WHITE PAPER

Making Cloud an Integral Part of Your Enterprise Storage and Data Protection Strategy

Sponsored by: Riverbed Technology

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EXECUTIVE SUMMARY

The explosive growth of enterprise data is posing new storage and data management challenges for enterprises. The advent of advanced storage and networking technologies makes it possible for IT organizations to take advantage of cloud-based IT services without sacrificing data integrity/security or application performance.

This white paper details the current challenges organizations face with respect to their evolving IT requirements, growing storage needs, and more extensive data protection requirements. It focuses on an expanding set of cloud-based storage offerings and the buying considerations of those who want to improve the data management metrics associated with data protection services such as backup and recovery. The paper also takes a closer look at the solutions offered by Riverbed Technology that allow organizations to integrate cloud-based storage within solutions that address a growing set of data protection demands.

The Evolution of IT in the Modern Datacenter

The modern datacenter is undergoing an unprecedented transformation in the way IT is managed and delivered. Fueled by rapidly evolving business and operational considerations, today's IT executives and administrators are under an increasing amount of pressure to respond to a new set of requirements.

The recent recession has created a new world of business goals with respect to IT delivery, including the need or desire to:

- Reduce or eliminate capital expenditure
- Streamline and develop more predictable operational expenditure
- Comply with regulatory and/or business governance mandates
- Deliver IT services to increasing numbers of internal and external users
- Leverage the inherent value of business data through increased analytics
- Rapidly deploy new services to internal customers

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From a technological and operational perspective, organizations must consider increasing pressures to:

- Improve asset utilization over an increasingly complex association of networking, physical and virtual server, and storage infrastructure
- Offer a growing number and variety of applications across a wide range of needs and interoperability levels
- Extend access of applications and data to expanding numbers of internal and external users, with mobility a growing and pervasive challenge
- Obtain control over the incessant growth, long-term management, and security of information, with increasing requirements to deliver layers of management that protect, extend, and leverage the value of data
- Reduce and move to more predictable energy consumption for power and cooling
- Provide end-to-end data protection and backup/recovery services that fulfill more stringent application and user requirements

The need to create a more dynamic IT environment — one that can rapidly respond to the changing business needs and operational demands within the modern datacenter — is giving rise to alternative methods of IT delivery.

Cloud Storage: An Attractive Alternative

The confluence of the business and operational realities described above, the explosive growth of enterprise data, and the advent of advanced storage and networking technologies has given rise to a class of cloud-based IT delivery alternatives.

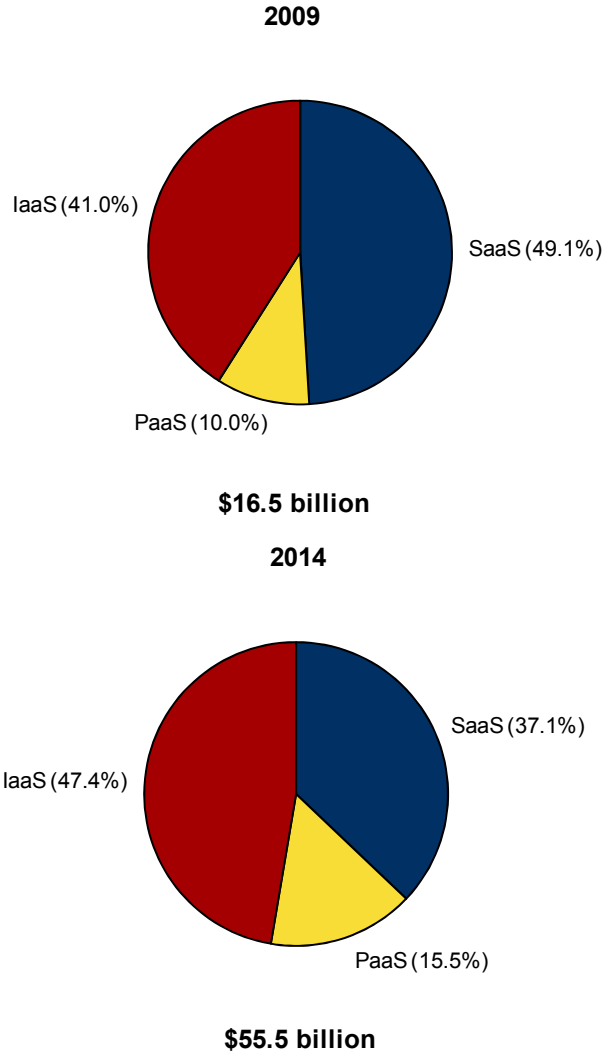
Advancements being made within the datacenter with respect to consolidation, virtualization, and improvements in management, utilization, and efficiency are creating the early stages of such "private" cloud offerings designed to provide a more holistic dynamic environment that can adapt to changing business needs.

