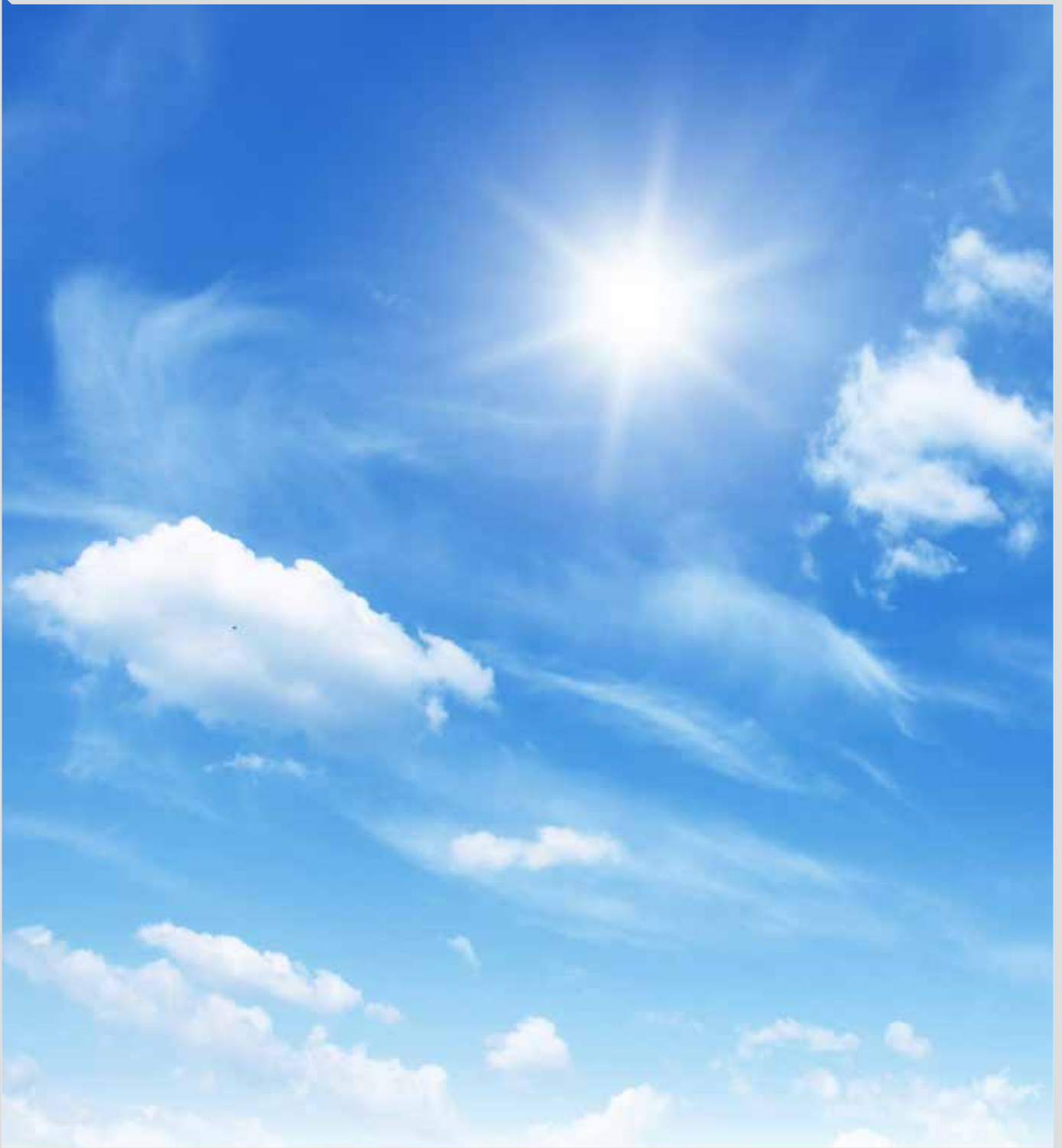


HOW TO MOVE TO THE CLOUD?

