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Intelligent Upgradeable Rack PDU

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firstname.surname
@datacenterdynamics.com

ADVERTISING

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Dedric Lam
Vincent Liew

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Yash Puwar
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LATAM

Daniel Clavero
Santiago Franco

USA

Kurtis Friesen

DESIGN

Chris Perrins
Holly Tillier
Jess Parker

ASSOCIATE PUBLISHER

Ewelina Freeman

CIRCULATION

Manager

Laura Akinsanmi

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datacenterdynamics.com.br
twitter.com/DCDnews

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Bill Boyle
Global Managing Editor
@BillBoyleDCD

Power Man (Design & Strategy). Covers power, finance, mergers, corporate & telco data centers.



Peter Judge
Global Editor
@PeterJudgeDCD

Green Guru (Critical Environment). Also, open source, networks, telecoms, international news.



Max Smolaks
News Editor
@MaxSmolaksDCD

Captain Storage (IT & Networks). Also, international incidents and data sovereignty.



David Chernicoff
US Correspondent
@DavidChernicoff

Former CIO, test lab leader and developer. Our man in Philadelphia gets his hands dirty.



Virginia Toledo
Editor LATAM
@DCDNoticias

Editor LATAM edition DatacenterDynamics. Breaking the molds. Based in Madrid, Spain.



Celia Villarrubia
Assistant Editor LATAM
@DCDNoticias

Assistant editor LATAM DatacenterDynamics. News and pithy opinions in international edition.



Michael Kassner
US Contributor
@MichaelKassner

Our man in Minnesota. Fifteen years' enterprise and IT writing on technology, science and business.



Paul Mah
SEA Correspondent
@paulmah

IT writer, also teaches tech in Singapore. Deep interest in how technology can make a difference.



Tatiane Aquim
Brazil Correspondent
@dcdfocuspt

Our Portuguese-speaking correspondent with an in-depth knowledge of Brazilian public sector IT.

UNITED KINGDOM

102-108
Clifton Street
London
EC2A 4HW
+44 (0) 207 377 1907

USA

28, West 44th Street,
16th floor
New York,
NY 10036
+1 (212) 404 2378

SPAIN

C/Bravo Murillo
178 - 2ª Planta
28020 Madrid
España
+34 911331762

SHANGHAI

Crystal Century
Tower, 5/F, Suite 5B
567 Weihai Road
Shanghai, 200041
+86 21 6170 3777

SINGAPORE

7 Temasek Blvd
#09-02A, Suntec
Tower One
Singapore 038987
+65 3157 1395

Riding the open-source wave

There's no doubt in our minds: open source has changed the world already – and it's only just started (p25).

If you're in data centers, your current job is all about the cloud: you're either delivering it, harnessing it, or running like hell from it. And the public cloud simply couldn't exist without Linux and other open-source software. Try scaling infinitely and adding functions at will in a proprietary environment and see how far you get (p26).

But if you've been with *DatacenterDynamics* at all in the past year or two, you'll be well aware that it's not stopping there.

OpenStack is making that model available to more cloud builders, and the Open Compute Project is taking it into the racks themselves (p31). Open source rewrote your software. Now it's coming for your hardware.

Elsewhere in this issue, we look at the skills you need to get under your belt (p18) and the cost of suffering a DDoS attack on your facility (p20).

Meanwhile, politics doesn't often impinge on us directly, but in a couple of months, Britain has a referendum on whether to remain in the European Union. How would a so-called "Brexit" affect data centers? Adi Kishore tells us on p22.

It's become obvious that the cloud doesn't make everything simple. The ease of setting up cloud operations means you will end up with multiple cloud services. Paul Mah reports from Singapore (p14) on how the Asia-Pacific region plans to handle the multi-cloud issue using management software.

And in Brazil, standards makers are attempting to use international specifications that allow interchange of cloud instances. It's important for Brazil's cloud customers, but the local cloud industry needs it to: with cloud standards in the local language, Portuguese, these providers have a better chance of competing on the international market.

If Britain votes for Brexit, the United Kingdom might also need this option.

•
Peter Judge - global editor
[@PeterJudgeDCD](#)



Open-source code rewrote your software. Now it's after your hardware

96.6%

of publicly accessible servers on the internet run Linux (W3Cook)

European Hubs

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AMSTERDAM



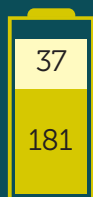
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LONDON



PARIS



● Available Colo Power

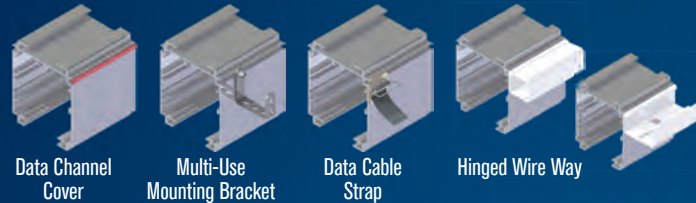
● Total Colo Supply (MW)

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Source: CBRE

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*Accessories are only compatible with new systems of 250, 400 & 800 amp STARLINE Track Busway.

Teraco grows Africa facility

Vendor-neutral colo provider Teraco is expanding its Johannesburg site sevenfold. The 27,500 sq m project is expected to complete in 18 months. The original facility was limited by power restrictions, but an increase of 10MVA has allowed the expansion.

\$500m bank boost for IO

IO has won more than \$500m to finance US sites and grow internationally. The data center provider, which specializes in modular construction, has received \$445m in debt capital from Deutsche Bank; it will use the money to refinance its US debts and buy land.

Direct access to IBM cloud

Canada and IBM have partnered to allow Bell Business Markets to offer Canadian customers direct access to the IBM cloud, opening up IaaS, PaaS and private cloud solutions previously unavailable to Canadians.



Google expansion to include new Japan data center

Google is adding 12 regions to its Cloud Platform during the next two years, building it into more of a competitor to Amazon Web Services (AWS). The regions will be served from data centers that include a new one in Tokyo.

In public cloud services, regions are geographic areas with their own data center resources: Google has promised two new regions in 2016, one in the US west, served

from Oregon, where the company has an expanding footprint, and the other in Tokyo. As Google has not yet announced a data center location in Japan, this must be a new one. Another 10 regions will follow in 2017, served from existing or new sites.

“We’re adding to this global network for Cloud Platform customers by expanding our roster of existing Cloud Platform regions

with two more – both operational later this year,” said cloud product manager, Varun Sakalkar, in a blog announcement. Each region will have multiple availability zones – different local data center resources with low latency links.

Google already has a site in The Dalles, Oregon, and announced plans to expand this with another 23 acres in 2015.

Google has been expanding in Asia, with data centers in Taiwan and Singapore. A new region in Japan will require a data center.

Google is still playing catch-up with Amazon, of course. While Google currently has four regions (central US, eastern US, western Europe and Asia), the AWS public cloud already has 12 regions and is planning five more.

<http://bit.ly/25tX5kX>

VOX BOX / DCD VIDEO



Dave Wolfenden
Director and owner
HeatLoad

That’s not Cat 5 in the cable run

One of my colleagues thought it would be fun to let a kitten have the run of the data hall. It immediately disappeared down the first cutout in the floor. We spent the day lifting tiles in an effort to retrieve it. Before the end of our shift, we captured it and, relieved, thought we had got away with it. We were wrong. For the next two years, we found little dried husks of cat poop blowing in the air stream. Who knew such a small animal could produce so much?!

<http://bit.ly/1Sj4PMP>



Michael Moreland
Server DRAM marketing
Crucial

Scale up or scale out

How do you scale your data center’s performance? Scale up (vertical) – this involves installing more high-performance components in your existing servers, usually in this order: processors, memory, then storage. Scale out (horizontal) – once you have got as much as possible out of existing servers, the only way to go is adding more servers. This is more expensive as it involves more software licences.

<http://bit.ly/22X9Bas>

Equinix growth plan underway



Equinix will build four new International Business Exchange (IBX) data centers this year – in Tokyo, Dallas, São Paulo and Sydney – and spend \$4.5bn on acquisitions. The expansion, which includes the purchase of Telecty (above) in London, will add more than 3m sq ft of colocation space in 37 data centers, taking Equinix's presence to nearly 150.

Equinix added five data centers last year – in New York, London, Singapore, Melbourne, Toronto – and announced the purchase of Bit-istle in Japan (for \$275m) and Telecty Group in EMEA (for \$3.8bn). The new facilities will add more than 4,000 new cabinets and 200,000 sq ft of white space when fully built.

The TY5 data center will be in close proximity to TY3 near Tokyo's financial district. SP3 in São Paulo will open as Equinix's SP2 facility in Tamboré is nearing capacity, doubling its capacity in Brazil.

