

About this paper

Despite many years of raising awareness of the benefits offered by cloud computing there are still some negative perceptions about the security of cloud services that remain and are holding back cloud adoption and its benefits. Given the importance of cloud computing to the UK's digital future it is vital that the cloud security messages and advice being delivered today are relevant to how cloud services have evolved, address the concerns being raised by cloud users and reach the right audiences.

To ensure this happens techUK has brought together cloud computing industry leaders and cyber security experts to develop this paper. It aims to provide information and advice SMEs, that can start to address trust and security concerns and misconceptions surrounding cloud services.

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Introduction

Cloud computing is fundamental to the UK's digital future. The next wave of the digital revolution is being powered by the Internet of Things (IoT), mobile applications, big data analytics and Artificial Intelligence (AI). Cloud computing underpins all of these developments. It provides the capability to store, process and manage the vast volumes of real-time information being created through digital innovation.

The volume of information now being created on a daily basis means that cloud is fast becoming the easiest solution to adopt for organisations and consumers. Cloud provides the ability to access computing platforms and resources on an 'on-demand' basis, driving organisational efficiency and often cost savings. This flexibility increases innovation, productivity and business competitiveness.

Too often potential users hold back from harnessing cloud benefits due to concerns about the security of cloud computing services. In the UK 61% of SMEs say that they are worried that information might get lost, stolen or damaged in the cloud.¹

However, the reality is that cloud services can offer much greater levels of security and resilience as required by users. With the cyber security tools and solutions available today, cloud computing services can be as secure as users require.

The aim of the following document is to build greater trust in the security of cloud computing with business leaders that may be considering looking to use cloud services. It aims to provide information and advice for those who are deciding whether to transition to the cloud.

¹ Federation of Small Businesses (FSB) Cloud Computing Survey 2015 <http://www.fsb.org.uk/media-centre/press-releases/security-fears-stop-firms-using-cloud-computing-services-says-fsb-pr-2015-05>

Cloud as an enabler of business growth

What is cloud computing?

Cloud computing is an approach to computing which enables SMEs to access on-demand computing power and resources as and when required. Computing resources such as applications, development environments, platforms, software and infrastructure are all delivered as a service; typically charged as consumed.²

Cloud represents a shift from traditional computing. Benefits of adopting the cloud include the ability to:

- tap into state of the art efficient information and IT infrastructures without having to make up-front capital investments
- scale up and scale down IT requirements based on business needs, resulting in reduced IT costs
- increase operational flexibility, agility and efficiency by not having to wait to build traditional complex computing hardware based infrastructure
- access automated and repeatable deployment of computing infrastructure
- Offer employees the applications and tools they need to do their job which can help organisations to reduce the risk of shadow IT.³

The full value of cloud computing to your organisation will only be realised if it addresses your business needs, aims and objectives in a secure and controlled manner. For example, providing your employees with authorised agile and flexible tools which are necessary for them to perform their jobs.

The decision to take the first steps towards cloud should be driven by not just a desire to invest in the latest technological innovation, but also by a desire to solve identified business problems.

² <http://www.techuk.org/insights/news/item/8072-techuk-s-cloud-business-guide-for-business-leaders>

³ Shadow IT refers to IT devices, software and services used by employees within the workplace that are unknown or outside the control of the organisation.

Taking the first steps – how can cloud help your business?

If you are interested in adopting cloud computing or have made the decision to move to the cloud you should take a moment to consider the importance of information to your business and the security responsibilities that you have to your customers and employees.

Organisations of all sizes and across all sectors have a responsibility to ensure appropriate security measures are in place at all times to protect the information you create, collect, process, manage, store and share. This can include information about your employees, customers and supply chain partners as well as business related information such as tax returns and audit reports. If you are a partner in another organisation's supply chain you may also have responsibilities to ensure you have effective security measures in place.

The good news is that the cloud offers security benefits that can help SMEs to protect their information by providing greater security and resilience on demand as a service. Many reputable cloud computing service providers offer cloud services, including Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS), that are already aligned with best practices in cyber security.

