

# RISING CLOUD AN ASSET MANAGER'S GUIDE TO CLOUD COMPUTING

## AN ASSET MANAGEMENT WHITEPAPER

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# RISING CLOUD

## An Asset Manager's Guide to Cloud Computing

### Profitability Lost and Found

Asset managers continue to cope with the profound effects of the 2008-2009 market collapse. The question decision makers continually ask is "what can be done to recover lost profitability while maintaining an IT infrastructure and operation that mitigates risk"?

One solution can be found in migrating older or locally installed front, middle, and back office systems onto cloud platforms. The value proposition for migrating technology only gets stronger as margins are squeezed and firms are tasked to do more with less.

In the financial services space in particular, "The Cloud" and its associated service providers are seen playing a central role in maintaining hardware and software, and taking responsibility for upgrades and version control. Such capabilities can have a material impact on firms, allowing them to focus not on system architecture but rather on servicing clients and growing assets. Cloud computing also dramatically reduces the total cost of ownership and offers significant business value to buy-side firms, which seek to increase efficiencies in their IT environments.

As Chief Technology Officers and Chief Security Officers explore the applicability of the cloud, we hope this SunGard paper will serve as a high level guide and educational tool for your firm.

### What is "The Cloud"

Cloud computing is a form of IT delivery that provides users with on-demand access to a flexible, wide-ranging pool of technology assets composed of services, applications, servers, networks and storage facilities.

Because of the term "cloud computing" and the habit of referring to data and applications as being "in the cloud," it can be easy to forget that "the cloud" is housed in physical facilities. Available via a web interface to remote users, cloud computing services are powered by highly virtualized processing and storage systems in data centers.

Clouds consist of groups of one or more physical servers sitting behind an access point that distributes requests for access. Proprietary hosted systems can be built in-house on top of existing hardware; or access to external clouds can be rented on demand from third-party vendors such as the major online retail companies. The cloud's virtualization feature allows users to run multiple applications and operating systems independently on a single server. Additionally, administrators can quickly move workloads from one virtual workspace to another, easily prioritizing business needs while maximizing server resources.

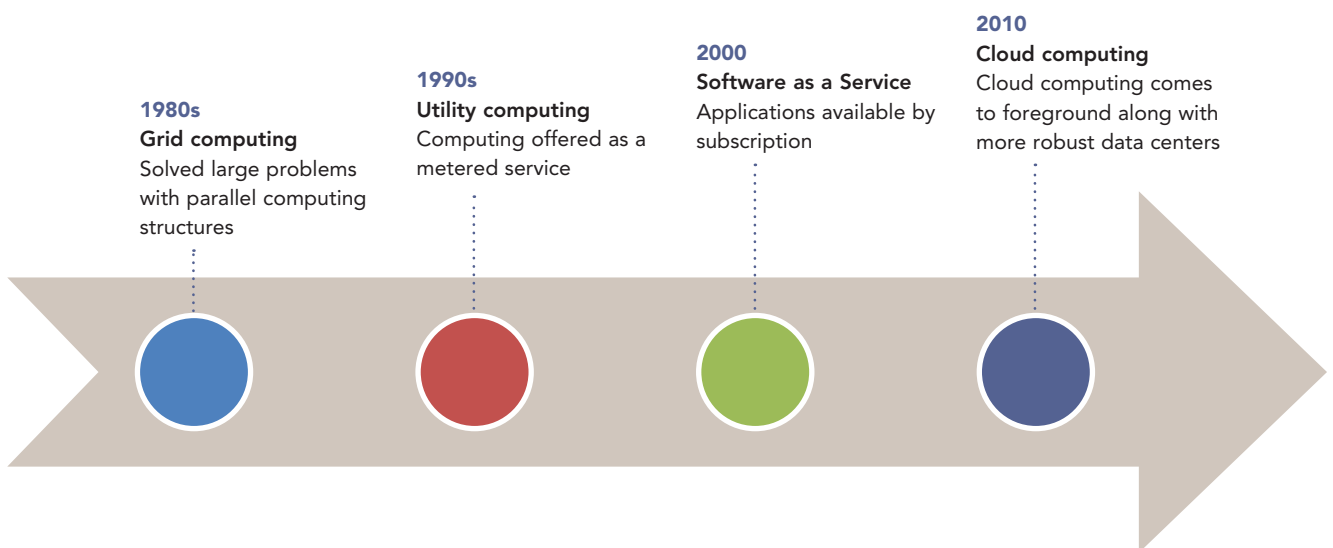
## How Does Cloud Computing Work?

