

CLOUD U

YOU WANT TO PUT MY DATABASE WHERE? Determining the Right Fit Between Your Technology and the Cloud, and When It Makes Sense to Stay In-House

Through this year-long series of whitepapers and webinars, independent analyst Ben Kepes is creating a Cloud Computing curriculum designed for technologists and non-technical users alike. The mission is to build widespread knowledge about the Cloud revolution and encourage discussion about the Cloud's benefits for businesses of all sizes. Read more CloudU whitepapers and register for upcoming webinars at www.rackspace.com/cloud/cloudU

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Executive Summary

Many organizations agonize over moving workloads to the Cloud and are hampered in their decision making process by a lack of non-biased information in the marketplace. In this report we give examples of the sorts of considerations business should look at when investigating a move.

These considerations span both business and technical issues and it is only through an honest appraisal of both of these drivers that the best decisions for a particular workload, within a particular organization, can be made.

Matching Technologies to Requirements – The Right Stuff in the Right Place

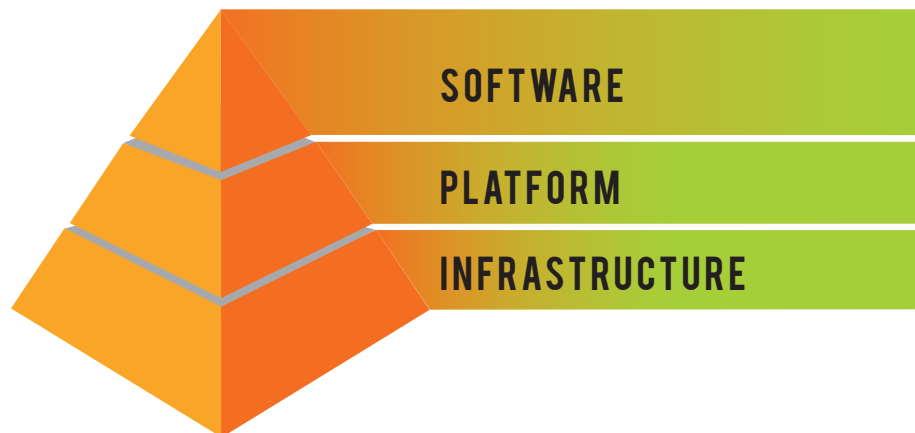
A theme we have reiterated in this CloudU series is that Cloud is for everyone but not necessarily for everything. What we mean by this is that almost all organizations have some requirements that we believe are appropriately delivered from the Cloud, but not all requirements should, in fact be Cloud based.

Given our contention then that Cloud is for everyone but not everything, organizations need to understand the different capabilities of Cloud solutions and look at those capabilities within the context of their own technical and business requirements.

We contend that organizations should look to move workloads where the capabilities of the solution closely match the technical and business requirements of their organization. This is especially true for organizations who are contemplating a move to the Cloud for the first time.

Refresher – What is the Cloud

Cloud is a term that covers a very broad range of services. As we detailed in a previous CloudU report¹ Cloud Computing is general depicted as a technology stack shown in the diagram below.



The Cloud Computing stack

This stack has three components;

- Software as a Service (SaaS), applications designed for end-users and delivered over the web
- Platform as a Service (PaaS), the set of tools and services designed to make coding and deploying applications quick and efficient
- Infrastructure as a Service (IaaS), the hardware and software that powers it all – servers, storage, networks, operating systems

Across these three parts of the Cloud, there are some consistent traits however. One of the best ways to explain what the Cloud is, and by extension to determine whether a product truly constitutes a Cloud offering, is by using an acronym developed by Dave Nielsen, one of the founders of the CloudCamp² series of conferences. This definition sees Cloud Computing described as OSSM (pronounced “awesome”). This simple concept stands for the following;

- On-demand: the infrastructure or hardware is already setup and ready to be deployed
- Self-service: the customer chooses what they want, when they want it
- Scalable: customers can choose how much they want and ramp up

if necessary

- Measureable: there's metering/reporting so you know you are getting what you pay for

Within the different parts of the stack there are different approaches, in particular IaaS has three particular approaches towards infrastructure. A previous CloudU report explained the differences between Public Cloud, Private Cloud and Hybrid Cloud.³

Public Cloud

Public Cloud is Cloud Computing infrastructure where the service is available to the general public or a large industry group. Additionally with the Public Cloud the service itself is owned by an organization selling Cloud services, and the same infrastructure is used to provide computing resources to multiple customers.

Private Cloud

Private Cloud takes many of the design cues from Public Cloud, but delivers IT resources in a way that the infrastructure or software is operated solely for an individual organization on dedicated hardware. Essentially, Private Cloud is a dedicated server or group of servers running multiple instances of virtual machines with the ability to scale up or down as demand changes.

