



STORAGE DEVELOPER CONFERENCE

SNIA ■ SANTA CLARA, 2016

Open Storage Platform

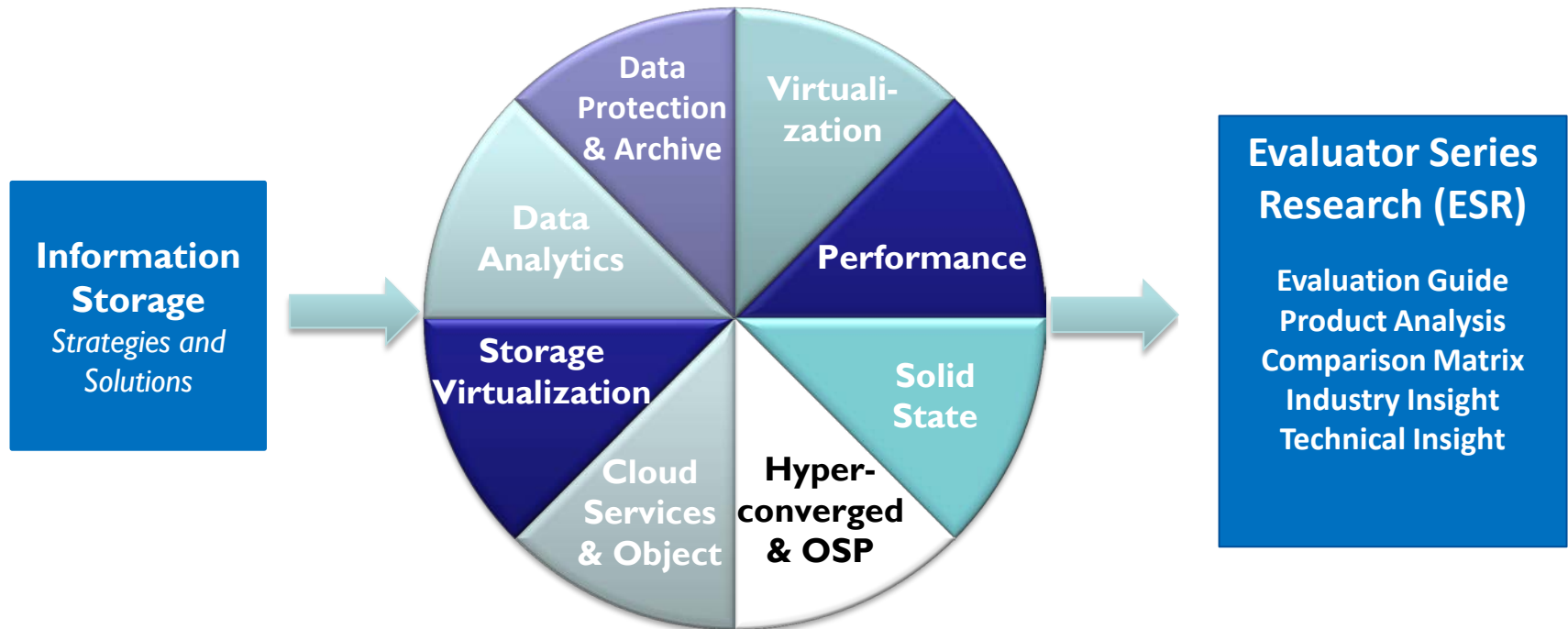
Eric Slack, Sr. Analyst
Evaluator Group



Evaluator Group

Unbiased In-Depth Information on Information
Management and Data Storage

Evaluator Group - Research Coverage



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Agenda

- ❑ What the Open Storage Platform is
- ❑ What benefits it can provide
- ❑ Relationship between OSP and Hyperconverged
- ❑ How OSP can be used to build an HCI
- ❑ Tour of current OSP products



Landscape Changes

Hyper-scalers – Amazon, Google, etc. developed own storage platforms

- Servers with captive storage (HDDs, and now incl SSDs)
- Wrote their own storage function software (example: Google File System)
- Needed resiliency in the application software layer
 - at cluster level, not in redundancy at hardware level
- Do-it-Yourself infrastructure - which they could handle

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Information Technology Deployments

Traditional Storage

Large
Traditional IT

Independent
Departments

SMB
Environments

Remote
Offices

Non-traditional Storage

On Premises

Private /
Hybrid
Cloud

Specific
Usage
Solutions

Off Premises

Public
Service
Provider

Hyper-scale Dream

Hyper-scalers' approach was appealing

- Flexible, cost effective, independent
- Technology 'trickle-down'

Made sense on whiteboard – others wanted to copy

- Enterprises
- Service Providers
- Opportunistic Integrators



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Hyper-scale Reality

Hyper-scale systems = Do-it-Yourself effort

Enterprise IT: Operations vs Development

Enterprises need

- Commercial products, implementation, support
- A model for design and deployment
- Roll your own approach, not DIY



Open Storage Platform Components

Open Storage Platform

Software-Defined Storage

Storage Function Software

- Virtual SANs
- Clustered File Systems

Storage Services Software

- Data Protection
- Data Management

Server-Based Storage

Intel-based Servers

- Add-in features
- Special Functions

Direct-attached storage

- Internal to server devices
- External to server

Open Storage Platform Offerings - SDS

Software-defined storage

Storage function software

- Atlantis USX
- DataCore
- EMC ScaleIO
- Hedvig Dist. Platform
- HP StoreVirtual VSA
- IBM Spectrum Accelerate
- Maxta MxSP
- NexentaStor
- SoftNAS
- StorMagic SvSAN
- VMware VSAN

