

HOW TO BUILD A BETTER CLOUD

PART TWO: IMPLEMENTATION

Key considerations for your hybrid cloud journey

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INTRO

Part One of 'How to Build a Better Cloud' covered the planning phase - business needs assessment and outcomes definition, service catalog creation and delivery model analysis, readiness and interoperability assessment and internal engagement for a hybrid cloud journey.

This paper covers the next steps, setting out some of the key considerations when putting these plans into practice. Where to build your private cloud so that it interconnects seamlessly with your public cloud partners and applications. Accessing the cloud marketplace. What to look for in cloud providers and implementation partners. How to avoid lock-in and ensure maximum flexibility and the best possible management and performance.

The topics covered here are intended to give IT Directors, CIOs and CTOs, reminders and ideas, with access through online sources and further reading to deeper information. However, they are also meant to be accessible for non-technical senior managers who are embarking on the hybrid cloud journey. As pointed out in Part One, the cloud presents new business opportunities in every functional area, and requires a closer level of cooperation and understanding between IT and the rest of the organization than ever before.

Cloud drives cultural change. For the most ambitious businesses, it can be the foundation for a process of digital transformation. A shared understanding of the key moving parts of the cloud is a useful starting point for the new habits, discussions and creative interactions that will take place on this journey.



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The road to the cloud.

(Don't forget the)

BENEFITS OF THE CLOUD

Flexibility

Scalability: Cloud infrastructure scales up – and down – to support fluctuating workloads

Storage choice: Choose public, private, or hybrid storage offerings to suit

Control: Set your level of control with as-a-service options, i.e. software as a service (SaaS), platform as a service (PaaS), and infrastructure as a service (IaaS)

Security: Virtual private cloud, encryption, and/or API keys help keep data secure.

Efficiency

Accessibility: Apps and data accessible from any Internet-connected device

Speed to market: DevOps in the cloud speeds time to market

Data security: Network backups avoid loss of data through hardware failures

Equipment Savings: Using remote resources saves on cost of servers and more

Pay as you go: Utility structure means users only pay for the resources they use.

Competitive edge

Streamlining: Cloud service providers (CSPs) manage underlying infrastructure, allowing you to focus on the front end

Fresh Tech: Service providers regularly update ensuring the latest technology

Collaboration: Worldwide access means geo-independent teams

Speed: You can partner, create and move workstreams and solutions faster.

LOCATION, LOCATION, LOCATION.

If the infrastructure that you are proposing to shift to the cloud is still in your own data center, now is the time to move into cloud-neutral colocation. Cloud traffic is migrating to neutral data centers at a breathtaking pace. According to Cisco, CAGR is 33%, and by 2019 86 % of workloads will be processed by cloud data centers, with only 14% processed by traditional data centers.

One of the reasons for this seismic shift is that cloud-neutral data centers are optimal locations for hybrid clouds, coupling private clouds for latency/compliance sensitive applications and data with the scalability of public clouds. Cloud-agnostic and carrier-neutral, they also comply with world-class uptime and sustainability standards, as well as sector-specific certifications. Cloud-neutral data centers bring the cloud marketplace to the user, housing partners that can help IT teams back up data, orchestrate multiple clouds or synchronize data across multiple devices and locations.

Flexible cloud interconnection is also key. Many neutral cloud data centers now offer cloud exchanges, such as EvoSwitch's OpenCloud exchange, which use vendor-neutral, widely accepted standards for the benefit of service providers, brokers and users.

The genuinely neutral exchanges allow real-time trading of bandwidth, supported by a bilateral contract with suppliers. They provide high-speed, secure and cost-effective access to the broadest possible range of cloud service providers and partners, including, but not limited to, large IaaS players like Microsoft, Amazon, Google, Rackspace, Softlayer or VMware.

Businesses can also evolve easily into cloud service providers in this environment, building or commissioning their own cloud services using open source cloud development partners. Businesses that join these fast-expanding cloud marketplaces can provision and deprovision resources based on context, application, desktops, and business unit. This makes them much more agile and constitutes a significant step up in digital transformation capability.

OpenCloud offers low-latency routes directly to the public cloud providers and partners you need.



THE CLOUD LANDSCAPE

The definition of cloud has expanded over the last few years, and the range of public platform, infrastructure and software services is still growing fast. But - at the platform and infrastructure level - there are still just a few famous names that lead the sector.

The following are the top three:



+ AWS - 'the iphone of the cloud' - still holds by far the largest market share globally, but like the iphone, the competition is closing the gap. AWS offers a huge range of services with winning performance, but requires a more DIY approach, mainly due to their lack of existing business apps.



