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SimpliVity Strikes Again! Further Attacking Complexity in the Data Center

Analyst: David Reine

Management Summary

Do you wish you had a universal, multi-purpose building block? Often, this thought has crossed my mind – at home, at work, and in the data center. At home, I wish that my lawn had one standard kind of grass, instead of the hodgepodge that it seems to have become. Caring for it certainly would be easier. Also, I wish that I could get by with far fewer tools (e.g., far fewer sockets and wrenches than my collection of standard and metric in various lengths and with at least four different sizes of drive ends). And in the data center, I constantly hear a call for better, simpler building blocks, mostly as a reaction to the plethora of servers, switches, appliances, and more that seem to fill rack after rack. **That is today's topic – the wish for a universal, multi-purpose data center building block.**

Let me take you to my field of dreams. **What I want is one building block from which everything can be built.** Maybe this is as simple as a universal concrete block or brick. With one, I can do almost anything. Why have 20, 50 or 100 kinds when one (or maybe a few) can get you where you want to go. **In my field of dreams, the key word here is “universal”, where one building block serves all needs.** I hear some of you screaming back at me that this is a fantasy. Let me explain why it just might be achievable and why you can see this happening all around you and not recognize it because you are tuning out the possibilities as being unrealistic.

As an industry, we are deep into server virtualization. For most applications, it is accepted as the norm. The business manager and user do not care on which server an application is run or, most of the time, exactly where that server is located. So, it is safe to conclude that virtualization software (like *VMware*, *Hyper-V*, and the like) enable many varieties of x86 servers to look like a universal building block, regardless of the server brand or what is “under the hood”. Yes, the capabilities may be different, but as long as the needed work is getting done without delay, the differences are not noteworthy. Nowhere is this truer than in the Internet cloud, where you may be getting a slice of a server with certain characteristics, plain and simple. **The virtualized server slice (a.k.a. as a virtual image or instance) is a good and accepted example of a universal building block.**

Maybe you are with me so far (with respect to server virtualization), but thinking about many possible exceptions where the universal building block analogy may not seem to apply. You are thinking that every server in every rack needs to be connected by communications and storage networks (i.e., switches), be augmented by accelerators of all sorts, security devices, storage arrays (of many tiers), quality of service and protection devices, etc., and that many of these require significant levels of redundancy to meet quality of service requirements. In the old days, up to not too long ago, each of these specialized devices was based on proprietary architectures, with custom chips and a lot of special firmware. **In the past, specialized hardware was required to get the job done.**

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The Clipper Group, Inc. - Technology Acquisition Consultants ♦ Internet Publisher

One Forest Green Road ♦ Rye, New Hampshire 03870 ♦ U.S.A. ♦ 781-235-0085 ♦ 781-235-5454 FAX

Visit Clipper at clipper.com ♦ Send comments to editor@clipper.com

More recently, we have come to realize that while hardware was the heart and soul of the solution before, it really is the specialized-software (firmware) that makes the difference. These days, many formerly specialized devices have become x86 appliances, often running a thin and efficient version of Linux under the hood. **So while you continue to buy servers, storage, switches, and other appliances, you really are buying (primarily, i.e., most of the time) an x86 server with the right customized software.** Unfortunately, when you look down the aisles at your racks of servers and storage, you see anything but universality. Yes, you may see standardization, but that doesn't give you universality.¹

Why is this true? How did it happen? Well, **over the decades we got to where we are through many generations of evolution.** Evolution was critical, because we needed to crawl before we could walk. *If we were to start all over, would we strive to get to where we are with a dozen or more vendors providing many dozens of non-uniform server-like boxes? Absolutely not.*

Today, we have very powerful x86 server cores, and plenty of them, with exceptionally large amounts of memory, both DIMM and Flash. Each has universal (Ethernet and/or InfiniBand) network connectivity that can be used for many purposes and can support many protocols. We see built-in SSD and rotating hard drive storage, which can run highly-capable virtualized environments and operating systems, and which, most importantly for most applications, can scale out to meet the needs of a dynamic enterprise. **All that we need is some vendor to break away to make real and manageable the dream of a flexible, scalable data center built with a universal, multi-purpose building block.** If this seems to be too hard to conceive, please read on, because **SimpliVity has realized my field of dreams – with universality and simplicity.**

Fixing Data Center Complexity

What does your data center look like? Is it a complex IT infrastructure consisting of a

¹ If there was only one standard, then it could be universal. But when there are many standards (like one for servers, one for SAN switches, one for NW switches, one for each appliance, etc.) then it is not singular (universal) solution. When there are several-to-many different units of each type, then you tend to have a management nightmare and overspending.