Storage services software

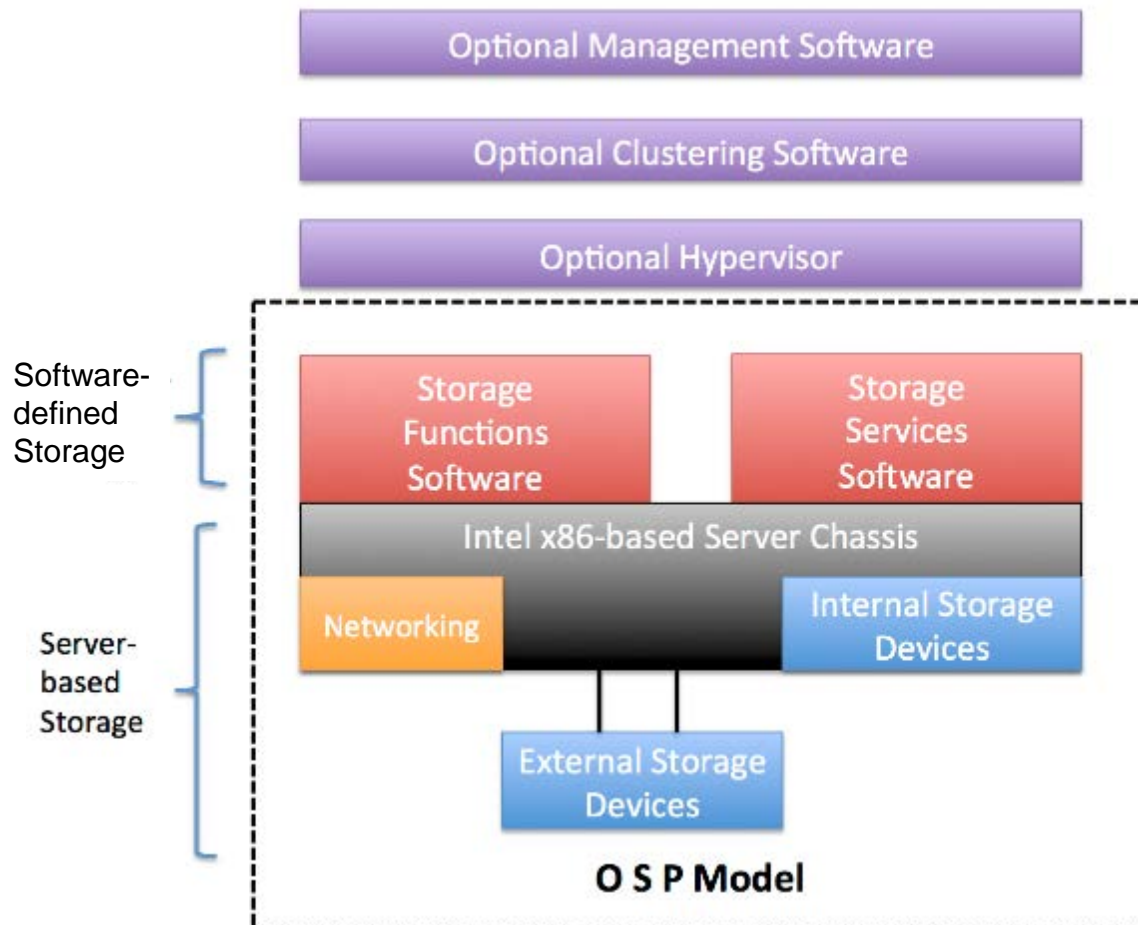
- Quantum StorNext

Open Storage Platform Offerings - Hardware

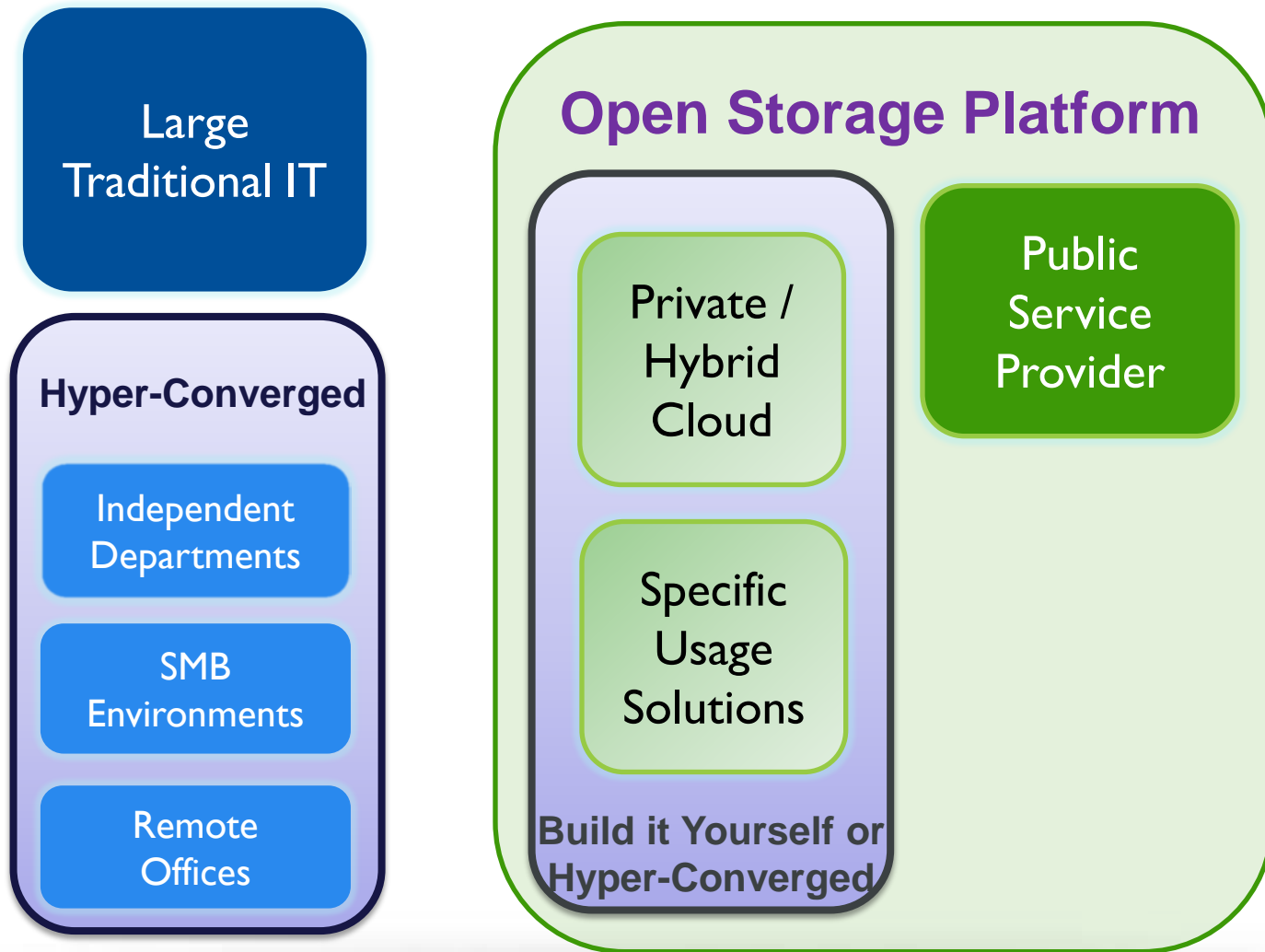
Server based storage

- Server OEMs - Intel x86
 - Cisco
 - Dell
 - HPE
 - Huawei
 - Inspur
 - Lenovo
 - Quanta
 - Supermicro
- Box builders
 - Aberdeen
 - 45 Drives
 - Evolve Mfg
- Direct-attach Storage
 - SanDisk InfiniFlash
 - X-IO ISE
 - HGST?
 - Seagate?

