An Expansion Stage Software Company's Guide to

LEVERAGING THE CLOUD

Is cloud computing a fit for your organization?
The answer is all in the details. But as online services become increasingly commonplace and small companies are acquired for millions at a dizzying rate, one thing is for certain – the cloud can no longer be ignored.

You run an expansion stage software company.
You've been reading the tech blogs and going to the software conferences. Everywhere you go, you read and hear about cloud computing. You hear about private clouds, public clouds and hybrid clouds. Cloud computing is taking over, with Amazon at the lead. You've seen young companies a fraction of your size acquired for hundreds of millions of dollars by big brand tech companies. You've heard Larry Ellison's take on it, Marc Benioff's take on it, and have discovered that just about *anything* can be related to the cloud.

IN THIS REPORT

Perhaps you're wondering if any of this is relevant to you. You just make and sell traditional software. Maybe you are SaaS, which according to some people *is* cloud. Perhaps you should add cloud to your messaging as well? If you're wondering how you can benefit from cloud computing *without* adding it to your messaging, **read on**.

What's a cloud anyway?

It depends on whom you ask. The least interesting definition is one that classifies all SaaS as cloud. It's least interesting because that would imply there's nothing new about cloud computing; that it's nothing but a new term for an old business model.

But that's just not true. There is something new: availability of configurable IT infrastructure on demand via a self-service (through full service) interface, scaled up or down almost instantaneously based on usage, on a mass basis to everyone. On top of this can be developed software that optimally utilizes the underlying elastic infrastructure for different use cases, whether to offer a development platform or something else. This is more or less how Larry Ellison defined the cloud at Oracle OpenWorld 2010.

For our purposes, let's agree that cloud is not traditional SaaS (just a bunch of servers hosting software and making it available over the Internet, as they have been for the last 11 years). For the service to be considered cloud computing, the underlying IT infrastructure should be:

- Virtualized
- Elastic
- Highly scalable
- On demand
- Self-service with the ability to develop robust software on the infrastructure (note that there are other flavors of services from some providers that range all the way to full service)
- Billable on a usage basis (though not necessarily actually billed on a usage basis)

SCOTT MAXWELL
Founder and Senior Managing Director, OpenView Venture Partners

"Cloud service providers open up an entirely new architecture for innovation, and they do it while lowering the total cost of ownership relative to owning your own data center. Like electricity and septic systems, I fully expect that cloud service providers will be the dominant location for server loads over the next decade or two. Only companies that have the largest data center needs or specialized needs will be running their own data centers in the future. That said, like all newer architectures, there will be glitches and setbacks along the way."

Should you build your own *(private)* cloud?

Only if you're a very large enterprise with significant resources, both in terms of money and IT expertise and have very particular IT, compliance, and security needs that are not addressed by third-party (public) cloud providers. At least that's the conclusion of just about every industry consultant we've spoken with, as well as a Microsoft November 2010 white paper titled *The Economics of the Cloud* and a 2010 paper by David Floyer at Wikibon called *Private Cloud is More Cost Effective than Public Cloud for Organizations Over $1B*. Otherwise, you should leverage the existing cloud infrastructure already out there, whether you want to use it as a customer or offer your own cloud-based service to others. That is, unless you're convinced you'll be the next Google or Facebook and have deep pocketed investors who are equally convinced. During the rest of this discussion, the term "cloud" will simply refer to third-party public cloud service providers.

What can cloud do for you?

First, if you can make a connection between your product or service and the cloud, and as a result somewhat reasonably add cloud to your messaging on your website's home page, by all means do! Beyond that, it depends on who you are and what you do. Some use cases where we see cloud gaining traction are:

- Development and QA operations
- On-premise deployment and integration
- Storage
- Software training
- Sales demos
- Websites

A note on generic clouds

There are many cloud service providers that only provide pure Infrastructure as a Service (IaaS). So far, we have found over 500 providers claiming to be cloud service providers on their websites. You can use their services for any use case, but they're not optimized for anything specific, so the effort to implement some of the more complicated solutions is higher and the ultimate ROI is lower. The big ones are:

- **Amazon EC2** – The cloud hosting pioneer and leader, typically used by individual developers and midsize businesses. Amazon last year achieved PCI Phase I compliance, opening the door to hosting e-commerce businesses. One

The Different Flavors of Cloud

The advent of cloud computing brought with it a host of new variations and terminology. Just like that, an already confusing technology become even more so. Public or private? SaaS or IaaS? What does it all mean? Here are some quick definitions to keep it all straight.

