

# DISASTER RESISTANCE

FIVE LESSONS ABOUT DISASTER  
RECOVERY FROM HURRICANE  
SANDY



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*On Oct. 29, 2012, Hurricane Sandy tore through the eastern coast of the United States, causing heavy damage to the New Jersey coastline and New York City.*

On Oct. 30, the superstorm left 8 million Americans without power, thousands without homes, highways closed, and subway systems flooded. Sandy's 90 mph winds spanned more than 1,100 miles, making it the largest Atlantic hurricane on record. At least 125 deaths and \$63 billion (and counting) in economic losses were left in the hurricane's wake.

Four managed service providers (MSPs) in the path of Hurricane Sandy recently learned some grim lessons about disaster recovery and business continuity. All four were able to recover and restore their clients' data, despite the intensity of the storm and its widespread damage.

How? With emergency preparedness, a little Yankee ingenuity, and lots of disaster resistance. In this white paper Rashaad, Guy, Sean, and John share five lessons they learned the hard way from Hurricane Sandy.

## DISASTER RESISTANCE

At StorageCraft, we like to use the term "disaster resistance" to describe the efforts the best modern businesses take to mitigate the effects of a disaster.

In these days of Big Data and our heavy reliance on technology for even the smallest pieces of our businesses, recovery doesn't always cut it anymore.

Downtime and data loss are only getting more expensive and many businesses are finding creative ways to set up their IT environments so that when disaster strikes, they can keep operations up and running, even as they repair damage in the background.

Today, technology is making it possible to fight back against disaster and that's what disaster resistance is all about.



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## LESSON 1: PREPARE FOR LONG-TERM AND WIDESPREAD POWER LOSS

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*Scenario: Your client's office is on the 37th floor in Lower Manhattan. There's no power to its building, and it won't be restored for six weeks or more. Your client's servers are backed up on tape. Every hardware supplier in your area is also out of power and shut down.*

The above scenario could've been the situation for Rashaad Bajwa, president and CEO of Domain Computer Services in Cranbury, NJ. But happily, two years ago he started convincing his clients to migrate away from tape backup. Today, almost all of his clients are on an image-based backup solution. Rashaad explains:

To get to a functioning environment with tape takes at least four or five days, maybe a week. After Sandy hit, if you'd brought us a tape, our first reaction would be to throw it back at you. We didn't have time to build all new servers and restore them via tape. We didn't have a hundred extra man hours in the middle of a crisis.

With Hurricane Sandy, Rashaad has now helped clients in New Jersey and the greater New York metro area recover from three major disasters, including the terrorist attacks on Sept. 11, 2001 and Hurricane Irene on Aug. 28, 2011.

During 9/11, only 1% of our clients were impacted. Last year, Hurricane Irene impacted 5% of our clients. Some of them lost power for a week or more. Sandy was a totally different scale—it impacted 95% of our clients. Some lost power, water, Internet, or all of the above.

While almost all of his clients lost power, those located in Lower Manhattan and the Jersey Shore also lost access to their facilities. One client, a financial services firm just three blocks away from the New York Stock Exchange, couldn't get to their offices. The streets and subways were flooded and saltwater had destroyed the power connections in the basement of their building. With no lights or elevators to reach their offices on the 37th floor, it wasn't practical to physically relocate their servers.



Rashaad was able to boot up multiple servers, including the firm's IP-based phone systems, and run his client's entire LAN remotely, on six virtual servers in the datacenter of Domain Computer Services.

We got all of their servers up and running literally in hours after the hurricane. The hurricane hit Monday night, we had our first conversation with the firm's principals Tuesday morning, started executing on the recovery plan, and later Tuesday their servers were up and running in less than an hour on our cloud "warm site." We were able to be heroes from a technology standpoint. If this had happened two years prior, it would've been a very different outcome.

### DOMAIN COMPUTER SERVICES

Domain Computer Services, Inc. is one of the largest IT MSPs serving the New Jersey / greater NYC metro area. Domain has designed, implemented, and protected the technology infrastructure for over five hundred businesses ranging from small law offices to Fortune 500 companies.

For some clients, they play the role of a fully outsourced IT department, engineering group, help desk, etc. For others, they just supplement internal staff for special projects like server implementations, security consulting, backup, disaster recovery, and continuity solutions.

Whatever the level of engagement, their secret sauce is the same—spoil your clients so their only regret is not finding you sooner.

Visit Domain Computer Services at <http://go-domain.com>.

This disaster resistance provided by the combination of a good backup and disaster recovery plan and the right solution allowed Rashaad to be a hero from miles away in New Jersey, without setting foot in Manhattan.