Clouds provide request-driven, dynamic allocation of computing resources for a mix of workloads on a massively scalable virtual infrastructure. Because the cloud computing model reduces the need for capacity planning at an application level, the user of an application can request resources from the cloud and obtain them quickly. By contrast, in a non-cloud environment, it could take much longer for administrators to reconfigure hardware and software to add more computing power.

### The Evolution of Cloud Computing

The foundation for cloud computing was constructed in the 1980s. From the grid computing mainframes of that decade, utility computing then offered clusters as virtual platforms with a metered business model by the 1990s. More recently, software as a service (SaaS) has raised the level of virtualization to focus on everything from subscriptions to applications.

From those origins, cloud computing allows today's users to gain access to their applications from anywhere, at any time, through a wide variety of portable devices.



While many asset managers will enter into cloud computing with a primary goal to save money, the cloud is really an entry point to becoming more efficient by continuing the evolution of technology architectures, management tools, operational processes and customer relationships.

## Different Clouds For Different Needs

In many industries, the public cloud is the most recognized form of cloud (not so with the financial services industry, where private clouds dominate). However, it is important to make the distinction. Rather than having dedicated equipment for each client (servers, networking, surge protection, storage, bandwidth, etc.), clients share a pool of resources. By sharing equipment, a public cloud offers the greatest possible cost efficiencies, as well as excellent scalability and elasticity.

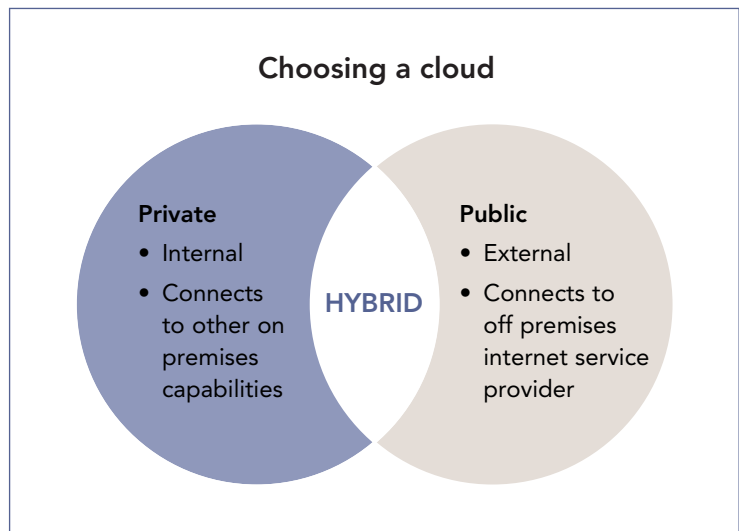
However, because the public cloud does not have the same regulatory scrutiny, security can be a concern. Access is typically through shared Internet connections. This fact makes a public cloud less than ideal for hosting sensitive applications and data.

For increased security, many businesses turn to a private cloud solution. In a private cloud, many of the resources in the operating environment are dedicated to a single client, ensuring that the client's data never shares virtual space with another company. With private leased line access replacing Internet connections, the client can also be granted access to security and management controls as needed.