Take advantage of application migration to the cloud



INTRODUCTION

The role of cloud as a valid IT delivery platform is now accepted by many CIOs, IT directors and IT organisations, who see it as offering clear advantages. Arriving at this point has been quick and driven mainly by the Business Units (BU) rather than IT, and that brings challenges that need to be addressed.

The BU sees cloud as a cost saving because of the way it is purchased and costed. The CIO and IT department might agree with this but are all too aware of the complexity of IT and new technologies. They are also concerned as to how IT will be integrated when it is moved outside of the organisation. This is where a systems integrator can play a significant part in helping the business understand:

1. What applications go where
2. What type of cloud deployment model is most appropriate
3. The migration paths to the cloud
4. What the service requirements for cloud are, and
5. How to assess the return on investment

The potential benefits for both a systems integrator and an enterprise from the effective use of cloud are substantial. However, these benefits, like all infrastructure changes, need to be understood, planned and valid goals set in order to ensure that they do deliver on their promise.

CLOUD DOES NOT CHANGE THE BUSINESS RELATIONSHIP

The key for the systems integrator is that cloud does not change their relationship with existing customers. The five criteria above are no different from those that would be used to make any platform decision.

Business decision makers must also be aware that the underlying fundamental relationship with their trusted suppliers does not change when cloud is introduced. If their existing relationships currently include outsourcing or professional services in the architecture and deployment of IT, cloud is simply just another platform.

This paper looks at the practical issues for moving applications to the cloud. It addresses the need to choose the applications carefully and how to decide what type of cloud platform is suitable for delivering cloud benefits.

DATA CENTRE AND CLOUD LOCATION

In our recent whitepaper “No Cloud Is An Island”, we explained how different cloud models worked and the benefits of a model that encompassed private and public cloud models. The hybrid cloud, as it is known, is a foundation for delivering savings from a cloud approach. This is not just about savings from the reduction in CAPEX but the savings that can be achieved when the solution is OPEX-friendly as well.

One of the key elements for a systems integrator looking to build its own cloud infrastructure is finding a trusted data centre partner who can provide a carrier-neutral environment, which offers the flexibility required. Carrier-neutral colocation data centres offer a wide choice of carriers to source services from. This range of carriers enables a systems integrator not only to effectively manage the SLA for its service, but also to reduce the latency of its service delivery. The way in which these neutral data centres bring together “communities of interest” including systems integrators, cloud providers, carriers and enterprises, is fundamental in the successful delivery of hybrid cloud solutions.



WHAT APPLICATIONS GO WHERE?