OSP – Big Picture



OSP Deployment Opportunities



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OSP Software Products



Atlantis USX Open Storage Platform

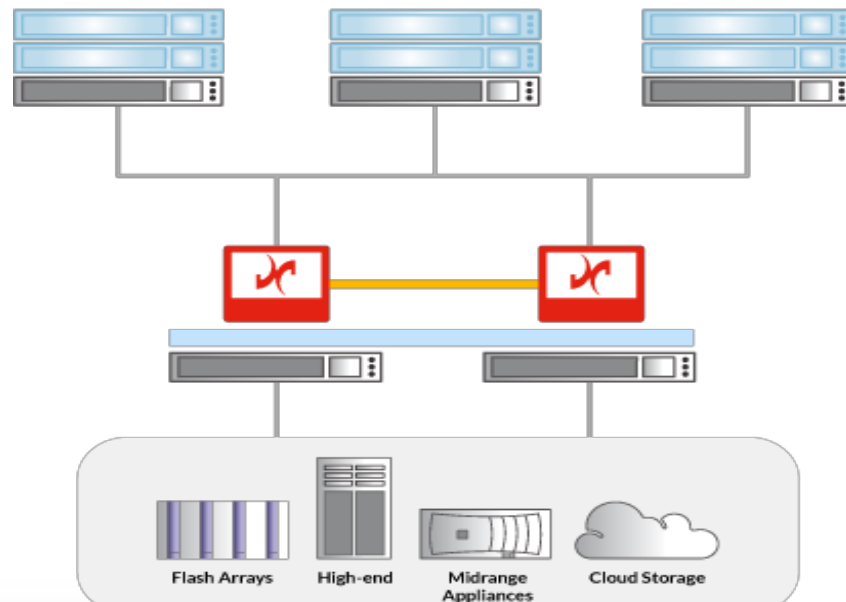
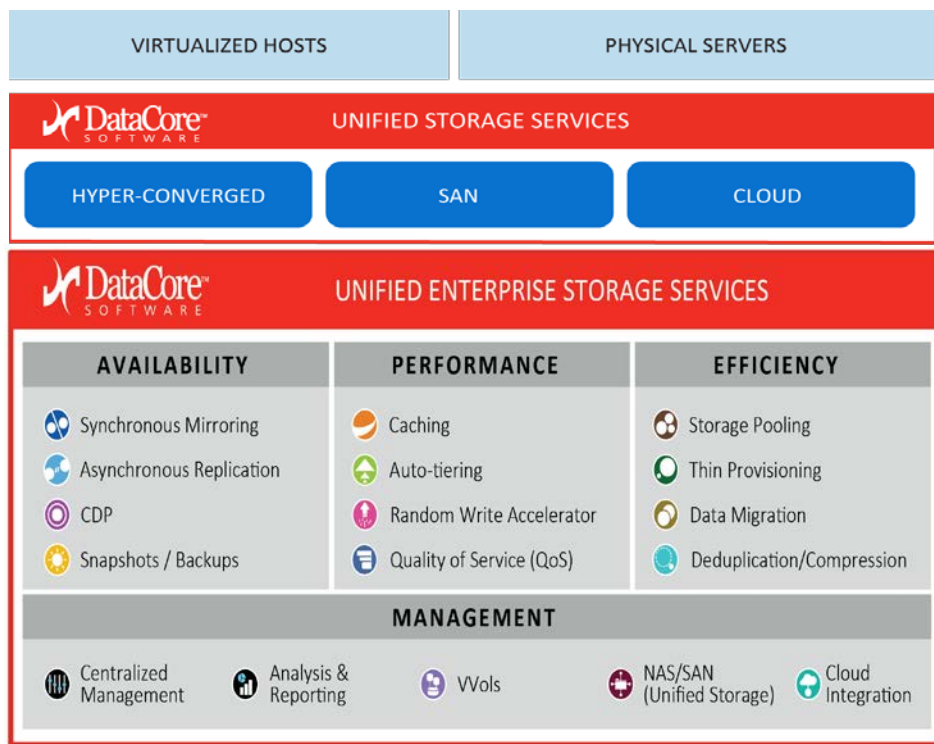
- ❑ Scale-out, software-defined storage solution runs as VM on vSphere or XenServer
- ❑ Abstracts server (flash, DRAM, HDD) or networked storage (SAN or NAS) into shared pool
- ❑ Data access via **iSCSI, NFS, SMB or S3** protocols
- ❑ Real-time, content-aware deduplication and compression, **up to 10x data reduction**
- ❑ Advanced feature set
- ❑ USX is software **foundation for HyperScale** appliances



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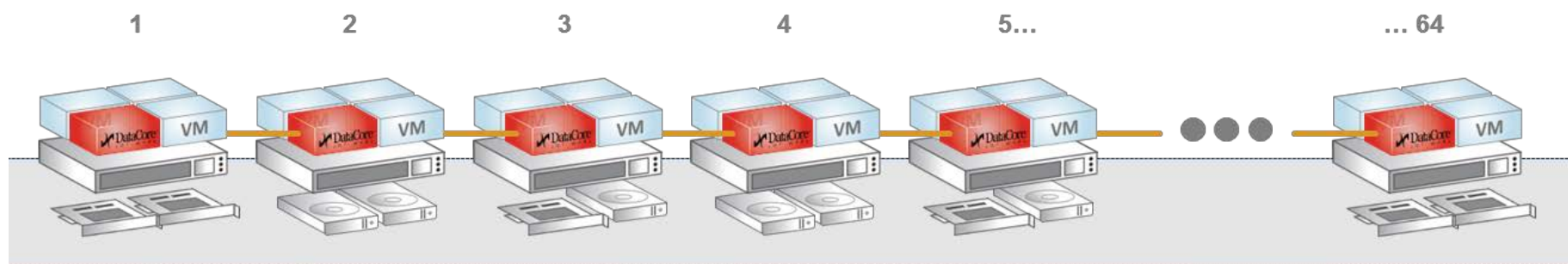
DataCore SANsymphony

