

the **Availability Digest**

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@availabilitydig – Our September Twitter Feed of Outages September 2017

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



A rodent's revenge: rats chew through the optical fibre in South London

Apparently unspecified 'rodents' nibbled their way through a communications cable in South London in August, plunging UK provider TalkTalk and others into what's been described as a major outage. It appears that the entire cable (presumably containing multiple fibres) had been gnawed through and broken.

<https://t.co/eEUjs0eCwE>

Eclipse sidelight: As moon obscures sun, natural gas is backup power.

During the solar eclipse on Aug. 21, operators of giant solar fields from California to the Carolinas relied on power from fast-start natural gas generators as well as hydroelectric plants and other sources to fill the gaps as the sky darkens. The celestial event, the first total solar eclipse visible in the lower 48 states since 1979, provided owners of gas turbines a chance to shine even as the fossil fuel is expected to be displaced over time by solar and wind energy.

<https://t.co/TEkNizUSOH>

Why We Need More Microgrids for Resilience but Aren't Getting Them

The "vulnerable" U.S. electric grid needs more microgrids for resilience; but outdated rules may get in the way, according to a new report by the National Academies of Sciences, Engineering and Medicine. The congressionally-mandated report listed microgrids and other distributed energy resources (DERs) as among 12 fixes to bolster a grid that remains susceptible to "large-area, prolonged outages that could cost billions of dollars and cause loss of life."

<https://t.co/MpINnirX4k>

The Mars Colony of the Future Could Be Powered by This Advanced Microgrid

SpaceX and Tesla CEO Elon Musk wants to put a million people on Mars in the next century. They'll be ferried to the Red Planet on a fleet of spaceships that can each carry 100 or more people and will make their living in an environment bereft of oxygen and full of danger. While you can't breathe the air on Mars, with some creative thinking you could bring in many of the comforts of home. Mars has great potential for energy generation. While its atmosphere is dusty, the sun's light reaches down to the surface, allowing for solar panels. And the wind that provides the driving force of erosion on Mars could be harnessed for wind farms. The industrial manufacturing giant Siemens is trying to plan for this reality. "Mars will be the ultimate microgrid," the company says on its [website](#). "With no centralized power sources, communities will one day rely on decentralized energy systems."

<https://t.co/e5XteuNUai>

Can Blockchain secure industrial processes?

The large industrial firms who suffered so badly after the Petya attack could have benefited from having a fully blockchain enabled system - this is due to the security-by-design that underpins the technology. Often described as the 'distributed ledger,' blockchains are a means of storing data (and potentially secure code) via a peer-to-peer network of computers. As there is no central server storing data (which can act as a target for cyberattack), the data is copied identically across each 'node' in the network, meaning that if one computer is compromised, it does not result in a business-critical failure. Changes to any information has to be accepted by the majority of other computers across the network (called '*consensus*') before information can be updated on the blockchain. This is the backbone of the security of a 'distributed computer', peer-to-peer, ledger based system.

<https://t.co/FDcT04P2KX>

Local governments modernize their antiquated equipment to reduce downtime

No city or county ever wants to suffer downtime. To ensure high availability, some governments modernize antiquated equipment. State-of-the-art technology, such as converged or hyperconverged infrastructure, takes advantage of virtualization and offers high redundancy. Local governments also find success through a broad set of strategies and technology to bolster uptime.

<https://t.co/6uNVR9ztLM>

The 10 Biggest Cloud Outages of 2017 (So Far)

The bigger the cloud provider, the higher the standard they're held to for reporting and remediation. Whether the outage was caused by a technical glitch, human error or malicious attack, customers want an honest assessment and explanation of the remedies put in place to ensure it won't happen again. Here are 10 of the outages so far this year that sparked such discussions.

<https://t.co/9G6xjaSgsM>

The stock market has about 12 mini flash crashes a day — and we can't prevent them

Blink. About 300 milliseconds just passed, the same time required for a lightning bolt to travel 100,000 feet, a satellite to fly 2 miles or a stock price to swing from \$10 to \$0.0001 and back. Indeed, that actually happened to the shares of the software company Qualys a few years ago. Similar mini flash crashes involving substantial, instantaneous price moves take place about 12 times a day.