+ Microsoft Azure is well represented by partners in Europe, has the benefit of seamless integration with onsite MS apps like Office, SQL and Visual Studio, and is increasingly well integrated with open source developer platforms like Linux. The platform is currently catching up to AWS.



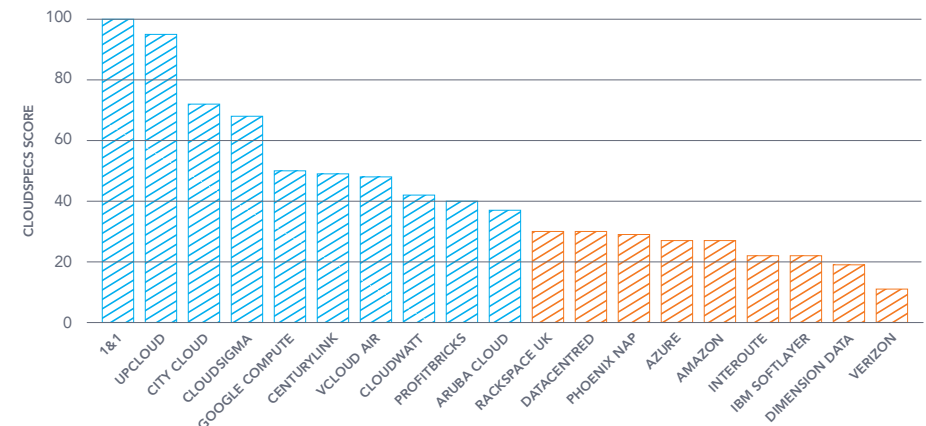
Google Cloud Platform

+ Google Cloud offers access to the custom-built solutions and infrastructure that have driven Google's global success. The platform is perfect for Google Apps with a particularly strong Big Data portfolio.

If you choose to locate your infrastructure with a major service provider, the breadth of additional services tends to be key to the selection decision. These parameters will have been mapped already in your Service Catalog (see Part One, Planning). But remember, although the infrastructure business looks like an oligopoly, there is no default provider, and you should consider the potential for working with more than one. It's simply a question of best fit with your business.

There are many more providers than 'the big three', with much to recommend them. In a recent price-performance evaluation by CloudSpecs of the leading European IaaS providers, Google, Azure, and AWS were rated as #5, #14 and #15 respectively.

Overall CloudSpecs Ranking



PICKING A PARTNER

IaaS and PaaS tend to be delivered through partner businesses with local infrastructure and experts. The alternatives are either self-management or contracting of a third-party integrator. Self-management is ideal if this is manageable, but this is unusual. Generally, it is necessary to involve specialists for design, implementation and orchestration.

13 | Third party consultants can deliver excellent value over a short project. However, the fact that it is often not possible to build a long-term relationship means that the relationship is not so investable, so responsibilities and liability need to be very clearly set out at the beginning.

Top 10 questions to ask prospective cloud partners:

When you are getting to know a cloud partner, don't forget the obvious questions:

1

Can you prove how reliable you are? Your standards and certifications need to match ours.

2

What are your T&Cs? Not your IaaS providers, yours. If something goes wrong can you fix it or do you pass it on?

3

Will you commit your staff to spending significant amounts of time on-premise?

4

Do you have an issue with working weekends, e.g. for migration?

5

What are your hours? (when it comes to critical data, 9-5 won't do!)

6

Can you show me some satisfied customer content like customer cases and endorsements?

7

Have you got experience in my sector? (check the website; ask for contact with previous customers).

8

Do you sell competing products? Look out for potential conflicts of interest.

9

Does your portfolio (and footprint) map to my digital needs, not just now but as I grow? (and how fast are you growing anyway?)

10

Just how well do you understand the product you are selling? (come and present the features to the team and explain the opportunities they offer).

For most, delivery through a partner business is a good option, and there are many excellent providers to choose from. To find the right vendor - one that has a lot of experience and successes under its belt with businesses similar to yours - you will need to dedicate significant effort to research.

Talk to your colocation provider; we want your implementation to work first time and have years of experience in migration and troubleshooting, as well as good working relationships with a range of service and connectivity providers. Sign up and research groups and associations. Remember that face to face communication is often fuller and franker than published material, so attend events.

When you have a shortlist, request statistics on reliability (uptime, availability) and security. Ask for and follow up references. Meet with other clients that are of a similar size or have similar needs and find out what they have learned from their own cloud experiences. Ask about pricing. Ask about the features they are getting and which ones they wish they were getting. Ask about any security and reliability issues. You need to know everything that could possibly go wrong in order to stop it happening.

