# SDS Industry Report 2014

T A B L E  O F  C O N T E N T S

**Preliminary**
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# 1 - Executive Overview

The report defines and segments the global SDDC market into various sub-segments with in-depth analysis and forecasting of revenues. It identifies drivers and restraints for this market with insights into trends, opportunities, and challenges. MarketsandMarkets has segmented the global data center security market by type of solutions: software defined network, software defined server, software defined storage; by end users: telecommunication service providers, cloud service providers, enterprise; by regions: North America (NA), Asia Pacific (APAC), Europe (EU), Middle East and Africa (MEA) and Latin America (LA).

## IT Industry Dynamics & Market Drivers

Storage infrastructure that is managed and automated by intelligent software as opposed to by the storage hardware itself. In this way, the pooled storage infrastructure resources in a software-defined storage (SDS) environment can be automatically and efficiently allocated to match the application needs of an enterprise.

### Application dictate Real Storage Requirements

Ultimately, applications know what characteristics of storage they require in terms of performance level, cost, size, resiliency and location. Applications request this by sending API calls for virtual volumes meeting these characteristics. SDS simply translates these API calls into a set of instructions that automatically and on-the-fly provisions storage be they in Block, File or Object stores in the Disk based DAS, NAS or SAN or at appropriate tiered pools of RAM, Flash and Disk that closely meet these application requirements.

However, there is absolutely no reason at all to further go down the path of storage silos, where the NetApp guys, the EMC guys and the Flash guys all are separated, without much knowledge of each other or of application requirements.

## Separating the Storage Hardware from the Software

By separating the storage hardware from the software that manages the storage infrastructure, software-defined storage enables enterprises to purchase heterogeneous storage hardware without having to worry as much about issues such as interoperability, under- or over-utilization of specific storage resources, and manual oversight of storage resources.
The software that enables a software-defined storage environment can provide functionality such asdeduplication, replication, thin provisioning, snapshots and other backup and restore capabilities across a wide range of server hardware components. The key benefits of software-defined storage over traditional storage are increased flexibility, automated management and cost efficiency.

SDS abstracts the software that controls the storage functionality or services from the physical storage hardware.

SDDC

Software-defined data center (SDDC) is the phrase used to refer to a data center where all infrastructure is virtualized and delivered as a service. Control of the data center is fully automated by software, meaning hardware configuration is maintained through intelligent software systems. This is in contrast to traditional data centers where the infrastructure is typically defined by hardware and devices. Software-defined data centers are considered by many to be the next step in the evolution of virtualization and cloud computing as it provides a solution to support both legacy enterprise applicationsand new cloud computing services.

 

## Core Components of the Software-Defined Data Center

According to Torsten Volk, EMA, there are three core components of the software-defined data center: network virtualization, server virtualization and storage virtualization. A business logic layer is also required to translate application requirements, SLAs, policies and cost considerations

## Opportunities

### Market Sizing by Market/Product Segments

### Key Technologies

### Migration Strategies

### Players – Existing Large Incumbnts & Startups

### Competitive Positioning of Suppliers – Vision & Execution

### Investment/M&A Opportunities

# 2 – Industry Dynamics & Market Drivers

It's been decades now, but there was a time when all functionality was concentrated in the host. Input/output (I/O) operations and file systems were entirely managed by the host; disks were dumb, direct-attached devices. As functionality expanded, the CPU, memory and backplane (bus) became the performance bottleneck. Storage vendors responded to this market opportunity by providing more functionality in the storage array to the point where each now has its own operating system and embedded file system. With virtualization engines now handling more and more data movement Data movement demands can be extremely resource-intensive, consuming all available memory and CPU cycles as well as saturating I/O channels.

SDS creates the potential for scale-out storage that can use commodity hardware, in contrast to the tightly coupled software and hardware of traditional storage-area networks (SANs) and NAS systems.

## Vendors of traditional storage virtualization take on SDS

Storage virtualization failed to catch fire the way some vendors hoped it might, but the buzz around software-defined storage is giving them another chance to reposition their products.

