



Are You Prepared for Cloud Failure?

It's 3:00 A.M. and you awaken to the sound of a text on your phone. Is it the kids? Is it your mother-in-law? You focus on the bright screen in a pitch black room and discover it's neither the kids nor your mother-in-law. The server is down at work and it requires your immediate intervention. In a half-awake stupor, you drag yourself to your laptop and discover the server is not running at all. You think, "Wonderful, time to rush into work!" Just how long will you be down?

At BASIS, we run all of our servers – production, build, web – in the cloud, specifically the AWS (Amazon Web Services)



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cloud. Among many other benefits, this prepares us for a quick recovery from text messages like this and allows us to finish a good night's sleep. This article reveals how we have prepared ourselves with the use of the latest technology from both the industry and BASIS.

What is AWS?

The AWS cloud is a collection of data centers that run virtual machines and charges for runtime, storage, and network usage. The cloud provides flexible configuration and backup possibilities that in-house LANs don't normally offer. When a cloud machine or "instance" goes down, it takes only a matter of seconds to create another identical instance from an "AMI" or Amazon machine image. The administrator saves permanent data on a virtual hard drive or "volume" and attaches it to an instance. The flexibility of virtual machines relieves system administrators from any concerns about hardware and allows them to focus on server and software configuration. As with the virtualization of so many other objects, physical limitations no longer apply: You can easily have 1 machine or 100 machines, all identical.

Amazon has several data centers around the world; in the US - California, Oregon, and Virginia; and worldwide - Brazil, Ireland, Japan, and Singapore, etc. If a server fails, one can usually solve the problem by connecting to a still-running instance and performing remote administration. It might be necessary to launch a new instance of the server if Amazon has experienced failures with its own (non-virtual) servers that caused an entire region or availability zone to become unavailable (see bit.ly/wXsGyz). Regions and availability zones becoming unavailable is problematic and extremely expensive for businesses.

Earlier this year on June 29th, the Washington D.C. Derecho storm (abcn.ws/PUBe2l) caused a power failure at one of Amazon's data centers (zd.net/KNQJRz). The power outage directly impacted companies like Netflix, Instagram, Pinterest, and Heroku. In particular, Netflix's streaming services were out for three hours at an extremely high peak usage time. During these failures, large service providers not only must recover from the outage, but also field a tremendous volume of customer service calls. In general, for companies that operate in the cloud but aren't prepared for regional outages, such an outage means the inability to conduct business for the duration of the outage and can also mean loss of data.

Be Prepared

So exactly what does it mean to "be prepared" for a cloud catastrophe? In short, being prepared means keeping redundant copies of data over multiple regions. BASIS employs three methods for backing up data and copying machines across several regions to maintain redundancy.

The first backup method BASIS uses is our own BBj® replication to copy our databases and files to machines in other regions. Configurable in Enterprise Manager, replication creates up-to-the minute copies of our data and BUI programs on several machines in other regions. Should we ever experience a failure in California, for example, we can recover from any one of several copies of our important files created at the time of the failure.

The second method backs up data using the Linux utility 'rsync' to copy the BASIS production system's drives each night to a failover copy of production. Our production machine is in a data center in one region separate from the region of the failover machine's data center. This means if we experienced such an outage, we could quickly launch the failover machine in the other region, which becomes our new production machine.

The third method BASIS uses is backups of data using a Linux backup utility called Duplicity. While the other two methods keep a single copy of data at a particular point in time, Duplicity keeps an incremental backup spanning a month's time. This way, if we find our up-to-the-minute and 24-hour-old data are faulty, we can recover from an earlier period of time when our data is still good. While data from the other two methods of backup is available instantly, data from

Duplicity is incremental so it requires a rebuild that could take a few hours.

In addition to maintaining copies of data, BASIS backs up all AMIs to other regions. Currently, Amazon does not provide a convenient way to back up machines across regions, so we have developed our own process. Basically, we copy the AMI's root volume to another region and then create a new AMI from that volume. Since AMIs change so seldom compared to live data, we only make backup copies of AMIs as we update them.

A Quick Recovery

BASIS employs these procedures daily in anticipation of a major outage. If or when this inevitable event might occur and our production server fails, we can switch (or "fail over") to another region with a quick recovery time of less than 5 minutes.

To execute this failover, the first step is to change the production server's DNS record so that it points to an IP address in the new region. Then we set our DNS up with a TTL of 300 seconds (5 minutes) and launch an instance of the AMI we copied over in the new region and attach the backup volume to the instance. Next, we rsync our replicated data to the backup volume and then assign the IP address to our instance that corresponds to the DNS record we just changed. Finally, we start up all the necessary services on our new instance and we're back in business. The entire process takes less than 5 minutes!

Conclusion

While running all BASIS' servers in the cloud allows us to continue business regardless of whether our employees are in the building, a cloud outage has the potential to bring business to a grinding halt. BASIS, however, incorporates geographical redundancy into its maintenance procedures as a strategy for quick recovery. This strategy ultimately allows BASIS to continue business as normal and serve you much more effectively than if we maintained all our servers on a single LAN within our building.

A cloud outage can result in immeasurable loss of money and data. Geographical redundancy is a vital strategy for quick recovery in the event of such a loss. Running all BASIS servers in the cloud allows us to continue regardless of whether our employees are onsite or virtual. This strategy ultimately allows BASIS or anyone to continue running business as normal and serve customers more effectively than from servers maintained on a single on-site LAN. Take it from us, setting up servers with redundancy in the cloud IS the best and most effective way to be prepared. If you are looking for a robust, affordable ERP cloud solution, you would be hard pressed to find one that is more architecturally reliable and redundant than the AddonSoftware® Cloud solution, because it comes with this BASIS tried-and-tested robust redundancy and recovery system, right out of the box! ■



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