<http://bit.ly/1Sj9luJ>

Dell sells services arm to NTT Data to pave way for EMC deal

Dell is selling its services business to Japanese services firm NTT Data, to clear the decks for its giant merger with EMC. NTT is paying \$3.1bn, according to regulatory filings cited by *The New York Times*, which falls well short of the \$5bn Dell was reportedly hoping for, and also represents a loss on the business, which was created when Dell bought services firm Perot Systems for \$3.9bn in 2009. For Dell, this helps finance the EMC takeover, for which it is selling assets and gathering finance from investors to add to the debt that Michael Dell raised when he took the company private in 2013.

For NTT Data, the deal gives it a bigger services strength for outsourcing, which it must intend to move towards the cloud, and which will also rely on a continuing technology partnership with Dell itself. The unit claims particular strength in the healthcare and insurance sectors.

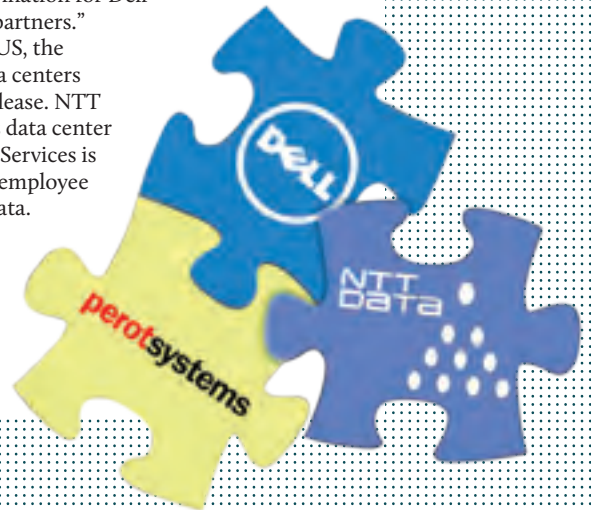
"Welcoming Dell Services to NTT Data... initiates an important business relationship with Dell," said Toshio Iwamoto, president and CEO of NTT Data Corporation.

Michael Dell, CEO of Dell, echoed this: "Together, NTT Data and Dell Services will be a winning combination for Dell Services customers, team members and partners."

The Dell Services data centers in the US, the UK and Australia will join NTT's 230 data centers around the globe, according to a press release. NTT Communications has been expanding its data center and cloud business in recent years. "Dell Services is a well-run business and we believe in its employee base," said John McCain, CEO of NTT Data.

Suresh Vaswani will remain as president of Dell Services, reporting to Michael Dell, until the transaction closes.

<http://bit.ly/1RHt8no>



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Mainframe code hits commodity hardware

Swiss startup LzLabs showed what it calls the world's first software-defined mainframe at CeBIT in Hanover. The product enables IT administrators to run traditional mainframe workloads – typically involving thousands of transactions per second – using Linux and basic commodity hardware.

The company has already established partnerships with

Microsoft, which will support the technology on the Azure public cloud, and Red Hat, which will ensure compatibility with its Linux distribution.

Mainframes are more powerful and more resilient than commodity, but they are far more expensive and, importantly, the skills needed to manage them are disappearing.

LzLabs says its system can replace specialized hardware and familiar operating environments such as IBM's z/OS, while still retaining full application-level compatibility with physical machines that go back at least 50 years, like the IBM System 360.

The system recreates the primary online, batch and

database environments of mainframes in a managed software container and requires no conversions or rewrites of applications.

LzLabs hopes the product will enable businesses to move their expensive legacy applications to modern infrastructure without requiring a massive new investment.

"Despite an almost universal desire to liberate mainframe applications to improve interoperability, business agility and to reduce costs, the risks and complexity of rewriting or

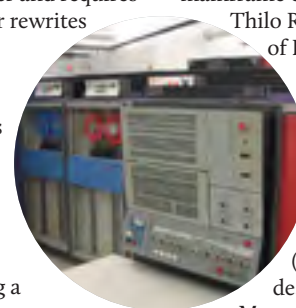
recompiling code have been assessed as too high by many mainframe customers," said

Thilo Rockmann, chairman of LzLabs.

To prove its validity, the company showed a demonstration running on an Intel Next Unit of Computing (NUC) miniature desktop PC.

Meanwhile, Linux Foundation is improving the functionality of open source on mainframe hardware with the Open Mainframe Project.

<http://bit.ly/1TixjuW>



Cisco goes after converged dollar with HyperFlex

Cisco has entered the hyperconverged infrastructure market with the HyperFlex HX series of appliances, seen as the vendor's most important server announcement since it launched the Unified Computing System (UCS) in 2009.

UCS includes compute, virtualization and networking fabric; HyperFlex adds software-defined storage software from Springpath to create a fully-featured system-in-a-box. As a second-generation hyperconverged system, this will avoid the pitfalls that have affected competitors, Cisco believes.

<http://bit.ly/1VRpEEN>

Oracle offers a public cloud on customers' premises to allay fears



Oracle is offering to put a physical part of its public cloud inside customer premises as a way to ease concerns about storing data in the cloud. The new Cloud at Customer installs a so-called 'cloud machine' under Oracle's control and on its cloud, but with the customer able to set policies so data is kept on that machine only. Oracle stresses this is not a way to force hardware sales: there is no upfront cost for the hardware and users only pay for the resources they consume.

<http://bit.ly/1StsuN5>

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Google 'most significant' company to join OCP

Google has joined the Open Compute Project (OCP) and is contributing 48V DC power distribution technology to the group, which Facebook created to share efficient data center hardware designs. Urs Hölzle, Google's senior vice-president of technology, announced at the OCP Summit that Google would share its 48V DC shallow rack, saying it has increased energy efficiency by 30 percent by eliminating multiple transformers.

Google is submitting the specification to OCP and is working with Facebook on a standard that can be built by vendors, and which Google and Facebook can adopt. "We have several years of experience with this," said Hölzle, as Google has deployed 48V technology across large data centers. Google's racks are shallower than the norm, because IT equipment can now be built in shorter units. And shallower racks mean more aisles can fit into a given floorspace.

Google is joining OCP because there is no need for multiple 48V distribution standards, said Hölzle, explaining that open source is good for "non-core" technologies, where "everyone benefits from a standardized solution".

Google is the most significant firm to join OCP since Microsoft came on board in 2014.

<http://bit.ly/IRBuL6z>



Humidity hurts hard drives more than heat

Humidity is a greater threat to hard drive reliability than temperature variations, according to a study led by Rutgers University in New Jersey. Failures caused by humidity could have a knock-on effect, reducing the benefits of free cooling.

In their paper, *Environmental Conditions and Disk Reliability in Free-cooled Datacenters*, Ioannis Manousakis and Thu Nguyen, with assists from GoDaddy and Microsoft, added up statistics from nine large data centers, covering more than a million drives, used for periods ranging from 18 months to four years. The effects on controllers and adapters clearly increased as humidity levels rose.

Disk failures accounted for 89 percent of component failures in a data center, with DIMMs coming second at 10 percent, then CPUs and PSUs.

The humidity-related failures were so marked that annualized failure rate (AFR) statistics could be used to distinguish between free-cooled facilities with humidity controls and those without.

In regions where high levels of humidity occur naturally, placing drives in the hot region at the back of a server improved reliability.

<http://bit.ly/1RHcy8q>

Is Hyperconvergence a Viable Alternative to the Public Cloud?

ON DEMAND - 1 HOUR WEBINAR

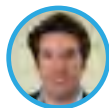
WATCH NOW

If you missed the recent webinar, with Evaluator Group and SimpliVity on how hyperconverged infrastructure can deliver the efficiency, elasticity and agility of public cloud, you can now view online at www.datacenterdynamics.com/simplivity-webinar

In this one-hour interactive webinar, we explored and debated the reasons why Hyperconverged infrastructure really can be more efficient than the cloud, with contribution from our expert panel.



Eric Slack
Evaluator Group



Rich Kucharski
SimpliVity



Stephen Worn
DatacenterDynamics

Watch again here: www.datacenterdynamics.com/simplivity-webinar

Schneider builds Li-ion UPS

Schneider Electric is planning a series of uninterruptible power supplies (UPSs) that feature Li-ion batteries instead of the valve-regulated sealed lead-acid (VRLA) batteries that are normally used. The Li-ion offering will be lighter, smaller and produce a higher energy output than the VRLA option. The batteries also produce less heat and have lower maintenance requirements. The new range should last longer.

"While VRLAs remain the dominant UPS energy storage technology due to their low cost and high reliability, Li-ion is becoming more attractive," said Pedro Robredo, vice-president of secure power systems at Schneider Electric.

