Understanding The Cloud

Benefits and Considerations for Fund Managers

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Executive Summary

Today, cloud computing pervades nearly every aspect of our digital lives – both personally and professionally. We are constantly hearing acronyms like **SaaS (Software-as-a-Service)**, **PaaS (Platform-as-a-Service)**, **IaaS (Infrastructure-as-a-Service)** and terms like *public cloud* and *private cloud*. Questions continue to permeate about the usage of these models in corporate technology infrastructure. Which one is right for our firm? Is one more economical than the other? Are these methods of storing data safe?

As more and more firms in the hedge fund industry continue to adopt cloud computing, understanding the benefits and considerations behind cloud technology becomes more important than ever. This paper will define cloud computing and address the benefits and concerns behind the ever evolving technology known as "The Cloud".

Understanding the Cloud

Cloud computing is all the rage. Due to its rapid adoption and commercialization, for many "The Cloud" has come a ubiquitous term for nearly everything on the Internet. Before we go any further, let's answer the basic question: "What is cloud computing?"

Cloud computing is a style of computing whereby IT resources (think servers, firewalls, even bandwidth) and software applications (think Facebook®, LinkedIn®, Bloomberg®, and Backstop™) are made available to large numbers of end-users, on-demand over the web. Cloud computing is the delivery of computing as a service rather than a product, which has spawned the growth of thousands of cloud computing businesses in the last decade.

In a sense, cloud computing businesses resemble traditional utilities. For example, a property owner pays a reasonable fee for access to water from a utility company rather than digging their own well, installing a pump and maintaining a water cleaning and storage facility. The price they pay for the service is commensurate with the amount of resources they consume and also takes into account the providers' cost to maintain and improve the underlying infrastructure. Cloud computing is no different - rather than buy, install, and maintain computing resources, consumers of cloud services pay providers a reasonable fee to utilize the tools they need and conveniently access them over the Internet.

Public, Private & Hybrid Clouds

Later in this paper we discuss several different ways in which cloud services are used by the alternative asset management industry. In order to fully understand these services, it is important to have some familiarity with the major types of clouds and how they are provided.

Public Clouds

Public clouds are owned and maintained by third party service providers like Google®, Microsoft ®, Amazon®, and Backstop Solutions Group. These clouds provide secure, multi-tenant infrastructure for on-demand computing power, data storage, and consumer bandwidth for many users at once. Services offered through public clouds are generally targeted towards specific markets, rather than individual companies. One of the key advantages to using public clouds is for individual firms that are able to take advantage of larger, more scalable and often more secure IT infrastructure than they could otherwise afford to build themselves. In the case of investment managers, using a public cloud service that is tailored to the asset management industry has its own benefits as well. Because these services are utilized by many firms with similar needs providers are generally able to release important features and services faster and more efficiently than an individual firm could by itself.

Private Clouds

While public clouds services are intended for multiple firm usages, **private clouds** are built and maintained exclusively for one firm. Over the past decade, many asset managers have built out data rooms in their offices or leased rack space in a data center for application hosting and disaster recovery planning. As the relative costs of hosting equipment in a data center have continued to fall in recent years, many managers have begun to outsource some - or all of - their private cloud infrastructure to experienced third-party cloud computing partners. With private cloud services, managers maintain complete control over their computing resources, but depending on what they are utilizing, may also bear the full cost associated with supporting and maintaining those resources or software applications.

Hybrid Clouds

Regardless of how a fund manager feels about adopting cloud computing, it is becomingly increasingly more difficult, expensive, and inefficient to fully internalize an IT infrastructure. **Hybrid clouds** combine the best of the public and private cloud worlds, making it possible for managers to pick and choose which services to maintain internally and which to outsource to third parties.

More Than Just Software

Many people mistakenly think of cloud services as being limited to only software applications; however, a major benefit inherent in the cloud model is the infrastructure that is needed to host, build, and use software applications can also be provisioned via the internet.

There are three main categories of cloud services used by asset managers today: *Software-as-a-Service* (SaaS*), Platform-as-a-Service* (PaaS), and *Infrastructure-as-a-Service* (IaaS). This paper discusses examples of SaaS and IaaS offerings for alternative asset managers.