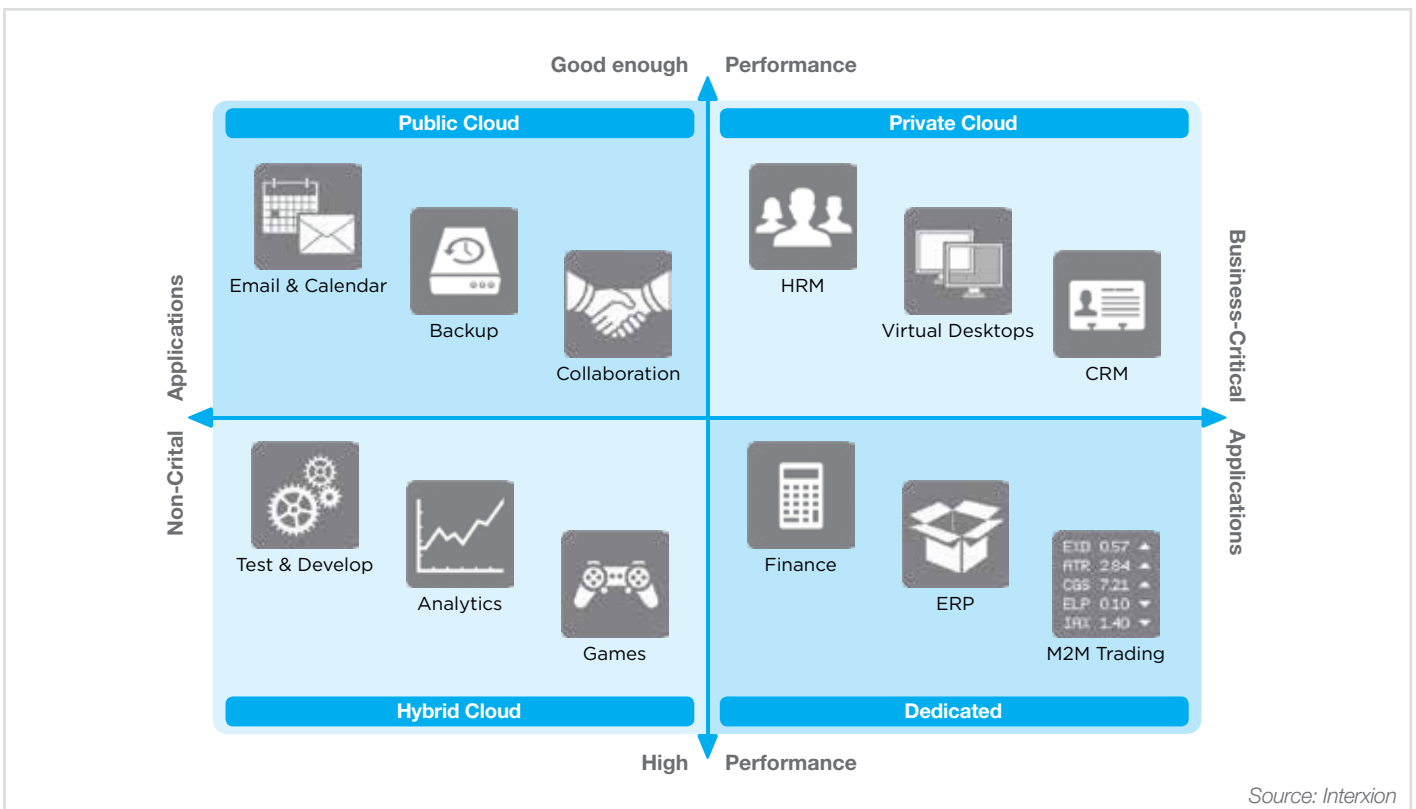
Not every application is suitable for cloud deployment and advising customers on what applications should be deployed in or out of the cloud can be complicated.

Preparation for cloud deployment of applications provides an ideal opportunity to review the application landscape that is in use. All organisations will have a mix of new, old and unused applications. There will unquestionably be a mix of versions of applications, often caused by the length of time it takes to roll-out updates and new versions. Another issue is unauthorised applications that have been brought in by users or departments to deliver business functionality that isn't provide by the IT departments.

Reducing this application pool to a reasonable size not only significantly reduces the threat landscape from unpatched software. There are further significant savings to be made from the reduction in software licences that are required. In recent analyst briefings from IBM and HP, they have seen a 60% reduction in the application landscape as part of the planning for cloud.

Application rationalisation will also provide an opportunity to decide which applications are business-critical and which applications can be deployed to the cloud. Whether to locate an application in the cloud or keep it local can be a complex decision:

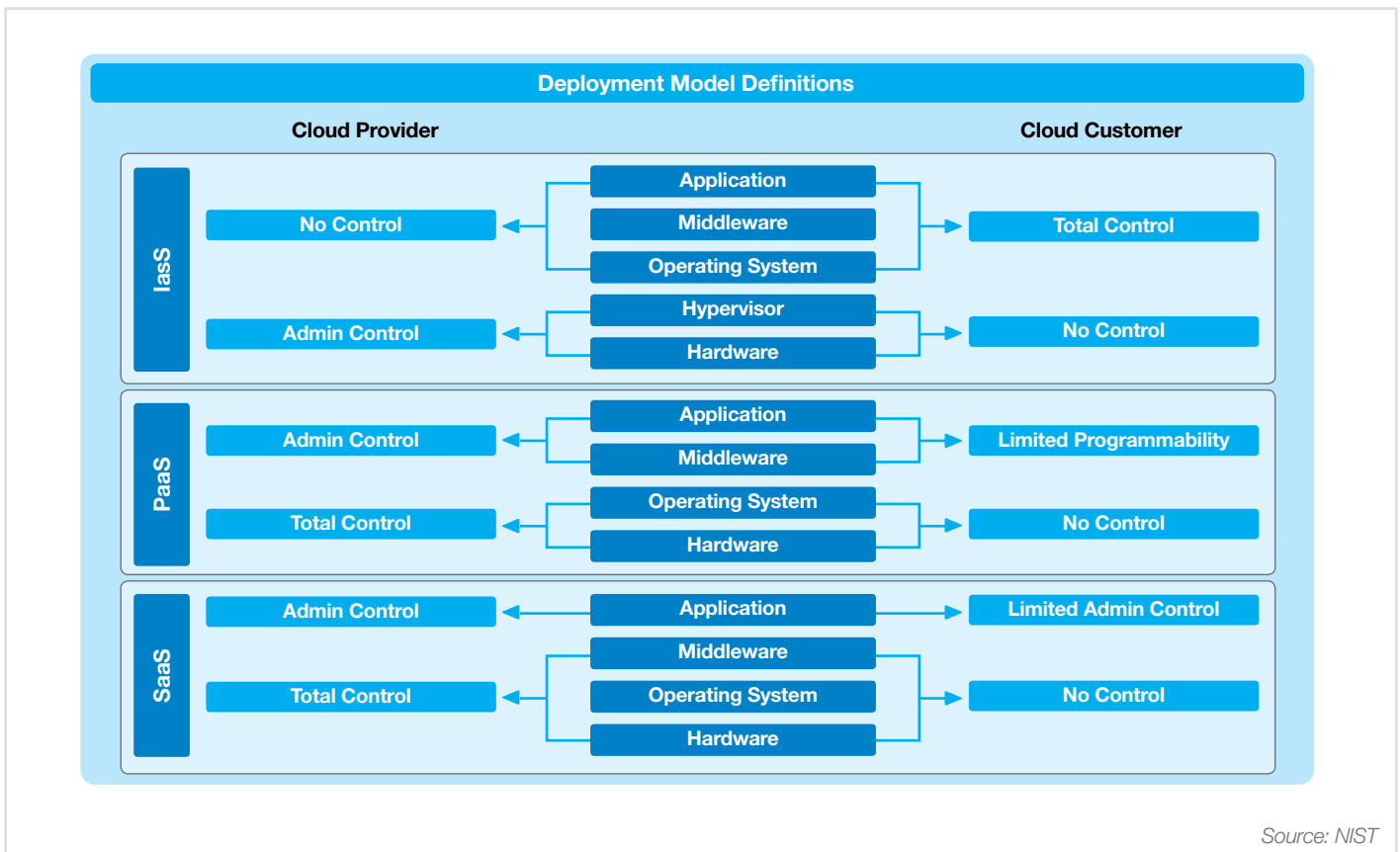
1. Is the application data business-sensitive?
2. Where will the data be held: locally, or in the cloud with the application?
3. Can the location of the data be determined to ensure that compliance is adhered to?
4. Is the application business-critical?
5. Does the cloud provider offer better disaster recovery capabilities than you currently use?
6. How is data secured?



The diagram demonstrates how cloud, location, performance and applications can be brought together. General applications such as e-mail and collaboration are not high performance and can be placed on public cloud. At the other end of the spectrum are applications that are business-critical, highly sensitive and require high performance systems, such as ERP, finance and M2M trading. These are best run on dedicated systems where the business can provide security and risk analysis.

WHAT TYPE OF CLOUD DEPLOYMENT MODEL?

There are three key deployment models that underpin the right cloud migration path to take.



Infrastructure as a Service (IaaS):

IaaS is a basic cloud service. It provides resources such as virtual machines (VM), network load balancers, storage and connectivity. To take advantage of this model, computing resources such as CPU, memory, storage and network are added to a VM and then an application is deployed into that same VM.

While the underlying platform is managed by the cloud provider, the user of the platform is responsible for maintaining their applications and taking backups. Some cloud providers may offer a backup option for the VM to another location to provide a level of disaster recovery but the user still has to consider if they should be taking off site backups.

Platform as a Service (PaaS):

PaaS is a computing platform, operating systems, databases and applications delivered by the cloud provider. Customers deploy onto, and developers write code for, the PaaS.