We had their infrastructure up for them so quickly, their biggest problem was figuring out where to send their staff.



*Power outages weren't all businesses had to deal with. Flood waters made many businesses completely inaccessible, as this picture from eMezzanti, another MSP affected by Sandy, shows (see page 9). But as Rashaad's story demonstrates, the right plan can even cope with this.*

## WHAT YOU NEED

Though image-based backup has become popular in recent years, many businesses still use tape.

A quick search on the Internet shows that, contrary to popular wisdom, the debate between tape and disk is still a reality.

Proponents of tape tout its lower cost, greater storage space, and supremacy in archiving. While compelling arguments for all of these things can (and have) been made for disk-based backups as well, in many ways, these arguments completely miss the point.

Tape worked well when data recovery was a luxury, not a priority and when downtime barely even existed. Today, data loss and downtime kill businesses.

According to Rashaad, rebuilding a server from tape could take as much as a week, so when considering your backup technology, consider the recovery as well. Can you afford to be down for a week?



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## LESSON 2: PLAN FOR THE WORST SCENARIO POSSIBLE

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*Scenario: One of your clients is a manufacturer running its enterprise resource planning (ERP) system on a cluster. Hurricane Sandy knocks out the power to its SAN, and when power comes back up, your client discovers that its SAN has lost its partition information. All of its data appears to be gone. Meanwhile, your office has lost power and phones.*

Guy Baroan, founder and president of Baroan Technologies, located in Elmwood Park, NJ, says

We didn't anticipate the phone company being down, so we posted on Facebook, Twitter, and our website how clients could contact us. Luckily we had wireless signals, so we called all of our customers via wireless and asked if they needed help.

That's how Guy found out about his client's ERP system.

They were panicked because, as a manufacturer, the ERP system was their entire business.

The next day Guy discovered the client's RAID configuration was lost.

I thought their IT guy was going to have a heart attack. We restored the data from the last snapshot they had before they lost power. The entire SAN was restored in 20 minutes.

A year ago this client was using a different backup and disaster recovery solution. Had that still been the case, they wouldn't have had such an easy recovery. It would've taken several hours. We were able to get everything back to the way it was a few minutes before the power was lost. The client was grateful beyond belief.



Even though the Baroan Technologies office was without power for nine days, their clients' data was safely replicated to a data center about an hour away.

We were able to work remotely, wherever we had power and Internet, in employees' homes, client's offices. Our datacenter kept us running.

After Hurricane Irene in 2011, Guy revised his backup and disaster recovery plan and started replacing his clients' backup systems with an image-based recovery solution. He also started requiring offsite backup for greater disaster resistance.

Your information should be backed up or replicated to a datacenter that guarantees uptime levels that you cannot.

### BAROAN TECHNOLOGIES

Baroan Technologies is a managed service provider that has been serving business clients since 1997.

Located in northern NJ, Baroan Technologies delivers IT consulting, implementation, and tech support to small and medium-sized businesses in the area.

President Guy Baroan founded the company with a vision of being "One Point of Contact" for every aspect of a business's technology needs, and that's why Baroan Technologies offers a wide variety of services and solutions.

In addition, their diverse client base has allowed them to become adept at many industry-specific technologies.

Visit them at <http://www.baroan.com>.



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In addition, Guy recommends making a plan for disaster recovery that includes every potential issue and how you would avoid it or deal with it.

You may expect that if you have no power, the phone lines will be down as well, so you can contact the phone company and have them forward your calls to a different number, like a cell phone or answering service. But what happens if the phone company is down and they can't forward your calls? Where would your clients call? How would they know where to call? Think about everything that can go wrong and come up with the absolute worst-case scenario.

Because of Hurricane Sandy, Guy is revising his disaster recovery plan to include setting up SIP trunks and the capability to receive calls even without power or the local phone company.

We'll be making it possible for our people to work remotely with their internal extensions by utilizing the latest telephony offering via VoIP. We'll have a second phone system in our datacenter rack. The SIP trunks will be pointing to our main office for all calls and if they're not able to get to them, due to power failure or Internet access interference, we can redirect them to the datacenter phone system.

To prevent power outages, Guy is in the process of getting town approvals for a generator that would power the whole building rather than a few servers.

We'll be placing this on the roof—something that we didn't consider as a need—but after the water issues with Sandy, we realize it needs to be high enough off the ground.

### RECOVERY POINTS

Having backups saved both locally and offsite is a crucial part of your backup and disaster recovery plan, but just as crucial is knowing how much data you can afford to lose. This is called your *recovery point objective* (RPO).

