C5 alliance

www.c5alliance.com

The Cloud

Cutting through the hype

Jumping to the cloud will give your business a quantifiable boost.
But you'd better look before you leap

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01. Overview

You're probably sick of hearing how cloud computing is going to revolutionise IT. Wade through the promotional blurb of most vendors, and you'd be forgiven for thinking the cloud was less a utility model, more like a binary version of the second coming.

Here at C5 we have a more considered take. Yes there are incredible savings to be made by harnessing the pooled resources of the true cloud. But much of the cloud offering remains very hazy.

Advances in computing are never as definitive as people like to make out, and immature services invariably arrive on a wind of hype, mistruth and trouble. The cloud has all this in spades, yet every IT vendor is still clamouring to stick the word 'cloud' next to their product.

The Channel Islands aren't immune to the noise. In fact they suffer worse than most. A surprising number of local 'cloud' services have sprung up to exploit the buzz. But let's not beat around the bush here: the wrong choice could seriously harm your business.

You may, for example, have been offered the £100-a-month 'cloud hosted desktop', a remote service using an off-the-shelf copy of Microsoft Office. When you learn that Microsoft will from early 2011 offer its own cloud version of Office, one that's custom-built for the new environment and containing far more extensive features – from a mere £6.71 a month – you begin to see the problem.

At C5 Alliance our feet are planted firmly on the ground. We can help you carefully select certain cloud options that offer quantifiably compelling benefits. By using cloud services where appropriate, as part of a more expansive and considered hybrid IT set-up, you can make the most of the savings and flexibility the cloud brings while keeping the risk to an absolute minimum – and evolve your cloud set-up to meet the changing demands of your business.

If you're intrigued by the cloud but baffled by the noise, and if you wish to know more about how it can benefit your business, what risks are involved and how to find the best solution, then read on. C5 has cut through the hype for you…

02. What is the cloud?

One of the biggest myths about the cloud is that it's just one thing. It isn't. Vendors have seen a bandwagon and they want on, attaching the term to a dizzying range of technologies. The obvious problem here is that they wind up selling services that really aren't cloud at all.

Even Steve Ballmer was recently driven to ask an audience: 'What the heck is the cloud?' And he's CEO of Microsoft. So it's useful to apply a standard definition.

The National Institute of Standards and Technology (NIST) defines the cloud as:

'A model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.'

Let's recap that in English. The cloud essentially allows you to use the internet to hand the management of your data and IT services over to external specialists. You benefit from pooled computing resources, which give greater agility, elasticity, power and storage capacity. And it's faster. It saves on time and kit, which means saving money. And you can use the applications when you want, scale them to your needs, and pay only for the amount you've used. By moving to the cloud, computing becomes another utility – just like electricity or gas.

So is the cloud really going to stick? The short answer is yes. Several heavily resourced IT powerhouses have thrown their weight behind the development of cloud-based applications. Google, Oracle, Amazon, and more recently Microsoft, have pumped billions of dollars into research and development, and are releasing cloud services for virtually every aspect of business.

With the kind of muscle offered by Microsoft Azure, Office 365, Google Apps and Salesforce.com, and the obvious economies of scale they deliver, cloud applications are simply set to become an integral part of working life.

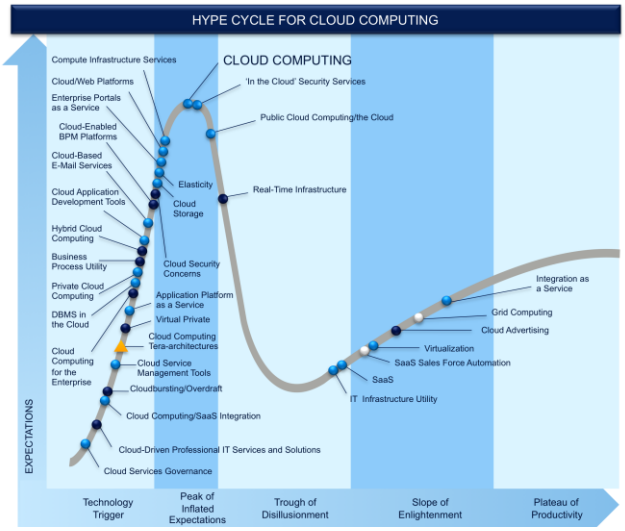
03. The hype problem

The buzz around the cloud is not necessarily undeserved, but it's dangerous because it doesn't tell the whole story.

Gartner has plotted cloud computing on its notorious Hype Cycle (Figure 1, below). Notice how it's sitting right at the very top, reflecting how everyone is clamoring for a piece of the cloud action, often blind to whether it's actually a good idea.

But there's a storm brewing for cloud vendors and clients alike. To the right of that steep curve lies the 'trough of disillusionment'. Under Gartner's model, the peak of hype is always followed by a downward trend, as vendors and clients realise the industry isn't heading where everyone thought. Sound ominous? It's that realisation which killed companies like Boo.com when the internet bubble burst. Many Channel Island 'cloud' vendors may soon learn how that feels.

For a company to invest in services currently at the top of the Hype Cycle, the business benefits have to be particularly compelling. If that technology is so good it delivers savings substantial enough to negate the risk, then jumping on board early may be wise. But you have to choose the right model…



Beware the 'cloud hosted desktop'

The Channel Islands have a peculiar take on the cloud story. Many local vendors are jumping on the bandwagon and rushing out competing 'cloud hosted desktop' services, for £100 a month per user.