Hybrid Cloud

Hybrid Cloud, as the name implies, is any pairing of Public Cloud with any other IT infrastructure. That could mean Public Cloud mixed with dedicated in-house servers, servers hosted at a service provider, or even Cloud-based servers from one or more Cloud providers.

Given this wide selection of services and delivery offerings that fall into the broad heading of "Cloud" this report will focus on IaaS and not PaaS or SaaS. We note however that many of the business and technical drivers for moving to IaaS also apply to PaaS and SaaS.

With an understanding of what Cloud is, it is now time to look at the business drivers for a move to the Cloud, in order to understand what should, and more importantly what should not, be moved to the Cloud.

Business Drivers for Moving to the Cloud

It is important to understand the business drivers for a move to the Cloud, in order to determine which workloads are appropriate for Cloud delivery.

Location of User base

For an organization that is spread over multiple locations, Cloud Computing is often a preferable choice. While on-premise infrastructure works fine when all employees work out of one central location, as soon as mobile access and multiple locations are thrown into the mix, Cloud becomes the most central location to store data. Cloud also tends to provide better economics than providing individual servers and network components to multiple branch offices.

Budgetary Constraints

In situations where an organization has limited budget with which to purchase and maintain software and hardware, Cloud Computing is attractive. Traditional IT expenditure has been very capital intensive. Hardware had to be bought outright and software licenses were generally an expenditure that appeared on the balance sheet.

As we detailed in a previous report however,⁴ Cloud Computing changes this and allows IT to be acquired via operating expenditure (OpEx) rather than by needing large capital expenditure (CapEx). The ability to acquire IT resource on a monthly basis without soaking up large capital outlays is very attractive for cash-constrained organizations.

Development and Testing

For organizations that utilize significant amounts of application development and testing, IaaS can be a very attractive way of obtaining their infrastructure. Under traditional IT models, many development opportunities were foregone as business units struggled to meet the cost/benefit ratios needed by decision makers. By moving development to the Cloud, organizations can significantly mitigate the risk of new projects and, by extension, are able to execute on more development opportunities.

Add to this the fact that developing on traditional infrastructure is hampered by having to wait for IT to provision resource(s) and we have a compelling reason to move test/dev to the Cloud.

Avoiding Vendor Lock-In

Many organizations have real concerns around vendor lock in. Vendor lock-in is a situation where an organization is unable to move vendors because their data, processes and infrastructure is inextricably linked with one particular vendor. This link is often related to proprietary formats or approaches towards technology. As we discussed in a previous report,⁵ by utilizing a Cloud resource built on open standards, users gain certainty that their data can be moved between vendors at will, helping avoid lock-in.

Need for Highly Specialized IT Talent, On a Budget

Many small and mid-sized organizations struggle with needing specialized IT talent but are unable to meet the budgetary hurdles to acquire that talent. For these sorts of organizations, Cloud Computing is attractive as it allows them to enjoy a highly skilled IT workforce which essentially comes packaged with the services they are renting in the Cloud. While basic level IT service can be provided by any reasonably technology savvy business person, higher level service requires specialist and expensive skills that might be out of the range of small and mid-sized organizations.

Round the Clock Support

Related to the issues around the need for specialized talent, organizations that have a need for true round-the-clock IT support may find it difficult to acquire that internally. With Cloud Computing, organizations can leverage the fact that vendors pool resources across multiple customers and hence can justify providing true 24*7 support.

Infrastructure Expansion

In a previous report⁶ we detailed just how complex a modern data center is. Data centers are exceedingly complex and expensive projects to build and maintain. The level of sophistication of a modern data center is far in excess of what most standalone organizations could afford to build. From physical security to multiple redundant power supplies, modern data centers leave no stone unturned.

For organizations that have outgrown their existing infrastructure, Cloud Computing allows them to acquire cutting edge technologies within a very limited budget.

With an understanding of the business drivers for a move to the Cloud, we will now address the technical drivers for such a move.

