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WHITE PAPER

Enhancing Business Value with an Edge-Optimized Virtual Server and Storage Delivery Solution

Sponsored by: Riverbed

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IDC OPINION

With the right information, delivered at the right time and in the right place, organizations better serve customers, make smarter decisions, and react faster to changing conditions. These elements all come together at the remote/branch office or store.

Today, one of the most difficult aspects of the IT investment decision process is identifying the optimal deployment location for IT assets such as servers and supporting storage systems. The division between the datacenter, which sits at the core of the business, and the many edges (remote, branch, and satellite offices as well as storefronts and construction sites) of the business remains one of the most daunting challenges for senior IT executives.

The wrong deployment choice can stifle business innovation, dramatically increase IT/network costs, degrade the customer/user experience, and expose the organization to unwarranted business risk. Traditionally, the choice between edge and core was an either-or proposition. Making matters worse, once the organization decides to proceed down one path for specific applications, it is typically extremely difficult to shift direction, even if circumstances have changed. Near-term efforts to reduce cost or respond quicker often translate into long-term increases in IT/network costs or reductions in business agility/reliability.

Today, new edge-optimized virtual server and storage solutions eliminate either-or from the edge and core decision. IDC interviewed three companies that deployed such a solution — Granite from Riverbed Technology. These organizations discussed their use cases and the benefits derived from the Granite solution. While the companies are still early in the deployment cycle, results suggest that edge-optimized solutions can effectively address organizations' remote site requirements. Benefits described by the three companies include:

- Improved **use of IT assets** at central datacenters and at remote locations (often cutting in half the IT assets required at remote sites)
- Reduced IT and third-party **staff resources** required to support remote office assets (often translating into thousands of dollars per year per site)
- Lowered deployment and **upgrade times** for many remote site–based applications from months to weeks, days, or even hours (while eliminating most site visits)

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- Dramatically improved **data protection** and **data retention** practices across the extended enterprise (while enabling faster onsite or near-site recovery)

The key to attaining these benefits, of course, is effective implementation of solutions, such as Granite, that make it easier to react to changing business conditions.

THE EDGE IS WHERE BUSINESS GETS DONE IN THE EXTENDED ENTERPRISE

The effective collection and use of information are key requirements for organizations in today's competitive business environment. Organizations are rapidly building out new branch offices in new geographies to reach new customers. They are creating new in-store services based on smart devices and kiosks that build tighter links to existing customers. They are also collecting, analyzing, and reacting to new data generated by smart devices and sensors in these dispersed locations.

It is not surprising, therefore, that making wise investments in business applications as well as the IT and communications assets used to support employees and customers in stores or branch offices is a major area of focus for senior business executives. Whether the industry is energy, healthcare, financial services, manufacturing, or retail, investments must focus on meeting business requirements at the edge.

Enabling Rapid Business Innovation

Supplementing existing applications with new information types (e.g., digital imaging systems or smart sensors) is a key driver of innovation in many industries today. One of the fastest and best ways to enhance existing offerings and develop innovative new offerings is through the consolidation and more effective use of often widely dispersed and fragmented information that is created or already exists in remote offices at the edge of the organization.

