the Availability Digest™

- - - achieving 100% uptime

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The digest of topics on Continuous Availability. More than Business Continuity Planning.
BCP tells you how to *recover* from the effects of downtime.
CA tells you how to *avoid* the effects of downtime.

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It's Time to Pay Attention to Time

In the next two decades or so, time in our IT systems may suddenly roll backward. This is due to date/time fields overflowing in many applications, databases, file systems, and other utilities.

There exist two issues. One is known as the Y2038 problem. In many systems, date/time is kept in a 32-bit integer. These integers will roll over on January 19, 2038. Instead, the date will suddenly be shown as December 13, 1901. The other issue is the Y2042 problem. The 64-bit time integer in IBM z/OS systems will roll over on September 17, 2042.

Though both complications have been fixed in many systems, other systems have gone unrepaired. Now is the time to search your applications and utilities for these difficulties and get them fixed. The Y2038 and Y2042 time anomalies are described in this issue's article, "Future Dates Spell Problems for IT."

This article is an example of the stories we write for the Digest and for others. If you have an article, a case study, or a white paper that you would like written, come talk to us. We also provide consulting services and seminars on high- and continuous availability. We'd be glad to help you.

Dr. Bill Highleyman, Managing Editor

Case Studies

Amazon S3 Storage Taken Down by Fat Finger

Amazon Simple Storage Service (Amazon S3) stores objects via a simple web interface. S3 is designed to scale past trillions of objects worldwide. Many web sites depend upon S3 to store their data.

Amazon's S3 storage has been unbelievably reliable. Amazon claims eleven 9s when running redundant copies in multiple regions. However, on the morning of February 28, 2017, S3 storage failed while an Amazon team was debugging an issue that was causing the S3 billing system to run slowly in the Northern Virginia (US-EAST-1) Region.

A team member executed a command to remove a small number of servers from one of the S3 subsystems used by the billing process. Unfortunately, the team member entered the command incorrectly; and a larger set of servers than was intended was removed.

Amazon S3 storage went down because of a human fat-finger error. As we have said many times in the *Digest*, humans need to be redundant also. If a critical command is about to be entered, do it with two people – one to enter it and one to check it before it gets executed. If Amazon had done this, they would have averted an embarrassing outage.

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Best Practices

Future Dates Spell Problems for IT

Two major date rollover events are on the horizon for IT systems. They are known as Y2038 and Y2042. Either one of these events could cause applications that use dates beyond the rollover dates to crash. And there are many such applications. For instance, life insurance policies and home mortgages can extend decades into the future, well past the rollover dates.

The Y2038 problem is a direct result of the common use of 32-bit date/time fields. These fields will overflow on January 19, 2038, and time will revert to December 13, 1901. The Y2042 problem results from the representation of time in IBM z/OS mainframes. It will roll over on September 17, 2042.

Though these dates are more than two decades in the future, beware! Time passes quickly; and the longer one waits to correct an application, the more difficult the fix may be. Most of us will still be working two decades from now when these rollovers will impact our systems and applications. Now is the time to begin to analyze the impact these date events will have on us and to take action to mitigate any serious consequences.

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Availability Topics

Airline Outages Continue to Ground Passengers

Airline IT system outages continue to lead to long check-in lines, flight cancellations, and passengers stuck in airports. It seems that no airline is immune. When you arrive at the airport in plenty of time, the failure of any one of a number of systems can ground your flight.

The airline industry still limps along on a core of old technology. Airline systems were developed decades ago when flights were fewer and passenger options simpler. As airlines merged and new features were added, the systems had to start performing round-the-clock. They no longer could be brought down for upgrades and patches.

System faults do occur. There is nothing we can do to avoid them. What we can do is to make sure that we can recover from them. This means that all critical systems must have redundant backup systems that can take over in the event of a primary system failure. Failovers should be practiced periodically to ensure that backups are working and that failover procedures are proper and are understood.

With proper redundancy and failover procedures, the frequency of airline IT system outages can be stemmed.

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Recommended Reading

The High Availability Design Spectrum – Part 4

[Editor's Note: In his book "High Availability IT Services," Dr. Terry Critchley lists twenty-three areas that can have an impact on the availability of IT business services. In this multipart series, and with his permission, we publish his observations. In Part 1 of this series, we reviewed his first four reflections - his Parts A through D. In Part 2, we examined his next nine considerations – his parts E through M. Then in Part 3, we published his six observations N through S. In this final Part 4, we publish his last four opinions, T through W.]

Dr. Terry Critchley: Most of the documentation on HA/DR I have come across majors on hardware, mainly redundant or fault-tolerant, and, to some extent software. My thesis is that the spectrum of activity needed to design, implement and maintain a high availability business IT system and recover from failures small and large (DR) is much, much greater. I have listed 23 areas (A to W) that can have an impact on the availability of business services that are IT-based. I am sure it will be evident that these areas can have a significant impact on the availability and non-availability of any service or system.

Remember, focusing on availability and focusing on avoidance of non-availability are not the same thing if you think about it.

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Tweets

@availabilitydig – The Twitter Feed of Outages

A challenge every issue for the Availability Digest is to determine which of the many availability topics out there win coveted status as Digest articles. We always regret not focusing our attention on the topics we bypass.

Now with our Twitter presence, we don't have to feel guilty. This article highlights some of the @availabilitydig tweets that made headlines in recent days.

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