<http://bit.ly/1PDbijO>

GoDaddy launches cloud platform

Web-hosting specialist GoDaddy has launched an OpenStack-based public cloud platform and a range of Software-as-a-Service products. GoDaddy Cloud Servers are available worldwide from data centers in the US, aimed at small businesses that need just a few virtual instances.

The SaaS component of the platform is powered by Bitnami, a popular library for open-source server application deployments, supporting the LAMP (Linux, Apache HTTP Server, MySQL and PHP) stack, WordPress, Drupal and other software.

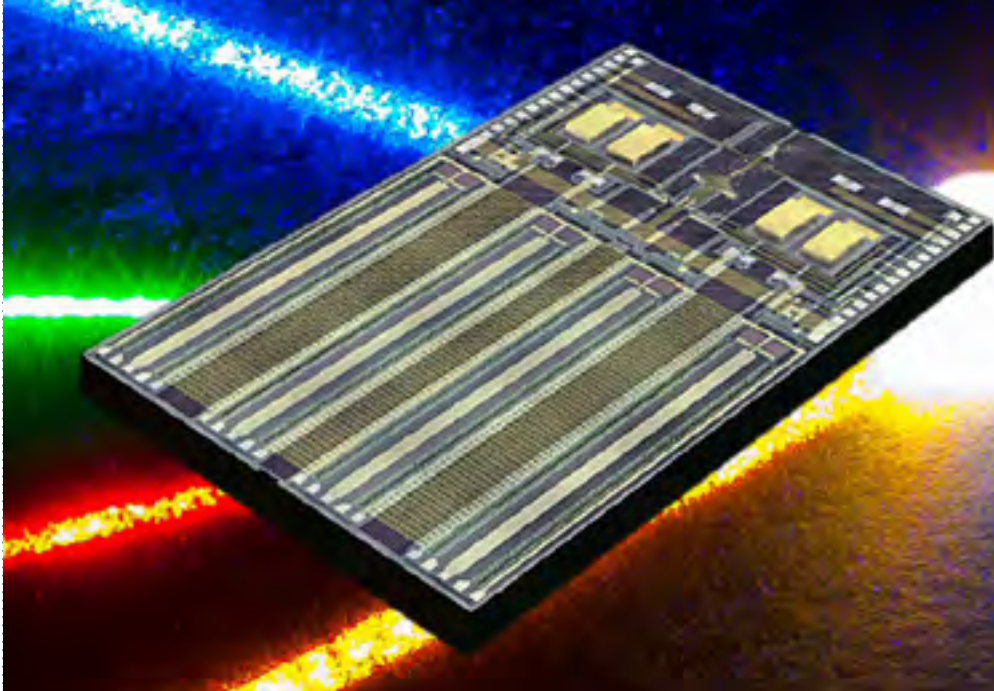
GoDaddy Cloud Servers have SSD-based storage and support snapshots for instant cloning of servers.

<http://bit.ly/1LWSfGr>

19%

extra cost of European cloud compared with US (Coreix survey)

Source: Macom / Eric Doyle



Macom makes 100Gbps silicon photonics chip

Macom has claimed the laurels as the first company to produce a laser-driven, photonic integrated circuit (L-PIC). The device can offer a total data throughput of 100Gbps.

The MAOP-L284CN complies with CWDM4 (coarse wavelength division multiplexing) and CLR4 Alliance standards, requiring it to use four 28Gbps channels that

generate wavelength (color) channels to reach the combined throughput of 100Gbps across up to 2km (1.24 miles) of single-mode fiber.

The need for high-speed communications in the data center has been evident for some time as traffic has put stress on the achievable throughputs of 10Gbps networks. Hyper-scale cloud data centers being built

by companies such as Amazon, Facebook and Microsoft are looking for compact, efficient and inexpensive solutions to data transfer bottlenecks.

Macom's product uses four high-bandwidth Mach-Zender modulators to split laser light into 1,270, 1,290, 1,310 and 1,330 nanometer wavebands, and a CWD multiplexer to transmit the light through the fiber optic cable.

Vivek Rajgarhia, vice-president of strategy in Macom's high-speed networking division, said: "Silicon-based photonic integrated circuits, or PICs, enable integration of optical devices such as modulators and multiplexers on to a single chip. We believe Macom's L-PIC solves the key challenge of aligning lasers to the silicon PIC with high-yield and high-coupling

efficiency, making the adoption of silicon PICs a reality for high-speed optical interconnects within the data center."

The MAOP-L284CN chip includes integrated test access point (TAP) detectors for fiber alignment, system initialization and closed-loop control. The only optical requirement for installation of the device into QSFP28 (quad small form-factor pluggable) transceiver applications is a single fiber aligned to the output edge coupler of the 4.1x6.5mm die.

Macom is also offering the MASC-37053A modulator driver for optimized performance and power dissipation. The driver also features integrated clock and data recovery (CDR).

<http://bit.ly/1RoRjLo>

Phoenix to get 63MW microgrid data center

ADC and Arizona Public Service (APS) are building a facility in Phoenix with its own power generation, which uses the utility grid for backup alongside UPS.

At 63MW, this is one of the largest US microgrid deployments, with its own 69kV substation fed from three different sources. It will have a PUE of 1.15, even in the water-starved Phoenix area, with its average daily temperatures over 75°F (24°C).

<http://bit.ly/1UzkLB3>

Digital Realty buys site for Frankfurt data center

A six-acre site in Frankfurt has been acquired by Digital Realty to build a 27MW three-building campus covering a total of 31,600 sq m (340,000 sq ft).

Digital Realty says the amount of data center space available in Frankfurt is at an all-time low, but demand has improved recently, due in large part to growing concerns over data sovereignty laws.

Digital Realty hopes to break ground later in 2016 and open a suite in 2017.

<http://bit.ly/1LWMSaa>

ASHRAE drops plans to require PUE levels

ASHRAE has abandoned a controversial plan to include recommended levels of efficiency in a standard for data centers.

The draft ASHRAE 90.4 energy standard for data centers was unpopular with the industry for suggesting data centers should achieve specified levels of efficiency, measured by the power usage effectiveness (PUE) metric. A new draft bases compliance on the mechanical load component (MLC) instead.

<http://bit.ly/22XD83z>



Reasons to worry about multi-cloud

- Multiple interfaces
- Multiple management tools
- Complex federation of user accounts
- Need for a single control point
- Multiple certifications



Multi-cloud takes off in Hong Kong and Singapore

Combining clouds is a good idea, but increased complexity brings challenges for the cloud-committed, reports *Paul Mah*



Paul Mah
SEA Correspondent
 @paulmah

Businesses in South East Asia are increasing their use of cloud services, and the indications are that this trend is set to grow, according to a new report commissioned by Rackspace. The study, conducted by IDG Connect, surveyed 250 IT professionals from Hong Kong, Singapore and India.

Most businesses use between two and five cloud services, according to the study, but the figure is projected to jump by 50 percent over the next two years. So, the number of cloud

services used by some businesses could increase to eight or more.

There is no question about the advantages the cloud offers, though the study cites a number of challenges stemming from multi-cloud use, such as technical overheads, an inability to monitor and manage complex workloads, and the need for user management across multiple cloud platforms.

The study looks at every cloud usage scenario, according to Adam McCarthy, senior director and general manager for Rackspace in Asia, including OpenStack-based

Managing the cloud is so complex it requires a certain level of expertise

Management is tied up in trying to figure out the different clouds, setting them up, and then building interoperability and manageability. "A lot of people find that the administrative overhead of managing the cloud is creating a lot of work by itself. In some cases, it's about managing providers," said McCarthy.

Unsurprisingly, the report finds that the use of a cloud service management provider can simplify business interfaces and management overheads. But doesn't involving a third party detract from one of the core benefits of the cloud – its self-service nature?

"That might have been true in the past, when the services offered were much more simplified and it was a newer market," said McCarthy. But cloud platforms and their usage have evolved to a level of complexity that necessitates expertise. "It's an unfortunate by-product that the cloud becomes more complex when there is so much to offer," he noted.

"Now it is more important to have deep expertise in the services to ensure you get the most out of it. The better the cloud gets, the more complicated services get," he said. A richer and more complex cloud environment makes it harder for businesses to do self-service.

Recent years have seen the development of specialized standards for cloud environments, such as the Multi-Tier Cloud Security (MTCS) standard for Singapore published in 2013, and the Cloud Outage Incident Response (COIR) guidelines from the Infocomm Development Authority (IDA) of Singapore. McCarthy said this is a reflection of the growing maturity of the cloud and its increasing relevance for IT deployments. MTCS is an extension of ISO27001 and takes a lot of best practices that were previously established to make it more accessible to a cloud utility model. "These standards are absolutely great. I think they continue to legitimize the

value and the accessibility of cloud solutions to businesses," said McCarthy.

