# Rackspace – Another Hosting Service Bites the Dust

December 2007

As Om Malik said, "Our Internet infrastructure … is as fragile as a fine porcelain cup on the roof of a car zipping across a pot-holed goat track." This observation was made after yet another Internet infrastructure failure when Rackspace, a major hosting service for thousands of web sites, went down for reasons that would be hard to anticipate – a truck hitting a transformer that powered its data center.

In spite of triply-redundant power backup, this incident started a sequence of events that resulted in many of the web sites which it hosted going down for hours. The one faint glimmer of success in this disaster is that the company was completely open and honest with its customer base and worked hard to keep everyone informed.

## Rackspace

Rackspace, headquartered in San Antonio, Texas, provides web hosting services for thousands of web sites around the world. It operates eight data centers – four in the U.S. (two in San Antonio, one in Dallas, Texas, and one in Herndon, Virginia) and four in the U.K. Founded in 1998, it has grown at a rate in excess of 50% per year and now hosts over 13,000 web sites worldwide.

Rackspace has historically been among the most reliable of the hosting providers, boasting that it provides zero downtime. In fact, its SLA (Service Level Agreement) offers a 5% credit for every 30 minutes that it is down.

It also boasts about its "fanatical support" and has been named the Best Customer Service Organization by The American Business Awards in 2005 and 2007.

## The Outage

### Sunday, November 11, 2007, 4 AM

In spite of claiming zero downtime, November, 2007, was not a good month for Rackspace, After suffering an outage earlier in the month, Rackspace faced another outage at 4 AM Sunday, November 11. This one was due to a "mechanical failure" as yet undefined (at least publicly), and it knocked out hundreds of customers served by its Dallas data center.

True to its claim of fanatical support, Rackspace mustered 100 "Rackers" to track down and fix the problem. Service was restored fairly quickly.

*Monday, November 12, 2007, 6:30 PM*

The next day, while Rackspace was still trying to determine the cause of Sunday's outage, disaster struck again. In the early evening of Monday, November 12, at 6:30 PM, it suddenly lost power to the entire Dallas data center, the same data center that was down the day before. Unbeknownst to Rackspace, a trucker had passed out and rammed a transformer that fed the data center. The transformer exploded, and the data center went black.

As planned, Rackspace's emergency diesel backup generator kicked in; and the data center came back to life and continued in operation with but a brief interruption. This allowed Rackspace operators to switch to their secondary power source – a completely separate utility line feeding the building. At this point, the emergency generator had done its job and was shut down. Triple modular power redundancy had paid off.

However, fifteen minutes later, the secondary power source shut down. This time, the blackout was requested by the emergency personnel trying to free the trapped truck driver so as to avoid electrocution of not only the truck driver but also the emergency workers. Things were happening so fast at the scene of the accident that Rackspace was not notified by the electric utility of the intent to shut off the data center power.

Again, the emergency generator started up and continued to power the data center. The diesel generator was designed to power the data center indefinitely (so long as fuel was available), and the data center was once again operational with little impact on the hosted web sites.

But a serious and unanticipated problem began to become apparent. With each interruption in power, the air conditioning chillers had to recycle. It would take them about a half hour to recycle before they were effectively cooling the data center again. The chillers were down for about fifteen minutes as a result of the first power outage, and they would have been back on line in another fifteen minutes, a delay accounted for in the data center design. However, with the second interruption in power, the chillers had to once again recycle.

With thousands of powered servers pumping out heat, the temperature in the data center was rapidly climbing to a dangerous level. Management realized that this extended time without air conditioning would cause the servers to overheat and could cause significant damage to the hardware. Therefore, management reluctantly decided to shut down all of the servers in the data center to protect them. The Dallas data center was now completely nonoperational.

The customer damage extended well beyond the thousands of web sites that the Dallas center hosted. One of the web sites, for instance, was that of 37Signals, a software-as-a-service company. 37Signals provides software services to millions of end users. All of these users were now down as well. This failure spread its ugly tentacles around the world.