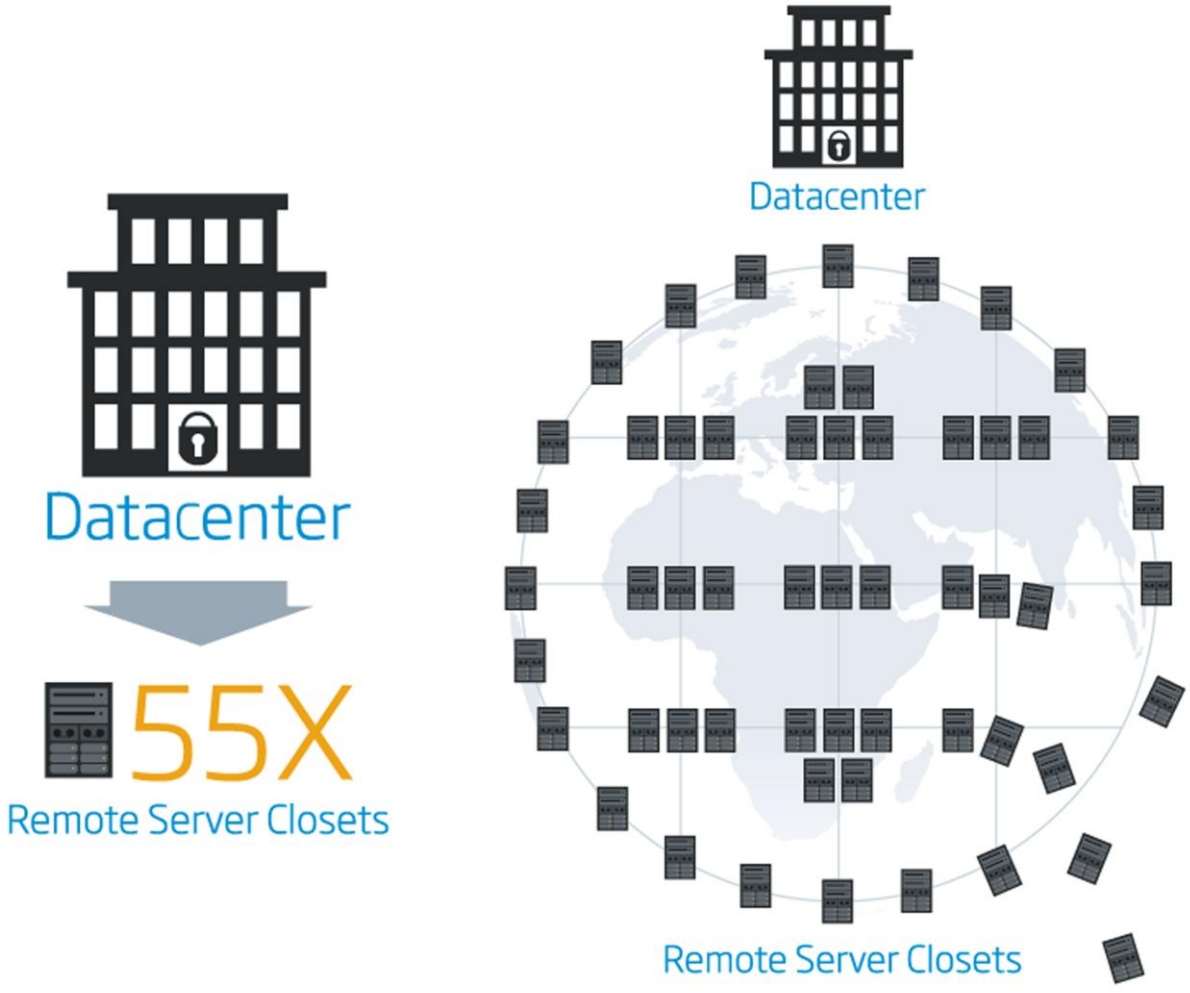
For example, many energy and mineral exploration companies depend upon the collection and assessment of increasingly sensitive imaging and seismic sensor data to make critical business and safety decisions in real time. The challenge, of course, is that most of this data is generated at the edge, but the expertise to analyze and react to it is not. Getting the data from the edge, which often suffers from slow or unreliable connectivity, to the center poses major challenges.

Controlling the Cost of Doing Business

For every centralized datacenter of over 10,000 square feet deployed today, over 110 server closets are in operation. If half of those server closets/rooms are supporting small businesses, midsize and large companies are operating 55 remote IT facilities for every large datacenter. Despite continued plans to consolidate IT assets at large, centralized datacenters, geographic expansion and new service delivery are driving a steady increase in this ratio (see Figure 1).

FIGURE 1

IT Assets in the Extended Enterprise



Source: IDC, 2013

As a result, unforeseen or uncontrollable increases in the costs of IT systems needed to provision and support new remote office applications pose major challenges to sustained corporate growth. As companies expand their reach, the time and resources (often translating into more than $10,000 per year in FTE staff per remote site) required to sustain/upgrade existing branch office applications and roll out new ones can quickly begin to erode margins and inhibit future growth.

In the world of retail, for example, companies are capitalizing on, or reacting to, customers' increasing use of mobile devices to evaluate and order products, both online and in the physical store. Retailers must replace existing point-of-sale platforms while enabling more in-store digital content delivery/collection. Companies need to deploy more powerful and sophisticated applications in stores, but to ensure consistent service delivery and limit operating costs, they are developing and managing these applications and the data in them from centralized datacenters.

Sustaining/Protecting the Business

The best information in the world, provided at the lowest cost, is useless if customers, employees, or business partners "on the ground" at remote locations can't access it when they need it, or if they doubt its integrity. Concerns about the availability and integrity of information can directly affect revenues and profits. They also raise issues related to corporate risk in the areas of governance and intellectual property that can influence reputations as well as have significant legal and financial implications.

