StorMagic

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STORMAGIC VORSTELLUNG

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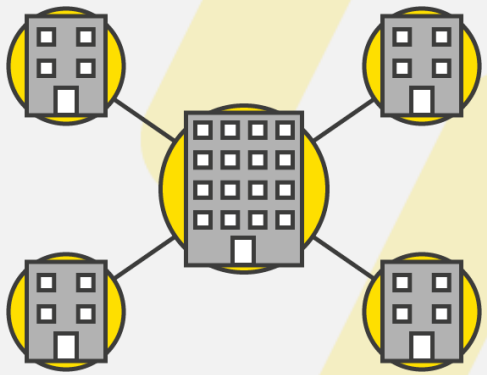
SIMPLIFYING STORAGE **AT THE EDGE**

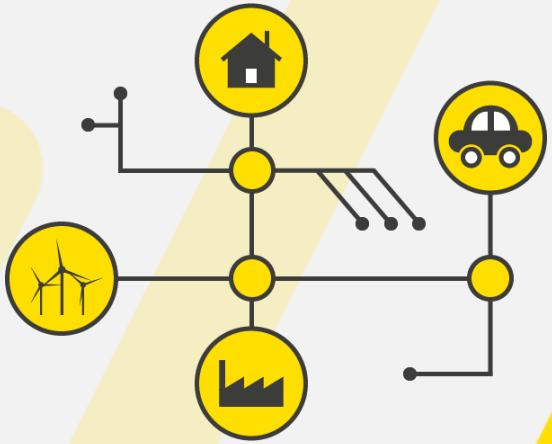
THE RISE OF **EDGE COMPUTING**

IF IT'S NOT DATACENTER OR CLOUD, THEN IT'S THE EDGE



ROBO

Micro-datacenters



IoT

By 2018:

47x more data will be generated outside the datacenter than inside

By 2021:

1 million new IoT devices will be sold every hour

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Gartner

PAIN POINTS **AT THE EDGE**

COMPLEXITY

- Datacenter designs don’t work at the edge
- Latency to cloud/datacenter
- Vendor lock-in
- Can be 100’s or 1000’s of sites

PAIN POINTS **AT THE EDGE**

COST

- Too much hardware
- Lack of IT staffing
- Many sites drives higher costs
- Power, cooling, space

PAIN POINTS **AT THE EDGE**

INFLEXIBLE

- Different designs at each location
- Over-provisioning
- Difficult to grow cost-effectively

INTRODUCING **STORMAGIC SvSAN**

- Virtual SAN replaces physical SAN
- Software only: runs on any hardware
- Virtualizes disk, flash and memory
- Simple two node clusters with no single point of failure
- Enables hyperconvergence