They are of course labeling it the cloud. But if you peer through the 'cloud-wash' you'll soon see cause for concern. It's just not the way the majority of the industry is heading. While the vendors of the 'cloud hosted desktop' are shouting as loudly as anyone about the power of their product, they're selling solutions that are more at home in a private environment. And they've failed to give proper respect to the security problems inherent in this still immature technology.

How can they possibly compete, when true cloud pioneers like Google, Amazon and Microsoft are pouring billions of dollars into reconfiguring and securing their own services?

For more concerns over the Channel Islands' strange focus on the 'cloud hosted desktop' see page 11…

04. The different types of cloud

The emergence of true cloud services like Salesforce.com hasn't been an overnight phenomenon. It's actually the latest in an evolution of services that has moved in-house IT provisions progressively in to the hands of external providers.

Companies shouldn't view this as a race to the true cloud. Each step in the journey presents certain advantages, but increased risk too. The most effective solution is in fact to cherry-pick elements of each and combine them – in a model known as a **hybrid cloud**.

From Private to Public
Imagine to the left of Figure 2 there sits the traditional IT set-up, where a company has a stack of servers in the office computer room, and every time it needs to add extra users or services to the network it has to set up back-up and file storage, physically upgrading the servers by buying extra hardware. The process works, but it involves up-front expense, inflexibility, and a strain on the infrastructure – installing provisions around power, temperature and security. Each step to the right in the diagram involves a new **deployment model**, which moves the user progressively away from the traditional set-up, eliminating these burdens.

Here's a run-down of these deployment models and what each brings:

The private cloud
In the first step on the cloud journey, the company moves from physical servers to virtual servers. The hardware remains in the office or data centre, but virtualising the servers means it uses less space and gains flexibility: now a new server to support extra users can be added at the touch of a button, reducing your costs and carbon footprint and speeding everything up.

The next step, the managed private cloud, simply means getting an external provider to manage that kit. Rather than paying an in-house engineer to enable more storage, install another server or patch the environment, the client leaves all that work to its provider.

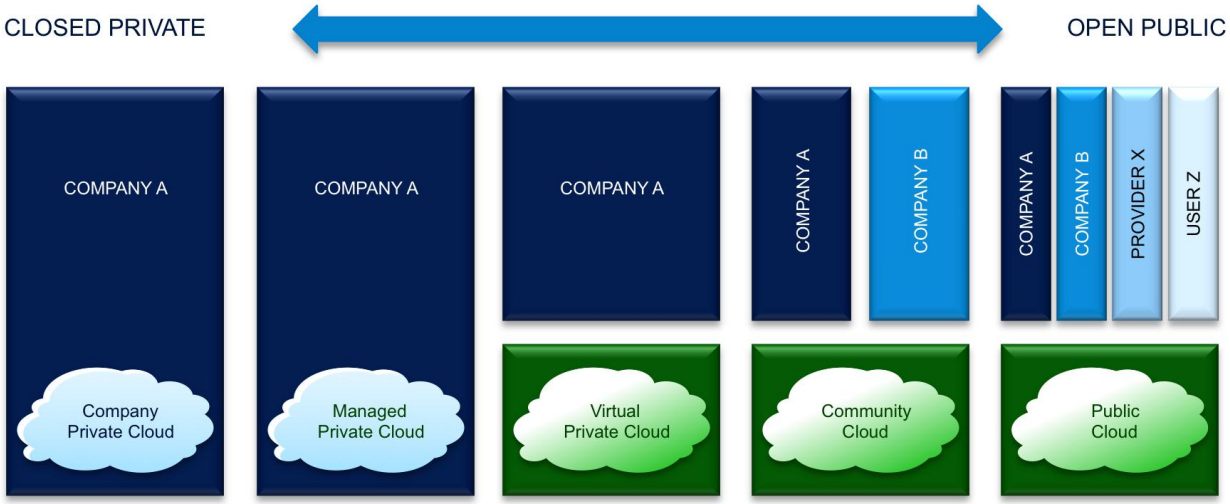


Figure 2

Virtual private cloud
This is a logical progression. Do you now need any server equipment in the office at all? The provider can instead host your servers at its data centre. A trusted provider will minimise the risks by making investments in temperature controls, security and power. Plus you can still visit the premises and inspect the conditions and, if need be, physically retrieve your server from the racks.