Private cloud	Public cloud
Closed infrastructure; increased security	Security can be a concern
Provider manages data centers on site	Access through shared Internet connections
Regular monitoring of security by outside auditing firms	Service provider manages the environment

In many cases, companies are starting to explore a hybrid cloud approach. That is, they are looking to connect data centers, public and private clouds in any combination. Some firms use a public cloud for non-sensitive data or testing and rely on a private cloud for critical data and applications. While retaining their independence, the individual clouds are bound together to facilitate the portability of data and applications.

With a hybrid cloud, an organization manages some resources in-house while other functions are managed externally. For example, an organization might choose to migrate their investment accounting function to the cloud, while performing other tasks within their own IT infrastructure.

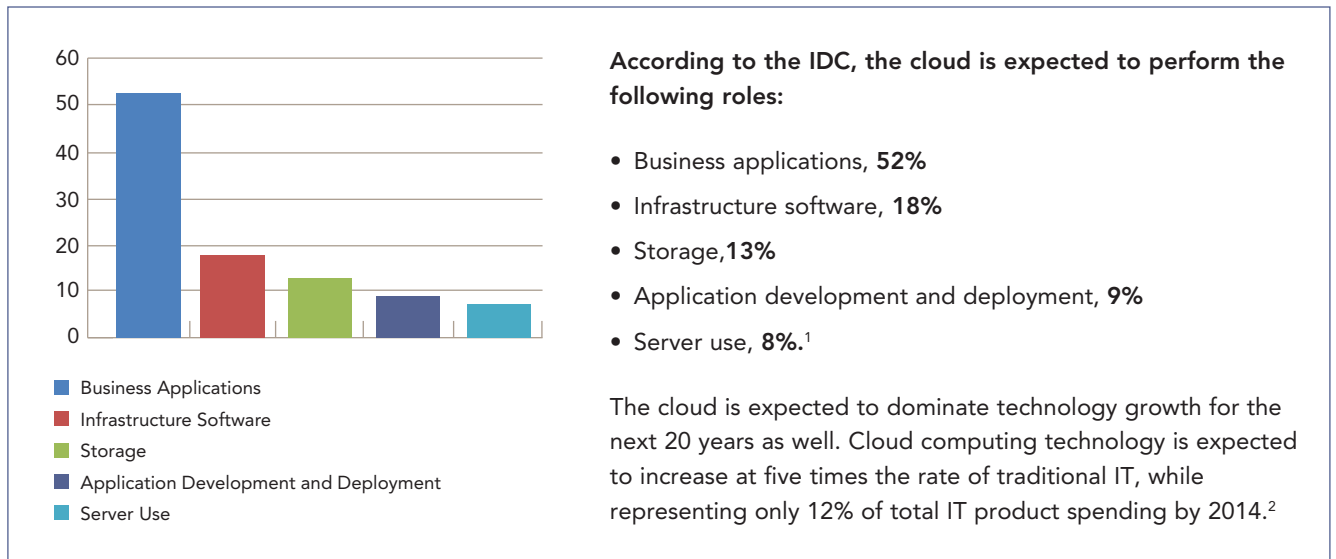


For many firms, the hybrid approach can be the best of both worlds: It allows a business to take advantage of the scalability and low cost of a public cloud, while still having access to specially designed dedicated capabilities within the highly secured environment of a private cloud.

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## The Unstoppable Cloud

The asset management industry's extensive use of SaaS programs has provided a significant foundation for migration to cloud-based platforms. Many of the processing, storage and security tools an asset manager requires to run its business are now available through cloud-based applications.

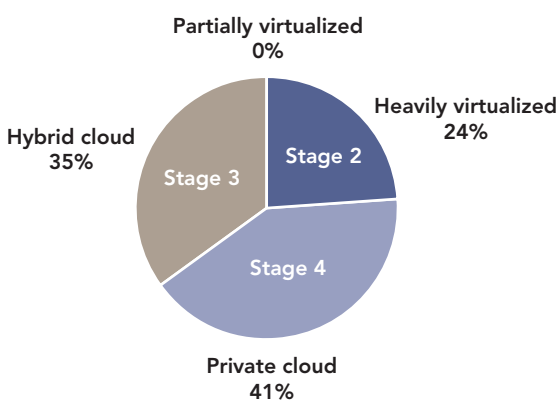


<sup>1</sup> Source: IDC <http://gigaom.com/cloud/infographic-cloud-computing-by-the-numbers/>

<sup>2</sup> Source: IDC <http://www.techrepublic.com/blog/networking/cloud-computing-to-grow-at-5-times-rate-of-traditional-it-says-idc/3133>

## The Cloud For Asset Managers

Increased regulations imposed on the financial services space and its participants are expected to have a material impact on the technology and operational decisions they will need to make.