- DataCore SANsymphony **virtual SAN**
- Runs as VM on all major hypervisors or as Windows server
- Virtualizes existing storage - SAN or DAS
- Scale up storage, scale out virtualization controllers



DataCore Hyper-converged Virtual SAN

- ❑ **Scale-out virtual SAN**
- ❑ 2 – 64 nodes per cluster
- ❑ Runs as VM on all major hypervisors / Windows server
- ❑ Low-latency architecture
- ❑ Low price/performance (per SPC-1 IOPS™)
- ❑ SDS layer for RYO Hyperconverged Infrastructure solution



EMC ScaleIO Overview

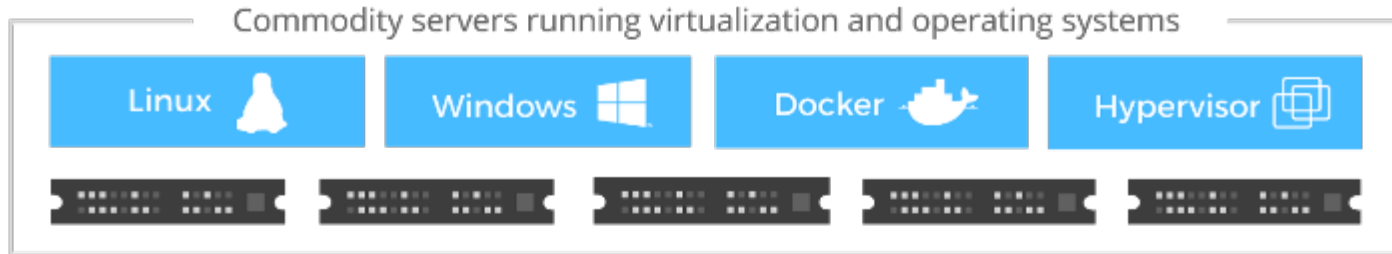
- ❑ Clustered SDS solution scales **3 nodes to >1000, 16PB**
- ❑ Pools local server capacity or DAS, shares data via **iSCSI**
- ❑ Runs as VM or on Windows or Linux server
- ❑ Volumes are parsed, mirrored, distributed across cluster
- ❑ Data Server installs on contributing servers
- ❑ Data Client installs on consuming servers
- ❑ Infrastructure agnostic, **no cluster uniformity**
- ❑ Expands or shrinks non-disruptively
- ❑ Supports **two types of configurations**
 - ❑ Hyper-converged – Data Client and Data Server on same box
 - ❑ Two-Layer – Data Client and Data Server on different boxes

Hedvig Distributed Storage Platform

- ❑ Scale-out software solution abstracts local flash and disk into pooled, virtual volumes
- ❑ “RAID-less” architecture distributes data blocks across cluster
- ❑ **Runs as VM** on all major hypervisors, as **Docker** container on **Linux server**
- ❑ **Hyper-scale** configuration scales storage separately from compute
- ❑ **Hyper-converged** configuration scales storage and compute together
- ❑ Supports iSCSI, NFS, S3, Swift and OpenStack Cinder

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Hedvig Distributed Storage Platform



Hedvig Distributed Storage Platform



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HP StoreVirtual VSA Overview

- ❑ **Scale Out server-side Block Storage**
- ❑ Clustered nodes with data distribution
- ❑ Thin Provisioning
- ❑ Snapshots
- ❑ Remote Replication
- ❑ Hypervisor advanced features (vMotion, Live Migration, etc...)
- ❑ **Adaptive Optimization**
- ❑ Thin Provisioning
- ❑ Local/Remote replication
 - ❑ Remote Copy
 - ❑ Reservation-less thin provisioned snapshots
- ❑ Remote Management
- ❑ Zoning
- ❑ Non-disruptive upgrades