Software-as-a-Service solutions (SaaS) also known as “on-demand,” or “hosted software,” come in various shapes and sizes. Today, fund managers

Key Categories

IaaS = core computing resources

PaaS = application development & deployment platforms

SaaS = complete software solutions

have access to cloud based tools for email, , spreadsheet modeling, general ledger accounting, compliance tracking, CRM, investor relations, research management, portfolio analytics, web reporting, and trade order management (to name a few).

Platform-as-a-Service (PaaS) offerings are often used by managers who have dedicated internal software engineering resources to write custom or middleware applications. Under the PaaS model, internal developers write the code that is needed and then engage a vendor to run it on scalable, lower-cost, hosted hardware infrastructure. The Microsoft Azure® and Google App Engine® platforms are good examples of PaaS solutions in use by some fund managers today.

Infrastructure-as-a-Service (IaaS) solutions are generally used as a direct extension of an organization's IT systems. With IaaS, users gain access to raw materials like hardware, storage devices, or data center capacity, needed to build and host platforms and software. Many hedge funds utilize IaaS for disaster recovery and data backup processes.

Benefits of the Cloud

Most benefits associated with cloud computing fall into one of three categories: **economic, infrastructure, and strategic.**

The major economic benefits associated with cloud solutions are driven by their utility-type pricing nature, which assures that managers can pay as they grow without the burden of major, up-front capital expenditures. Today's hedge fund manager can save tens to hundreds of thousands of dollars per year by outsourcing some - or all - of its IT needs.

While the infrastructure-related cost savings associated with cloud computing can be especially beneficial for start-up firms, well-established managers often realize even greater savings due to the sheer number of legacy software and systems they use. However, savings on equipment and software aren't the be-all-end-all of economic benefits; often the biggest long-term expenses associated with IT infrastructure are maintenance-related. With traditional insourced computing systems in which the manager is solely responsible for the maintenance of its infrastructure, the cloud provides the ability to shift part of the burden to a third party. This helps to ensure that a manager's internal IT staff is able to focus more on mission critical, high-value computing issues and less on time consuming maintenance routines.

As any IT manager will tell you, keeping up with infrastructure requirements of today's sophisticated business applications is no easy task. It is not uncommon for fund managers to recycle server and PC inventory every 18 to 24 months. Not only is it wasteful and expensive to have to continuously invest in new equipment, it is also incredibly time consuming and labor intensive. By design, cloud computing is highly scalable and incredibly flexible. Cloud services providers are able to monitor, manage, maintain, and upgrade hardware and software on behalf of multiple users with various needs – in real time. Because cloud computing leverages this multi-tenant model, as needs increase for servers, memory, and storage capacity, providers can anticipate and proactively add new capacity as required. For end users, there is no need to purchase, deploy, or maintain new equipment.

Disaster Recovery

Business data that is archived on internal equipment or in the cloud may need to be restored at some future point; after all, this is reason for storing it in the first place. If the existing protocol is to back up to tape and send to a remote location five states away, it will likely take several days to get the data restored. Not only is the data inconvenient to access, but it could also interfere with the ability to perform daily work activities.

A cloud backup architecture is intended to be faster and allow for quicker restoration than many traditional data storage systems in-house. Day-to-day work being done through cloud can be backed up continuously throughout the day, and can also be readily accessed in the event of a disaster situation. Cloud architecture, with its data storage and internet accessible capabilities, can simplify the process of recovery and, for many managers, make it an economic no-brainer. Under an onsite model, firms could expect to nearly double their implementation and operating costs for a disaster recovery solution that is comparable to what cloud-based services automatically provide. When done correctly, cloud service clients should not even be able to tell if they are working in a live environment or are in disaster-recovery mode - which is imperative to a successful disaster recovery plan.

Cloud providers are also using a variety of security infrastructure tools **including Intrusion Detection Systems** and **Intrusion Prevention Systems** (IDS/IPS) that a typical fund operating an onsite infrastructure might not have the budget for. On average, fund managers who utilize the cloud for their IT operations can be better protected than those who keep them in house, for a fraction of the cost.

