CLOUD FOR BUSINESS

OVERVIEW

Mega-companies make way for techies

Cloud computing has much to offer businesses of all sizes and take-up is accelerating with companies increasingly opting for a variety of providers

DAVID BENADY

From the biggest enterprises to the smallest startups, companies are transforming the way they work by turning to cloud computing for their IT needs.

The benefits are huge as there's no need for vast capital expenditure on energy-hungry servers. Staff can work on programs from anywhere and seamlessly collaborate on shared files. Data is stored remotely, so won't be lost if the system goes down, and cloud computing offers great flexibility for businesses that are growing fast and need fluctuating bandwidth.

But finding the right provider of cloud computing services can be far from straightforward.

Take-up of cloud computing services has been rapid, with the market growing by more than 20 per cent a year. In 2017, the global public cloud market will exceed $146 billion, up from $87 billion in 2015, according to Forrester Research.

This fast-expanding market is dominated by Amazon Web Services (AWS) followed by Microsoft Cloud. Google and IBM are the next biggest players and, together with the two leaders, they make up the mega-providers that control over half the market. Following behind is a league of significant players such as Rackspace, Alibaba, Oracle and Salesforce.

There is also a multiplicity of mid-sized and smaller companies offering to host services in the cloud and managing the services offered by the biggest players. Even so, it is the mega-providers, especially AWS, that are growing fastest as they attract global corporations.

These corporations often have large IT departments with plenty of in-house expertise to handle the deployment of cloud services. Smaller businesses, on the other hand, may need advice to help them find their way around the services and will require support in the event of problems and bugs.

Some argue that businesses go to the mega-providers because of their strong reputation for helping companies migrate seamlessly to the cloud. Maarten van Montfoort, vice president for North Europe at IT services provider Comparex, says: "One of the reasons many businesses opt for a mega-cloud provider is the view that they represent a 'safe pair of hands'.

"Already many chief information officers struggle to identify and implement the cloud services most suitable for their business. Mega-cloud providers have become the default choice because of the perception of the greater ease of migrating to a large vendor."

However, smaller players are sensing an opportunity to offer a custom service for companies without strong in-house expertise. Jack Bedell-Pearce, managing director of UK cloud and data centre provider 4D, says the market is changing rapidly and the biggest players Amazon and Microsoft are pulling away from the pack. "The other players have given up fighting the scale war with Amazon," he says. Cisco pulled out of its public cloud offering late last year.

But he claims some companies have had a difficult experience with the mega-providers. "Bosses say that is where we want to be and they task their chief information officers to migrate everything across," he says. However, there can be problems as the large-scale providers may not provide the right kind of support for companies.

> The most important thing is for businesses to define their aims for cloud computing before they take a decision about which service to use

Mr Bedell-Pearce says the mega-providers assume big companies will have in-house IT experts who can provide support if something goes wrong. "It is not like a smaller service provider where you can pick up the phone and talk to a techie. The reason the mega-providers' prices are so low is because that is all they are offering, the commodity of the cloud platform," he says.

One effect of the increasing size of the biggest players has been the growth of managed cloud services. A big trend has been for organisations to use a variety of cloud providers. This opens the way for specialists who help businesses manage the multi-cloud system. Darren Norfolk, managing director of cloud management service Rackspace UK, quotes a report from RightScale which shows that applications are running on an average of eight different cloud services.

"There's lots of complexity if you then go and try to hire different skillsets for all of those different types of clouds, and that's what we are seeing with customers we are working with," says Mr Norfolk.

He explains that in many companies, the marketing and development teams tend to be highly innovative and push to get products to market quicker than a centralised IT team. These teams may hire their own cloud provider.

"There are many different dynamics and that is where this whole multi-cloud aspect comes to fruition, and we see an opportunity where there are organisations that aren't choosing one size fits all," he says. Where there are multiple cloud providers, it makes sense to work with a consultancy to oversee the management of the clouds.

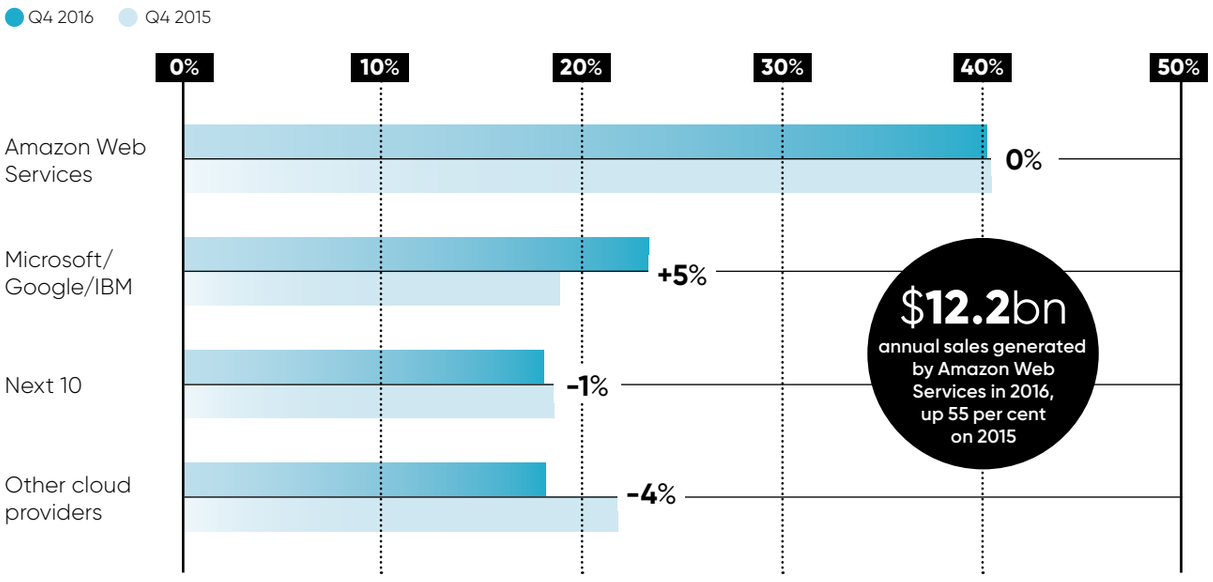
File-hosting service Dropbox is making a play for a share of the cloud market. Philip Lacor, Dropbox vice president for Europe, the Middle East and Africa, says the most important thing is for businesses to define their aims for cloud computing before they take a decision about which service to use.

Important considerations include finding a cloud system that is agnostic about operating systems, whether Mac or Windows, while security should be top of the agenda. "They should also select cloud providers that adhere to strict security principles and guidelines. The most important thing to consider is the usability of cloud services. If technology is clunky, employees will use their own consumer services, which could create security issues," he says.

Some businesses will need a high degree of support so will prefer to use a smaller player. But as Mr van Montfoort from Comparex says: "Ultimately, every cloud journey is different and the needs of every business are different, which means it is not the size of the vendor which should be important, but whether the contract a chief information officer signs up to actually fits the needs of the business."

THE RACE FOR PUBLIC CLOUD LEADERSHIP

CHANGES IN GLOBAL MARKET SHARE FOR PUBLIC INFRASTRUCTURE AS A SERVICE AND PLATFORM AS A SERVICE

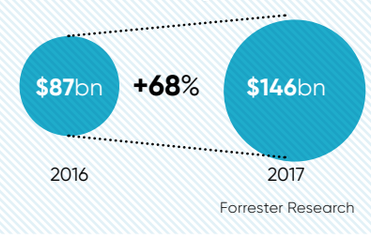


Synergy Research Group 2017

FACTFILE

PUBLIC CLOUD

Estimated size of the global market



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COMMERCIAL FEATURE

Get help with multi-cloud

The adoption of cloud technology has steadily risen over the last decade. The way organisations are using cloud has also evolved, most recently into a multi-cloud model, which market watchers are confident will be the next logical move for most organisations

In its *FutureScape: Worldwide Cloud 2017* report, analysts IDC predict a multi-cloud architecture will be adopted by more than 85 per cent of enterprises by 2018, a trend driven by the fact that businesses are increasingly aware of the merits and limitations of individual cloud providers.

Many are now exploring the benefits and challenges of employing multiple cloud suppliers and seeking out the managed cloud partners that will help run their multi-cloud strategy in the most effective way.

John Engates, chief technology officer at leading managed cloud company Rackspace, says: "The question that organisations are now asking about cloud technology has shifted from 'why cloud?' to 'what cloud?' and they are recognising the benefits that multi-cloud solutions can bring in creating a robust platform that is scalable, stable, cost effective and helps them meet the challenges of an increasingly complex regulatory landscape."

A multi-cloud strategy is extremely flexible in allowing organisations to choose services and providers that will best meet their requirements, right down to the individual business processes or business units. Rather than using solely a public or a private cloud, a business leverages two or more cloud services across multiple vendors to create a broad-ranging cloud approach that can deliver a number of benefits.

One of the biggest benefits is that different cloud providers offer different products and technical capabilities suited to the various demands of diverse customers and applications. There are also cost benefits, as utilising a mix of clouds based on pricing models often garners cost-savings.

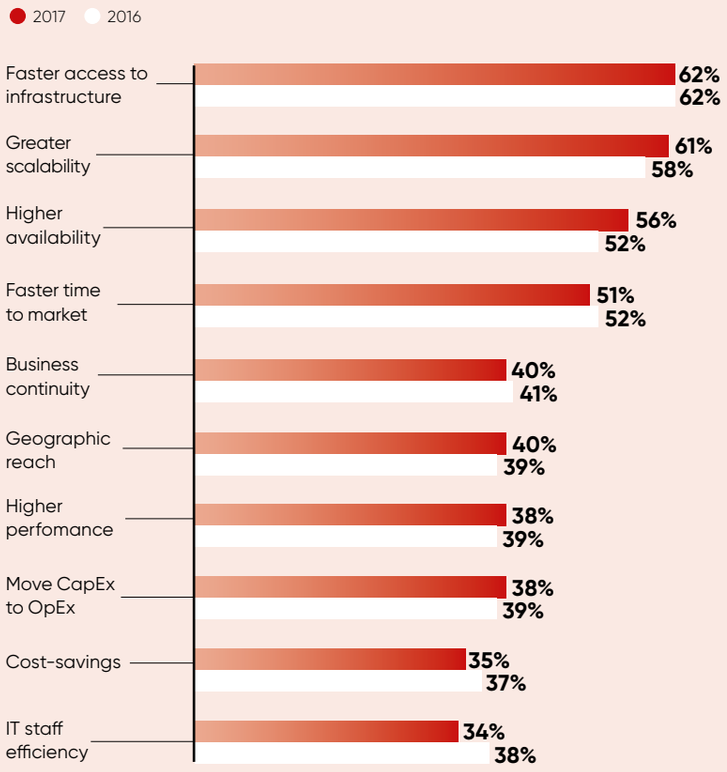
Onerous data protection legislation is set to have an increasingly significant impact on IT strategy, creating a greater burden of compliance. However, with a move towards a tailored multi-cloud strategy, organisations can store more sensitive data on-premises or in private cloud environments, and move other workloads to public cloud environments to utilise the scalability, cost efficiency and compute capabilities.

In addition, by not having all their eggs in one cloud "basket", organisations can maximise redundancy to ensure site stability and consistently deliver a good user experience.