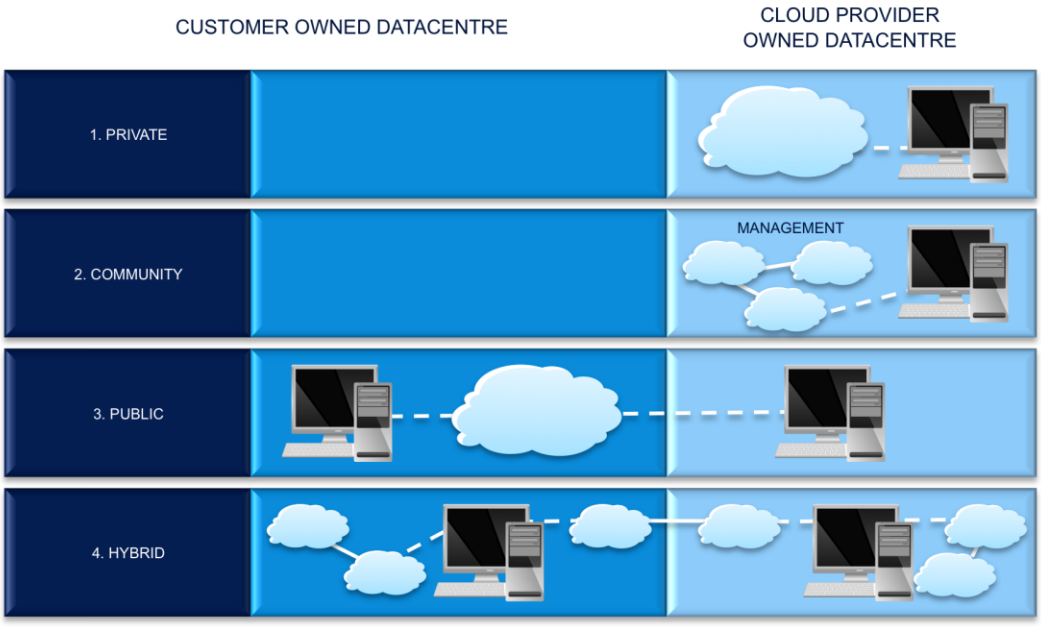
C5 has a great deal of experience creating managed private clouds for companies. We also work a great deal with the likes of Foreshore, 2e2 in Guernsey and Jersey Telecom all of which have 10 years' experience of data centre hosting, and have made huge investments in their hosting infrastructure. It is a safe bet.

Yet cross the line towards the more open public cloud, and greater risks start to emerge. It still offers huge value, but the technology is newer, and the ground less certain.

Community cloud
Here the data is once again hosted remotely, with virtual machines using software to recreate the server environment. Your data sits on the same physical kit as that of other users. Each has its own distinct virtualized environment, with various methods of ensuring data isolation. The benefits are the greater flexibility, extra computing power and reduced costs that come with pooled resources.

It's a sound idea, yet the technology is still relatively new and there are inherent weaknesses in the virtualised server model, as it is a piece of software and potentially more vulnerable than a physical piece of hardware. But the sector is maturing, and it will soon be quite viable to host machines in a shared virtual environment – as long as there are distinct divides in the software infrastructure between different customers' environments.

Great care must therefore be taken in applying the community cloud model. If the cloud service administrator makes mistakes when configuring the system, it may allow others to view your data. This is why it is so important to engage with a provider that has a proven track record in successfully delivering virtual hosted services.



Public cloud
This is the arena of the true cloud pioneers, like Google, Microsoft, Amazon and Salesforce.com Applications and data are hosted entirely remotely by companies providing cloud services, and made available to the general public.

There are of course even greater risks here – users may end up with no idea where their data is being stored. It's a matter of faith, going with established vendors with vast resources to pump into security and back-ups, and of weighing up the benefits: the immeasurable resource-pooling potential of such global organisations makes their services cheaper still and even more powerful. It's a massive and justifiable lure for prospective clients.

Hybrid cloud
This is a composition of two or more of the above cloud models. They remain unique entities, but are bound by standardised or proprietary technology that enables data and application portability, like cloud bursting to balance the load between clouds. It's less risky and allows the user to tailor their cloud use to suit their needs – putting non-sensitive data in the public cloud and benefiting from its power and elasticity, while keeping sensitive data in-house where it's more secure and in adherence to jurisdictional domiciled data considerations.

Hopefully that clears up how the cloud can be deployed. Now we must add a little on the three service models in the cloud.

Infrastructure as a Service (IaaS)
Gives users the chance to run arbitrary software, including operating systems and applications, in the cloud, run by a third party. The user benefits from the host's processing power, storage, networks and other resources.

Platform as a Service (PaaS)
A 'shift right' from IaaS, here the user is able to install their own applications in the cloud, running them on top of an operating system deployed and maintained by the cloud provider. This could, for example, be a database running calculations of millions of hedge funds. The client owns the data and the code to run the calculation, on a system owned and managed by the provider.

Software as a Service (SaaS)
This is where we find the likes of Salesforce.com, Gmail, Microsoft Office 365, YouTube and Eventbrite. The providers' software runs on their public cloud infrastructure, and users can access it from any device, requiring only a thin interface such as a web browser.

05. Benefits of the cloud

One of the worst aspects of excessive hype is that the real benefits of the cloud get lost in the noise. A sensible look at the technology shows that the cloud has plenty to offer:

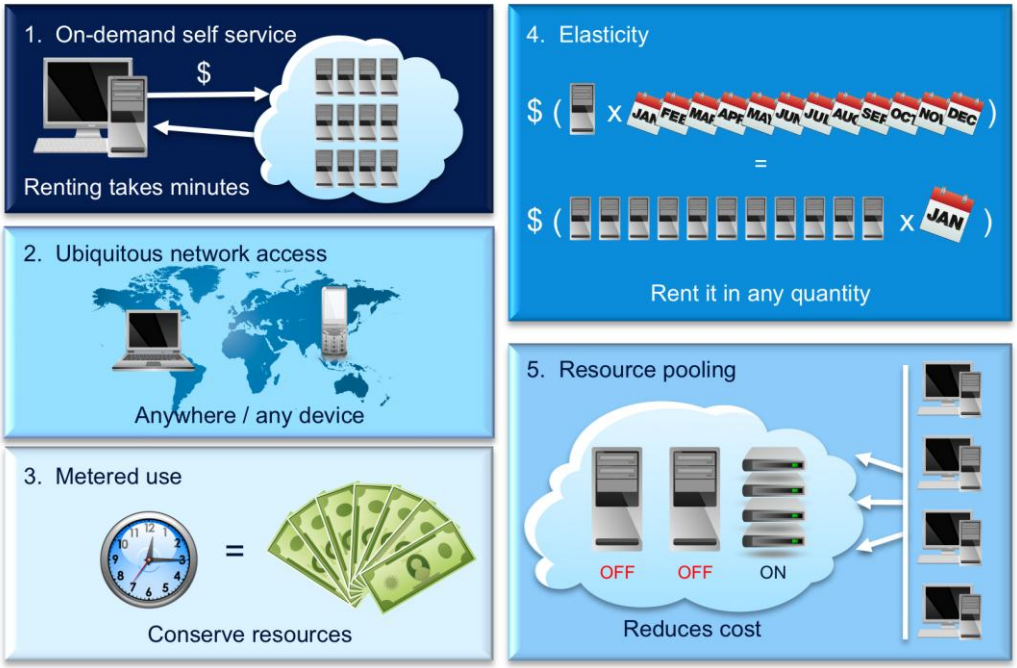
Computing becomes a ubiquitous utility
This delivers better agility, elasticity and storage capacity. It saves money and leads to greater efficiency – for the vendors and customers alike.