If your business relies on data that needs to be accurate up to the minute, offsite backup images that are a week or a month old are better than nothing, but still not as useful as they could be. (Of course the same is true for local backups.)

Determining your RPO is one of the fundamental steps of good disaster recovery planning. Guy wouldn't have been able to recover his client's server as effectively if he hadn't planned in advance the frequency of its backup images to meet its own, rigorous needs.

Be sure you know what your RPO is and keep in mind that you may have different RPOs for each server.



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## LESSON 3: CHOOSE YOUR OFFSITE STORAGE CAREFULLY

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*Scenario: Your most critical files are backed up and stored offsite. But your offsite storage facility isn't far enough away from the disaster zone and it loses power.*

While thousands of businesses lost power during Hurricane Sandy, the clients of Sean Furman, president of STF Consulting in Atlantic Highlands, NJ, didn't lose their data.

A ton of datacenters in New York went dark because they ran out of diesel fuel for their generators, or because they got flooded. We'd learned from Hurricane Irene how to continue operating as a business throughout a storm. The key was having all of our critical services in the *right* datacenter.

The day after Hurricane Sandy hit, STF Consulting was fully operational. According to Sean,

It's a testament to my systems and my staff. A lot of IT companies were shut down. I'm a unique managed service provider because I own my solution, end to end. My business can continue in the most adverse conditions, and clients with data in our datacenter experience some of the most resilient infrastructure and highest availability possible.

With disaster resistance in mind, Sean offers these criteria to businesses looking for a datacenter provider:

- Geography. "Far away from potential disasters, but close enough that driving there isn't a huge hassle."

- Redundancy. "Insist on full N+1. Our datacenter is a Tier 4 facility, the absolute highest level you can get."
- Compliance. "SSAE 16 Type II is a must!"
- Relationship management. "The datacenter should be big enough to offer amazing services but small enough to have a tight relationship with."
- Boots on the ground. "You want to be able to leverage datacenter employees for power cycles and quick checks in an emergency."

Not long after Hurricane Irene, Sean started building his own backend infrastructure to support data replication and offsite storage. His data had zero downtime during Sandy. On the other hand, his office had no electricity for a week.

We were 100% functional because all of our tools—our ticketing system, our email—live in the datacenter. Our customers' data was restored remotely.

For three days Sean's truck became a "mobile command center," driving from cell tower to cell tower to get a signal.

The cell towers had generators, but when the generators ran out of fuel, the towers went down.

Using multiple 4G broadband cards, three notebook computers, and mobile phones with Bluetooth, he and a couple of staff members would contact clients and find out what they needed.

### STF CONSULTING

*Bridging the Gap between Business and Technology*™

### STF CONSULTING

Founded in 2000, STF Consulting began with a vision to help small and medium-sized businesses like yours get a real return on their technology investments.

Since then, they have remained dedicated to providing state-of-the-art IT support, service, and products that allow their clients to get ahead of the competition and achieve greater success.

STF Consulting is a company committed to taking technology and business beyond simply implementation, through to the next level of innovation.

Lowering your total cost of ownership and improving your return on investment are two concepts they give top priority.

Visit STF Consulting at <http://www.stfconsulting.net>.



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One particular client, a wholesale jeweler just entering its busiest time of year, was in the process of migrating to the datacenter when Hurricane Sandy came to town.

We only had 75% of the migration done. Their server died right after the storm from a power surge. We were able to mount the server image and share the mount point over the network, and copy all the data across the network. It took less than 30 minutes from start to finish, 60 GB of data restored. The customer was thrilled.



*Sean (above) had to wait in line for more than two hours to get gas and he clearly wasn't alone. Does your plan account for resource and time problems like this?*

### DOWNTIME MONSTER

Downtime kills. The more we rely on IT systems and data to run our businesses, the more periods without access to those systems or data hurt.

Our tolerance for downtime (often called *recovery time objective*, or RTO) has to drive our disaster recovery planning, even more than data loss and RPO. There have been solutions to the data loss problem for years, so these days, the true determining factor in beating a disaster is our ability to recover quickly, without any downtime.

Offsite backup in geographically diverse locations is one piece of the downtime defense, but it alone cannot beat the beast. When considering a solution, you need one that makes it easy to turn your backups into production systems, whether through virtualization or some other means.

Backups are only useful in recovery if you can a) access them even if your building is flooded and b) use them to run your business until you can restore your primary systems.



*Scenario: Your business is flooded and your office has no power. You have a backup and disaster recovery plan so your data is safe, but your employees can't get to the office and you're running low on sleep.*

John Motazedi found the above scenario when he arrived to help a colleague in Hoboken, NJ, soon after Hurricane Sandy. John, the CEO of SNC Squared in Joplin, MO, had survived a tornado tearing through his town in 2011. He knew what to do, and he'd convinced four disaster resistance experts in his accountability group to join him in New Jersey.