"It is interesting that both MTCS and COIR – both quite long documents – highlight some things in the survey, such as fixed categories of risks and cloud operations management," he said. "That is important because it is a present drain of time in companies. I think that is where managed providers add value." ●

private cloud, virtualization solutions from VMware, public cloud offerings such as Amazon Web Services (AWS), Rackspace Cloud, Microsoft Azure and Google Compute Engine, and software-as-a-service (SaaS) such as Dropbox and Salesforce. "It's split almost equally," said McCarthy. "Some people are talking about public cloud as the activity that is going on. Some are purely using a private cloud. Some are hybrid cloud or SaaS."

Relying on multiple cloud services allows businesses to spread their risk footprint, even as they get to choose the best combination of cloud services and the best-of-the-breed cloud platform to meet their unique requirements. A business may also require certain tools and technology on rival cloud platforms. In such a situation, they could rely on a directory service such as Active Directory to federate user accounts across both platforms.

On the flip side, businesses want a single view of their usage levels and costs, regardless of the number of cloud platforms used. And herein lies the problem: it is a lot of work to get multiple clouds to work together. IT departments are finding themselves

Herein lies the problem: it is a lot of work to get multiple clouds to work together

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APAC Austin Hughes Electronics Ltd.
Unit 3608-12, Cable TV Tower, 9 Hoi Shing Road,
Tsuen Wan, HK
Tel : +852 2415 2121 Fax : +852 2110 9010
Email : inquiry@austin-hughes.com

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Brazil's standards-making bodies

- The Brazilian Association of Technical Standards (ABNT)
- The National Telecommunications Agency (Anatel)
- The Federal Data Processing Service (Serpro)

Brazil's standards makers forge an open cloud

A new international standard will allow Brazilian companies to compete in the international cloud computing market, reports *Tatiane Aquim*



Tatiane Aquim
Brazil
Correspondent
[@dcdfocuspt](#)

The ISO/IEC 17788: 2015 standard provides an overview of cloud computing, as well as a set of terms and definitions.

It's the Portuguese version of a joint publication by the telecoms standards body, the International Telecommunication Union (ITU), and the International Organization for Standardization (ISO).

In Brazil, the work was done by teams from the Brazilian Association of Technical Standards (ABNT), the National Telecommunications

Agency (Anatel) and the Federal Data Processing Service (Serpro). To Anatel, the standard consolidates the basic reference architecture and will allow cloud technologies to be developed more quickly so the whole industry can develop products that will work together and scale better.

From this year, any Brazilian company wanting to offer cloud services to the international market will benefit from adopting the standard, which allows them to adjust their offerings for international consistency.

Meanwhile, companies that consume cloud services will find it easier to compare the offers made by providers of cloud services, as everyone will have a common understanding. For small businesses, the standard is especially useful, as they usually have few technical IT specialists and will be more susceptible to confusion when marketing campaigns make conflicting claims.

The process of standardizing cloud computing began in 2012, shortly after the completion of some relevant ISO work on electronic documentation standards (ODF and OXML), according to Serpro analyst Luiz Guilherme Aldabalde. This resulted in a new working group, which was set up as a cooperative between ITU-T/SG 13 and ISO/IEC JTC 1/SC38.

In Brazil, ABNT teams, Serpro and Anatel worked together for about two years, making recommendations to improve successive versions before the final publication in 2014. According to the three institutions, Brazil was an important player in the development of the standard. Many contributions from Brazil are present in the final translated version of ISO/IEC 17788: 2015. "This is emblematic of Brazil's participation in the preparation and review of a global standard," said Aldabalde.

The release of the standard vocabulary and overview of cloud computing in Portuguese will allow companies, users,

industry associations, legislators, regulators and members of the IT and telecoms sector to work with a common understanding of what cloud computing is, said Aldabalde. It also gives an idea of what kind of benefits can be obtained, so those wanting to join the ecosystem can make a better risk assessment.

In addition, the standard allows everyone to work on internationally valid settings that enable Brazilian companies to export their services. It also gives Brazilian consumers a chance to properly review the services on offer.

Brazil now has a set of terms and models that are the basis for preparing bids and establishing what service levels will be offered and required. "Every standard is a reference source for specifications," said Aldabalde. "Every time you establish a pattern for a technology, it is easier to understand the issue, assess the differences between suppliers and propose improvements."

From this year, the standard will be one of the references in the acquisition or preparation of any product related to the cloud. The standards will be used to evaluate providers, enabling greater transparency

both in sales and in purchasing, promoting competition and removing unique solutions.

Serpro says cloud computing in Brazil is expanding, since there is significant demand for the benefits obtained from the adoption of the technology, such as cost reduction, flexibility, ubiquity and consolidation of processing. But there are still questions about safety, the reality behind the advantages offered and connectivity. Serpro also

pointed out that cloud computing offers better use of computing resources and opens the adoption of a utility model in which users pay for the resources they use. But this new world brings in certain fresh concepts, such as the use of servers located outside the company's own premises, owned by a cloud service provider.

ABNT expects the standard will be widely adopted, facilitating the possibility of a trade in cloud computing services for both cloud providers and cloud consumers. It is hoped the standard will provide greater visibility for the work of the Brazilian standards community dedicated to this technology, enabling greater adoption of international standards to the Brazilian reality. ●

The standard allows everyone to work on internationally valid settings

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Skilling up could increase your options

Data center professionals have no problems finding work. But having the right qualifications could open the door to better opportunities, says *Michael Kassner*



Michael Kassner
US Correspondent
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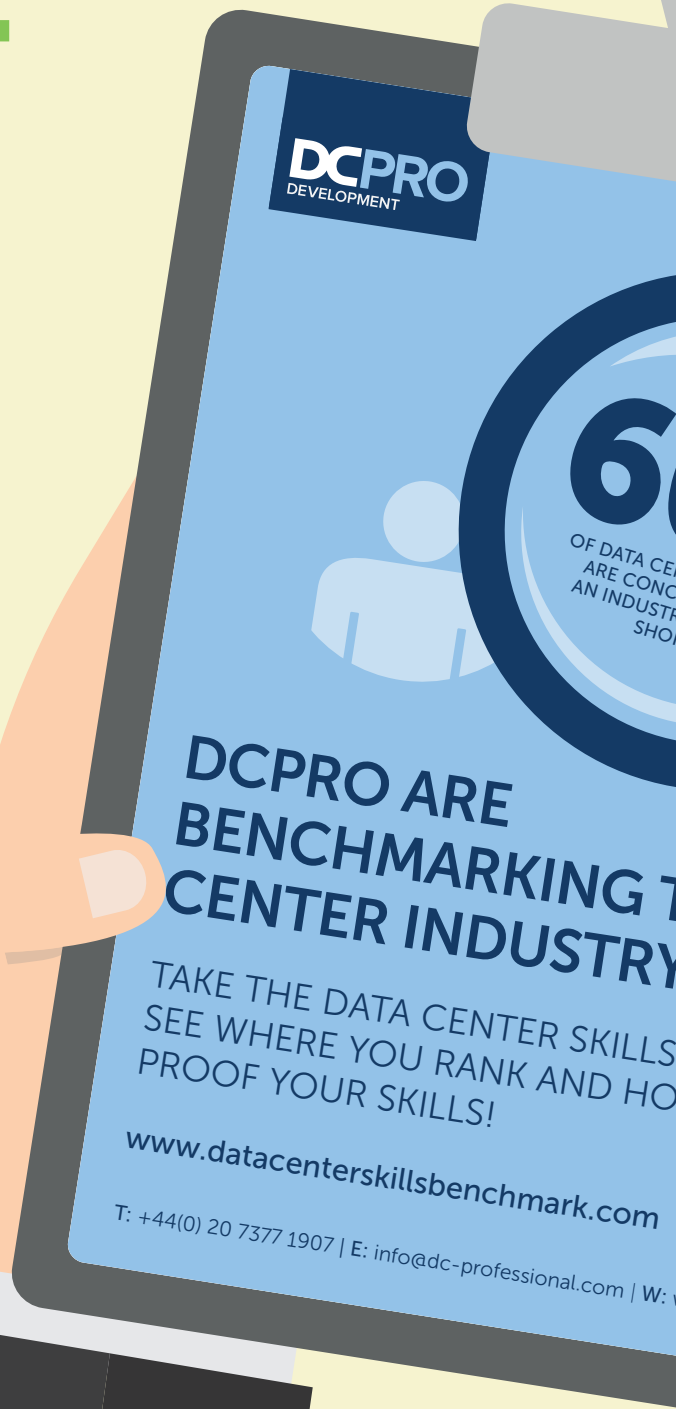
You don't need a crystal ball to predict good times ahead for IT professionals with data center experience.