PUBLIC CLOUD – Online services from an external cloud provider, typically offered in a highly-scalable, pay-as-you-go model. Organizations can use these services to save costs by taking data and applications out of their on-premise data centers and hosting them with a third-party cloud provider.

PRIVATE CLOUD – An in-house cloud model with similar scalability and resource consolidation benefits. However unlike a public cloud service, a private cloud infrastructure is owned and maintained by an organization's internal IT department and usually hidden behind a firewall.

HYBRID CLOUD – Some combination of public and/or private cloud, along with traditional on-premise service management. Many consider hybrid clouds, or hybrid IT, as an ideal way to leverage the cost benefits and scalability of public cloud providers while maintaining complete control of more mission-critical services and applications.

SOFTWARE AS A SERVICE (SaaS) – The most common and widely understood of the "as a Services", SaaS can be described as any software that is essentially rented from a third-party and provided over the Internet. In this sense, SaaS can be thought of as On-demand software, allowing companies to access an application for business purposes online without needing to purchase or maintain the service themselves.

PLATFORM AS A SERVICE (PaaS) – The next evolution of SaaS, a PaaS offering takes things one step further by providing a platform that developers and organizations can actually write their own code for and build on. Whereas SaaS providers allow customers to simply rent services, PaaS offers the actual virtual servers and applications themselves to be customized to fit a company's own particular business needs.

INFRASTRUCTURE AS A SERVICE (IaaS) – Also referred to as Hardware as a Service, IaaS provides the bare hardware, storage and networking components – and nothing else. Organizations can essentially rent out the hardware they would normally buy and maintain themselves and access it over the Internet. However, while the IaaS provider houses and maintains the hardware, the customer must load, configure and manage the software applications and services from scratch, just like they would in their own data centers.

benefit of using Amazon is that just about all of the cloud ecosystem tools out there, like RightScale, work well with Amazon, typically exclusively.

- **Rackspace Cloud** – More suited for the enterprise customer, based on the open source OpenStack software, co-developed with NASA, and supported with a number of other tools for monitoring, including Cloudkick, which Rackspace acquired.
- **GoGrid** – Like Rackspace, well suited for enterprise hosting. Also like Rackspace, offers pure cloud hosting as well as bare metal shared and dedicated servers and hybrid cloud solutions.
- **Savvis** – Also a good solution for enterprise customers. Offers co-location and bare metal hosting as well as cloud.
- **Terremark** - A global enterprise IT services provider that offers full cloud-based solutions to enterprise and government customers, among the many other services it has.

Development and QA Operations

If you sell software:

- You spend money on hardware for developers to build on and QA to test on
- Your engineers and system administrators have to configure and manage their development environments, and your QA engineers need to configure and manage their testing environments, consisting of different hardware and software.

The more complicated the software; the more complicated and diverse the development and customer environments and tools; the more rigorous the testing – the more capital and engineering time you have to pour into dev and QA ops. Furthermore, doing load testing of significant size can be prohibitively expensive for any expansion stage business.

By providing customizable infrastructure on demand with easy to use self-service interfaces and integrated development platforms with tools, cloud services do a great job of reducing:

- Capital expenditures on hardware to support development and QA
- Time and skill required to configure and manage development and QA environments for your engineers and systems administrators

At the same time, cloud services can increase:

- Time spent on writing product software code
- Overall productivity
- Team collaboration

You can leverage cloud for these benefits because:

- Since you can use as much computing resource as you need whenever you need them, and pay only for what you use for how long you use it, your capital expenditures and maintenance expenses go down. You may no longer need to maintain your own on-premise dev or test environment at all, or at least such a large one.
- Cloud infrastructure providers allow your engineers to configure their on-demand systems via easy to use (to varying degrees) online interfaces and easily integrate any component they need.
- Scalable cloud infrastructure lends itself to specific development and QA use cases like collaborative code repositories and load testing.
- Having your dev and QA in the cloud gives your team the ability to share and collaborate on the exact same infrastructure and code globally across geographically dispersed employees.