These reforms will have a substantial influence on more than 4,000 brokerage firms and an estimated 8,500 investment managers globally. The new regulations are likely to push some firms to further migrate functions which are traditionally maintained within the walls of the asset management firms.

Chief financial officers will continue to apply pressure to heads of IT and operations to seek ways to trim costs in response to continued market uncertainty and reduced profitability.

At Gartner's Data Center Conference in December 2010, 55 attendees responded to a poll asking, "By 2015, how would you describe your virtualization progress (choose the one most applicable)?" The responses at left show a majority of users in the financial services space lean toward greater use of private and hybrid clouds.

In addition to demands for asset management technology improvements, there will likely be opportunities for institutions that service asset managers and broker-dealers. These include custodian banks, sub-custodians, prime brokers and hedge-fund administrators.

With unprecedented regulatory activity and more stringent client demands on asset managers, achieving growth will be difficult without the appropriate technology infrastructure in place.

If asset managers are forced to divert scarce and valuable resources to overcoming operational issues and deficiencies in their investment management IT platforms, then their prospects for increased productivity weaken.

The table to the right, from TowerGroup, outlines six issues the researcher believes will become major priorities for the asset management business and technology due to regulatory reform. According to TowerGroup, asset management functions likely to benefit from technologies like cloud computing include real-time, regulatory and performance reporting; data management and valuation; as well as compliance management and audits.

<b>OTC derivatives</b>	<ul style="list-style-type: none"> <li>• Collateral management</li> <li>• Central clearing</li> <li>• Real-time reporting</li> </ul>
<b>Leverage and capital adequacy</b>	<ul style="list-style-type: none"> <li>• Real-time positions monitoring</li> <li>• Regulatory reporting</li> <li>• Leverage management</li> </ul>
<b>Hedge fund registration</b>	<ul style="list-style-type: none"> <li>• Audits and compliance</li> <li>• Performance reporting</li> <li>• Investor education and disclosure</li> </ul>
<b>Valuations</b>	<ul style="list-style-type: none"> <li>• Data management</li> <li>• Intraday valuation</li> <li>• OTC valuation</li> </ul>
<b>Risk management</b>	<ul style="list-style-type: none"> <li>• Data management</li> <li>• Attribution analysis</li> <li>• Systems integration</li> </ul>
<b>Audit and compliance</b>	<ul style="list-style-type: none"> <li>• Compliance management</li> <li>• SEC audit preparation</li> <li>• employee surveillance</li> </ul>

## What Solutions Does the Cloud Provide?

For asset management firms, the recession of 2010, coupled with extreme market volatility, has lowered both assets under management and fees. In addition, The Dodd Frank Amendment, EU mandates, Basel III and other regulatory initiatives have further challenged managers. With these new requirements in place for additional reporting and auditing, asset managers have assumed a larger regulatory burden – one that will need additional recordkeeping resources to meet the new compliance standards.

Post-crisis asset managers find themselves confronted by three major challenges to:

1. Lower the total cost of ownership
2. Ensure a high level of security
3. Expand operational capabilities to be responsive to intensified compliance audits

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## 1. Lower Total Cost of Ownership

Total cost of ownership (“TCO”) is the term used to calculate the costs to run a system over its lifetime, and is the most effective metric to compare the costs of cloud computing and installed software. It not only incorporates the fees paid to vendors, but also equipment and staff costs.