SvSAN SOLVES PAIN **AT THE EDGE**

SIMPLE

Set and forget

- Works in any environment
- Run 1000 sites as easily as 1

COST EFFECTIVE

Lightest footprint, lowest cost

- No more physical SANs
- Lightweight requirements

FLEXIBLE

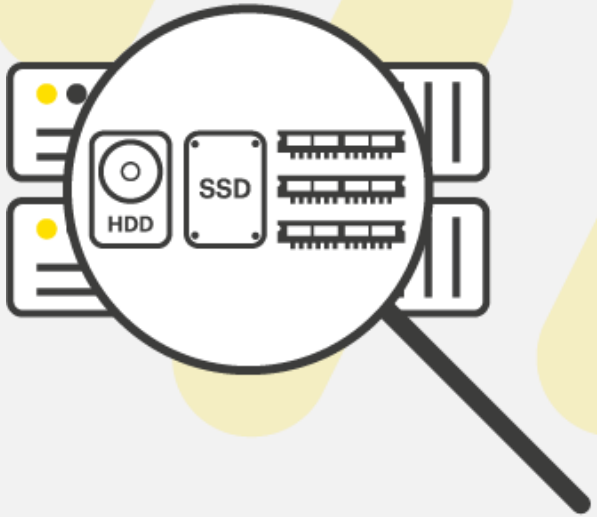
Today's needs, future proofed

- Adapt to any environment
- Multiple deployment options

WORKS IN **ANY ENVIRONMENT**

- Anywhere in the world, even poor, unreliable networks

Any drive type



Any x86 server

vSphere & Hyper-V

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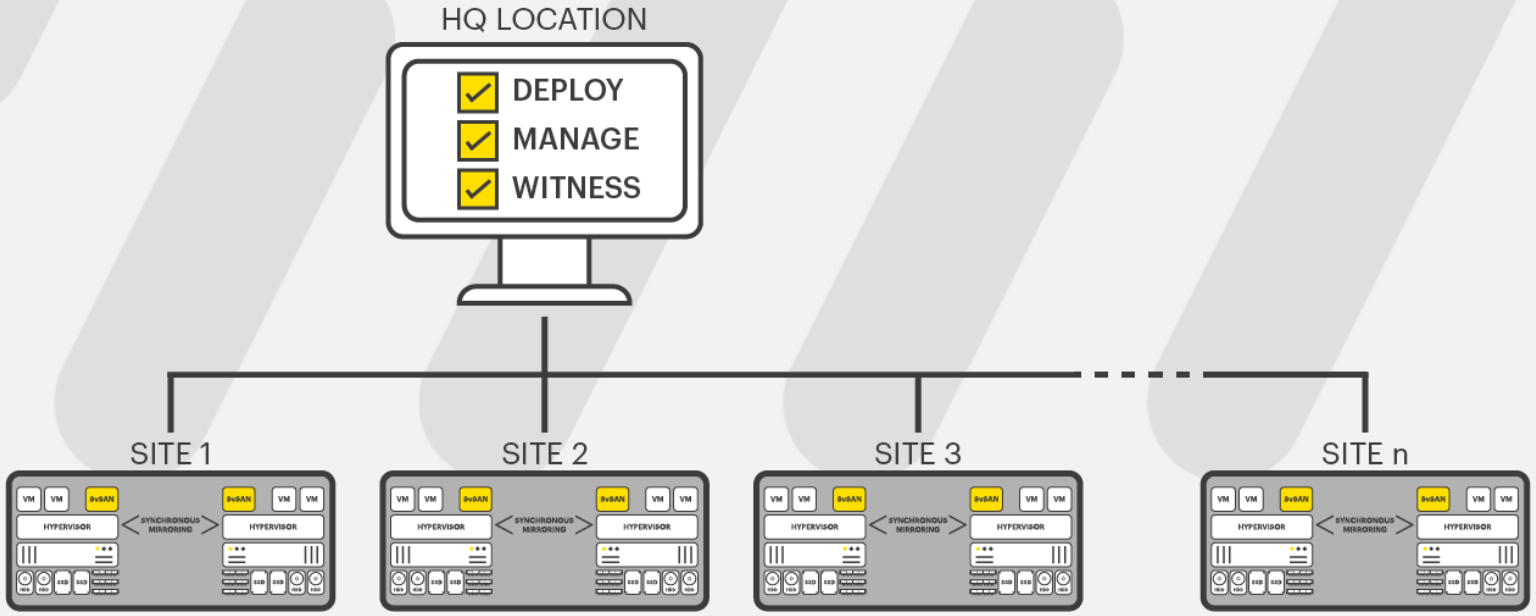
RUN 1000 SITES **AS EASILY AS 1**

- Centralized management and deployment
- Split-brain risk eliminated – one tiny remote witness for all sites
- Powerful automation tools and scripts
- Integrates with vCenter and SCOM



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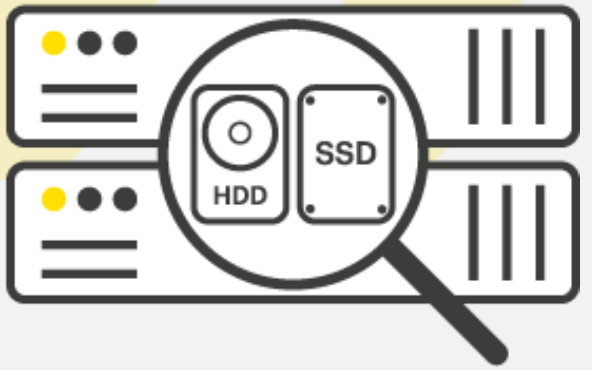
NO MORE **PHYSICAL SANS**

