PBS Works: The Trusted Suite for HPC Workload Management

Victor Wright, HPC Account Specialist

April 7, 2014
Overview

Founded ...
In 1985 as a product design consulting company

Today ...
A global software, services & technology leader
with 48 offices in 20 countries and 5,000 customers worldwide
# Customers

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<th>Automotive</th>
<th>Aerospace</th>
<th>Heavy Equipment</th>
<th>Government</th>
<th>Life/Earth Sciences</th>
<th>Consumer Goods</th>
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Altair Knows HPC

Altair is the only company that...

Makes HPC tools

PBS Works™

Develops HPC applications

HyperWorks®

and uses HPC application to solve real problems!

We know how to give companies the cost-effective resources needed to create market-leading products and drive business growth
Current HPC Trends

- GPUs and Co-processors
- Green Computing / Power Management
- Big Data
- Cloud Computing
- Exascale
HPC Workload Management Needs

Web-based Job Submission & Management
- Topology-aware scheduling
- Policy-based scheduling
- Energy-efficient scheduling
- Flexible hooks framework
- End-to-end availability
- Limitless scalability
- First-rate security certifications
- Global expert support
- Allocation management
- Comprehensive system monitoring
- Cloud enablement
- Simple, powerful GUIs

Remote Results Visualization

Job and Resource Scheduling

Analytics & Reporting
PBS Works Suite

- Increase Productivity
- Meet HPC Goals
- Reduce Expenses

Easy to Use
Hard to Break
Do More (with less)
Keep Track and Plan
Open Architecture

Compute Manager
RUN | MONITOR | MANAGE

Display Manager
VISUALIZE | ACCESS | COLLABORATE

PBS Analytics
VIEW | OPTIMIZE | FORECAST

Allocation Management
COMPUTE | STORAGE | BUDGET
SAO
VISUALIZE | ANALYZE | OPTIMIZE
HPC Job Scheduling & Workload Management
Faster time-to-results, better throughput and utilization

- Scalability and Reliability: Desktops to Clouds
- Within the TOP 3 Job Scheduling Tools (as published by IDC)
- Policy-driven Scheduling
- Accelerator Scheduling (e.g. MIC, GPGPU, FPGA)
- Green Provisioning™ for Power Management
- Topology-aware Scheduling
- EAL3+ Security Certified
- Extensible Plugin Framework
- Mature and Reliable Technology

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NASA’s Workload Manager of Choice for All NAS HPC Resources

~200k cores scheduled by PBS Professional

_Without its flexibility, it wouldn't have been able to handle what we're doing._

– NASA Ames

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Schedule  |  Prioritize  |  Scale
HPC App-aware Cloud Portal Tuned for End-Users
Simplify HPC services – no IT degree needed

- Single “pane of glass” for HPC work (zero client install – browser only)
- Drag-and-drop input decks to submit HPC work (custom options auto-populate)
- Watch progress & view intermediate results while jobs are running
- Post-process and visualize remote results (e.g., graph energies) without moving files
- Even fix inputs “in place” and re-run (without re-uploading big input files)
- Secure, unified access, anywhere… anytime

I push enter and my jobs run; results come back when they’re done.

– Major Automotive OEM
Display Manager

Remote Visualization of Big Data within a Single Portal

Visualize Your Datasets for Rapid Collaboration and Innovation

- Consolidate hardware and software resources
- A secure and traceable way to access their intellectual property
- Easy and accessible collaboration tools for globalized infrastructure
- Reduces software maintenance and deployment costs
- Instantaneous application invocation
- Flexible application resource allocation
- Allows for instant collaboration on large volumes of data through a simple interface, anywhere & anytime

Visualize  |  Access  |  Collaborate
PBS Analytics

HPC Accounting & Analytics Portal
Visualize Historical Usage for Optimized Returns on HPC Investments

• Allocate Costs & Plan for Future Capacity
• Visualize Workload & Historical Usage
• Data Drill-down to Underlying Data
• Filter by Project, App, User, Group, Queue, Host, …
• Canned reports out-of-the-box, and customize your own
• Aggregate data from multiple PBS Professional servers
• Analyze historical data as far back as PBS Pro 5.3
• Slideshow Mode for Continuous Display (in Lobby)
• Export to Customer Billing System

Maximizing our license utilization means we don’t have to buy a new license, set up another workstation, and hire another engineer to keep up with demand.

– Trelleborg
Allocation/Accounting Management System

- Uniquely supports multiple compute, storage and budget ($) resources
- Manages resource grants, quotas, budgets, limits, etc.
- Implements complex business logic
- Handles charge-back for used resources
- Reporting tools
  - Real-time reporting of accounting/allocation data
- Soon to be integrated with OpenStack cloud environment
- New capabilities/benefits
  - Single point of managing quotas across all storage systems
  - Daily stakeholder usage reports
  - Daily project usage reports
  - Single accounting system to manage complete environment

Compute | Storage | Budget
What is Software Asset Optimization (SAO) ?

- A rapidly deployed business analytics solution to visualize, analyze and optimize the utilization of enterprise software licenses
For More Information

• Get the latest news from PBS Works
  • www.pbsworks.com/

• Find out about Altair’s HPC Cloud offerings
  • www.altair.com/cloud/

• Learn more about Altair
  • www.altair.com/

• Contact me
  • Victor Wright
  • vwright@altair.com