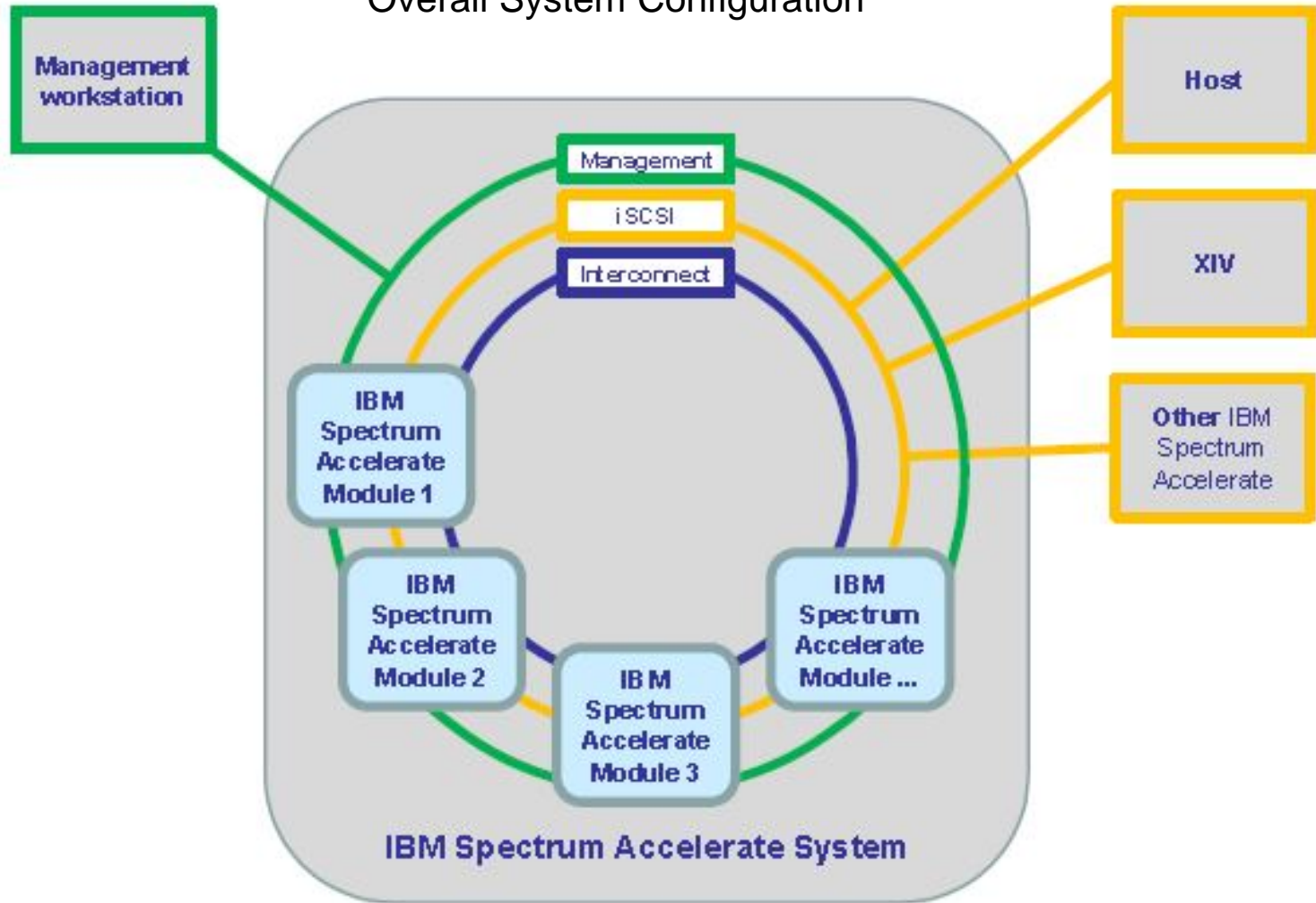
IBM Spectrum Accelerate

- ❑ **XIV software** for installation on public and private clouds
- ❑ All XIV features available for **VM-based storage**
- ❑ Can replicate between Accelerate and hardware-based XIV systems
- ❑ Same XIV GUI for management
- ❑ Supports up to 144 VMs of Accelerate
 - with IBM Hyper-Scale Manager
- ❑ Scales from 8 to 325TB per VM, 40PB for Hyper-Scale Manager

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IBM Spectrum Accelerate

Overall System Configuration

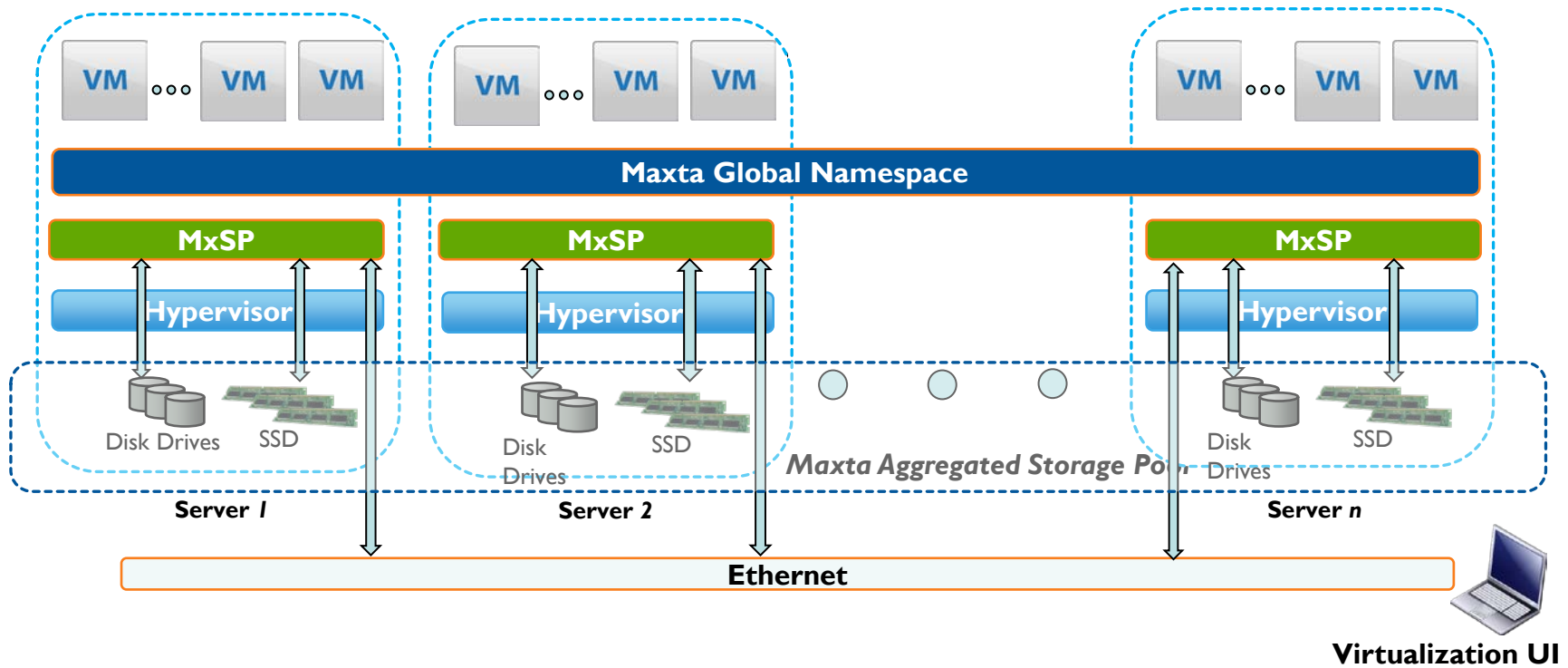


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Maxta MxSP Overview

- ❑ Hyperconverged architecture
- ❑ Available as **appliances or software-only**
- ❑ Appliances pre-configured by channel partners
- ❑ Aggregates server DAS into single storage pool
- ❑ OpenStack, KVM, vSphere software platforms
- ❑ **Freemium** model
 - 3-node cluster, 12TB max capacity, w/out support
- ❑ **VM-centric, VM-optimized**
- ❑ Local and Remote Replication
- ❑ Read and write-back caching
- ❑ Checksums to ensure Data Integrity
- ❑ Capacity optimization -- Thin provisioning
- ❑ Inline data reduction (Dedupe & Compression)
- ❑ “Zero copy” snapshots and clones

