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Are Your Applications Facing Critical Date Issues?

Many systems may crash on January 19, 2038, when their date/time 32-bit signed integers overflow. It will be true especially of Linux/Unix systems. Our March 2017 article "Future Dates Spell Problems for IT" highlighted this upcoming concern.

It turns out there also may be a Year 2028 challenge caused by a 'temporary' fix for Y2K. We describe it in this issue in "Not Only the Y2038 Problem - There's a Y2028 Problem."

Fortunately, there exist some good utilities to test your applications for proper operability around critical dates. They are mentioned in "Testing for Y2038 and Y2028." Though 2028 and 2038 may appear to be far off and as such of no concern to us in 2017, don't wait much longer to ensure your applications will behave properly in the future.

The articles you read in the Availability Digest underscore the IT architectures about which we write for ourselves and for others. Our experience in the design and implementation of mission-critical systems is extensive; and we demonstrate our experience via our in-house seminars, our consultations on system architectures and risk analyses, and our writing services – everything from white papers, web content, and case studies to patent disclosures and technical manuals. See our complete list of offerings at www.availabilitydigest.com.

Dr. Bill Highleyman, Managing Editor

Case Studies

Yahoo's Users Are Victims of Massive Hacks

Yahoo is an American technology company headquartered in Sunnyvale, California. It was one of the pioneers of the early Internet era; and it is globally known for its Web portal, its search engine Yahoo Search, its email offering Yahoo Mail, its financial aids Yahoo Finance, and many other web-based services.

Yahoo is the highest-read news and media website, with over seven billion views per month. It is the sixth most visited website globally. Roughly 700 million people visit Yahoo websites every month. About 250 million people use Yahoo email. About 81 million use Yahoo Finance.

As a consequence, Yahoo has over a billion user accounts. This has made it a prime target for hackers, as evidenced by massive hacks of user data over the past several years. In 2013, user data from over one billion active and inactive accounts was stolen by hackers. In 2014, 500 million user accounts were hacked. Further hacking occurred in 2016.

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Recommended Reading

Internet Disruptions

An interruption of its Internet service can wreak havoc with a company. A recent survey by Spiceworks focused on the impact that an Internet-service disruption can have on an organization. The survey was sponsored by Dyn, a major DNS (Domain Name Services) provider that resolves URLs entered by users into IP addresses so that the web sites being referenced by the URLs can be accessed via the Internet.

The Dyn survey included over 200 IT decision makers in companies with 1,000 employees or more in the U.S., Canada, and the U.K. All the companies selected had external-facing applications. The majority of those interviewed deemed the outage to be crippling, excruciating, or painful.

In this article, we review the findings of the Dyn Survey. It indicated that nearly all companies suffered an Internet outage in the last year, and nearly all expect an Internet outage in the next six months.

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Product Reviews

Testing for Y2038 and Y2028

In "Future Dates Spell Problems for IT," an article we wrote for our March 2017 issue, and the "Not Only the Y2038 Problem, - There's a Y2028 Problem" you'll find in this issue of the Availability Digest, we explained future date issues that may cause applications to crash.

The Y2038 problem comes about because in many systems, date/time is kept as a signed 32-bit integer. Using this technique, times cannot be encoded past 03:14:07 UTC on January 19, 2038. Times beyond this will wrap around and will be stored as a negative number. The Y2028 problem comes from an attempt to sidestep the Y2K problem.

It is therefore very important to test applications, especially legacy applications that have been around for a long time and for which the code may be lost, to determine if they will face a Y2028 or a Y2038 problem. Fortunately, there are good test tools to do this.

In this article, we review two of these tools. One is Softdate from DDV Technologies. It can be used to test dates for IBM z/OS, Linux/Unix, and Windows systems. The other is OPTA2000 from TANDsoft for testing HPE NonStop systems.

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The Geek Corner

Not Only the Y2038 Problem – There's a Y2028 Problem

We pointed out in an earlier issue that systems may crash on January 19, 2038, due to the overflow of 32-bit date/time fields. For some systems, such a catastrophe might occur a decade earlier in the year 2028. However, this will occur for a completely different reason.

Applications used to employ a two-digit year field to save memory space. However, as Y2K approached, the IT industry realized with horror that 2000 defined in a two-digit year field would be interpreted by systems as 1900. Thus, all later years in the 21st century would be treated as having existed in the 20th century. 2010 would be 1910. 2085 would be 1985, and so on.

Massive efforts were launched to modify applications to move from a two-digit year field to a four-digit year field. However, some clever individuals came up with another technique. Since the calendar repeats itself every 28 years, it was only necessary to roll the calendar back 28 years. All the days of the week would be correct. The application simply had to be modified to add 28 to the year.

This was a much easier change. Data stored in the database could still use two-digit dates. For those unmodified applications that are still around by the year 2028, beware the Y2028 bug. It could deliver a painful bite.

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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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