This is often a highly automated and scalable environment. The management tools ensure resources are provisioned when demand reaches a given level. The cloud provider maintains the platform and patches the operating systems, web servers and databases.

Software as a Service (SaaS):

The application software is installed in the cloud and accessed by the user only when needed. The cloud owner manages the software and owns the licenses and effectively rents the software to the users which means they make significant savings by only paying for software when they are using it.

CHOOSE YOUR MIGRATION PATHS TO THE CLOUD

According to Gartner, there are five key migration paths to a fully enabled cloud environment: (1) re-host on IaaS, (2) re-factor for PaaS, (3) revise for IaaS or PaaS, (4) rebuild on PaaS, (5) or replace with SaaS. Each of these has their pros and cons and offers opportunity for the systems integrator to add value.

Re-host on Infrastructure as a Service (IaaS)

Applications are migrated into virtual machines and then deployed on IaaS. A quick win for IT with immediate cost savings and access to additional resources. There are times when data may be a problem here. Regulatory requirements may demand data is held within a geographical area for security. Application access to data that is kept locally and not uploaded into the cloud could well pose a challenge in terms of available bandwidth.

Pros	Cons
<ul style="list-style-type: none"> • Speed: Applications can be easily moved from physical to virtual using a variety of tools and the application can then be uploaded directly to the cloud provider's environment. • Cost savings: No local hardware to buy and no power or cooling costs. 	<ul style="list-style-type: none"> • Scalability: Customer is responsible for adding or removing resources, which can lead to a delay in incident response. • Maintenance: Customer is still responsible for the maintenance and patching of their virtual machines. • Distributed applications: These require careful checking to ensure that all relevant elements of the application have been captured in the virtual machine otherwise the applications will fail. • Backups: If data is uploaded, there must be off-site backups by the customer.

Re-factor for Platform as a Service (PaaS)

Applications run natively on the PaaS rather than being installed in customer VMs. This leads to a better level of integration between the applications inside the PaaS and allows the customer to focus on applications rather than the platform. One challenge that must be overcome is the integration of applications on PaaS and those kept on-premise by the customer. Issues over data security and bandwidth are the same as for IaaS.

Pros	Cons
<ul style="list-style-type: none"> • Familiarity: Developers are using the same languages and tools that they currently use. • Integrated management: Operations teams are using a single management tool to manage local and cloud based systems. • Savings: No need for retraining the IT department to learn new management tools or languages. • Scalability: As more resources are required, they are dynamically allocated ensuring that systems keep running. As the demand dies down, resources are re-allocated. 	<ul style="list-style-type: none"> • Lock-in: There is a risk of lock-in when the developer embeds access to other services from the cloud provider. This can be avoided by sticking to the capabilities of the generic languages and frameworks. • Missing capabilities: Only those features supported by the cloud provider will be available in the development and support frameworks. This may mean that early in the cloud provider's deployment, there could be limitations on what can be achieved.

Revise for IaaS or PaaS

Revising for IaaS and PaaS is ideal for customers who want to extend existing applications to the cloud as part of a distributed application landscape. Developers take advantage of the applications delivered in the PaaS and extend on-premise applications to take advantage of new features. The major challenge is for the developers to understand the issues involved in writing distributed applications.

Pros	Cons
<ul style="list-style-type: none"> • Performance: Application extensions that are written to perform natively on the cloud platform will run faster and take advantage of features that may not be available on the existing platform. • Faster time to market: Writing new front-ends to legacy applications means delivering quick wins to Business Units. • Integration: Highly integrated applications will make it easier for business units to take advantage of IT systems and the data they contain. 	<ul style="list-style-type: none"> • Slower time to market: If the entire application is to be moved to the cloud and then extended to take advantage of new services, this is likely to take quite some time before benefits are available

Rebuild on PaaS

As cloud matures, developers will begin to treat it as a first-class deployment platform. Applications are architected to take advantage of cloud services and interoperate with core systems. This is a complex integration challenge that builds on the integration lessons from “Revising for PaaS”.

In addition to the revise path, the customer can make significant savings from no longer supporting large scale legacy applications. Getting the service levels and disaster recovery processes right is essential.

