

The Planet Blows Up

September 2008

On Saturday, May 31, 2008, an explosion blew out three walls in the Houston data center of The Planet, one of the world's largest providers of dedicated servers for more than 22,000 businesses. The resulting damage disabled 9,000 servers used by 7,500 web hosting companies, taking down web sites serving millions of customers. It was days before service was completely restored.¹

The Planet

The Planet provides dedicated servers for a variety of companies, many of which are web-hosting companies. Operating six data centers, two in Houston, Texas, and four in Dallas, Texas, The Planet is the largest privately-held dedicated-server hosting company and the fourth-largest such company in the world.

Most of its customers are wholesalers. They lease dedicated servers from The Planet and resell time on their leased servers to other users, primarily retail merchants operating their own online stores. These sites serve millions of Internet customers.

The Planet has recently begun to offer managed hosting services directly to businesses of any size.



¹ Information for this article was obtained from the following sources over the time period from May 31 to June 3, 2008:

The Industry Standard
Center Networks
MSFN Forums
dslreports.com
The Tech Herald
The Register
The Planet Forums

The Explosion

At 5:55 pm on Saturday, May 31, an explosion took down The Planet's H1 Houston data center. It is conjectured that a short circuit in a high-volume wire conduit set a transformer on fire, which then caused an explosion of battery-acid fumes from the UPS battery-backup system.²

The explosion was strong enough to blow down three walls surrounding the electrical equipment room on the first floor of the data center. It



three-phase power transfer switches

blew apart the power-transfer switch that transferred the data center from utility power to backup diesel generator power, thus knocking out power to the entire data center. Fortunately, no one was injured.



UPS battery room

Though no servers or networking equipment was damaged, 9,000 servers leased by 7,500 customers were brought down due to the power outage. More than

one million retail sites were affected by the explosion, denying service to millions of Internet users.

For safety reasons, the fire department evacuated the building and directed that the backup generators could not be turned on. It wasn't until after 10 pm that staff were allowed back into the building to assess the damage.



diesel generators

At this time, Doug Erwin, the CEO of The Planet, issued the following statement:

"This evening at 4:55 pm CDT in our H1 data center, electrical gear shorted, creating an explosion and fire that knocked down three walls surrounding our electrical equipment room. Thankfully, no one was injured. In addition, no customer servers were damaged or lost.

We have just been allowed into the building to physically inspect the damage. Early indications are that the short was in a high-volume wire conduit. We were not allowed to activate our backup generator plan based on instructions from the fire department.

This is a significant outage, impacting approximately 9,000 servers and 7,500 customers. All members of our support team are in, and all vendors who supply us with data-center equipment are onsite. Our initial assessment, although early, points to being able to have some service restored by mid-afternoon on Sunday. Rest assured we are working around the clock.

We are in the process of communicating with all affected customers. We are planning to post updates every hour via our forum and in our customer portal. Our interactive voice response system is updating customers as well.

There is no impact in any of our other five data centers.

² Photographs by Kevin Hazard of The Planet.

I am sorry that this accident has occurred, and I apologize for the impact.”

As we shall see, it was days before full service was restored.

The Recovery

The Planet immediately mobilized their staff and the staff of their vendors for an around-the-clock recovery effort. They determined what equipment had been destroyed and arranged for immediate replacement of this equipment.

The staff was able to move some customers to new servers in other data centers, but limited cooling capacity in the data centers limited this to only a few customers. Shortly after the explosion, The Planet had to deny further requests for reprovisioning.

Sunday evening, Mr. Erwin released the following statement:

“As previously committed, I would like to provide an update on where we stand following yesterday’s explosion in our H1 data center. First, I would like to extend my sincere thanks for your patience during the past 28 hours. We are acutely aware that uptime is critical to your business, and you have my personal commitment that The Planet team will continue to work around the clock to restore your service. As you have read, we have begun receiving some of the equipment required to start repairs, While no customer servers have been damaged or lost, we have new information that damage to our H1 data center is worse than initially expected. Three walls of the electrical equipment room on the first floor blew several feet from their original position, and the underground cabling that powers the first floor of H1 was destroyed. There is some good news, however. We have found a way to get power to Phase 2 (upstairs, second floor) of the data center and to restore network connectivity.”