> A multi-cloud strategy is extremely flexible in allowing organisations to choose services and providers that will best meet their requirements

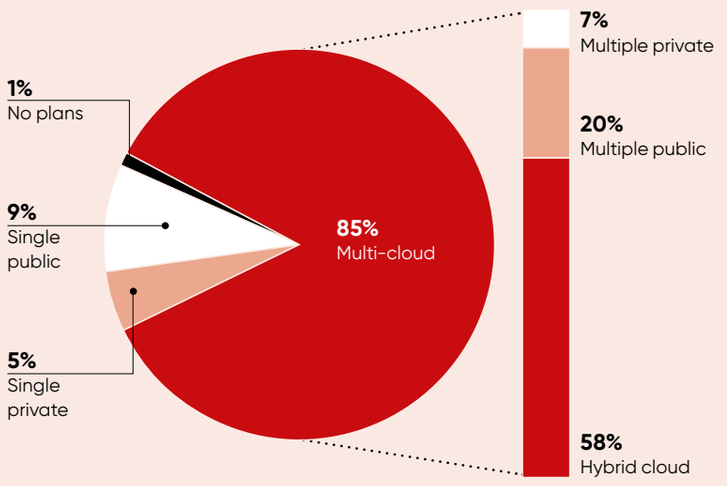
CLOUD BENEFITS 2017 COMPARED WITH 2016

PERCENTAGE OF RESPONDENTS REPORTING THESE BENEFITS



ENTERPRISE CLOUD STRATEGY

1,000+ EMPLOYEES



State of the Cloud, RightScale 2017

But it is not all smooth sailing. While multi-cloud can deliver huge benefits for enterprises, it can also be complex and challenging to implement and run, as Mr Engates points out.

"Clearly, businesses can and do benefit from the adoption of a multi-cloud approach, both in terms of higher performance and cost-efficiency capabilities," he says. "However, in committing to a multi-cloud infrastructure, they will also face a number of challenges, notably those surrounding management and integration."

These include difficulties around the logistics of managing IT services across multiple providers for example, how to delegate responsibility for things like scheduled downtime and service visibility of the entire infrastructure. As each cloud provider is delivering only a part of the business strategy, none of them has obvious accountability for overall service delivery.

The biggest challenge is likely to be a lack of expertise. According to the *RightScale 2016 State of the Cloud* report, this is the biggest barrier to cloud adoption. "The simple reason is that cloud technology is relatively new and most people in IT are not cloud natives," says Mr Engates.

Because cloud technology is evolving at an increasing pace, organisations constantly have to review and inevitably redesign their IT solutions and integration. They also face the challenge of staying abreast of the pricing of multiple providers to establish whether or not they are getting value for money.

Compliance is another potential minefield. Ensuring that all applications are correctly licensed and compliant with external regulatory bodies is no small undertaking.

Many organisations do not have the resource to manage multiple cloud providers effectively themselves. The recruitment, training and engagement of a team with the requisite IT skills to do so can incur huge business expense. Such a move for most companies would be neither efficient nor cost effective.

> Rackspace employs dedicated specialists, whose sole job is to remain highly skilled on these platforms and they are continually learning the latest in technology

The solution for many multi-cloud-enabled enterprises has been a managed cloud approach, working with a managed cloud partner with the expertise and experience of managing tens of thousands of environments and numerous platforms.

One such partner, Rackspace, works with some of the world's leading enterprises to provide the skills and expertise to manage their multi-cloud environments, be it on AWS, Microsoft, VMware or other infrastructures. In doing so they are also able proactively to support clients in developing a strategy that keeps the IT department aligned with their overall business goals.

As cloud technology continues to grow and evolve, and the number of services offered multiplies, it will inevitably become more challenging to manage a complex combination of clouds. For example, this year alone, AWS has released more than 71 new updates, including new security features, tools that simplify the movement of data around an organisation's cloud, testing features and authentication services. This creates difficulties for IT departments in maintaining the skills needed to keep up with these changes.

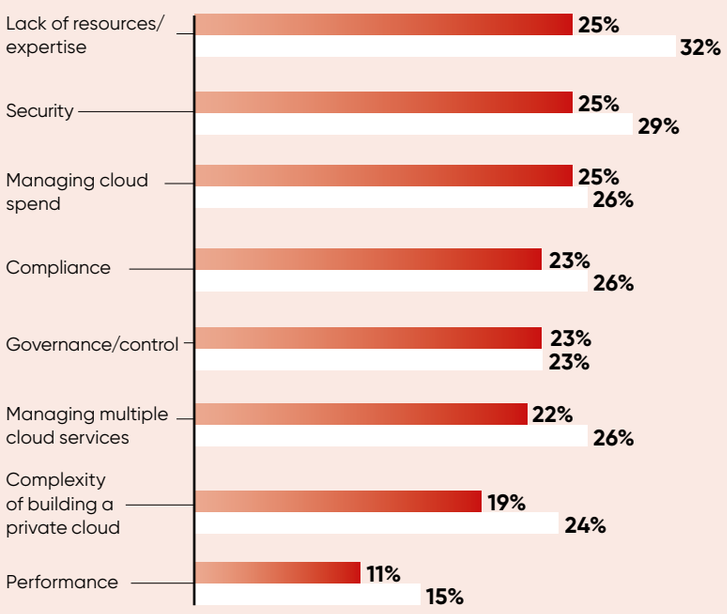
Rackspace employs dedicated specialists, whose sole job is to remain highly skilled on these platforms and are continually learning the latest in technology, enabling the enterprise's IT team to focus on their core role of meeting company objectives.

Mr Engates concludes: "We are already seeing a huge increase in demand for managed cloud services and a greater reliance by organisations on companies such as Rackspace to manage their evolving multi-cloud environments, improving business efficiencies, increasing cost-savings and, at the same time, enabling them to focus on their core business."

For more infomation please visit www.rackspace.co.uk

CLOUD CHALLENGES 2017 COMPARED WITH 2016

PERCENTAGE OF RESPONDENTS REPORTING THESE CHALLENGES



State of the Cloud, RightScale 2017

SHADOW IT


Klaus Vedfelt/Getty Images

Time to bring innovation out of the shadows

Is it time to recalculate the rewards shadow IT brings to information technology and redefine the risk?

DAVEY WINDER

Shadow IT is the use by employees of unauthorised cloud applications and services, such as Dropbox, Google Docs and OneDrive. This definition does not imply these apps and services are inherently dangerous or insecure, simply that they have not been authorised for use by the IT department and so are often invisible to security controls.

The *Businesses @ Work* report from secure identity management specialist Okta reveals that 56 per cent of apps used within the average enterprise are not provided and authorised by IT, and this is up from 48 per cent the previous year.

What's more, the latest *Cloud Security Report* from Intel Security shows 74 per cent of UK businesses have a public cloud service in use that has been commissioned by departments other than the IT department.

> A ban on shadow IT is not only pointless, it's a ban on innovation

That statistic of 74 per cent is interesting as it's above the global average of 66 per cent. "In the UK at least, shadow IT is becoming almost the norm," warns Raj Samani, chief technology officer for Intel Security in Europe, the Middle East and Africa.

Overall visibility of shadow cloud services dropped by 4 per cent last year, according to Mr Samani, so is this a problem needing to be tackled before we can ever really consider shadow IT to be a good thing? Indeed, should it be blocked altogether?

"A ban on shadow IT is not only pointless, it's a ban on innovation," says David Rosewell, head of strategy at Fujitsu, who adds that shadow IT is the democratisation of IT in practice.

"If companies haven't any shadow IT purchases, then they should be worried. Either companies don't have a handle on what's going on or, worse still, their staff aren't motivated enough to improve how they can harness IT to help the business," he says.

As Nigel Hawthorn, chief European spokesperson at cloud security experts Skyhigh Networks, says: "When you block the well-known cloud services, you inadvertently push your users to the less well known and often more risky ones," so achieving the direct opposite of the security goal.

If not a blanket ban, then what? Javvad Malik, security advocate at unified security management company AlienVault, advises the IT department works with employees to make them aware of their responsibilities in protecting data.

"Having a data classification policy complemented by a brand reputation monitoring and external threat intelligence service that can discover where either the corporate brand is being used without permission or intellectual property is publicly available," is the answer, according to Mr Malik.

Quentyn Taylor, director of information security at Canon Europe, sums it up best when he says: "There isn't such a thing as shadow IT, there is only missed opportunity." Mr Taylor agrees that IT is no longer the sole preserve of IT departments and argues that how to stop it shouldn't be on the chief information officer's agenda. He says: "Security teams are no longer departments of 'no', but are becoming departments of 'how?'"

The concept of shadow IT really just highlights there's a demand for services which do not yet exist within the organisation. "My advice would be to form a small group of people – at Canon we call it the Tiger Team – which proactively identifies user need and, if the solution meets it and works within legislative constraints, we go for it."

Professor Steven Furnell, senior member of the Institute of Electrical and Electronics Engineers and professor of cyber security at Plymouth University, finishes where we started, with a definition of shadow IT. His is something that "helps to shine a light on services that the enterprise could benefit from". Users are clearly doing it for a reason that isn't likely to be purely based upon bloody-mindedness.

"They are doing something that they feel is aiding them to work," Professor Furnell concludes, "so is it something that would benefit others if provided in an official and supported guise?" Organisations should grasp the opportunity that shadow IT provides, rather than stand in the way or turn a blind eye.

TOP TIPS

NO SHADY BUSINESS

Martin Smith, cloud security consultant at BSI Espion, suggests three ways to bring IT securely out of the shadows

01

Monitor your network to keep track of what shadow IT is lurking in your system. To identify the cloud services being used outside IT's scope, you can process log data from your firewalls, proxies and mobile device management products.

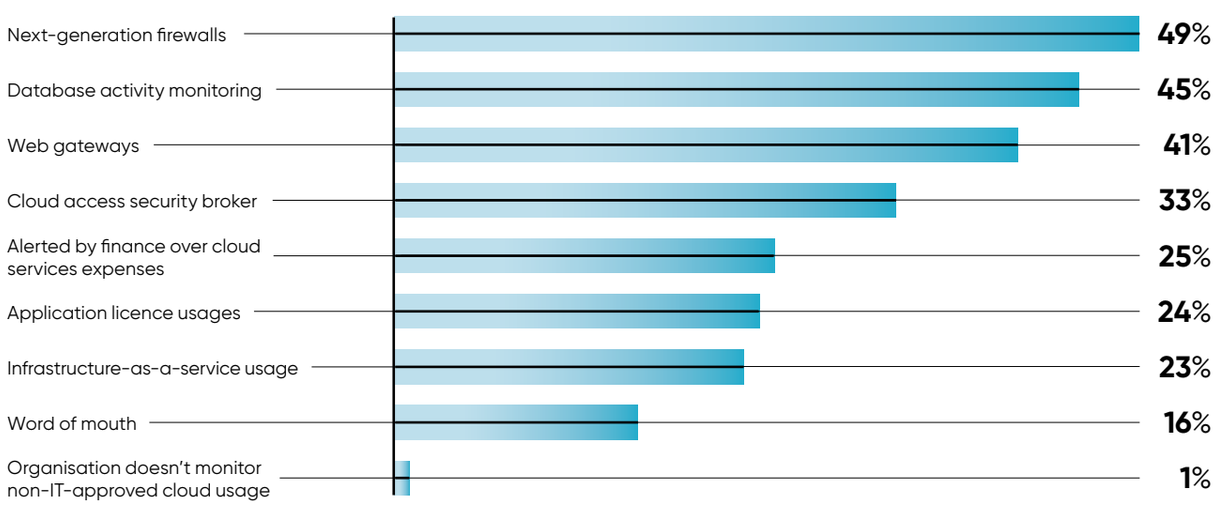
02

Make use of available "intelligence" resources to find out about shadow apps; technologies that help enterprises determine the trust level of apps with all-in-one app risk management services and global app databases.

