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Slashing Downtime from 24 Hours to 24 Minutes:

Technology Advancements Make Warm-Site Disaster Recovery Possible

Don Beyer

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A paperless healthcare system offers great promise, but the increased reliance on technology raises serious questions that can keep hospital executives awake at night.

What if our IT systems fail? How long can we afford to be down?

In this era of healthcare reform, downtime is far more critical than ever, and what was once considered standard recovery time is no longer acceptable. Better approaches are needed.

Backed by CareTech Solutions, Oakwood Healthcare has transformed its disaster recovery plan, and the change is a dramatic one -- a reduction of recovery time from one day to less than half an hour. Here's how.

Redefining Disaster Recovery

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Serving southeast Michigan, Oakwood Healthcare includes four acute care hospitals, 1,243 licensed beds, 65 outpatient sites, one rehabilitation skilled nursing center, and more than 9,000 employees and 1,300 physicians.

As Oakwood's Corporate Director of Technical Services, Don Beyer is responsible for the health system's IT operations and infrastructure. "We now have 8,800 workstations, up from 7,200

a year and a half ago," he says. To prepare for the new world of electronic medical records, Oakwood switched to Epic software. "With our Epic deployment we rolled out about 6,000 new devices -- everything from tethered and non-tethered barcode scanners, printers, badge readers, workstations, you name it."

The move to Epic led to a rethinking of how Oakwood approaches disaster recovery.

"When you think about disaster recovery, it's one of those areas that's usually down the priority list," said Beyer. "It's viewed much like an insurance policy, and just like any good insurance plan, you try to get good value for the amount of money that you spend on it, because it's one of those things that you hope you never have to use. In that context, disaster recovery is a cost. It's overhead."

In the traditional world of disaster recovery, the costs can be high.

Typically, you pay a monthly recurring cost to an outside service vendor for providing disaster recovery capability, and when a disaster hits, you pay another one-time charge for each disaster, and then you pay a daily charge when it occurs.

The long-standing, traditional method is known as cold-site disaster recovery. It involves making an arrangement to have available equipment, capacity and connectivity off-site. It also requires labor-intensive testing once or twice a year to ensure the system works, involving detailed, time-consuming documentation.

Oakwood's move to Epic opened up some new possibilities for disaster recovery.

"Rather than thinking about disaster recovery as a separate, stand-alone requirement, we took a fresh look at it," said Beyer. "We wanted to see if we could leverage our disaster recovery environment on a regular basis by using the available resources for maintenance, load balancing and relocations, rather than having resources sit idle until the world falls apart."

When Oakwood switched to Epic, it decided to relocate the system's primary data center at CareTech Solutions' Somerset facility in Troy, Mich. As part of that plan, a data center in one of Oakwood's hospitals was designated as its new disaster recovery location.

“It made sense for us to maintain a data center at our biggest hospital, since it held a lot of equipment that needed to be on site anyway,” said Beyer. “For example, radiology imaging involves files too large to be sending across the network. That got us thinking about warm-site disaster recovery and the advantages that could bring.”

“It’s a good model,” adds Caschera. “Typically, the hospital already has the infrastructure, and if it has a data center that could support recovery, it would make sense that you look at that as a viable recovery site option

Key Measures of Disaster Recovery

The two key measures in a disaster recovery plan are Recovery Time Objective (RTO) and Recovery Point Objective (RPO).

RTO specifies how quickly each particular operation needs to be up and running again.

RPO specifies the point of time from which data needs to be recovered, typically the time of the last system backup.

The switch from cold-site to warm-site disaster recovery has a dramatic effect on both measures.

“Let’s do compare and contrast,” said Beyer. “In the old days, our recovery time objective would be somewhere between 24 to 72 hours. With a warm site, we bring down one machine, then bring up the other machine, and just change our network pointers. We go from 24-hour capability to about 24 minutes.

“The second piece of this is the recovery point objective. The RPO used to be the last backup that you took, and sometimes, the last backup you took off-site, because in a true disaster, whatever tapes are still at the data center are not available -- so it could be the backup from the night before. We’re now down to a zero recovery point objective, because we’re dynamically replicating the data. We’ve gone from a two- to three-day recovery point to simultaneous.”

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How It’s Done

A couple of key technology advancements is making warm-site disaster recovery possible.

“One is server virtualization, which is the ability to run multiple servers on a single piece of hardware,” says Beyer. “We now have a farm of 20 servers that are running 1,300 virtual servers. And if we take one of those servers out, the load is redistributed automatically, which greatly increases our efficiency.