Today, a large legal firm is likely to be managing contracts and intellectual property for customers around the globe. It's important for legal professionals in remote offices to have fast and reliable access to sensitive information and records, but it's also critical that the firm protect client information from loss or exposure due to local regulatory/law enforcement inconsistency. While more information is being collected and used at the edge, both the responsibility for and the control over its retention and use are increasingly centralized. IT organizations must deal with an expanding set of business-critical applications in remote locations, a shrinking window for acceptable time to application recovery in branch offices, and a heightened awareness of the costs associated with lost or corrupted data at the edge.

THE EDGE VERSUS CORE DILEMMA

Identifying the optimal deployment location for IT assets such as servers and supporting storage systems is one of the more challenging aspects of the IT decision process today. Removing either-or from the edge/core discussion is now possible because of solutions that enable a hybrid approach to managing assets. Examining the traditional benefits of centralized versus edge location assets helps underscore the need for and value of this new, more hybridized operating approach.

The benefits typically associated with centralization of IT assets include:

- Higher utilization of IT assets and IT staff resources (further enhanced in recent years by widespread adoption of server and storage virtualization technologies)

- More consistent and scalable application deployment, data protection, business recovery, and data retention practices/processes
- Faster organizationwide rollouts of new applications as well as application upgrades/fixes

Conversely, the benefits typically associated with the decision to place IT assets at the edge include:

- Reduced latency in accessing information, which is critical not only in transaction-intense applications but also when end users need to access large content files
- Greater flexibility in responding to the unique data and feature requirements of remote offices in different geographies or business sectors
- Less exposure to expensive, unreliable, or unavailable telecommunications circuits, especially in fast-growing, but still emerging countries

Historically, organizations had to choose between these sets of benefits and were then stuck with the choice, even if conditions changed. Now, they take advantage of new solutions that deliver both sets of benefits.

Resolving the Edge Versus Core Dilemma with Edge-Optimized Virtual Servers and Storage

In today's extended enterprise, living with the trade-offs of edge versus core is no longer acceptable or necessary. The key is creative bonding of the operational efficiency gains associated with server virtualization and datacenter storage technologies to optimize storage use/delivery/protection, WAN acceleration, and data security capabilities. When the edge of the enterprise and the core at the datacenter are linked together in an integrated solution, IT organizations can centralize control, security, and protection of distributed server and storage assets while ensuring timely access to (or recovery of) data and applications relied upon by users across the extended organization.

EDGE-OPTIMIZED USE CASES

To further explore this evolution, IDC spoke with three companies about their experience with edge-optimized virtual server and storage delivery solutions — specifically their Riverbed Granite solution implementations. While the interviewed organizations are still early in the deployment cycle, their comments suggest that edge-optimized solutions can quickly deliver a number of business benefits to organizations.

The remainder of this white paper examines the use cases that drove these companies to deploy edge-optimized solutions in their remote locations and examines the Granite solution in more detail.

Customer Goal: Improve Datacenter Asset Use While Reducing IT Hardware Costs and Operations Overhead at Remote Sites

The Challenge

The impact of server and storage virtualization on datacenter-based IT asset utilization is well documented, with companies of all sizes and types reporting >50% annual reductions in deployments of server and storage assets in datacenters thanks to improved asset utilization. Unfortunately, few companies achieved similar gains in remote offices. They are still running three, four, or more servers at utilization rates of less than 10%. Why?

For many, virtualized environments called for deployment of expensive, high-touch advanced SAN storage systems into locations with no IT staff resources. Even sites that were able to leverage existing storage assets struggled with new storage and backup management processes that taxed the skill sets of local staff.

The Edge-Optimized Solution

When speaking with companies that use edge-optimized solutions to enable local execution of centrally managed VM instances and data volumes, IDC found that they could more easily consolidate remote servers running critical local applications.

The Customer Impact

In many cases, customers were able to cut the number of servers deployed in remote sites by over 50% without having to deploy advanced storage or backup systems. This improvement further affected cost savings by reducing the IT staff required at remote sites to monitor and maintain the excess servers and storage.

In one case, a large international legal firm was able to improve its datacenter asset utilization rates while greatly reducing IT hardware and operational costs at its remote sites by 5x. This particular firm, which had 20 branch offices, was able to consolidate and centralize its hardware, software, and support to four main offices across the globe. In doing so, the firm greatly reduced the exorbitant cost to deploy and maintain duplicate operations across all 20 branches: "We set out originally to have a couple different boxes to handle different parts of the problem. Granite has now allowed us to handle WAN optimization and storage consolidation and storage protection in one box."

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The benefits derived from this shifted approach resulted in significant improvements, not only in total cost of ownership but also in the return on investment in hardware and operations investments. Additionally, the firm achieved significant improvements in its risk mitigation efforts by reducing the number of potential points of access from malicious external sources.

