

# PBS Works for NVIDIA

GPU-Accelerated Computing made better with NVIDIA DCGM and PBS Professional®



Altair's PBS Professional brings NVIDIA customers worldwide the power of Graphics Processing Units (GPUs) and High-Performance Computing (HPC) to address vital computation in fields such as artificial intelligence, deep learning, self-driving cars, and virtual reality.

## The PBS Works Suite

An enterprise-class solution to increase productivity and reduce expenses for all organizations leveraging HPC.

- **PBS Professional:**  
Industry-leading workload manager and job scheduler for HPC environments
- **PBS Access:**  
Gateway to HPC and remote visualization for engineers and researchers
- **PBS Control:**  
Admin portal to control HPC workloads and optimize cluster and cloud use

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

Altair's PBS Works, an award-winning workload management suite, is the leading tool for engineers, scientists, and administrators to deploy, access, control and optimize HPC infrastructures.

## PBS Works 2018 includes:

- The latest version of Altair's industry-leading workload manager, PBS Professional, which comes with several significant updates.
- PBS Access, a brand-new intuitive user interface for HPC users.
- PBS Control, a powerful toolset for HPC administrators with seamless cloud bursting and deployment capabilities.

## PBS Professional:

Features in Altair's PBS Professional HPC workload manager are now available to NVIDIA Data Center GPU Management Tool (DCGM) users and bring new functionality and performance levels:

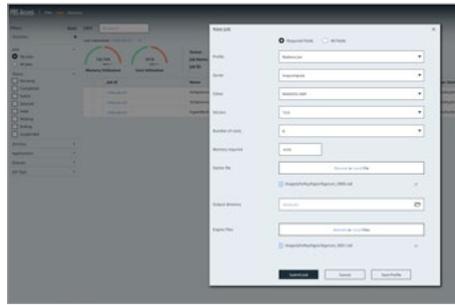
- Pre-job node risk identification and GPU resource allocation
- Automated monitoring of node health
- Reduced job terminations due to GPU failures
- Increased systems resiliency via intelligent routing decisions
- Increased job throughput via topology optimization
- Optimized job scheduling through GPU load and health monitoring

## PBS Professional Commercial and Open Source Licensing options:

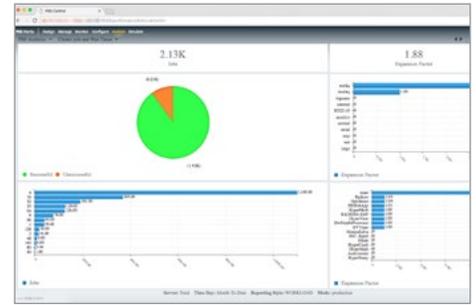
PBS Professional Commercial and Open Source licensing options serve the whole HPC world: the **private sector** where commercial terms, production hardness, and enterprise focus is paramount, and the **public sector**, where open source, collaboration, and leveraging bleeding-edge technology are important. These two



*PBS Professional® is a fast, powerful workload manager designed to boost HPC productivity*



*PBS Access is a job submission and monitoring portal for engineers and researchers*



*PBS Control gives administrators tools to manage clusters and cloud appliances*

sectors have traditionally been siloed, with no single tool able to reach critical mass. Our single code base with dual-licensing uniquely allows innovations to naturally flow between the two sectors, accelerating new developments and resilience for all.

### Key Features & Benefits of PBS Professional:

- GPU scheduling prioritizes use and manages access to all types of accelerators
- Estimated job start times enable workflow planning, helping meet deadlines
- Job arrays allow for maximum throughput; schedule, execute and manage unlimited jobs
- User, group, and project limits let you implement fine-grained policy adjustments
- Plugins manage job execution to easily support health checks, 3rd party integrations and site-specific customizations
- Advance resource reservations guarantee resources for recurring needs

### NVIDIA DCGM Integration:

NVIDIA DCGM provides timely identification and resolution of GPU issues through robust, active health monitoring and

diagnostics. DCGM includes multiple levels of health monitoring that can be initiated as part of the job life cycle or independently as needed.

- Run-time health checks: low-overhead, non-invasive health monitoring can be initiated while jobs are running, and queried at any time, without impact to application behavior and performance
- Prologue check: quick health check of the GPU (which takes a few seconds) before scheduling a job to ensure overall health and readiness
- Epilogue check: online GPU diagnostic tests to determine root cause issues, initiated upon job failure. These take a few minutes to complete

### PBS Access:

For engineers and researchers, Altair's new PBS Access provides a simple, powerful and consistent interface for submitting and monitoring jobs on remote clusters, clouds or other resources. Users can focus on core activities and spend less time learning how to run applications or moving data around, and are able to:

- Submit and manage jobs from anywhere with drag-and-drop simplicity
- Manage remote files and data directly from the secure web portal

- Watch progress of running jobs, both graphically and via tail -f
- Collaborate by sharing high-fidelity remote visualization sessions
- Protect IP by keeping proprietary data in house, and sending only pixels outside

### PBS Control:

For system administrators, Altair's new PBS Control provides 360-degree visibility and control to simulate HPC clusters and clouds:

- Monitor and troubleshoot in real time
- Report usage (hardware and software) by individual, group, project, or organization
- Understand trends to plan for future needs
- Simulate infrastructure changes to answer "what if" questions using real historical workloads with various hypothetical changes in quantities of nodes and licenses
- Define once, deploy anywhere: HPC appliances on public clouds, private clouds, or bare metal
- Leverage cloud bursting for peak workloads
- Define policies to automatically manage and control cloud costs