Public cloud offerings represent an extension of and complement to the private, internal cloud that is evolving within the datacenter. These offerings represent a set of alternatives that IT organizations can leverage to address not only operational pressures such as offloading certain provisioning, reporting, disaster recovery, or administrative processes but also business pressures such as addressing reductions in capital spending and developing more predictable operational expenditure.

IDC predicts the future of public cloud services to be very strong, with the market opportunity growing from $16.5 billion in 2009 to $55.5 billion in 2014. Today, public cloud services consist largely of software as a service (SaaS), with platform as a service (PaaS) and infrastructure as a service (IaaS) growing with respect to customer interest and adoption. Figure 1 shows the IDC forecast for worldwide public cloud services.

FIGURE 1

Worldwide Public Cloud Services Forecast, 2009 and 2014



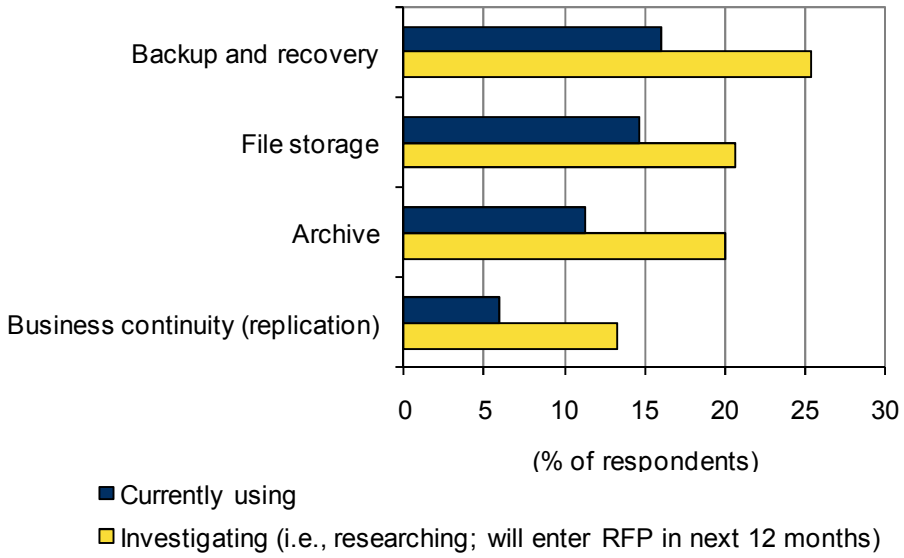
Source: IDC's *Worldwide and Regional Public IT Cloud Services 2010–2014 Forecast*, June 2010

Within the public cloud services offerings, elements of infrastructure such as compute and storage are anticipated to be among the largest growth areas. Specifically, the use of storage in the cloud, fueled by data protection services such as online backup and recovery, will continue to garner a great amount of interest and continued adoption. IDC expects the cloud-based backup and recovery opportunity that is already well under way to continue growing dramatically from $724 million in 2009 to $2.5 billion in 2014.

Additional IDC research suggests that IT organizations are finding backup and recovery to be among the most prevalent storage functions they would consider using in the public cloud. Figure 2 shows the survey results of 300 enterprise organizations investigating the use of or currently implementing some type of storage in the cloud, with backup and recovery leading among these use cases.

FIGURE 2

Interest in and Adoption of Cloud-Based Storage Services



Source: IDC's *Storage in the Cloud End-User Survey*, July 2010

Into the Cloud: Not Without Concern

As IT organizations consider the adoption of cloud-based services, they ultimately need to ensure optimum levels of control with respect to performance, reliability, efficiency, security, and service levels among applications and end users. For environments within the datacenter, a significant level of investment has been made over the years to reach these optimum levels of control. The transformation to dynamic IT and the move to a private cloud delivery model are predicated on maintaining this control.

