

the Availability Digest™

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--- 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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A Tiny Chip Enables Chinese Infiltration

In 2015, Amazon began evaluating a startup company called Elemental Technologies for acquisition. Elemental's products fit nicely with Amazon's government business.

However, Amazon uncovered troubling issues with Elemental's servers. Scrutiny of several servers by a security company revealed a tiny microchip on the motherboards that was not part of the original design. The servers were provided by a company located in Beijing, China. Investigators found that the chips allowed attackers to create a doorway into any network to which the altered servers were attached.

This article and our other stories in this issue are examples of what 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, we encourage you to contact us. We also provide consulting services and seminars on high- and continuous availability.

Dr. Bill Highleyman, Managing Editor

Never Again

China Infiltrates U.S. Companies

In 2015, Amazon began evaluating a startup company called Elemental Technologies. Elemental's products would help Amazon with its streaming video service known as Amazon Prime Video. Its contracts fit nicely with Amazon's government business such as its highly secure cloud that Amazon was building for the CIA.

However, Amazon uncovered troubling issues with Elemental's servers that customers installed to handle video compression. Amazon had Elemental send several servers to a security company for testing. Scrutiny of these servers revealed a tiny microchip on the motherboards that was not part of the original design. The servers were provided by Super Micro Computer Inc. (Supermicro) located in Beijing, China. Investigators found that the chips allowed attackers to create a doorway into any network to which the altered servers were attached.

This attack by Chinese spies reached almost 30 U.S. companies, including Apple and Amazon. Apple had planned to order more than 30,000 servers from Supermicro over the next two years for a new global network of data centers. When the malicious chips on the motherboards were found, Apple severed ties with Supermicro.

[--more--](#)

CenturyLink Takes Down 911 Service

A widespread outage on CenturyLink's network, which provides phone, TV, and Internet services, lasted almost two days and hampered emergency phone service in several U.S. states. The outage was caused by a faulty network management card. The nationwide outage for CenturyLink customers included those trying to reach 911 emergency services.

Reports of trouble began about 4 AM EST on Thursday, December 27. Two days later, it was being reported as a nationwide outage. The disruption affected 911 emergency services nationwide.

It appears that a physical problem such as a cut trunk line interacted badly with supposedly more advanced network routing technology. The root of the problem was in a CenturyLink data center in Denver. The outage was caused by a bad network management card. The card was propagating invalid frame packets across devices, causing a series of issues that forced the company to reboot much of its networking equipment.

[--more--](#)

Best Practices

HPE's Spaceborne Computer Survives a Year on ISS

SpaceX launched a Falcon 9 rocket carrying a high performance computing system built by HPE to the International Space Station. The capsule successfully docked with the ISS on August 14, 2017.

The Spaceborne computer is part of a year-long experiment by NASA and HPE to run a high performance commercial computer off-the-shelf (COTS) system in space to see how it reacts to the unique environment.

The length of the experiment is roughly that of a journey to Mars, during which the spacecraft will need high performance on-board computing resources with high reliability. As the ship gets further away from our planet, the feasibility of using on-the-ground technology becomes smaller, with up to a 20 minute latency.

During the voyage, the computer will be subject to radiation, solar flares, subatomic particles, micrometeoroids, unstable electric power, and irregular cooling.

[--more--](#)

Switching Replication Engines with Zero Downtime – Part 3

In Part 1 of this article series, we described how a data replication engine could be switched with another replication engine that is a different version of the current engine or is in fact one from a different vendor without taking an outage. We call this zero downtime migration (ZDM).

In Part 2, we showed how this migration could be improved by adding one or two additional nodes. We also discussed the unique considerations when using bidirectional replication. In this Part 3, we look at switching replication engines without missing or re-replicating any data.

[--more--](#)

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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