Perfection in the Cloud

Sequel to Our Salvation is in the Cloud

Software development is hard enough by itself, but testing and deploying software can be equally difficult. Most developers have discovered the power of virtualization through the use of VMware, Xen and other virtual OS vendors on their own back office servers. Cloud computing gives companies the power of this same virtualization, but with unlimited hardware capacity and flexibility. Most BASIS customers only have one production server and if they have a test server, it is seldom identical in size and speed to the production server. Differences between the test and production servers expose the company to insufficient and inadequate testing environments at a minimum, and to mismatched configuration nightmares at a maximum.

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Identical Cloud Machines to the Rescue

The cloud architecture utilized by Amazon and many others, gives developers access to ~40,000 servers at each location or availability zone in each region. Since all instances of an image are Virtual machines and each instance of an AMI (Amazon Machine Image) is virtually identical, the test machine can be identical to the production machine. This solves the problem of testing in an environment that is almost like the production machine, but not exactly.

The next challenge is to test with the same database and software that is running in production. Through the magic of the cloud infrastructure, developers can create another drive that is exactly like the drive that is mounted to the production machine. Now, for the first time since the beginning of software development, even the companies with the smallest budgets can afford to test their software on identical OSs and hard drives before deploying their new software into production. Since most cloud providers only charge for each hour their machines or hard disks are in use, developers can perform comprehensive testing that all but eliminates the need to fail back to the old system. However, the cloud simplifies the fail-back process as well. For example, if you have two identical systems available in the cloud, while you are running your regression testing and doing an upgrade, if you do happen to find a problem with the new software, you can fail-back to the old system within a couple of minutes because you did not have to tear up the original during the upgrade.

Deployment Solutions and Benefits

BASIS uses large well-known cloud infrastructures like Amazon and Google to reduce the risks in cloud deployment. Through the use of content delivery networks (CDN), auto-scaling and load balancing, the dependence on a single machine is spread to a cluster of machines in numerous regions and multiple availability zones in each of those regions. Google's page speed service can allow BASIS' web sites to be accessed from a region nearest to the client browser. Amazon's Cloud Front CDN gives all of BASIS clients access to product, documentation, and videos from a cloud server farm nearest the client. >>

While this CDN architecture gives the BASIS customers the most pleasant surfing and downloading experience, it also adds to the robustness of the deployment architecture because it means that there are multiple copies of this data on multiple networks. This vast redundancy also provides speed and robustness never before imagined, while expenses are contained because the cost is calculated by the volume of the data stored and the frequency of the access, which is much better, easier, and cheaper than the traditional model of building and maintaining servers at multiple locations around the world.

BASIS' Drupal-powered websites and Bugzilla systems all depend on MySQL databases that are configured to run redundant databases in multiple regions. Products that depend on the BASIS language and RDBMS utilize the built-in database replication functionality to maintain real-time copies of the database on both the East and West Coasts as well as copies in Europe and Asia. Through the use of Amazon's Route 53 DNS, BASIS is able to pragmatically move access to their production servers all around the world with no more than a 5-minute delay in rerouting of the DNS traffic. By utilizing all of the modern day technology, BASIS has been able to eliminate many of the human limitations and flaws from their production facilities. Using as many automatic fail-over systems as possible makes it feasible for BASIS to maintain the 7/24 up-time systems that their customers expect.

Closing in on Perfection

Perfection is a strong word and may not ever be appropriate when used in conjunction with technology, but it is easy to see and say that the cloud infrastructure is the closest thing to perfection that this old technologist has ever seen or dreamed of experiencing. Having the ability to have identical hardware, software, OSs, and configuration for QA, testing, and deployment is the closest thing to technology nirvana one can hope to attain. When adding the CDNs and auto monitor and fail-over software to the mix, it is hard to imagine a sweeter system. Who knows what the next generation of technology pioneers that come along behind Steve Jobs, Bill Gates, and the Google Guys may figure out about how to make technology even more dependable and more robust. However, in 2011, the cloud is the closest thing to building, testing, and deploying perfection that BASIS has found.

Try the cloud out for yourselves; investigate the various options like BASIS did or consider taking advantage of our learning curve by contacting us to learn about our Cloud Hosted Offerings.

Read the prequel BASIS Advantage article *Our Salvation is in the Cloud*