



## Introducing the Portable Batch System, Professional Edition: PBS Pro™ 5.0

Building on the *de facto* standard for batch queuing on Linux clusters, and over five years of supercomputer workload management experience, PBS Pro™ 5.0 provides new features and enhancements in stability, reliability and fault tolerance, making it the trusted solution for workload management on UNIX platforms.

### PBS Pro™ features include:

**Portability** ...complies with the POSIX 1003.2d standard for shells, utilities, and batch environments.

**Configurability**... allows sites to establish their own scheduling policies for running jobs, using a flexible job scheduler, in both time-shared and space-shared (dedicated) environments.

**Expandability**... supports the dynamic distribution of production workloads across local and wide-area networks, and the logical organization of physically separate computing systems.

**Versatility**... adapts to a wide variety of administrative policies and provides an extensible authentication and security model.

**Job-Interdependency**... enables the user to define interdependencies between batch jobs such as execution order, synchronization, and execution conditioned on the success or failure of another specified job.

**Cross-System Scheduling**... provides transparent job scheduling on any system by any authorized user. Jobs can be submitted from any client system both local and wide area, crossing domains where needed.

**Multiple User Interfaces**... provides a graphical user interface (GUI), *xPBS*, for submitting both batch and interactive jobs, querying jobs, queues, system status, and job progress; also includes CLI.

**Security and Access Control Lists**... permits the administrator to allow or deny access on a per system, per group, and/or user basis.

## PBS Pro™ 5.0 Fact Sheet

**Job Accounting**... maintains detailed logs of system activities for charge back or usage analysis per user, per group, per project, and/or per system.

**Automatic Load-Leveling**... provides the capability to distribute the workload across a cluster of systems, based on hardware configuration, resource availability, and user requirements.

**Enterprise-wide Resource Sharing**... does not require that jobs be targeted to a specific computer system. Jobs can run on the first available system that meets their resource needs.

**Automatic File Staging**... provides users with the ability to specify any files that need to be copied onto the execution host before the job runs, and any that need to be copied off after the job completes.

**Comprehensive API**...includes a complete Application Programming Interface (API) for sites who desire to integrate PBS with other applications, or have unique job scheduling requirements.

**Parallel Job Support**... works with parallel programming libraries such as MPI, PVM and HPF. Applications can be scheduled to run within a single multiprocessor system or across multiple systems.

**Common User Environment**... offers users a common view of the job submission, job querying, system status, and job tracking over all systems.

**System Monitoring**... includes a graphical user interface (GUI) for system monitoring, *xPBSmon*.

**Computational Grid Support**... provides an enabling technology for meta-computing and computational grids including support for the Globus Grid Toolkit. In addition, PBS staff are leading the Grid Forum scheduling standardization efforts.

**Advance Reservations**... supports the ability to reserve computational resources in advance, for example, to ensure that half of your machine is available to run a demo tomorrow from 2-4pm.



### New in PBS Pro™ version 5.0:

- Easy to install binary distribution
- Optimized inter-daemon communications
- Job suspend and resume on all supported systems
- Enhanced fault tolerance
- Increased scalability (number of jobs can scale into the thousands)
- Support for SGI IRIX “cpusets”
- Enhanced standard scheduler
  - Easier to configure
  - Provides better load balancing
  - Provides backfilling
- Support for advanced reservation scheduling
- Computational Grid support
- Support for Globus
- Support for new systems
  - Solaris 2.7 & 2.8
  - FreeBSD 4.x
  - Cray SV1 running Unicors 10

### Supported Architectures:

#### Workstations/Servers:

- Sun SPARC w/ Solaris 2.3-2.8
- DEC ALPHA w/ Digital Unix 4.0d,
- Compaq Tru64 Unix
- HP 9000 w/ HP-UX 9.x,10.x, 11.x
- IBM RS/6000 w/ AIX 3.2, 4.1-4.3
- SGI systems w/ IRIX 5.x, 6.1-6.5.x
- Intel & Alpha systems: FreeBSD, NetBSD,
- Redhat Linux 5.x, 6.x, SGI Linux

#### Parallel Supercomputers:

- Cray T3D w/ UNICOSMK
- Cray T3E w/ UNICOS/mk2
- SGI Origin2000 w/ IRIX 6.4, 6.5.x
- IBM SP-series w/ AIX 3.2, 4.1-4.2 with (PSSP 2.1) and AIX 4.3 (PSSP 3.n)

#### Vector Supercomputers:

- Cray C90 w/ UNICOS 8, 9, 10
- Cray J90 w/ UNICOS 8, 9, 10
- Cray SV1 running Unicors 10
- Fujitsu VPP300 w/ UXP/v

### PBS Products offered by Veridian:

- PBS Pro™ software
- *Using PBS* Training Classes
- *PBS Administration* Training Classes
- *PBS Internals* Training Classes
- Annual Technical Support
- Installation Assistance
- Upgrade Assistance
- Customization
- System Analysis
- Needs Assessment

### PBS Pro™: The Trusted Solution for Workload Management

“PBS enabled the establishment of a common queuing environment across heterogeneous HPC systems and architectures.”

– C. Stephen Jones, USAERDC DOD MSRC

“We saw utilization rates jump from 20 to 70 percent on the [IBM] SP after the installation of PBS”

– David Tweten, NAS Facility

### About Veridian:

The PBS Products department of Veridian Systems is based in the heart of California’s Silicon Valley, and includes internationally recognized experts in batch job scheduling, distributed resource management, and supercomputing. Veridian is a private company with 1999 annual revenues of \$613 million, which operates at more than 50 locations in the U.S. and overseas, and employs nearly 5,000 people. The company is known for building strong long-term relationships with a highly sophisticated customer base. For additional information regarding Veridian, visit our website at [www.veridian.com](http://www.veridian.com).