SUMAVI

The Data Center Operating System[tm]

BUSINESS OVERVIEW

The Business Opportunity

Cloud Computing has the potential to significantly reshape the IT industry, but this highly proclaimed concept has not taken root as quickly or as broadly as anticipated, though it has gained commercial viability recently. Most notably, IT resources are currently available for lease in public offerings such as Amazon's Elastic Compute Cloud (EC2) environment.

Cloud Computing in its rudimentary form is simply the ability to utilize a pool of IT resources as needed, when needed. Computing on demand is a long held dream of many IT professionals, but has been an elusive reality for the most part. This has primarily been due to the fact that the provisioning and management of these compute resources has been difficult at best. This solution void is a business opportunity to be exploited. A robust, easy to use solution will accelerate the economic benefits and general acceptance of Cloud Computing solutions.

Key Value Drivers

- Elimination of expensive hardware deployment
- Reduction or elimination of high cost of single purpose hardware solutions
- Elimination of the costs of hardware servicing and hardware replacement
- Decrease in the management complexity of existing solutions
- Exclusion of the required and expensive expertise to deploy hardware solutions
- Increased interface capability to work load management solutions, self service portals, metering & billing solutions, resource pool management, and performance monitoring

Market Opportunity

Commercial computing on-demand resources offered for lease (Public Cloud) and internally deployed corporate computing solutions (Private Cloud) both are in need of extensible provisioning & management solutions.

In the technical paper entitled "*Above the Clouds",* the authors describe why cloud computing is becoming a significant reality of IT service offerings.

> "Cloud Computing is a new term for a long-held dream of computing as a utility, which has recently emerged as a commercial reality. Cloud

> Computing is likely to have the same impact on software that foundries have had on the hardware industry." [1]

Cloud computing encompasses services commonly referred to as Software as a Service (SaaS) as well as computing services offered in a "pay-as-you-go" manner (Utility Computing). These two offerings capture both ends of the computing spectrum and commonly describe the classification of users as "Cloud Providers" and "Cloud Users". As explained by Armbrust[2] there are three new aspects driving the general acceptance of cloud computing:

- The illusion of infinite computing resources available on demand
- The elimination of an up-front commitment by Cloud users
- The ability to pay for use of computing resources on a short-term basis as needed

Framed with these characteristics, Cloud Computing becomes highly valuable to a Cloud User. Rather than spending the requisite amount on hardware to handle peak computing needs, a consumer can now purchase hardware needed for the minimum level required and then consume Cloud computing resources above and beyond that on demand, when needed. So, rather than spend additional IT dollars to handle the peak computing demand, a more minimal amount of computing resources can be purchased and all the excess demand can take advantage of on-demand Cloud Computing (see Figure 1).

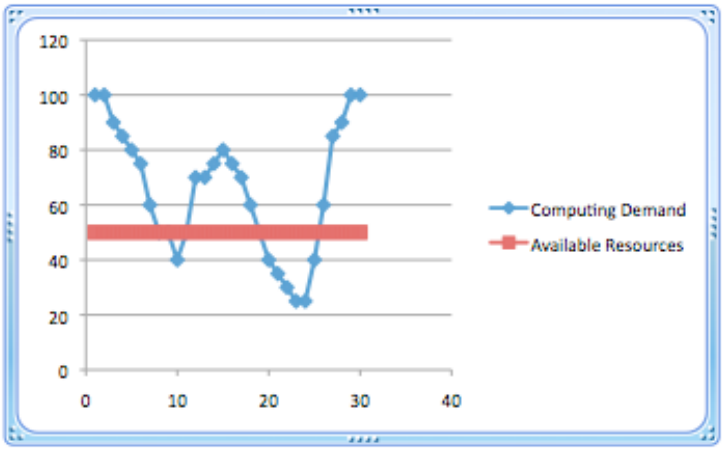

Figure 1

[1] *"Above the Clouds: A Berkeley View of Cloud Computing"*, (Armbrust, Fox, et. al.)

[2] *"Above the Clouds: A Berkeley View of Cloud Computing"*, (Armbrust, Fox, et. al.)

As these “on-demand” computing resources become more plentiful, both within the public cloud arena and within the private realm of a specific corporate environment, the need for easy to use, highly functional, provisioning solutions become critical to the success of “Cloud Providers”.

The Sumavisor^{tm}

Sumavi has the opportunity to play a key role in transforming Cloud Computing from a cumbersome concept to a revolutionary reality. The difficult management of IT resources becomes much easier with the functionality of the Sumavisor^{tm} software solution. The Sumavisor^{tm} manages all virtual and physical compute resources with an easy to use, yet powerful, graphical user interface. The Sumavisor^{tm} provides the needed abstraction layer from all virtual and physical IT compute nodes, and an easy way to provision and put those resources to work when and how you need them.