AVOIDING LOCK-IN, ENABLING GROWTH

While there is potential for waste, consider using more than one provider because this lets you compare partners in a real-world situation. It is perfectly practical – and becoming increasingly common – to have a hybrid between multiple clouds, or to run multiple solutions across multiple clouds. As mentioned in Part One: Planning, Rightscale estimate that enterprises are running applications in an average of 1.8 public clouds and 2.3 private clouds and experimenting with around the same number in each category. As time passes, you can migrate more to the one that you like the best. Regard this flexibility as an investment. Migration is a disruptive process and this is a long-term move, so it's important to get maximum flexibility and optimum support.

Again, geography should come into your considerations. Factors like emerging data protection regulations and IoT/Machine-to-Machine communications can require major infrastructure extensions. Also, your cloud infrastructure should be ready to support you in new markets. Regional reach and redundancy can be enabled through the flexible interconnections in a cloud-neutral data center. Pick your traffic region, add an availability zone, and include backup sites to overcome any Single Point of Failure. Then provision your server and configure your services. The process is straightforward and – in a carrier-neutral environment – cost-effective. Then you can expand to other zones and regions as needed.



**YOUR CLOUD
INFRASTRUCTURE SHOULD
BE READY TO SUPPORT
YOU IN NEW MARKETS**

SERVICE LEVELS & PERFORMANCE

Standard SLAs tend to fall short when it comes to hybrid cloud deployments, as each hybrid deployment is different. SLAs need to establish clear guidelines of engagement for both the user and service provider.

19 | The SLA should address three primary risk areas:

Data

Who secures the link when data leaves the private cloud? There are privacy and integrity concerns associated with this data movement because the privacy controls in the public cloud vary significantly from the private cloud. The SLA should address data custody, control, possession, and right of return.

Compliance

Businesses still need to comply with regulations that pertain to data governance, even if data leaves the premise. SLAs need to clearly outline the service provider’s compliance with regulations like Sarbanes-Oxley, healthcare data or payment standards (PCI).

Audit

SLAs should cover access to the documents necessary to demonstrate compliance to an auditor and also specify who pays for the service provider’s time during an audit.

Availability and Performance

Availability generally means different things depending on the services offered. For IaaS, availability is usually defined in terms of infrastructure, such as cloud servers and storage. For PaaS, availability may be defined in terms of functionality and access to the platform, and for SaaS providers, availability will be defined in terms of application and data availability. Ensure that guarantees and definitions are clearly outlined in the SLA.

Outages & Updates

What happens when a portion of the hybrid cloud becomes unavailable due to an outage or a natural disaster? Whether the problem occurs in the private cloud or the public cloud, the SLA should spell out a coordinated and transparent process so that both parties work together to resolve the problem at hand. Update schedules should also be clearly defined in the SLA.

SECURITY: FIRST & LAST

21 | One of the great benefits of the cloud is the variable levels of security it can bring, with built-in encryption, and/or API keys to help keep data secure, as well as dedicated service providers offering the latest solutions to security challenges. There is also an increasing range of specialist security solution providers, many of them focused on identifying danger signs from user behaviour.

However, with the growth in cyber attacks, in particular data theft, DoS and DDoS, security represents one of the cloud's greatest challenges. Security should be central to the cloud delivery models you select at the outset of your cloud journey, and it should continue to be central to your day-to-day cloud management.

By evaluating and managing the security of your cloud services, it is possible to mitigate risk and maintain, or even surpass, the levels of security in the traditional IT environment. But this requires a very rigorous and transparent approach.

Key considerations should be:

- + Ensuring effective governance, risk and compliance processes are in place
- + Auditing operational and business processes
- + Managing people, roles and identities
- + Ensuring adequate protection of data and information
- + Policing and enforcing privacy policies
- + Assessing security provisions for cloud applications
- + Ensuring cloud networks and connections are secure
- + Evaluating security controls on physical infrastructure and facilities
- + Managing security terms in the cloud service agreement
- + Understanding the security requirements of the contract conclusion/exit process

Top 10 security questions to ask prospective cloud providers:

Expect convincing answers to the following questions, but make sure the responses are also reflected in your contract:

1

Who can see my information?

2

Is my data located in multiple data centers in different locations so that it is protected from regional attacks?

3

What redundancies do you have in place to protect my data?

4

What specific measures do you take to encrypt my data?