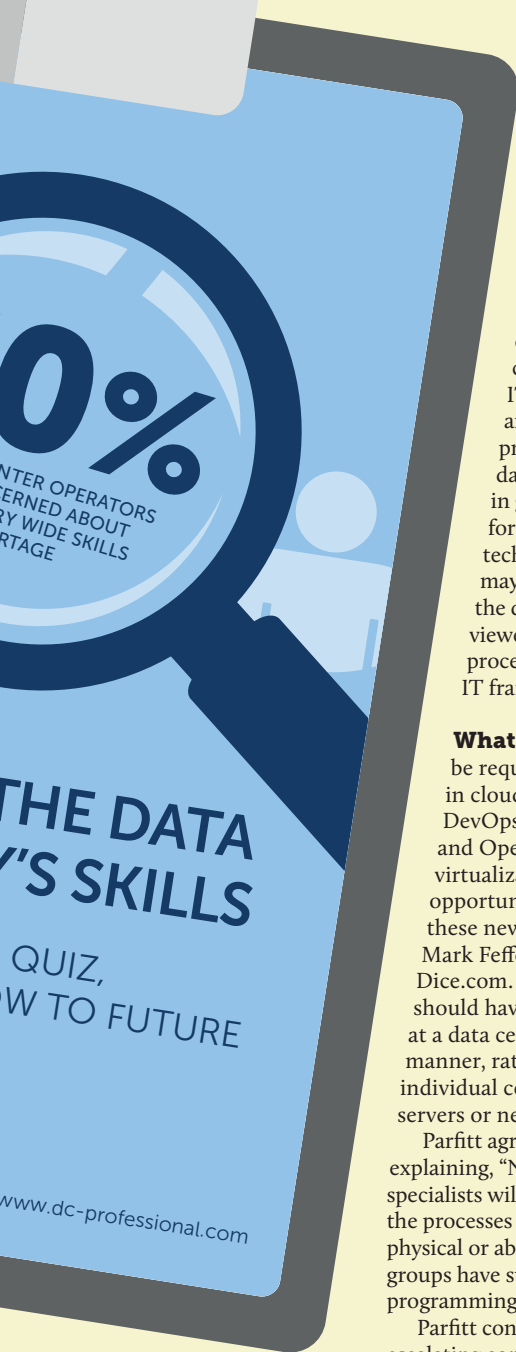
"The data center market saw tremendous growth in 2015, with independent providers in the United States alone earning revenues of \$115.3 billion and experiencing 6.1 percent growth," said a spokesperson for specialist real estate firm JLL. "We see demand only increasing."

To cover that kind of growth, forecasters are predicting over half a million data-centric IT jobs will be in play by 2020. Right now, in Minnesota alone, over 3,000 data center positions are currently being advertised by one online job placement site.

There may be a fly in the ointment, though. Not only are there not enough experienced IT professionals; it appears veteran data center workers may soon find their field of expertise is no longer applicable.

"By 2020, the data center industry won't be viewed exclusively as facilities or IT, as it has over the past two decades," writes Nick Parfitt in DCD Intelligence's report *Developing Solutions to the Data Center Skills Shortage*. "That's because the separation between these silos is disappearing as virtualization, cloud, and software-





1/2 million

US data center
jobs by 2020

defined utilities change the way that IT is housed, managed, and consumed. The process whereby the data center has drawn in groups of specialists for each area of technology or equipment may be reversed, and the data center will be viewed as a series of work processes within a wider IT framework.”

What kind of skills will be required? “Specialists in cloud, automation, DevOps (Development and Operations), and virtualization have the best opportunities for landing these new jobs,” suggests Mark Feffer, writing for Dice.com. “Those specialists should have the ability to look at a data center in a holistic manner, rather than focusing on individual components such as servers or networks.”

Parfitt agrees with Feffer, explaining, “New groups of IT specialists will emerge to oversee the processes of the data center in physical or abstract form. These groups have started to appear in programming and portals.”

Parfitt continues, “The escalating complexity of managing, utilizing, and planning for abstracted IT capacity and processes will increase the requirement for in-house data scientists capable of analyzing the considerable data required to ensure the effective use of abstracted and physical capacity in the context of corporate objectives.”

As a result of the shift in focus, Feffer suggests that all data center workers become more versatile, improve their coding skills, and

increase their knowledge of Bimodal IT, which Gartner defines as the practice of managing two separate, coherent models of IT delivery:

- Model 1 is traditional and sequential, emphasizing safety and accuracy.
- Model 2 is exploratory and nonlinear, emphasizing agility and speed.

Multi-skilling is what Parfitt calls it. “Multi-skilling can be defined as staff members undertaking tasks additional to their original skill sets or their stated jobs,” he explains. This can mean adding job roles.

How can you tell what skills you have, and which you need? DCD’s training arm, DCPro, has a skills quiz designed to benchmark your existing abilities and advise on how to stay current.

The next question becomes how do experienced workers and those wanting to break into a complex, high-paying industry go about proving they have multi-skilling capabilities?

Certifications and accreditation may be useful to both employers and those seeking employment in the data center industry, giving employers a sense of an individual’s capabilities, and helping potential employees distinguish themselves.

Ed Tittel, a 32-year veteran, checks his crystal ball every year to predict what certifications will be in demand, this year tipping qualifications from EMC, Cisco, VMware, Schneider and cabling group BICSI (see Box).

IT professionals may have the advantage, but certifications can only help, says Tittel: “it can be a real feather in your cap, and open the door to new and better work opportunities.” ●

Certifications that count

EMC – Data Center Architect (EMCDCA): Validates design skills related to virtualized infrastructures and cloud environments. The training is vendor-neutral, and consists of two tracks: storage networking design, and enterprise backup recovery design.
bit.ly/1YdMLrD

Cisco Certified Network Professional – Data Center: Geared toward technology architects and engineers, the CCNP Data Center identifies individuals who can implement Cisco Unified Computing System (UCS) blade and rack-mount servers, and install, configure, and manage Cisco Nexus switches.
bit.ly/1TzUtx5

VMware Certified Professional 6 – Data Center Virtualization: Employers appreciate this certification, people new to VMware need to complete prerequisite training, and then sit for two exams. A successful candidate will understand how to administer and troubleshoot vSphere V6.
vmw.re/1CBhuWn

Schneider Electric Data Center Certified Associate: A good start for members of a data center IT team who design, build, and manage the facility.
bit.ly/1S8EVLf

BICSI Data Center Design Consultant: The DCDC credential recognizes individuals who have demonstrated both the knowledge and ability in the planning, implementing, and making critical decisions regarding data centers.
bit.ly/1YdMjJW

The rising cost of DDoS

Data centers may be more reliable, but failures due to malicious attacks are increasing. Their cost is also rising, says *Michael Kassner*.



Michael Kassner
US Correspondent
@MichaelKassner

Some cost accountants would cringe at his methodology, but after a 2013 DDoS attack on Amazon, Network World journalist Brandon Butler took a simple route to come up with an attention-grabbing headline: “Amazon.com suffers outage - nearly \$5M down the drain?” Did Amazon really lose this much money? Or did it lose more? Butler worked backward from the company’s reported quarterly

earnings: “Amazon.com’s latest (2013) earnings report shows the company makes about \$10.8 billion per quarter, or about \$118 million per day and \$4.9 million per hour.” The DDoS outage lasted nearly an hour, hence the almost \$5 million figure.

That is a truly staggering amount to lose in one hour of unplanned maliciously-caused downtime. And Butler’s methodology seems logical on the surface. But could we get a more accurate idea of the actual cost?

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If the Ponemon Institute is known for anything, it is the company's diligence in providing accurate accounting of issues on the company's radar - in particular security issues. Its areas of interest happen to include the cost of data center outages, which it covers in a regular report series.

The executive summary of the latest, January 2016, report says: "Previously published in 2010 and 2013, the purpose of this third study is to continue to analyze the cost behavior of unplanned data center outages. According to our new study, the average cost of a data center outage has steadily increased from \$505,502 in 2010 to \$740,357 today (or a 38 percent net change)."

To reach those conclusions the Ponemon researchers surveyed organizations in various industry sectors (63 data centers) that experienced an unplanned data center outage during 2015. Survey participants held positions in the following categories:

- Facility management
- Data center management
- IT operations and security management
- IT compliance and audit

The Ponemon researchers used something called activity-based costing to come up with their results.

Harold Averkamp at AccountingCoach.com describes activity-based costing as follows: "Activity-based costing assigns manufacturing overhead costs to products in a more logical manner than the traditional approach of simply allocating costs on the basis of machine hours. Activity-based costing first assigns costs to the activities that are the real cause of the overhead. It then assigns the cost of those activities only to the products that are actually demanding the activities."