Resource-pooling brings incomprehensible power
Need to make a complicated calculation on a vast database? You can in an instant. And you're using far less energy in the process.

It's elastic
If you need to accommodate 20 extra users, their accounts can be created at the push of a button. IT needs are no longer restricted by your infrastructure. Capabilities can be purchased in any quantity at any time.

Less hassle and lower costs
The States of Jersey, for example, will be moving from their own servers to the private managed cloud. Their consolidation strategy, delivered incrementally, will facilitate better cost management and savings in areas like electricity and hardware replacement. For their remaining infrastructure they are also moving to a hybrid private cloud. This further reduces the burden on their internal systems, while ensuring that they use existing infrastructure efficiently by sharing the load from previously dedicated hardware, extending its life and reducing recurring costs.

Low barrier of entry
The cloud makes business easier for start-ups, and as it's on-demand you pay only for what you use. Gone are the days of having to shell out up front to invest in racks of hardware you may never even need.



05. Downsides

A problem with hype is that it tends to ignore or play down the inherent risks. The cloud is just like any new technology in that it comes with a raft of problems that must be overcome. Here are 10 key considerations:

Where is your data?
Previously it sat on a server in your office or a local data centre. Now you may not know where it is, and that could raise serious jurisdictional implications (see Appendix I). There are also data protection laws to consider.

How is your data being treated?
It's crucial to know who has access to your information, and whether they've had proper background checks. And how is it stored? Is there a chance it's being mixed with the data of other users – and perhaps even competitors?

Is it secure?
Sensitive information in the cloud can be incredibly vulnerable. In July 2009, a hacker gained access to confidential documents stored on Google Apps by hacking a Twitter employee's official email account hosted by Gmail.

Is it being monitored?
Many cloud vendor contracts include the right to monitor all data they store. This probably wouldn't suit certain Channel Island clients, and is another spur to be highly selective about what you put in the cloud.

Can you trust the hardware?
Are there adequate procedures against downtime through power outages or natural disasters? And do you have a business continuity plan in place ready for when problems occur?

How do you get out?
If something does go wrong, or you wish to change your provider, have you signed an exit clause that allows you to pull your data out? Even if you have, the vendor may not offer any help getting data out of its environment. Microsoft is one such example. You will need third-party tools and professional help.

Who owns what?
Cloud vendors often supply proprietary development tools, allowing the user to create their own databases or applications. If you don't clearly delineate your IP rights from those of the vendor, you could be in for a nasty surprise should you decide to take those databases or applications elsewhere.

Are the terms set in stone?
Cloud vendor contracts often allow the vendor to modify the terms of the agreement. Simply continuing to use the system once it's been changed, or after a certain stated period, is often enough to imply the user accepts those changes.

Could you get stung?
The service agreement of one popular cloud vendor says it has the right to terminate and suspend access to the services if the user's account falls into arrears. And there's no obligation to retain the user's data: you could find it 'irretrievably deleted' after 30 days.

Do you have access?
You have to be connected to the Internet 24/7 to be able to access your line of business systems. This puts a greater reliance on other third parties such as telcos, and a greater investment may need to be considered to ensure you have resilient network access to the Internet.

06. The role of the aggregator

Here at C5 Alliance we don't directly sell our own cloud services, but we are introducing the cloud as part of our overall solution strategies.

We currently work with hosting partners to build and manage private clouds for our clients. We give consultancy and maintain the hardware, hosted locally at Foreshore, Jersey Telecom and 2e2 or still on the client's premises, while developing certain cloud elements – migrating email to the Microsoft cloud, for example, and providing the hands-on care to supplement what Microsoft provides.

We ensure it's all running correctly, and are on hand to manage the push-button scalability of these virtual services.

But C5 is also developing its role as an aggregator. This is a different provision to that of other local providers, many of whom are building their own systems on often scant resources. By contrast an aggregator takes the powerful true cloud services of established vendors – from Microsoft's CRM to Amazon Web Services and video hosting via YouTube – and tailors them for clients by adding extra elements to the package.

Using some suitable cloud services is an excellent idea, harnessing for example Microsoft Office 365's capacity for voice and video conferencing and instant messaging.

The different plans in Office 365 will suit different businesses, from small operations to huge multinational enterprises, and it gives users access to Office online as well as a copy for their local machines should they not be 'connected' to the cloud for any reason. It will provide a huge range of true cloud services from £6.71 per user per month.