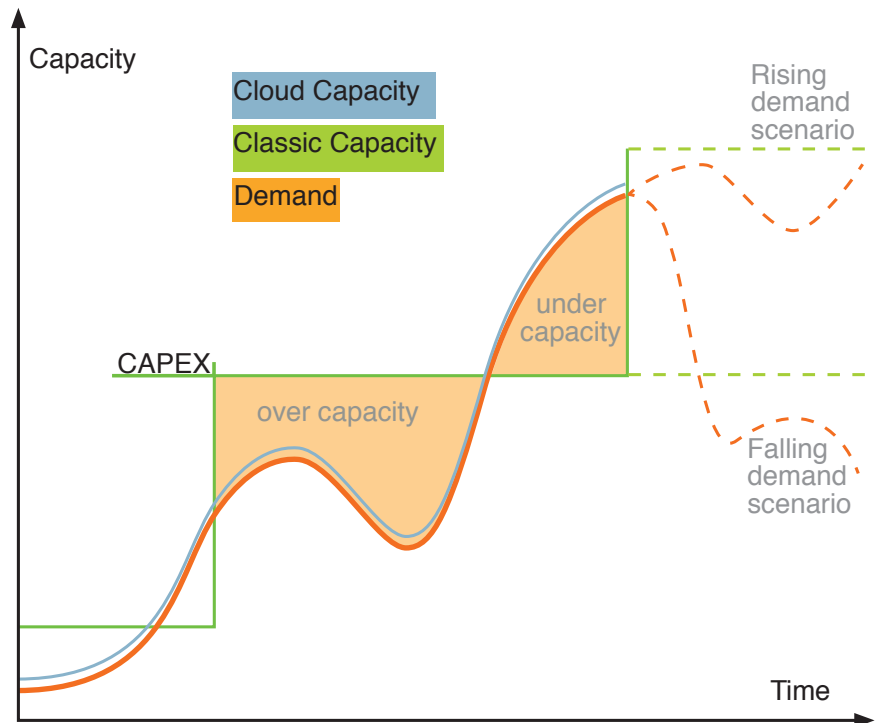
Technical Drivers for Moving to the Cloud

While many organizations will be making a decision to move to the Cloud for business decisions, many others will do so because of the technical attributes that Cloud Computing brings. It is important to understand these different drivers.

Variable Loads

For organizations whose applications face significantly variability in terms of load, Cloud Computing can offer a way to solve the capacity issues. As the diagram below shows, with highly variable loads, organizations need to decide between two equally unpalatable options. Firstly, businesses can decide to invest in sufficient capacity to handle peak loads, but in doing so to have significant redundant capacity much of the time. Secondly, they may obtain resources for median loads but in doing so to risk service degradation under peak loads.

On the other hand, by using Cloud Computing organizations are able to scale their infrastructure to closely match demand curves.



Demand Capacity Curves⁷

Automation

Under traditional IT models, the deployment of infrastructure requires significant physical activity – building of data centers, provisioning connectivity, power and cooling, deployment of the servers etc. With Cloud Computing organizations can automate the management of disparate Cloud resources and in doing so reduce the need for manual intervention and hence potentially increase the reliability of the infrastructure compared to traditional models.

Resiliency and Redundancy

Related to the automation benefits, with Cloud Computing organizations can utilize a Cloud management service to provide high levels of resiliency so that, in the event of an outage, workloads can automatically fail over to alternative Cloud vendors.

Security

As we detailed in our CloudU security report,⁸ security in the Cloud is a partnership between vendors and customers. That said, Cloud Computing can offer organizations a higher level of security than they would be able to obtain with on-premise infrastructure. With increasingly high levels of nefarious security breaches on infrastructure and applications, a well hardened, world class infrastructure in the Cloud is attractive to organizations struggling with managing the risks on their own.

With an understanding of both the business and the technical drivers for a move to the Cloud, it is now time to apply those drivers and make suggestions as to when organizations should, and should not, consider a move to the Cloud.

Making the Decision, When It's Best to Stay In-House

There are no simple answers to the question of which workloads should move to the Cloud and which should remain in-house. Rather a number of factors: industry type, existing IT situation, fiscal imperatives, size of organization and employee issues all add nuance to the decision making process. Add to this the fact that, with Private Cloud, organizations can obtain some of the benefits of Public Cloud within their own premises and much complexity is involved in the decision.

With that said there are some guidelines, both technical and business, that make the decision more clear.

Financial Factors

In an organization that has significant amounts of existing infrastructure that remains largely undepreciated, a move to the Public Cloud is a difficult decision to sell to the business. For this reason, organizations in this situation may wish to utilize their existing hardware, but with an overlay of software to turn it into a Private Cloud.

Business Location

For customers who have only local offices, with largely basic needs that are static, there may be no compelling reason to move to the Cloud. While Cloud undeniably brings some benefits to organizations, for many these benefits will not be sufficient to justify a shift.

Where Compliance Needs Dictate the Location of Data

Certain organizations will fall under regulations which dictate where their data can, and cannot, be stored. Organizations for example under some PCI and HIPAA compliance regulations may be unable to store data in the Public Cloud. Again for these organizations a Private Cloud setting may be the best solution.