- Eliminate physical SANs and storage networks
- Converge compute, storage and networking
- Powerful commodity servers for performance
- Removes a management headache and single point of failure



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LIGHT **FOOTPRINT,** LOW **COST**

- Significantly less hardware per site
- Less power, cooling & spares
- Fewer things to manage

	StorMagic	Others
Servers per site for HA	**2**	3
CPU per server	**1 vCPU**	> 10% CPU
Memory per server	**1GB**	32GB (min)
Storage types	**Any**	SSD req'd
Witness network bandwidth	**9kbps**	1.5Mbps
Witness # of VMs required	**1:1000 sites**	1 per site

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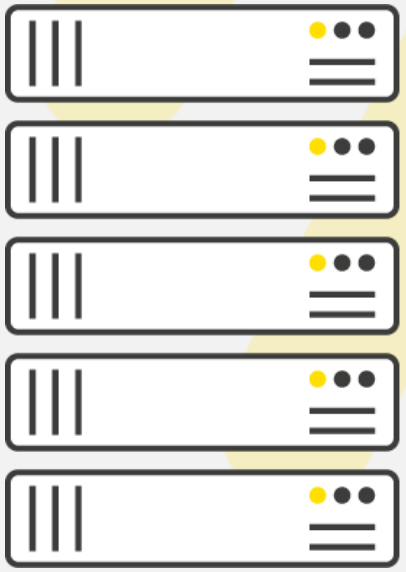
ELIMINATE **OVER-PROVISIONING**

- The game has changed since your last server refresh

Typical hyperconverged appliances



Advanced Analytics
Configure to precise IOPS and capacity

StorMagic
Enabling less hardware

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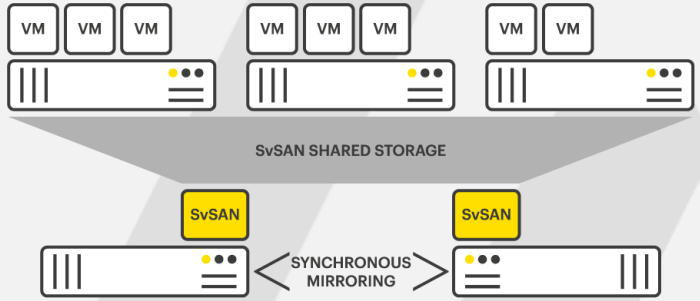
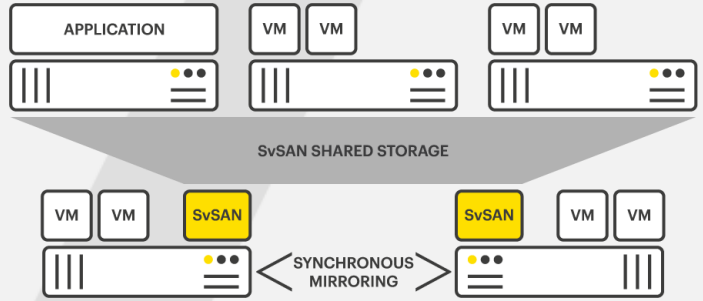
MULTIPLE DEPLOYMENT OPTIONS