Meanwhile the aggregated solution allows for sensitive data to be kept in-house. This is true hybrid cloud.

In short, the cloud is not simply an 'all or nothing' deal. An aggregator can help build the service that truly meets the client's specific needs.

Case study: States of Jersey

Mark Loane, MD of C5 Alliance, describes working with the States of Jersey to build the right solution for them.

'The States of Jersey have encountered a lot of challenges running the traditional server set-up in-house, and have since moved to a dedicated private cloud model for their internet servers. They now pay C5 a monthly subscription to look after their web IT provision.

It's hosted as IaaS at Foreshore and Jersey Telecom, but the data is still on their hardware. This is reassuring – should the States encounter any problems it's straightforward to move the physical server's to an alternative provider.

We are now also suggesting the States consider some true cloud services. They've already started moving towards some SaaS – video hosting for their websites at YouTube, which is full cloud, and event management at Eventbrite. And they may even consider moving their email to the cloud.

The States of Jersey are also moving from their own server's to a private managed cloud. Their consolidation strategy, delivered incrementally, will facilitate better cost management and savings in areas like electricity and hardware replacement. For their remaining infrastructure they are also moving to a hybrid private cloud. This further reduces the burden on their internal systems, while ensuring that they use existing infrastructure efficiently by sharing the load from previously dedicated hardware, extending its life and reducing recurring costs.

The whole thing is safe: our SLA with the government for the private cloud is 120 pages long. There are exit strategies, proof of back-ups – it's a full-scale managed services agreement.

The States show just what can be achieved with the hybrid model, mixing the private cloud with a managed private cloud and the public cloud.'

07. Concerns about the ‘cloud hosted desktop’

The noise coming from vendors in the Channel Islands is dominated by the ‘cloud hosted desktop’. But this managed service is not being promoted to the same level by vendors elsewhere. The wider industry is moving in a different direction entirely. If we run through some details on the ‘cloud hosted desktop’ you may agree there’s good reason for that.

With the ‘cloud hosted desktop’, the client is simply paying for the use of a regular copy of Microsoft Office, hosted remotely, with their screen acting as a terminal into a remote session. This copy of Office will run on one or more servers, with each client’s data sitting alongside that of other users. The email boxes of separate clients may also sit beside each other, using out-of-the-box programs like Exchange. There is a very real risk of the vendor configuring these machines incorrectly – and potentially leaving data in the wrong place. This is risky, and the chances of data corruption or theft are real. The prospect is disconcerting. Here’s a run-down of further concerns:

The ‘cloud hosted desktop’ is not true cloud
Users sign up for a fixed service on a yearly or longer-term contract, rather than paying for a scalable on-demand service. They can be locked into an old version of the software with no chance to upgrade. This isn’t utility computing, so can’t really be called ‘cloud’. It’s simply a rental model.

These vendors lack ‘cloud’ experience
Each system has been built and maintained by small teams of local engineers with no previous experience building an enterprise-level multi-tenant solution. Their resources pale in comparison to those of Amazon and Google, and many of the local service-level agreements and exit clauses lack substance.

It’s potentially insecure
With multiple users logging in to the same directory there’s a chance of cross-contamination. In the event of a major Zero day security vulnerability being discovered, a shared solution can’t ‘close it’s doors’ to reduce risk in the way an in-house solution can.

It’s limited
As Microsoft doesn’t permit these vendors to supply a separate local copy of Office for portables or other machines, users are stuck with the hosted version. Buy a second copy separately, and you’d still struggle to access your files outside the managed environment.

There are hidden costs
Users still need PCs and networks in the office, requiring day-to-day management, protection and support. Then there’s the cost of migrating data, and of the line of business applications required outside of Office that are not part of the £100 bundle. These costs soon stack up, and in our opinion it is not a viable or cost-effective model.

It’s just not the future
The ‘cloud hosted desktop’ is not supported by Microsoft’s strategy, which is promoting Office 365, private clouds and Azure and has the power to dictate the industry’s general direction.

It’s an unsustainable market
With six rival vendors competing for Channel Island business, can you be sure that the vendor you decide to back will still be here tomorrow? Why take such a huge risk on a solution that may have no future?

And the worst thing? The ‘cloud hosted desktop’ doesn’t even save you money!
For 50 users at £100 per month over 3 years would cost £180,000. C5 has calculated that if you hosted your servers as a private cloud it would cost as little as £100,000 (with a fully managed service) and even less if using a hybrid model.

Given the above concerns, the £100 ‘cloud hosted desktop’ really doesn’t seem like the answer.

08. Questions to ask the vendors

- Do you have a comprehensive SLA designed to protect my business?
- Do you use a risk-based information security model?
- Do you maintain and update a detailed set of security controls for risk mitigation?
- Do you have a documented regulatory framework for my business sector? (PCI-DSS, SOX, GLBA)
- Do you operate within a framework, which covers data privacy and security, such as the ISO27001?
- What is your security patching policy?
- How long would it take you to recover any corrupted or lost data, and how much could I lose?
- Can you prove that you carry out regular audits?
- What is your strategic roadmap for the next two years?
- If I decide that this is simply not working for me, how can I extract myself from your systems quickly and cleanly?
- Are you backing up each client's environment separately? If so, can I have a copy of my data in a usable format so that I can test your processes and run a trial restore with my own team?

09. So what's the future of the cloud?

The cloud landscape will continue to evolve as the hype dies down, most companies should be patient and consider moving only suitable systems to the cloud.

