

Using and Managing a Linux Cluster as a Server

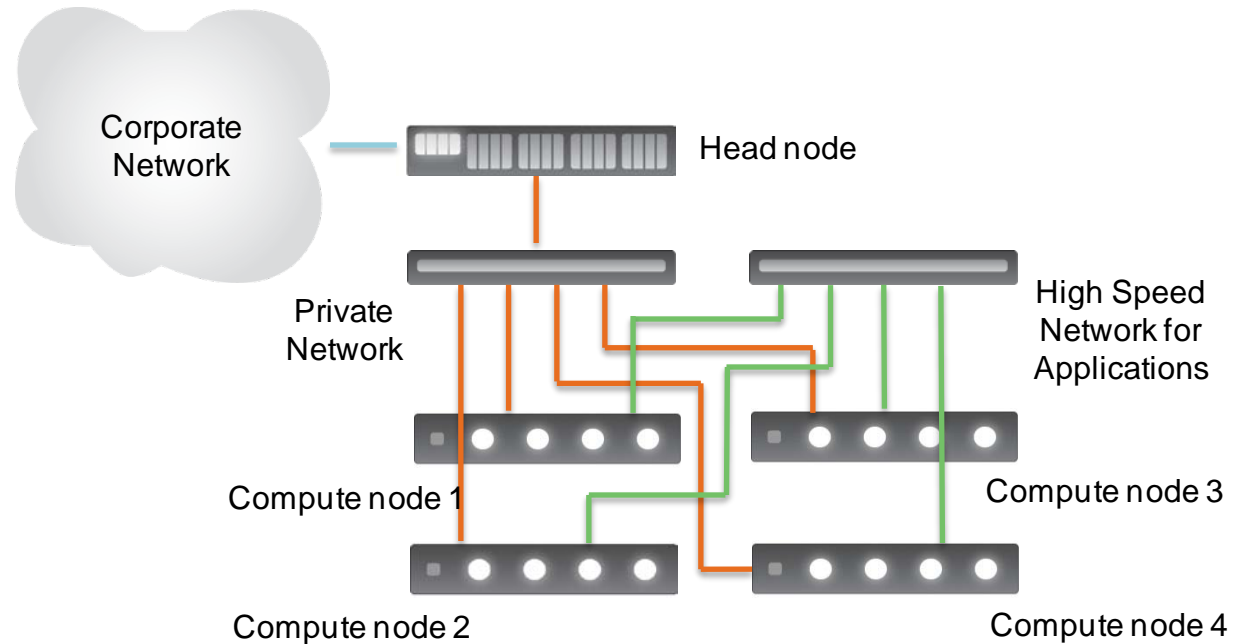
William Lu, Ph.D.

Cluster

- **A cluster is complex**
- **To remove burden from users, IHV typically delivers the entire cluster as a system**
 - Some system is delivered as a personal supercomputer