What we brought to the Hurricane Sandy victims was our own personal experience. Each one of us had already been through a disaster. That gives you a different perspective, on the outside looking in: "Do you have this process in place? Do you need to order hardware? Can we ship equipment here?" We knew which questions to ask.

John also knew which supplies to bring. In addition to his personal "bug-out bag" (level 2 first-aid kit, water purifying pills, energy bars, and work gloves), he brought the following:

- Flashlights and batteries
- Solar-powered chargers for cell phones
- Solar-power-charged battery pack
- Power strips and power cords
- Multitools and wire cutters

- Cold-weather gear (gloves, hats, coats, emergency blankets)
- Soap and hand sanitizer

John and his associates from the Heartland Technology Group (HTG) were all MSPs experienced in imaged-based backup and disaster recovery solutions. Hurricane Sandy had flooded the office of eMazzanti Technologies, owned by their colleague, Carl Mazzanti (remember the picture on page 4?). Though his clients' data was stored safely in the cloud, his office floor was covered in a stinky, soggy mess. John says,

You wouldn't believe the damage two inches of water can do, especially with electrical outlets in the floor. It shorted out all his equipment. It's surprising how quickly saltwater corrodes wiring. We really needed those power cords. Probably a quarter-million dollars of inventory in Carl's office got ruined.

More than 60% of eMazzanti's clients were without power or had no access to their facilities. John helped set up a "triage area" in an engineer's house about twenty miles from the office.

The poker table became our Network Operations Center.

From there they contacted clients, let them know they'd spun up all their data to the cloud, and prioritized recovery efforts.



## SNC SQUARED

Founded in 1998, SNC Squared Technology Group provides IT support and comprehensive managed services to small and mid-sized businesses in Joplin, Missouri and the Four States Area (Kansas, Oklahoma, Missouri, and Arkansas).

SNC Squared helps customers realize the full potential of their technology investments. Their staff of IT professionals keeps up with the latest technologies and certifications so they can offer everything a fully staffed, in-house technical support department provides.

In addition to reliable, responsive service, they offer this guarantee: "Our goal is zero downtime. If something does go wrong, we'll have a technician on site in less than an hour, guaranteed. And even if your server dies completely, we can have you up and running again in short order thanks to our emergency backup virtual servers."

You can contact them at <http://www.sncsquared.com>.

Sometimes we had to use a little ingenuity to solve problems. One client, an advertising company, had power but no Internet because their cable modem power supply had shorted out from a voltage spike. I took my battery pack, ran their cable modem off of that for nine hours, took it back and charged it at night, then brought it back for another nine hours. Otherwise, they would've been down for five days.

Hurricane Sandy hit Hoboken Monday night, John and crew arrived Friday night, started rewiring the office on Saturday, and by the time they left on Tuesday, full power had been restored to the eMazzanti office. Eight days after the second-costliest Atlantic hurricane in history, 100% of Carl's clients were either up and running in their own offices or running in the cloud—with 100% of their data.

John credits the accountability group volunteers, a detailed backup and disaster recovery plan, and a tested-and-true disaster resistance solution for the successful recovery of his colleague's business.

When something this big hits, you can't do it alone. Forget about being the Lone Ranger—ask for help and ask for it early. Put a plan in place when you have a clear mind, because you won't make good decisions when you're under stress, hungry, and exhausted.



*Setting up shop at a poker table in someone's kitchen may not be ideal, but the whole point of your disaster recovery plan is keep your business running no matter what. If you can't run your business in a situation like this, maybe it's worth considering why not and what you'd need to change to make it possible.*

### A LITTLE HELP

Sometimes in our focus on technology and software, we forget the integral part that people play in our disaster resistance.

Whether it's communicating the plan with the people in your organization, making sure you have the technical support you need from your software and hardware providers, or writing a call tree to ensure all your employees are safe, people have to play a central role in your plan.

People can play a much larger role, however, as John's and Carl's experience shows. By joining an accountability group like HTG, or even doing something a little less formal, surrounding yourself with other people is a great way to strengthen and protect your own business.

And, it gives you a chance to give something back.



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## LESSON 5: TEST AND REVISE (AND PRINT) YOUR PLAN REGULARLY

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*Scenario: You've written a detailed backup and disaster recovery plan, considering all possible scenarios. A statewide emergency knocks out power at all of your locations. You don't have a hard copy of your backup and disaster recovery plan...at any location...including your home.*

The scenario above actually happened to Guy Baroan during Hurricane Irene.