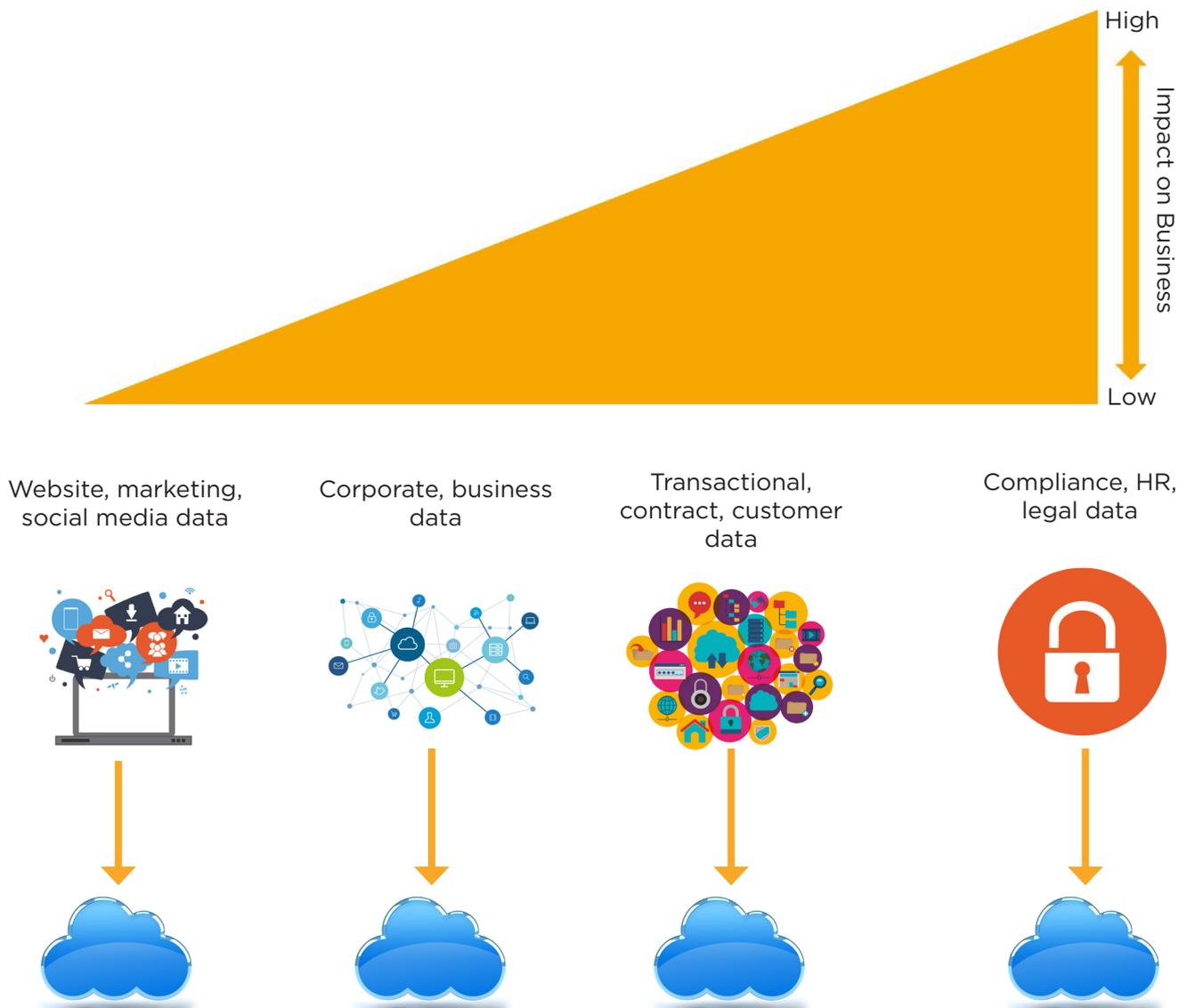
As soon as a customer starts to make use of a cloud service, they should benefit from the investment made by cloud providers in state-of-the-art security network defences that are updated automatically in response to changes in the online threat environment. This means that busy businesses may no longer have to manually download security updates, install patches or run back-ups to ensure that their information remains secure.

But are these security benefits right for your organisation and the information you want to move to the cloud?

Are cloud services secure and safe?

Before deciding whether to move to the cloud you should think about how you want to use cloud services and what information your organisation is happy to share with the cloud, as well as which provider meets your needs. Not all cloud services will be the same.

The chart below illustrates how the level of data privacy and security requirements you might be looking for from a cloud services provider might be different depending on the type of information you are sharing when using a cloud service.



Is the security offered by the cloud right for your business?

The UK has a vibrant, fast moving and ever evolving cloud computing market. There are multiple cloud providers, of all size and shape, offering a range of innovative cloud services, both as a free to use or paid for service that UK SMEs can take advantage of.

With many different services available it's important to remember to read the providers Service Legal Agreement (SLA) and Terms and Conditions (T&Cs) and consider the different levels of services and data privacy and security measures that might be offered between a paid or free cloud service. Also consider what industry recognised and independent standards (for example ISO standards⁴) cloud providers are compliant with and whether these standards are externally validated. Examples of these standards include:

- ISO27001 (Information Security Management System)
- ISO27017 (Security Controls for Cloud Services)
- ISO27018 (Personal Data in Cloud Environments)
- Cloud Security Alliance (CSA) STAR
- Cyber Essentials & Cyber Essentials Plus

Reputable cloud providers continue to invest significantly in cyber security technology, policies and procedures to ensure customers' information is protected against a wide range of cyber threats wherever it is being stored. Remember it's your choice!