Following Averkamp's definition, Ponemon analysts came up with nine core process-related activities that drive expenditures associated with a company's response to a data outage (see Box). It's a detailed list, and includes lost opportunity costs.

The research report goes into some excruciating detail, and significant real information can be gleaned from the survey's key findings. For example, the maximum cost of a data center outage has more than doubled since Ponemon Institute started keeping track, from \$1 million in 2010 to more than \$2.4 million in 2016.

"Both mean and median costs increased since 2010 with net changes of 38 and 24 percent respectively," says the report. "Even though the minimum data center outage cost decreased between 2013 and 2016, this

statistic increased significantly over six years, with a net change of 58 percent."

The report also found that costs varied according to the kind of interruption, with more complexity equalling more cost.

"The cost associated with business disruption, which includes reputation damages and customer churn, represents the most expensive cost category," states the report. The least expensive costs, the report says involve "the engagement of third parties such as consultants to aid in the resolution of the incident."

The Ponemon report looked at 16 different industries, and the financial services sector took top honors with nearly a million dollars in costs per outage. The public sector had the lowest cost per outage at just under \$500,000 per outage.

Next, the Ponemon team looked at the primary cause of outages. UPS system failure topped the list, with 25 percent of the companies surveyed citing it. Twenty-two percent selected accidental or human error and cyber attack as the primary root causes of the outage.

Something of note is that all root causes, except cyber crime, are becoming less of an issue, whereas cybercrime represents more than a 160 percent increase since 2010.

One more tidbit from the key findings: complete unplanned outages, on average, last 66 minutes longer than partial outages.

The Ponemon researchers did not determine the cost of an outage per hour; deciding to look at the price per outage and per minute, and how those numbers have changed over the three survey periods. The cost per outage results are considerably less than that reported for the Amazon incident, but an average of \$9,000 per minute or \$540,000 per hour is still significant enough to make any CFO take note.

Data centers can only increase in importance, according to the Ponemon analysts, due in large part to cloud computing (30 percent CAGR between 2013 and 2018) and the IoT market (expected to reach 1.7 trillion dollars by 2020).

"These developments mean more data is flowing across the internet and through data centers—and more opportunities for businesses to use technology to grow revenue and improve business performance," write the report's authors. "The data center will be central to leveraging those opportunities."

An interesting point made by the report is how costs continue to rise and the reasons for data center downtime today are mostly not that different from six years ago. The one exception is the rapid and apparently unstoppable growth in cyber attacks.

The report authors are concerned about this very large increase in cyber attack outages, and they make a stark warning that the problem is not going away soon. ●

Components of cost

DETECTION COST

Activities associated with the initial discovery and subsequent investigation of an outage incident.

CONTAINMENT COST

Activities and associated costs that allow a company to prevent an outage from spreading, worsening, or causing greater disruption.

RECOVERY COST

Activities and associated costs related to bringing the organization's networks and core systems back to normal operation.

EX-POST RESPONSE COST

All after-the-fact incidental costs associated with business disruption and recovery.

EQUIPMENT COST

The cost of equipment, new purchases, repairs, and refurbishment.

IT PRODUCTIVITY LOSS

The lost time and expenses associated with IT personnel downtime.

USER PRODUCTIVITY LOSS

The lost time and expenses associated with end-user downtime.

THIRD-PARTY COST

The cost of contractors, consultants, auditors, and other specialists engaged to help resolve unplanned outages.

LOST REVENUES

Total revenue loss from customers and potential customers because of their inability to access core systems during the outage.

BUSINESS DISRUPTION

Total economic loss of the outage, including reputational damages, customer churn, and lost business opportunities.

Debates about the June referendum on Britain's exit from the EU – or Brexit – have dominated headlines in the UK in recent months. There have been letters to newspapers from political and business leaders, arguments in parliament, incensed accusations of fear-mongering, and counter accusations of deception.

But what about data centers? In a recent DCDi research report, *Metropolitan Hub Series: London*, we listed a Brexit as a threat to London's role as a major global data center hub. London is the center of the UK data center industry, accounting for more than a third of all data center capacity in the UK. It is also the largest data center market in Europe, and the third-largest in the world, based on current DCDi estimates. It accounts for more than a million square meters of white space and more than 1GW of power. So any damage to London will have an impact on the UK's data center industry, even if data center investment outside the capital is not markedly affected.

London's success as a data center hub is built on its role as a center for trade and commerce. In particular, it is a major financial center, and this is a powerful driver for data center investment. Today, London has the largest stock exchange in Europe and is the largest center for derivatives markets, foreign exchange markets, money markets, issuance of international debt securities, and international bank lending worldwide. In fact, London is currently the top-ranked financial center in the world, according to the Global Financial Centres Index.

London's data center industry has expanded well beyond finance now, but we estimate finance still accounts for about one-third of all data center capacity in London (including in-house facilities and colocation), so it is still very important.

In the event of a Brexit, it is difficult to imagine the financial capital of Europe remaining outside Europe in the long term. Obviously, we don't know the terms and conditions of a Brexit, so it is impossible to intelligently predict what will happen. The timeline for many of these changes is also

Should UK data centers fear Brexit?

If Britain votes in favor of an exit from the European Union, this could have serious consequences on data centers located there, says *Adi Kishore*

unclear, since the terms of the exit will likely take years to hammer out.

Certainly London's entire financial sector will not decamp overnight, but it is probably realistic to expect that a considerable percentage of financial activity currently in London will migrate onshore, to destinations such as Paris and Frankfurt.

Data residency issues might also add impetus to this shift. Since the Safe Harbour ruling in October 2015, we have been expecting more storage and processing of data to move into the EU. This dynamic initially favored new investment in London, but if it is no longer part of the EU, it may result in data transferring out of London, rather than into it.

And while the financial sector is not the only industry that supports London's data centers, other industry verticals are likely to be affected similarly. At least some percentage of the large European companies that are currently headquartered in London (100 of the 500 largest European corporations) will also move some percentage of their data requirements back to the continent. There probably will be some reverse flow from Europe; ie, British data that is stored in Europe today will return to Britain. However, this is likely to be eclipsed by the flow into Europe over time.

London also has some disadvantages as a data center destination. Like most congested hub

cities, space and power are scarce resources. Building and running a data center in London can be expensive. And the UK's power situation is a cause of concern even outside the data center industry. London's broad attractiveness as a data center destination has more than compensated for these challenges so far, but could a Brexit tip the balance in favour of European hubs?

London also benefits from a sort of "economic gravity." Its commercial draw pulls together financiers, entrepreneurs, technologists and marketers to drive growth and development in a variety of industries, with new businesses springing up around existing ones.

A Brexit would surely weaken London's "gravity," but it's unclear if it would do so sufficiently to discourage investment in data centers. It's also not clear if another European city would necessarily become the commercial center of Europe. Rather, investment may be spread across multiple European destinations, which would favour London.

All in all, we would expect a Brexit to have a medium-term negative impact on London's role as a business and financial center, and therefore as a destination for data center investment. It will also give rise to considerable uncertainty. But it is almost impossible to determine how significant or sustained this impact will be on the data center industry. ●



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Peter Judge
Global Editor

 @peterjudgeDCD

Open to the core

They used to laugh at open technologies. Standards were defined by hapless bureaucrats and ignored in the real world, and open code was written by hippies in sandals who were probably socialists to boot.

They're not laughing now. Open-source software powers the cloud, standards have been wiping out their proprietary rivals, and open technologies are seriously growing.

But what do we mean by open? There are at least two strands: open standards and open source. We'll go into some specifics about the differences on the following pages, but for now, standards are top-down, while open source is a bottom-up, grassroots movement.

Licences are important in both worlds. Formal standards should not require you to use one vendor's products; at the very least, everything mandated in that standard must be available on fair, reasonable and non-discriminatory (Frاند) terms.

And open-source technologies should give you the power to inspect and change the technology you are using. The best licences also require you to return those modifications for others to use.

The point is, while vendors have the right to make money, they don't have the right to lock you in. You own the technology you use.

Open source is particularly powerful in a data center environment. Web-scale hardware gains from the economies of scale, when customers make their own specifications and buy kit on an open market.

And it's not just cheaper, it's better. If there's a need, anyone can knock up an add-on or a variation in less time than it would take for a big vendor to run a focus group. And if it's a real need, the code will be made better through use and attention.

And it can roll out as far as you like. You can't run a scalable cloud on a proprietary technology, where every instance of a server incurs a new licence fee.

Open source is here to stay.

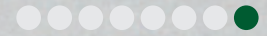
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Peter Judge - Global Editor

OPEN

to

change





The cloud consumes technology differently. It needs scalable, flexible commodity hardware and software. Only open source can feed the data centers of tomorrow, write *Peter Judge* and *Roger Strukhoff*



Peter Judge
Global Editor
[@PeterJudgeDCD](#)

We've become familiar with the dictum by original Netscape co-founder Marc Andreessen that "software is eating the world". True, but the reality is more nuanced than that.