- EMC lays out SDS vision with ViPR
- VMware pumps up software-defined storage strategy
- HP adds auto-tiering to StoreVirtual VSA
- Sanbolic Melio5 features distributed architecture
- Open source OpenStack Storage ties to virtualization infrastructure
- Software-based Red Hat Storage can run in VM environment
- Use cases for software-based Inktank Ceph Enterprise include VM storage
- CloudFounders jumps on software-defined storage bandwagon
- EMC views SDS as what storage virtualization should have been
- HDS CTO on virtual-oriented data storage
- DataCore Software chairman equates SDS to storage virtualization
- Vendors try to make storage virtualization as useful as server virtualization

By increasing communication between the array and the hypervisor, VM-aware storage can provide advantages such as improved data migration and performance.

- Tintri expands VM-aware storage line
- Hypervisor-aware storage provides per-VM reports
- VM-aware storage is one way to optimize performance

 

## VM support in storage systems increasingly extends beyond VMware

Storage vendors have long supported the virtualization technology of the dominant vendor, VMware, and they've been gradually adding support for additional hypervisors, especiallyMicrosoft's Hyper-V. To read more about storage market trends related to VM support, check out the following 2013 stories:

- Gridstore zones in on Hyper-V performance
- Nutanix releases technical preview for Hyper-V
- Impact of second-generation Hyper-V on data storage
- VM-aware, hyper-converged storage beef up hypervisor support
- Storage features in Red Hat Enterprise Virtualization

## Storage management adapts to virtual environments

Vendors continued to enhance both virtualization-specific and general storage managementtools to provide more fine-grained insight into the performance of virtual environments.

- Dell updates Foglight virtualization management platform
- Windows Server 2012 R2 aids storage management for virtual environments
- VMTurbo expands resource management to virtual environments
- Monitoring, testing tools aid in planning, managing VDI
- Virtual server trends affect storage management

## The Software-Defined Datacenter – Core Components

In part 1 of this series of four posts, we examined the grand vision of the software-defined datacenter (SDD). In this second post of the series, we will take a look at the core components of the SDD (see Figure 1) and provide a brief evaluation of how mature these components currently are.

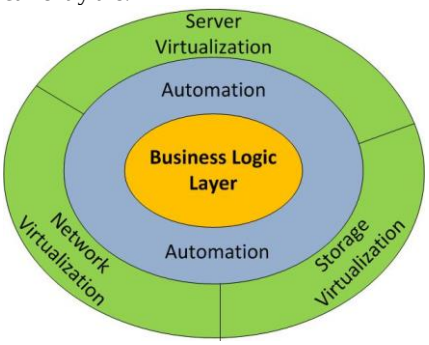


Figure 1 – Core Components of the Software-Defined Datacenter

## Network Virtualization

Creating the required network is a common reason for high provisioning times of new application environments. While it typically takes minutes to provision even a very large number of virtual machines, the requested networking resources often have to be created and configured at least semi-manually from multiple management interfaces. Not only does this process require advanced networking skills, but it can also lead to provisioning errors that can cause security issues. Software-defined networking (SDN) allows the user to simply specify which servers have to be connected and what the relevant SLAs are. The software then figures out the most efficient way of fulfilling these requirements without the typical configuration-intensive process.

**Take a look at the following vendors:** Cisco Systems, Nicira (now part of VMware), BigSwitch Networks,Lyatiss, Xsigo Systems

VMware's acquisition of SDN-company Nicira and Oracle's purchase of Xsigo, as well as significant initial rounds of funding for multiple network virtualization and startups such as Big Switch, demonstrate that we are at the dawn of the age of network virtualization. We could compare today's state of network virtualization with the status of server virtualization a little more than a decade ago. However, we can expect market leaders such as Cisco Systems to adopt the concepts and protocols of network virtualization, such as OpenFlow, and therefore remain more relevant than server hardware vendors

 

over the past decade. Cisco's significant investment in its own SDN startup, Insieme, is a great indicator that the company does not intend to allow its networking products to be commoditized without a fight.

