When the Creeks Rise: Disaster Recovery in Cedar Rapids

What do you do when your school buildings are flooded and your systems are in jeopardy? You act fast and learn from your mistakes.

By Dave Brousard

Thursday, June 12, 2008, dawned as another beautiful morning in Hawaii. There was a slight breeze, and the projected high was in the mid-80s with a chance of a shower in the afternoon. I couldn't wait to get moving.

Then the phone rang and everything changed.

It was my brother in Cedar Rapids, Iowa. He had just waded a half mile through chest-high water carrying only his cat and had taken shelter at the middle school. I couldn't really comprehend what he was telling me. Water that high? At his house? It just didn't make sense. He lives 10 blocks from the river and had never had water in his basement. But now it was up to his windowsill? He told me to turn on CNN and sure enough, there was my hometown.

My family and I sat glued to the TV for a good part of the day. Every camera shot seemed to be of some place we knew. One-fifth of the city of Cedar Rapids was under water. Thankfully, there were no fatalities.

At about 7:00 p.m., I decided to check my work email—I am the director of information technology at Grant Wood Area Education Agency in Cedar Rapids—

Left: Dryers helped dry the previously flooded rooms. Right: Servers were moved to a temporary location so systems could be brought back online.

but I couldn't connect. I thought that was odd so I tried calling up my Grant Wood home page. Still no response.

Back home in Iowa it was 1:00 a.m., so I couldn't call anyone to find out what was happening. I did try calling my work number to see if someone had left me a message. This time, I got a fast busy signal. I didn't have a good feeling.

I stayed up that night and watched the news until 2:00 a.m.—which was 8:00 a.m. back home. Then I called Al, our network engineer and one of the most dedicated and knowledgeable people I know. He said it was bad, and there might be three feet of water in the building. The local creek had flooded the building because it had nowhere to flow because the river was so high. The good news, he told me, was that he and two other people moved the four racks of computers to the second floor. The bad news was some of them had not shut down gracefully, so there was no telling how they might restart. We didn't know when we might be able to get in the building.

Saturday, June 14, 2008

We flew into Cedar Rapids on Saturday morning. The view from the air was incredible. Water was everywhere. We landed, got our bags, and went straight home. I dropped off my family and headed to work. I had no idea what I would see or if I could even get in the building.

As I approached, I saw that the water had retreated enough so I could get to the building. Pulling up to the entrance to my department, I could see that the water in the building had been a foot deep. I opened the door and peered in. The electricity was still on, so I turned on the lights and went in. I was the first one there.

Mud covered the floor and stuff had floated everywhere. I detected a slight smell of smoke and went farther into the building. Peering through the window of one of the hallway doors, I saw that smoke filled the entire hallway. I called the fire department; within five minutes, an entire assembly of fire trucks had arrived. I led the firefighters around, and we finally found a surge protector that had been underwater and had shorted out. They deemed the building safe and left.

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My attention now turned toward those servers on the second floor. How could we get them functional so we could start doing payroll for the 60 school districts that we service? Those districts understood, but that understanding wouldn't last long if they missed a payroll and staff members couldn't pay their bills.

My first phone call was to Al to get his thoughts. He suggested that we move the servers back to the first floor where there was appropriate power and Ethernet. Then we could start turning some of them on.

The elevator was on the first floor, the doors were open, and it had power. However, the floor outside the elevator was covered in some type of oil. Not knowing anything about elevators, I called our building engineer. He directed me to the maintenance closet on the ground floor, which housed the elevator pump. The elevator pump had been submerged in water and was now coated with the same oily substance. I was in way over my head, so I called the elevator service department. They asked if I was willing to pay for an emergency call. I had no choice.

When the service person arrived less than an hour later, I took him to the closet; he shook his head. The oil was hydraulic fluid. The motor needed to be removed and rebuilt. Next, he looked at the elevator and informed me that we should have left it on the second floor so critical components wouldn't have gotten wet. He'd be back the next day (Sunday), but in the mean-

time, I needed to clean up the fluid and disconnect the motor so he could take it to be rebuilt. I also needed to pump the water out of the elevator shaft.

Off to work I went. For the expense of a Wet/Dry Vac, I removed all the fluid, cleaned out the maintenance closet, and disconnected the motor. About that time, Al appeared, as did another employee, and we began cleaning up our server room—which was hard to do, given the city ban on clean water use. However, we got the job done and finally called it a night at 11:00 p.m. It had been a long day.

Sunday, June 15, 2008

I was up and at the home improvement store by 9:00 a.m. to buy a pump. I spent Sunday cleaning out the elevator shaft, helping remove the motor, and recleaning our computer room where water had seeped back in. We went home at 11:00 p.m.

Monday June 16, 2008

Monday was the day we hoped to have our elevator working so we could move those four racks of servers back to their home. However, the elevator company said that wouldn't happen until Tuesday. Since there was nothing we could do, we set about helping others who had arrived clean up their areas.

At about noon, Al had an idea. We could get our email and our Web server going and that would be our first little victory. We grabbed some extension cords and some Ethernet cables, and several hours later we had email. That one little success really boosted morale. We were connected to the world again!

Tuesday June 17, 2008

Tuesday was our day. The elevator motor was installed, and the elevator repairman was able to get all our equipment back to the first floor. By noon, we were plugging in servers and by 7:00 p.m., we had everything back up and running. The building was still a mess and would be for the next year. We moved our servers three more times, but those moves paled compared with the uncertainty of those first few days.

What Did We Learn?

You need capable, dedicated staff who are not afraid to make decisions without a road map. Right or wrong, they must feel comfortable doing so, knowing that you will support them no matter what happens. I had that person in Al. Instead of calling it quits and going home, he made some tough decisions, which in the end were the right decisions.

We have made a lot of changes as a result of what we learned that day in 2008. The most important is the 12-by-27-foot telecommunications shelter we purchased to house our servers. This tornado-proof shelter is raised four feet above the level of the 2008 flood and has redundant air-conditioning. Recently, another area education agency (AEA) purchased the same type of shelter. We each have the same kind of facility and the same backup system; so each evening, we back up our data not only to the backup system at our location but also to the identical backup system at the sister agency.

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Our agreement with that other agency also states that each will provide a server that can be virtually subdivided to run email, Webmail, DNS, and our finance and payroll systems. So should such a catastrophe happen again at either agency, we now have a location where we can begin recovery and restore our hardware and data.

These critical pieces should be up and functioning within four hours. That time frame includes the two-hour drive to the other agency and also assumes that the staff there will get started as soon as they get the call for help.

This process is tested twice a year at each location. After the test, staff members from each agency sit down and discuss what worked and what didn't and ways we can make the entire process more effective.

One of our remaining vulnerabilities is having more than 60 servers at our location. We cannot feasibly have that many servers at our sister agency. So we are exploring the possibility of developing some type of disaster recovery consortium that any Iowa AEA or local education agency (LEA) could join. The only stipulation to membership would be for each organization to make one server available at its location that meets a set of predetermined criteria that could be rededicated for disaster recovery for some other member of the group if necessary. This type of consortium would then provide more servers that could be used should a disaster happen to a member of the AEA or LEA.

The next time you drive by your nearest body of water, whether it is a creek, lake, river, or ocean, try to find its high-water mark. Now imagine what would happen if the water exceeded that spot by 10 feet. That's what happened in Cedar Rapids, Iowa, in June 2008. Are you prepared?

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