A number of cloud service providers have created solutions optimized for various issues around development and QA operations. These solutions also lend themselves well for use cases around on-premise deployment and integration testing.

Some of these solutions are IaaS providers with self-service interfaces that automate activities around specific use cases. Others are full Platform as a Service vendors (PaaS), which in addition to the above, host entire development environments and stacks. These are integrated with various developer resources ranging from source code repositories to continuous integration servers to issue tracking to push-button deployment to production monitoring.

In the IaaS category, take a look at Skytap, an OpenView Venture Partners portfolio company also backed by Ignition and Madrona. Skytap has been providing cloud-based solutions since 2006 and offers enterprise solutions tailored to QA, development and training, though their solutions are utilized for other use cases as well.

Also take a look at Joyent, one of the more mature IaaS players, which has been around since 2004 and is backed by Peter Thiel, Intel, Greycroft.

"The cloud has enormous potential to dramatically reduce the cost and complexities of supporting development and QA operations. In fact, based on a recent customer study conducted by OpenView Labs, ISVs have identified issues with running and supporting multiple development/testing environments as the most common challenge of building and shipping their applications."

TIEN ANH NGUYEN
Associate,
OpenView Venture Partners

IF YOU LIKE THE SOUND OF A FULLY-INTEGRATED PAAS, CHECK OUT THE FOLLOWING:

If you're a Ruby on Rails shop

Heroku – A PaaS and Ruby pioneer, recently acquired by Salesforce for over $200 million. Went from supporting 30,000 applications in 2009 to over 100,000 in 2010 and is popular for Facebook applications. That said, as of 2010, the majority of those projects were on the free solution and did not represent paying customers.
EngineYard – Smaller than Heroku in terms of project volume and community, indicates 1,900 customers on its website. The company targets larger customers with an enterprise offering, xCloud.

If you're a Microsoft shop

Microsoft Azure – Supports Java and PHP in addition to .Net. Azure boasted 31,000 customers in February, 2011, one year after launching.

If you're primarily a Java shop

CloudBees – A newcomer in 2010, with solid backing from JBoss-backers Matrix Partners. CloudBees features Hudson hosted as a service.
Makara – An early Java PaaS acquired by Red Hat in 2010.
CloudFoundry – The result of VMWare's SpringSource acquisition.
eXo – Launched in March 2011, still in Beta.
Google App Engine – A development environment for Python and Java, offered since 2008.
Cloud9 – Ajax.org's offering for JavaScript and HTML5 development.

Note that most of these PaaS providers don't support just the language / platform by which we categorized them. Many of them also support PHP, Python, etc.
There's also a newcomer that seeks to offer a broader, more flexible PaaS: dotCloud. dotCloud aims to give developers the ability to very easily create any custom stack they want from many different components (database, web server, IDE, etc.) with ease.

Of course, cloud benefits extend to product development and delivery as well. Mashery, one of OpenView's portfolio companies for example, provides application program interface (API) management for providers of web services.

Organizations can use Mashery's solutions to manage and implement their own API programs for the cloud, and extend their sales channels and brands in the process.

This type of service could be a boon for many expansion stage technology companies moving forward, as Mashery has already provided API management for big names like Netflix, Best Buy and MTV, as well as many leading-edge startup and expansion stage organizations.

TIP: Also consider these cloud-based tools for improving development and QA execution:

- SOASTA – for load testing.
- Electric Cloud – for build and release management.
- GitHub – for hosting and sharing your Git code repository.