With increased demand for compute resources and increased costs to procure, deploy and manage such resources, there is a great need for a powerful, easy to use, provisioning solution. No longer must these resources be dedicated to a single task, used only when that task needs to be processed. The Sumavisor^{tm} solution enables the easy and quick provisioning (within minutes) of needed resources to complete computing tasks on demand.

Existing offerings range from the superficial to the very difficult to use and deploy. Solutions requiring a level of expertise not commonly found with most IT staff members. The Sumavisor^{tm} offers a unique solution based on industry proven technology.

Product Description

The initial product offering is a software only solution but may evolve into a top of rack provisioning appliance, a Sumavisor^{tm}. Each Sumavisor will be designed to manage the set of resources available within a defined pool of computing nodes. In addition, each Sumavisor^{tm} will be aware of all other instances for a given network. For example, each Sumavisor is aware of all other nodes on the network and as such, can provision and manage resources in place of another Sumavisor^{tm} in the event of system malfunction. Each head node can use cloning or scripted installation methods and can provision physical or virtual resources.

The Sumavisor^{tm} offers Operating System provisioning, remote power management, remote console capabilities, and virtual and physical machine management. Supported Operating Systems include traditional Linux and stateless, Windows Image X - scripted and iSCSI, VMware ESXi and ESX, KVM, and Xen. Hardware platforms supported include IBM, HP, Dell, blades and most IPMI compatible devices.

The Sumavisor[tm] has a powerful, yet easy to manage user interface and is architected in a distributed fashion rather than a hierarchal manner. This design allows unlimited scalability and easy failover capability.

The perceived value of Cloud Computing is being able to utilize a pool of IT resources as needed, when needed. This can only be achieved if these IT resources can be provisioned in short order with limited difficulty. Cloud Computing has been somewhat slow to take root because of the complexity of hardware management and the lack of software tools to truly abstract a pool of IT resources. Offering a solution to these issues provides a measurable economic benefit, better utilization of resources, a reduced need for full-time technical expertise and more effective IT solutions.

Removing the complexity of managing the compute nodes, both virtual and physical, enables IT professionals to focus entirely on their business data and the business tasks at hand. In addition, the deployment of a Cloud Computing environment in a private cloud allows a set of resources to be configured on demand as needed and the use of IT resources in a public cloud greatly reduces capital costs of acquiring and managing compute hardware.

The Sumavisor[tm] solution removes the complexity of managing a pool of IT resources, greatly reduces IT costs by more efficiently using resources, and enables the acceleration of Cloud Computing solutions.

The Sumavisor[tm] represents the summation of all virtual and physical IT infrastructure and the management and deployment of these IT resources.

Sumavi utilizes the extensive development and resources of the open source project Extreme Cloud Administration Toolkit (xCAT) developed by Egan Ford and the xCAT development team. The xCAT software is used without any encumbrance or restriction as part of a commercialized Sumavi offering.

Value Proposition

The Sumavi technology is deeply rooted in deploying the largest scalable systems in the world. It has been provisioning scale-out systems for over 10 years. The Sumavisor[tm] is the most logical and easiest path to migrate datacenter resources into a cloud infrastructure. Existing solutions are easily migrated and extended. The advanced, supported technology has a restful API and is easily interfaced to other complementary solutions.

The Sumavisor[tm] offering facilitates the most cost effective solution for deploying, provisioning and managing IT compute resources. Rather than spending an inordinate amount of time configuring, monitoring or servicing hardware, staff time can be completely focused on provisioning a solution for your computing needs.

The Sumavi provisioning solution gives you an easy-to-use, graphical software suite to manage all your computing needs via the “Cloud”.

About Sumavi, Inc.

Sumavi, Inc. (www.sumavi.com) is the provider of a highly scalable provisioning engine designed for the rapid repurposing and deployment of virtual and physical IT infrastructure. Sumavi is well positioned to make a significant impact in the Cloud Computing and IT infrastructure management business sectors by capturing a major portion of the resource tier[3] of Cloud Services solution offerings. The initial Sumavi product, the “Sumavisor[tm]”, accelerates the adoption of Cloud Computing as an effective and reliable computing solution for IT professionals by implementing a scalable, powerful and easy to use software suite for the provisioning and management of hardware resources.

Mission Statement
To revolutionize scale-out-computing solutions with product offerings that facilitate abstracted centralized computer resources in a dynamic, agile, and on-demand fashion.

Company History
Sumavi was established in February of 2010 as a new startup in the ThinkAtomic portfolio of companies. ThinkAtomic provides the incubating environment to establish the key fundamentals of an early stage company, including management mentoring, legal and accounting services, and the necessary infrastructure of office facilities and computing resources. The high demand for an easy to use provisioning solution became evident as data centers began to expand service offerings to include “Cloud Computing” solutions. Sumavi was founded on the market demand for solutions to easily facilitate and quickly provision specific environments for on-demand computing needs.

[3] “The architecture of a Private Cloud Service” - Gartner Research. 15 March 2010 – (Resource Tier: Component managers, Resource pools, Virtual resources, Physical resources)