### VMware and Cisco or VMware vs. Cisco?

Many would regard VMware's Nicira acquisition as an act of hostility toward Cisco Systems. VMware is basically spending $1.26 billion on acquiring a startup that aims at shaving off the margins of Cisco's bread and butter business. Of course, the Nicira acquisition is a long-term investment aimed at eroding Cisco's business only gradually; however, Steve Herrod's quote definitely applies: *"If you're a company building very specialized hardware … you're probably not going to love this message."*

At the same time, Cisco is doing the right thing, expanding its leadership position by rapidly increasing its own SDN capabilities. The Open Network Environment constitutes Cisco's initiative, based on the Nexus 1000V switch, to make its networks open, programmable, and application-aware.

## Server Virtualization

Pioneered by VMware over a decade ago, server virtualization is the most mature of the three SDD components. Today, we see a trend toward organizations adopting multi-hypervisor strategies, in order not to depend on any one virtualization vendor and to take advantage of different cost and workload characteristics of the various hypervisor platforms. Configuration management, operating system image lifecycle management, application performance management, and resource decommissioning are currently the most significant server virtualization challenges. Many enterprise vendors, such as HP, CA Technologies, IBM, BMC, and VMware, currently offer solutions addressing these challenges.

## Storage virtualization

Similar to SDN, storage provisioning has traditionally constituted a significant obstacle for many IT projects. This is due to the often complex provisioning process that involves many manual communication steps among application owner, systems administrator, and the storage team. The latter has to ensure storage capacity, availability, performance, and disaster recovery capabilities. Often storage is overprovisioned to "be on the safe side." Overprovisioning storage is expensive, as most organizations pay a significant premium to purchase a brand-name SAN. Today, when buying SAN storage, there typically is a significant brand loyalty and very little abstraction of storage hardware from management and features. As in the instance of networking, when bundling hardware and software, vendors are able to achieve significantly higher markups compared to cases where hardware and management software are unbundled.

**Take a look at the following vendors:** Virsto, Nexenta, iWave, DataCore Software

The concept of the "storage hypervisor" is currently gaining more and more traction. Similar to the SDN and server virtualization, the storage hypervisor enables customers to purchase any brand of hardware and manage it via a centralized software solution. Abstracting the management software from the SAN allows customers to manage multiple storage types and brands from one single software interface. Advanced features, such as high performance snapshotting, high availability across multiple geographical locations, data stream de-duplication, and caching, are unbundled from the actual storage hardware, allowing customers to add on additional storage arrays of any brand, whenever needed.

### The EMC – VMware Dilemma

EMC's ownership of VMware can be seen as a strong inhibitor when it comes to advancing storage virtualization, as EMC is certainly not interested in having its hardware margins taken away. Therefore, VMware has little incentive to contribute to the advancement of the hardware-independent storage hypervisor. However, we are now at a point where the company must face reality and acknowledge that storage hardware commoditization is inevitable. The significant investments of venture capital firms in storage virtualization companies – Virsto, Nexenta, Nutanix, NexGen Storage, PistonCloud, and many more – demonstrate the inevitability of this development.

## Business Logic Layer

As a reminder from last week's post on the basics of the SDD, a business logic layer is required to translate application requirements, SLAs, policies, and cost considerations into provisioning and management instructions that are passed on to the automation and orchestration solution. This business layer is a key requirement for the SDD, as it ensures scalability and compatibility with future enterprise applications, so that customers do not have to manually create new automation workflows for each

existing or new application. The business logic layer is the “secret sauce” that is essential for tying together network virtualization, server virtualization, and storage virtualization into the SDD.
Without the ability to automatically translate application requirements into API instructions for datacenter automation and orchestration software, there will be too many manual management and maintenance tasks involved to dynamically and efficiently place workloads within the programmable network, server, and storage infrastructure.