On-Premise Deployment and Integration

The more complex an enterprise customer environment is, the more there is that can go wrong during a software package implementation, especially when it involves integration with other systems. Just ask your sales engineers and professional services people. Even SaaS can involve difficult integrations to customer environments.

The cloud provides a great platform to replicate a customer's environment and test a deployment or integration in that cloud before executing it in production. It's certainly a better solution than

having your own hardware and trying to manually configure it, within narrow limits, every time you have a new type of environment to deal with. Your deployment / integration cloud environment can even become a collaborative work environment for both customer IT personnel and your implementation engineers.

TIP: When selecting an IaaS or PaaS vendor, review their technology partners and depth of community. Be sure to pick a solution provider with a rich ecosystem that will provide you lots of (potentially free) tools and support.

The IaaS and PaaS vendors that are great for development and QA operations also lend themselves well to the on-premise deployment and integration testing use cases.

TIP: To make sure you're saving money, create an ROI calculator in Excel. You can do this for all the use cases. Here's one example.

Storage

If your business generates a ton of data on a regular basis and you need to hold on to that data, consider cloud storage versus traditional on-premise storage or even dedicated hardware hosted by third parties, especially for archived data or secondary storage.

Depending on your volume and growth, relying on on-demand cloud storage can save significant costs on purchasing, maintaining and managing your own hardware, or fixed costs on dedicated hosted hardware. Some software startups make cloud storage appear to your network as networked storage and even monitor its performance through compression and caching.

There are lots of cloud storage vendors out there. They differ in pricing, performance and security. For more details, check out this Network World article comparing a few different cloud storage providers.

Some of the vendors they mention include:

- Amazon S3
- Rackspace
- Egnyte – Around since 2006, Egnyte offers the Cloud File Server, backed by Kleiner Perkins, and has acquired an impressive list of enterprise customers. Egnyte also has a hybrid cloud solution, incorporating a NAS appliance.
- Nirvanix – A descendent of Streamload, a legacy Internet storage company founded in 1998. Nirvanix offers enterprise cloud storage solutions and claims to be 200% faster than Amazon. Like Egnyte, Nirvanix offers a hybrid solution.

Larger service providers like AT&T also offer cloud storage.

TIP: You can combine a cloud storage service provider with a storage gateway from Nasuni or TwinStrata to make cloud storage look to your network and perform more like network storage. Nirvanix's and Egnyte's latest solutions have this capability built in.

5 Cloud Points to Think About

DID YOU KNOW…

1. In May 2010, CIO Update reported a Gartner study estimating that by the end of 2012, approximately 20% of businesses will own none of their own IT assets (i.e. they will only use SaaS or cloud-based service models).

2. Though virtualization is often described as "a stepping stone" to cloud computing, the two technologies are not the same. As David Lithicum of InfoWorld writes, "Virtualized servers do not constitute a cloud. Cloud computing means auto provisioning, use-based accounting, and advanced multi-tenancy, capabilities well beyond most virtualization solutions."

3. Tech entrepreneur Bob Warfield argues that the environmental impact of cloud servers is typically less than with on-premise setups. "You can feel good about these being more green solutions than you're likely to have the expertise to create in your own data center," he writes.

4. While "in house" control over data and security make private clouds an attractive option for many organizations, they also come with a hefty implementation price tag. As SearchCloudComputing reports, this is one reason why hybrid cloud computing may be the most realistic choice for most companies.

5. Security concerns continue to weigh heavily on the minds of organizations considering a move to a cloud-based model. In a 2011 survey by TrendMicro, 50% of respondents cited security and data protection as their biggest cloud roadblocks, with performance and availability close behind at 48%.

Software Training

Providing hands-on training to your customers, partners and field employees on your software can be a very expensive and time-consuming proposition. It may involve setting up a physical training center, lots of traveling, lots of hardware with the same installed software, and so on. This is especially true for on-premise software, but can even be true for SaaS.

A number of vendors have developed cloud-based solutions to address these costs and make hands-on, remote mass training on software much easier.