Hyperconverged

Server SAN

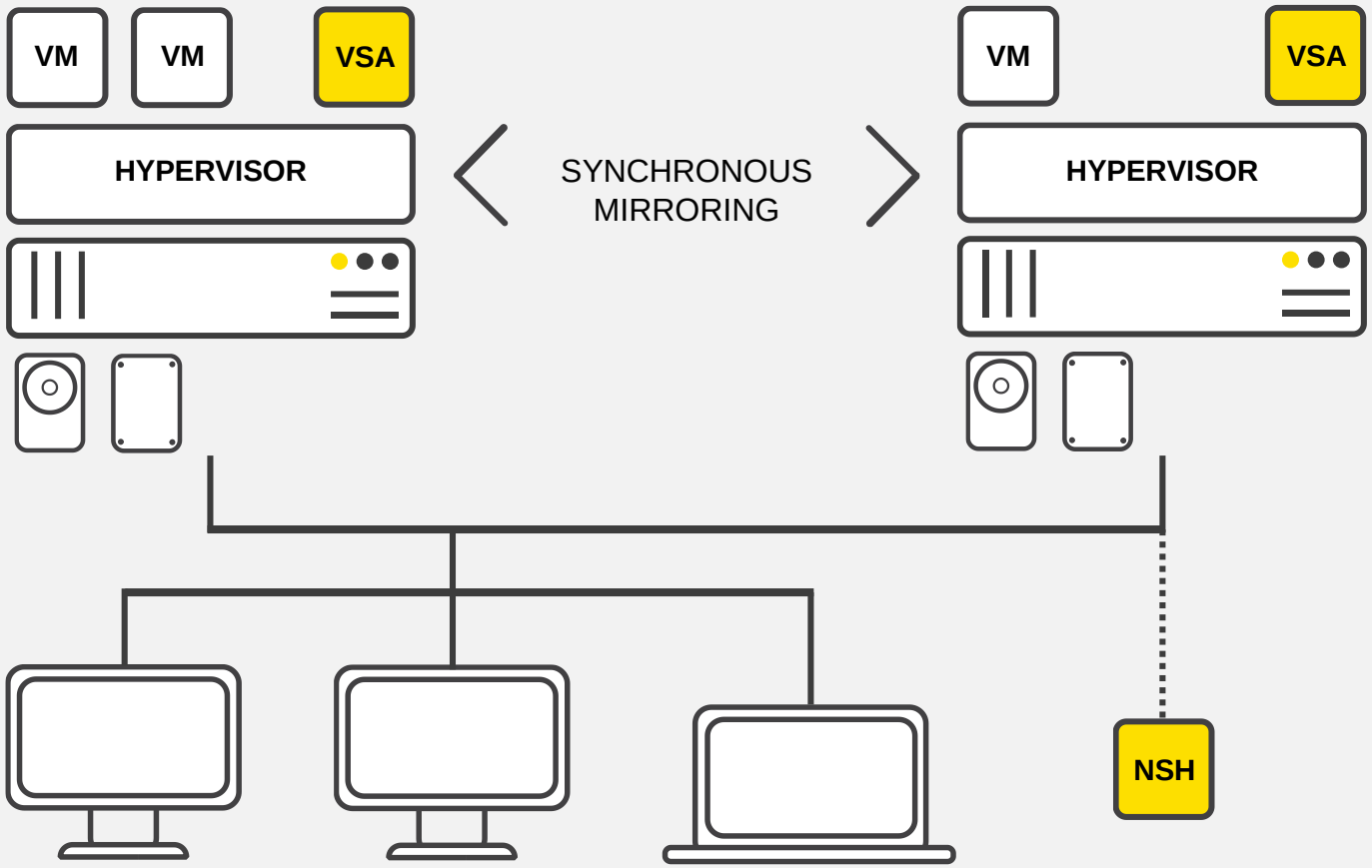


Hybrid Converged



STORMAGIC SvSAN

Software Defined Storage



SvSAN VSA – Virtual Storage Appliance

Lightweight software defined storage platform

Synchronous Mirroring

Synchronously mirror your storage between as little as two hosts for high availability and protection of your storage

Stretch Cluster Support

Mirror storage across separate sites to protect against major outages

Centralized, Simplified Management

Control all your SvSAN clusters from one place with simplified management tools

Remote Shared Witness - NSH

Flexible cluster witness keeps your mirrored storage in sync and highly available