<https://t.co/TztxyMbqA9>

Failover strategies for the modern enterprise

In today's increasingly distributed enterprise, connectivity is key. Even short periods of network downtime can have an immediate impact on revenue and can leave a company exposed to a range of compliance, regulatory and security risks. While there are a number of options available to help solve this problem, wireless failover solutions offer the best balance of efficiency and effectiveness for modern enterprises. Increasingly, businesses are harnessing the benefits of 4G LTE networks for permanent primary connectivity. These businesses are optimising and pooling data usage among multiple distributed locations, deploying their networks faster than the competition, and have the ability to manage their networks remotely with minimal IT support.

<https://t.co/ZuxkCgDLGR>

Why IT projects still fail

In the age of agile development, devops and related management techniques, is IT project failure even a thing anymore? The answer, sadly, is yes. In the past, IT failures often meant high-priced flops, with large-scale software implementations going on way too long and way over budget. Those failures can and still do happen. Case in point: IBM's never-completed \$110 million upgrade to the State of Pennsylvania's unemployment compensation system. But IT failure today is frequently different than in the past, as agile, devops, continuous delivery and the fail-fast movement have changed the nature of how IT handles projects. But the fact of the matter is that IT projects still fail, just in new and sometimes more insidious ways.

<https://t.co/u5kb7YxmHi>

Will predictive AI finally solve the multi-billion-dollar downtime problem?

Downtime for today's large, complex businesses means more than a simple inconvenience. The cost of interruptions, especially when workers are prevented from completing tasks due to out-of-service infrastructure, can be huge. A Gartner study called "The Cost of Downtime" suggests that a large company may actually lose as much as \$540,000 per hour from a preventable technical failure. The problem is that without a holistic assessment of equipment wear and reliability, scheduled maintenance may be out of whack with reality. Service companies are now increasingly looking to adopt predictive analytics to eliminate time wasted and maximize profits attained. Not surprisingly, a new generation of predictive analytics companies are tackling this multi-billion-dollar problem.

<https://t.co/fPxYYsaEx9>

NSE technical glitch shows switchover to back-up site isn't easy

A technical glitch faced by the National Stock Exchange (NSE) on Monday and data breach at banks earlier this year have raised queries on the ability of the financial sector to quickly respond to and resolve major cyber security incidents.

<https://t.co/1k8tyyqxYv>

Marketo suffers major outage after domain renewal fail

Marketing automation service provider Marketo has apologised after it failed to renew its main website domain, leading to a large-scale outage. CEO Steve Lucas “profusely apologised” for the mishap on Twitter, and it was partially resolved when a customer spotted the unregistered domain and renewed it before someone else could. The domain had been set up for automatic renewal, but the process somehow failed. Lucas said the company had so far “identified process errors with auto renewals as well as human errors” in the initial post-mortem.

<https://t.co/9QQIZ2Nm2P>

Why online retailers should be scrambling now to avoid Black Friday outages

While most consumers are taking their summertime vacations, retail giants are mobilizing to beef up their online infrastructure and stress test their systems to handle the surge of holiday shoppers at the end of the year – which can generate more than 30% of their yearly sales. To keep retailers’ applications running smoothly, IT and Ops teams should follow a checklist to help them hit their targets throughout the year so they are ready for extreme scalability and continuous IT operations when the big shopping days hit. Here is what IT and Ops teams should have already checked off their list this year.

<https://t.co/OQSav6b2ZV>

GitHub goes down — and takes developer productivity with it

GitHub, the service that is still pretty much the de facto standard for managing source code, suffered from a major outage on July 31st. Sometime around 9:30am PT, users started to experience issues with the service and weren’t able to check in new code and make pull requests.

While the company first considered this to be a minor outage, it quickly upgraded the status to “major service outage.” Back in 2015, *GitHub* was the victim of a major DDoS attack that plagued the service for a couple of days. A similar attack also took the service down back in 2012.

<https://t.co/G14lcNZzDR>

The Importance of Failover Testing

Once we have thoroughly tested an application in service, we would like to make it highly available. This is typically accomplished by providing a backup copy of the application. Should the production application fail, the plan is to move all processing to the backup application. A good plan, but will it work? The only way to be sure is to test a real-life failover. Will the backup take over? Will it do it quickly, or will it take minutes or even hours to assume processing? Or will the failover fail? We can only determine this by testing the failover capabilities of our system. But sadly, failover testing is hardly ever done or is only done partially.