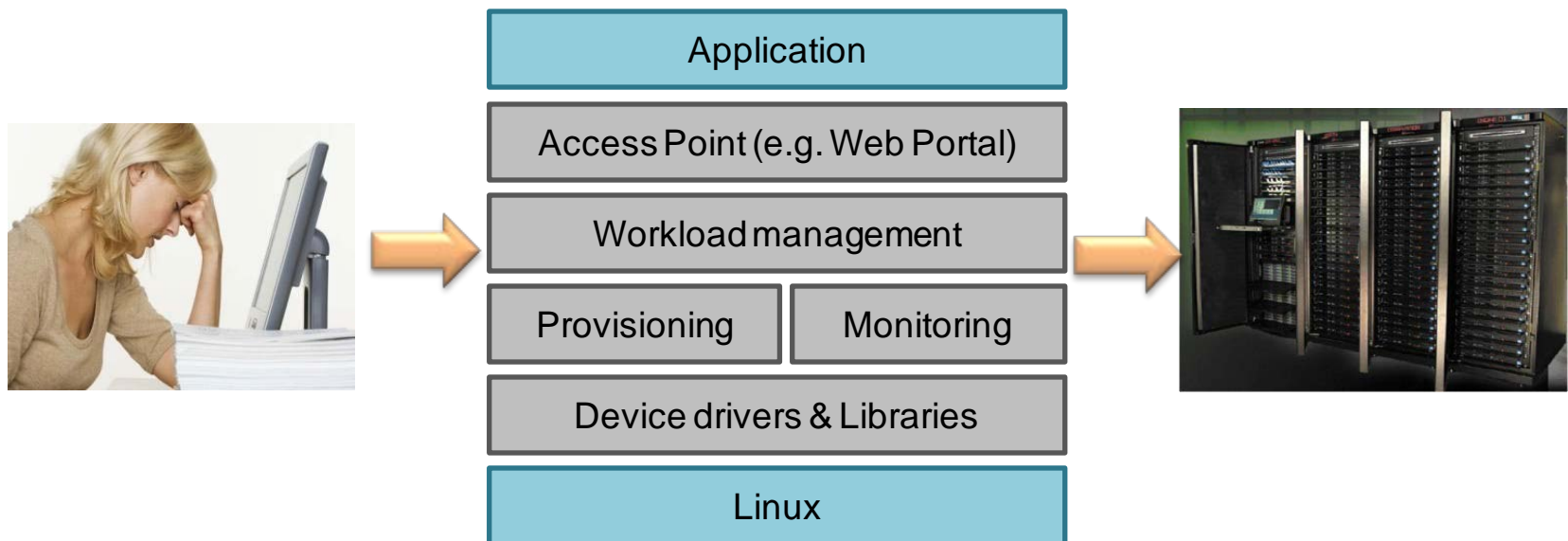


Courtesy of Cray



Linux Cluster Management Software

- **Cluster Management Software is more than just an OS**
- **Getting all the components right and working together requires special expertise across system to applications**



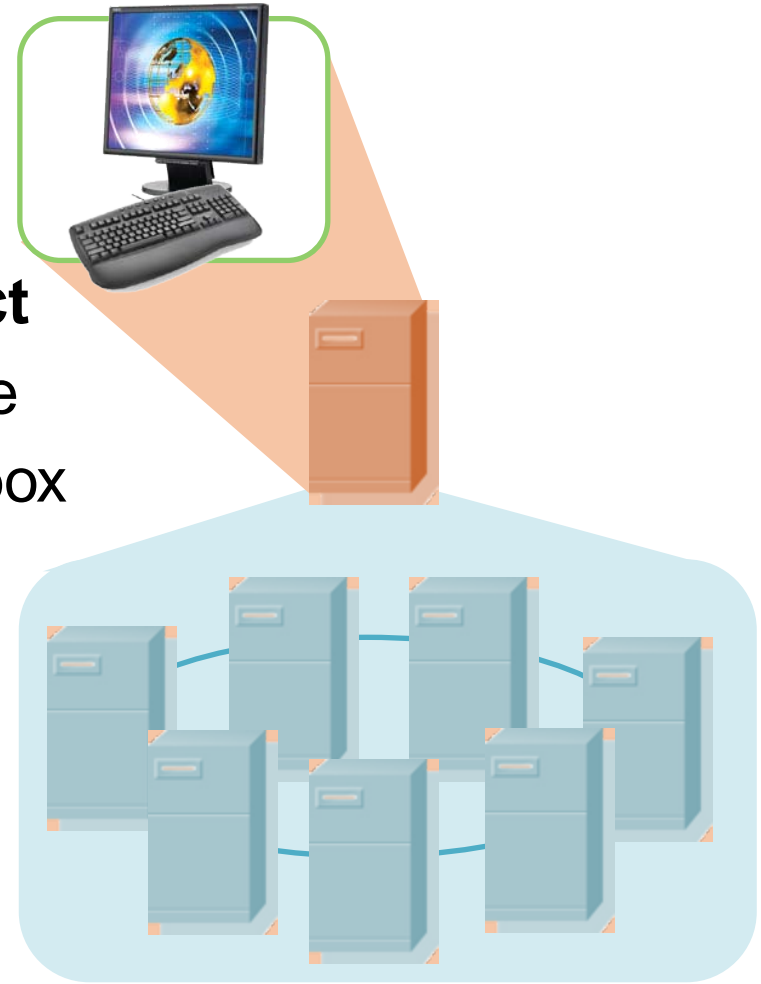
What We Need

User:

- Workstations
- HPC Applications

Simply Add a Software Product

- **Install** easily from one console
- **Integrate** applications out of box
- **Access** from anywhere
- **Secure** data
- **Supported** by HPC experts



Introducing Platform HPC

Complete Cluster Management Solution

- Powerful cluster management
- Robust and high performance workload management
- Commercial MPI library
- customizable web portal

Integrated Application Support

- Out of box job submission portal for commonly used commercial applications
- Easily customizable application templates
- User portal for accessing jobs and data