Performance Caching Features

Utilized SSD and system memory to boost your performance

Scale Flexibly

Scale-Up and Scale-Out

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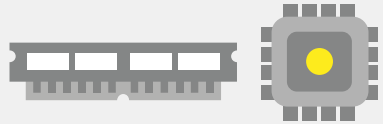
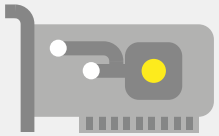
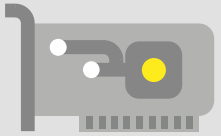
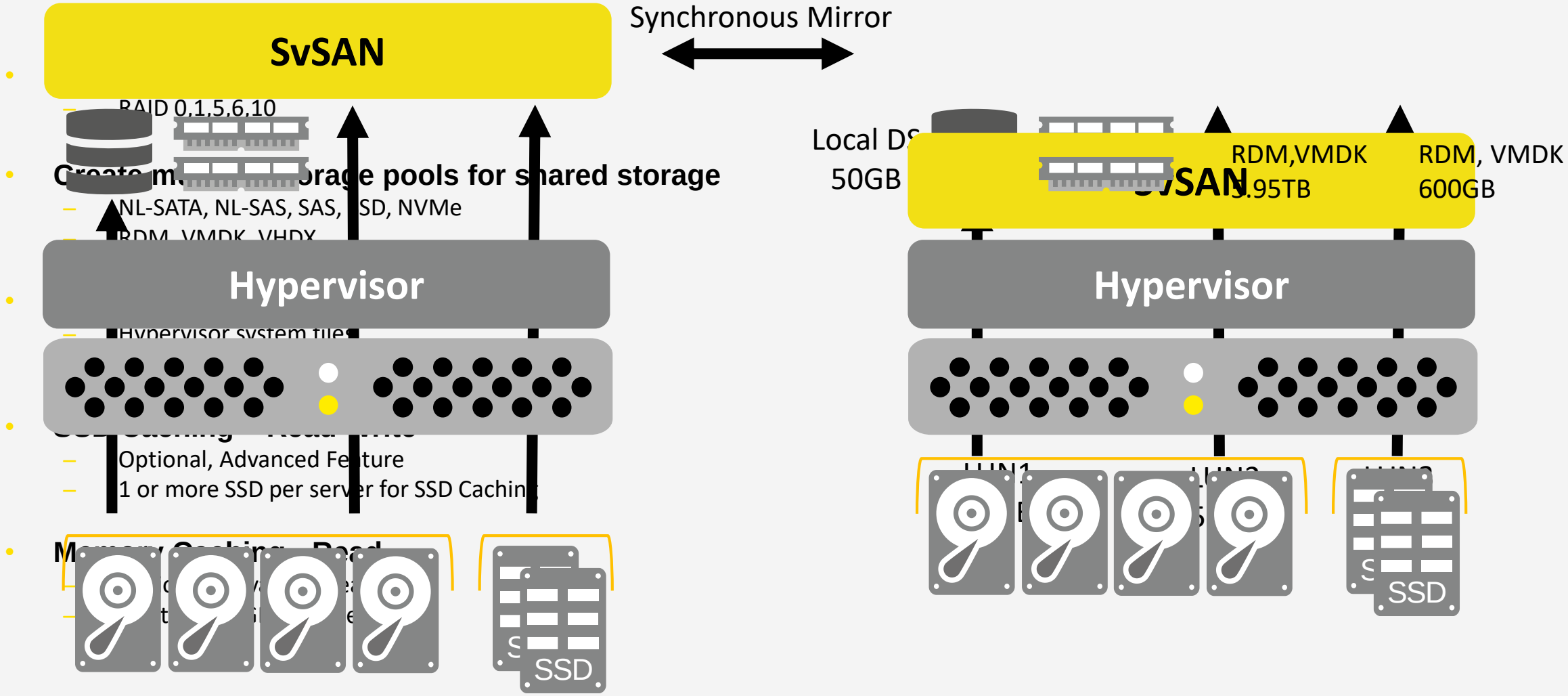
SvSAN - Hardware Requirements

Hardware Requirements	
VMware vSphere Microsoft Hyper-V (2012R2 and 2016)	
Any x86 hardware platform supported by the chosen hypervisor	
SATA, SAS, SSD Hypervisor supported storage controller Flexible RAID configuration	
Switched traffic or direct connection	

SvSAN - VSA Requirements

VSA – Virtual Storage Appliance	
Linux Kernel	
500MB Boot Drive 20GB Journal Drive	
1 vCPU	
1GB RAM (Standard) 2GB RAM (Advanced) Up to 32GB per VSA for Memory Caching	
1Gb, 10Gb, 40Gb networking	