03

Work with employees to tackle the issue. Aim to have a clear dialogue about their business challenges and requirements. IT should ultimately be enabling the organisation to work better and smarter at a known level of risk which is accepted.

HOW GLOBAL IT DEPARTMENTS MONITOR NON-IT-APPROVED CLOUD USAGE



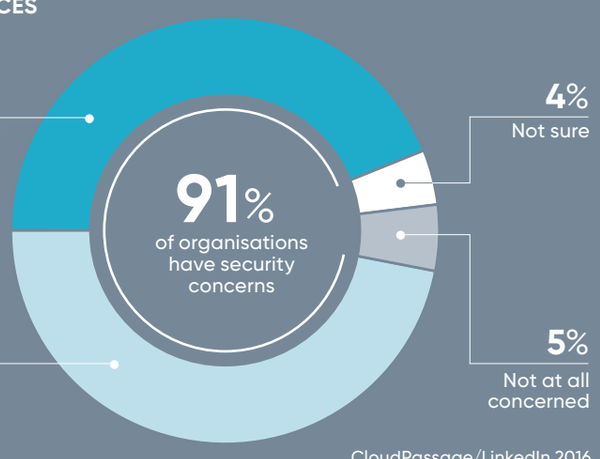
Intel Security 2017

TRUST AND SECURITY IN THE CLOUD

A lack of knowledge and worries about cloud security are among the chief barriers to cloud adoption and management buy-in, but while trepidation remains trust is slowly improving. Here are the top cloud concerns of IT departments worldwide

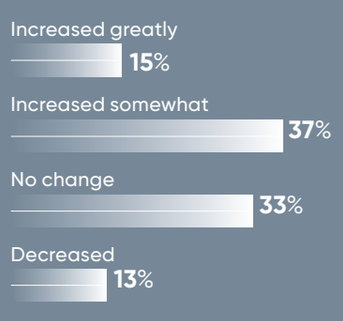
PUBLIC SENTIMENT IN THE CLOUD SHOWING SIGNS OF IMPROVEMENT

LEVEL OF SECURITY CONCERN RELATED TO ADOPTING PUBLIC CLOUD SERVICES



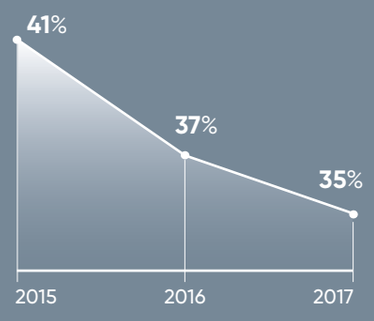
CloudPassage/LinkedIn 2016

HOW TRUST IN THE CLOUD HAS CHANGED AMONG EXECUTIVES IN THE LAST THREE YEARS



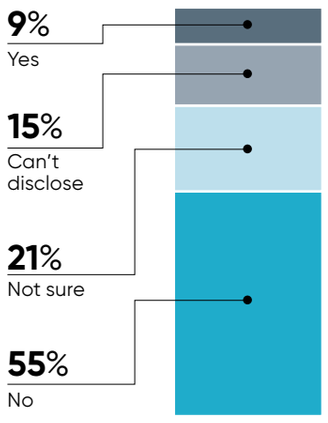
Economist Intelligence Unit 2016

PERCENTAGE OF ENTERPRISE IT LEADERS RATING CLOUD SECURITY AS A SIGNIFICANT CHALLENGE



RightScale 2017

DID YOUR ORGANISATION EXPERIENCE A CLOUD-RELATED SECURITY INCIDENT IN THE LAST 12 MONTHS?



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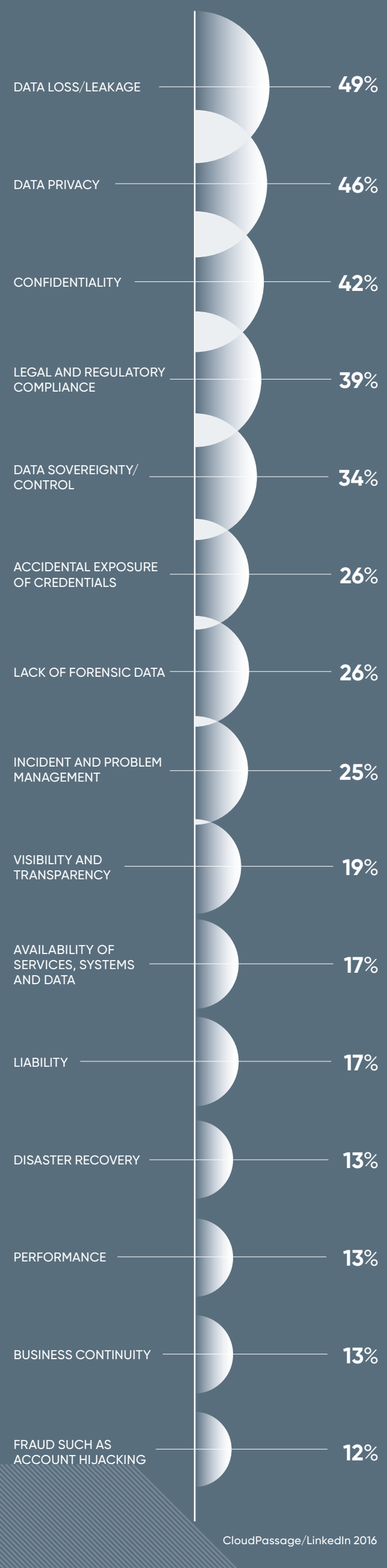
BIGGEST CLOUD SECURITY CONCERNS



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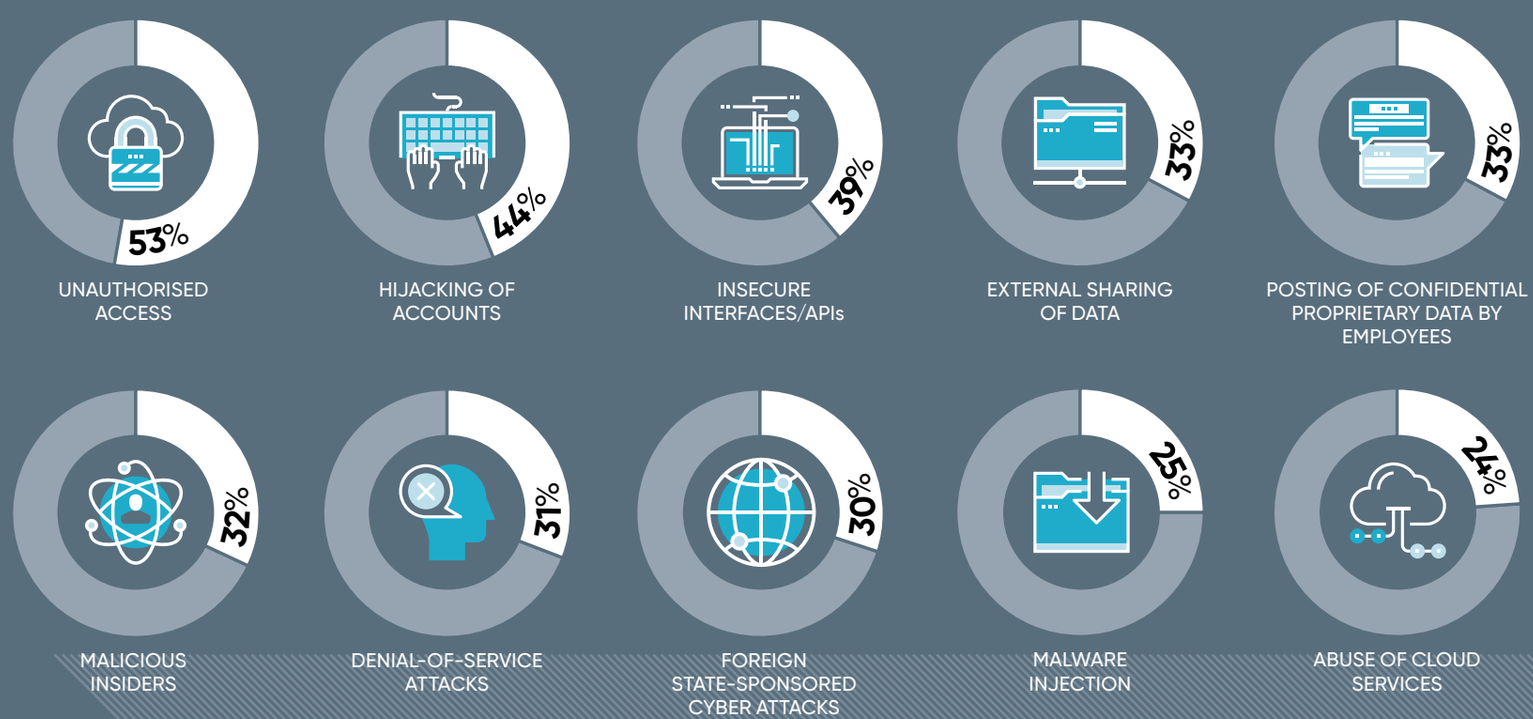
BIGGEST SECURITY THREATS IN PUBLIC CLOUDS



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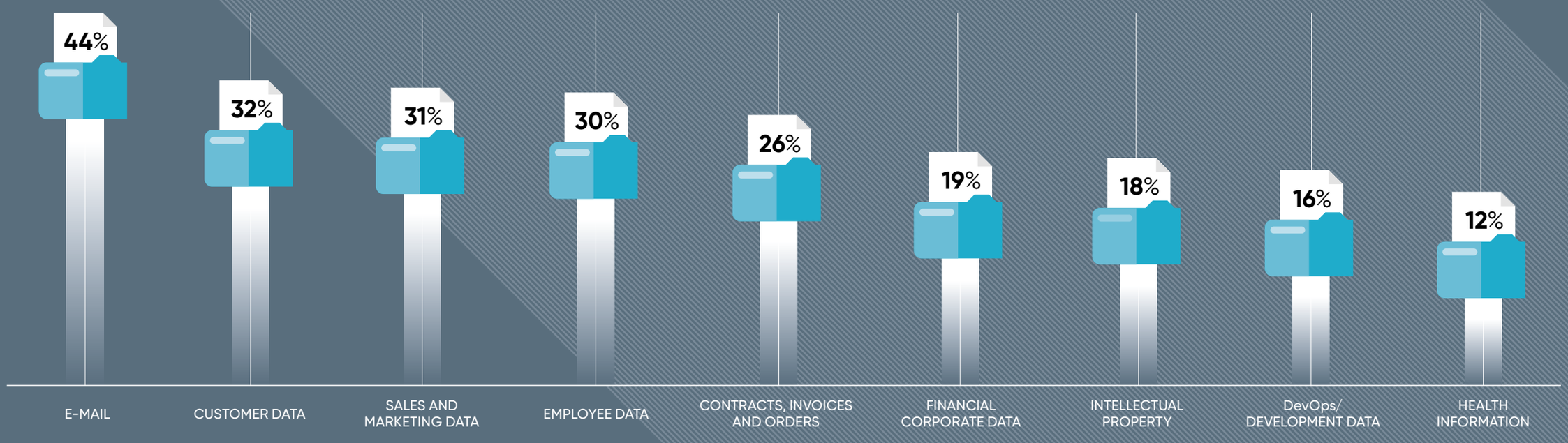
TYPES OF CORPORATE INFORMATION STORED IN THE CLOUD



CloudPassage/LinkedIn 2016

COMMERCIAL FEATURE

The fundamental shift

Businesses had long prioritised finding the right hardware to support their applications and then cloud computing dominated IT discussions. Their focus is now shifting towards handing over the technical worries in this area and simply demanding that systems achieve the desired strategic result

It is a shift that even the industry itself failed to properly predict. Buyers, accustomed to purchasing based on deep knowledge of the platforms and hardware supporting their applications, became much more interested in focusing on outcomes than the bits and bytes.