Fund managers are in the business of raising, investing, and servicing capital. From a strategic standpoint, the more time and money a fund manager can spend pursuing those objectives, the more successful it will likely be over time. This is not to say that investment managers shouldn't employ IT personnel or manage any of their own hardware or software. Indeed, as will be discussed later, there are still many applications that are not necessarily best deployed via the cloud. Rather, from a strategic standpoint, the more a fund manager can focus on building and maintaining the systems that give it a competitive advantage in the marketplace, the better off it will likely be in the end. Like a prime broker, law firm, or fund administrator, a reputable cloud solution provider can be a valuable strategic business partner and fund managers should think of service providers in the same way when evaluating vendors.

Cloud Considerations

As indicated, there are numerous advantages to cloud computing but it does not mean that every investment manager can, or should drop current practices to move their business to the cloud. For the financial services industry, issues surrounding data privacy, system availability, and application performance tend to top the list of concerns that must be overcome prior to deploying a cloud solution. In addition to asking the right questions about security, availability, and performance, managers should evaluate providers on other metrics such as industry experience and technology focus.

Security & Privacy of Data

For small to medium sized business – those with less than 500 employees – cloud computing can be more secure than internally managed systems. For example, many cloud computing providers offer **multi-factor authentication** as part of their offerings. This type of user authentication is more secure

than standard user name and password conventions because it combines multiple methods of identifying a user. For example, with multi-factor authentication, managers can require that their users first log into internal networks over a VPN before accessing a web-based service. Other authentication points could include user name and password access with physical security tokens or biometric scanning devices.

Most software platforms used by fund managers every day require continuous care and feeding when it comes to applying the most up-to-date security patches. Many firms don't have the human resources to adequately perform the time consuming and often complex tasks associated with applying each and every fix and update as they become available. The result is that they frequently and unwittingly put the integrity of their systems and data at risk. Cloud vendors are in the business of providing physical and software security to their clients and are highly incented to keep their systems up to date on the client's behalf.

Many of the security concerns related to cloud computing are similar to those that were raised in the late 1990s when the practice of co-locating in third-party data centers began to spread in earnest. Remember, cloud storage companies do this for a living – if they couldn't guarantee optimum data security, they wouldn't be in business. Nevertheless, fund managers should always ask questions about - and get comfortable with- the measures taken to ensure the privacy and security of their data once it finds its way into the cloud.

SaaS companies and their contracts should be clear regarding what, if anything, they are permitted do with your data. Here are some key questions to ask a potential cloud service provider:

- Do you retain ownership of your data as it resides the vendor's servers, or can it claim ownership of the information once it has it?
- Does the vendor have the right to use your data for purposes other than providing you with a specific service?
- What privacy and security policies does the vendor have in place?
- How secure is your data?
- Is it backed up? How often?
- Who has access to your data?
- Does the provider keep logs of activity and access?

Hedge Fund, Private Equity, Venture Capital, Fund of Funds and other investment managers are required to comply with regulations like the state of Massachusetts' CMR 17, which specifies how sensitive personal client information must be safeguarded. Does your vendor know which laws affect your business and does it operate its platform to help ensure you are able to maintain this compliance?

Scalability and Availability

There are also other considerations about the scalability and availability of your new vendor's infrastructure that you may want to vet out depending on its affects to your current system infrastructure.

- Can you access the software via its standard user interface as well as some kind of an API?
- Can you write your own software programs against it?
- Is your vendor running your applications on hardware it controls in a SAS 70 compliant data center or is it renting cloud infrastructure from another third party?

- How quickly can your provider add capacity as your needs grow and expand?
- How frequently does the vendor release new code, schedule updates, test its disaster recovery and failover plans?
- How do they monitor system availability and up-time?
- Will they share the information with you?

A reputable cloud vendor should be able to provide scalable and reliable service as the needs of its user base expand. They have the ability and expertise to find and hire the requisite talent needed to continue to add scale, resources, and the facilities needed to support your business without driving your cost for their service through the roof.

