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Synchronous Replication is Alive and Well

We have had some thoughtful comments on our LinkedIn Continuous Availability Forum about whether synchronous replication is really useful. These comments reflect many that I have received in the availability seminars that I give. Certainly, for maintaining a remote copy of a database for whatever purpose, asynchronous replication has been the popular choice.

However, asynchronous replication brings with it one serious problem; and that is the loss of data following a source-system failure. Synchronous replication solves this problem but poses its own challenge. The backup system has to be fairly close to the source system (for instance, in the same metropolitan area) for application-performance reasons. Thus, disaster tolerance may be compromised.

As related in this issue's case study, two banks have recently solved such challenges by building triplexed data centers. One data center is located hundreds of miles from the production system and is the disaster-recovery site kept in synchronism by asynchronous replication. The other data center is a "data bunker" near the production system that uses synchronous replication. This architecture satisfies the bank's needs to recover quickly from a disaster with zero data loss.

Let's keep this discussion going on the *Continuous Availability Forum*. Who else is using synchronous replication and why?

Dr. Bill Highleyman, Managing Editor

Case Studies

Banks Use Synchronous Replication for Zero RPO

Two banks, the Bank of New York and the Fifth Third Bank, each have built highly-resilient, triplexed data-center complexes that use a mix of asynchronous and synchronous replication. One data center in the complex, the disaster-recovery data center, is located a long distance from the production data center and is kept synchronized by asynchronous replication. Another data center, the "database bunker," is located nearer to the production data center and is kept synchronized by synchronous replication. By doing so, the banks have achieved zero data loss and a recovery time of two to four hours following a disastrous failure of their production data centers.

The implementation of a triplexed data-center architecture using a mix of asynchronous and synchronous replication is fairly new. By selecting this route, an enterprise can "have its cake and eat it, too." It can ensure that no common disaster will prevent it from offering IT services to its customers and partners while at the same time ensuring that no data will be lost.

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Never Again

More Never Agains IV

It is once again time to reflect on the damage that IT systems can inflict on us mere humans. We have come a long way in ensuring the high availability of our data-processing systems. But as the following stories show, we still have a ways to go. During the last six months, hardware/software and network faults shared responsibility, each causing about one-third of the outages. The rest of the outages were caused by a variety of problems such as power failures, construction mishaps, and hacking.

Some failures of note:

- The London Stock Exchange gives up on its Microsoft trading system.
- The expert in networking, Cisco, takes its own network down – twice.
- Redundancy works in the Mars orbiter – three failovers and still going.
- A wild saw severs 144 fiber cables feeding a single New York office building.
- Chinese hackers go too far and take down Internet service in much of China.

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Best Practices

Roll-Your-Own Replication Engine – Part 2

Active/active systems depend upon synchronized distributed copies of the application database. The predominant technology for keeping database copies in synchronism is to replicate data changes between the database copies. Though it is certainly feasible to incorporate data replication within the application, it is more common to utilize a replication engine that can serve the needs of multiple applications.

There are many excellent, commercially available data-replication engines that today serve a wide variety of server systems and databases. However, it is always tempting to consider building your own replication engine so that you can save all of those license fees while at the same time ensuring that it will meet your requirements.

Organizations have built their own data-replication engines. However, it is quite a complex task. The purpose of this two-part series is to ensure that you have thought out all of your active/active data-replication requirements so that you don't get caught in an embarrassing or untenable situation during production. In Part 1, we discussed general issues that relate to replication-engine technology. Here in Part 2, we concern ourselves with issues specific to asynchronous- and synchronous-replication technologies.

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Recommended Reading

The Disaster Recovery Journal

The Disaster Recovery Journal is a leading publication read by over 60,000 business continuity professionals. It focuses on the issues, procedures, and techniques for properly creating and implementing the business continuity plan so important to the restoration of a company's operations following a disaster.

For those IT managers and corporate executives who are responsible for disaster recovery, and for the business continuity professionals who guide them, the Disaster Recovery Journal is a very important resource. It reaches far beyond its quarterly articles to its monthly webinars, semiannual conferences, and many online tools to provide up-to-date and useful information on the state and practice of business continuity technology.

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