Cloud ABC for SMEs

Before deciding whether to move to the cloud, consider the Cloud ABC. In the table opposite are some issues and key questions you might consider when determining whether the security controls in place are appropriate to your needs.

⁴ http://www.iso.org/iso/iso_catalogue/catalogue_tc/catalogue_tc_browse.htm?commid=601355

Points to consider	Questions to ask your cloud provider about the service being provided
<p>A Always think about the type of information you are responsible for and the requirements to find the right security arrangements needed based on the type of data involved.</p> <p>Think about the security arrangements you are looking to have in place. It might be important to you to know who has access to and visibility of your information?</p>	<p>Have you read the supporting Service Level Agreement (SLA) and Terms and Conditions?</p> <p>Within the SLA are there contractual areas that address security arrangements in place, resilience of the underlying cloud infrastructure, service availability, business continuity and disaster recovery procedures?</p> <p>What security standards, for example ISO standards, is the cloud provider compliant with? Have they been externally validated?⁵</p> <p>Is data encrypted when it is in motion and/or at rest?⁶</p> <p>Has the resilience of the underlying cloud infrastructure been independently security tested? How frequently do these tests take place?</p> <p>What unscheduled service outage/unavailability has the cloud provider experienced in the last 12 months?</p>
<p>B Be aware of your legal and regulatory requirements and responsibilities.⁷</p> <p>You may have specific legal or regulatory data requirements depending on the sector you operate within that you may need to consider.</p>	<p>What is the governing law and jurisdiction of the contract?</p> <p>Is your cloud provider aware of the new General Data Protection Regulation (GDPR) that will be implemented into UK law on 25 May 2018?⁸</p> <p>How will your service change with the introduction of GDPR in May 2018? GDPR is coming, you and your cloud provider should be preparing for this. See the box below for more information on GDPR.</p>
<p>C Choose the best cloud service that is right for your organisation and meets your needs. It is your choice.</p> <p>Select a cloud provider that is offering a service that offers the security arrangement you need, meets your legal requirements and is a good fit for your organisation.</p>	<p>Can the provider unilaterally change the contract and terms of service?</p> <p>What are the access management processes, i.e. who has access to customer information and what policies are in place to manage staff access?</p> <p>What checks or vetting are undertaken on the cloud service providers staff?</p> <p>Is there a right for the information to be transferred back to you at the end of a contract at no additional cost?</p>

5 <https://www.bsigroup.com/en-GB/CSA-STAR-Certification/>

6 <https://digitalguardian.com/blog/data-protection-data-in-transit-vs-data-at-rest>

7 Check out techUK's Cloud Business Guide for Business Leaders for more information on the legal and regulatory issues you may need to consider, <https://www.techuk.org/insights/news/item/8072-techuk-s-cloud-business-guide-for-business-leaders>

8 Find out more about the new GDPR at the UK Information Commissioners Office website www.ico.org.uk

Changes to Data Protection Legislation (GDPR)

In May 2018 the new EU General Data Protection Regulation (GDPR) will come into force in the UK. This guide does not go into detail on the changes that the GDPR will introduce. However, if your organisation is processing or storing the personal data of European citizens you will be impacted by the changes being introduced including measures relating to data portability and breach notification. The GDPR also introduces changes regarding liability for data controllers and data processors that will impact cloud services providers as well as significantly greater financial penalties in the event of breaches. The UK's Information Commissioner's Office (ICO) website⁹ provides more information on GDPR and the changes it will introduce.

Conclusion

techUK hopes this guide helps you to start benefitting the full opportunities that cloud computing has to offer.

It is understood that a challenge facing business leaders in making the transition to the cloud is the change it presents in the way organisations procure and access IT requirements whilst still needing to balance existing business demand for speed and security. However, it should be remembered that investment in cloud computing enables organisations to be more mobile and agile, increase collaboration between customers, suppliers and employees, improve efficiency and reduce costs. What is certainly clear is that business leaders will find it increasingly difficult to ignore the benefits of the cloud as the full potential of these technologies are fully realised by others.

Use the links below to find out more information about techUK's work on cloud computing and cyber security, including newsletters, upcoming events and activities which can support you on your securecloud journey.

- **techUK Cloud, Data, Analytics and AI Programme**
<http://www.techuk.org/focus/programmes/cloud-data-analytics-and-ai>
- **techUK Cyber Security Programme**
<http://www.techuk.org/focus/programmes/cyber-security>

⁹ www.ico.gov

techUK represents the companies and technologies that are defining today the world that we will live in tomorrow.

The tech industry is creating jobs and growth across the UK. 900 companies are members of techUK.

Collectively they employ more than 700,000 people. These companies range from leading FTSE 100 companies to new innovative start-ups. The majority of our members are small and medium sized businesses.

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