**Translating Business Logic into Automation Instructions**

Currently, IT process automation vendors are working hard on making their products more accessible to the business. Easier-to-use workflow designers and flexible connectors for myriad current enterprise applications are one step into the right direction. However, to truly enable the SDD, IT process automation will have to progress significantly over the next few years.
The journey to the SDD will be a long one. At its end point, enterprise IT will have become truly business-focused, automatically placing application workloads where they can be best processed. We anticipate that it will take about a decade until the SDD becomes a reality. However, each step of the journey will lead to efficiency gains and make the IT organization more and more service oriented.
In next week’s post, I will discuss some of the current controversies and challenges around the SDD, such as blades vs. “pizza boxes,” intelligent hardware vs. commodity hardware, and open architecture vs. vendor-specific stacks.

## Obstacles and Priorities on the Journey to the Software-Defined Data Center

### Key Goals of SDDC

Organizations have long been frustrated with slow delivery of new applications and IT's inability to optimally operate, manage and update these applications. Public cloud services have benefited greatly as a result, due to the perception that they are faster to deploy and easier to manage. SDDC with its inherent benefits will become one of the dominating trends in enterprise IT in 2014 based on the premise that SDDC radically aligns IT infrastructure to specifically meet application and service requirements to better serve the business. Deploying, operating, managing and updating applications in the most cost-effective, secure, agile and policy-compliant manner is the key goal of the SDDC. SDDC starts with an IT operations mindset that focuses on reinventing the infrastructure provisioning and management process in a much more policy-driven manner, closing the traditional gap between enterprise IT and the business.

core priorities on the journey to the SDDC for improved IT alignment with business requirements include

- centralized management across a massively heterogeneous IT infrastructure
- repeatable configuration of software and infrastructure for optimal application deployment
- orchestration and automation for application deployments across silos

Organizations are also seeking to benefit from the ROI and cost advantages of Software Defined Storage (SDS), software-defined networking and network virtualization. All three of these technologies can be seen as catalysts for a more application-centric data center.

### Software-Defined Storage and Availability

Software-defined storage, a foundational component of the software-defined data center, abstracts storage resources to enable pooling, replication and on-demand distribution. The result is a storage layer much like that of virtualized compute—aggregated, flexible, efficient and scalable. The benefits are across-the-board reductions in the cost and complexity of storage infrastructure.

### App-Centric Policies to Automate Storage Consumption

Software-defined storage enables consistent policies across all resources in the heterogeneous storage pool, making consumption as simple as specifying the capacity, performance and availability

 

requirements for each application or virtual machine. This policy-based automation maximizes the utilization of underlying storage resources while minimizing administrative overhead.

### Virtualized, Hardware-Agnostic Data Services

Data services such as snapshots, clones and replication are delivered in software as virtual data services, provisioned and managed on a per-virtual machine basis. Independence from the underlying storage hardware makes these services especially easy to allocate.

### Data Persistence Through Virtualization of Hard Disks and Solid State Drives

As server capabilities increase, software-defined storage solutions allow enterprises to augment their storage resources by leveraging the same inexpensive industry-standard hardware they use for compute. Utilize solid state drives and hard disk drive as shared storage for virtual machines to achieve high performance, built-in resiliency, dynamic scalability and up to 50 percent reductions in storage TCO.

### Software-Defined Availability

The software-defined data center delivers availability for all applications independent of the platform stack. This technology lets you establish a consistent first line of defense for your entire IT infrastructure. You can automatically detect and recover from any software or operating system failure affecting Exchange, SQL, Oracle, SharePoint or most any other popular packaged application.

 

# 3 Market Segments & Product Requirements

Software Defined Storage (SDS) is one of the hottest topics in today's data center. Naturally, every vendor defines SDS based on their own product range, sometimes leaving customer out of the equation.

The following three questions are at the core of the SDS discussion:

- How does enterprise storage have to adapt to keep up with modern IT requirements?
- What is the impact of the shift toward SDS on existing technology, processes, organizational structures and culture?
- How can customers get there?