Customer Goal: Improve Business Agility with Rapid Provisioning

The Challenge

Improving agility in response to dynamic business demands is a top priority for business leaders when setting priorities for their IT teams. They are demanding 50% or greater reductions in the time it takes to develop, deploy, and update applications and services. Virtualization played a major role in meeting this business goal for datacenter-based applications. Until now, however, it was virtually impossible to service remote sites with new applications or updates to existing applications for the simple reason that it required onsite visits by internal or third-party IT operations staff. Upgrades across the organization could take months and came at a high price in terms of onsite service and support.

The Edge-Optimized Solution

The edge-optimized virtual server and storage delivery solution extends the business value benefit of rapid application deployment associated with virtualization to the remote office.

The Customer Impact

IDC spoke with organizations that can now update existing applications or roll out new applications in weeks, days, or even hours. VM instances and data set additions/updates on centralized storage assets are quickly, automatically, and virtually nondisruptively extended to remote sites with no onsite intervention required.

All of the companies IDC interviewed for this paper achieved substantial benefit by being able to rapidly provision their remote locations from their datacenters through this edge optimization approach. "One of the primary advantages is to simplify the infrastructure in the branch office. Having to manage less infrastructure at these remote offices just makes the IT infrastructure more robust," said a company in the precious metals industry. These companies achieved both soft and hard cost savings as a result. The significant reduction in the amount of time to roll out new applications helped greatly with reducing soft costs, plus the ability to deploy applications through this approach helped companies save on the costs for remote site hardware and the personnel required to be onsite at remote locations to ensure that application deployment was successful.

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Customer Goal: Improve Data Backup and Recovery, Data Retention, and Data Security for Remotely Generated and Used Information

The Challenge

Backup and recovery of applications and data at remote offices is one of the most daunting challenges for IT organizations. The best way to ensure regular backup and recovery of information is to centralize it on storage systems (with supporting secondary storage) in the datacenter. From a business perspective, however, the

need to deliver information as close to the customer as possible (e.g., to a remote sales engineer or branch manager at a bank) has historically required the dispersal of information to the remote office.

The deployment of servers and storage systems, along with the implementation of consistent backup practices, at numerous remote sites (in the case of banks or retail outlets, thousands of sites) is both an administrative nightmare and a security nightmare for many organizations. Companies that attempted to leverage basic remote replication also saw major spikes in network circuit costs, often the largest remote site expense in many regions.

The Edge-Optimized Solution

Companies deploying edge-optimized solutions reported that they were able to consolidate data protection for remote sites while reducing concerns about security, network costs, and availability for dispersed enterprises.

The Customer Impact

Organizations deploying such a solution noted that consolidation of branch data to the central datacenter dramatically improved data protection practices and recovery times onsite or — in the case of total loss of the remote site — at alternative locations.

For example, for one company working in the oil and gas exploration industry, key business issues that needed to be addressed included data retention, backup, recovery, and security. This had to be done within the context of operational constraints, such as having skilled hands onsite at geographically remote locations to ensure data was properly managed. This presented challenges across the IT hardware, connectivity, and staffing spectrum.

By deploying an edge-optimized solution, this company leveraged colocation and remote replication capabilities from remote sites back to the datacenter, optimized traffic between the locations, and reduced the need for physical hands onsite at the remote locations. In using edge optimization technologies, the company achieved better performance and significantly reduced latency. It was also able to accelerate the movement of data generated at the remote site to the central datacenter, where the data could be more quickly analyzed and acted upon. "I was pleasantly surprised that not only did we hit all the benefits or hit the requirements we were hoping to hit, but we found new ones as well," said a company in the oil and gas exploration industry.

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By using an edge-optimized solution, this company avoided "soft costs" associated with loss of business productivity because deployment of the one device it used enabled significant business benefits immediately. Overall, this company managed to reduce its hard costs by 60% by deploying this approach across its five remote sites. When the reduction in costs for remote hands to handle backups for each of the five sites is added to the mix, the cost savings increase significantly.

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RIVERBED GRANITE: SERVER AND DATA CONSOLIDATION FOR THE EDGE

Riverbed is a leading provider of application performance solutions for globally connected enterprises. Its goal is to help enterprises successfully and intelligently implement strategic initiatives such as virtualization, consolidation, cloud computing, and disaster recovery without fear of compromising performance for the end user. By giving enterprises the platform they need to understand, optimize, and consolidate their IT, Riverbed wants to help enterprises build a fast, fluid, and dynamic IT architecture that aligns with their business needs.

The Granite virtual server and storage delivery solution, which Riverbed launched in 2012, is designed to enable more seamless consolidation and centralization of data protection and management for virtualized applications by making better use of datacenter storage assets. It also enables "local-speed performance" and reliable access to data and applications by end users at branch and remote office locations.