Exhibit 1 — Components of Today's Complex Data Center Infrastructure

- Mission-critical application and data servers – some-to-many virtualized
- Business-critical application and data servers – many virtualized
- Special-purpose servers, like Internet and security servers
- Tier-1 (primary) storage
- Tier-2/3 (secondary) storage
- Data deduplication/compression servers/appliances
- Data protection servers/appliances for business continuity
- Disaster recovery appliances (and redundant/duplicated infrastructure)
- SSD/Flash Acceleration devices
- SAN switches/directors/appliances
- SAN management servers/appliances
- WAN optimization devices
- Network switches
- Network management servers/appliances

heterogeneous mix of servers and storage? Does it require a staff of IT administrators to attempt to maintain daily operation and business continuity? Data centers of all sizes, in every industry, experience the same issues, just on a different scale, perhaps affecting the smaller data center more critically than the larger ones with deeper pockets and more data center expertise. These issues concern budget, space, scalability, and staffing. Unnecessarily-complex infrastructures can destroy a data center budget, increasing the total cost of ownership for your IT environment, turning black ink into red ink, and putting your job on the line. Please see Exhibit 1 above for a more complete list of the possible components in today's over-complicated data center infrastructure.

Most every data center, from SME to the largest enterprise, seems to be looking for a simplified, multi-functional infrastructure that can eliminate the complexity caused by current use of an antiquated data architecture not suited for today's virtualized and cloud-based environments. At the root of this problem is a highly specialized, out of control infrastructure made up of an assortment of heterogeneous hardware and software, consisting of open systems and

proprietary servers, a variety of operating environments (Windows, Linux, UNIX, etc.), and an assortment of storage solutions, including DAS, NAS, and SAN. This infrastructure is expensive, not well integrated (if at all), and results in a real management and cost burden. It is mandatory that the IT staff gain control of that infrastructure in order to reduce operating costs, simplify the environment, and deliver a higher quality of service (SLA) to its customers.

Thus, there seems to be a burning need for a vehicle that supports general purpose workloads with data mobility, scalability, and optimized performance, especially serving both public and private cloud environments, across a wide variety of industries. In fact, the need for a dynamic infrastructure is causing a shift in the infrastructure paradigm of many traditional data center. The modern IT staff must replace complexity with simplicity, inflexible systems with flexibility. This shift is represented by a new breed of infrastructures, one that is based upon a converged and consolidated environment. Replacing the existing infrastructure will enable the IT staff to improve performance, functionality, and data protection with savings in both capital expenditures (CAPEX) and operating costs (OPEX), lowering the TCO of that data center. In fact, a new infrastructure is required even more so by the smaller data center that may have been forced to make do without some core functionality because of the cost.

Simplifying the Data Center with SimpliVity

With the announcement last August of their OmniCube hardware and OmniStack architecture, SimpliVity brought innovation to the data center with a simplified solution which removed the complexity that had been holding back virtualization and access to the cloud. Now SimpliVity has announced the next generation of both, with new models and updated software. To learn more about SimpliVity and OmniCube, please read on.

Who is SimpliVity?

SimpliVity is a company that was founded in 2009 with the express purpose of simplifying the IT infrastructure by means of a new data architecture. SimpliVity launched its *OmniCube*² platform as the first globally-federated

and converged infrastructure solution, with the express purpose of bringing together all of the necessary components of an IT infrastructure, including servers and storage, into an easy-to-use 2U x86 open-systems platform, with the lowest possible cost. Based upon corporate growth as a metric, SimpliVity seems to be well on that path, doubling in size since the August announcement, projecting to double again by the end of 2013.

OmniCube is an ideal solution for both public and private clouds where providing flexibility and scalability is essential in delivering cloud services. In fact, because of this flexibility, OmniCube enables smaller enterprises to compete with the largest cloud providers in attracting new customers.

Some of the baseline services that SimpliVity provides include: high availability, accelerated performance, and improved serviceability. SimpliVity already has achieved marked success in a wide variety of use cases, including healthcare, finance, insurance, education, telecommunications, manufacturing, and technology.

SimpliVity OmniCube

SimpliVity's OmniCube has been designed and optimized specifically for a virtual machine (VM) environment, combining standard off the shelf x86 servers with SimpliVity's *OmniStack* technology to simplify operations via the most economical infrastructure platform available. OmniCube enables the IT staff to replace existing infrastructure consisting of servers, SAN storage, SAN switches, and data protection appliances with a single, simplified software stack that runs on a commonplace x86 server.

Moreover OmniCube includes a new, unique data architecture, whereby all data is in-line deduplicated, compressed, and optimized at inception, with no impact to performance. This offers the following unique benefits.

- Reduced IOPS to SSD/Flash or HDD
- Reduced capacity and associated space and power
- Enablement of global mobility of VMs and data, at a fraction of the time and cost

² See [The Clipper Group Navigator](#) dated October 21, 2012, entitled *Removing Complexity from the Infrastructure* –

SimpliVity Simplifies the Data Center, available at <http://www.clipper.com/research/TCG2012023.pdf>.

