes use and manages access to all types of accelerators as well as the Intel® Xeon Phi™ coprocessor, with full access control and accounting
- Estimated job start times enable you to plan your workflows and meet deadlines
- Backfill TopN scheduling eliminates wasted cycles without delaying any work
- Dynamic provisioning via HP Insight CMU automatically changes OS to match changing workload demands
- Submission filtering "hooks" to change/augment capabilities on-site, on-the-fly
- Shrink-to-fit jobs boost utilization, especially before planned system outages; plus, jobs actually run sooner.
- Efficiently distributes workloads for maximum return on investment (ROI)
- Virtually unlimited scalability supports configurations from workgroup clusters to the largest single-system image super-computers
- Job arrays allow for maximum throughput to schedule, execute and manage unlimited jobs
- User, group, and project limits to implement fine grained policy adjustments
- Tunable scheduling formula defines any policy, including on-the-fly "exceptions"
- User customizable "runjob hooks" ensures allocation management limits are strictly enforced
- Advance resource reservations guarantee resources for recurring needs
- Unified job & resource ("Vnode") architecture allows you to write job requirements once and automatically optimizes placement
- Job status with history (via "qstat -x"), allowing you to never lose track of jobs
- Python, the portable modern scripting language, is available everywhere allowing one script to be used across all architectures
- Preemption and checkpointing allows you to immediately run high-priority work

**And many more. Visit [www.pbsworks.com](http://www.pbsworks.com) for a detailed list of technical features.**

## Workload Management on HP Systems

HP integrates with workload managers and schedulers like PBS Professional to help drive the highest utilization levels for HP Apollo systems and ProLiant clusters. PBS Professional supports multiple users and applications with an efficient queue management system that enables jobs, both batch and interactive, to be presented to the system based on site-defined policies and priorities. It also utilizes a scheduling system to make the most efficient use of available hardware and software resources. With PBS Professional, HP cluster administrators can set user priorities and policies, track usage, and provide a queuing system for job submissions.

## HP and Altair: Leaders in HPC

HP is the undisputed market leader in HPC, offering the broadest spectrum of high performance computing solutions, from workgroup and departmental servers to systems designed for the engineering enterprise and supercomputing centers. Altair has served the HPC market for decades with award-winning workload management, engineering, and cloud computing software. Together, HP and Altair deliver innovative, industry standard solutions that are optimized for scalability and performance to reduce capital and operating expenses.



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**For more information about PBS Professional, visit [www.pbsworks.com](http://www.pbsworks.com) to request a quote or view a demo.**

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