Fully Certified and Supported

- Certified with hardware vendors
- Supported by the world's largest HPC software support organization



Platform HPC



Complete Cluster Management Software

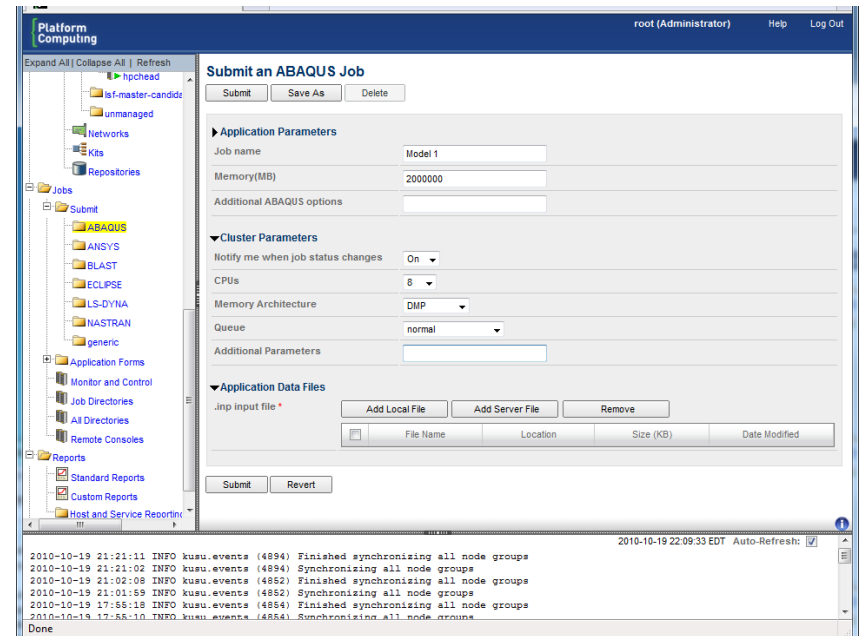


	Platform HPC	Alternative Commercial Solution	Alternative Open Source Solution
Linux Provisioning & Patching	√		√
Windows HPC Server OS Support	√	√	
Dual Windows/Linux Support	√		√
Single Web Portal	√		
Workload Management	√	√	√
Integrated Application Support	√	Limited	
One-step Install	√		
Configurable Web Portal Interface	√		
Commercial MPI Library	√		Open source MPI

User Web Portal

Templates for commercial apps

- ANSYS Mechanical
- ANSYS Fluent
- ANSYS CFX
- LS-DYNA
- MSC Nastran
- Schlumberger ECLIPSE
- Simulia Abaqus
- Blast



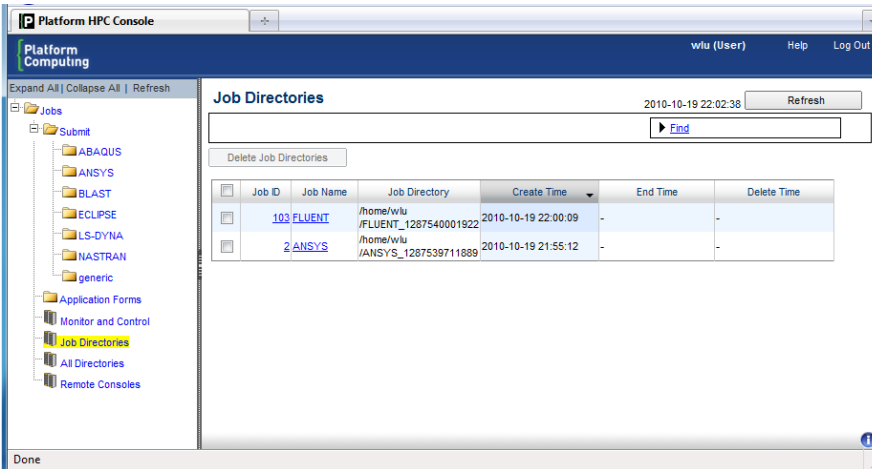
Self-documenting

- User friendly interfaces
- Minimize job submission errors

Start Using Your Cluster Without Running Scripts

Job and Data Access Web Interface

Job Data



Makes it easy to remotely submit, monitor, & manage jobs

- Customizable interface
- Job data management
- Interactive job support
- Job monitoring and control
- Job status notification