One of the primary reasons firms turn to the cloud is to lower the TCO of the IT ecosystem. Traditionally, buy-side firms have relied heavily on large internally built proprietary systems to serve front, middle and back office functions. As a result, this involved tremendous resources to not only build out specific IT infrastructures, but the systems and processes on the periphery, like business continuity and disaster recovery plans as well as the data centers and servers.

Management and maintenance of internal systems also come at a steep cost. As technology ages and becomes more antiquated, it also becomes more expensive to service and maintain. Additionally, there are implications for end users who must use a technology that perhaps in many instances, creates inefficiencies. The upgrading of versions can also interrupt usage and become a labor intensive process, placing additional stress on internal resources both at the end user and the firm. Not to mention, traditional software typically requires dedicated head count to manage IT systems. Over time, internal IT staffing typically can become one of an organization’s largest costs.

Today, with shrinking margins and heightened regulatory requirements, buy-side firms are looking to migrate functions that are not core to their business strategy. This move in turn alleviates some of the pain they experience from overgrown internal systems – and ultimately lowers the Total Cost of Ownership.

### Contrasting the added value of SaaS with traditional IT

Traditional Hardware and Software	Cloud Computing
<ul style="list-style-type: none"><li>• Pay upfront capital expense</li></ul>	<ul style="list-style-type: none"><li>• Pay-as-you-go-operational expense</li></ul>
<ul style="list-style-type: none"><li>• High upfront cost and annual maintenance costs</li></ul>	<ul style="list-style-type: none"><li>• Lower up-front subscription costs</li></ul>
<ul style="list-style-type: none"><li>• Cost for applications, maintenance, infrastructure and IT/application resources</li></ul>	<ul style="list-style-type: none"><li>• Cost for annual subscription and minimal IT/application resources</li></ul>
<ul style="list-style-type: none"><li>• Longer time required to install and configure applications</li></ul>	<ul style="list-style-type: none"><li>• Faster implementation and time-to-productivity</li></ul>
<ul style="list-style-type: none"><li>• Not much control over vendor after purchase</li></ul>	<ul style="list-style-type: none"><li>• More control over relationship with vendor</li></ul>

One of the core precepts of cloud computing is to avoid over-provisioning and under-provisioning the IT function. Along with the cloud’s cost, revenue, and margin advantages, rapid deployment of cloud services offers a low entry cost, and the potential to enter and exploit new markets. Additionally, the cloud’s speed and rate of cost reduction can be much faster than traditional IT. In cloud computing, a buyer can purchase a service subscription from a provider instead of buying, owning, managing and updating a traditional IT platform themselves.

Other productivity benefits can include:

- **Pay-as-you-go**

Because cloud computing has a cost structure that functions in many ways like a utility billing model, IT infrastructure becomes an operating expense and ceases being a capital expenditure. By utilizing the cloud's shared resources, a company can pay according to actual server usage over time rather than having to spend capital up front to maintain large systems via data centers, upgrades and audits.

- **Scalability**

The computing power available in the cloud is virtually unlimited, enabling an asset manager to use the cloud without worrying about capacity issues. This also enables firms to scale up or reduce cloud power in minutes in contrast to traditional IT centers where the decision to purchase or rent additional physical servers may take significantly longer.

- **Ease of implementation**

The cloud is a rapid deployment model that enables applications to be implemented more quickly than installed systems. In addition once installed, clients can benefit from always being on the most recent version, further promoting best practices within that particular area.

- **Automatic, seamless upgrades**

In contrast to traditional locally installed IT, which must update its software on-site periodically which is a manually intensive exercise, cloud users can execute upgrades much more easily with limited drain on IT staff.

- **Facilitates M&A activity**

The cloud offers a powerful way to accommodate time sensitive M&A activity. Instead of rebuilding internal technology departments with each new merger or acquisition, most technology requirements can migrate to the cloud and stay there, regardless of corporate moves below.