Pros	Cons
<ul style="list-style-type: none"> • Performance: Applications that are written to perform natively on the cloud platform will run faster and take advantage of features that may not be available on the existing platform. • Savings: Moving from large legacy hardware estates that are often expensive to maintain and run will result in significant cost savings • New platform features: Taking advantage of the new features inside the cloud provider’s platform will save the IT department having to add those to existing applications. As a result, this should generate a higher ROI than the Revise option. 	<ul style="list-style-type: none"> • Lock-in: Once applications have been tightly integrated with the service provider’s platform, it may be difficult to move from that platform to an alternative supplier

Replace with Software as a Service (SaaS)

SaaS offers major savings by lowering the cost of using applications. Users rent rather than buy application licences. When the application is no longer needed, the licence is handed back. For flexible workforces or where contractors are used, the savings are at their highest.

There are challenges with SaaS. The first challenge is that the applications need to be designed for cloud delivery. The second is whether the data should reside locally or in the cloud. This third is ensuring that the software manufacturer is willing to license their software for delivery through SaaS. There are already examples of SaaS-ready applications in the area of office productivity, CRM, databases and data analysis tools.

For some mid-sized organisations SaaS offers an exciting opportunity by providing access to applications that were too expensive to be justified previously.

Pros	Cons
<ul style="list-style-type: none"> • Cost savings: No local hardware, no software licences and no power or cooling costs. This is virtually the same as an outsourced solution with the benefit of flexible resource allocation for workload flows. • Access to high value enterprise software comes within the reach of SMEs who can now afford to deploy software that can offer a competitive advantage. • Scalability: This is handled automatically by the cloud provider through their SaaS platform. 	<ul style="list-style-type: none"> • Lock in: For commodity software such as office-based applications this is not an issue, but where the software needs significant customisation, any breakdown in the business relationship between the business and the cloud provider could be a problem.



WHAT ARE THE SERVICE REQUIREMENTS FOR CLOUD?

One of the most important elements of cloud delivery is the Service Level Agreement (SLA). With applications and potentially data in the cloud, there is a requirement for the SLA to reflect this change of business process and the risk to customers of not being able to access applications or data.

Realism: Expecting 99.9999% uptime is unrealistic. Only an extremely small number of organisations get close to this figure with their on-premise solutions. For cloud, where there are many more variables that will impact performance, this is a wholly unrealistic target. Rather than use unobtainable numbers, it is important to identify key metrics for the SLA and how these will be priced.

Latency: If the application is latency sensitive, it is critical that the data and application are located in close proximity, ideally within the same data centre.

Set a performance baseline: Metrics only work if there is something to compare them with. Part of the cloud migration planning should include application profiling. This will provide an indication of how applications use resources and what levels of performance are currently being achieved through the on-premise installations. This data is ideal for setting base metrics and then deciding on what additional levels of performance are required.

Certification: The cloud platform provider has the opportunity to ensure that they conform to a range of international standards for data centre operations. These range from power efficiency to security standards. Organisations looking to take on cloud services should ensure that their partner is, at the very least, meeting the same standards as they do. Those that meet the most stringent standards will attract a premium price for access to their facilities and services.

Resolution: With any service-based agreement there is always the potential for failure. There should be a very clear approach to how any dispute will be resolved. This should start with the SLA which will detail response times and how an issue is notified. The more business-critical the system, the shorter the response time, and therefore the more important it is that there is a clear, unambiguous and effective process to escalate any issues.

Compensation and cost:

Compensation levels should be clear and at the front of the SLA. They will identify what can be expected should the SLA be breached and how any compensation will be applied. Transparency is important and a clear process will improve customer relationships.

Always on: Disaster recovery and business continuity are still challenges for enterprise IT. Part of a premium SLA will show what the process is for ensuring business continuity, and how the disaster recovery process can be invoked.

HOW TO ASSESS THE RETURN ON INVESTMENT (ROI)

The key ROI for cloud is often seen as savings related to CAPEX. This is a very limited objective and ignores other costs, savings and benefits. It also assumes that the OPEX of moving to cloud can be kept within existing financial budgets.