Businesses across all industries would in the past have grilled their vendors on very particular details and even insisted on specific hardware configurations. Vendors, as a result, had built huge businesses around selling a vast array of hardware.

Then over the last decade cloud computing dominated IT discussions, inspiring a vision of all compute and storage resources in one place, with users able easily to connect and consume "as they go".

Initially some market watchers suggested that the world would consume its IT from a small number of large public cloud factories. More recently, however, a more balanced concept has emerged with organisations choosing to implement cloud computing on premises in their own data centres as well as using the public cloud for specific applications.

Buyers and service providers are realising the need to spend time assessing what is the right model for each specific application and workload because each workload requires its own tailored solution.

Matt Foley, Europe, Middle East and Africa cloud presales director at Hewlett Packard Enterprise (HPE), explains: "Everything has turned upside down when it comes to purchasing habits. Customers used to look at the exact configurations and even write them into the procurement contracts. They now keep more of an eye on the end-result they want and it is up to us as technology companies to deliver this for them.

"People care much more about having applications that are available, work quickly and provide the experience customers need, so they can deliver the service customers and staff require."

Some vendors started to promote the public cloud as the answer for everything. But the decision-making process is far more sophisticated. Buyers and service providers are realising the need to spend time assessing what is the right model for each specific application and workload, as each of them requires its own bespoke solution.

The optimal solution for any single company can be a mixture of public cloud and private cloud or an on-premise solution with applications often using a combination of these environments; this is often referred to as a hybrid model.

Many different industries are exploring this opportunity, says Mr Foley. HPE has noticed a particularly strong shift within the financial sector now some of the private-cloud models can help address the concerns and demands of regulations for strict in-house control of data.

The same applies to other industries as companies realise they can create these "as-a-service" models, using smaller services providers or on-premise solutions, and gain the benefits of flexibility and speed, but also define the location of the data and therefore address the differing data protection regulations on information storage that exist around the world.

A key shift to have occurred in recent years, Mr Foley says, is that smaller companies are increasingly able to derive the same advantages through the cloud as their much larger counterparts. HPE's own work with its resellers and independent software vendors enables those companies to tailor services specifically to the needs of smaller customers.

This helps address issues such as local language support and helps ensure small firms get the advice they need. "There is a real opportunity for second and third-level service providers to generate recurring revenues and provide a great advisory and technical support capability around using the cloud," he says.

Faced with the worry of how to achieve the desired business results and at the same time ensure compliance and the right levels of security, businesses need to work out which applications should be kept in their own data centres and which services should be acquired from a local service provider or a big public cloud service provider.

> Customers now keep more of an eye on the end-result they want and it is up to us as technology companies to deliver this for them

In this situation, customers are typically turning to advisory firms. An attractive proposition is to work with companies such as HPE and its network of partners, providing consulting, management systems, operational support and a catalogue of available services.

Mr Foley says: "Businesses face dilemmas, including having to grapple with questions on how to manage the array of traditional IT systems, in-house private cloud systems and public cloud services, how to monitor them, and how to react every time circumstances change."

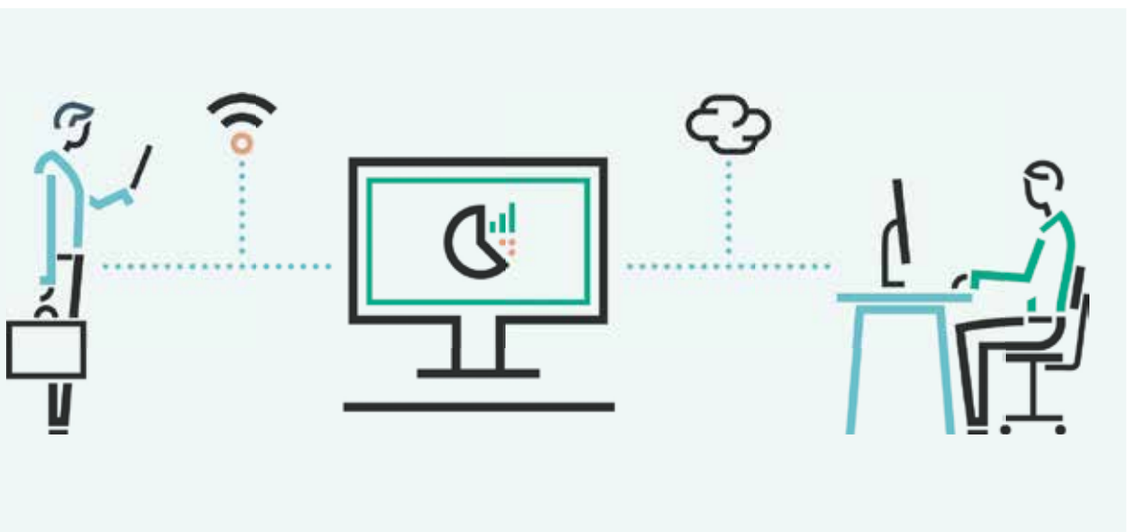
He adds that this can be simplified: "By putting in a single management layer they can speak to the various systems below. Before now, they've had to deal with a variety of different infrastructures, from VMware and OpenStack to Amazon, Microsoft and Google. But now we can consolidate all this on to one 'simple-to-manage' access layer."

Looking to the future, Mr Foley is convinced the key to success, when it comes to deploying cloud services, will be to work with a company that spends the time understanding the requirement for a specific application or workload. "I would counsel customers that no single vendor has the right answer for every application," he says.

For its part, HPE has been expanding the scope of its capabilities through a number of strategic acquisitions, partnering deals, innovations and investments, with the aim of creating a greater degree of harmony across infrastructures deployed by its customers. Its investments include a notable cash injection into fast-growing data-centre startup Mesosphere, which has technology that automatically allocates resources to smart power applications.

With a key ambition for many companies being to deploy applications more easily and without having to worry about the underlying architecture, Mr Foley concludes: "It is a relief for many companies to no longer have to think about how all the technology functions, or whether it is suitable, and simply to have applications that do the job."

To find out more about how to make the most of the cloud in your business, please visit www.hpe.com/uk/en/solutions/transform-hybrid



SMALL BUSINESSES

Cloud catapults startups high into the big league

The cloud is a small business's best friend, with its power and reach developing all the time, offering a greater range of services

DAN MATTHEWS

Uber and Airbnb are often exalted as case studies of global startup mastery. Both are valued in the multiple billions of dollars and, such is their success, have created a new genre of business – the so-called sharing or "access" economy.

But these businesses would be nothing without the technology upon which they operate. Without cloud computing delivered via software as a service (SaaS) they would have remained concepts, nice ideas with no realistic prospect of traction.

"Both companies leveraged cloud technologies to expand their computing power and scale, including online payment processors and cPaaS [capacity-planning-as-a-service] solutions to notify their users via text of arriving drivers and reservation confirmations," says Carlos Aragon, director at GENBAND. "The costs of having to build all of this functionality in-house would have killed their business models before they were even born."

Indeed they would. Airbnb achieved lift-off in 2008 with just $50,000 of capital. In 1995, leading tech providers like IBM offered a hard drive with one gigabyte of storage – enough to house about 25 songs – for $3,000. Before the cloud, in other words, the numbers just didn't stack up.

In layman's terms, the cloud enables startups and small businesses to compete on a global footing. Instead of investing heavily in infrastructure and hardware, they can switch on services and scale them as operations grow.

"Cloud services are instantly available, can scale with needs and are maintained using professional standards," says Peter Moore, chief executive at Lolly. "They allow small firms to focus less on managing and maintaining operating systems and hardware, and more on driving greater efficiencies and streamlined processes for customers.

Startups and small firms, as well as corporates, have been quick on the uptake. A new study of 250 small businesses by the Cloud Industry Forum shows 82 per cent of companies with fewer than 20 staff use at least one cloud service. In the same survey last year just 54 per cent did so.

More than seven in ten respondents said they would increase their reliance on the cloud in the next 12 months and 8 per cent have moved their entire IT platform into it, with a further 62 per cent expecting to do so in future.

Dan O'Mahony, enterprise and cloud solutions architect at KYOCERA Document Solutions, says the array of services and tumbling prices have made the case for the switch. Market leaders such as Amazon, Google and Microsoft have started using the cloud as bait to entice new customers, instead of a profit centre in itself.

"The 'race to zero' will be an interesting one to watch," he says. "Amazon has led the way with five price cuts since launching their service, and both Google and Microsoft are following suit. It will be an interesting development in the industry should a cloud provider give away the platform in return for signing up for other services.

"Microsoft and Google, for example, seek to entice users to the cloud by bundling storage in with their cloud-based office products. Competitors, such as Box and Dropbox, will need to be innovative with their product set to compete in the marketplace – this will mean more products and lower prices, which can only be good for small business."

But the cloud is much more than storage. Skype has dropped the cost of international calls from several pounds a minute to mere shekels. QuickBooks allows accounting on the go, with co-ordination between accountants and client business. Evernote has removed the need for a filing cabinet.

Then there's Slack, the revolutionary communications and workflow app that co-ordinates teams and makes working on a project by multiple groups much easier. And of course there's Office 365, which for an annual fee automatically upgrades to the newest version, and the Google Apps universe of problem-solving tools.

So is there a downside to the cloud for small businesses? The quick answer is, not really. The old privacy concerns of five years ago have partly been ironed out by the entrance of global players with multi-billion-dollar security budgets, says Eva-Maria Dimitriadis, chief operating officer of C5 Accelerate.

"No matter how much you invest in security, you cannot invest as much as large players like Amazon or Microsoft," she says. "So if you are hosting your workloads on their platforms, you get the benefit of their spending in this area."

One potential risk centre is the challenge of adapting to the cloud and bringing staff with you, especially if they are married to traditional ways of working. Again, this is minimised by the fact that so many consumer-facing apps are cloud-based and anyone with a smartphone is probably already accustomed.