We currently create, process and consume amounts of data that were unimaginable a generation ago, and we must be able to produce hardware of quality and in quantity to keep pace. Software is indeed chewing up the ability of hardware to deal with it – the IT systems of the world currently process several zettabytes (ie, several million petabytes) of data annually, and projected growth rates are 26 to 28 percent per year (according to research by Cisco), thereby doubling the amount of data every two or three years.

No single company can keep up with that and, because every part of the system is interconnected with the others, the only way to meet the demands of the cloud is to distribute the workload, invite the world to help, and keep the doors open. In other words, open source has become, quite simply, the only viable approach to webscale and cloud technology.

In the 20 years since it was created, the Linux OS has become the most widely used software in the world, with customized distributions cropping up in embedded processors for everything, including networked devices.

Amazon doesn't share much about its technology, but it is well known that Amazon Web Services (AWS) – the biggest public cloud service in the world – is running on millions of servers, each running Amazon's own version of Linux. How else could it scale as it does for the prices it charges?

Outside of Amazon, OpenStack has become the leading public cloud platform, and that is an open-source project. Big Data is revolutionizing the handling of information, allowing insights to be extracted from giant data sets – and the leading offerings are based on the Hadoop open-source platform, which emerged from efforts by Google and Yahoo to handle floods of information on commodity hardware. Because Hadoop is open source, managed by the Apache Foundation, that power is now available to anyone.

Open source reached the hardware level in a big way in 2011, when Facebook shared its server designs and launched the Open Compute Project, which is now destroying vendor lock-in ►



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Open technology is vital “above the rack and below the stack”. So it’s not software that’s eating the world: it’s open source.

Open-source technology is licensed in such a way that others can get involved, and the players each adopt the best open-source license for their purposes: the Gnu General Public License (GPL) version 2 is a favorite with “purists” because it requires developers to share their modifications with the community, while the Apache license allows vendors the tempting opportunity to extend the software with code they can keep to themselves.

“In open source, code is currency, and the medium in which you earn respect,” says Cole Crawford, CEO of Vapor IO. He should know: he was there at the formation of OpenStack and led the Open Compute Project before setting up to create an open-source means to manage data center hardware at Vapor IO.

That company is just one example of a valuable open-source effort. All the associations and organizations mentioned here are doing the grinding, daily work that keeps the data flowing, and the biggest companies are now betting on open technology.

Whether you’re modeling a complex scientific problem, collecting and analyzing data from a new industrial manufacturing plant, or just watching some stuff on YouTube, you’ll be glad that these organizations and companies exist, and are focused on nothing but open. ●

Open minds at CeBIT

Open source was at the fore of the giant European tech show, CeBIT in Hanover, in April. I moderated a panel which, along with Frank Weyns of Rackspace, featured Calista Redmond of IBM and the OpenPower Foundation, and Monty Taylor of the OpenStack Foundation. OpenPower and OpenStack are part of a constellation of open-source groups (see box).

I also met with Peter Ganten, who heads the German company Univention, as well as the Stuttgart-based Open Source Business Alliance.

Open technology has arrived in a big way in Germany, mirroring what’s going on in the US, Canada, the UK, several other major markets, and developing markets throughout the world.

Research I’ve been conducting over the past year from primary data sources suggests that countries as diverse as Denmark and Finland, China and the Philippines, Jordan, and Morocco and Senegal are regional leaders in using open source to improve their overall IT infrastructures.

Roger Strukhoff is executive director of the Tau Institute and open-source track chair for DCD Converged



Open-source alliances

APACHE FOUNDATION

Umbrella body supporting nearly 100 top-level open-source projects, notably Hadoop and related Big Data activity, several databases, web and Java-related technologies.

FREE SOFTWARE FOUNDATION

A campaigning non-profit organization, aiming to promote computer user freedom and defend the rights of all free software users.

LINUX FOUNDATION

Non-profit foundation sponsoring the work of Linux Torvalds and other Linux developers, dedicated to keeping Linux free, supported by hundreds of tech companies.

OPEN COMPUTE PROJECT

Shares efficient designs for cloud infrastructure, with contributions in servers, network and many other areas. Launched by Facebook in 2011, it now has around 100 organizational and community members, and hundreds of active individual members. Recent announcements include expansion into telecoms hardware and the arrival of Google as a member.

OPEN DATA CENTER ALLIANCE

An independent body working on standards for cloud computing. Founded in 2010, it is backed by Intel and includes large vendors such as BMW.

THE OPENPOWER FOUNDATION

Customizes IBM Power microprocessors. Chips based on IBM’s designs can be made at any fab and mixed or integrated with any other products. Also shares firmware with its own github repository. Announced as a consortium in August 2013, now a foundation with 157 members.

OPEN SOURCE BUSINESS ALLIANCE

The Open Source Business Alliance is the merger of European Linux user groups, based in Stuttgart, Germany.

OPEN SOURCE INITIATIVE

Non-profit organization and standards body that maintains a list of software licenses that meet the open-source definition and promotes an understanding of those licenses.

OPENSTACK

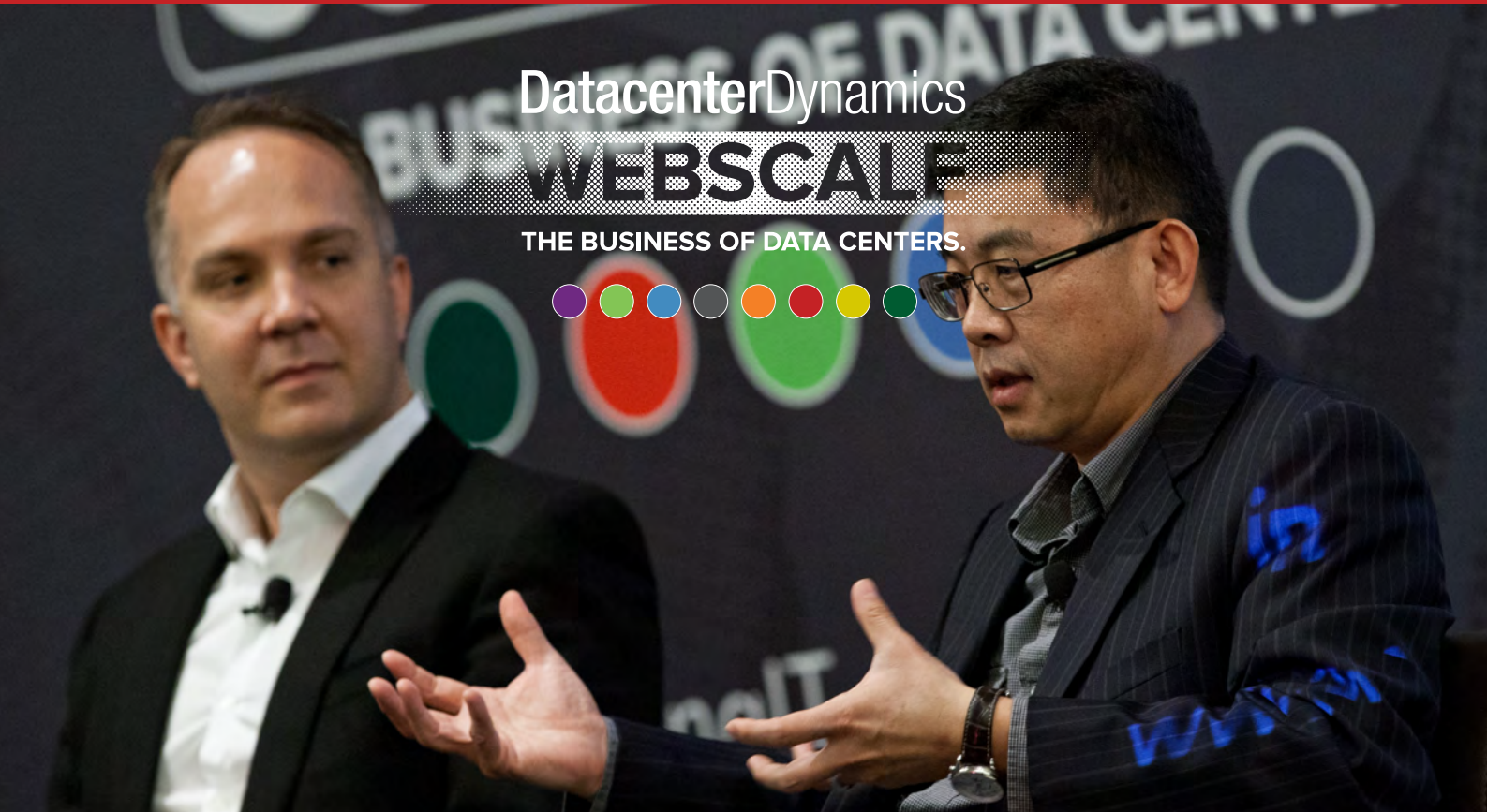
Open-source cloud platform with many components, including compute, networking, security, block storage, database and orchestration. Launched by NASA and Rackspace in 2010, now a foundation with 170 members and 30,000 community members.