Consider having an exact replica of your software deployed in a customer's environment, or a SaaS implementation customized for a specific customer with their actual data, all in the cloud. Now consider having the ability, with the press of a button, to send a URL providing access to this training instance to 100 customer trainees, each one receiving their own systems to interact with as if they were using the software in production. These 100 trainees can be anywhere in the world and in a 100 different places. Each customer can now follow the training materials and interact with the software in a production-like environment. Once the training is done, you stop paying for the underlying infrastructure. When you want to do the training again, you can bring it back up in minutes and start paying again.

If you need to make a change to the environment or the training, you only have to do it once, and then can make as many replicas for as many trainees as you want.

This is remote software training via the cloud.

The benefits here are similar to the previously mentioned use cases with a few additional ones:

- Lower capital expenditures, maintenance, and management costs related to training
- Less time to set up any given training
- Increased geographic and numeric reach of training
- Improved quality of training via a hands-on experience more similar to real production environments

The big difference between the training use case and the previous ones discussed is impact on revenue. Assuming you charge for your training, leveraging cloud computing to do more training for more people across more geographies directly leads to higher revenue (at lower cost).

The solutions providers we've seen in the training space also offer solutions for sales demonstrations. They are:

- Hatsize – Founded in 2000, Hatsize today references a number of large enterprise customers.
- CloudShare – Backed by Sequoia and Charles River, CloudShare offers strong integration with SalesForce.com and has built-in CRM and partner collaboration tools to support trainings and demonstrations.
- Skytap – Though Skytap is strongest in the development and QA domains, it has also developed a number of use-case specific solutions for remote training and has landed significant enterprise accounts in this arena.

Sales Demonstrations

DEVON WARWICK
Sales and Marketing Associate, OpenView Venture Partners

"Demos are a critical element of the sales process. If your prospect can't actually visualize the product and see firsthand the benefits of investing in your offering, the deal will likely go sour. Take that, and couple it with the fact that cloud solutions (from a demonstration perspective) can save your sales team time and money -- to not take advantage of this technology would be foolish."

Your current sales demo probably consists of a generic Webex demonstration of your product by your sales engineer to a prospect. What if instead of doing that, your sales engineer could send a prospect a URL that led them into a virtualized environment replicating their production environment? What if once the prospect clicked on the URL, they could interact with your product in their context with their data in your product?

And what if it took your sales engineer very little time to set this demo up for each prospect? And what if you didn't have to worry about any of the underlying infrastructure for it or idle hardware because this demo was on a third-party cloud provider's infrastructure, and you only paid for the time and capacity your sales people utilized?

All of this is now possible with cloud solutions.

The benefit is clear: higher sales win conversions via much more effective demonstrations without a significant amount of additional cost.

The same solution providers targeting the training use case also have solutions for providing sales demonstrations. They are **Hatsize, CloudShare and Skytap.**

Websites

Websites are a great use case for cloud computing, especially if you're targeting consumers. In the pre-cloud world, you had to decide how much computing power you were going to put behind your website before launching. You faced two risks: paying for way more capacity than necessary to meet actual demand, thus losing money, or not having enough capacity, seeing your website crash, and thus losing traffic and money.

Scaling to meet growing demand rapidly also requires planning and work. But if your website is on a cloud service, you don't need to worry about that quite as much, since the capacity will scale up and down with demand, as will your bill.

The same is true if your business is an online archiving, backup, or hosting business of some kind; leveraging third-party cloud providers as the underlying infrastructure will help you scale successfully at lower cost. Many of the PaaS vendors already discussed lend themselves to hosting websites, since your developers and website administrators can write the code and deploy it at the press of a button in a scalable cloud environment all with one vendor.

In addition, we've seen Acquia do a nice job hosting Drupal, the popular open source content management project, in the cloud as part of their Drupal Gardens and Dev Cloud services. Besides just hosting customers' Drupal-based projects on Amazon's EC2, Acquia offers a full Drupal-based PaaS.

What should you watch out for?

Now for the fine print. Like with anything, there are pitfalls in using cloud services. The valuable impact of cloud computing described can only be realized in certain contexts. There are plenty of issues specific to you and your business and to the individual cloud service providers that may dampen or eliminate the benefits entirely.

