When Amazon fixed the traffic flow, a failsafe triggered: The storage volumes essentially freaked out and began searching for a place to back up their data. That kicked off a "re-mirroring storm," filling up all the available storage space. When storage volumes couldn't find any way to back themselves up, they got "stuck." At the problem's peak, about 13% of the availability zone's volumes were stuck.

But why did a problem in one availability zone ripple out to affect a whole region? That's precisely the kind of glitch Amazon's infrastructure is supposed to prevent.

Turns out EC2 had a few bugs. Amazon describes them in detail in its analysis, but the gist is that the master system that coordinates all communication within the region had design flaws. It got overwhelmed, suffered a "brown out," and turned an isolated problem into a widespread one.

Interestingly, those bugs and design flaws have always been in place -- but they wouldn't have been discovered if Amazon hadn't goofed up and set off a domino chain.

Amazon says that knowing about and repairing those weaknesses will make EC2 even stronger. The company has already made several fixes and adjustments, and plans to deploy additional ones over the next few weeks. The mistake presented "many opportunities to protect the service against any similar event reoccurring," Amazon said.

Of course, Amazon's customers **aren't so thrilled** to have been guinea pigs in this cloud-crash learning experience. Amazon offered a mea culpa, and said it would give all customers in the affected availability zone a credit for 10 days of free service.

"We want to apologize," the company said in a prepared statement. "We know how critical our services are to our customers' businesses and we will do everything we can to learn from this event and use it to drive improvement across our services." ∎