

BY ROGER D. KIRK

“HIGH AVAILABILITY” IT STRATEGIES

Protect Data & Profitability



The average total cost of a data loss incident affecting just one desktop PC is \$2,900, according to David M. Smith, PhD, Associate Professor of Economics at the Graziadio School of Business and Management, Pepperdine University.

This figure includes the cost to replace hardware (if needed), the cost of data recovery, and lost time and productivity. In fact, lost time and productivity represents the highest portion of the total cost (\$1,750) – more than 60% of the total.

And, if the lost data cannot be recovered, the business impact may be far greater. “It is possible that a data loss incident could have catastrophic economic results; for example, if it was a customer database or other data critical to business operations,” Smith observes.

If these costs are the result of data loss from one PC, imagine the potential costs of a data loss affecting a server (such as the one that runs your company’s financial management system).

Today’s successful construction companies rely on digital information for every business process – from job costing to A/R – and no company can afford the significant downtime associated with an IT system failure, natural disaster, or human error.

That’s why, at the very least, your construction company should implement an effective disaster recovery strategy. Better yet, it should invest in a high availability IT solution that creates a redundant system for all business-critical IT applications: financial, project management, and file and print services.

Is Disaster Recovery Really Enough?

Many construction companies schedule nightly data back-ups of modified files and weekly full back-ups.

Data tapes are also sent to off-site data archiving and storage companies at least once a month, depending on company size, geographic location, season of the year, and the critical importance of the data.

A Real Life Adventure

But that may not offer enough protection, as many in construction have learned the hard way. “We experienced a cooling failure in our server room, which caused an outage,” recalls Noel Peters, IT manager, Clark Construction Company, Lansing, MI.

“Although we didn’t lose any data (we were able to recover from tape), the event was a significant disruption in our normal business operations. Today, we look at tape primarily as a means of historical storage, rather than a current means of recovery.”

Clark (a full-scale commercial construction company) now uses a high availability strategy to protect its financial, project management, and paperless services. “We wanted to mitigate future risk, especially as the company continues to grow,” Peters says. “We looked at how we could create high availability and scalability. That is what drove us to replicate our data to remote data centers.”

A High Availability Strategy

A high availability strategy should be: 1) reliable, 2) easy to manage, and 3) scalable and flexible.

Reliable

Reliability ensures maximum uptime and data integrity. To identify an appropriate strategy for your company, its management team must first decide what amount of downtime and data loss is acceptable, if any. For example, can your company continue to function without its computer system for an hour, day, or week? Can it afford to pay staff to re-enter an hour’s, day’s, or week’s worth of lost data?

Easy to Manage

Your company’s strategy must be easy for your IT team to manage. For example, if you select a high availability clustering solution, it should include automatic resynchronization of data, in addition to e-mail or message notification of critical issues. This reduces the amount of time spent reacting to problems.

Scalable & Flexible

Your company’s strategy should also be scalable; that is, it should be capable of scaling up to accommodate increasing volumes of data and numbers of users as your company’s business grows. In addition, the strategy should be highly flexible to meet your company’s changing business goals.

A Redundant System

There are several technology solutions that meet the criteria of reliability, manageability, scalability, and flexibility. These create a redundant system through: 1) hardware fault tolerance, 2) clustered servers, 3) storage area network (SAN) environments, and 4) remote failover sites. Be sure to consult your IT professional to determine which options are right for your company.

Hardware Fault Tolerance

Use of a hardware fault tolerance solution recognizes that most construction companies need functioning systems, even during hardware faults or errors. Fault tolerance can be achieved through the redundancy of memory, disk drives, and power supplies. Disk arrays also provide a level of fault tolerance.

Various levels of redundant arrays of independent disks (RAID) provide different types of data protection strategies, depending on business needs. For example, RAID 0 improves speed and disc capacity, but does not protect against data loss. RAID 1 (data mirroring) protects against data loss, but does not affect speed or capacity. RAID 5 (which requires three or more disks) protects against data loss if one of the drives in the array fails.

Clustered Servers

Clustered servers provide ongoing computer service in a one-for-one strategy when a primary server fails. Clusters are often used for critical applications or databases, as well as for file sharing.

This approach eliminates a single point of failure through redundant hardware and network connections. In this arrangement, the primary server “synchs” or transfers data in real time to a secondary server, preferably in a remote location. When a fault is detected in the primary server, the secondary server automatically takes over as the primary server.

High availability clusters use a virtual private network (VPN) tunnel when conducted over a wide-area network.

SAN Environments

SAN environments can also provide a degree of high availability and redundancy. These systems share storage devices that provide full data access when a hardware device goes down.

Essentially a remote storage device, a SAN attaches to a server through your company’s network and functions as if it’s locally attached to the server. However, because it is not part

of the local server hardware, it is not affected in the event of a hardware failure. For an added measure of data security, the SAN can be located off-site.