5

How do you manage encryption keys?

6

What happens and how will you restore my data if there is a crash or cyberattack? *(Also how long will it take to complete a request to clone or refresh a database or application?)*

7

What security certifications do you have?

8

Are you compliant with the latest security protocols?

9

If a breach occurs, what are the provider's policies regarding disclosure, and how long before you are notified?

10

If you are a reseller, who is responsible for service and support?

CONCLUSION: THE ROAD TO THE HYBRID CLOUD

While the stages and considerations set out in this and the previous paper on planning are by no means exhaustive, they will hopefully give readers planning the move to hybrid a framework for discussion as well as some fresh ideas:

Part 1: Planning

- + Business needs definition
- + Outcomes definition and articulation
- + Cloud Portfolio/Service Catalog creation
- + Cloud Delivery Model analysis
- + Culture check, internal stakeholder engagement program
- + Cloud Readiness Assessment, budgeting, ROI analysis
- + Cloud Roadmap launch
- + Resource Review: data and team

Part 2: Implementation

- + Cloud-neutral colocation and marketplace access
- + Cloud provider selection
- + Expert partner assessment and selection
- + Multi-cloud approach and geographies
- + SLA and Security, processes and considerations

A final few words. Dedicating your valuable time to the research, planning and negotiation necessary to build a better hybrid cloud will pay major dividends. Handled correctly, it will drive profit from cost, putting IT at the heart of new product development and revenue generation, enabling the expansion – and ultimately the transformation – of your business.

SOURCES & FURTHER READING

McAfee State of Cloud & Security

www.mcafee.com/us/solutions/lp/cloud-security-report.html

Cisco Cloud Index

http://www.cisco.com/c/en/us/solutions/collateral/service-provider/global-cloud-index-gci/Cloud_Index_White_Paper.html

Public IaaS Competition webinar

<https://www.sitepoint.com/a-side-by-side-comparison-of-aws-google-cloud-and-azure/>

Very readable comparison AWS to Azure

<http://www.euroitgroup.com/aws-vs-azure-cloud-computing-comparison/>

Azure v AWS deck

<https://www.slideshare.net/rightscale/azure-vs-aws-best-prac>

Shifting market shares big three

<http://www.cnbc.com/2017/04/27/microsoft-azure-growing-faster-than-aws-google-cloud-behind.html>

Shared Responsibility

<https://blogs.msdn.microsoft.com/azuresecurity/2016/04/18/what-does-shared-responsibility-in-the-cloud-mean/>

CloudSpectator Top 10 European CSPs

<http://connect.cloudspectator.com/european-cloud-service-providers-report-download>

SLA Guide

<http://www.cloud-council.org/deliverables/practical-guide-to-cloud-service-agreements.htm>

Security 10 Steps (2015 version)

<http://www.cloud-council.org/deliverables/CSCC-Security-for-Cloud-Computing-10-Steps-to-Ensure-Success.pdf>

There is a huge amount of free information available.
Here is a selection worth exploring:

News

The WHIR news and info: www.thewhir.com/category/cloud-computing

CloudTech: useful news stream: www.cloudcomputing-news.net

NetworkWorld from IDG: www.networkworld.com

Insights

Detailed planning: www.cloudindustryforum.org/content/cloud-adoption-roadmap

451 cloud research and insights: www.451research.com

Hybrid considerations: www.computerworld.com/article/2834193/cloud-computing/5-tips-for-building-a-successful-hybrid-cloud.html

EuroCloud pan-European know-how and standards: www.eurocloud.org

Performance and pricing analysis: www.cloudspectator.com

Groups

Spiceworks Cloud Computing & SaaS forum: www.community.spiceworks.com

Google forum: www.groups.google.com/forum/#!forum/cloud-computing

Linked in Virtualization & Cloud Computing Group:

www.linkedin.com/groups/57400/profile

Linked in Cloud Security Alliance: www.linkedin.com/groups/1864210/profile

Standards

European Cloud Standards Coordination: www.csc.etsi.org

Cloud Standards Customer Council: www.cloud-council.org

Training

Digitale Infrastructuur Nederland: Cloud University project:

www.dinl.nl/en/dossiers/cloud-university

Interactive learning: www.cloudindustryforum.org/content/e-learning-courses

Cases

CIO insights on cloud journey (hospitality, automotive, events, gaming):

www.i-cio.com/strategy/cloud/item/four-pioneering-cios-on-the-journey-to-a-cloud-centric-world

Financial services sector move to hybrid presentation: www.vimeo.com/152443510

Colophon

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