- **Redeploy resources to revenue generating activities**

Cloud services let firms redeploy resources and professionals toward more client-facing, business development activities. A company can focus on new products and projects to enhance profitability.

- **Evolutionary**

While asset managers oversee portfolios, the cloud is constantly improving and accommodating new technologies. In effect, without internal investment, the cloud can grow with the asset manager and the industry. With proprietary systems it is much more labor-intensive to adapt quickly to new technology. This has significant implications on downstream systems and resources.

To utilize the cloud's powerful capabilities, buy-side firms need to identify the most experienced provider they can find to benefit from the full realization of tangible savings. For a buy-side firm, the time spent on implementing, managing, securing, and upgrading internal infrastructure disappears by transferring the heavy lifting to the cloud provider.

## 2. Security: Locking Down The Cloud

Threat	Potential Remedies
<b>Nefarious Use of Cloud</b> Criminals leverage new technologies to manipulate information and avoid detection.	Stricter initial registration and validation processes can help. Comprehensive inspection of customer network traffic and monitoring public blacklists for one's own
<b>Shared Technology Issues</b> Attacks have surfaced in recent years that target the shared technology inside cloud computing environments.	It's important to implement security best practices for installation and configuration. Choosing a hosting service with extensive, private, dedicated resources may be preferable to patching over vulnerabilities.
<b>Data Loss or Leakage</b> Loss of core intellectual property could have competitive and financial implications. Worse still, there might be compliance violations and legal ramifications.	Implement strong API access controls; and encrypt and protect integrity of data in transit.

It is important to recognize that one cannot mitigate security risk 100% in the cloud (or in internal systems for that matter), however steps can be taken to significantly reduce risk to a level that is acceptable for a given business need. The most crucial step in reducing risk is vendor selection. The right vendor will work in partnership with customers in order to maximize cloud security. The key is: security is a collaborative effort between the vendor and the client. The vendor can provide the means by which a secure environment is achieved and make it a practical reality<sup>3</sup>.

To illustrate the importance of enabling data security, 80% of small- and medium-sized enterprises affected by a major data control failure permanently closed their doors after 18 months<sup>4</sup>. Additionally, according to an IDG Research survey of IT leaders, 68% of respondents indicated that security is a primary concern; 57% said they worry about data control; while 43% fret over meeting requirements of SLAs.

Increasingly organizations will demand that their cloud providers be ready to help them make the case to board members, investors and regulators on a range of security issues.

Along with the above remedies, there are other things asset managers should consider when thinking about security.

- **A secure vendor**

The longevity, stability, experience and expertise of the vendor is obviously something that should be examined extensively. Time and again, new cloud providers have come and gone, and because a cloud is a service to be utilized and not a stand-alone product, the disappearance of a provider can have significant impact on a firm's business and data. This is why the provider should also possess the applicable knowledge which has been established with numerous customers.

- **Data security**

Data is the lifeblood of the cloud and without the correct protections in place, data can be compromised. Sound encryption protects the integrity and availability of data housed in the cloud. Intrusion detection and prevention is also paramount where a vendor's firewall, scanning, and anti-virus applications should be considered.

- **System access**

Firms must also examine the area of system access, who has access to what, and why? Policy and process controls must also be in place to ensure only approved individuals have rights to system code or data.<sup>3</sup>

- **Ease of monitoring**

A firm must also have the ability to easily monitor and track 24/7 system processes and have the ability to adjust permission-based dashboards.

## Availability and Recovery

At some point, regardless of the provider, an incident will occur. It may involve a minor power loss a few hours in duration or a catastrophic natural disaster that destroys a data center facility.

Every asset manager needs the full assurance that their data environment is recoverable. To do that, an effective disaster recovery plan must lay the groundwork for creating a robust, multi-form system of back-ups and redundancy. A recovery plan must be comprehensive enough to cover on-the-ground data centers as well as the cloud. Additionally, the recovery strategy needs to be supple enough to have on-line as well as off-line capabilities at another cloud site.

