



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



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Software-Defined Infrastructure Enables Application-Led Solutions Deployment

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Today, the ability of businesses to react quickly to changing market dynamics is putting new agility demands on datacenter infrastructure. Greenfield next-generation applications (NGAs) built around mobile computing, social media, big data/analytics, and cloud technologies increasingly define the differentiation businesses seek to establish and proliferate in this dynamic new era. IT administrators need to ensure that these critical application environments are accessible across all mobile and social media platforms. Given the disparity of storage capabilities necessary in this new era, deployment models are becoming increasingly application led, and enterprises are turning to software-defined infrastructure to get the agility they need to dynamically configure the underlying server, storage, and network resources to meet application-specific requirements efficiently and cost effectively.

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

- Q. Managing the mix of legacy and greenfield applications faced by today's IT administrator sets up some special infrastructure challenges. What are they?**
- A. Most datacenters today continue to manage at least some critical legacy applications while adding the greenfield applications they need to fit into evolving business models and go after new customers with unique demographics. Legacy applications, which were typically built around a single data type, tend to be far less dynamic than the NGAs blossoming everywhere. The static, hardware-defined infrastructures that met the requirements of legacy applications are not a good fit for NGAs that must simultaneously handle different data types (block, file, and object), must scale to accommodate 10x to 100x the performance and capacities of legacy applications, and must support real-time response and dynamic resource allocation. As administrators seek to improve the efficiency of datacenter operations, they are moving away from the hardware-defined infrastructures of the past that would result in a proliferation of siloed storage solutions to more software-defined infrastructures that allow them to flexibly allocate resources to meet specific application requirements.

Faced with the mix of legacy applications and NGAs, datacenters must maintain two types of enterprise IT management approaches: the classic enterprise model and the newer Web-scale model. Classic enterprise IT is characterized by an environment that supports a large number of relatively static applications, limited on-staff software design and support expertise, and smaller economies of scale. Web-scale IT, on the other hand, supports far

fewer but extremely dynamic applications that are built around custom designs that demand deep on-staff software development and support expertise and are deployed with massive economies of scale. Storage solutions in particular must be designed differently in the Web-scale world, and we are seeing new server-based storage architectures that heavily leverage flash media and cloud technologies emerging as a viable option. This "bimodal IT" model threatens to push the complexity of modern datacenters beyond where they can be reliably and cost effectively managed using traditional administrative methods.

Q. What does it mean for a storage infrastructure to be "application led"?

- A. Each application has an I/O profile that demands certain capabilities from the storage infrastructure in terms of performance, reliability, availability, scalability, and recoverability. The storage configuration that meets those requirements most cost effectively is very specific to that application and will be suboptimal for other applications in terms of performance, cost, and so forth. This sort of optimum resource allocation on an application-by-application basis not only leads to the most efficient use of available resources but also ensures that each application gets the storage configuration it needs to meet its individual service-level requirements, whatever they are.

The "application-led" model contrasts significantly with the older, more static storage model where a storage appliance can present only one resource mix to the varied applications it supports. In the "storage-led" model, the resource allocation for each application is determined not by the application's requirements but by the storage solution itself. In the "application-led" model, the requirements of the application determine the storage it gets.

Q. Why is this important for IT practitioners managing modern datacenter workloads?

- A. Application-led storage configuration ensures that each application will get the storage resources it needs to meet its particular requirements. This translates into a number of metrics that are important at a business level, including meeting customer expectations for easy access, user experience, scalability, and other measures of value that are critical to an organization's brand differentiation.

Datacenter administrators could deploy a separate storage solution, configured appropriately for each application, which would fulfill the functional requirements of the "application-led" model. With hardware-defined infrastructure, this is the only option, and this approach would result in a heavily siloed environment that would be very expensive and very complex to manage. Virtualization technology enables a software-defined storage model that lets IT practitioners cost effectively pursue the "application-led" model that best meets business requirements, allowing them to dynamically allocate the specific mix of resources needed to meet the individual requirements of each application from a single, cost-effective datacenter infrastructure built around industry-standard hardware.

Q. What role can software-defined infrastructure play in helping IT administrators efficiently manage the mix of legacy and greenfield application environments?

- A. Software-defined infrastructure allows IT administrators to pursue the more desirable "application-led" model for storage resource allocation in a cost-effective manner, thereby offering better value to the business in meeting its goals and ultimately the needs of its customers. But such an infrastructure also has significant implications for how IT administrators manage extremely high data growth in today's very heterogeneous datacenter environments while continuing to reliably manage IT operations to meet customer and corporate governance requirements. Software-defined infrastructure allows datacenters to deploy the different storage architectures, resources, and APIs they need to deliver

necessary service levels with a consistent set of programmatically managed storage management capabilities and workflows. It also makes it much easier to deploy the automation necessary to reliably manage the broad mix of application, data, and equipment types in modern datacenters given today's shrinking administrative resources and increased spans of control.

The imperatives for today's IT practitioners are to automate operations to reliably increase administrative span of control and simplify tasks, provide the broad access to data needed to drive the business (regardless of data type), and be able to cost effectively deploy and manage the specific architectures and solutions needed (virtualization, flash, cloud, converged, hyperconverged, etc.) to meet business requirements. Software-defined infrastructure provides the level of flexibility needed to utilize server, storage, and network resources most efficiently and cost effectively to meet these requirements.

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 both hardware- and software-based solutions.

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