SvSAN - Example Host Configuration

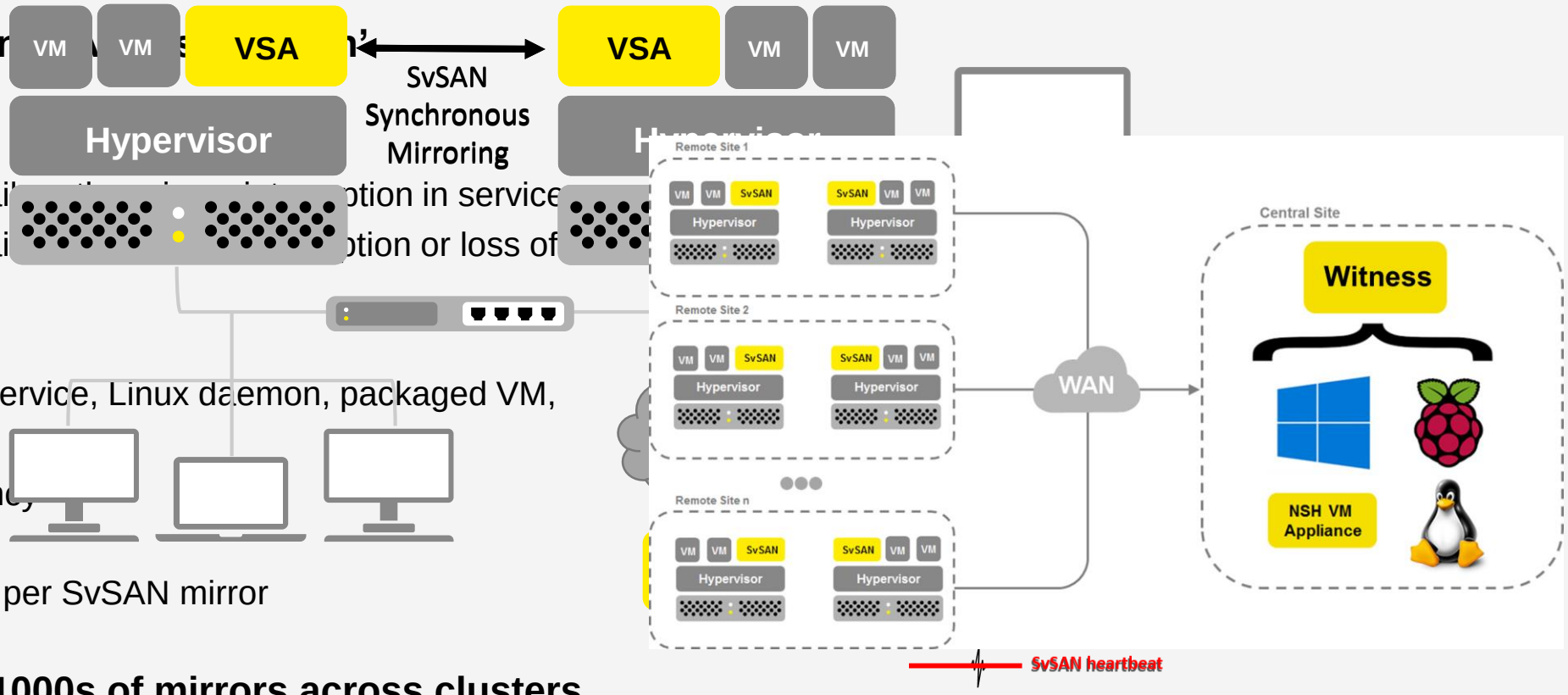


RAID Pool Storage
(0,1,5,6,10)

Cache Storage
(0,1,5,6,10)