Network Issues

Some organizations will have applications which are difficult to operate at internet speeds. While these applications may work fine in a LAN setting, often trying to use them across the internet proves difficult. While internet speeds are certainly

improving all the time, there are some applications where file size issues are likely to make in-house the only practicable delivery method for the foreseeable future.

Little Need for External Integration

Applications that utilize data purely from within the organization and have no requirement to connect with external data sources may be perfectly served from on-premise data. While not needing external data connection doesn't change the other drivers for Cloud adoption, organizations should still include this as part of their decision making process.

Since each organization is different, it is impossible to provide a formula for whether or not an application should be moved to the Cloud. To help the decision-making process, however, the appendix to this paper contains a checklist that you can use to think about which business and technical drivers impact a move to the Cloud. As always, you should consult with a service provider to discuss your particular situation.

Conclusion

Many organizations struggle in the face of claims by some advisers that all their data should be stored in the Cloud immediately. The reality is far more nuanced than those more aspirational advisers would admit. While we contend that the Cloud will be the predominant location of applications and data in the medium term – for organizations with specific demands today, some future vision is less than helpful.

We advise organizations to look at their operations closely – both from a business and a technical viewpoint, to assess dispassionately what workloads are appropriate to move to the Cloud, and which workloads should remain, at least for the time being, on traditional infrastructure.

APPENDIX

Checklist for Cloud Readiness

The following is a simple checklist for organizations to assess their Cloud readiness and requirement level. If your organization answers “yes” to four or more of the questions below, Cloud should be considered for the organization.

Business Drivers

- Do you have staff working remotely?
- Do you have plans to increase your IT infrastructure needs?
- Is your infrastructure reaching end of life?
- Are you constrained in terms of Capital Expenditure?
- Does your organization have a high level of software test/development?
- Does your organization struggle to obtain IT talent internally?
- Is 24*7 support important for your organization?

Technical Drivers

- Is your application workload highly variable?
- Do you need automatic infrastructure scaling and provisioning?
- Do you have a need for complex IT redundancy and resiliency that you struggle to obtain internally?
- Have you faced issues around IT security?

About Diversity Analysis

Diversity Analysis is a broad spectrum consultancy specializing in SaaS, Cloud Computing and business strategy. Our research focuses on the trends in these areas with greater emphasis on technology, business strategies, mergers and acquisitions. The extensive experience of our analysts in the field and our closer interactions with both vendors and users of these technologies puts us in a unique position to understand their perspectives perfectly and, also, to offer our analysis to match their needs. Our analysts take a deep dive into the latest technological developments in the above mentioned areas. This, in turn, helps our clients stay ahead of the competition by taking advantage of these newer technologies and, also, by understanding any pitfalls they have to avoid.

Our Offerings: We offer both analysis and consultancy in the areas related to SaaS and Cloud Computing. Our focus is on technology, business strategy, mergers and acquisitions. Our methodology is structured as follows:

- Research Alerts
- Research Briefings
- Whitepapers
- Case Studies

We also participate in various conferences and are available for vendor briefings through Telephone and/or Voice Over IP.



About Rackspace

Rackspace® Hosting is the service leader in Cloud Computing, and a founder of OpenStack™, an open source Cloud platform. The San Antonio-based company provides Fanatical Support® to its customers, across a portfolio of IT services, including Managed Hosting and Cloud Computing. Rackspace has been recognized by Bloomberg BusinessWeek as a Top 100 Performing Technology Company and was featured on Fortune's list of 100 Best Companies to Work For. The company was also positioned in the Leaders Quadrant by Gartner Inc. in the "2010 Magic Quadrant for Cloud Infrastructure as a Service and Web Hosting." For more information, visit www.rackspace.com.



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Ben Kepes is an analyst, an entrepreneur, a commentator and a business adviser. His business interests include a diverse range of industries from manufacturing to property to technology. As a technology commentator he has a broad presence both in the traditional media and extensively online. Ben covers the convergence of technology, mobile, ubiquity and agility, all enabled by the Cloud. His areas of interest extend to enterprise software, software integration, financial/accounting software, platforms and infrastructure as well as articulating technology simply for everyday users. More information on Ben and Diversity Limited can be found at <http://diversity.net.nz>

Endnotes

- [1] http://broadcast.rackspace.com/hosting_knowledge/whitepapers/Understanding-the-Cloud-Computing-Stack.pdf
- [2] <http://www.Cloudcamp.org>
- [3] http://broadcast.rackspace.com/hosting_knowledge/whitepapers/Creative_Configurations_Whitepaper.pdf
- [4] http://broadcast.rackspace.com/hosting_knowledge/whitepapers/Cloudonomics-The_Economics_of_Cloud_Computing.pdf
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- [7] <http://www.chades.net/?tag=cloud-adoption>
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