International Pharmaceutical Company uses Bright Cluster Manager to Effortlessly Integrate the Cloud Into Their Existing IT Infrastructure

This major pharmaceutical company used Bright Cluster Manager to extend their existing IT infrastructure into the cloud. Now their cloud instances can be provisioned, monitored and managed as easily as the physical servers in their data center.

This pharmaceutical company took advantage of Bright Cluster Manager's ability to provision, monitor and manage its on-site clusters and cloud instances in Amazon Web Services (AWS).

The Customer

A major pharmaceutical company explored use of Bright Cluster Manager to provide a single pane of glass into its servers, clusters and instances in the AWS cloud. The servers are distributed between four geographically distinct locations, and require support from the systems-administration team that is located at one of these four locations. Using Altair PBS Professional, the company has configured each of the four geographically distinct locations as peers from the workload-management perspective. PBS Pro maintains a real-time inventory of node availability on a per-location basis. Jobs submitted to PBS Pro are separated into six types based upon resource requirements that detail job size, processing and memory requirements, urgency, software image and other needs.

The Challenge

The challenge integrate AWS cloud into the existing IT infrastructure with minimal administrative overhead, and no disruptoin to user workflow.

The Solution

Bright Cluster Manager is integrated with PBS Pro and can incorporate IT resources based in AWS clouds. This customer added an instance in the AWS cloud as a fifth location. Because PBS Pro is aware of workload demands, it can direct Bright to dynamically provision resources in the AWS cloud. Known as dynamic cloud resizing, this functionality in Bright is enabled through use of a specialized resource requirement in PBS Pro. The PBS Pro tag details the types and sizes of the nodes to be instantiated in the AWS cloud.

Bright Cluster Manager optionally allows for a persistent resource in the AWS cloud. Known in Bright as the Cloud Director, this resource can serve as a repository for software images and/or data. Because job's software and data needs are met in the AWS cloud, penalties owing to the latency of transferring data between the site and the cloud can be virtually eliminated. Software licenses can be accessed through Bright's tunneling functionality back to the license server. (Bright now includes support for Amazon VPC. This support provides a number of features and functionalities that are enhancements when compared to the tunneling functionality offered previously.)
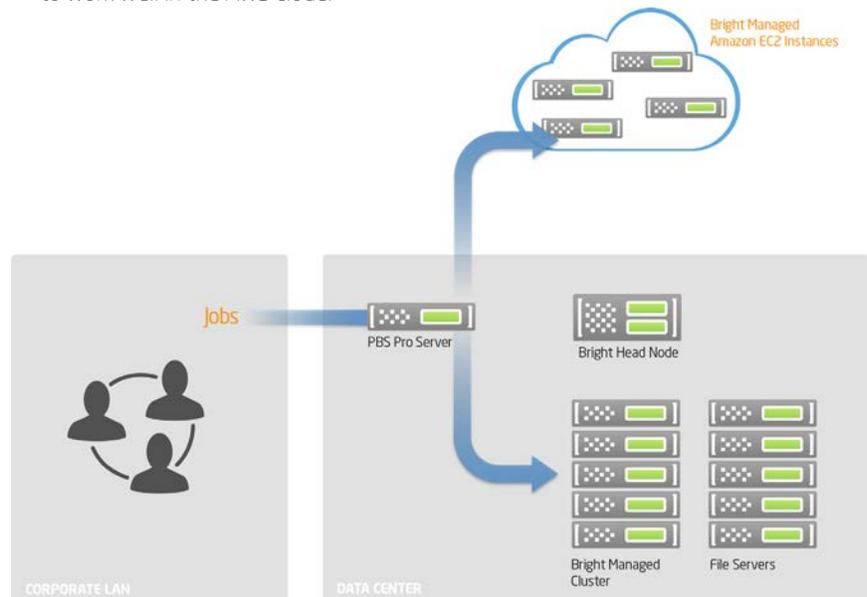
Bright Computing

Bright Cluster Manager offers the option of a:

• Single queue - All jobs are submitted to a single queue in PBS Pro. Use of the AWS cloud is determined by business rules, availability of data and availability of compute resources.

• Cloud-specific queue - All jobs submitted to this PBS Pro queue have been predetermined to work well in the AWS cloud.

