

## Why PBS Professional?

- Proven for over 20 years
- Thousands of customers worldwide
- Voted #1 HPC Software by HPCWire readers
- Built by HPC people for HPC people – Altair Knows HPC
- Million-core scalability and end-to-end resilience
- Flexible plugin framework to meet complex requirements with ease
- Unparalleled security with EAL3+ certification and support for SELinux\*
- Fast, powerful scheduling with power and topology awareness and GPU / Xeon Phi support
- Global support with local experts in 48 offices across 22 countries



"PBS beat the competition in both **performance and flexibility**... Altair really knows HPC."

— NCI

"The product's flexibility, and the company's **expertise and support**, is simply unparalleled."

— Fujitsu

"Around **\$200,000 in energy savings** per year."

— US Army (RDECOM)

"Altair's **expertise and dedication** to success is **unbeatable**."

— Weizmann Institute

PBS Works is a division of  Altair

The **trusted leader** in high-performance computing (HPC) workload management, PBS Professional efficiently schedules HPC workloads across all forms of computing infrastructure. Easily **scaling to support systems of any size** – from clusters to the largest supercomputers – PBS Professional ensures you receive the **maximum value** from your hardware and software investments.

## Customers choose PBS Professional to:

- Improve performance with a fast, powerful, reliable workload manager
- Reduce costs by optimizing hardware, software and power use
- Get first-rate technical support with personal, one-on-one attention
- Maximize user productivity and ensure SLAs are met
- Ensure cloud readiness with a product proven for public and private clouds
- Gain peace of mind with an established commercial leader known for excellent service and customer care
- Simplify HPC and cluster administration
- Gain the flexibility to meet complex custom requirements
- Ensure the highest level of security – only PBS Pro offers EAL3+ certification and SELinux/MLS support\*
- Implement business priorities by ensuring the most important jobs run first and complete on time
- Reduce risk by minimizing – and automatically recovering from – hardware failures

## Licensing Options

PBS Professional is available under two different licensing options for commercial installations and as an Open Source Initiative compliant version. At the heart of this is fostering common standards and a thriving HPC community and to this end, Altair has made a big investment by releasing the two licensing options. Each version of PBS Professional contains the same core codebase to benefit both the private and public sector.

**Visit [www.pbspro.org](http://www.pbspro.org) to learn details and join the community.**



## Key Features & Benefits

- Shrink-to-fit jobs boost utilization, especially before planned system outages – one supercomputing center recovered 800,000+ idle CPU hours in just a few months
- GPU / co-processor scheduling prioritizes use and manages access to all types of accelerators (nVidia, AMD) as well as the Intel® Xeon Phi™ coprocessor
- Estimated job start times enable you to plan your workflows and meet deadlines
- Backfill TopN scheduling eliminates wasted cycles without delaying top priority work
- Dynamic provisioning automatically changes OS to match changing workload demands
- Submission filtering "hooks" to change/augment capabilities on-site, on-the-fly
- Topology-aware scheduling optimizes task placement for all HPC network topologies (InfiniBand, SGI, Cray, IBM, GigE etc.), improving application performance and reducing network contention
- Job arrays allow for maximum throughput to schedule, execute and manage unlimited jobs.
- User, group, and project limits to implement fine-grained policy adjustments
- Plugins for "execution events" to easily support health checks, 3rd party integrations and site-specific customizations\*
- Tunable scheduling formula defines any policy, including on-the-fly "exceptions"
- Green Provisioning™ for automatic resource shutdown/restart to conserve energy (proven to lower one customer's energy use by up to 30%)
- User customizable "runjob hooks" ensure allocation management limits are strictly enforced
- Advance resource reservations guarantees resources for recurring needs
- Heterogeneous MPI allocations (e.g. 64GB mem for rank 0, but only 1 GB for others) reduce memory waste
- Job status with history (via "qstat -x"), so you never lose track of jobs
- Python is available everywhere allowing one script to be used across all architectures
- Preemption and checkpointing allows you to immediately run high-priority work

## The PBS Works Suite

HPCwire's 2014 "Best HPC Software" suite includes PBS Professional plus:

- **PBS Analytics** for job reporting and accounting
- **Compute Manager** for remote job submission, monitoring and management
- **Display Manager** for remote visualization
- **Software Asset Optimization** for right-sizing license investments

Learn more at [www.pbsworks.com](http://www.pbsworks.com)

## Technical features

GPU and coprocessor (Xeon Phi) scheduling	Heterogeneous clusters	Standing reservations	Checkpoint / restart
Scheduling formula	Kerberos	Eligible time	Job arrays
Fairshare	Age-based scheduling	Metascheduling via peer scheduling	Topology-aware scheduling
OS provisioning	License scheduling	Preemption	Job history (qstat -x)
Web services	Extensible plugin framework ("hooks")	Dynamic resources	Multi-core
Job dependencies	Estimated job start times	Interactive jobs	Backfill TopN
24x7 online community	Beyond petaflops scalability	User / group / project limits	"Shrink-to-fit" jobs
On-demand licensing	Green provisioning™	\$restrict_user	Cross domain solutions
Fail-over	Hybrid jobs (MPI+OpenMP)	MPI integrations	Power-aware scheduling
Policy-based scheduling	Over-subscription	EAL3+ security	Node health monitoring

## Supported Platforms

PBS Professional supports all major platforms and operating systems.



\*Limited availability – ask Altair about implementing this capability at your site.



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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