In short, providers must build these three guarantees into a dependable recovery plan:

### 1. Availability

A company's business will grind to a halt if connections to the cloud are severed. Therefore, it is vital that a vendor provide an SLA outlining availability, reliability, and redundancy.

### 2. Capacity

One of the greatest benefits of cloud computing is its elasticity – that capacity can be expanded and contracted on-demand. To ensure this benefit, the SLA should articulate how much added capacity is guaranteed to be available for periods of peak usage.

### 3. Storage

Managed storage is critical, with integrated backup and restoration capabilities.

It is imperative that all critical parties know their specific roles and responsibilities. To review and approve the SLA will clarify who is responsible and for what at every point in the network. To aid in this effort, the European Network and Information Security Agency (ENISA) has even provided a number of best practice directives to security officers. For example, ENISA advises that:

*“Customers are responsible for keeping their applications up to date – and must therefore ensure they have a patch strategy (to ensure their applications are screened from malware and hackers scanning for vulnerabilities to gain unauthorized access to their data within the cloud).”*

*“Customers should not be tempted to use custom implementations of Authentication, Authorization and Accounting (AAA) as these can become weak if not properly implemented.”*

To be secure in the cloud, then, an organization must work with their vendor to design a fail-safe SLA. This will go a long way in ensuring adequate resilience and back-up capacity, as well as capabilities for data restoration and disaster recovery.

<sup>3</sup> SunGard Security in the Cloud:

[http://www.sungardas.com/Documents/SecurityintheCloud\\_WPS-057.pdf](http://www.sungardas.com/Documents/SecurityintheCloud_WPS-057.pdf)

<sup>4</sup> SunGard Business Continuity Readiness: are you prepared?

<http://www.sungardas.com/Solutions/DisasterRecovery/PlanningAndSoftware/Pages/PlanningAndSoftware.aspx>

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## 3. Compliance: Regulating and Auditing The Cloud

Asset managers need to find a service provider that clearly demonstrates that its cloud environment and processes address both industry-specific and universal compliance requirements. Providers, on their side, must demonstrate they have embedded the appropriate services, controls, and procedures to support a customer's compliance requirements.

Putting protections in place is especially necessary in the asset management world where regulators stand ready to impose fines and other penalties if compliance and fiduciary standards are not met.

With a heavy regulatory focus on risk management and compliance, investment management organizations are likely to overhaul their systems to support needs in five areas: risk management, compliance, reporting, analytics, and data management.

It is increasingly clear that the Dodd-Frank Act and EU mandate will also have a profound impact on the technology departments of asset management firms (as well as other participants), requiring them to enhance many of their applications.

Under Dodd-Frank and the EU mandate, most alternative investment managers will be required to register with a regulatory body. Other notable changes concern new reporting requirements for monitoring systemic risks, changes to regulation of over-the-counter (OTC) derivatives, and potential changes to industry fiduciary standards.

Key cloud advantages specific to regulatory compliance include:

- **More compliant facilities and processes**

Many midsize companies don't have the resources in place to manage the audit and certification processes for an internal data center. Cloud providers can address both, and help companies manage their mounting regulatory obligations.

- **Rapidity**

Through its speed and scalability, the cloud can help buy-side firms accommodate quickly to increased regulatory burdens without the need to completely build out new internal technologies.

To measure the risk and regulatory impact of investment decisions, regulators will also inspect every link in the data management process from the asset manager and data center, right through to the cloud computing provider. This is why a firm's cloud provider must have extensive experience in both the complexities of this highly regulated industry, as well as a proven track record with hosting private and hybrid clouds.

### **Not all cloud service providers are created equal**

Bearing in mind that all technology requirements frequently change over time, a company should look for a vendor with a broad portfolio of other investment-related services to accommodate new business growth. A vendor with a wide array of technology services and the depth of financial services necessary to look out for their client's best interests, can help keep a financial firm on the path to best practices as it evolves over time.