The real ROI for cloud is about the costs that it would take to deliver the same level of service internally. This includes hard and soft metrics such as uptime, user experience, cost of hardware / software, integration, cost of bandwidth, data centre power and cooling costs, and staff costs

To some degree these are the same basic metrics that are applied to all IT projects. The key to establishing an ROI on cloud is to look at what a cloud solution enables that could not have been achieved using existing IT systems or platforms. This should be thought of as a cloud premium

The most effective way of determining the cloud premium as part of the ROI is to compare the business case with what cloud offers. When doing this, consider what it would cost to deliver this using existing IT infrastructures and tools. This will help clarify what is cloud premium and what is simply a benefit from more flexible processes.



Business Case	Cloud Premium
Reducing the cost of development and testing environments:	<ul style="list-style-type: none"> • The speed with which a testing environment can be provisioned • Ability to do more intensive and extensive testing of applications • Access to high value test tools on demand via SaaS • Access to test professionals in different locations
Scalability:	<ul style="list-style-type: none"> • Ease of adding additional compute, network and/or storage resources on demand • Ability to shrink resource pool when not required
Competitive advantage:	<ul style="list-style-type: none"> • Faster time-to-market for new applications and solutions means new market opportunities can be quickly explored • Speed of identification of trends and designing competitive solutions • Lower cost of IT releasing more money for other parts of the business

THE ROLE OF THE SYSTEMS INTEGRATOR

For many businesses, building a private cloud is a complex process. Just a few years ago, they were being told that virtualising their data centre would turn it into a private cloud. While they gained some performance improvements and saved on some CAPEX, they have never achieved the savings or business agility that they expected.

Having experienced these challenges building a private cloud, today's task of integrating public cloud projects to build a hybrid cloud solution has been even more challenging. Part of the problem has been the poor implementation of tooling by cloud providers and the lack of federated security and management tools but these are not the only issues.

Financially, the stress on enterprise IT department budgets mean that they lack the funding to understand cloud. They also lack the necessary skills to manage complex integration projects across delivery platforms. Many of them already use trusted partners such as systems integrators to help them through this. When moving to cloud, it makes sense, therefore, for the systems integrator to be part of that new integration project.

WHAT DOES THE SYSTEMS INTEGRATOR ADD?

The systems integrator brings an understanding of the complexity of large projects. Their business model is built around helping customers understand multiple platforms and to deploy their IT infrastructure where it can be most effective.

In the cloud, the systems integrator has an opportunity to not only extend their existing relationships with enterprise customers but to add a new dimension. Cloud helps glue different platforms together, and allows the systems integrator the opportunity to build a platform tailored to their customers.

Integration between platforms, the need for federated management and security tools, along with the ability to deliver on industry standards plays to the strength of the systems integrator. However, these are not the only areas where the systems integrator adds significant value. Systems integrators are able to deliver cloud-based SLAs to enterprise customers.

MANAGING A CLOUD-BASED SLA

Managing a cloud-based SLA starts with two clear lines of separation. The first is what part of the application or service is cloud and what part is not cloud. The second is establishing who is responsible for monitoring: systems integrator or customer.

The systems integrator will base their metrics on the SLA that they are given by carriers and their carrier-neutral data centre partner. This is important as only the systems integrator will know what the base SLA can be. By using multiple carriers, they can improve on an SLA but not by much and it is important that they do not over promise.

Clear and unequivocal metrics are central to any management of an SLA. Uptime is an example of a metric that might seem clear, but is far from unequivocal when it comes to the provisioning of a service. As cloud is about the delivery of a service or application, the best way to monitor its performance is to set metrics that are based on the performance and availability of an application.

Once the SLA has been set, the systems integrator can see metrics and data across the whole cloud, enabling them to identify issues. The customer, through the use of federated monitoring and management tools will be able to see what happening to the services they are using. As both parties will be using the same base data, it will be relatively easy for the systems integrator to identify and rectify SLA breaches.

To gather the right data, agents or monitoring software need to be deployed at the key points throughout the cloud environment. The data gathered by these agents needs to be consumed by the existing management tools used by both the customer and the cloud provider.