Jacob Doherty of Doherty Associates says: "Features such as real-time collaboration, where multiple users can work on the same document simultaneously, are unavailable until everyone's document is updating at the same time.

"Cloud working is a new way of working, and your people will need training and potentially encouragement to embrace a new approach, particularly if they are used to a methodology which they have been using for a number of years."

Cost might become a problem too, says Kamal Anand, head of A10 Networks cloud business division, especially if they are not managed closely.

"The biggest area to be careful about and track is cost, making sure the ease of accessing and scaling infrastructure does not make the costs spiral up. So, having good governance around cost-monitoring and management is critical."

But it's clear that corporates now have as much to fear from unheard of startups in the cloud as they do their biggest and most-established rivals.

SMALL BUSINESS AND CLOUD

SURVEY OF SMALL BUSINESSES WITH UNDER 20 EMPLOYEES

82% currently use at least one cloud service, up from 54 per cent last year

71% expect to increase their use of cloud to increase in the next 12 months

8% have already moved all of their IT to the cloud and a further 62 per cent expect to do so at some point in future

70% expressed concerns about data privacy

Cloud Industry Forum 2017

> The array of services and tumbling prices have made the case for the switch

CASE STUDY

SONOVATE

Richard Prime, co-founder of Sonovate, contract finance providers for recruitment agencies, says: "My business partner Damon Chapple and I run our business from two separate locations – I'm in London and Damon is based in Cardiff. Flexible working is therefore essential and plays a central role in how we operate.

"We're growing rapidly, increasing our headcount from 25 employees at the start of 2016 to 116 today, and I need to ensure we can continue to attract the best talent to maintain this growth. Offering flexibility is key to attracting and retaining talent, especially as the workforce is increasingly mobile and dispersed.

"For all these reasons Sonovate is largely cloud-based. The team can operate from multiple locations, but remain in constant contact, hold meetings and share information at the drop of a hat. We use applications like Google Hangouts for meetings, including our weekly board meeting, and Trello to ensure that team members are aligned.

"We make sure employees can access and work with the same files in real time so collaboration on projects is easy, whether they're in Cardiff, London or working elsewhere.

"This kind of flexibility works well for our business. It's a great incentive for our employees and it means that regardless of where I am, where Damon is or where our employees are based, productivity is always maximised.

"Sonovate's product has been successful and growing our team has been key to meeting demand. Being cloud based has enabled us to scale incredibly quickly; we wouldn't have been able to do so with minimal fuss were it not for all our systems being easily accessible.

"Our product is also cloud based, so set-up is instant for customers. As a result we've been able to roll it out quickly and become one of the biggest contract finance providers in the recruitment market in just three years."

sonovate

HUMANITARIAN APPLICATIONS

Good things can come from innovative tech

From diagnosing Torres Strait Islanders to rebooting an entire country, here are five ways the cloud is helping humanitarian efforts around the world

CHARLES ORTON-JONES

MALARIA STRATEGY

1

Zambia wants to eliminate malaria by 2020. To get there it's relying on the power of the cloud. A project called Visualise No Malaria uses geospatial data, such as elevation and slope, combined with topographical wetness and stream power, to provide an accurate map of water flow. Combine this with meteorological data, such as temperature and rainfall, and scientists can predict the likely locations for malaria outbreaks, which kill around 3,000 a year in Zambia. The work is the result of a partnership between healthcare non-profit organisation PATH, database provider EXASOL and visualisation tool Tableau. Each organisation brings something useful to the project. Tableau turns data into infographics, either through the cloud or offline. EXASOL offers in-memory computing, which radically speeds up processing times.

ESTONIAN DEFENCE PLAN

2

The Estonian government is nervous. Russian troops are located just a few miles over the border and there's a fear of a Ukraine-style intervention by Vladimir Putin. But what if Russian tanks rolled in? What would happen? Obviously it would be a nightmare. British and American troops are located on the border, as part of a "trip-wire strategy" to get Nato mobilised. If the worst happens, the Estonian government has a rather ingenious contingency plan. Estonia's entire government IT systems have been uploaded to the cloud and stored on international servers, so the country could be relocated at a moment's notice if needed. A government in exile could relocate, boot up the cloud systems and serve the 1.3 million citizens as before.

AUSTRALIAN HEALTHCARE

3

Providing medical care to Australia's rural communities is a challenge which illustrates the value of the cloud. It's not practical to lug heavy diagnostic kit hundreds of miles into the bush. Nor can medics make the journey as it's time consuming to tour towns and villages so far from medical centres. So the South Australian Childhood Rheumatic Heart Disease Screening Project conducts in-school heart disease screening for 1,800 Aboriginal and Torres Strait Islander children. The goal is to identify and track the prevalence of rheumatic heart disorders. Travelling sonographers are able to conduct an echocardiogram on site. Abnormal echocardiograms are uploaded to the cloud for further review by a children's heart specialist. The use of the cloud has meant 38 children have been diagnosed with previously undetected congenital or rheumatic disorders.

COMIC RELIEF

4

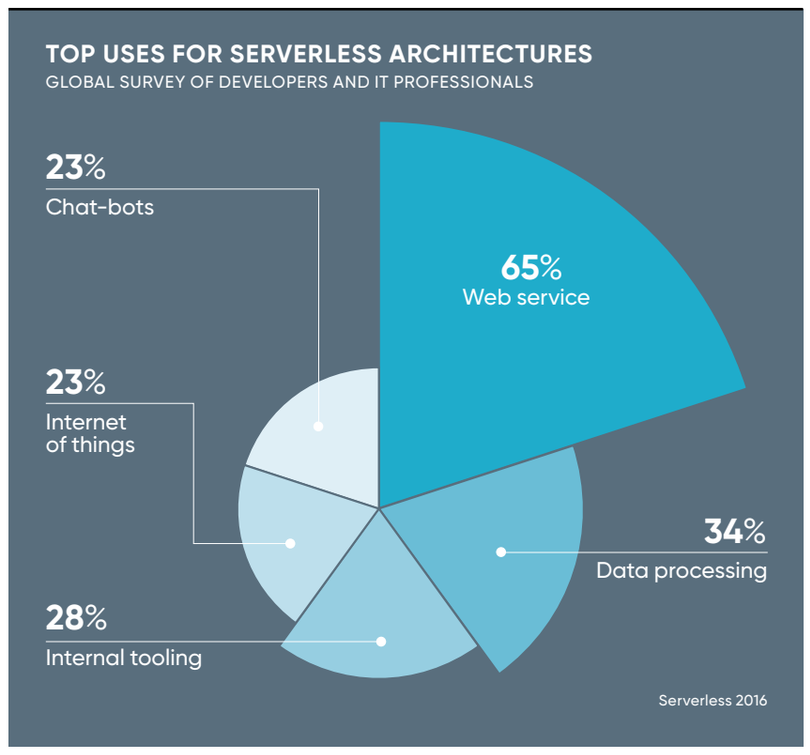
A classic use of cloud computing is to manage spikes in traffic, Christmas sales for example. Or in the case of Comic Relief the annual surge of donations. Comic Relief was founded in 1985 by *Blackadder* creator Richard Curtis and comedian Lenny Henry. In the past 30 years it's raised more than £1 billion for good causes through Red Nose Day and Sport Relief. As well as 14,000 call centre operatives in 120 locations, who volunteer their time for free, Comic Relief is heavily reliant on their website for processing on average 800,000 donations. In 2012 the Comic Relief IT set-up got a complete make-over and partner Armakuni was instructed to build a cloud-based donations platform. A cloud native approach and use of test-driven development enables Comic Relief to process up to 400 transactions a second.

SCIENCE LIBRARY

5

The line between science and technology is becoming blurred. X-rays are diagnosed by algorithms and IBM's Watson artificial intelligence engine is making accurate oncology suggestions. And researchers worldwide are crunching datasets to find correlations which will lead to the treatments of the future. The cloud makes all of these breakthroughs possible. In particular, data-sharing is made easy through the cloud. The Embassy Cloud is the one of the world's largest datasets. Housed by the European Bioinformatics Institute, it fulfils 18.5 million requests for medical data every day. Embassy Cloud clients have direct access to the data, services and computing power of the institute. Tools include a similarity search tool for nucleotides, a protein signature library and the *Expression Atlas*, which shows how genes and proteins are expressed under varying conditions.

SERVERLESS COMPUTING



The next big thing to save you money

Serverless computing is one of the hottest trends in tech, however it's also one of the most misunderstood – for starters, it may be called serverless, but it uses servers

CHARLES ORTON-JONES

So what is it? In a nutshell, serverless computing is a cloud model whereby businesses rent servers, but the maintenance is entirely outsourced to the provider. Security and updates are managed by the host. You pay for what you use. The best known providers include Amazon Web Services's Lambda, Microsoft Azure Functions and IBM OpenWhisk.

If the concept sounds rather familiar to the traditional cloud model, well it is. But serverless takes outsourcing and pay-as-you-use to an extreme. Richard Munro, chief technologist at VMware cloud services in Europe, the Middle East and Africa, points out: "Even in the world of cloud famous for pay-as-you-use ideas, the reality is that a lot of resources are switched on ready for a set of functions to execute, regardless of whether they do or do not, because the application is running.

"With serverless, the only things processing, and therefore billed, should be when functions are actually being called and executing, such as when a user actually uploads an image file."

Peak loads are easier to manage. Lisa Heneghan, head of CIO advisory at KPMG, offers this simple explanation: "If a business uses 50 servers most of the time and up to 80 servers at peak times, a traditional on physical server model may see the business paying for up to 100 servers, all day and every day, to make sure that it meets peak capacity and have contingency.

"Traditional cloud computing allows the business to pay for what it uses. In this case, the 50 servers all day, every day, plus 30 servers or more when required. Serverless computing goes one step beyond. Rather than paying by server per hour, businesses only pay for the resources that they use per transaction, which may constitute just a fraction of a server for a fraction of a second."

The versatility of serverless makes it ideal for companies with sales surges or startups with unpredictable demand. Rufus Grig, chief technology officer of Maintel, says it's great for mobile app developers as demand can be managed.