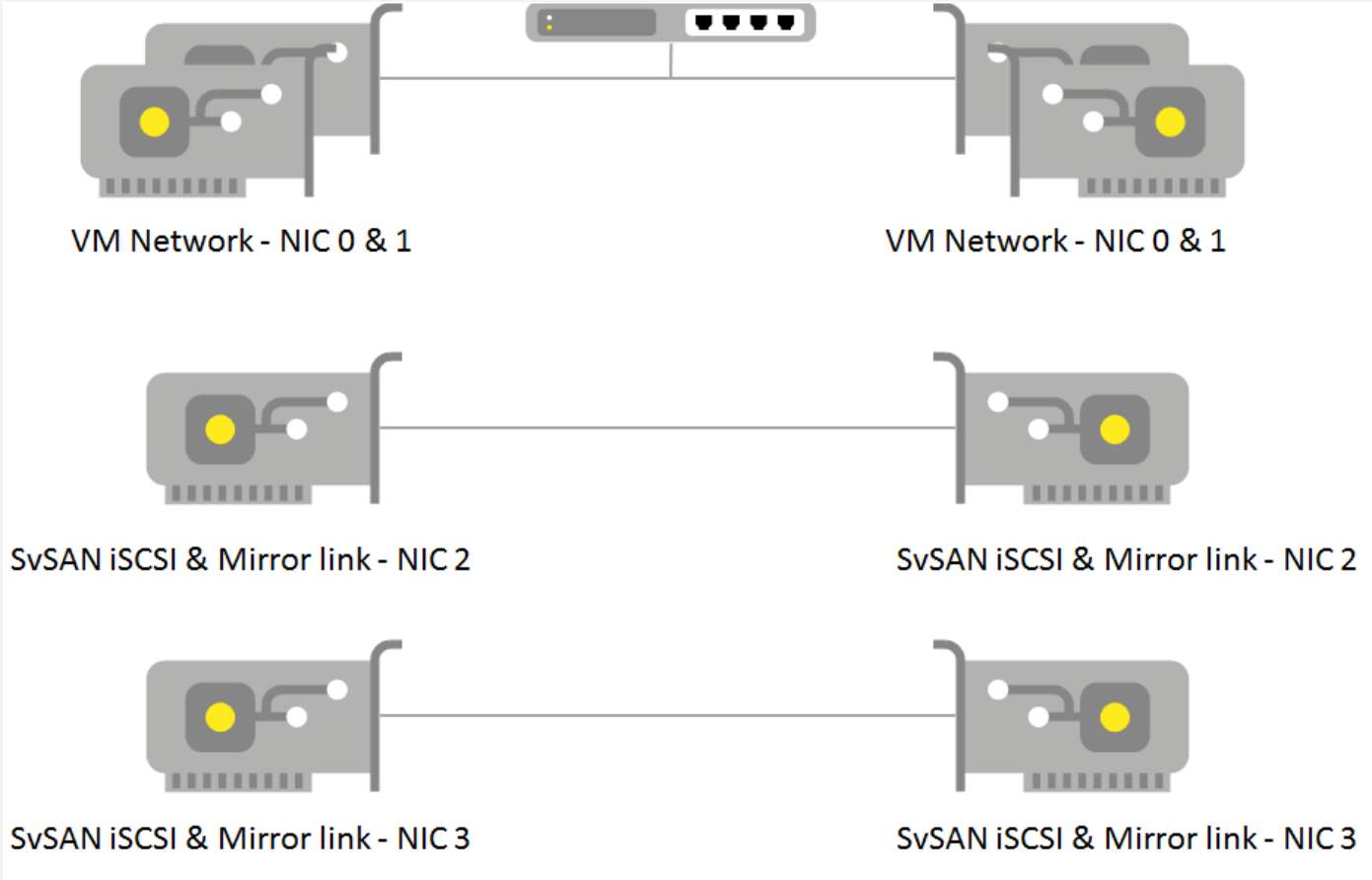
SvSAN - Neutral Storage Host (witness)

- **Tie-breaker service for SvSAN mirrors**
- **Prevents data inconsister**
- **This ensures**
  - In the event of a single fai ption in service
  - In the event of multiple fai ption or loss of
- **Local or Remote**
  - Supported as Windows service, Linux daemon, packaged VM, Raspbian (Raspberry Pi)
  - Withstands 3000ms laten
  - Up to 20% packet loss
  - 9kbs bandwidth required per SvSAN mirror
- **Single NSH instance for 1000s of mirrors across clusters**