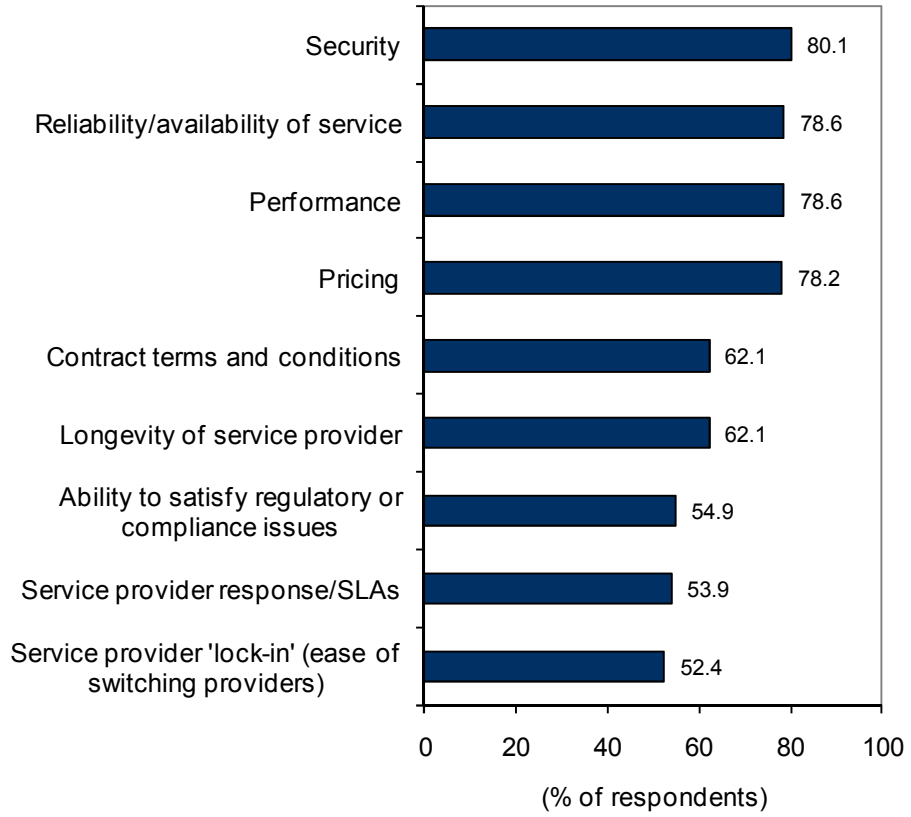
The concerns around maintaining control are intensified when organizations consider moving to a public cloud model for portions of IT delivery, including specific applications or workloads such as backup. Figure 3 shows the top challenges perceived by end users when they are considering the use of cloud-based backup and recovery. Based on these survey results and other IDC research and observations, these concerns can be categorized into the following three broad segments:

- Uncontrollability
  - Security of data — both in motion and at rest
  - Manageability and timely retrieval of data among multiple locations
- Unreliability
  - Performance — predictable access and fast data transfer
  - Availability of services

- Uncertainty
  - Complexity of choices, vendor lock-in, and pricing
  - Ability to integrate new public cloud–based offerings with existing applications and processes

FIGURE 3

Top Perceived Challenges for Cloud-Based Backup and Recovery



Source: IDC's *Storage in the Cloud End-User Survey*, July 2010

The Service Provider Ecosystem

Despite the advancements in technologies and the increasing sophistication of public cloud–based services, no one service provider can deliver a holistic offering that will entirely address all of these concerns. End-user concern will be addressed and alleviated only within a collaborative ecosystem. With service providers on the back end of the ecosystem, such as infrastructure providers offering compute and storage as a service, a framework of partnership is developing to bridge gaps in capabilities regarding the complete user experience, particularly as it relates to expanding levels of control with regard to performance, security, availability, and cost.

Ultimately, the ecosystem of service providers working with complementary technology and solutions providers can provide a faster, more secure, more reliable, and potentially less expensive public cloud experience centered on the following benefits:

- Peace of mind — by maintaining options for cloud users and control of data, metadata, and encryption keys
- Predictability — by guaranteeing local access, minimizing the impact of network on performance, and enabling quick recovery
- Practicality — by integrating cloud solutions with existing data management and protection applications and strategies

With regard to data protection and backup and recovery, one such company serving a critical role within the expanding cloud-based ecosystem is Riverbed Technology.

The Riverbed Solution

Riverbed is a worldwide supplier of integrated WAN optimization solutions. It provides a full portfolio of platforms and services that work together to meet IT requirements for more reliable and cost-effective enterprisewide access to data and applications.

Whitewater Cloud Storage Accelerator

The Riverbed Whitewater storage appliance addresses the concerns of many organizations with regard to using public cloud solutions for storage. Whitewater builds on Riverbed's successful history of providing network acceleration and optimization technologies for applications over a WAN and brings these optimization benefits to storage, with a particular focus on data protection including backup and recovery, replication, and elements of disaster recovery.

