

Moab Adaptive HPC Suite™

Scale, Complexity? What's Next?

Every new technology that accelerates workload execution or requires different run-time environments adds to the complexity of managing state-of-the-art HPC facilities. As node counts grow from thousands to tens of thousands and supporting multiple operating environments and specialized technologies while maintaining operational efficiency becomes increasingly challenging.

When resources are dedicated to project or operating-system silos flexibility is limited resulting in inadequate utilization, delayed results from disjointed workflows, inability to accommodate workload demands and missed SLA commitments.

The design and acquisition of additional systems to meet the needs of new or growing projects can cause delays of 6–18 months. Even when the capability of existing resources is sufficient, re-provisioning and re-allocating them to meet user requirements is labor intensive and simply takes too long. Efficiently mapping workloads to available resources is no longer enough, resources need to be dynamically adapted to meet user's workload requirements.

Moab Adaptive HPC Suite 6.0

Moab Adaptive HPC Suite™ overcomes the challenges of meeting changing workload demands by dynamically adapting the resources to the changing requirements of user workloads, streamlining processes, enforcing SLAs and achieving organizational objectives.

Moab Adaptive HPC Suite 6.0 dynamically adapts HPC resources on demand to match workload needs, an essential capability for delivering HPC as a Service and HPC clouds. Moab 6.0 and TORQUE 2.5.4 introduce support for hybrid GPGPU-based systems that scale to tens of thousands of nodes with user access managed by an intuitive self-service portal.

Moab Adaptive HPC Suite provides an extension of the core capabilities of Moab Cluster Suite (policy-based management, predictive scheduling, policy- and SLA-based resource allocation, and scalable architecture) by adding these essential adaptive capabilities—

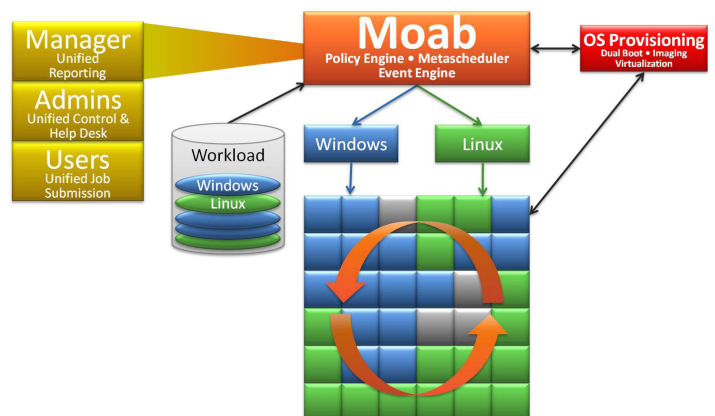
- ▶ dynamic resource modification—increases system flexibility and utilization, leverages benefits of resource consolidation, and increases customer satisfaction
- ▶ energy-aware resource management—reduces response times, energy usage, and costs

Dynamic Intelligence

Moab Adaptive HPC Suite changes a node's operating system, software, and other resources on demand in response to workload needs.

As an intelligent resource manager, Moab determines when the OS mix should be modified for optimal efficiency, based on defined policies and service-level agreements and on current and projected workload. When specified conditions are met, Moab automatically triggers the OS change on the needed number of nodes using a site's preferred OS-modification technology, such as dual boot, diskful, or stateless (diskfree) provisioning.

Moab's hybrid-OS model also consolidates administration and centralizes job submission across OS platforms. Administrators can easily manage the policies and workload for multiple OS environments using Moab's unified console. Moab can also



make the dual-OS nature of the system transparent to end users by applying application and workload information that ensures jobs run on the correct OS without the need for users to specify an OS.

By enabling dynamic, automatically triggered reprovisioning of operating systems, software, and other resources, Moab Adaptive HPC Suite helps achieve maximum resource utilization and increased ROI.

Intelligent Energy-Saving Policies

Managing the usage—and costs—of energy is of increasing importance for computing facility managers and directors worldwide. Moab Adaptive HPC Suite offers optional energy-management solutions particularly suited to HPC environments.

Moab seamlessly and automatically monitors system energy use to give managers and administrators a global view of power consumption.

Most important, Moab can actually reduce energy use through workload-consolidation policies that intelligently pack workload on underutilized servers and through intelligent power-management policies that automatically place idle servers in power-saving modes.

Benefits

- ▶ Integrate and unify management across diverse resources and environments
- ▶ Control and share resource usage among users, groups, and projects
- ▶ Simplify use, access, and control for both users and administrators
- ▶ Automate tasks and processes to streamline job turnaround and reduce administrative burden

- ▶ Implement a scalable architecture that is grid- and cloud-ready, compatible, and extensible
- ▶ Reduce energy use and costs by applying intelligent workload consolidation and automated power management
- ▶ Maximize resource utilization by eliminating costly, inflexible OS-specific resource silos and thereby accomplishing more with your existing resources
- ▶ Simplify the use and management of mixed-system environments with a unified interface and automated service-level enforcement
- ▶ Dynamically adapt from one OS to the other based on workload and policies to balance resource usage
- ▶ Automate full organizational processes that include multiple operating systems—various “flavors” of Linux, as well as Windows†, applications
- ▶ Tune and reserve the future OS environment mix based on scheduled activities and historical usage patterns

Delivering HPC as a Service

Moab Adaptive HPC Suite dynamically adapts HPC resources on demand to match workload needs while enforcing quality-of-service guarantees and service-level agreements .

With Moab Adaptive HPC Suite, your organization can—

- ▶ Increase resource efficiency 10-30% for 90-99% utilization‡
- ▶ Gain control with automated tasks, policies, and reporting
- ▶ Boost cost-effectiveness, improve response times, and increase customer satisfaction

†A subset of Moab’s management capabilities is available when Windows HPC Server 2008 is included in a mixed environment.

‡Utilization figures are derived from surveys of Moab users.

Let’s Talk . . . Set Up a Demonstration . . . and Test in Your Environment

- ▶ An Adaptive Computing solutions advisor can guide you to the products and services that will best meet your needs, and will work with you to set up a live, online interactive demonstration designed specifically for your organization.
- ▶ Contact a solutions advisor by phone or email, or visit our Web site today—

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