Granite includes two components:

- Granite Core Appliance, a physical or virtual appliance in the datacenter that integrates with centralized storage assets, including support for leading datacenter-class storage systems by providers such as EMC, NetApp, IBM, and Dell
- Granite Edge Appliance, a service that can run either autonomously on a dedicated system at edge locations or as part of a previously installed Riverbed Steelhead WAN optimization appliance

The Granite solution increases transmission rates across the WAN and reduces latency so that compute platforms in remote offices can reliably access data stored and managed on storage at the central datacenter. With Granite, customers achieve rapid, local access to data in remote locations while ensuring that a "single" consistent version of the data is protected and secured on highly scalable and reliable datacenter-class storage systems.

Granite additionally allows for centralized management of data, applications, and virtualized server instances while leveraging advanced encryption to prevent data loss/leakage from servers and data in use at the remote location.

How Granite Storage Delivery Works

The Granite solution enables companies to decouple remotely placed servers from storage that traditionally needed to be locally attached. This implementation reduces the amount of IT equipment required at branch offices as well as the associated staffing requirements. It does this by enabling the consolidation of edge servers and storage into the datacenter. Through the Granite architecture, IT can protect provision, patch, back up, manage, and grow data that's accessible to the branch sites from the central datacenter.

One of the key features of Granite is that it provides companies with local network (LAN/SAN) performance at branch offices via the WAN. By deploying Granite, companies can leverage the following capabilities:

- Block-level pre-fetch that accelerates common actions such as OS boots, application launches, and document opens
- An authoritative block cache to support local-speed data commits and continued operations during WAN outages
- Data compression and deduplication to reduce the volume of data transferred over the WAN
- Data optimization to accelerate data transfer and reduce latency

Data Reliability, Accessibility, and Security

Granite consolidates data and applications at the hub and enables more direct and immediate monitoring and control over IT systems. With hub-based backup, companies can help mitigate the likelihood of data loss due to point problems at remote sites, while automated data replication to a central datacenter enhances full remote site recovery in the face of major disasters. Integration with industry-standard snapshot frameworks enables application-consistent data protection directly in the datacenter. When disaster or data loss occurs at the branch site, Granite enables companies to recover quickly from the hub storage.

This same capability also ensures greater visibility into and control over regulatory compliance, security vulnerabilities, and adherence to standard operating procedures.

Instant Provisioning and Recovery

Granite enables local execution of datacenter stored servers through its highly efficient "boot over the WAN" capability. This allows IT organizations to start and utilize required virtual servers very quickly over distance. The ability to deliver branch IT from the datacenter enables a new approach for edge IT management that takes full advantage of datacenter best practices while gaining capabilities such as instant provisioning and restores. The IT needs of a new office can be preconfigured in the datacenter and booted into service onto a Granite Edge appliance with all data immediately available locally.

Challenges/Opportunities for Riverbed

While Riverbed currently offers a broad portfolio of WAN acceleration and edge optimization solutions, the company must continue to expand the range of virtual server and datacenter storage solutions that it supports. It must also continue to optimize Granite to address additional remote site applications such as virtual desktops (VDI). In particular, Riverbed must continue to enhance the ability of its solutions in the area of automated data life-cycle management and integrated access control for security. This effort includes expanding partnerships with vertically specific content and archiving solution providers.

Finally, Riverbed must further educate its customers on the benefits of setting up an edge-optimized environment that takes advantage of automated data migration and data management capabilities for improved disaster recovery and compliance.

ESSENTIAL GUIDANCE

Boosting IT and network efficiency at the edges of the organization is not a one-time effort. Organizations' information bases and requirements are constantly changing in response to mergers or shifting business/customer requirements. Consolidation of systems and information at remote sites and central datacenters must be seen as an ongoing, iterative process, and any system deployed, whether in the datacenter or at the edge, must make this process faster and less operationally intensive now and in the future.

The key to attaining these benefits, of course, is effective implementation of solutions such as Granite, including the adjustment of related processes (e.g., application deployment and backup processes). A well-thought-out implementation also makes it easier to expand use of the solution into new user bases and for additional services. Finally, a sound implementation makes it easier for an enterprise to react to changing business conditions and new application needs.

The companies that IDC interviewed stated that the Granite solution was easy to deploy and extend as they activated additional capabilities for consolidation, data protection, and dynamic data life-cycle management. Those that acquired the solution through a Riverbed business partner also stated that the partner provided a support infrastructure as well as a set of complementary implementation and planning services that allowed them to meet current goals while preparing for future needs of the business.