<https://t.co/mP81q7Gf4W>

From the July Availability Digest: "How HPE is Making Blockchain Resilient"

Blockchain. Oh, no! Another new technology about which I know nothing. That statement summarized my feelings about blockchain until I heard a presentation from HPE’s Matt Riesz at the May 2017 NYTUG meeting in Berkley Heights, New Jersey (USA). Matt is a superb speaker. His clear, concise explanation of how blockchain works elevated my understanding from total ignorance to a “not nearly as dumb as I thought I was” level. This article is based on Matt’s presentation.

<https://t.co/SO5iPvzhVi>

Thousands evacuate North Carolina's Outer Banks after power outage caused by construction

At the end of July, thousands of tourists had to evacuate two islands along the hugely popular Outer Banks in North Carolina after a construction company caused a massive power outage. The Cape Hatteras Electric Cooperative said that PCL Construction told the cooperative it had accidentally driven a steel casing into an underground electric transmission cable while working on the new Bonner Bridge on North Carolina's coast.

<https://t.co/jgheaXBicf>

EINSTEIN'S LITTLE-KNOWN PASSION PROJECT? A REFRIGERATOR

Many people know that work on nuclear weapons enabled the development of the first electronic computers. But it's no less true that the humble refrigerator, in a roundabout way, enabled the development of the first atom bomb. While reading the newspaper one morning in 1926, Albert Einstein nearly choked on his eggs. An entire family in Berlin, including several children, had suffocated a few nights before when a seal on their refrigerator broke and toxic gas flooded their apartment. Anguished, the forty-seven-year-old physicist called up a young friend of his, the inventor and scientist Leo Szilard. "There must be a better way," Einstein pleaded.

<https://t.co/7P29xcqZh8>

Adobe Flash Will Be Dead in 3 Years, and It's About Time

Adobe is finally killing off its Flash plugin. The death of Flash has been a long time coming, and the full migration to HTML5 will likely result in more secure experiences and longer battery life. Just last April, Adobe had to issue a security update to Flash to address a critical vulnerability that left users susceptible to ransomware.

<https://t.co/z7T5sTPf1F>

More than Back-up Power: The Genius of the Healthcare Microgrid

During the Northeast blackout of 2003, half of New York City's 58 hospitals suffered failures in their back-up power generators. When hospital back-up power fails, as happened again in some Northeast hospitals in 2012 during Superstorm Sandy, patients must be evacuated to other facilities, creating a chain-of-care nightmare for the patients, their families and caregivers at all facilities. That is why it's important for healthcare professionals and community leaders to think holistically about their power supply. Installing a microgrid at the main hospital may not be enough to ensure stable patient care in a crisis. Communities need to look at their entire healthcare chain.

<https://t.co/kBUVS62ue4>

Causes of downtime

We have spent years analyzing and classifying the causes of downtime in data centers, but the subject is now a burning issue. The recent case of British Airways, with 75,000 passengers affected and more than £100 million in direct losses, joins a number of other events in recent months which present a surprising panorama.

<https://t.co/gla6B7bWoO>

Russian hackers hit Ireland's power grid in another cyberattack on UK's critical infrastructure

Kremlin-based hackers reportedly targeted Ireland's power grid in another cyberattack on UK's critical infrastructure. Security experts believe that the Russian hackers intended to compromise control systems and targeted senior engineers of Ireland's Electricity Supply Board (ESB) with phishing emails. Experts also said that Ireland, which is home to the European headquarters of major American tech giants such as Facebook, Apple and others, is being used as a testing ground by Russian hackers.

<https://t.co/odyUnPwjbm>

Here's what happens inside Amazon when one of its AWS hosting services goes down

In late February 2017, a number of large websites across the Internet abruptly went down. The outage lasted several hours — and Amazon's S3 hosting service was to blame. This is because all the affected sites made use of Amazon Web Services (AWS). The S3 outage highlighted the unique vulnerabilities of our digital world: a handful of companies are responsible for maintaining huge swathes of the Internet — and when there's a problem with one of them, thousands of businesses and millions of people can be left unable to work. So what happens inside Amazon when there's a tech failure of this magnitude?