This can be considered a logical 'toe in the water' if they choose a local host with the right experience, processes, and managed infrastructure, and it could save them significant time and money.

From there they can then extend to a hybrid model, using public cloud for certain non-sensitive areas like event management, payroll, CRM and accounting via SaaS, and benefiting from the power, speed and elasticity of a true cloud database.

And how about the cloud in the Channel Islands? The future locally will largely depend on the adoption of the service and the survival rate of the competing parties. We believe that there will be attrition, and that this in turn could stifle the adoption of local provisions. If this scenario does play out, local clients will potentially leap from on-premise and private cloud solutions to the primary cloud providers, lured by the obvious economies of scale afforded by the global players over the local providers.

As for the bigger picture, you have to look at what those global players are saying. Microsoft has certainly made its stance clear. 'Many of our customers have told us they want the benefits of cloud-computing — fast deployment, increased agility, lower costs — but with tight control over things like physical infrastructure and security policies,' said Brad Anderson, corporate vice president of Microsoft's Management and Security Division. 'Our new private cloud offerings fulfil that need at the infrastructure level, while providing a clear migration path to cloud services at the platform level.'

C5 Alliance takes the same view, and urges clients to seek those with knowledge and experience to help them decide the most powerful yet safest solution. And this, categorically, is not to go to a vendor selling the £100-a-month 'cloud hosted desktop' and say: 'take away my pain'.

Do so and you may find that your 'agile and elastic' service provision is bound by a three-year lock-in, and that the vendor expects you to buy your way out. They have bet their company on you being there for the ride – whether they provide a great service or not.

Unfortunately the consequences of a bad decision could be severe. Take the wrong path and it could cost you: not just money, but perhaps even your business.

10. Five steps to taking that leap

1. Plan it
Get the right advice, and build a realistic migration strategy over time. Companies simply need to assess their internal systems, looking for any opportunities to move identified low-risk services to the cloud.

2. Shift in stages
First consider decommissioning your computer room and move your hardware to hosted providers like Jersey Telecom, Foreshore, 2e2 & C&W and get managed services to help you maintain that environment. Then consider PaaS with local vendors for some of the less risky technologies, like web servers and CRM databases.

3. Check their credentials
If the likes of Facebook and Google have had high-profile issues with privacy and security, even with the amount of resources at their disposal, can you really trust that local vendor? What are they offering in terms of process, security standards, access controls and customer support?

4. Get your SLAs sorted
Cloud service-level agreements should provide the following assurance **–** consistent, reliable access to IT resources, and solid contingency plans in the event of an outage.

SLAs should also cover the handling and destruction of back-up tapes, data accessibility, customer support, legal policies, liability, and confidentiality. And they must include exit clauses.

Ask many Jersey vendors to show you their standard SLA and they won't be able to. Going with a vendor that can't provide an SLA is potential commercial suicide.

5. Keep your IT team
Your techs still have a major role to play. They simply need to understand the cloud offerings and re-skill themselves to help integrate hybrid cloud solutions. They won't lose their jobs. It's simply a case of adapting, of switching their focus and moving on to more value-added services that will benefit the business.

The progression to the cloud is inevitable
If you're not talking about at least some of these cloud technologies then your business is missing a trick. At the most basic level, a user's carbon footprint and costs will be dramatically improved by using a selection of cloud services in a lower risk hybrid set-up.

There is, however, rough weather ahead. You must be careful to take your time and choose the right options. Soon the buzz around the technology will die away, and you'll be sat in the cloud simply as another quiet part of everyday computer provision.

By then, of course, you'll be able to look down on everyone chasing that next bandwagon. And you will know not to jump too soon.

Appendix I

A short warning on jurisdictional issues

If you thought the hype surrounding the cloud was confusing, then the jurisdictional issues around hosting are positively baffling. As such it's worth introducing some of the issues here, as any clients handling sensitive data need to be aware of the potential pitfalls.

If data sits on your physical machine, the legal implications are clear: it's yours, and it's covered by the rules of your jurisdiction. But hand custody over to a cloud host and the definition of who owns those bits and bytes of data – and which jurisdictional laws apply – becomes incredibly complex.

Moving data to the cloud may mean transferring it to a new jurisdiction, triggering data protection requirements and regulatory considerations. Cloud clients may have a nasty surprise, when they discover that data they've stored in the cloud turns out to be subject to the laws of a distant jurisdiction.

Jersey and Guernsey have no specific laws regarding data sovereignty, so there is no legal boundary to any company storing all its data with a vendor in the cloud. But there are still legal and reputational risks of unintended disclosure along with data protection to consider.

Take, for example, the UK's Home Office, which is attempting to revive plans to force service providers to keep records of all e-mails sent on their systems, for as long as a year. Meanwhile, under the USA's Patriot Act, American law enforcement agencies can access hosted data in the USA if they consider it simply 'relevant' to their investigations. And the host is obliged not to tell the user its data has been seized – despite what your contract may state.

In at least one case in the US, an entire public cloud server was seized under a search warrant directed at one particular company, meaning other companies' data was also taken simply because it also sat on that server.

Would your clients be happy to learn that their trust or private client data is held on cloud servers where tax authorities could feasibly remove it, and the host is told not to tell you?

There are other tax issues. In automated transactions, the jurisdiction where the transaction is processed, i.e. where the data is based, is often where it is taxed. If cloud hosting means transaction processing will happen in another jurisdiction, make sure it doesn't affect your tax position.

