



I D C A N A L Y S T C O N N E C T I O N



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Why Abstraction Is a Critical Requirement for IT Agility

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Enterprises are well on their way to embracing what IDC refers to as 3rd Platform computing, an era characterized by new application types — mobile computing, social media and business, and big data and analytics — that heavily leverage virtual infrastructure, flash storage, and cloud technologies. At the same time, IT organizations are continuing to support legacy application environments such as databases, messaging and collaboration systems, and file shares. To efficiently meet these needs — effectively bridging legacy and new environments — CIOs must follow an IT infrastructure strategy that supports the agility to accommodate different application requirements and rapidly adapt to a dynamic and evolving business climate.

The following questions were posed by HDS to Eric Burgener, research director of IDC's Storage practice, on behalf of HDS' customers.

- Q. 3rd Platform computing introduces significant new requirements for infrastructure in the areas of performance, scalability, availability, and agility. What are some of the key strategic considerations when managing the infrastructure this demands?**
- A. As older and newer application types are consolidated onto virtual infrastructure, solutions must deliver consistent submillisecond latencies and potentially up to millions of IOPS across extremely large data sets that are growing at high rates. With so many businesses directly dependent on IT infrastructure to drive revenue, optimize product and service delivery, and support new business and customer opportunities, datacenter management strategies must focus on the concepts of **abstraction**, **automation**, and **access**.

Abstraction of functionality into a software-defined infrastructure enables the agility to provision and reuse resources in a very granular manner in a heterogeneous environment. Automation improves the reliability of datacenter workflows, improves the productivity of administrative staff, increases the administrative span of control, and enables IT generalists to efficiently manage the delivery of application services (thereby lowering administrative costs). Access focuses on making data and business insights based on that data easily available to a variety of endpoint device types while still providing IT the flexibility to choose the best data organization method (block, file, object), storage medium and device type, and architecture to meet business requirements.

Abstraction effectively virtualizes resources spread across many different systems, allowing them to be managed by a set of data services and through APIs determined by the software-defined layer. The agility enabled by virtualization allows logical solutions to be easily assembled on the fly to meet a variety of requirements, and to be easily repurposed into new solutions as business requirements change.

Q. Why is agility so critical in this new era of computing?

- A. Legacy applications, built around a classic enterprise IT model, and new applications, requiring more of a Web-scale IT model, have very different requirements in terms of workload support, administrative expertise, and economies of scale. Trying to maintain two separate IT infrastructures, each tailored to a different set of requirements, is not efficient or cost-effective in the long term. A software-defined infrastructure allows a common set of server, storage, and network resources to be provisioned as needed into infrastructure solutions that can meet any requirement, depending on how they are configured. This provides a more efficient and cost-effective IT infrastructure that is easier to manage and can adapt to evolving business needs as required.

Today's business models are much more dynamic than they have been in the past, demanding a rapid response capability to meet customer service needs, deliver on service-level objectives as data sets continue to grow at high rates, and provision IT solutions to pursue new projects, business opportunities, or customers in real time. Creating resource pools whose provisioning is not constrained by storage silos increases utilization rates, improves efficiencies, and minimizes waste. Web-savvy customers expect quick turnaround on requests and immediate access to services 24 hours a day. The siloed, hardware-based infrastructures of the past cannot keep up with the pace of modern-day business, which requires new technologies such as virtualization, flash and cloud-based storage, and software-defined infrastructure to deliver the necessary agility.

Q. What can storage virtualization bring to 3rd Platform computing environments?

- A. Storage virtualization is a powerful feature that delivers both technical and business benefits. Virtualizing different types and generations of storage behind a centrally managed set of consistent data services provides more uniform functionality, making it easier to provision resources into tiers to meet different service levels (at different price points). This eases administrative requirements and improves productivity because operators do not need to learn different workflows for a given feature, such as replication, for different vendors' arrays. They can set up and manage cross-platform workflows using a single, familiar approach.

The single point of management enabled by storage virtualization allows orchestration of datacenter workflows that includes a variety of equipment, leading to more comprehensive automation solutions that are more efficient. And when IT infrastructure is virtual, the existence of APIs allows storage virtualization to work hand in hand with server virtualization to create even more comprehensive automation that can include all types of IT resources (server, network, storage, and applications).

Workloads can be placed on the storage architectures for which they are best suited as determined by performance, scalability, or cost. Intelligent storage tiering can be leveraged to most effectively use small capacities of very high-performance flash storage to significantly improve overall performance, and solutions are available that can very granularly tier even a single volume across different storage tiers for optimum efficiency. Storage virtualization allows this to be performed automatically by the arrays per established policies, optimizing data placement as workloads evolve, without manual intervention.

Storage virtualization's ability to abstract data location from physical location allows tiered environments to be used effectively to improve performance, price/performance, and scalability. Stretch clusters provide a highly resilient environment that can sustain the loss of an entire site with no application downtime or data loss, and data can be transparently migrated to the appropriate tier based on frequency of access to help lower overall costs without impacting how that data is accessed.

Finally, storage virtualization can significantly ease the technology refresh process. Online data migration can be performed between older and newer arrays without having to shut down application services, meeting the widespread customer requirement for continuous availability. Older equipment can be nondisruptively repurposed, preserving investments because the equipment allows those arrays to be integrated into workflows that span different generations of storage.

The power of abstraction is in the increased flexibility and degrees of freedom it affords IT infrastructure managers in leveraging the resources they have to most efficiently enable the business to evolve to where it needs to be.

Q. What are other examples of abstraction that are important in managing a datacenter for optimum efficiency?

- A. Software-defined infrastructure is built around the concept of the separation of the control and data planes in storage. When workflows can be created that leverage different tiers and types of storage, operations become more reliable, administrative span of control is increased, and operator productivity is improved. The level of agility can be increased (or upgraded) by a simple software update — it is no longer tied to the specific capabilities of a particular hardware platform. Datacenters can be migrated to newer technology generations without associated downtime to take advantage of higher performance and storage densities, improved efficiencies in energy and floor space consumption, and improved infrastructure density.

The industry is clearly moving toward a software-defined everything model that, combined with virtual infrastructure, will enable the nondisruptive integration of new technologies with the agility to move and reassemble resources on demand to meet any changing business requirements. Markets are evolving more rapidly than ever before, and businesses that can most quickly adapt their IT infrastructure to new business processes will have the first shot at new customers and opportunities as they arise. The abstraction delivered by storage virtualization is a prerequisite within the storage layer to enable this flexibility and agility.

ABOUT THIS ANALYST

Eric Burgener serves as a research director for IDC's Storage practice, which includes Storage Systems, Software, and Solutions research offerings; quarterly trackers; and end-user research as well as advisory services and consulting programs. Mr. Burgener's areas of coverage include flash-based arrays (all-flash arrays and hybrid flash arrays) as well as storage virtualization solutions. A veteran of the storage industry for almost 30 years, Mr. Burgener has worked with enterprise storage technologies since 1991, including hardware- and software-based solutions.

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