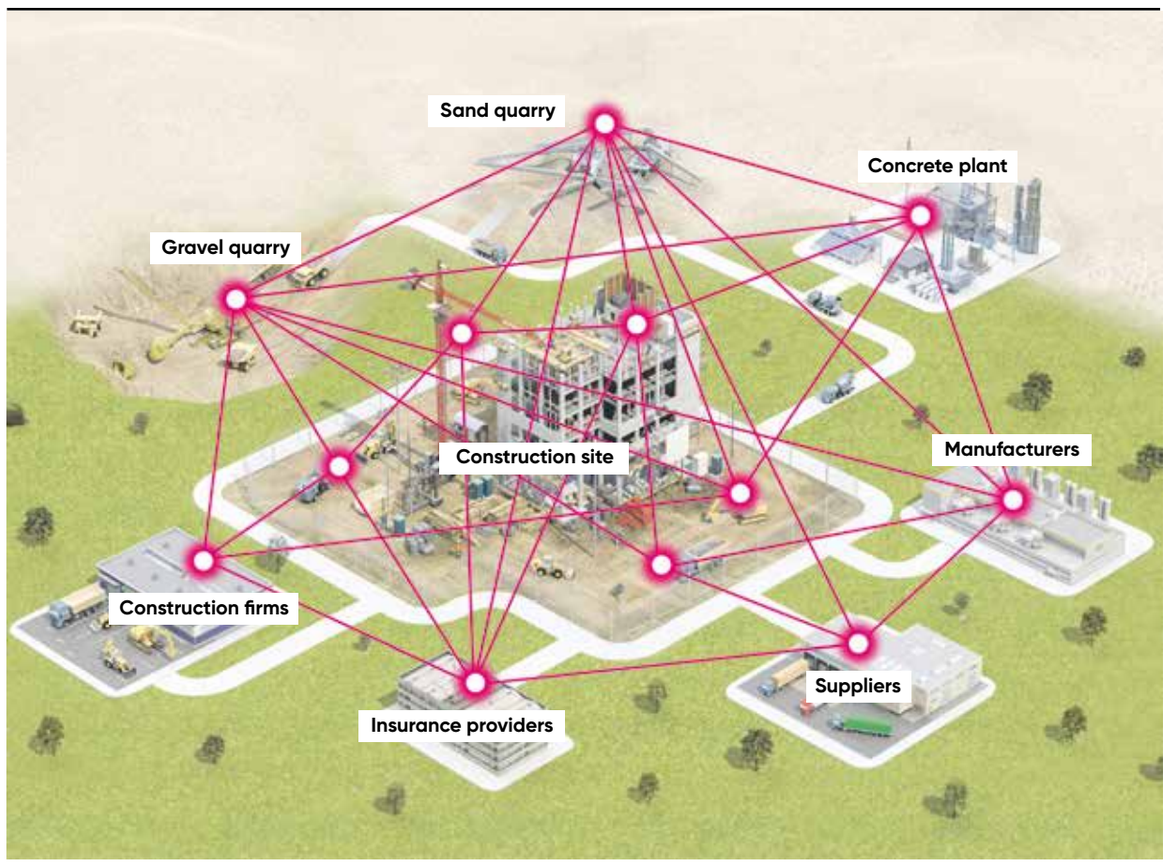
"In a serverless world, I no longer need to worry if one person or one million people press a button at the same time," he says. "Serverless cloud provides immense scale. Likewise, if an app performs poorly one month, the creator is not left out of pocket."

The disadvantages? Excessive usage can trigger hefty bills. An app which goes viral without a billing strategy in place could cause a headache. There's the issue of control. Delegating management of the servers to a third-party provider eliminates the ability to audit and monitor usage, to debug and check security. This worries some companies and regulators may not approve of serverless data hosting.

Lee Atchison, senior director at analytics platform New Relic, warns: "Each service provides a different and unique method for offering serverless computing. This means that an IT professional who wants to take advantage of serverless computing will find they are locked into a single cloud service provider to a greater degree than if they use more standardised traditional server-based computing."

> In a serverless world, I no longer need to worry if one person or one million people press a button at the same time

COMMERCIAL FEATURE



Securing IoT's foundations

When people describe the internet of things as the most exciting trend in business, they're not wrong. Just look at the application of this technology we have witnessed already, says **Scott Cairns**, chief technology officer of T-Systems

T-Systems

Construction companies track millions of dollars' worth of equipment and materials as they are moved around building sites, while farmers maximise crop yields by fitting harvesting machinery with sensors, transmitting data back to base for analysis.

A new industry touted as servitisation is being created, where rather than sell products, manufacturers are renting out hardware such as aircraft engines and diggers. Internet of things (IoT) sensors measure usage for billing and can monitor wear so engineers can fix machines before they break.

However, amid the euphoria and race to interconnect, there is a problem yet to be addressed. We've heard too many stories of security breaches as a result of hastened IoT implementation. Some are trivial, resulting in minor issues that become cautionary tales, while others are terrifying in their potential for damage.

In 2015 a *WIRED* magazine reporter participated in an experiment involving the hacking of a Jeep Cherokee while it was travelling at 70mph. This involved the experienced hackers traversing the internet to take control of steering, brakes, air conditioning and wipers, all while sitting comfortably in a house ten miles away.

We need a wake-up call. Without a robust and reliable security model in place, opening the door to IoT capabilities is like pouring water on cracked concrete – it will expose your environment, permitting undesirable content to find a way in through every hairline fracture in your infrastructure.

The truth is implementing an IoT strategy needs a rethink in the way we address both security and privacy. For anyone formulating an IoT plan, there are key steps to take.

SECURE NETWORK

The first action is to engage your security division, through the chief information security officer (CISO). The CISO needs to be involved from the outset in all board-level discussions around the notion of entering the IoT space. It is the CISO who understands the current business models, the security guarding this space and the technologies involved in IoT adoption. The CISO is the nexus between technological security and business acumen.

Once engaged, the security team can ensure the existing processes are ready for the new flow of data that will be provided by IoT device incorporation. They know who else to engage. Your new working group must understand the scope and risk, and perform a calculated investigation. Does your existing network architecture have capacity to handle this influx of data? Is there sufficient space on your storage area network or cloud to hold the volume of data that will be received through these devices? Do you have the relevant accreditation and compliance to handle the sort of data you are preparing to gather and store?

The working group will explore many topics including security, network, storage, server, process, governance, privacy and more. The clearer the picture, the easier it is to work with the business to ensure a successful integration of IoT capability.

By getting these foundational steps right, the CISO should orchestrate the required activities with the confidence of the business and the support of a service integrator with expertise in security and communications.

REGULATION

Look at regulation, but do not rely on it. Complacency in the IoT industry has many sources. A major one is the trust consumers and companies have in regulation, although on the surface this does seem reasonable. Ofwat guarantees clean water and the Legal Ombudsman keeps lawyers on the straight and narrow. But the internet of things has not yet reached maturation and neither security nor privacy are satisfactorily covered by legislation.

IoT devices by their very nature can be constructed from inexpensive components and connected to the internet with ease. Many do not function in a way that is understood by classical infrastructure and the industry is full of creative, but unreliable actors.

While mainstream vendors can be monitored for conformance with regulation, the relative low cost of entry allows virtually anyone access to IoT technology. This enables individuals to expend maximum effort to advance capabilities, with no pressure to adhere to any regulations in place. This means private information can be transmitted from unlicensed IoT devices, not adhering to the standard telecommunication regulations enforced on large vendors.

Recently the IoT Alliance Australia published their *Internet of Things Security Guidelines*, by which they aim to help industry understand the measures that must be taken to ensure practical application of security within the field of IoT. This is one of the first open publications of its kind, aimed at both educating corporations and proposing measures to tackle the concern around the security of the IoT. I highly recommend reading it.

£50m
in losses are incurred annually due to theft at construction sites

£180bn
spent on complex construction projects per annum in Europe

160
companies are involved in a typical large-scale construction site

75%
of all equipment manufacturers would like to offer additional services, for example compressed air hammer as a service

Your security team needs to understand the state of legislation, but also what it doesn't cover. The New General Data Protection Regulation requirements mean there's a renewed focus on the law. Now is an ideal to time to get up to speed.

PARTNER UP

The tantalising potential of IoT means the only option is to engage. But the security and data concerns will be hard to master alone. A proven method is to join forces with a specialist in the field.

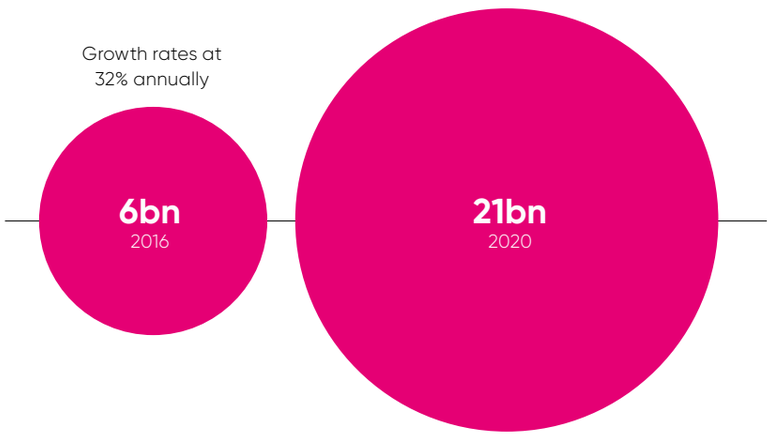
As a global force in the communication world, T-Systems is renowned for its cutting-edge work across innovative fields. In IoT, this includes solutions spanning manufacturing, the digital world, and the consumer space. Our approach is that security must be engrained in the heart of IoT and we offer services covering the three fundamental security pillars: prevent, detect and respond.

Within this space, T-Systems has a number of offerings that help analyse, report on and then prepare corporate environments in readiness for entry into the IoT. These services range from cyber defence and cloud security, to leading-edge technology such as drone defence solutions. We are constantly looking at the next threat vectors and working on ways to mitigate these attacks through robust services and solutions.

It's time to unleash IoT. We are on the cusp of incredible new services and concepts. Yes, there are challenges, but with the right approach they can be overcome. Together we can make the most of this incredible opportunity. The only limit to the potential of the IoT is our creativity.

To find out more please visit www.t-systems.co.uk/iot

GROWTH OF IoT DEVICES OVER NEXT 4 YEARS



T-Systems

CUTTING COSTS

Watch out for that expensive cloud sprawl

Matching your needs to the amount of cloud you buy should save cash, but it's no easy task to always get it right

ADRIAN BRIDGWATER

While most of the executives in the C-suite are now convinced of the wider technical and operational worth of cloud computing, the chief financial officer isn't quite as content.

Uncontrolled adoption of the cloud model often sees entire departments starting to spin up clouds for what end up being incongruent disconnected implementations bought very typically from different cloud vendors. This is the unpleasant reality of so-called cloud sprawl.

In cloud sprawl, business units lazily select instances of cloud without mapping them accurately enough to the real amount of computing, data analytics and storage power they really need. Cloud is flexible, inherently so, but the right level of purchase must be made at the point of sale.

Cloud sprawl is not just wasteful in initial monetary terms, it can also result in the development of inconsistent or non-interoperable datasets where one side of the business can't understand the other side's data.

In this world of multi-cloud environments where some clouds are private on-premises, some are public residing in a data centre and some are a hybrid combination of the two, how on Earth do you not get sprawled?

Don't panic quite yet. It's not quite a case of place your bets, buy some cloud and hope it's enough to not get stung for outstepping the service level agreement (SLA). A growing number of firms are moving into the cloud services management space to provide monitoring tools and the level of algorithmic intelligence needed to work out capacity needs.

"Organisations look to cloud for agility and expect cost-savings, but we often hear stories of rampant overspending and 'sticker shock' when they actually get their bill," says Andrew Hillier, co-founder and chief technology officer at Cirba. "It is fundamentally important to buy the right cloud infrastructure. We have found that most organisations overallocate resources internally and this is very costly if you move into the cloud like for like. Resizing cloud instances to match their workload demands can immediately save as much as 20 per cent off the bill."

> Organisations look to cloud for agility and expect cost-savings, but we often hear stories of rampant overspending

24%
of cloud-focused companies rate cost as a significant challenge

RightScale 2017

38%
of organisations only invest up to 15 per cent of overall IT infrastructure spending on cloud

CloudPassage 2016

But it's tough for firms running applications with varying transactional workloads, Mr Hillier concedes. Cirba quite literally makes nothing but cloud infrastructure control software. The firm talks about using cloud effectively like playing a game of Tetris – fit all the blocks, in this case cloud resources, together so they nestle up as snugly as possible.

