



Extensible Performance — Managing Technical Computing in the Clouds

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EXECUTIVE SUMMARY

Many technological advances in information systems have made it possible for large organizations to address many computationally intensive tasks, such as modeling the risk produced by a financial move, creating architectural or product designs and the creation of digital images. It took the emergence of Infrastructure as a Service (IaaS), a form of cloud computing, to make this approach available to all organizations, not just those who could afford a datacenter full of computational systems, administrative staff and the like. Newcomers to this problem-solving approach need easy-to-use, easy-to-manage tools to monitor, automate and optimize the use of computational resources even though they're off premise and owned by a service provider.

WHAT IS THE ISSUE?

As computer systems, networking equipment and storage have dramatically decreased in price, many types of problems that previously were too expensive to automate are now being automated. Clusters of computers combined with inexpensive parallel processing monitors have been used to address needs in the areas of risk management, non-destructive testing, architectural or engineering modeling and the creation of high quality digital content.

The key issue is that administrative staff, real estate, clusters of machines, their storage systems and the required networking equipment can be too expensive for organizations. Even if the organization is large enough to have its own datacenter, systems used for technical computing are still expensive, take up space in the organization's datacenter, consume a great deal of power and produce a great deal of heat.

This has meant that only the largest of organizations, or organizations having applications that produce so much revenue that the costs of computing, of datacenter real estate, of power and of staff are quickly submerged.

Cloud computing suppliers have begun to present infrastructure as a service (IaaS) offerings that have made it possible for this technology to be applied in many more areas.

WHAT IS CAUSING PAIN?

What is the pain being addressed - more and more applications in the areas of content creation, risk analysis, non-destructive testing, architectural or mechanical engineering have been designed to use up as much processing power as can be made available — organizations

are trying to do more with less and prefer not to build another datacenter — organizations want the flexibility of accessing huge levels of processing power when that is needed, but not have to pay for the real estate, systems, storage, networking, staff, or electricity when that computational power is not needed.

WHAT WOULD AN IDEAL SOLUTION LOOK LIKE?

An ideal solution would be that organizations could use systems managed by a service provider, such as Amazon, Google or Rackspace, and only pay for the resources they use, when they use them. The rest of the time, those resources would be available for others to use.

A large number of systems could be utilized, when needed, to solve computationally intensive tasks. Small organizations could use larger computing resources than their budget would typically support. Large organizations could quickly set up computing solutions and not have to wait for the purchasing, installation, testing and support processes to be set up.

ENTER CLOUDFUZION

Axceleon, a long-time provider of technical and high performance computing solutions, has enabled Infrastructure as a Service (IaaS) cloud computing services to be managed by its EnFuzion enterprise job scheduling, resource management and workflow automation technology. Axceleon is calling this combination “CloudFuzion.” Today, CloudFuzion supports Amazon’s EC2, and will be launched on Microsoft Azure shortly.

CloudFuzion can be thought of as a cloud cluster configuration management tool that is layered on top of service providers’ IaaS offerings. This provides a high performance computing/technical computing Platform as a Service (PaaS) offering.

CloudFuzion provides a highly scalable, highly manageable solution. The cloud resources utilized can be automatically adjusted based upon pre-set service level agreements (SLAs). This includes things like managing job performance, or the time required to complete a job, process or transaction. It can also include controlling the cost, that is how much organizations have to spend. CloudFuzion’s SLA management is very granular and allows control of things such as budgetary control per process up to cost per day.

CloudFuzion can automate workflows including the ability to move work into and out of the cloud. It can also manage clusters of cloud computing resources.

As with the company’s EnFuzion product, CloudFuzion offers the following benefits:

- ☒ Performance and Scalability — CloudFuzion is designed to manage thousands of machines allowing organizations to see nearly linear performance gains as additional machines are added.
- ☒ Client-Server Model — CloudFuzion utilizes the proven client-server architecture to ensure reliability, scalability and performance for computational clusters or farms ranging from two to thousands of machines.

- ☒ Enterprise Resource Management and Workflow Automation — CloudFuzion enables users to automate, monitor and optimize computationally intensive tasks such as content rendering, modeling, engineering studies, or even game execution!
- ☒ Maximum Utilization of Multi-core Processors — today's highest performance systems are based upon multi-core technology. CloudFuzion's high performance scheduler ensures extremely high levels of processor utilization.
- ☒ Heterogeneous, Multi OS-Platform Support — CloudFuzion natively supports Windows and Linux, A computational farm or cluster could be made up of a mix machines running different operating systems
- ☒ Intuitive GUI, Standard Web Interface — Clear, concise and intuitive graphical user interface lets staff work with a render farm without pain or hassle. The intuitive CloudFuzion web interface allows users to monitor and control job progress from anywhere by using a standard Internet browser, without the need to install additional client software on remote machines.
- ☒ Flexible Scheduling and Lights-out Options — Extensive and flexible scheduling options help to manage jobs, machine pools and licenses. Automatic retry and restart options work around application faults and machine failures to ensure job progress.
- ☒ Extensive Administrative and Reporting Tools — Intuitive web interface for render farm allows administrators to access and control all aspects of the computational farm or cluster from anywhere, using a standard web browser. CloudFuzion offers complete log and performance data on all aspects of the farm/cluster's operation, including information on jobs, machines, users, performance, financial metrics and errors.

S U M M A R Y

CloudFuzion, using Amazon's EC2 and Microsoft's Azure, offers a powerful tool that can help organizations needing technical or high performance computing solutions to start today without having to purchase systems, operating system software, or hire administrative staff.

CloudFuzion ought to be considered as part of a flexible, high performance and yet, low cost testing and production environment.