



Dynamic Provisioning Solution

Dynamically provision OS and VMs based on job submission

Benefits:

- Delivers higher service level to end users with a transparent, flexible and dynamic infrastructure
- Saves infrastructure and IT management costs with automated solution
- Increases SLA in a shared environment without sacrificing overall system utilization
- Provides historical workload data and resource requirement data for capacity planning

Highlights:

- Dynamic system provisioning based on workload and policies
- Centralized management console for manual provisioning and control of the automated provisioning
- Visibility to IT administrator for ease of troubleshooting and user support
- Isolate job run time environments from each other on multi-core systems
- Migrate jobs from one machine to another, without stopping them in order to optimize job scheduling and guarantee resource allocation and ownership
- Enhance fault tolerance, eliminating work lost due to hardware failure
- Optimize application license usage by running a job on any slot, and later migrating it to the fastest machine

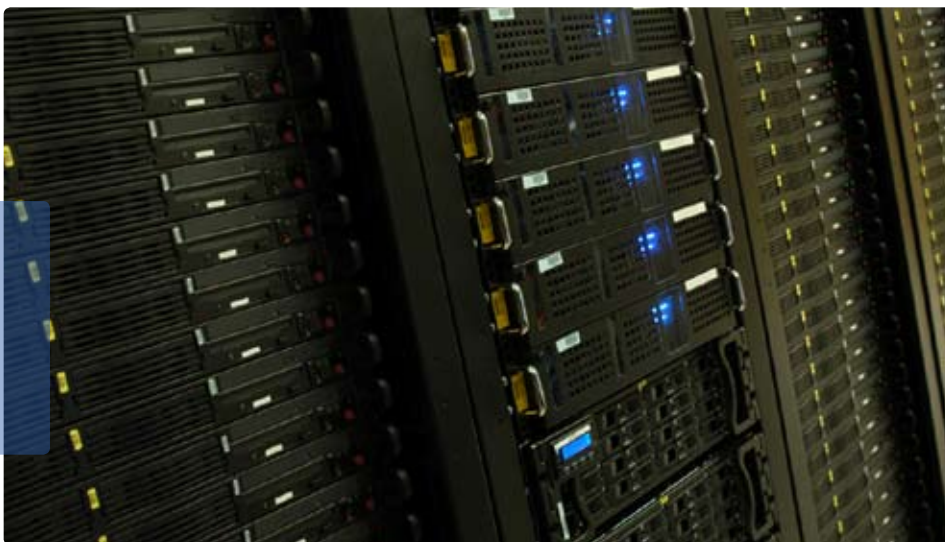
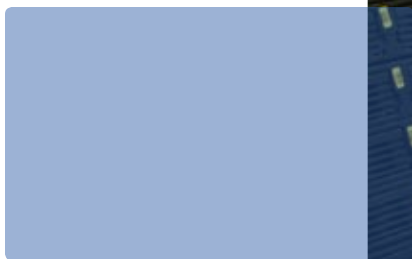
Dynamic VM Provisioning Solution

The Dynamic VM Provisioning solution reduces HPC management cost by dynamically provisioning virtual machines (VM) based on monitored workload and job resource requirements. The solution is delivered by Platform Computing leveraging Platform LSF and Platform VM Orchestrator.

Now that multi-core CPUs are mainstream in the HPC environment, it is very common for a machine to be shared by many applications and many users. However, sharing a machine poses many challenges:

- The specifics of the application run time environment within a particular operating system (OS)
- Application run time environment preparation slows down the job scheduling process
- One misbehaving job can cause OS problems and affect other jobs
- Once a job is on the host, it is difficult to move it away until it is finished, which means ownership of expensive resource (large memory machine, expensive licenses etc.) in a shared environment is difficult to enforce
- Job scheduling is sub-optimal due to a lack of ability to move running jobs around, especially in an environment with many long running jobs





As VM technology matures, the integration between workload management and VM technology allows users to overcome all these challenges. Dynamic VM Provisioning is a unique solution offered only by Platform Computing. The end result is an agile cluster optimized for maximum resource utilization and job throughput.

Who needs the Dynamic VM Provisioning solution?

A typical candidate for this solution would be a company that is looking for ways to increase utilization for expensive resources. Without the capability of migrating jobs from machine to machine, the organization typically has to statically configure machines for large jobs, medium jobs, and small jobs. This defeats the purpose of sharing and causes low resource utilization. By running jobs inside a VM, the organization will be able to run small jobs on large memory machines, and migrate those jobs when high priority jobs need large memory machines. Dynamic VM Provisioning will solve these issues and help the organization build a more agile and more manageable HPC environment.

Dynamic OS Provisioning Solution

The Dynamic OS Provisioning solution reduces HPC workload management costs in heterogeneous clusters where demand for one operating system (OS) far outstrips demand for other OSs. This solution, delivered by Platform Computing, allows you to build your cluster in whatever hardware configuration best suits your needs, but still retain flexibility to provision resource to handle current or future fluctuations in OS demand.

Who needs the Dynamic OS Provisioning solution?

A typical candidate for this solution would be an organization with a large cluster serving multiple departments or work groups. Due to different application needs, each group or department needs nodes in the system to dynamically change OS based on the requirements of a submitted job. Commonly, a mixture of Windows and/or Linux operating systems, with varying configurations will be required to support the applications. The challenge is that at different times, the split among multiple OSs needs to change based on the user and application demands. Although a node can be easily booted or provisioned with a particular OS from a central location, manually managing such change is tedious, troublesome, time consuming, and as a result, impractical. Automatic, dynamic OS provisioning based on workload is the only viable solution to this problem.

The Dynamic OS Provisioning solution uses Platform Manager as the provision engine and Platform LSF as a workload scheduler. The dynamic OS provisioning add-on module works with Platform LSF and Platform Manager to allow nodes to change personality dynamically and automatically based on user demands. The solution can also be extended to support other provisioning tools.

Platform™

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World Headquarters
Platform Computing Inc.
3760 14th Avenue
Markham, Ontario
Canada L3R 3T7
Tel: +1 905 948 8448
Fax: +1 905 948 9975
Toll-free tel: 1 877 528 3676
info@platform.com

Sales - Headquarters
Toll-free tel: 1 877 710 4477
Tel: +1 905 948 8448

North America
New York: +1 646 290 5070
San Jose: +1 408 392 4900
Detroit: +1 248 359 7820

Europe
Basingstoke: +44 (0) 1256 883756
London: +44 (0) 20 7977 1480
Paris: +33 (0) 1 41 10 09 20
Düsseldorf: +49 2102 61039 0
Munich: +49 89 517397 52
Oslo: +44 1256 883756
info-europe@platform.com

Asia-Pacific
Beijing: +86 10 82276000
Xi'an: +86 029 87607400
asia@platform.com
Tokyo: +81 (0)3-6302-2901
info-japan@platform.com
Singapore: +65 6307 6590
lliew@platform.com

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