<https://t.co/VwQlnStOin>

Cyber intrusion or IT single point of failure? <https://www.>

Whether directed at governments or businesses, there are headlines about cyber intrusions virtually every day. Rather than publicly admit the cyber intrusion, victimised companies often claim that the Information Technology (IT) data centre actually stopped working because one component failed – a condition known as a 'single point of failure'. Why cyber intrusion and not attack?

<https://t.co/fh5iwbEfh7>

Metro's \$80m back-up system may have failed at moment Melbourne needed it

The \$80 million back-up system for Melbourne's rail network may have triggered the glitch that recently brought down the city's train system, stranding or delaying an estimated 175,000 passengers. Metro's state-of-the-art Disaster Recovery Site contains hundreds of servers in a secure environment with uninterruptible power and is the last line of defence for Melbourne's rail commuters. But it failed at the precise moment it was needed, plunging the city into chaos on the cusp of the evening peak.

<https://t.co/yOqLqzrkTP>

Severe thunderstorm to blame for problem with Canada's 'flight plan system': Nav Canada

The organization responsible for air traffic control in Canadian airspace says a severe thunderstorm in mid-July in Ottawa was to blame for an outage affecting its automated flight planning system. Nav Canada president Neil R. Wilson said in a statement that the water flooded one of its facilities shortly after midnight, affecting the network that handles flight plans and requiring staff to evacuate to a nearby facility where back-up systems are located.

<https://t.co/4Jv3CKXt1B>

Lock your doors, people: Verizon breach on unsecured AWS server exposes 14M customer records

Storing files on public cloud services is one of the most secure ways to protect your data, so long as you actually secure it. A contractor working for Verizon recently exposed 14 million customer records, including phone numbers and PINs that would grant account access, after leaving the data unprotected on one of Amazon Web Services' servers. That contractor, who is most likely no longer working for Nice Systems, set up an AWS S3 server to store the records as part of a project they were working on for Verizon but left the information "downloadable by anyone with the easy-to-guess web address."

<https://t.co/Wm2uzatO0x>

15 famous ERP disasters, dustups and disappointments

You can find out how crucial an enterprise resource planning (ERP) software rollout can be for a company from a single word: *billions*—lawsuits over failed ERP and customer relationship management (CRM) implementations are now being denominated in the billions of dollars.

<https://t.co/OQ0fbcPch1>

Massive Valley blackout again puts spotlight on L.A.'s failing infrastructure

The explosion at a Northridge power plant that left 140,000 customers across the San Fernando Valley without electricity in July was a major blow to Los Angeles' power grid. The size of a large truck, the high-voltage transformer that was destroyed was more than 40 years old.

<https://t.co/Pwi1uqlfyV>

GDPR: Protect your data, recover more quickly

On 25th May 2018, the European Union's General Data Protection Regulations (GDPR) will come into force. Despite the Brexit negotiations, UK companies will have to comply with GDPR; and Article 5 of the regulations requires companies to take particular care of personal, sensitive data. It obligates that data must be "processed in a manner that ensure appropriate security of the personal data, including protection against unauthorised or unlawful processing and against accidental loss, destruction or damage, using appropriate technical measures." Organisations therefore need to ensure that compliance is upheld by conducting regular audits and by being aware of the biggest threats to their businesses.

<https://t.co/YLCrvR0TwH>

Amazon Patents Detail Drone Fulfilment Center, Propellers That Change Sound

The pursuit of commercialized drone delivery doesn't seem to be slowing in the U.S. More than one recently-published patent application by Amazon focuses on an area related to drone delivery. Three patents, which were initially filed at the end of 2015 and recently published by the U.S. Patent & Trademark Office, include a fulfilment center for drones, a motor failure backup design and a system to dynamically modify the natural sound of drones in flight.

<https://t.co/ObCSbM2N2M>

From the Availability Digest: British Airways Downed by Fat Finger and Testing Shortsightedness

Say it ain't so, British Airways. On Saturday, May 27, a systems crash in a British Airways (BA) data center caused a massive disruption of air travel at Heathrow and Gatwick Airports and at airports in 70 countries. The outage was caused by human error. We often refer to such an event as a “fat finger” blunder. A technician mistakenly turned off the UPS system in BA's active data center and shut down all of BA's servers. Unfortunately, British Airways suffered from a syndrome that exists in many organizations. BA never had fully tested its failover capabilities to the backup data center.

