

# the Availability Digest™

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--- achieving 100% uptime

August 2016

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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The 2016 OpenVMS Boot Camp will be held in Nashua, New Hampshire, from September 25<sup>th</sup> to 28<sup>th</sup>. Registration is now open. September 25<sup>th</sup> is the Pre-Conference Seminar. The call for papers is currently open. You can register on the Connect website at <http://www.connect-community.org/openvms>.

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## Data Center Power Efficiency is Abysmal

In the last issue of the Availability Digest, we discussed the threats to our societies of a total, extended electrical power outage. Ever since the early 20<sup>th</sup> century, we have depended upon the constant availability of electrical power. Without power, we will be unable to function.

I have therefore taken it upon myself to monitor how we use power to ensure that we do not tax our power generation facilities to the failure point. As I describe in this issue's article "Data Centers Consume Inordinate Amounts of Energy," among the largest users of power are our data centers. They consume more than twice the power of all the households in New York City. Yet they are powering twelve million servers that are doing little or no work most of the time.

Data-center power consumption can be reduced dramatically by more extensive use of virtualization to increase server utilization and by shutting down servers that no longer are in use. If just half of the potential energy savings were achieved by today's data centers, they could slash their energy usage by 40%. This is equivalent to the electricity consumption of all the households in the U.S state of Michigan.

- Dr. Bill Highleyman, Managing Editor

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## Never Again

### Southwest Airlines' Router Grounds 2,300 Flights

Southwest Airlines is the world's largest low-cost air carrier. It operates about 3,900 flights daily.

In July, 2016, a router failure grounded Southwest Airlines for four days. The airline had to cancel 2,300 flights, and thousands of other flights nationwide were delayed.

A router in Southwest's network failed in a very unusual way. It was only a partial failure, so the backup router did not detect the failure and consequently did not take over the routing functions. The router outage took down Southwest's websites and numerous applications for several hours.

During this time, Southwest was unable to operate. This was the worst data-processing outage in the company's history. Southwest's CEO issued an apology, saying that the way the router failed was so rare the company could not have prepared for it.

We have stressed the importance of failover testing in the Availability Digest many times, and this is an excellent example of why failover testing is so important. Any imaginable outage should be simulated and tested to ensure that failover will work. Most companies do not do this because such testing is disruptive and expensive. However, in Southwest's case, testing could have saved the airline about \$10 million dollars USD in lost bookings.

[--more--](#)

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## Best Practices

### Data Centers Consume Inordinate Amounts of Energy

The explosion of digital content, big data, e-commerce, and Internet traffic is positioning data centers to be among the fastest-growing users of electricity in the United States.

In 2013, data centers consumed an estimated 91 billion kilowatt-hours of electricity, more than twice that of all households in New York City. If worldwide data centers were a country, they would be the world's twelfth largest consumer of electricity, ranking somewhere between Spain and Italy. Data-center energy consumption is estimated to increase by more than 50% by 2020.

The world's aging power infrastructure is unable to keep up with the electricity demand in many developed countries. However, there are numerous ways in which a data-center administrator can reduce the power required by his data center. If just half of the potential energy savings were realized by today's data centers, they could slash their electricity consumption by 40%. This is equivalent to the electricity consumption of all the households in the U.S. state of Michigan.

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## Availability Topics

### Failsafe

I recently watched the 1964 movie thriller “Failsafe.” Back then, the United States kept multiple bombers armed with nuclear bombs in the air to deter a nuclear attack from the Soviet Union. If a suspected enemy incursion was detected by radar, the bombers would all head for Russia until they arrived at the “failsafe” point. If at that point they were not called back, the bombers would continue to Russia to drop their nuclear weapons.

During one such suspected incursion, the U.S. bombers were called back; but one bomber group did not receive the recall directive and continued on a course to Moscow. The movie focuses on the efforts to recall them.

During the efforts to determine how to recall the errant bomber group, a Mr. Knapp of Amalgamated Electronics makes the statement:

“The more complex an electronic system gets, the more accident prone it is. Sooner or later, it breaks down. Machines we make are so fast, so accurate, and the mistakes they make are so subtle, very often humans just can’t know whether the machine is lying or telling the truth.”

Fifty years later, this is still true. Computers and their software certainly can “lie.”

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## Recommended Reading

### High-Performance IT Services

“High-Performance IT Services” by Dr. Terry Critchley (Auerbach Publications, 2016) is an extensive and easy-to-read explanation of IT system performance issues and approaches, where Critchley’s four decades of IT experience clearly are evident. Most books on this topic dwell heavily on the mathematics behind system performance. This is perhaps useful for those specializing in performance enhancements, but they represent a level of detail that is over-the-head of line-of-business IT managers and their staffs.

Instead, Dr. Critchley focuses on explaining these concepts in simple English, supported by numerous figures. As he demonstrates, a clear figure can explain to the layman the meaning of a complex set of equations without needing to be a mathematical genius. This is not to say that Critchley ignores the mathematics of system performance, such as the all-important theory of queues. Rather, he confines the math to a segregated set of chapters and appendices that are arbitrary reading for those who want to dig deeper.

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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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