Here are some stumbling blocks:

- The noise around cloud computing
- Pricing models
- Security and compliance issues
- SLA's

The "noise"

Just because a vendor identifies itself as a cloud vendor, does not necessarily mean it utilizes cloud computing in any way. That may not matter for you and the value proposition, but keep this in mind.

More specifically, if you're looking for elasticity for fast scalability, you're looking for a cloud service provider, and a SaaS company pitching itself as cloud won't meet your needs. Be sure you have a clear understanding of what you need in the underlying infrastructure and evaluate any vendor you're considering against that criteria by asking direct questions. Don't get caught up in a debate about the definition of the cloud, either. It's irrelevant. Their infrastructure and services either meet your criteria or they don't.

Pricing

Just because a vendor pitches its service as cloud does not mean it charges for it on a purely on-demand basis. It may offer that service on a traditional subscription price model, locking you in for large fixed purchases of capacity when you don't need it. Alternatively, it may have hybrid minimum purchase plus elastic capacity models, as well as a bunch of other combinations.

Be sure you understand and model your costs over time with any cloud service if you plan to spend lots of money with them. The complexity of the pricing schemes can work against you, and before you know it, you're spending tons more money than you expected.

Security and compliance

Be sure your cloud provider has the levels of security and compliance that are necessary for your business. Amazon EC2 is PCI Phase I compliant, but many

other service providers are not. Your data needs to be secure both in the cloud and on its way from you to the cloud. If you have a Compliance or Security Officer in your business, be sure to check with them on precisely what you plan on putting on a third-party cloud early on before you waste your time pursuing something that will be blocked anyway.

SLA

Read the fine print. Have a clear understanding of what SLA you need to offer your customers or the users in your business, and what in turn you need from the cloud provider. If their SLA is worse than what you need, you may have to spend more with them to get to the higher level, which brings us back to the pricing issue.

BRENDAN COURNOYER
Marketing Associate and Editor, OpenView Venture Partners

"It seems like over the past few years, everyone has added 'cloud' to their overall message – especially the big vendors. But the technology is maturing faster than many expected. As with virtualization before it, IT customers are becoming much more comfortable with the cloud; not just as a concept, but a reality of how they do business."

What now?

If you've found any of this cloud primer interesting, go forth and do your own research Be sure you have clear pain points to address or well-defined improvements to drive, and then find the solution that makes sense for you. Any initiative absolutely needs to be tied to well-defined business goals.

Once you've found and reviewed all the relevant vendors, you may find a great solution for your needs, and it might not even have anything to do with cloud computing. In any case, dig through the noise and understand the details. Cloud computing may be simple or complex, but its value comes down to your needs.

OTHER RESOURCES

To follow the latest news in cloud computing, we recommend regularly reading these sites:

- Network World
- CloudTweaks blog
- CIO Magazine's Cloud coverage
- Bitcurrent
- Sys-Con
- TechCrunchIT
- CloudAve
- SearchCloudComputing

Cloud Services from the OpenView Portfolio

Skytap

Skytap

Skytap offers self-service automation for the cloud to help organizations develop, test, migrate and train on new or existing cloud applications. One of the key calling cards of Skytap solutions is a lower total cost of ownership for cloud-based apps. Gartner estimates a potential of 25% to 50% reduction in annual TCO using Skytap.

Skytap offers solutions for:

- Application Development and Test
- Application Migration
- Hybrid Clouds
- Virtual Training
- Sales Demos and Proof of Concepts

Mashery

Founded in 2006, Mashery offers API management solutions for web service providers. Organizations can leverage Mashery's offerings to manage and implement their own API programs for cloud computing, while at the same time extend their sales channels and corporate brands.

Mashery solutions include:

- API Traffic Manager – tools for managing API access and deployment
- API Distribution Network – a scalable API platform delivering fast and reliable API access
- API Reporting and Analytics – tools to help track and measure API performance
- API Partner Portal – multiple capabilities for engaging with developer partners

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