<https://t.co/RZOZ2nkdnr>

Be Proactive in Data Center Earthquake Mitigation

Of all the natural disasters that can affect data centers, earthquakes are among the most damaging. Given the data center industry's continued growth and expansion throughout California, these potentially catastrophic events are always top of mind for data center owners and operators.

With the passing of the 27th anniversary of the 6.9-magnitude Loma Prieta earthquake, centered within 10 miles of Santa Cruz, now is the time for data centers across California and other areas prone to seismic activity to reevaluate their earthquake disaster strategies and look at the availability of proactive protection plans.

<https://t.co/UbV98CkgFF>

Check your provider's data center rating

If you don't consider the cleanliness of a restaurant when choosing where to eat, it will cost you. Eating at an unsanitary restaurant can impact your health, make you sick and, in some cases, kill you. There is a standard way to measure restaurant cleanliness, so why not data center performance? Infrastructure Masons' founder Dean Nelson has proposed the Data Center Performance Index. DCPI uses simple performance grades in three categories: Availability, Efficiency and Environmental.

<https://t.co/jic9QXdOGV>

BBC News - Somalia internet outage is 'major disaster'

Somalia's government says an ongoing internet outage is costing the country \$10m (£7.7m) each day. The outage affects southern Somalia and was caused by damage to an undersea fibre-optic cable in late June.

<https://t.co/eoRwANOp64>

IBM Says This Breakthrough Will Breathe New Life into Moore's Law

IBM, GlobalFoundries, and Samsung said recently that they have found a way to make thinner transistors, which should enable them to pack 30 billion switches onto a microprocessor chip the size of a fingernail. The tech industry has been fueled for decades by the ability of chipmakers to shoehorn ever smaller, faster transistors into the chips that power laptops, servers, and mobile devices. But industry watchers have worried lately that technology was pushing the limits of Moore's Law—a prediction made by Intel co-founder Gordon Moore in 1965 that chips could double in power every two years or less.

<https://t.co/cv1dKYssow>

Norway's Largest Wind Farm to Power Google Data Centers

A new wind farm in Norway will begin providing electricity to tech giant Google in September. The 50-turbine Tellnes wind farm will produce 160 MW of power – making it the biggest facility of its kind in Norway and Google's largest in Europe.

<https://t.co/X0N5RVpp44>

6 reasons why IT recoveries fail

The top 6 reasons why recoveries fail to meet their SLAs are: 1) wrong decision-making at the point of failure, 2) DR solutions lacking adequate testing, 3) changes in live system not being updated on DR systems, 4) data volumes and bandwidth restrictions, 5) false DR test reports, and 6) reluctance to invoke DR solutions.

<https://t.co/yuk3L616GJ>

Sky and TalkTalk broadband hit by massive ongoing outage

Sky broadband (and phone) users were hit by a major outage in the Sussex area in July, with TalkTalk subscribers also affected. The cause? Apparently extensive damage was caused to fibre optic cables by digging works carried out by a third party, who apparently speared some key cables with a fence post. Seven breaks in fibre cables needed to be repaired.

<https://t.co/cbFlnbIFp2>

ATO takes systems offline in peak tax period

Mainframe problems forced the Australian Taxation Office to take most of its online portals and internal processing systems down for maintenance during the first week of 2017 tax time. Customers began complaining about an inability to access the ATO's myTax system through the myGov portal around lunchtime. Some reported receiving an "A951.09" error when trying to access the page.

<https://t.co/faxbnKuGUR>

London Ambulance New Year IT failure blamed on upgrade

The New Year's Day failure of London Ambulance's dispatch system, which took the system down for five hours on its busiest night of the year, has been blamed on a 'historic upgrade'. Staff had to switch to pen and paper, and some people had to wait seven hours for an ambulance. One call took 25-minutes to answer, and other calls had to be diverted to Scotland. One person died, possibly as result of treatment being delayed.

<https://t.co/4yKWUQMGgM>

Does Britain's Big New Warship Still Run Windows XP?

