



Intelligent HPC Workload Management



Moab® HPC Suite 8.0 **ENTERPRISE EDITION**

Enterprise HPC Challenges

While all HPC systems face challenges in workload demand, workflow constraints, resource complexity and system scale, enterprise HPC systems face more stringent challenges and expectations. Enterprise HPC systems must meet mission-critical and priority HPC workload demands for commercial businesses and business-oriented research and academic organizations. The Enterprise has requirements for dynamic scheduling, provisioning and management of multi-step/multi-application services across HPC, cloud and big data environments. Their workloads directly impact the revenue, product delivery and organizational objectives.

Enterprise HPC systems must process intensive simulation and data analysis faster, more accurately and most cost effectively to accelerate insights. By improving workflow and eliminating job delays and failures the business can more efficiently leverage data to make data-driven decisions to achieve a competitive advantage. The Enterprise is also seeking to improve resource utilization and manage efficiency across multiple heterogeneous systems. To speed the time to discovery, user productivity must increase, making it easier to access and use HPC resources as well as to expand to other clusters as workloads demand.

Enterprise-Ready HPC Management

Moab® HPC Suite - Enterprise Edition accelerates insights by unifying data center resources, optimizing the analysis process and guaranteeing services to the business. Through increased productivity, automated workload uptime, and consistent SLAs, Moab 8.0, for HPC systems and HPC cloud, continually meet enterprise priorities. It uses the battle-tested and patented Moab intelligence engine to automatically balance the complex, mission-critical workload priorities of enterprise HPC systems. Enterprise customers benefit from a single integrated product that brings together key Enterprise HPC capabilities, implementation services and 24/7 support. To continue speeding the time to discovery, Adaptive has added the following new use cases:

- **OpenStack integration** to offer virtual and physical resource provisioning for IaaS and PaaS
- **Performance boost** to achieve 3x improvement in overall optimization performance
- **Advanced workflow data staging** to enable improved cluster utilization, multiple transfer methods and new transfer types
- **Advanced power management** to reduce energy cost by 15-30% with clock frequency control and additional power state options
- **Enhanced web-based graphical user interface for administrators** to offer new reporting and monitoring capabilities

Accelerate Insights

Moab® HPC Suite – Enterprise Edition accelerates insights by achieving more accurate results delivered faster from HPC resources at lower costs by increasing overall system, user and administrator productivity. Moab provides the scalability, 90-99 percent utilization and simple job submission that is required to maximize productivity, ultimately speeding the time to discovery aiding the enterprise in achieving a competitive advantage due to their HPC systems.

Enterprise use cases and capabilities include the following:

- **Massive multi-point scalability** to accelerate job response and throughput
- **Workload-optimized allocation policies and provisioning** to get more results out of existing heterogeneous resources and reduce costs, including topology-based allocation
- **Unify workload management cross heterogeneous clusters** to maximize resource availability and administration efficiency by managing them as one cluster
- **Optimized, intelligent scheduling** packs workloads and backfills around priority jobs and reservations while balancing SLAs to efficiently use all available resources
- **Optimized scheduling and management of accelerators, both Intel Xeon Phi and GPGPUs**, for jobs to maximize their utilization and effectiveness
- **Simplified job submission and management** with advanced job arrays and templates



Moab® HPC Suite 8.0 ENTERPRISE EDITION

Moab manages the world's top systems and is ready to manage yours. We are the largest supplier of HPC job and workload management software to HPC sites. Many of the Top 500 and most innovative HPC systems rely on Moab to optimize throughput and utilization while balancing SLAs.

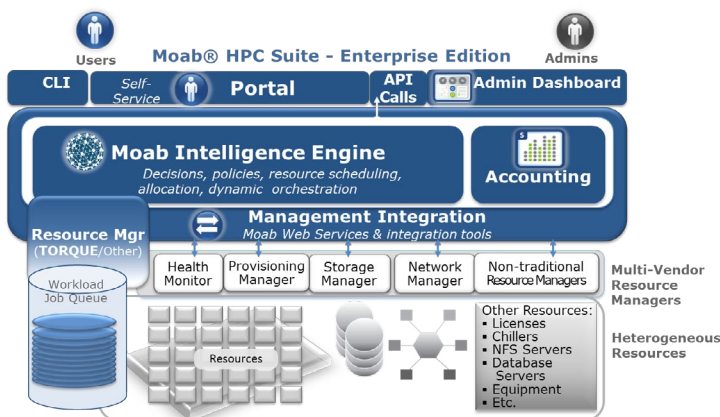
Guarantee Services to the Business

Job and resource failures in enterprise HPC systems lead to delayed results, missed organizational opportunities and missed objectives. Moab HPC Suite – Enterprise Edition intelligently automates workload and resource uptime in the HPC system to ensure that workloads complete successfully and reliably, avoid failures and guarantee services are delivered to the business. The Enterprise benefits from these features:

- **Intelligent resource placement to prevent job failures** with granular resource modeling to meet workload requirements and avoid at-risk resources
- **Auto-response to failures and events** with configurable actions to pre-failure conditions, amber alerts or other metrics and monitors
- **Workload-aware future maintenance scheduling** that helps maintain a stable HPC system without disrupting workload productivity
- **Real-world expertise for fast time-to-value and system uptime** with included implementation, training and 24/7 support remote services

Auto SLA Enforcement

Moab® HPC Suite – Enterprise Edition uses the powerful Moab intelligence engine to optimally schedule and dynamically adjust workload to consistently meet service level agreements (SLAs), guarantees or business priorities. This automatically ensures that the right workloads are completed at the optimal times, taking



into account the complex number of using departments, priorities and SLAs to be balanced. Moab provides the following benefits:

- **Usage accounting and budget enforcement** that schedules resources and reports on usage in line with resource sharing agreements and precise budgets (includes usage limits, usage reports, auto budget management and dynamic fair share policies)
- **SLA and priority policies** that make sure the highest priority workloads are processed first (includes Quality of Service and hierarchical priority weighting)
- **Continuous plus future scheduling** that ensures priorities and guarantees are proactively met as conditions and workload changes (i.e. future reservations, pre-emption)

Grid- and Cloud-Ready Workload Management

The benefits of a traditional HPC environment can be extended to more efficiently manage and meet workload demand with the multi-cluster grid and HPC cloud management capabilities in Moab HPC Suite – Enterprise Edition. It allows users to perform these actions:

- **Showback or chargeback for pay-for-use** so actual resource usage is tracked with flexible chargeback rates and reporting by user, department, cost center or cluster
- **Manage and share workload across multiple remote clusters** to meet growing workload demand or surges by adding on the Moab HPC Suite – Grid Option

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