Compliance & the Cloud

When alternative fund managers consider cloud applications, they often ask if they are compliant. The answer is that this depends on whether they are used in a compliant manner. The cloud is simply the structure; asking if the cloud is compliant is like asking if a laptop is compliant. If the laptop holds unencrypted customer data and is stored in the back seat of an investor relations officer's car, this behavior is not compliant.

When faced in a regulatory situation, the regulators are not going to rule on technology. Instead, their concerns will be whether or not a firm is meeting the requirements outlined in the regulations. How it meets the regulations is less of an issue. Best practices that regulators recommend are based on policies and procedures, not on underlying methods. Hence, the question is not whether the cloud is compliant; it is whether it is used in a way that supports compliance. Firms will always have to show that they are compliant. Regulators will not take someone else's word.

Regulators don't require that firms use vendors with SAS 70 or other certifications. A certification can be one step in vendor due diligence if it applies to the controls that matter to your situation, but it is not a substitute for doing the work. If a vendor has certification on the functions most relevant to you, then it can make the decision process easier, but certification should not be the only way to make a decision. The regulators also don't advocate one technology over another. (It would be futile, given the rate of change.) Instead, their concern is functionality, especially security and accessibility. Cloud computing has been shown to be compliant; for firms that are registered with the US Securities and Exchange Commission, the key requirement is that data be backed up and accessible. As long as that's the case, the firm is compliant in that respect.

The first challenge is to determine which rules apply. Private funds know what standards they have to meet when they begin talking to vendors. They vary, and there are nuances. For example, will using a cloud provider be considered as a transfer of data across international borders? (Many cloud providers can guarantee that data is stored in one country, if necessary.)

Everything and the Kitchen Sink

In years past, many applications had to be hosted locally because the resources required for running and maintaining data offsite either didn’t exist or were too expensive for most small businesses to afford. As such, the software and hardware to run everything from network file servers to account management, portfolio accounting, and document management systems was typically hosted locally. Offsite hosting was largely limited to general storage, communications archiving, and disaster recovery systems.

With the ubiquity of the cloud and the rush by traditional technology vendors to provide access to their products through the web, it is more important than ever for managers to think through and evaluate their technology needs with a long-term horizon. Just because a particular solution is available as a cloud service, doesn't necessarily mean it is entirely ready for the cloud. Many software applications used by fund managers run at the same relative speed regardless of where they are hosted. However, for certain computing functions, latency can pose a serious problem. As such, managers should thoroughly evaluate the performance and reliability of web-based services for activities requiring extremely low latency.

Experience and Focus Matter

Many generic cloud solutions boast that their applications are perfect for any business of any size. While that may be the case, in reality, this generally means that without significant and costly customization - users end up with tools that provide minimal tangible benefits and poor customer service. A fund manager who asks a residential real estate lawyer to pen an offering memorandum for a global macro hedge fund is probably not going to get the best document. The same logic applies to selecting a software platform.

In the end, investment firms should determine the best technology structure suited for them based on internal resources and data requirements. Thoroughly evaluating the operational risks and benefits associated with various cloud offerings can help solidify the decision between cloud versus local.

Conclusion

Cloud computing will continue to grow and evolve, adapting to the ever changing needs of its user base. Recent IDC cloud research shows that the cloud services industry will reach $72.9 billion by 2015, representing a growth rate over four times the projected rate for the worldwide IT industry as a whole. Whether an organization chooses to incorporate a cloud solution or a local solution remains completely up to them, but one thing is for sure – "The Cloud" is here to stay.

About Backstop Solutions Group

Backstop Solutions Group, LLC is a privately held Software-as-a-Service (SaaS) platform company, providing cutting-edge software to hedge funds, funds of funds, endowments and other institutional investors. Backstop Solutions was founded in 2003 and is one of the fastest growing software providers in the financial services industry. Backstop Software is used by more than 315 firms throughout the United States, Europe and Asia and has been repeatedly recognized by industry leading managers and service providers as a top technology provider in the alternative asset management field.

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