

# Harvard Medical School builds flexible computing cloud to enable world-class research



## Customer

Harvard Medical School

## Industry

Life Sciences

## Challenges

- Large and dispersed group of research scientists and teams required top-flight dynamic resource management tools to efficiently meet all users' requirements
- People represent the most expensive resource, so software must be reliable, easy-to-use, and effective

## Solution

Platform LSF

## Business Results

- Built an internal cloud computing environment and are now looking at opportunities to connect to external cloud environments for additional ability to dynamically meet demand for resources with cost-effective supply
- Platform's experience in developing technology, support and service allows Harvard to focus resources on core competencies rather than cluster performance and resource management
- Allows the systems team to focus on systems not process
- Allows the research team to focus on research not systems

## Using Industry Leading Software to Meet Demand for Compute Resources

The Harvard Faculty of Medicine conducts research in numerous locations around Boston. Six academic basic science departments are housed in and around The Quad, the nucleus of Harvard Medical School. Fifty clinical departments conduct vast amounts of basic and clinical research. Many of the faculty appointed to these departments are based at 17 affiliated institutions, including teaching hospitals.

With such a dispersed and varied team of research staff and facilities, Harvard Medical School requires top-flight resource management and scheduling software to ensure that demand for compute resources can be dynamically and efficiently matched with available supply at the lowest possible cost.

"High performance computing is just at the center of discovery today and it's personally gratifying for me that we are enabling researchers to one day find the cure for cancer, to continue the discovery and genomics and proteomics and that the impact of our work here can actually make a big difference on alleviating human suffering caused by disease," says Marcos Athanasoulis, Dr. PH, Director, Information Technology, Harvard Medical School.

We've been delighted to have Platform as a partner. It's really been key to our success in meeting the needs of our users in a flexible way. I really don't know how we would have done it without Platform and the support that we get.

Marcos Athanasoulis, Dr. PH,  
Director, Information Technology  
Harvard Medical School

## Platform LSF Key to Harvard's

### Ability to Build Shared Infrastructure

"We now have 500 users and over 1,000 cores. That will grow to 3,000-5,000 cores in coming years," he continues. "It started with a few terabytes of data, we now have 130 terabytes. So certainly by the metric of our people using it, it has been a fantastic success."

Platform LSF plays a key role in enabling Harvard's cluster to dynamically supply demand for compute resources to all of the users across the many organizations accessing the cluster. "Our primary scheduler is Platform LSF and we use that to handle all of the workflow of the cluster," says Dr. Athanasoulis. As Harvard's reliance on High Performance Computing rises, Platform LSF will play an even more important role, because of Platform's commitment to evolve with the needs of its customers.

"One of the things we're actually looking at is how do you start to move the computation towards the data rather than the data towards the computation?" says Dr. Athanasoulis. "We're looking at working with Platform and others, when we've grid-enabled certain applications, on how we transport the actual jobs to the places where the data reside. Platform is really key to our ability to do that sort of thing."

In fact according to Dr. Athanasoulis, Platform LSF is so critical to the shared infrastructure model that Harvard is building, that about half of the nodes in the cluster were added as a result of the perception among the owners of the nodes that including their nodes in the cluster would deliver major performance enhancements. He also cites the ease with which Platform LSF fits onto a heterogeneous environment. Harvard's cluster seamlessly integrates x84\_64, OSX and PowerPC SMP systems.

## Plans for the Future

"An area that we're very interested in working with Platform and other vendors is to integrate into the cloud so that we can really provide on demand resources," says Dr. Athanasoulis. "So someone who's willing to have their job run on Amazon EC2 can still submit it through Platform LSF, and we can then go and dynamically create virtual machines out of the cloud. As long as we have their 33 digit billing code that we can bill them back for those service, we would love to enable that sort of thing."

Harvard, like many of Platform's customers in the research industry sees the relationship with Platform as one of the key benefits of using Platform LSF. "We've been delighted to have Platform as a partner. It has really been key to our success in meeting the needs of our users in a flexible way," says Dr. Athanasoulis. "I really don't know how we would have done it without Platform and the support that we get. The flexibility of the tool and the reporting aspects that we can get really enabled us to provide this service."

### Platform is the Best Option for Serious Research Institutes

Harvard is unlikely to be looking at other options when they build out their cluster in the next couple of years. For a leading edge research institute, only the best commercial software is good enough to do the job.

"While there are open source alternatives among others, what we believe and what we've found in practice when we've tried [other workload management software] is that while you might save a few dollars on the licensing cost, the most expensive resource we have here is people," Dr. Athanasoulis says. "So the amount of time it takes to configure a similar setup to what we can do with Platform is just not time we have to spare."



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