Exhibit 2 — OmniCube Functionality

- **Core Infrastructure Services** – providing high availability, high-performance, and serviceability
- **Simplified Scalability** – Delivering increased performance one OmniCube at a time
- **In-line Deduplication and Compression** – all data is inline deduped, compressed, and optimized during input saving I/Os and improving performance
- **Bandwidth Efficient Replication** – providing an efficient data transfer between OmniCube systems across remote data center(s)
- **Data Protection** – enabling VM-level backup and bandwidth efficient replication for disaster recovery via a policy-based engine
- **VM-Centric Management** – enabling all actions, policies, and management from a VM administrator’s perspective, with one integrated GUI
- **Public Cloud Integration** – enabling movement of data between OmniCube and a public cloud
- **Cache-Accelerated Performance** – enabling high-speed access to the most critical data

Source: SimpliVity

- Optimization techniques that eliminate redundant data that usually is injected by the operating system stack.

OmniCube empowers a single VM administrator to manage the entire environment through a single pane of glass integrated into the familiar *vSphere/vCenter* client interface, eliminating the *pain* of existing complexity from multiple *panes*. This enables the scalable deployment of pools of shared resources with a converged architecture forming a *Global Federation*. This underlying technology enables an intelligent network of collaborative systems, providing massive scale-out capabilities as well as VM-centric management through a single unified interface for the entire global infrastructure. This enables a single administrator to manage all data centers and branch offices, located anywhere (i.e., globally), while giving the administrator the visibility and control to take action on a per-VM basis. The result is the OmniCube Global Federation, which delivers local high availability (HA) and data protection within the data center, remote replication for disaster

recovery across data centers, data movement to and from the public cloud, and the global management of all virtual machines throughout the federation.

Thus, OmniCube can replace entire racks containing many servers and storage devices and special-purpose appliances (all with their own networking, power, and cooling) with a pair (or more) of compact 2U building blocks to eradicate complexity in the data center, improving data mobility, scalability, and optimizing performance. OmniCube consolidates server, storage and networking services and, along with OmniStack, delivers a variety of advanced functionality, to improve the management, protection, and performance of all the VMs that run therein. (See Exhibit 2 above for an overview of OmniCube functionality.) OmniCube provides the flexibility and functionality that the enterprise is looking for from every data center, especially when it comes to data protection and disaster recovery capabilities. Flexibility has enabled SimpliVity to build a new infrastructure paradigm for the healthcare, finance, manufacturing, technology, insurance, telecommunications, and education industries. At the same time, OmniCube reduces complexity and improves SLAs, improving RPO and RTO objectives and application availability, while reducing data center staffing requirements and lowering the TCO of the enterprise IT infrastructure, with no impact on functionality.

When OmniCube was introduced last August, there was one model, the SimpliVity *CN3000*, designed to run all workloads from SME to globally federated environments, which represents all current deployments. Today, an improved version of the *CN3000* remains the flagship for SimpliVity. However, now there are two new models that have been added to the product family: the entry-level *CN2000* and the ultra-high-performance *CN5000*. Each model has been designed to enable increased value with every new deployment.

SimpliVity *CN3000*

The *CN3000* was originally configured as a dual socket server with 12 cores of *Xeon* performance. It could support up to 512GB of DRAM memory with an effective storage capacity of 40TB³, consisting of four 200GB SSD drives and up to eight 3TB HDD drives.

³ Effective storage will depend on the rate of compression and data deduplication for your data.

This configuration was priced at \$55,000.

Today, the revised CN3000 is geared to support a variety of traditional workloads, such as *MS Exchange*, *MS SQL Server*, and *MS SharePoint*, along with web-hosting back office applications enabling customers to run their entire IT environment on a single OmniCube server. It also enables the data center to host large-scale public and private clouds. This new OmniCube supports twice the performance with up to 24 Xeon cores in a dual socket configuration. The new CN3000 still supports up to 512GB of memory and up to eight 3TB HDD drives. However, the capability for SSD has been increased, significantly. The CN3000 can also support up to four 400GB or 800GB SSDs. The CN3000, and all other models have two standard 10GbE ports and two standard 1GbE ports with an additional two of each available as an option. This will support a majority of workloads across a wide range of environments from the smallest to largest enterprise. Pricing for the CN3000 starts at \$55,000.

SimpliVity CN2000

The CN2000 is targeted as a building block for remote offices and SME environments. It is an all-in-one data center building block that has been right-sized for less demanding situations for environments with lower capacity needs and tighter budgets. It is ideal for file servers, print servers, DNS, DHCP and other lighter-weight applications. The CN2000 has a single socket with up to eight cores of Xeon performance, along with support for up to 128GB of memory and up to eight 1TB HDD drives for up to 10TB of effective storage. The CN2000 also can support up to four 100GB SSD drives. This represents the “right-size” resource pool of processing, storage, and memory to enable the SME to start small and scale out as the business grows, while remaining within the budget guidelines. Pricing for the CN2000 starts at \$32,000.

