Bright Computing

Phoenix Analysis & Design Technologies uses Bright Cluster Manager for new Cores on Demand Infrastructure as a Service Product Offering

CASE STUDY

"With Cores on Demand, PADT buys and hosts a cluster and grants customers affordable short term leases to use the cluster as if it's their own."

— Ahmed Fayad
PADT's Cores On Demand Manager

Phoenix Analysis & Design Technologies (PADT) is one of the Southwest's leading providers of turnkey engineering services and products for simulation, product development, rapid prototyping & alternative energy. They have a strong focus on turbine engines (especially fans and propellers) and they've also had good success in medical device product development.

As a major ANSYS engineering simulation channel partner, the company found that the models produced to simulate electrical mechanical engineering designs and conduct stress tests were growing larger and larger. As the models grew, so too did the need for compute power.

In response to its customers' need for a more affordable way to gain access to the compute power needed for these massive modeling efforts, PADT established a new Cores on Demand infrastructure as a service (IAAS) product offering. To manage the Cores on Demand service, PADT recently turned to Bright Cluster Manager.

Ahmed Fayad, PADT's Cores On Demand Manager, explains, "With Bright Cluster Manager, PADT can strip the cluster back to the basics and bring it back up with all the necessary software packages needed to run the cluster, without having to go in manually one by one."

The Challenge

Ahmed Fayad considers his biggest challenge in launching the Cores on Demand service to be efficiently and securely overcoming software complexities and time associated with getting a cluster running – and then wiping it clean and getting it ready for the next customer.

He explains that PADT saw a huge need among customers conducting modeling who could neither afford to purchase huge amount of compute resources, nor hire an external company to conduct their modeling. "With Cores on Demand, PADT buys and hosts a cluster and grants customers affordable short term leases to use the cluster as if it's their own."

For this, PADT needed a secure environment, so the customer is the only

one who has access to the cluster. It had to be encrypted, yet quick and easy to reset, because the customer might be on it for only two weeks, after which it had to be readied for the customer next in line.

They had to be able to strip the cluster back to the basics and bring it up again with all the software packages needed to run on it. "If we had to manually reset to wipe the data to bring it to a vanilla state it would take a good portion of two or three days. To build automation ourselves would have taken a steep learning curve, plus we would have had to learn 20-25 software tools and script them together to get it to work seamlessly and cleanly. By using Bright, we could quickly go from our internal cluster to this IAAS model."

The Solution

Fayad contacted Bright Computing, based on a recommendation of a colleague who had demonstrated the software. After getting a short technical demonstration and explanation by a Bright application expert, Fayad was convinced the solution was right for the PADT application. Before opting for Bright Cluster Manager, Fayad had looked at other open source tools, including Rocks Cluster Distribution, a Linux distribution intended for high-performance computing clusters. While acceptable, it was not intuitive or easy to use. The biggest drawback was that the person implementing it had to be the admin, which was not appropriate for their production environment.

"I went through the Bright Cluster Manager documentation, which was comprehensive enough to get started," said Fayad. "I just had to ask a few specific questions and really did not need much more assistance. I took the CD and the admin manual and went through it step by step, answering the questions posed. Within a day or two I was running the cluster."

According to Fayad, the base work was handled using the Bright installation wizard, which he said posed all the relevant questions needed to configure the cluster's back end. He was then able to customize the setup to bring it to an offering. He compared the customization to that done by a Microsoft system admin who wants to roll out a change from Office 2012 to 2015 and needs to install the changes machine by machine. "With Bright, you make the needed changes once in an image. Then, with a single click all the nodes in the cluster get the latest and greatest."

The Result

From the moment Bright Cluster Manager was rolled out, Fayad was impressed with the resilience of the software, which he called well written and tested. Strong and reliable, it had no buggy codes or buttons, and no errors.

Fayad's team also conducted benchmarking to determine if using the Bright Cluster Manager management software resulted in any performance hits. They found that performance numbers using the sophisticated and useful management tool were comparable to those achieved when going barebones and doing everything manually.

He says that the Bright engineers were very responsive and demonstrated a deep knowledge of their product and PADT's requirements. "Bright support is more than adequate. They never talk down to their customer. Even when we had specific challenges, they came back with a specific solution to satisfy our needs and those of our customers. For example, some of our customers have International Traffic in Arms Regulations (ITAR) restrictions. Bright pushed us to apply certain features to meet ITAR requirements. They helped us with partitioning of clusters, to ensure users cannot see each other's files and software, or what is running or processing on the cluster."

In addition, Fayad finds Bright Cluster Manager's reporting and monitoring services to be extremely powerful. PADT can customize dashboards, reports, and system alerts and use the monitoring features whenever they require customized benchmarks. The features are useful for pinpointing what is consuming resources, like bandwidth, memory, or RAM. The alerts work well; the system sends an email if it faces any issues based on the parameters established. "You get a single pane of glass view of the entire environment," said Fayad. "The tools and ability to monitor are pre-implemented and it's up to you to tweak the numbers for the individual circumstances."

After conducting the tests, PADT deployed two clusters, put them on the internet, and developed the offering. They got their first customer last summer, generating the first revenue from the Cores On Demand product. Another customer, a leading MEP building systems firm utilized Cores On Demand to help simulate and optimize designs for a new NFL team stadium in the southwest. In addition; several internal customers have also successfully used the resource to simulate different engineering models.

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