Hybrid clouds also muddy the cloud-costing waters because they mix on-premises and public cloud platforms, which come with different economic models. It's like comparing apples with oranges while at the same time buying the apples by the pound and oranges in kilos. Products like the Nutanix Enterprise Cloud attempt to solve this problem by replicating public cloud platforms, such as Amazon's AWS, in a private data centre. It does this by employing similar technologies for integration and load balancing, and similar economics too.

So is cloud costing ever simple? Wael Elrifai suggests it can be, in his role as director of enterprise solutions at data integration and analytics company Pentaho. "If your computational workload is generally consistent throughout the day, it's pretty straightforward – just compare the cost per terabyte of your chosen cloud provider and the cost of running your own data centre," he says.

Mr Elrifai recommends keeping lower-cost operations away from cloud, but when they are more expensive and cloud could be a saving, then see which data and workloads can be off site only after doing a security and legal audit. But would that it were always that simple.

"On the other hand, if your computational workloads vary dramatically throughout the day, spiking to meet SLAs at peak times and troughing at other times, then you need to apply a more complex formula to make the optimal decision," says Mr Elrifai.

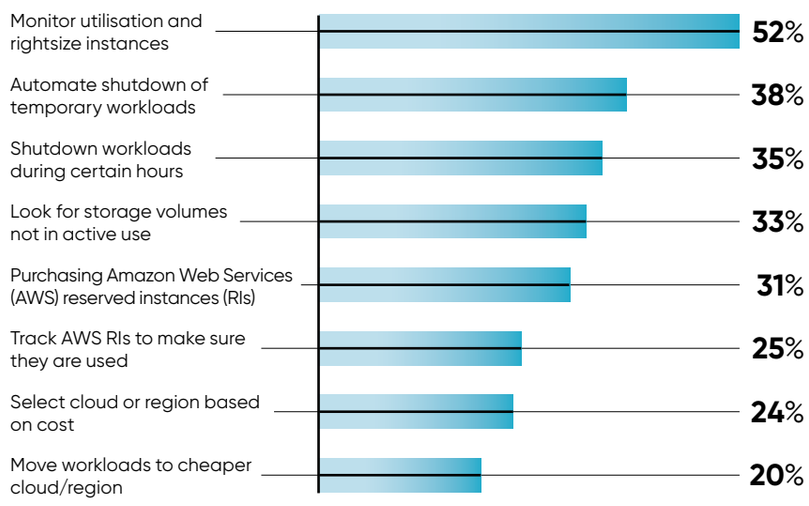
Is cloud purchasing going to get easier any time soon? Not necessarily, according to firms like cloud control specialist Comparex, pointing out that the number of cloud consumption and payment models on offer continues to grow, adding further complexity to cloud management.

Steve Denby, head of solution sales at Derby-based Node4, a firm specialising in managed hosting and data storage services, says: "It's important to remember that cloud pricing is based on computing workload, together with associated licensing and storage costs. Functionality such as disaster recovery, backup and security options all add additional cost," he says.

The reality is that cloud computing is a melting pot of ingredients. That pot is defined by different applications on different clouds with different service agreements enjoying different amounts of storage capacity over different input and output ratings on different data memory rankings split out over different levels of mission-criticality and security. Understanding this recipe and coming up with a fixed-price menu was never going to be simple.

HOW COMPANIES ARE OPTIMISING CLOUD COSTS

CROSS-INDUSTRY SURVEY OF IT PROFESSIONALS



RightScale 2017

TOP TIPS

HOW THE COST OF CLOUD IS CALCULATED

Life is difficult and cloud pricing is complex. Services and features vary wildly by provider and exact costs are notoriously difficult to compare. The main public cloud providers – Amazon AWS, Microsoft Azure and Google Cloud – bill by the hour, so we have to take into account how often a computing environment will be running.

Development and test clouds can be automated to spin down when not in use, but production environments typically need to be always online, so hence they are more expensive.

Mike Bainbridge, chief digital technologist at managed cloud company Rackspace, advises that standard, small virtual machines are cheap, which initially makes the cost appear low.

"However, when you look at the larger and more complex instances that may use GPU [graphics processing] and high-density CPU [central processing], the prices are significantly higher. Databases are the other most common element of a cloud purchase. These are often delivered 'as a service' and cost can vary wildly based on type, power and storage. Moving a database into the cloud effectively takes careful planning," says Mr Bainbridge.

He also points out that supporting services, such as network load balancers, security appliances and advanced monitoring, incur an additional charge. "These 'extras' are often actually 'must have', so must be taken into account and they can add up to a larger than expected monthly charge," he says.

The highest cloud cost tends to come from network bandwidth. The more popular a website in terms of visitors, the more data has to travel in and out, so this equates to a higher bill. In comparison with a traditionally hosted solution, this can be a significant and sometimes unexpected charge.

HARNESSING THE CLOUD

The Asahi Shimbun via Getty Images

Skipper Sir Ben Ainslie and the Land Rover BAR team's performance data is transmitted through the cloud for immediate and efficient analysis

Sporting chance that cloud is a winner

Competitors in a wide range of sports are benefiting from the advantage cloud computing can bring

CHARLES ORTON-JONES

The Oscar-winning film *Chariots of Fire* chronicles a sprinter's battle with prejudices, including the patrician notion that a paid coach betrays the ideals of amateurism. In the end the athlete Harold Abrahams sticks with his pro coach and wins the hundred-yards dash at the 1924 Paris Olympics. Today the ideals are inverted. Sporting teams pride themselves on obsessive preparation. Cost no object. The cloud is the latest tool offering an edge.

Video analysis is routine. When non-league side Lincoln City made it to the quarter finals of the FA Cup they were relying on video footage, made available through the Hudl cloud-based platform, designed for sports teams. Players can watch footage of rivals on a smartphone before a game or get a personalised breakdown of their own performances.

Golf's PGA tour works with Microsoft's cloud division on all aspects of its operation. The tour is organised using cloud tools, and a fan app offers player shot analysis, such as driving distance and putting accuracy, gleaned via volunteers with lasers on the course.

Perhaps the extraordinary example of technology taking over a sport is yachting. The British entry in this year's America's Cup has a £100-million budget. The result is a carbon fibre catamaran capable of 60 miles an hour.

Winning the America's Cup is staggeringly difficult and the rise of technology has made it even harder. A British team lost the opening encounter in 1851 and then spent a hundred years losing to the Americans. The cup was opened to international clubs and Aussie tycoon Alan Bond won in 1983. The American team is currently funded by Larry Ellison, founder of Oracle and ranked the world's seventh-richest person. He pioneered computer-aided design in refining boats for competition.

British fans have two reasons to be optimistic. The first is the leadership of Sir Ben Ainslie, the most-decorated sports sailor of all time with four Olympic golds. During the last America's Cup, Oracle Team USA lagged the New Zealander challengers by eight races to one. Sir Ben was drafted in as replacement tactician and led Oracle to eight successive wins to claim the Auld Mug.

The second is the sheer computing power harnessed by Land Rover Ben Ainslie Racing. Borrowing from Formula One, the team has at every stage used computer-aided design, matched with cloud storage and processing. The New York Stock Exchange-listed EMC Corporation is delivering cloud storage. BT is providing two full-time software engineers to manage the data hub.

BT is also working on a "virtual chase boat" project, which provides a live feed for video, audio and telemetry back to the base in Bermuda using high-grade Royal Navy 4G technology. Data is then sent via an onward link using BT's IP Connect network to mission control in Portsmouth. All data received from the boats during training and racing is injected into the data hub to enable performance analysis and review – this equals about 16 gigabytes of uncompressed data each day.

By transmitting performance data through the cloud, it will be possible to perform analysis and testing immediately. Previous approaches used by America's Cup teams took hours, usually leading to a wait until the following morning for changes to be made.

During testing, the team used artificial intelligence and machine-learning to track 350 data points on the boat. The carbon fibre yacht has been refined multiple times, including as a full-scale mock-up, but mostly using computer-aided engineering supplied by CD-Adapco and innovation partner Land Rover. On board there are telemetry systems, as well as eight high-definition video cameras. A technology innovation group, led by PA Consulting, is co-ordinating the wide variety of experts needed to bring all design elements together.

> By transmitting performance data through the cloud, it will be possible to perform analysis and testing immediately

POTENTIAL OF THE CLOUD

Aerospace will reach for the sky, eventually

It's going to take a long time to turn the aircraft production industry around to embrace the efficiencies offered by cloud computing

ADRIAN BRIDGWATER

The cloud computing model of service-based IT delivery is steadily being engineered into the manufacturing and operational fabric of the aerospace industry. This of course means that the opportunities for witty and quirky press headlines are almost limitless. Aerospace industry up in the clouds. Plane engineers soar to new heights with IT... and so on.

Except there's a problem. Because none of this will happen overnight.

"If you look aircraft production plants perhaps 50 years ago, the facilities look remarkably the same as they do today," says Jens Graffs, vice president of assembly and installation at Airbus. "Manual labour dominates the production line and workers need to be highly skilled."

For Airbus or any aerospace engineering firm to start moving towards more use of software automation, machine-to-machine communication controls, internet of things devices and sensors, data analytics and flexible IT consumption – all the attractive elements offered by cloud – there is a journey to be undertaken first.

"It is important to understand that a fully automated production line is not possible due to current build concepts," says Mr Graffs. "Also let's consider cycle time, an aircraft's life cycle is 30 years. So if we are going to start bringing in new cloud-based automation intelligence then we will need to be able to sustain the availability of that technology tool over the complete life of the aircraft."

For all a modern aircraft's intricate avionics and on-board computer systems, suddenly you start to realise how labour-intensive the physical creation of an aircraft still is. Airbus uses massive purpose-built jigs that cradle and hold the fuselage as it is slowly built, but real human beings tighten the nuts and bolts, albeit with electrically powered tools and calibration monitors.

"Our challenges in the future are that we will need extremely high customisation capabilities and the ability to work with a complete global supply chain. We need to start to be able to design for automation and work to implement controls focused on both cyber and product security," says Mr Graffs.

If Airbus were to stop selling aircraft today then it will take the company ten years to finish production lines and deliver on its open order book. So could the firm down tools for a period and spend some time implementing a new cloud platform? That obviously wouldn't be prudent by any management strategist's yardstick.

Airbus has a solution for implementing cloud and creating the digital factory of the future, and it comes in three phases. Initially the company has segmented out three core work domains – enterprise resource planning, manufacturing and engineering, and the physical workshop floor itself.

In a traditional business – Airbus's starting point – a company puts one of these work domains above the other in a vertical model. On the journey to cloud, the firm then attempts to put these domains on a horizontal plane (no pun intended) to create a more level operational surface. Finally, when cloud actually happens, the firm will achieve a more cyclical, full-integration approach.

At this point the company can introduce additional domains, including cloud-based software, to provide functionality such as product life cycle management. This is also when the firm can create digital twin virtual copies of all equipment to stress test and provide predictive maintenance functions, all from cloud-based software services.