## SDS - Key Requirements

- Works with any or most hardware brands
- Works with any or most types of storage: DAS, NAS, Flash, RAM, SAN
- Establishes feature parity across hardware platforms
- Offers centralized management of all corporate storage
- Policy based provisioning
- Intelligent tiering
- Independent of server hypervisor
- Comprehensive APIs (north and south bound)

**Bonus capabilities**

- Performance boost
- Self-service provisioning
- Application or VM-centric QoS
- Object storage support
- Translates between different storage types, such as HDFS, File, Block, Object
- Scale out
- Supports cloud storage
- Metering and chargeback
- Analytics

### Why this Matters to Customers

SDS is a logical layer that federates all existing and future storage of any age, brand or type. It enables customers to not pay multiple times for the same advanced storage features –snapshots, clones, DR, backup, thin provisioning, compression, deduplication etc. – and to more intelligently use expensive storage tiers such as Flash or RAM.

This means that storage features are purchased separately from the underlying hardware.
It does not mean that hardware is entirely commoditized, as performance and reliability characteristics still matter.

 

# 4 Market Demand Forecast & Market Shares

## Market Forecast 2013-2017

The global SDDC market is estimated at $396.1 million in 2013 and expected to grow to $5.41 billion in 2018. This represents an estimated CAGR of 68.7% from 2013 to 2018. In the current scenario, telecommunication service providers continue to be the largest user for SDDC solutions followed by cloud service providers. In terms of regions, North America is expected to be the biggest market, while Asia-Pacific (APAC) is expected to grow at a significantly faster pace in the coming years.

 

# 5- Enabling Technologies – Trends & Standards

Increasing demand for cost effective and flexible data center solutions along with the requirements for resource pooling, break down of vendor lock-ins and automatic networking configurations are playing an important role in shaping the future of the Software Defined Data Center (SDDC) market. Even though the solutions can be independently operated, they can be integrated together to provide an overall cost effective solution for the data center. Major Tier 1 companies and numerous start-ups are getting into this escalating market for SDDC.

# 6- Competitive Product Positioning & Strategies

## Traditional vs Virtualization Suppliers

## Large Storage Suppliers - Incumbents

### Total System Suppliers

### Hardware Suppliers

### Software Suppliers

## Emerging Start-Ups

## System Integrators

# 7- Suppliers: Portfolio & Strategies

## Software-only Vendors

By definition, these vendors have the highest credibility when it comes to truly abstracting storage management from the underlying hardware, as they simply do not sell hardware. Without this conflict of interest, each one of these vendors has a significant incentive to change the storage game for the benefit of the customer. This means providing as many of the features and benefits of Software Defined Storage as possible

- Atlantis Computing
- DataCore Software
- SANBOLIC
- Nexenta
- Maxta
- CloudByte

## Hardware Vendors Offering Software-only Storage

By definition, when a hardware vendor offers software that commoditizes its own range of traditional storage hardware, customers have to look at the fine print. However, each one of the below products deserves a close look and a comparison of features and economics.

- EMC ViPR
- HP StoreVirtual
- Hitachi
- IBM SmartCloud Virtual Storage Center
- NetApp Data ONTAP

## Storage Appliance Vendors

These are really software vendors, using mostly commodity hardware, including Flash arrays, as a delivery vehicle for SDS. This is a concession to the traditional way storage is purchased and mostly offers a turnkey experience. When considering the purchase of this type of storage appliance, it is essential to make sure to avoid the creation of technology islands that require separate management tools, processes and staff.

- Tintri
- Nimble
- Solidfire
- Nutanix
- Zadara Storage

# 8- Go To Market Channels

 

# 9- Recommendations

## Recommendations for Vendors

## Recommendations for System Integrators

## Recommendations for End Users by Vertical Industry

 

## Recommendations for Wall St /Investment Bankers

 

# 10- Methodology & Appendices

 