HOW TO STAND OUT?

The SLA is not the only element that makes the difference between cloud providers. Security, reliability, bandwidth and community are also important.

Security

While there is little empirical evidence that security is better managed by a cloud provider, the systems integrator does offer added value, as a systems integrator can typically manage a multi-tenant cloud more efficiently. Some of that value comes from their choice of data centre partner, who will be responsible for physical protection of the facility.

Many systems integrators have existing security practices that can be used to improve security beyond that which a customer could achieve on their own. The systems integrator can also ensure that security between the cloud and the internal systems is part of the whole solution.

It is important that the systems integrator conforms to the best international security certifications. These make a significant statement about the commitment to protecting customer data. With regulators introducing ever tougher rules on data protection and privacy, systems integrators that deliver a highly secure cloud, will stand out from those who do not.

Reliability

A major reason for moving to cloud-based IT is to get a higher level of reliability. Access to disaster recovery and business continuity solutions are services the systems integrator can extend to cover existing customer solutions.

Bandwidth

A carrier-neutral data centre provides the systems integrator with partners capable of building a fault-tolerant, high bandwidth cloud. To help link customers' existing data centres and cloud-based services, the systems integrator can sign agreements with carriers to provide leased lines. This increases performance, reduces latency, adds security and strengthens the SLA.

Community

It is more than possible for the systems integrator to build a successful business offering just IaaS, PaaS and SaaS. However, the business opportunities to evolve the existing systems integrator/enterprise IT relationship open up additional possibilities.

Among these are community or specialist clouds where the systems integrator can focus on building solutions in their preferred area of expertise. Examples are health services, local government, accountancy and manufacturing. Building these focused clouds allows the systems integrators to show a migration path to the cloud and a value proposition for customers.

Services and specialist clouds will be a key battleground for cloud providers. By taking early decisions, systems integrators will be able to position them at the heart of this battle.

CONCLUSION

Cloud offers system integrators a huge opportunity to move from being service-based to running their own infrastructures and widening their appeal to customers. As customers look to move away from CAPEX to OPEX across their IT budget, SIs can leverage cloud environments to enhance their relationships with existing customers and open up new markets.

Transformation of business models requires a bold approach. Companies like Apple, Amazon and Netflix transformed their business models a decade ago. Since then, record stores, book shops and video rental companies that failed to spot the trend have ceased to trade. Even those still around are struggling to adapt to the changes brought about by Apple, Amazon and Netflix.

Cloud now gives SIs that same opportunity to change their business model and transform their business. While others in IT are building out infrastructure, SIs can leverage their existing experience in integration of disparate systems and deliver an adaptable cloud model that allows businesses to seamlessly grow into the cloud.

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Ian Murphy has worked in technology as a journalist and analyst since 1983. He has written for a number of titles in computing; Computer Weekly, Techworld, Datacentre Times, IT PRO, Data Business, International Developer, Know Your Mobile, Anywhere You Go, Windows NT Magazine, EXE, and Cloud Pro. As a freelance analyst, Ian has worked for Philips Global Media, Ovum, MWD and Creative Intellect Consulting writing reports and consulting with a number of large technology businesses, writing white papers and giving keynote presentations at major IT shows.

Jelle Frank (JF) van der Zwet manages the pan-European marketing and product development programme for Interxion's sizeable and fast-growing cloud community. He has over 12 years of experience working in ICT product and business development. Prior to joining Interxion, he was responsible for product management and marketing of managed services at Imtech ICT, and was Senior Product Marketing manager at UPC. Jelle Frank began his career working in marketing management positions for KPN and Amsterdam Schiphol Airport.

ABOUT INTERXION

Interxion (NYSE: INXN) is a leading provider of carrier and cloud-neutral colocation data centre services in Europe, serving a wide range of customers through over 35 data centres in 11 European countries. Interxion's uniformly designed, energy efficient data centres offer customers extensive security and uptime for their mission-critical applications. With over 500 connectivity providers, 20 European Internet exchanges, and most leading cloud and digital media platforms across its footprint, Interxion has created connectivity, cloud, content and finance hubs that foster growing customer communities of interest

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