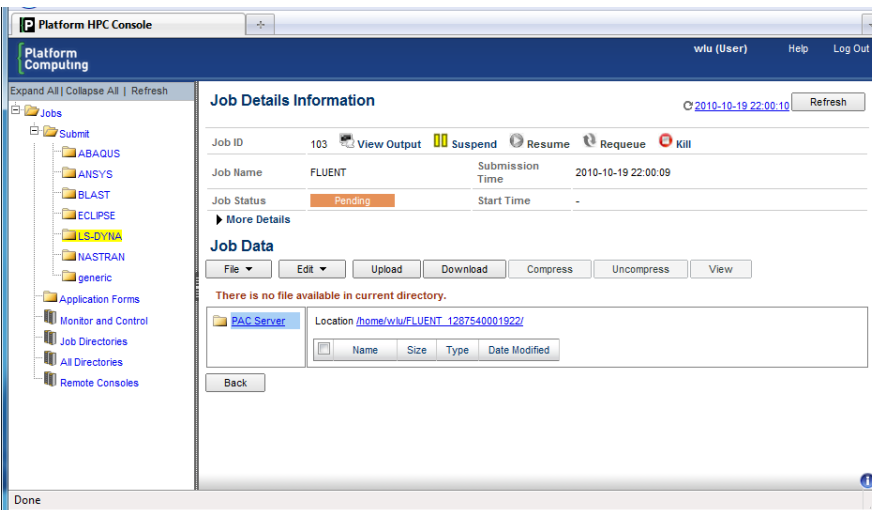
Simplified application deployment

- Easily package software as kits
- Pre-integrated commercial application support

Increasing security

- Restrict access to servers
- Restrict access to data

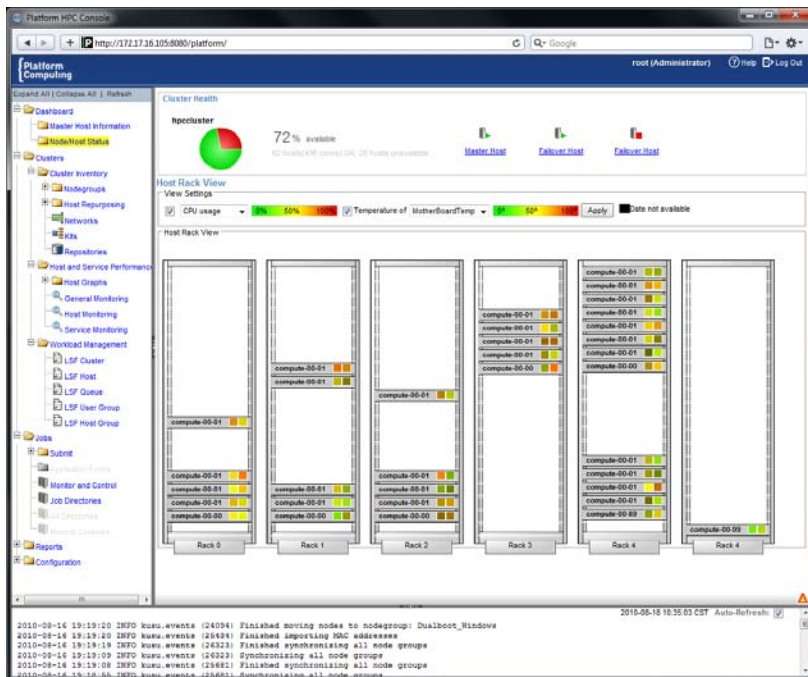
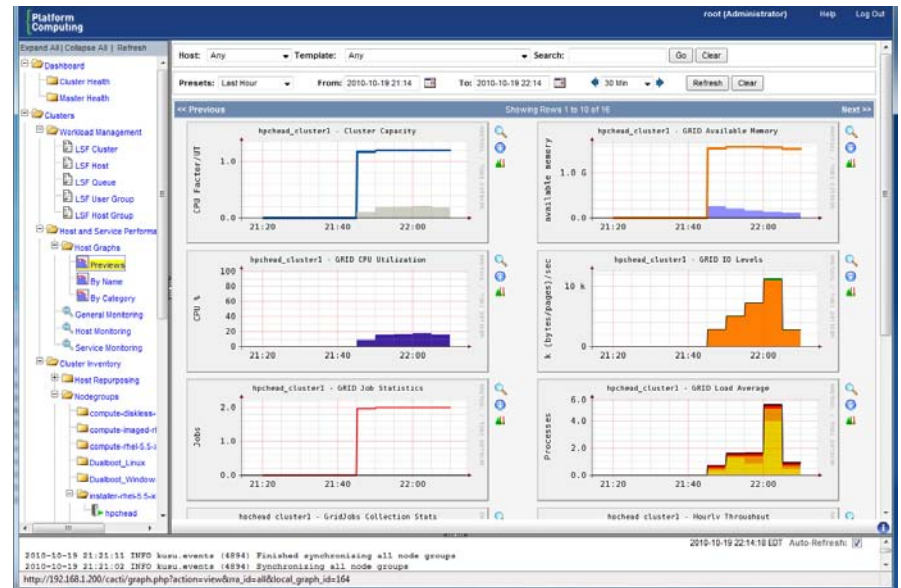
Job Status