Remote Failover Sites

A remote failover site is a physically separate site from which your company can run its systems when a disaster strikes the primary site. There are three basic types of failover sites, which are characterized by level of availability and potential down time.

A “hot site” exactly duplicates the primary site; it requires redundant/clustered hardware, software, administration, and monitoring. A “warm site” is partially equipped with all of the required links and hardware, but must be set up and turned on when needed. A “cold site” is ready for immediate use, but must be completely set up and configured before it can be used.

The High Cost of an In-House Solution

Going back to our “real life adventure,” Peters estimated the cost to harden Clark’s facility at about \$50,000; he also discovered that replicating project management and paperless services data over a secure Internet connection to a data

center would cost less than \$1,000 per month. Moreover, the data center vendor had a 99.999% guaranteed uptime and was responsible for ongoing systems and facility upgrades.

“One of the key factors in using a data center was the capital cost of ‘bullet-proofing’ our server room and building in redundant connections,” Peters says. “When we compared those with the cost of a rack in a data center that already has the infrastructure, including the cooling systems and failover for redundancy, the decision was quickly made.”

Clark still maintains servers at its own facility in Lansing, but the core servers it uses to manage its paperless services data are co-located in a data center that is also in Lansing. Similarly, the company’s project management data is replicated to data centers throughout the U.S.

In the future, Peters says, the company will consider extending the replication of paperless services data to another geographic location to protect critical information in case a disaster occurs.

The Real Life Adventure continued ...

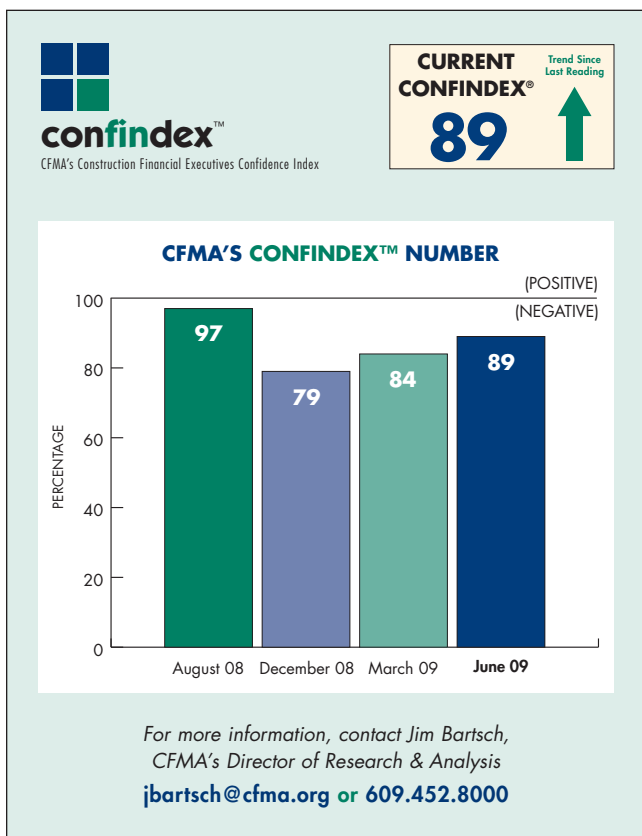
Following the same strategy that Peters implemented to ensure the high availability of his company’s project management and paperless services data, Lori Fernetto, Clark’s accounting manager, headed a committee that investigated off-site replication of the company’s financial management system, which runs on an IBM System i server.

“Before we implemented our new financial management system, we performed a daily back-up to tape and off-site tape storage,” Fernetto explains. “We also worked with an independent data programming contractor, who backed up our financial data from our IBM System i server to her own server.

“However, when we implemented our new system, our contractor’s server no longer had the capacity to function as a back-up server,” Fernetto continues. “So we looked at a clustering solution, and determined that it had what we needed.”

Although there are other solutions available for replicating data, Clark’s data is replicated in a Tier 4 data center in Chandler, AZ. Tier 4 data centers are designed to host mission-critical computer systems, with fully redundant subsystems and advanced building security.

“When you consider that our financial system holds the core financial information for our business, we couldn’t leave that as ‘secondary.’” Fernetto continues. “Although the outage in our server room didn’t affect our i server, if it had been affected, we



did not have something in place that would have allowed us to recover the next day. Now, we do.

“With our reliance on technology in today’s construction business, we can’t afford for the IT systems to be down,” Fernette says. “We have been proactive in addressing that concern.”

Reliability, short recovery time, reduced risk, and operational continuity are the major advantages of a high availability/disaster recovery system. Now, Clark Construction has covered all of its bases: financial, project management, and paperless services. As Peters says, “I can go home and sleep at night.”

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