We lost power for several days and needed to know who to contact for what, but we didn't have a physical printout of the recovery plan at our offsite locations. Until we actually went through the plan, we didn't know what we were missing. We thought we'd added everything to our plan after Hurricane Irene. As much as we thought we were ready, we still had things missing. Now we've tested our plan with two real live, worst-case scenarios. You should test your plan at least twice a year and update it when you find a gap.

Rashaad Bajwa echoes Guy's advice:

I would never wish a hurricane on anyone, but Hurricane Sandy allowed us to validate the backup and disaster recovery solutions we'd implemented. Get safeguards in place prior to the next event. After Irene and Sandy in back-to-back years, nobody I know is willing to bet against another similar event. Luckily, we had enough redundancies in place that we were able to keep all our promises.

Sean Furman cautions,

Be careful what you promise people during a statewide emergency.

He also suggests walking through your backup and disaster recovery plan.

Think about how fragile things are. Try to be proactive as much as you can. Consider what to do if your office has no power. Where will you and your employees work? What if your cell tower goes down? Have plenty of fuel on hand during a potential storm condition. Have discussions with your managed service provider before these things happen. Don't try to buy a generator during the storm.

John Motazedhi recommends practicing:

Don't wait for a disaster. Get a good backup solution and test it. Partner with a good company that does backup and disaster recovery processes as a standard practice. And check references.

## RECOVER-ABILITY

The four MSPs who shared their Hurricane Sandy experiences also share something else in common: StorageCraft products.

You can find out more about the end-to-end StorageCraft Recover-Ability solution and how it empowered these solution providers to deliver disaster resistance to their clients during one of the costliest Atlantic hurricanes in history by visiting <http://www.storagecraft.com>.



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RESISTANCE IS NOT FUTILE

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*Disaster resistance is available and affordable for small to medium-sized businesses.*

A knowledgeable managed service provider can help with the necessary backup and restore software, as well as disaster recovery services. Continuity planning for the entire business, disaster recovery planning for IT assets, and regular updates of those plans will help protect small and medium businesses and minimize the effects of a disaster.

Hardware failures and power outages are more likely to happen than natural disasters, and they can have devastating effects on small and medium businesses. Disaster resistance gives small business owners confidence that they can minimize downtime and eliminate data loss, no matter what happens.

Then, in the face of disaster, they can avoid panic by following the plans that will help them recover as quickly as possible.



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## ABOUT STORAGECRAFT

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*At StorageCraft®, the goal of complete disaster recovery drives everything we do. Our StorageCraft® Recover-Ability™ solution is an end-to-end, best-in-class backup and disaster recovery solution that is both fast and reliable.*

### STORAGECRAFT RECOVER-ABILITY

It starts with a good backup. Our award-winning *StorageCraft® ShadowProtect®* takes complete, pristine images of your machines, including all your operating systems, applications, services, and settings.

It then records changes at the sector level, so you always have an up-to-date copy of every machine in your IT environment, whether it's a critical server or an employee laptop, physical or virtual. We even work with specialized database servers, like SQL, SharePoint, or Exchange. You can get granular recovery in Exchange with *ShadowProtect Granular Recovery for Exchange*.

You have complete control over the frequency of your backups and you can set rules for consolidation and retention to manage your precious storage space using *StorageCraft® ImageManager*.

Plus, with *StorageCraft® ShadowControl® CMD™* you can monitor the machines in your backup environment from a single interface and get alerts when a machine is running

out of space, when a backup doesn't happen, or when any of a variety of conditions you specify is met.

We also give you tools to test your backups using *StorageCraft® VirtualBoot™* and *StorageCraft® Image-Ready™* technologies, which gives you confidence that your data is safe and that a disaster won't shut you down or hold you up.

Then we make it easy to replicate your backup images with *StorageCraft® Cloud Services* or to our cloud or to your own offsite location so you can always have your data close when you need it and at a good safe distance when a disaster comes.

When it does, you can launch your backups as virtual machines with VirtualBoot or mount them as drives for complete, granular access to your data.

Or you can pre-stage the recovery of a backup image in a virtual machine with our patented *StorageCraft®*



*HeadStart Restore®* technology, so if your main server blows up, you can be up and running in minutes. You can even virtualize your data in our cloud so even Mother Nature can't keep you down.

Then, you can rebuild your infrastructure and recover to all kinds of machines, physical or virtual, using our *StorageCraft Hardware® Independent Restore™* technology or *ShadowProtect IT Edition*.

You can't be sure what kind of disaster will strike you next, but with the StorageCraft Recover-Ability solution, you can be sure it doesn't matter. You'll be just fine.

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