Cloud computing is typified by its ubiquity and its flexibility, but as much as you start to regard it as a business utility in the same sense as electricity or water, you cannot simply just switch it on and expect some kind of turbo charge to happen.

Cloud computing will take off for aerospace and hit new heights, but expect some delays and a holding pattern. Sorry, couldn't resist.

> Manual labour dominates the production line and workers need to be highly skilled

Bao Fan/VCG via Getty Images

Aerospace's lengthy production journey and product life cycle make implementation of new cloud platforms more complicated

COMMERCIAL FEATURE

Looking skyward: the new era of cloud technology

Neil Davidson, vice president of enterprise at Deltek, discusses the benefits of an ascent into cloud and the new technologies on offer

Deltek Know more. Do more.™

I once had the dubious pleasure of being persuaded to take on the descent of a mountain called La Diavolezza. I felt I was up to the task. But descending the first 50 metres, realising the mountain was sheet ice – La Diavolezza was in fact a narrow icy ridge – and as the weather closed in, the predominant thought in my mind was to turn back. This was way out of my comfort zone and a leap into the unknown.

Perhaps this analogy can be applied to the adoption of cloud services. At present, cloud deployment is often wrongly perceived as a huge risk with a "successful" deployment simply akin to stepping over the top of a mountain with no visibility.

However, as organisations work to respond to emerging trends and changing market conditions, the way in which we regard cloud technology needs to be adjusted. It is not a deployment method that we simply procure, it is a re-engineering of both corporate infrastructure and strategy.

This concept is reinforced by three key points, namely the evolution of customer demands, the advancement of employee requirements and the anticipation surrounding future technology.

Firstly, it is important that we understand how profoundly the market is evolving. Clients procuring advertising or consulting services, for example, want to see value and measurable results against key performance indicators (KPIs), digital innovation, an ever-improving client experience that delivers low risk and the delivery of higher-quality projects for a fiercely competitive price.

> Global professional services companies must recognise the benefits that artificial intelligence and robotics are bringing to their industry

Similarly, the evolution of employee demands show growing numbers of millennials in the workplace are simply not attracted to employers who run legacy business software. Many of these millennials only know the cloud state, are digitally connected with unprecedented opportunities and companies are already finding they have no choice but to cater for these digital natives or run the risk of losing out on top talent to competitors.

Finally, global professional services companies must recognise the benefits that artificial intelligence and robotics are bringing to their industry. Gartner has already coined the term "algorithmic IT operations", which predicts application behaviour before problems arise so processes can be executed without human intervention.

We are also being confronted head on with augmented enterprise reality, which enables the visualisation of large amounts of data so it can be interpreted, analysed and imported before acting on it. Being a part of this evolution and actively operating within these current and futuristic concepts is impossible with archaic business technology in individual data centres.

Delve a little deeper into the benefits of cloud and it is linked directly to the concept that professional services firms have three choices to deliver value to customers – customer intimacy, product leadership and operational excellence.

Companies that focus on customer intimacy have extensive knowledge of their target market, and customise services and product offerings to match demand. They also find real value in big data analytics because of the insight it provides. Product leadership is exactly as it implies – the importance is placed on producing innovative products and services that directly respond to a market issue. Finally, those firms focusing on operational excellence approach the production and delivery of products and services strategically. They prioritise business processes and excellence above everything else.

Cloud technology, especially the likes of an enterprise resource planning (ERP) solution, which sits at the heart of all business operations for a professional service firm, has the ability to support all three of these value delivery models because it creates a new kind of agility around the customer experience. This is particularly relevant when considering the elements of pace, economies of scale, elasticity and the new digital ecosystem in which we operate.

> Professional services firms should set ambitious goals for cloud adoption, make sure their leadership teams are aligned and harness strong support from their technology partner

At present, professional service firms who are deriving the most value have a cloud partner that understands not only their industry but the intrinsic and individual nature of their business. Due to this they are able to accelerate the pace and impact of change that is relevant to them, enhance operations, optimise service offers, bolster the bottom line and translate decisions into actions quickly. They have a balance between a stable yet flexible infrastructure and reassurance backed by contractual guarantees on performance and security.

Looking forward, market-leading, agile professional services firms will be those that were savvy enough to identify that cloud and the new technologies within it are poised to make a serious difference to their industry. They will spend their time with the right partner that understands the unique nature of their business to identify the right KPIs and financial objectives, so they can revitalise the traditional operating model and deliver greater value to their clients.

The ascent itself won't happen overnight but as technology evolves, and industry and client demands change, firms must not leave potential financial benefits on the table. Instead professional services firms should set ambitious goals for cloud adoption, make sure their leadership teams are aligned and harness strong support from their technology partner. Now is the time to build momentum for the journey ahead.

It turned out Diavolezza means "the beautiful she devil" and it was one of the most exhilarating moments of my life.

NEIL DAVIDSON
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DELTEK

For more information please visit www.deltek.com

CHINA


Martin Puddy / Getty Images

UK firms need a friend for China connection

UK companies in the cloud sector cannot afford not to be in China, but may need to team up with a local partner to break into the Chinese market

PETER CUNLIFFE

The Chinese may have been late to join the cloud-computing revolution, but they are making up for lost time as the sector experiences ferociously fast growth.

It is being driven by the rapid uptake of the internet among consumers and the drive towards digitisation by business and industry.

The number of internet users in China last year topped 731 million people, the largest in the world and almost three times that of the United States, according to the China Internet Information Centre.

If that sounds impressive, it should be noted that only about half of the population is online, way behind the 80 to 90 per cent penetration typical in the West and highlighting the potential for future growth.

Just like their western counterparts, Chinese businesses and public sector bodies are turning to cloud computing because of the flexibility, efficiency and cost-savings it offers.

However, the rest of the world has not stood still either. In the Asia Cloud Computing Association's *Cloud Readiness Index 2016*, which assesses factors such as broadband quality, physical infrastructure and international connectivity, China has slipped from 11th to 13th place.

The need to keep up is not lost on Beijing which made cloud computing a key part of its five-year plan for 2016-2020 and two years ago launched its Internet Plus policy to accelerate the adoption of the cloud, mobile internet and the internet of things to boost economic growth and global competitiveness.

Management consultants Bain & Company have estimated that China's cloud market will be worth $20 billion by the end of the decade, up from $1.5 billion four years ago, and equivalent to a compound growth rate of about 40 per cent.

It is hardly surprising that Western technology and software companies are drooling at the prospects of breaking into or expanding in the Chinese cloud sector. They only need look at cars or fashion brands to see how lucrative China can be.

Professor Feng Li, chair of information management at Cass Business School in London, predicts growth will be "astronomical" and says: "China only began using the cloud a few years ago and the size of the market is tiny compared to America at the moment, but it is developing extremely fast and is likely to catch up very quickly.

"In the last few years foreign companies have been trying to get into the Chinese market. Their market share is still relatively small, but the potential is definitely there because of their technological capabilities, their reputation and their experience in this space."

The country's largest cloud provider is Alibaba Cloud, part of Chinese e-commerce giant Alibaba, and among its many domestic rivals are search engine Baidu, social networking group Tencent and telecoms equipment supplier Huawei.

Western companies are gradually muscling in, including Amazon Web Services, Microsoft's Azure, IBM and Oracle, but China is not an easy market to crack, as Google and Facebook have discovered, and there are big challenges to overcome for any new entrant.

The lack of internet penetration and poor broadband networks outside the big cities are major hurdles, but there is also a battery of complex regulations and legal issues to be tackled, as well as concerns about the protection of intellectual property and censorship of web content.

The digital arena has specific challenges sprouting from new national cyber-security laws announced last year which threaten tough punishments for companies that breach regulations.

Companies also face strict rules on the transfer of data in and out of China, and the use of foreign software and hardware by government bodies and state-owned enterprises.

Lillian Pang, vice president and associate general counsel for Rackspace, a US-based managed cloud provider with data centres in Hong Kong, says the scope of legislation is a clear indication that mainland China recognises the value and potential of its cloud market.

> For the UK's fast-growing and energetic cloud sector there are opportunities to piggy-back on the likes of Amazon Web Services, Microsoft and Alibaba

She warns that laws in the region are "vast and constantly changing" and adds: "Cloud providers and other organisations will need to ensure they have suitable protocols in place to comply with the various legislations."

Another potential obstacle is that cloud providers must have a local partner, while customers who want to use their services must have a Chinese account separate from their international accounts.

As a result, Amazon has teamed up with Beijing Sinnet, Microsoft and IBM with 21Vianet, and Oracle with Tencent.

Having a local partner potentially raises concerns about how much influence the Chinese will have, but Professor Li advises foreign companies to forge close local connections, saying it is important not to underestimate cultural differences between the West and China and also within different regions of China.

China too recognises the value of international expertise and Alibaba Cloud last August unveiled is AliLaunch programme to encourage foreign companies to use its services in China and develop a cloud-computing ecosystem. Early partners include SAP, Here, Hitachi Data Systems and Check Point.

Now ranked fifth largest cloud infrastructure provider in the world, according to research firm Canalys, China's global ambitions recently saw it announce plans for new data centres in the Middle East, Europe and Japan.

For the UK's fast-growing and energetic cloud sector there are opportunities to piggy-back on the likes of Amazon Web Services, Microsoft and Alibaba, and although the short-term prize might be securing business in China, the longer-term gain could be more international as Chinese companies broaden their horizons.

Alex Hilton, chief executive at the UK's Cloud Industry Forum, says the issues facing China are similar to those that face the UK such as bandwidth, security, migration from legacy systems, regulation and data sovereignty.

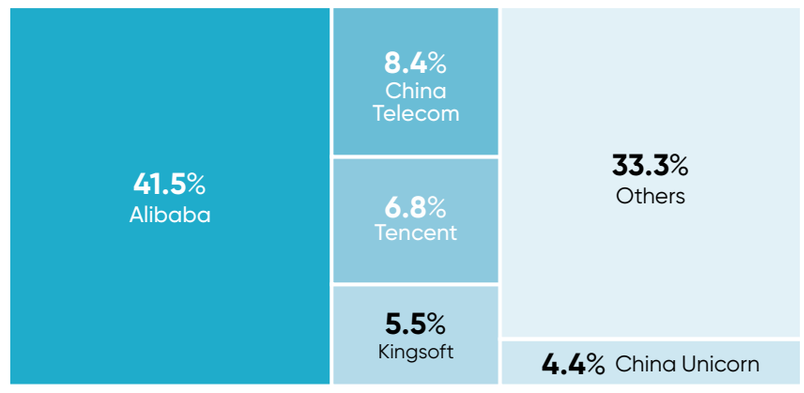
There are potentially huge opportunities for those that can help private and public sector clients overcome those problems and harness the power of the cloud to transform their operations.

Mr Hilton adds: "When we talked about cloud technology a few years ago, it was all about infrastructure and computing power, now it's about the applications and software element of it that organisations can utilise. Software is king, absolutely."

The advantage many UK companies have is they have built up expertise and experience in specialist areas, such as disaster recovery, the internet of things and unified communications that will be of immense interest to the Chinese.

CHINA'S PUBLIC CLOUD MARKET SHARE

ESTIMATED MARKET SHARE IN THE FIRST HALF OF 2016



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