Maxta MxSP Software



NexentaStor Scale-Up Unified Storage

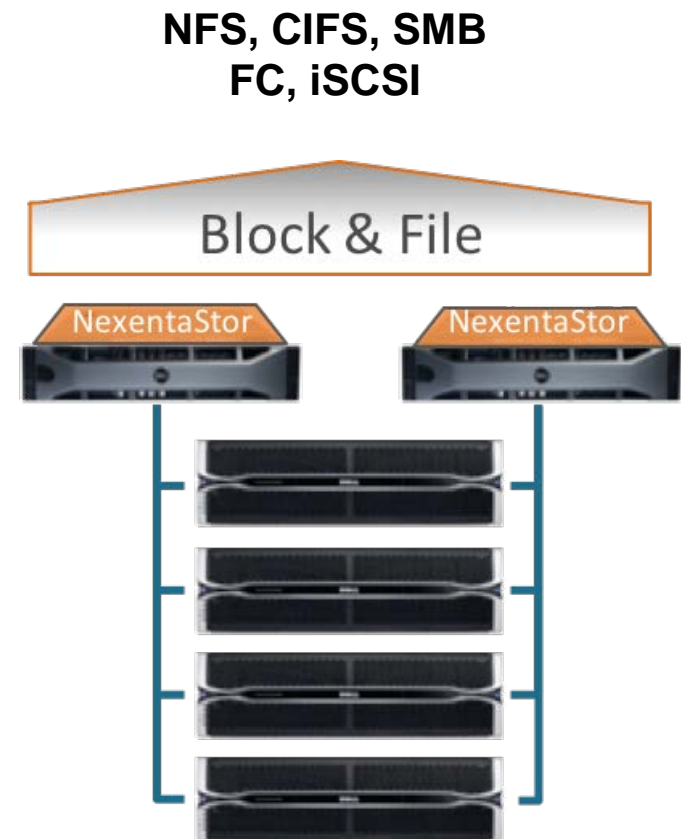
Unified storage services
(file and block)

Deployed on bare metal x86
servers

- 2 node active / active cluster
- Software RAID 1, N+1,2,3

With SAS connected storage

- Up to 2PB (raw)
- Hybrid and all-flash configs
- HDDs, SSDs, PCIe flash



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NexentaStor Scale-Up Unified Storage

- ❑ Up to **2PB storage capacity, unlimited namespace**
- ❑ **Feature-rich**, mature product
 - Read and write caching, auto-tiering
 - In-line deduplication and compression, thin provisioning
 - Snapshots and clones, synchronous mirroring
 - Dual and triple parity RAID with auto-rebuilds
 - Local and remote replication, incl. stretched clusters
- ❑ **NexentaStor 5.0**
 - NexentaFusion management layer
 - Self-documenting REST APIs
 - NVMe support

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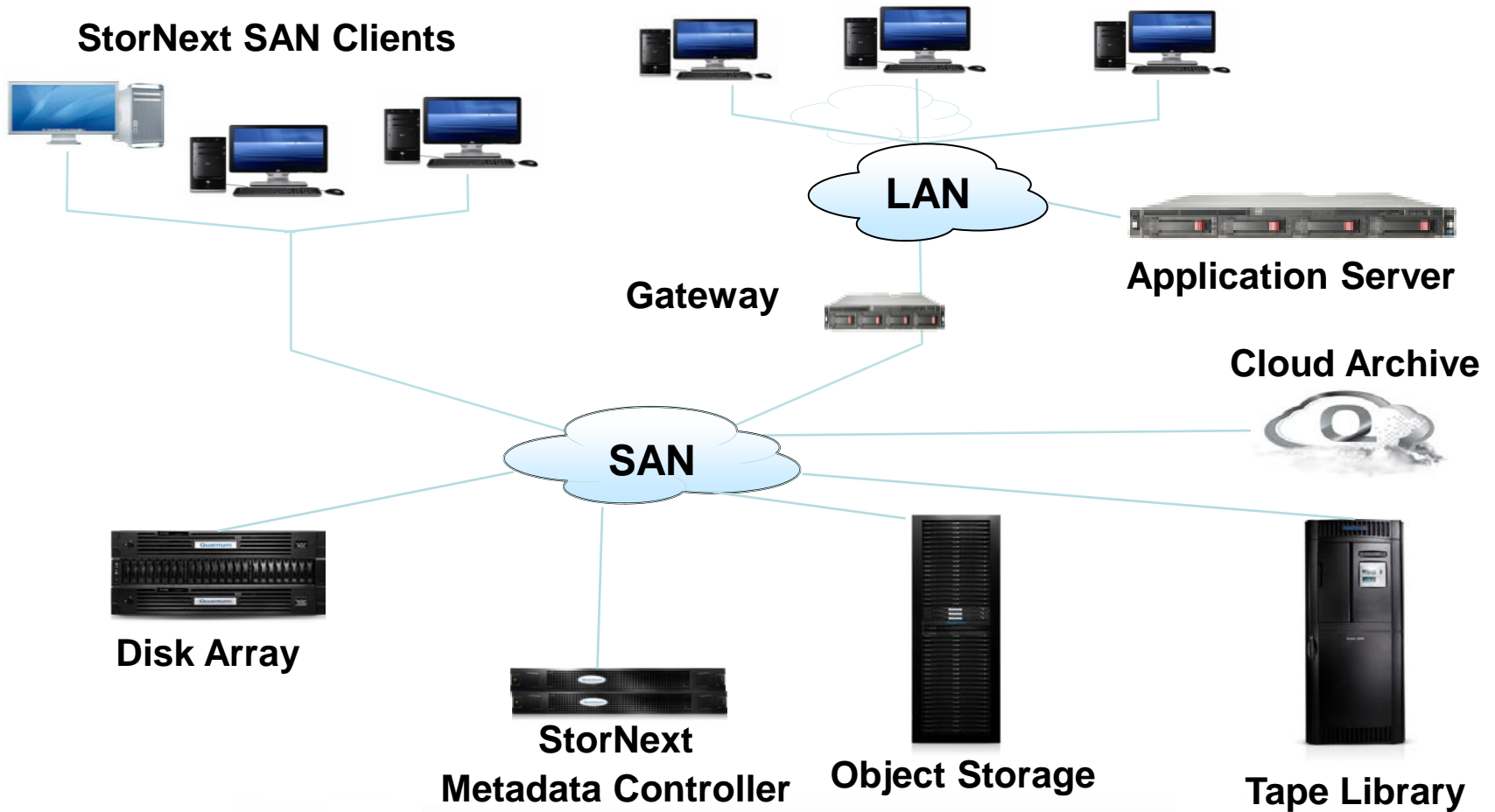
StorNext SAN-based File System