“Virtualization does a lot for us. It allows us the flexibility to move files among data centers. It even allows us to create a copy, upgrade that copy, and make sure the upgrade works before we switch over and throw it away. There’s a lot you can do when you divorce the server from its physical shell.

“We’re also working on technology that extends virtualization between sites. If we shut down a site, we can migrate all of our active servers over to another site. The ability to move virtual servers around between physical boxes and other locations has been a big advantage for us. We just copy the data over, move the virtual server from one farm to another, make sure it works, then we shut down the original server.”

“The reason that we can do such replication is the underlying architecture of that storage is fundamentally different from a lot of the products out there in the market,” adds Beyer. “Not only does it allow us to do live replication from site to site on a block-to-block basis, but it also allows us to take snapshots at a point in time and copy those over at any point of time.”

These technologies once reserved for rare events of disaster recovery are now being used for routine operational tasks, as well as simplifying complex, time-consuming, and costly processes such as the relocation of a data center.

“The requirements are basically the same for each,” notes Caschera. “If you’re migrating a data center, you’ve got to be running on another data center as quickly as possible. The same is true for a disaster recovery. It requires the same steps.

“Another key component of this is the network -- the bandwidth we’re using for all the activity between both sites,” he added. “What really drives the price of your disaster recovery insurance policy is what can you afford in terms of your required RTOs and RPOs. Health systems have other critical applications besides electronic health records, which is why cold-site disaster recovery can be so costly.”

Oakwood has three different layers of networks, says Beyer. “We have a core data center network for high-speed data replications. We have a user network. If I’m at a hospital, I connect to the data center via that. And the third layer is our public Internet connectivity. We do a significant amount of our business with outside providers, so that’s a critical piece.”

Beyer and Caschera note that building in redundancy and high data center availability is an important step in the planning.

“The book is getting rewritten there as well,” says Beyer. “The traditional way of providing high availability is through database clustering, but that creates an added level of complexity because you’ve got two nodes that are trying to synchronize.

“We’re finding that by getting out of clustering and relying on virtualization at the operating-system level, it simplifies the environment, and it’s quicker and easier. Instead of having two servers side-by-side, we have just one server on a server farm.”

A Multitude of Benefits

The advantages of warm-site recovery go beyond a reduction of downtime.

“One big advantage is the ability to use the back-up capacity for other purposes,” says Beyer. “We use ours for development and for copies of systems, so it’s not just wasted money into an insurance plan that you hope you will never use. It’s capacity that’s open for future use.”

Another major advantage is the time saved by eliminating the testing required with a cold site.

“With the technologies we are deploying, we can test whenever we want,” he added. “We don’t have to corral everybody once or twice a year for expensive cold-site test in another state. We can literally test our disaster recovery capability without disruption.”

Oakwood also expects to realize cost savings through cancellation of its cold-site insurance policies.

“CareTech Solutions is doing the same with some of our in-house operations,” says Caschera. “We used to need a lot of disaster recovery services from outside providers. Those are getting eliminated as we progress with our data centers here for our own recovery.”

Changing the Game

The implications of a paperless healthcare environment are deeper than they appear on the surface.

“If you think about the old-fashioned world, it was multiple systems that operated independently, using a lot of paper,” said Beyer. “When you go from a paper environment, where there is a zero downtime, to an integrated computer technology environment, that really ups the ante for the IT staff.”

Raising the stakes further are the requirements of healthcare reform, including Meaningful Use.

“Essentially, you’re putting all of your electronic medical records into one system, and when you do that, it’s very important that it stays up and running,” adds Caschera.

“Our customers’ expectations for system availability is high,” adds Beyer. “They want zero downtime. We can almost achieve that now. The difference between a cold-site and warm-site disaster recovery extends that capability to catastrophic events and has become a real game-changer for us,” said Beyer.

What’s Next

A new approach to disaster recovery is indicative of the many changes taking place in healthcare IT.

“I think most healthcare executives are going to be faced with the realization in the next couple of years that the relationship with IT is going to evolve,” says Beyer. “Particularly with the regulations and the changing nature of technology in the healthcare world. Electronic Health Records and Health Information Exchanges, mobile device technologies, data analytics, and telehealth being good examples. Healthcare IT organizations will need to continually challenge themselves on how to become a better strategic partner rather than an expensive necessity.”

Beyer credits his “talented team” for Oakwood’s IT breakthroughs. Almost all of his team of 80-plus IT professionals are from CareTech Solutions.

“One of the values of working with CareTech is the level of flexibility it provides,” he said. “It’s a partnership approach. We work together well to find the best solution.”

If you are interested in finding out more about how CareTech Solutions can support your disaster recovery plan, call us at (877) 700-8324 or visit our website at www.caretech.com.

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