



## White Paper: Agility in Information Technology

### Executive Overview

Cloud Computing is all the rage today, leading some to dismiss it as just the next in a long line of fads which fade as quickly as they appear. But behind the buzzwords surrounding Cloud Computing there are sound best practices hard learned from years of struggling with day to day IT challenges. The aim of this white paper is to outline those best practices, the technologies that enable and support them, and how they result in benefits immediately tangible to many types of businesses.

### The Challenges

Before discussing the state of Cloud Computing and its benefits, it is useful to discuss some of the ongoing challenges many IT based organizations have faced over the years.

- **Scaling:** IT organizations have learned a hard lesson that scaling a business system means far more than just throwing additional hardware resources at it. Every new piece of hardware added and network connection made has significant impact on the people resources managing the infrastructure. Even if adding new hardware and associated infrastructure were zero cost, scaling staff along with that growth is anything but fast or cost effective.
- **Reliability:** While technology continues to improve the reliability of almost every aspect of IT infrastructure, recovering from the inevitable faults is often far more time and resource consuming than the average enterprise can tolerate. This either leads to increased downtime, or large investments in duplicate infrastructure.
- **Flexibility:** Traditional technologies have encouraged and often forced IT departments to cast each particular piece of infrastructure into a specific role. This server is a mail server, that one is a file server, and so on. This freezes much of the infrastructure and adds a significant cost to repurposing it as business needs change.
- **Utilization:** With data centers full of systems cast into specific roles, utilization of those resources is untenably low, some industry estimates put it as low as 10%. This means that for every 10 hours your infrastructure is running, you are getting 1 hour of work out of it. A mail server wakes up and handles a minute worth of email and then goes idle for several minutes until more arrives. Despite this low utilization, you still pay for the power, cooling, networking and other associated management costs for that infrastructure.

These challenges greatly affect the overall agility of an organization. How quickly can your business react to changing demands from it's customers and markets? If your IT is operating in a traditional manner, struggling with these and other concerns every day, then our claim is your reaction time is insufficient at best. Address the scalability, reliability, flexibility and utilization of your IT infrastructure, and you are now able to much more rapidly and efficiently bring your solutions to market, which is, after all, why you're in business to begin with.

## Virtualization of the Data Center

The single most enabling technological development on the path to Cloud Computing has been the availability of several reliable, performant virtualization platforms (Xen and VMWare for instance). These products allow one to segment a single physical resource (server) into multiple virtual servers, while also allowing a virtual server to be quickly cloned, as well as migrated to additional physical resources running virtualization software. These capabilities at once addresses all four of the challenges outlined above.

Scaling a service, with proper engineering, is a matter of cloning more copies of the systems running a service. Reliability is increased because it is cheaper (in time, resources, and money) to spread a service across many virtual instances. Flexibility is gained when each of your physical platforms becomes a generic processing unit that can run one or more arbitrary virtual machines. And finally, increasing utilization of existing servers is inherent in the ability to deploy multiple virtual machines on to each existing physical server, netting the average data center at 10% utilization an 8x to 10x increase in processing capacity on existing resources.

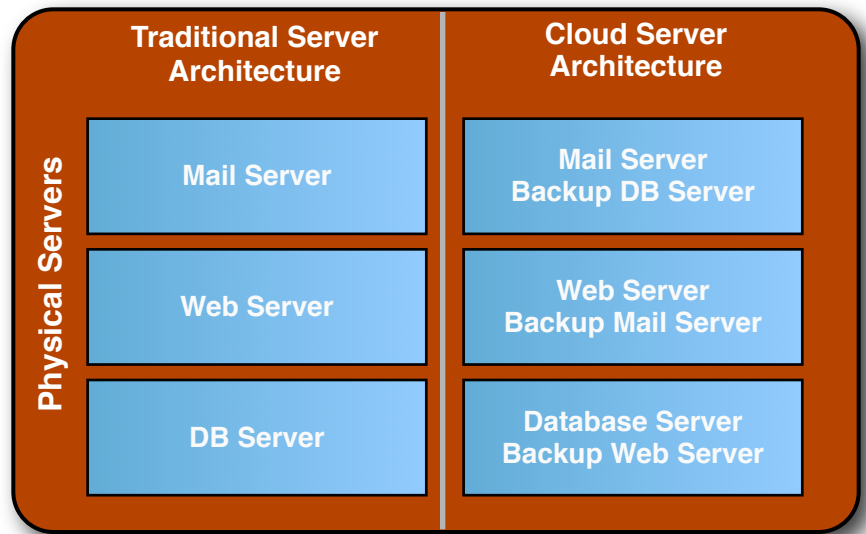


Figure 1

## Enter Cloud Computing

Cloud computing is merely the realization that we now have the capability to create data centers which are completely decoupled from the business systems being provided via their resources. With the emergence of standard virtual image formats, each server in a data center can be treated as a generic processing unit, often capable of safely and securely running several disparate operating systems and business services from any number of different enterprises. Figure 1 illustrates a very simple example of how virtualization in cloud computing allows better utilization of the underlying resources while at the same time resulting in a more reliable, redundant architecture.

One of the leading providers of cloud computing resources is Amazon and their Elastic Cloud Computing platform (EC2). Amazon does not provide ready to run, out of the box environments for standard Rails, PHP, and Java application servers and services, but rather the back-end virtual infrastructure and image management, and low level web service API's used to build these services.

CloudOps specializes in helping companies deploy their business systems into the EC2 environment. We have build a standard set of Ruby on Rails application server images for deployment into EC2, and continue to work with customers to build additional images (LAMP, PHP, J2EE, etc).

Unlike many cloud providers, CloudOps dedicates virtual machines for each customer. You do not share a virtual machine with any other user. You have full administrative (root) access to all your servers, and we can help you customize one or more images so that scaling your services is simply a matter of deploying additional instances (servers) into EC2.

We have extensive development and IT experience with a broad range of technologies and development environments, and are available to help you craft a dedicated, highly scalable and redundant architecture designed to meet the specific needs of your business and its customers.

Solving customer problems through creative use of technology is our passion, so contact CloudOps today to find out more about our services and how we can help.