- ❑ StorNext File System runs on SAN-attached metadata controller
- ❑ StorNext agent running on Win, Linux, UNIX or Mac OSX host
- ❑ Serves files to LAN-based clients through a gateway
- ❑ Primary capacity presented from
 - Internal storage or DAS
 - SAN-attached block storage or object storage
- ❑ StorNext Storage Manager enables tape, tiered arch.
- ❑ Mature product with installed base in many vertical markets

StorNext SAN-based File System

Distributed LAN Clients
CIFS/NFS

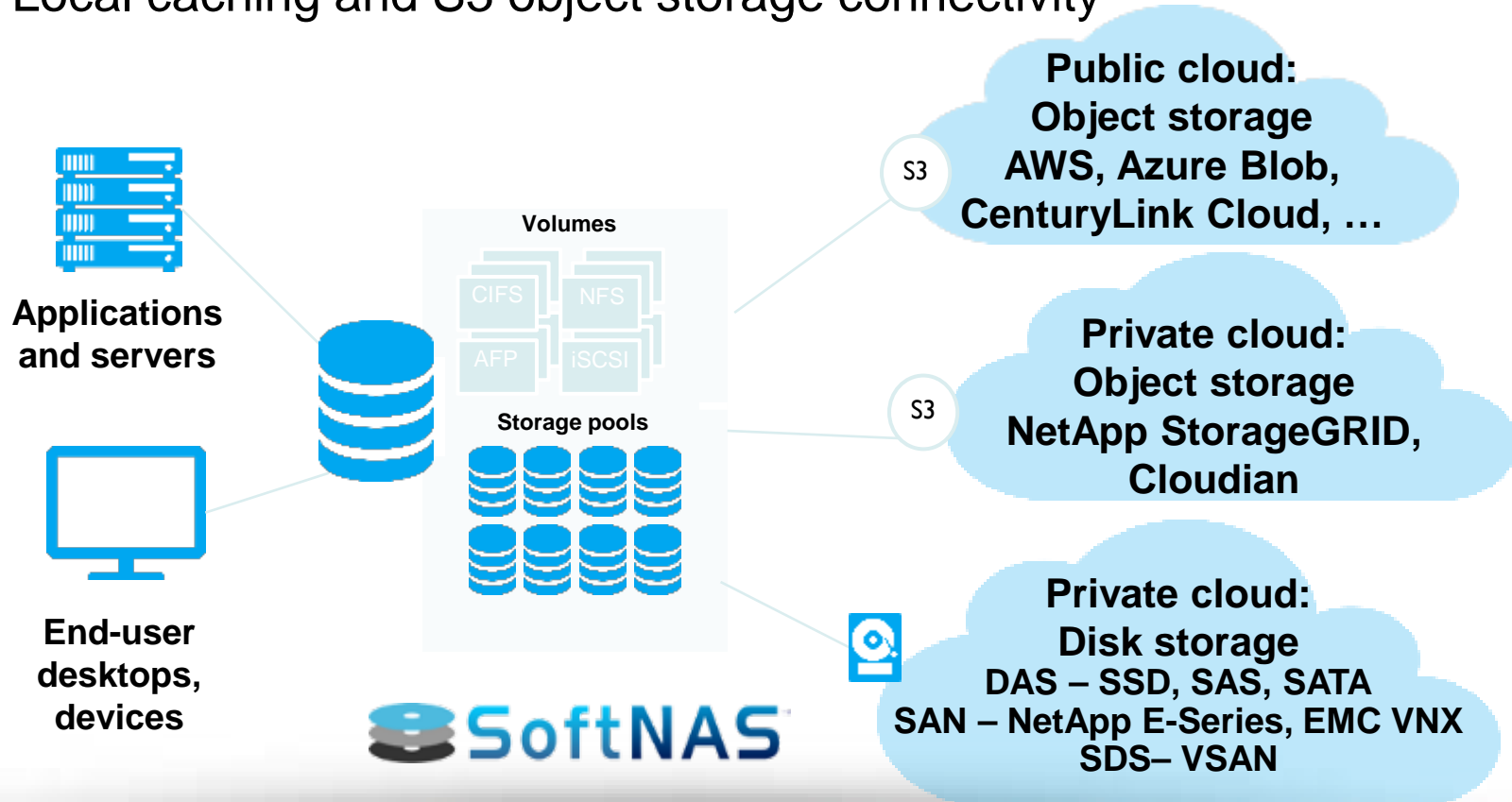
StorNext SAN Clients



SoftNAS Cloud File Gateway

On-premise and hybrid cloud storage deployment as a unified shared file system for VMware vSphere

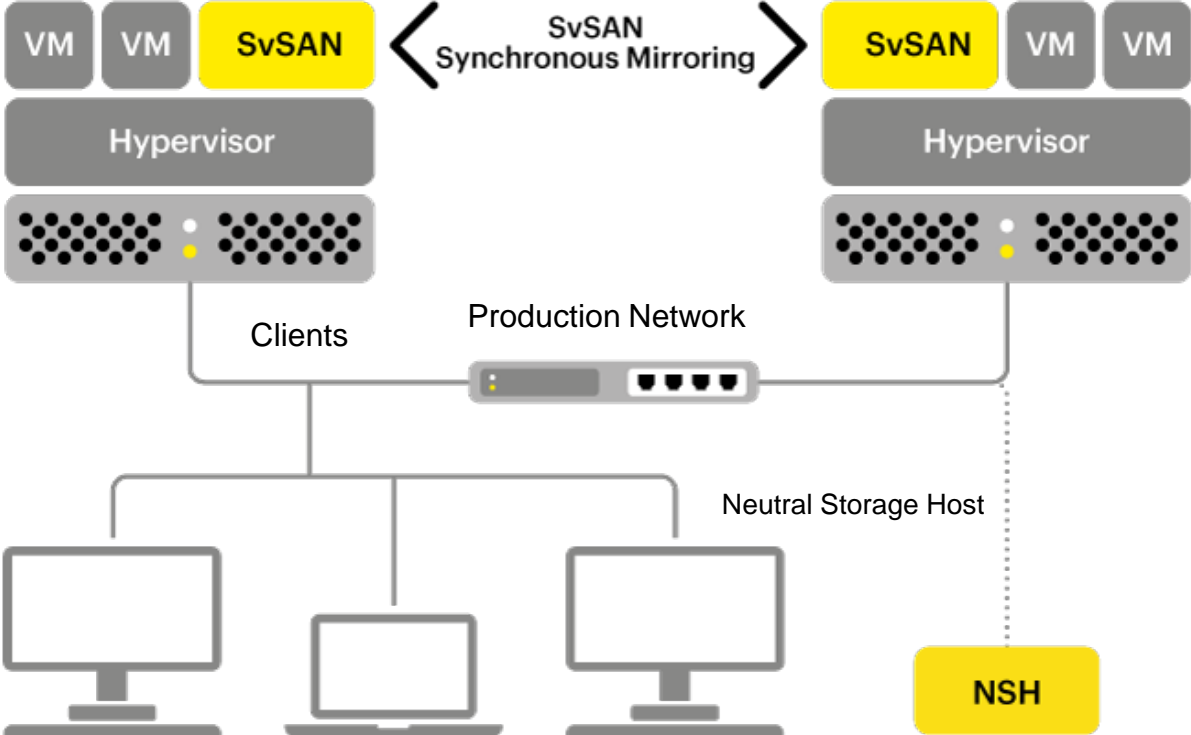
- Local caching and S3 object storage connectivity