## Cloud Provider Checklist For Asset Managers

Whatever cloud-based solution an asset manager chooses, the provider should have strong capabilities in all of these critical areas:

- Deep understanding of asset management industry
- Knowledge of compliance and regulatory issues
- History of providing cloud-based services
- Cloud provider does not outsource responsibility of passing an audit to a third-party technology vendor
- Responsible for the cloud technology
- Robust business continuity planning model with adequate datacenters for back-up
- Automatic upgrades by way of the cloud
- Predictable payments without a large up-front cost
- Capability for hybrid solutions to integrate the cloud with local installations if needed
- Willingness to customize solutions for asset manager
- Security and privacy protections that meet or exceed internal IT and data security policies
- Quickly scalable up and down as resources are needed
- Clear explanation about where data is stored and how it is handled
- Comprehensive SLA that meets or exceeds organization's needs and requirements
- Proven financial stability
- A track record of successes, including references

### Conclusion

Today's realities make cloud computing a logical fit for meeting the needs of both financial firms and their clients, who demand a combination of flexibility, efficiency and support for the completion of large workloads at high speed.

For financial firms, cloud computing can represent the cornerstone of a powerful business strategy that combines reduced costs and increased regulatory responsiveness, while maintaining a high level of security.

Clouds let companies redeploy valuable resources to undertake more business development initiatives. The key to accessing this technology, however, is the assurance that the chosen cloud provider has the depth of knowledge and experience required for firms that operate decisively in today's global financial markets.

While many asset managers will enter into cloud computing with a primary goal to save money, they will quickly see that the cloud is really an entry point to becoming more efficient by continuing the evolution of technology architectures, management tools, and operational processes.

### SunGard Brings The Cloud Down To Earth

For decades, SunGard has led the technology vanguard for the asset management industry worldwide.

SunGard was in "the cloud" before anyone was even talking about the cloud.

SunGard's Asset Management solutions can help take your business to the next level with a secure, scalable and private cloud-based platform that maximizes IT efficiency, reduces costs, lowers risks and increases the availability of your data and applications. SunGard maintains all hardware and software, provides operational support for securities pricing and corporate actions, and takes responsibility for upgrades and version control.

SunGard has been hosting IT for asset managers and ensuring data security for over 25 years, with global data centers that provide unsurpassed reliability and speed. Unlike other vendors, SunGard does not outsource hosting technology - all accountability and system integrity resides with SunGard.

SunGard hosts wide-ranging asset management applications delivered through proprietary operations space and managed data centers globally. Also, an established recovery rate further enables SunGard to extend a cloud programs built upon product expertise and reliability.

If you wish to know if you are ready for the cloud, SunGard's consulting services can provide a complete assessment of your IT environment, and develop the right migration strategy for a smooth transition to the cloud.

## Take It To The Cloud With The SunGard Suite

When an asset manager examines the intersecting activities that involve data, content and technology in an organization, the value and potential of cloud computing becomes even clearer. Firms should consider whether these areas of activity and internal functions might be ready for migration to the cloud.



## SUNGARD ASSET MANAGEMENT

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## About SunGard's Asset Management Solutions

SunGard's asset management solutions help institutional investors, hedge funds, private equity firms, fund administrators, and securities transfer agents improve both investment decision-making and operational efficiency, while managing risk and increasing transparency. SunGard's solutions support every stage of the investment process, from research and portfolio management, to valuation, risk, compliance, investment accounting, transfer agency and client reporting.

[www.sungard.com/assetmanagement](http://www.sungard.com/assetmanagement)

## About SunGard

SunGard is one of the world's leading software and technology services companies. SunGard has more than 20,000 employees and serves 25,000 customers in 70 countries. SunGard provides software and processing solutions for financial services, higher education and the public sector. SunGard also provides disaster recovery services, managed IT services, information availability consulting services and business continuity management software. With annual revenue of about \$5 billion, SunGard is ranked 380 on the Fortune 500 and is the largest privately held business software and IT services company. Look for us wherever the mission is critical.

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