MS *Queen Elizabeth*, the Royal Navy's newest vessel and the largest one ever built in the United Kingdom, is an impressive ship. Nine hundred and nineteen feet long with a crew of 1,600, the ship can carry up to 40 aircraft. *Queen Elizabeth* and her sister ship, *Prince of Wales*, will form the UK's main expeditionary force at sea, sailing into hotspots with their decks full of F-35 Joint Strike Fighters. Oh, and *Queen Elizabeth* also runs Windows XP.

<https://t.co/H0ntorgKz5>

Machine learning powers Tour de France

Amaury Sport Organisation (A.S.O.), organisers of the Tour de France, and Dimension Data, the Official Technology Partner of the Tour de France, have announced the use of machine learning technologies at this year's Tour de France to give cycling fans across the globe an unprecedented experience of this year's event.

<https://t.co/A7hQSce4OA>

How We'll Safeguard Earth from a Solar Storm Catastrophe

From the fabric of the global economy to families planning tonight's dinner, communications networks — and the power grid that underlies them — are woven more tightly through our lives than ever before. But those networks all could be gone in a flash. A geomagnetic storm triggered by a burst of solar energy could overwhelm the nation's power grid and shut down cell towers and communication networks. Similarly, a human-built electromagnetic pulse (EMP) weapon could temporarily wipe out the networks that connect and sustain us. Experts are not taking this lightly. From space-based research about the sun's energy to new efforts that could safeguard power stations against an attack, science is fighting back to keep our connections open

<https://t.co/Dibdr6EGWh>

Chase Bank experiences nationwide outages; ATMs, branches, credit cards affected

JPMorgan Chase on July 3rd was hit by significant outages at its branches and throughout its network, leaving customers unable to access their accounts or money in some cases. The problems were reported to be the worst in New York, Chicago, Houston, Dallas, Los Angeles, Florida and Seattle.

<https://t.co/ZXdEuaK5bf>

Everything you Wanted to Know about World's First Multi-Turbine Tidal Energy Field

Tidal Energy Company Atlantis is the largest of its kind in Europe. And right now, it is focusing on completing a four-phased MeyGen Tidal Energy Project on the coasts of Scotland. The project is a one of a kind Multi-Turbine Tidal Energy field that will be powering nearly 175,000 Scotland houses after its completion. The project is in the first phase of its development, but it has already received a funding of €37 million from EU for its second phase.

<https://t.co/fzSe5ZKBeL>

Bizarre computer glitch sends technology stocks all crashing to same price

A bizarre computer glitch sent shares in dozens of US technology companies including Apple, Amazon and Microsoft to the same price in early July, leading some to apparently lose billions in market value.

<https://t.co/NCYgLqPc3a>

Tech stocks appear to go nuts after computer glitch

The share prices of Amazon and other major tech companies appeared to go haywire on the eve of the July 4 holiday after a market data glitch. The confusion arose when some websites incorrectly showed Amazon (AMZN, Tech30) plummeting 87%, Apple (AAPL, Tech30) dropping 14%, and Microsoft (MSFT, Tech30) jumping 79% late Monday. U.S. markets had closed early ahead of the holiday. But the crazy moves weren't the result of wild after-hours trading, according to Nasdaq, the exchange where the stocks are listed. Nasdaq said the misleading prices came from test data it sent out that was "improperly" used by third-party companies that supply information to websites.

<https://t.co/Bv3i3CTv7f>

Cyberattack Fallout Engulfs FedEx, Shuts Terminals and Email

The global cyberattack that wended its way across continents in late June started creating real consequences at some businesses even as the virus's spread seemed to be abating.

FedEx Corp. said it could suffer a "material" financial impact after the bug affected the worldwide operations of its TNT Express delivery unit.

<https://t.co/7YcSdtnfy3>

Why is Redfin running its site from a single data center without a backup facility?

Redfin surprised a few people when it filed for an initial public offering in July. But inside the standard boilerplate of risk factors was something even more surprising: Redfin's entire site is hosted within a single Seattle data center.

<https://t.co/5FEhkpRtsi>

Power outage hits multiple Central American countries

A massive power outage recently hit Central America, causing millions of people to lose electricity for hours. The outage was caused by an overload in the Central American Transmission System in Panama. Countries affected by the outage included Panama, Costa Rica, Nicaragua, El Salvador, Honduras, Guatemala and parts of southern Mexico. The countries are all on the same power grid, which extends approximately 1,130 miles between Panama and Guatemala.

<https://t.co/5GF4ldnqmc>