StorMagic SvSAN

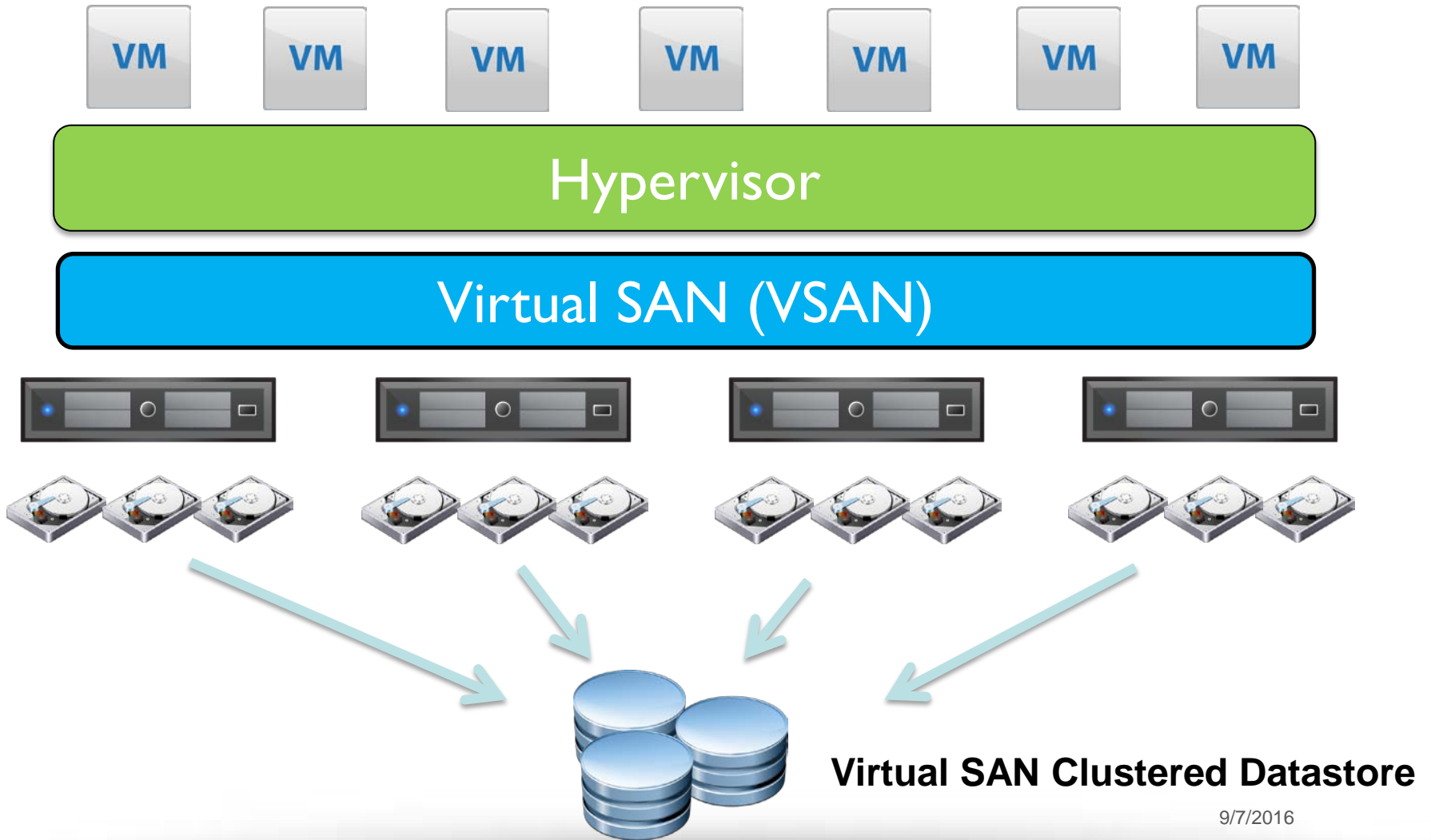
- ❑ Scale-out virtual SAN software
- ❑ Runs as **VMware** or **Hyper-V VM** or on **Linux** server
- ❑ Scales from two server nodes to thousands, 100s TB
- ❑ Aggregates internal HDDs or flash, plus **DAS and SAN**
- ❑ SSD and PCIe flash read/write caching and tiering
- ❑ Advanced data services
- ❑ **1500 customers**
- ❑ Server-side read caching and tiering
- ❑ Local synch mirroring with automated failover
- ❑ RAID with auto-rebuilds
- ❑ Remote replication, incl. target migration
- ❑ Stretched clusters for DR
- ❑ Non-disruptive scaling
- ❑ VMware vCenter integration

StorMagic SvSAN



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VMware VSAN Architecture



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VMware VSAN Data Services & Features

- ❑ Built into ESXi
- ❑ Leverage all of the VMware vSphere clustering data services and features
- ❑ Synchronous Mirroring – 3 mirrored replicas, one copy as a witness
- ❑ VSAN 6.2
 - Dedupe and Compression (claim 7x reduction)
 - Distributed RAID 5, 6 (“erasure coding”)
 - QoS – policy-based control IOPS consumed by VMs
 - SAP support

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Questions?

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