Deployed within the organization's datacenter, the Whitewater appliance improves efficiency and the administrative experience while reducing risk. As part of the ecosystem to improve the cloud experience, Riverbed has partnered with key storage service providers such as EMC, AT&T, and Amazon, which have embraced the opportunity to optimize the transfer of data between the third-party provider location and the enterprise organization's datacenters.

The Whitewater appliance integrates with existing backup applications such as IBM Tivoli Storage Manager, Symantec NetBackup, and Symantec Backup Exec and improves the performance of these applications without the need to reconfigure. In essence, the Whitewater appliance simply allows the existing backup application to recognize the cloud as an alternative target.

In addition, the appliance offers advanced features for both data in flight and data at rest, such as deduplication and advanced security encryption (SSL v3 for data in flight and 256-bit AES encryption for data at rest).

Benefits of Whitewater

The Riverbed Whitewater appliance addresses many concerns expressed by end users as they consider the use of cloud storage solutions. With respect to the particular concerns identified by end users and described earlier in this paper, the Riverbed Whitewater appliance provides the following benefits to enterprise organizations looking to leverage the cloud delivery model:

- **Peace of mind.** The management of offsite data transfer among multiple locations is dramatically improved given the ease of use to administer the appliance and through increased performance over the network. In addition, greater levels of control are established by securing the data with encryption of data in motion and data at rest and by offering an advanced key management system.

- **Predictability.** With greater levels of performance and availability, the cloud experience becomes much more reliable and allows the organization to move to a more predictable model of service levels regarding backup windows and recovery objectives (i.e., RPO and RTO).

- **Practicality.** Given the ability to integrate with existing local backup applications and infrastructure, significant levels of investment are preserved. In addition, the simplicity of the Whitewater open architecture within the datacenter, combined with partnerships among an expanding community of storage service providers, affords the enterprise organization the flexibility to choose among service providers either over time or over a geographically dispersed environment.

CHALLENGES/OPPORTUNITIES

The transformation to the cloud delivery model for portions of IT, such as backup and recovery, offers tremendous promise for many enterprise organizations. However, this transformation will not come without thoughtful consideration, planning, and preparation. Along the path toward making cloud a practical part of an IT strategy, organizations must keep in mind the following:

- Cloud will not be appropriate for all applications in all datacenters or all locations. Indeed, cloud will make sense for newer, often start-up, network-centric organizations or for business units within larger organizations focused on large content repositories (such as media/entertainment). However, within the broader enterprise datacenter operations, cloud will be adopted in a piecemeal fashion. Data protection services such as cloud-based backup and recovery are an appropriate beginning, and end users and technology suppliers will benefit from not biting off more than they can chew.

- Understanding how and where cloud fits into the overall IT environment will be extremely important. Given the options and permutations among public, private, virtual private, and hybrid cloud and the choices among location, operating, and access considerations, end users could find themselves bewildered over time. It will behoove organizations and solutions providers to engage with professional services to help end users navigate through this transformation.

- Over time, cloud will impact the way IT departments are organized. Organizations will coalesce around the broad categories of facilities management (running the datacenter), services management (orchestrating SLAs and the use of cloud services), and access management (controlling who uses the cloud among a growing set of diverse users). Given this, end users will need to adjust purchasing and management environments, while providers will need to adjust go-to-market and sales strategies.

CONCLUSION

Today's IT executives and administrators are under mounting pressures to create a more dynamic IT environment that can rapidly respond to changing business requirements and operational demands. In particular, the push for consolidation, the evolution of virtualization within the datacenter, the desire to move to a service-oriented model, and the advent of shared and efficient infrastructure offered by an expanding group of service providers have spawned an expanding class of cloud-based IT delivery alternatives.

Enterprise IT organizations will migrate to appropriate cloud services over time, with components of storage such as backup and recovery being an early, natural fit along this evolution. As organizations navigate through this transformation and consider the benefits of cloud, few will be willing to forfeit optimum levels of control with respect to performance, reliability, efficiency, and service levels among applications and end users. For many, the move to a public cloud delivery model is predicated on maintaining this level of control.

Ultimately, an ecosystem of service providers working with complementary technology and solutions providers can provide a faster, more secure, more reliable, and potentially less expensive public cloud experience. The Riverbed Whitewater cloud storage accelerator plays a key role in fulfilling the overall cloud experience by ensuring greater levels of control through ease of use, improved performance, and increased security while protecting investment in existing backup infrastructure — all of which are essential to making a graceful and effective move to the cloud.