In single queue configuration, jobs can be directed to local cluster or cloud

Each option has advantages. A single queue is the most effective from a resource-management standpoint. Submitted jobs run as resources become available wherever they (the resources) happen to be. Any job designated as `urgent' will run immediately. The limitations of the single-queue option are:

1. Business rules must be clearly established in Bright before the system is used. These rules must address the nature of the data and its degree of confidentiality, the use of the required software licenses in the cloud (as some vendors still do not support this option), the type of job – parallel versus serial processing - and any other legal or security issues which may arise;

2. The potential for FDA-regulated processes being submitted as part of a job run in the cloud since this has not currently been approved;

3. The potential for other regulated information to be used in the cloud with possible security and/or compliance concerns; and

4. The cost of cloud versus physical resources.

These concerns can be minimized through use of a cloud-only queue. In this scenario, jobs are submitted to a queue which will only run jobs in the cloud. All of the foregoing concerns must still be addressed, but will be subject to human decision as opposed to the automated decision in the first option.
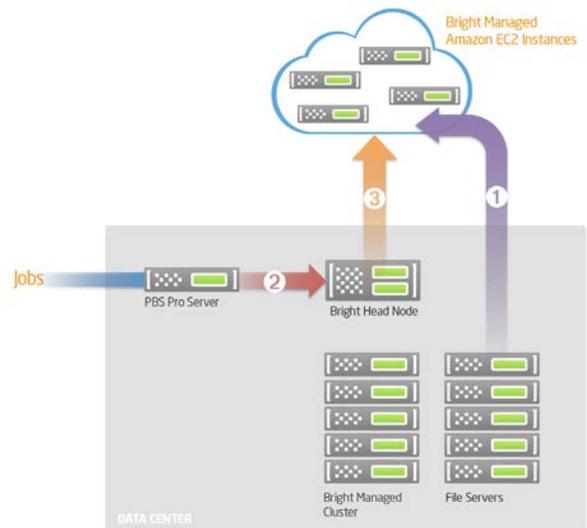
In either scenario, once it has been determined that the job will run in the AWS cloud, Bright automates the process. Bright will:

1. Upload the data required for the job via its data-aware scheduling functionality to the AWS cloud;

2. Instantiate specified nodes in the AWS cloud;

3. Provision the AWS cloud nodes with a specific software image;

4. Run the job;

5. Download the results and data; and

6. Remove AWS node instances - unless they remain required, for example, for processing additional workloads.
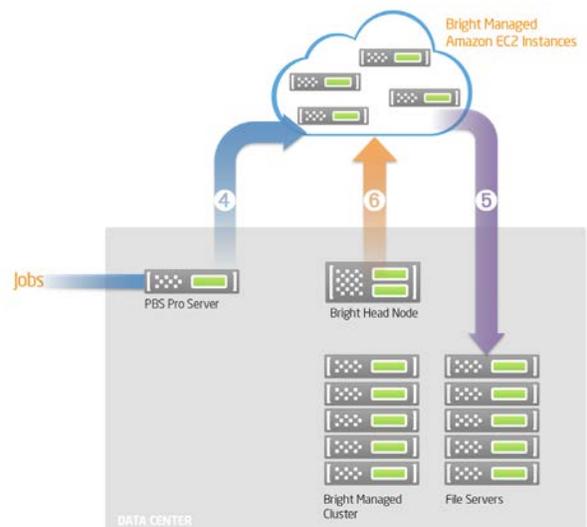
If spot market pricing is to be used, the desired price can be entered on the Bright console. The job will then be submitted when the desired price is met. If a job is terminated prior to completion due to the desired price no longer being available, it can be returned to the queue and run again when the desired price is again available.

Jobs that require cloud resources trigger Bright Cluster Manager to upload job data and provision nodes in the AWS cloud.

The Results

By using Bright Cluster Manager, seamless integration with the AWS cloud can be achieved. The cloud can be easily used as an additional resource on the system with virtually no administrative overhead. Because Bright is fully integrated with PBS Pro, workload can be intelligently scheduling through use of on site as well as resources made available through the AWS cloud. Through this process, Bright enables the AWS cloud as an extension of the on-premise IT infrastructure.

Cloud jobs are directed to run on virtual nodes in AWS. Once the job completes, Bright Cluster Manager downloads the results to local file servers.

Bright Computing

www.BrightComputing.com