## The Aftermath

Once power and cooling were restored, all of the thousands of servers had to be restored to service. Most of the web sites were up by the following day, Tuesday. However, they had been down for hours.

One thing that Rackspace did correctly was to stay in close communication with customers. It answered phone calls and emails, and it kept a running commentary on its progress posted on its web site (yes, its site was still up). Management expressed its firm belief in "keeping completely transparent and honest when communicating with customers, especially when performance issues impact them."

The Rackspace CEO told customers that he knew it would take millions of dollars to make things right with customers but that the company needed to do everything to keep them happy. He went

so far as to offer customers a release from the service contract with Rackspace if they wanted to migrate to another service provider.

A typical Rackspace response was sent in an email by a senior vice president to Om Malik, a Rackspace customer: "Om, we let you and many others down tonight. Bad luck or not, we failed to deliver what we promised. We also learned a lot about needing to communicate more in real time with customers. We are determined to earn back the trust lost tonight. We hope our customers, including you, give us that chance."

As would be expected, the blogs were furious. One noted that Rackspace's whole "zero downtime guarantee has actually been almost 10 hours of downtime in the past 48 hours." However, there were few if any postings that criticized Rackspace for not keeping customers informed.

This contrasts greatly with some other recent cases in which companies tried to cover up massive failures and provided little if any communication with customers. One was RIM, whose Blackberry service for North America went down for over a day in April, 2007[1]. It took RIM twelve hours to simply acknowledge that there had been an outage, and then there were no details forthcoming concerning the cause or what subscribers could expect.

In July of 2007, another major hosting company, Hostway, decided to move a newly acquired data center from Miami to its own data center in Tampa, Florida.[2] It notified customers that their web sites would be down for ten to twelve hours over the weekend while the move was taking place. Hostway grossly underestimated the problems associated with the move. The result – most web sites were down for at least three days, and some were down for a week. Hostway provided very little information about the status of the problem, posting only every other day or so a brief summary on its web site. Calls and emails went unanswered.

In both cases, these two companies were roundly criticized by their customers for their lack of communication. In contrast, though the Rackspace failure created a lot of criticism among its customers, almost none of it was directed at a lack of communication. Many of the blogs, in fact, were quite sympathetic to Rackspace and its current problems, pointing out that this was a highly unlikely and unanticipated sequence of events and that Rackspace had come back online as quickly as possible.

## Where's the Backup?

The Rackspace failure could have been avoided by proper disaster planning. Nowhere, evidently, in Rackspace's business continuity planning was the concept of data center redundancy. The N+1 redundancy that Rackspace had built into its emergency UPS (uninterruptible power supply system) and even its HVAC (heating, ventilation, and air conditioning) system and whatever redundancy that it had in its server farms came to naught when the entire data center was taken down.

What if this were a worse disaster – a hurricane taking out its San Antonio data center or a terrorist taking out a U.K. data center? Web sites could have been off the air for weeks or more before service could be restored.

Rackspace has eight data centers distributed throughout the U.S. and the U.K. Certainly, proper planning (and some investment) could have configured these data centers to back each other up. In the event that one became nonoperational for any reason, backup facilities in other data centers could have taken over the hosting of the affected web sites.

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[1] Blackberry Gets Juiced, *Availability Digest*; May, 2007.
[2] Hostway's Web Hosting Service Down for Days, *Availability Digest*; September, 2007.

## Lessons Learned

What Rackspace did right was to keep in close contact with its customers and to share their pain. For this, they got kudos.

What Rackspace did wrong was to not consider disaster recovery in its business continuity planning. Data centers can be taken down. It happened to Rackspace.

If you are planning to use third-party service providers for such functions as web-site hosting or application services, make sure that you understand their business continuity plans and are comfortable with them. What are their backup configurations? How long will it take for them to recover from any one of a variety of faults? Their survivability may well be your survivability.

As for the Availability Digest, we use GoDaddy. We hope that we will not be writing a Never Again article on our hosting service provider.