SimpliVity CN5000

The CN5000 has been designed as the high-end building block for the most demanding data center environments. It is targeted at high-performance workloads in the enterprise data center. It will support a variety of high-priority and high-business-impact workloads serving up to thousands of users. These include ERP, CRM, OLTP, and decision support systems. The CN5000 also can provide the largest enter-

prises and cloud providers the services they need to satisfy the most demanding applications.

It is configured as a dual socket system with up to 24 cores of Xeon performance to meet the demands of this environment. Like the CN3000, the CN5000 supports up to 768GB of memory, and up to 20 900GB high performance HDD drives for up to 30TB of effective storage (after deduplication). The CN5000 also supports up to four 800GB SSD drives. This system supports ultra-high performance application workloads for the enterprise and cloud providers. Pricing for the CN5000 starts at \$100,000.

SimpliVity OmniStack

If you look under OmniCube’s proverbial covers, you will find OmniStack, the core technology that enables OmniCube, delivering a new way of storing, managing, and sharing data. It consists of three unique SimpliVity innovations to improve data efficiency and mobility.

- ***The Virtual Resource Assimilator*** – enabling the intelligent pooling and sharing of OmniCube’s hardware to create an elastic, scalable pool of x86 resources;
- ***The Data Virtualization Engine (DVE)*** – providing the unique data architecture that delivers the first and only accelerated, globally deduped, compressed, and optimized solution. It enables OmniCube to optimize all data within the OmniCube Federation, improving the utilization and efficiency of all resources.
- ***The Global Federated Architecture*** – enabling an intelligent network of locally and geographically-distributed collaborative systems.

OmniStack v2.1 includes a variety of new and improved features in support of ease-of use. These include the following.

- ***Automated Support Captures*** – Automating the collection of Support Captures across the federation for upload to SimpliVity Support.
- ***Automated Software Upgrade*** – to enable the automation of software upgrades from the OmniCube GUI.
- ***Improved Deployment*** – enables a *Pre-Deployment Wizard* with configuration file output to reduce deployment time.
- ***Backup Filtering*** – providing the IT staff with the ability to search, sort, and filter backups with a single click.
- ***New UI Enhancements*** – to improve performance analytics and data deduplication, compression, and optimization metrics to better monitor performance and data efficiency.

The following are other new features.

- **VAAI Support** – to improve efficiency by enabling SimpliVity Clones in support of VMware clones and workflow;
- **Metro Federation** – proving the ability to deploy the two OmniCube nodes at campus distances for deployment efficiency; and
- **Amazon Cloud Data Center** – providing support for AWS EC2 OmniCube Cloud Datacenter for offsite backup and disaster recovery.

Improving the TCO

After decades of growth with the same IT infrastructure and the best of intentions, the enterprise data center has become a morass of disparate platforms and much suffering, due to the resultant complexity. It has reached a point where the data center staff must change the infrastructure paradigm or watch the TCO, and their jobs, drift over the horizon.

SimpliVity has developed a simplified architecture, including a novel data architecture, to improve the efficiency of the data center and lower that TCO. OmniCube, with OmniStack, enables the smallest and largest enterprise to meet improved SLAs for application runtime, RPO, and RTO, protecting the mission- and business critical data that the enterprise depends upon. OmniCube has a simplified, scalable, and dynamic infrastructure that enables the data center to reassign critical stall to new projects instead of simply maintaining the existing environment.

Conclusion

Because OmniCube delivers high-end functionality at a low-end price, it has received rapid acceptance and been able to grow at a surprising rate considering the rate of growth of others in the industry. With a worldwide partner network, enterprises around the world have been able to simplify their infrastructure, improve performance and functionality, and lower cost. If your enterprise data center is struggling to keep up with the demands of enterprise growth while staying on budget, you should take a hard look at how OmniCube and OmniStack might simplify your data center infrastructure, as well.



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- ***The Clipper Group can be reached at 781-235-0085 and found on the web at www.clipper.com.***

About the Author

David Reine is a Senior Contributing Analyst for The Clipper Group. Mr. Reine specializes in enterprise servers, storage, and software, strategic business solutions, and trends in open systems architectures. In 2002, he joined The Clipper Group after three decades in server and storage product marketing and program management for Groupe Bull, Zenith Data Systems, and Honeywell Information Systems. Mr. Reine earned a Bachelor of Arts degree from Tufts University, and an MBA from Northeastern University.

- ***Reach David Reine via e-mail at dave.reine@clipper.com or at 781-235-0085 Ext. 123. (Please dial “123” when you hear the automated attendant.)***

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