Ensure the new jurisdiction has data protection laws at least as strong as your current jurisdiction. Don't forget to find out where the cloud supplier's contingency site is, and where they are storing back-up media. If these are in different jurisdictions, you need to be aware.

As an over-riding rule, only store your data in a location where you're prepared to defend litigation.

But there are only two sure ways to know where your data is. The first is to ask the cloud service provider. The second is safer – to keep sensitive data in-house or with a local host, and only go to the public cloud with data that's not going to create problems. Such jurisdictional issues give great weight to the local hosting options provided by the likes of Jersey Telecom and Foreshore, as part of the hybrid solution.

Appendix II

Glossary of terms

Cloud Software as a Service (SaaS).
The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure and accessible from various client devices through a thin client interface such as a Web browser (e.g., web-based email). The consumer does not manage or control the underlying cloud infrastructure.

Cloud Platform as a Service (PaaS).
The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created applications using programming languages and tools supported by the provider (e.g., java, python, .Net). The consumer does not manage or control the underlying cloud infrastructure.

Cloud Infrastructure as a Service (IaaS).
The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud.

Datacentre hosting.
A data centre is a facility used to house computer systems and associated components, such as telecommunications and storage systems. It generally includes redundant or backup power supplies, redundant data communications connections, environmental controls (e.g., air conditioning, fire suppression) and security devices.

Private cloud.
The cloud infrastructure is operated solely for an organization. It may be managed by the organisation or a third party and may exist on premise or off premise.

Community cloud.
The cloud infrastructure is shared by several organisations and supports a specific community that has shared concerns (e.g., mission, security requirements, policy, and compliance considerations). It may be managed by the organisations or a third party and may exist on premise or off premise.

Public cloud.
The cloud infrastructure is made available to the general public or a large industry group and is owned by an organisation selling cloud services.

Hybrid cloud.
The cloud infrastructure is a composition of two or more clouds (private, community, or public) that remain unique entities but are bound together by standardised or proprietary technology that enables data and application portability.

On-demand self-service.
A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service's provider.

Aggregator.
An aggregation brokerage service combines multiple services into one or more new services. It will ensure that data is modeled across all component services and integrated as well as ensuring the movement and security of data between the service consumer and multiple providers.

1 *http://csrc.nist.gov/groups/SNS/cloud-computing*
2 *http://www.gartner.com/it/page.jsp?id=1064712*

Appendix III

Hosted Desktop Offerings:

Below is a matrix of the Hosted Desktop Offerings currently available in the Channel Islands. The matrix will be updated as more information becomes available. It is to be noted that Itex declined to provide the information requested.

Company	iConsult	Cloud International	Cronus	2e2	Itex
Offering Type	Public Cloud.	Public Cloud.	Private /custom.	Public, private or custom.	Public/Private.
Offering Name	Hosted Desktop.	Business on Demand.	n/a.	Safehost/ SafeBusiness.	Unknown.
Offering Contains	Outlook, Word, Powerpoint & Excel (2003/2007 or 2010).	Hosted Desktop with Office 2010 (2007 option), Sharepoint 2007 and all existing Line of Business Apps. Access to new SaaS applications. Service Level Guarantee. Dual-data centre resilience & failover. Encrypted 10 year 3rd party archival of all business data.	Per customer basis. Using Virtualisation platform. Standard offering contains Outlook, Word, Powerpoint & Excel.	Outlook, Word, Powerpoint & Excel (Office 2010) This is flexible depending on customer requirements.	Suspect Outlook, Word Powerpoint & Excel.
Storage Allowance	6Gb (Across mailbox an file level storage).	10Gb (Variable subject to requirements).	Per customer basis.	2Gb mail and 10Gb data.	Charged per Gb.
Authentication	Two factor using RSA SecureID token.	Password only.	Per customer basis. RSA SecureID if required.	Two factor using SafeWord token.	Unknown.
Mobile Devices Supported	Windows Mobile, iPhone, Symbian, Android &Blackberry (BB @ additional cost).	Windows Mobile, iPhone, Symbian, Android & Blackberry (BB @ additional cost).	Per customer basis.	iPhone, Android and MS Mobile. Blackberry coming soon.	Unknown.
Standard offering Cost	£90 - £99 depending upon the number of seats.	£200 per user setup then £125 per month per user.	Cost varies depending on requirements.	£150 per user per month for 1-2 users. £125 per user per month for 3-10 users. £99 per user per month for 11+ users.	£99 per user per month.
Additional Options & Costs	Blackberry £50 connection charge then £10 per month. Dedicated application server £99 setup then £99 per month - storage costs extra. Used for hosting software such as Quickbooks, SAGE, Trust Co software packages and/or SQL server. Infofonic SaaS Document Management –POA.	MS Dynamics CRM £15 pp/m. MS Project - £15 pp/m. Blackberry - £10 pp/m. Quickbooks (one time license purchase) £350. Additional Storage £2 per Gb/mth. Dedicated VM Server £variable. Private/dedicated cloud available.	Web Site Hosting. CRM. Online Payments. Accounting Packages. Content Management. Document Scanning. Workflow. Straight through processing.	Virtual server for £99 per month with 100Gb of storage. Additional storage £30 for 100Gb. Web browsing £8 per user per month. Blackberry £7 per month. Support of on premise desktop hardware- poa. IP Phones and support – poa.	Virtual Server for £100 per month.