Monitoring

Dashboard with Rack View

- Overview of the entire system
- Zoom in for detail information



Rich Charts and Reports

- Correlate workload with system performance
- Short term views and long term trends

Provisioning

- Flexible network interface setup
- Multiple provisioning methods
 - Package based provisioning – Enabling easy application deployment
 - Image based provisioning
 - Diskless support

The screenshot displays the Platform HPC Console interface. The main window is titled "Platform HPC Console" and shows the user "root (Administrator)". The interface is divided into a left-hand navigation pane and a main content area. The navigation pane shows a tree view under "Cluster Inventory" with sub-items like "Host Repurposing", "Nodegroups", "Dualboot_Linux", "Dualboot_Windows", "installer-rhel-5.5-x86_64", "hphead", "lsf-master-candidate", "unmanaged", "Networks", and "Kits". The "Nodegroups" folder is expanded, showing a list of nodegroups. The main content area displays a table of nodegroups with columns for "Nodegroup", "Description", "Reserved", and "Sync Required". The table contains the following data:

Nodegroup	Description	Reserved	Sync Required
compute-diskless-rhel-5.5-x86_64		✓	
compute-imagcd-rhel-5.5-x86_64		✓	
compute-rhel-5.5-x86_64		✓	
Dualboot_Linux	Boot Linux Partition		
Dualboot_Windows	Boot Windows Partition		
installer-rhel-5.5-x86_64		✓	
lsf-master-candidate			
unmanaged		✓	

At the bottom of the console, there is a log window showing the following messages:

```
2010-10-19 21:21:11 INFO kusu.events (4894) Finished synchronizing all node groups
2010-10-19 21:21:02 INFO kusu.events (4894) Synchronizing all node groups
2010-10-19 21:02:08 INFO kusu.events (4852) Finished synchronizing all node groups
Done
```

Dynamic Multiple OS Boot

Platform HPC dynamically changes the OS based on workload

- Linux and Windows operating system rebooting
- Based on resource policies to simplify management
- Dynamic, transparent to end users



Application Parameters		▼ Cluster Parameters	
Job Name	STRUCTURE_004A	Notify me when job status changes	On ▼
Release *	6.8.1 ▼	CPU(s)	12 ▼
Memory(MB)	2000	Memory Architecture	DMP ▼
Additional ABAQUS options		Span	▼
Type of Host *	<input type="radio"/> Linux (SLES 10) <input checked="" type="radio"/> Linux (RHEL 5.4) <input type="radio"/> Windows 2003	Queue	normal ▼

Platform HPC



Heterogeneous Cluster

Platform HPC: Fully Certified and Supported

Supported by Platform Computing, the world leader in HPC management solutions

- Nearly two decades of HPC experience
- Significant investment in certification & validation
- Support “from the source”
- 24x7 global support
- eSupport from Platform for clients with a support contract
- Automated subscriptions for bulletins, patches & updates
- Free software upgrades

“I really don’t know how we would have done it without Platform and the support that we get.”

Dr. Athanasoulis, Harvard Medical School

“This was a great support experience for me. One of the best I have had. Even better considering the fact we are in different parts of the world.”

Major Asian Energy Corporation

“Thanks a lot. You saved me. All my budget for Platform Support over the past few years has yielded a return as good as gold.” ***Prestigious US School of Public Health***

Platform HPC Partner Products



Platform HPC *Enterprise Dell Edition*



Cray Cluster Manager



HP Linux Value Pack



Platform Cluster Manager Fujitsu Enterprise Package

Platform HPC

More science, less computer science

Easy, integrated application support

Powerful performance

Scalable resource management

Easiest and best customer support

Thank you