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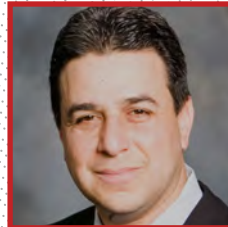
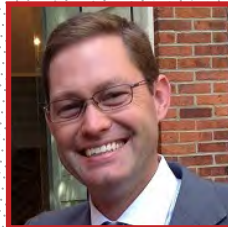
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How to lose UPSs, PSUs and cables

The open-source hardware coming out of OCP is rewriting the rule book for data centers, says *John Laban*

I used to think that 20 percent of what I thought was useful one year would be obsolete the next. I've just been to the Open Compute Project US Summit 2016, and I think I may have to shift my estimate to nearer 80 percent when it comes to OCP gear.

In one year, since the 2015 Summit, the open-source hardware magicians have shrunk product development times drastically compared with the big brand vendors. The OCP community has also made products that will disrupt the data center industry this decade. Here are some highlights:

Removal of AC-DC power supply units, or PSUs –

Conventional servers come with at least two AC-DC PSUs, each sized to support the total load of the ICT kit. Each PSU is underutilized, and 60 percent of each server's total capacity is stranded.

Blade center servers give better utilization with shared PSUs feeding up to 16 server blades.

The OCP community has scaled this to the complete rack, so each rack has its own AC-DC PSU feeding 12V DC to the servers via a copper busbar.

A traditional enterprise data center with 48 racks, 70 percent occupied by pizza box servers, would have 2,688 PSUs, or 3,000, including network and storage devices. An optimised 48-rack OCP solution would reduce the number of PSUs by 2,900.

Removal of out-of-band management ports –

Conventional servers normally have at least one out-of-band management port, which must be cabled and connected to Ethernet switches, which can double the quantity of cabling and Ethernet switch ports in the computer room.

The new OCP servers are networked for out-of-band management via powerline through the DC busbar in the rack and connect to a cheap Raspberry Pi single board

computer in each rack running Open DCRE (Data Center Runtime Environment).

In our 48-rack example, we can save 2,600 RJ45-RJ45 patch cords; 26km of Cat5e/6/6A cables; 2,600 RJ45 jacks; and more than 100 RJ45 patch panels, along with 50 24port Ethernet switches.

No centralized UPS – The OCP AC-DC power supplies in each rack are combined with a BBU (Battery Backup Unit) using Li-Ion batteries. This removes the need for the centralized UPSs and Valve Regulated Lead Acid (VRLA) batteries, plus the rooms that these centralized power resources occupy, which reduces the size of the data center by 25 percent. The latest OCP racks are slightly taller to house the distributed PSUs and BBUs, so we don't require larger computer rooms.

End of intelligent rack-mounted power strips –

These innovations make obsolete the use of dual rear-mounted intelligent power strips. For our 48-rack enterprise data center, this saves more than £50,000.

End of multimode cabling and parallel optics –

The OCP community announced the new single-mode 100GE duplex LC 500 meter 'Lite' optics – a value-engineered version of the existing 10km optics at one-tenth the price. This could reduce the fiber count compared with multimode parallel optics by 75 percent. Enterprise data centers that have gone down the road of multimode parallel optics may find themselves in a very embarrassing position in the next two years, having cabled their data centers with the wrong fiber cables and connectors.

OCP awareness

Join me on my OCP Awareness Course to learn more about how OCP innovations will disrupt enterprise data centers. ●

<http://bit.ly/tjhAFPP>



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DCD Com

Highlights: CeBIT 2016



A full house at International Buyers Club



Amazon Web Services session



Roger Strukhoff
Executive Director,
Tau Institute

"DCD at CeBIT brought together the logical and physical world, and united top industry experts, bringing forward powerful new innovations and cross-stack solutions in the zettabyte era."



Nexans session, DCD at CeBIT



Panel session on Stacking IT stage

Upcoming Events: DCD Converged

A world map graphic with several callout boxes for upcoming events. Each callout includes the DatacenterDynamics logo, the event name, the location, and the dates.

- San Jose**
July 19-20, 2016
DatacenterDynamics **WEBSCALE**
THE BUSINESS OF DATA CENTERS.
- New York**
April 19-20, 2016
DatacenterDynamics **ENTERPRISE**
THE BUSINESS OF DATA CENTERS.
- Bogota**
June 2, 2016
DatacenterDynamics **CONVERGED**
THE BUSINESS OF DATA CENTERS.
- Dubai**
April 25, 2016
DatacenterDynamics **CONVERGED**
THE BUSINESS OF DATA CENTERS.
- Shanghai**
June 15, 2016
DatacenterDynamics **ENTERPRISE**
THE BUSINESS OF DATA CENTERS.
- Melbourne**
June 21, 2016
DatacenterDynamics **CONVERGED**
THE BUSINESS OF DATA CENTERS.

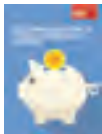


community

DCD at CeBIT took data centers to the heart of Europe's top tech trade show. April brings DCD Converged Madrid, DCD Enterprise in New York, and our US & Canada Awards ceremony

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www.datacenterdynamics.com/research/the-growth-strategies-of-baidu-alibaba-and-tencent-implications-for-data-centers/95304.article



Metropolitan Hub Series: Beijing
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Training



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New webinars from the leaders in data center technology

DESIGNING FLEXIBILITY INTO YOUR DATA CENTER POWER INFRASTRUCTURE

Wednesday, May 5, 2016
 2pm (EDT) / 7pm (BST)

As power density is rapidly increasing in today's data center, provisioning the right amount of power to the rack without undersizing or overprovisioning the power chain has become a real design challenge.

Managing the current and future power needs of the data center requires Cap-Ex to deploy a flexible power infrastructure, safely handling peak power demands, balancing critical loads and easily scaling to meet growing power needs.

In this webinar, you will learn how to create long-term power flexibility and improved availability for your operation, and how to increase energy efficiency and improve SLAs through a comprehensive set of best practices and real-life examples of actual data center customer problems solved.

Register: www.datacenterdynamics.com/raritan-webinar2



DatacenterDynamics AWARDS

NEW VENUES in 2016

All dates are confirmed for this year's DCD Awards!
www.datacenterdynamics.com/awards

Latin America Awards
 Tuesday, September 27,
 Mexico City

Asia Pacific Awards
 Wednesday, November 9,
 Hong Kong

Brazil Awards
 Tuesday, November 8,
 São Paulo

EMEA Awards
 Wednesday, November 7,
 Hilton on Park Lane, London



Most of us do not work for employers who can execute or banish us

Hope and glory

The words of Seneca, Roman philosopher, and a man who lived his life in ever-present danger, can be a useful guide to how we should be running our data centers: 'Cease to hope, and you will cease to fear.'

We have all observed — first in hope, then in slow realization — that all our dreams of that 'perfect' solution, whether it is big data or DCIM, are destined to languish in the trough of disillusionment. And it's not that every new thing will fail. The art is in choosing the failures whose code will survive in another iteration. In defeat there is still hope.

Most of us do not live in a working environment where our employers — in Seneca's case the unstable Roman Emperor Nero — can order our execution, banish us to the ends of the Earth or, if he was having a particularly good day, merely order us to commit suicide. But we do live in unstable times. Software and compute solutions spring up and others die every day. And we have to carry on innovating.

The slow but inevitable evolution of enterprise cloud services is making it increasingly difficult for even the stoutest fan of IT to avoid the beancounter's inevitable march on the IT department. When has the lack of real security for data ever been a reason for not adopting a new technology? I remember Phil Lieberman, founder and president of Lieberman Software, telling me years ago that even the IT auditors were more affected by cost arguments than security fears — and they are technically responsible for ensuring IT failures didn't happen!

Public cloud services allow enterprises to deliver key services from data centers closer to customers. Yet security fears still persist. This is why colo still has a high profitability quotient. This is also why the current trend towards enterprises using highly connected colocation data centers will almost certainly accelerate as data center providers compete for this business. MarketsandMarkets predicted recently that the colocation market will grow from an estimated \$25.70bn in 2015 to \$54.13bn by 2020.

The next hurdle for the colo market is the blizzard of cross-border data laws — but that will be next year's battle.

•
Bill Boyle - Global Managing Editor
@billboyleDCD

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