Company	iConsult	Cloud International	Cronus	2e2	Itex
Support Options	Mon – Fri (08:30 – 17:00) included in price. 24/7 for £99 per month for the first 10 users then each additional user charged at £10 per month.	Mon – Fri (08:30 – 17:00) Telephone 24/7 x 365 Infrastructure monitoring & support.	08:30 to 17:30 but can be changed to customer requirements.	Normal Office hours as standard. 13 hours x 7 days–poa.	Unknown.
SLA	No formal SLA as standard, but can be implemented if the client requires one. Typical response time is 2 hours.	Yes 99.5%.	Yes, custom per customer.	Yes. Not seen.	Unknown.
Architecture	Windows 2003/08 servers connected to Enterprise class SAN storage. Exchange 2007 in multi-tennant mode. Email SPAM protection using Mail Marshall. Application delivery and virtual servers using Citrix technologies. Industry Standard resilient Firewalls. Citrix appliances for load balancing. Portal written third part application.	VMWare VSphere 4.0 with resource QoS. HP Blade Servers & HP Lefthand SAN. Cisco Switches and ASA firewalls. MS Windows 2008 R2 Remote Desktop/ Remote App Server. MS Exchange 2010 (Multi-tenanted partitioning). MimeCast for SPAM filtering & 10 year archiving.	MS W2008 R2 RDP and remote applications. Encrypted Data.	Windows 2008 x64 servers. HP Lefthand SAN. VMWare VSphere 4. HP DL380 G6 Clustered servers. Exchange 2007 (2010 coming in 2011). Citrix XenApp 5. Checkpoint Firewalls. Cisco Switches.	VMWare. Citrix. HP Blade system (Matrix).
Accreditations	MS, Citrix, NetApp.	PCI-DSS, ISO27001, MS, Citrix, VMWare, Blackberry & Redhat Partner.	MS, Citrix VmWare.	PCI-DSS Level 1.	Unknown.
Minimum Term	1 Month	12 Months	3 Months	12 Months	Unknown
C5 Comments	Basic offering using proven technology. DR, SLA & Data Security Weak. Has the most experience in the Hosted Desktop market in Jersey.	Best of the hosted desktop bunch. Good DR capability, Data Security but Basic SLA. Too pricey though. We strongly recommend they drop hosted desktop and move is to IaaS and SaaS only.	They are more into the dedicated application hosting SaaS. Information regarding the hosted desktop adoption is not publically available. Not tried and tested by industry.	2nd place in the hosted desktop arena. Good all-rounder. A compromise of price vs. quality and security of the offering. It runs primarily from Guernsey. Again we strongly advise them to move out of the hosted desktop space and focus on delivering private cloud, IaaS and SaaS.	Details too sketchy to comment. Only small customer base in Guernsey and no customers in Jersey. Product release has been repeatedly delayed. Itex have publically gone through a significant transition in recent months to re-shape the business to focus primarily on hosted services.

Appendix IV

Private Cloud Offerings:

Below is a matrix of the Private Could Offerings currently available in the Channel Islands. We believe 2e2 are in the process of building an offering in this area and again Itex declined to provide the information requested. We are strongly advising vendors to invest in Private Clouds as well as SaaS such as Exchange email, SharePoint and CRM.

Company	Foreshore	JT
Offering Type	Private or Public.	Private or Public.
Offering Name	Virtual Dedicated Servers.	One Source.
Offering Contains	Virtualised Server platform. This is a VMWare server with the required OS e.g. – W2003,W2008 or Red Hat Linux. (with remote management) Resource QoS included.	Virtualised resource pool where the customer can deploy one or more approved VM images within the purchased "computing unit" limits. Resource QoS included.
Storage Allowance	Depends on customer requirements.	Depends on customer requirements.
Standard offering Cost	Depends on customer requirements and specification of virtual server. (Capacity can be allowed to "burst").	Depends on customer requirements. Customer pays for "computing units" i.e. – IOPS, CPU Cycles.
Additional Options & Costs	Dedicated or contented bandwidth for connection to the virtualized platform is possible. Managed Firewall service. Enhanced Operations support.	Flexible - depends on performance, availability and functionality requirements. All solutions use the same core infrastructure.
Support Options	24/365.	24/365.
SLA	Yes limited	Yes extensive
Architecture	VMWare. HP Lefthand SAN. Cisco Networking.	Virtustream xStream Platform running in JT Data Centre. Virtualised private cloud. Remote web management Console. Designed to optimize Oracle, SAP and MS applications. Resource QoS (CPU, I/O, Memory etc.). Available managed or unmanaged.
Accreditations	Level 1 PCI-DSS, VMWare & Cisco certified.	ISO27001 and ISO9001and SAS70.
Backups, DR & Resiliency	VMWare configured in HA mode with VMotion. (If a virtualisation server fails, the VM will automatically be migrated and brought online on another virtualisation server.) This service is currently in single site mode. Dual site resiliency is coming soon with daily snapshot backups. (other backup options are also available).	Multi-site.
Minimum Term	12 Months.	Unknown.
Additional Info	Customer provided with VM. Dedicated separate accredited technical resource for networking and virtualisation. Customer is also provided with management console.	Only approved applications can be run on the platform.
C5 Comments	Clustered VMware is industry proven. Dual site DR capability is a concern as not ready yet. Very expensive compared to using private cloud but located in their racks. But look like they are heading in the right direction.	Seems a robust solution but has limitations regarding which application can be hosted. In C5's opinion they have the strongest offering in the IaaS space in the channel islands at this time.

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