As Mr. Erwin indicated, 3,000 of the affected servers were on the first floor of the data center; and 6,000 servers were on the second floor. The Planet’s staff was able to get power to the second-floor servers, and around 5 pm Monday evening - two days after the explosion, the second-floor servers were once again operational.

Restoring power to the first-floor servers was a much more difficult challenge due to the extensive damage. Each of these servers was brought online as soon as possible, but four days after the explosion, full service to all customers had yet to be restored.

Communication

As we have said in previous articles, communication between the company experiencing the disaster and its customers is essential. The Planet tried very hard to provide excellent communications but with mixed reviews.

Its staff made frequent online updates to The Planet's forum to keep their customers apprised of what was going on. Until late in the evening of the explosion, Planet staff posted updates every fifteen minutes, even if the message said that there was no update at this time. Late in the evening, the updates continued on a time frame of about one per hour.

The Planet’s automated voice response system was kept updated as well. However, many users complained that they could not get to a real person to find out additional detail.

As one might expect, The Planet's blog became very active, both with support and with complaints. There were outcries when Planet staff allegedly started to delete negative blog entries from the forum.³

Lessons Learned

The obvious question to ask following this disaster is why The Planet did not have backup plans to cover a complete data-center outage given that most of its customers are web-hosting companies servicing millions of Internet users? It certainly had the geographical distribution to do this with its six data centers, but it did not have the network capacity nor the cooling capacity to add a significant number of servers to its other data centers. In fact, The Planet had just gone through a facilities consolidation effort that resulted in a significant reduction of cooling capacity required across the data centers. Obviously, no thought had been given to a backup plan that perhaps might require this excess capacity.

However, there is a more fundamental lesson here. Not only can the timing of disasters not be predicted, but the nature of disasters cannot be predicted. Remember the Rackspace outage caused by a truck hitting a transformer outside of its data center?⁴ Shortly after switching to diesel generators and then to its independent secondary power source, emergency personnel killed that power, too, causing the diesel generators to come to life for a second time. The rapid recycling of Rackspace's chillers during the dual power outage caused the chillers to provide insufficient cooling, and the servers had to be shut down because of rapidly rising heat in the data center. The thousands of web sites that the data center hosted were down until the next day.

Like the incidents at The Planet and Rackspace, it is impossible to protect a data center against all disasters. You can't anticipate what you don't know. The only option is to ensure that there is a backup plan in place that will allow the company's services to continue at an alternate site should the data center be taken out of service.

The Planet disaster demonstrates the need for tiered backup. In its case, The Planet provided dedicated servers to web-hosting companies. Each of these companies hosted the web sites of hundreds or thousands of small to mid-sized end-user companies. From an end-user's viewpoint, a failure anywhere along this chain would take down its site and cost it perhaps thousands of dollars per hour in lost revenue.

Therefore, it is important that the primary provider of computing capacity – The Planet, in this case – be able to switch over to an alternate facility. Likewise, each of the web-hosting companies must have a similar plan in case one of their data centers goes down or their service provider goes down. Finally, the end-users must have a backup plan to protect themselves from any failure along the chain.

The higher in the processing chain, the more important it is to be able to recover from a data-center disaster. This applies not only to companies providing dedicated computing capacity, such as The Planet, but also to those who provide cloud-computing services, software-as-a-service (SaaS), utility computing, grid computing, and other central-computing services.

Perhaps an impediment to such plans is the additional cost. However, there is nothing that says that this cost cannot be passed on to the customer as an additional service. An excellent example of such a service is Amazon's new Availability Zones, as recently

³ Interestingly, the updates posted to The Planet's forum by Planet staff seem to have disappeared from the forum's archive, which is accessible from The Planet's web site. However, these updates can be accessed directly at <http://forums.theplanet.com/index.php?showtopic=90185>.

⁴ Rackspace – Another Hosting Service Bites the Dust, *Availability Digest*, December 2007.

described in an Availability Digest article.⁵ Also, IBM is investing \$300 million to build thirteen cloud-computing backup centers in ten countries. They will provide data-center disaster recovery within two to six hours.⁶ Perhaps the day of the reliable compute utility is on the horizon.

⁵ How Many 9s in Amazon, *Availability Digest*; July 2008.

⁶ IBM to spend \$300 million on 13 "cloud computing" backup centres in 10 countries, domain-b.com; August 21, 2008.