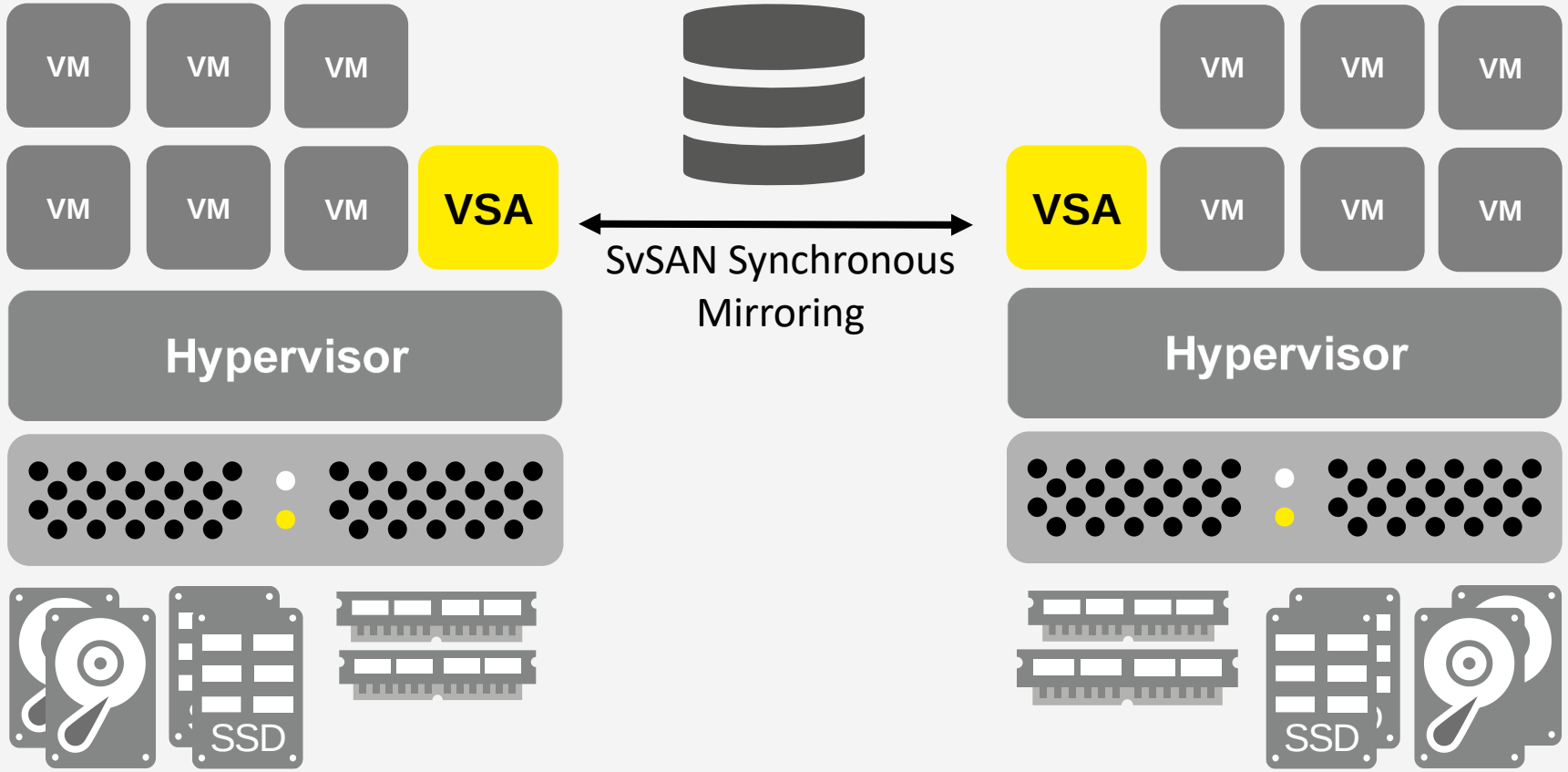


SvSAN example host networking configuration

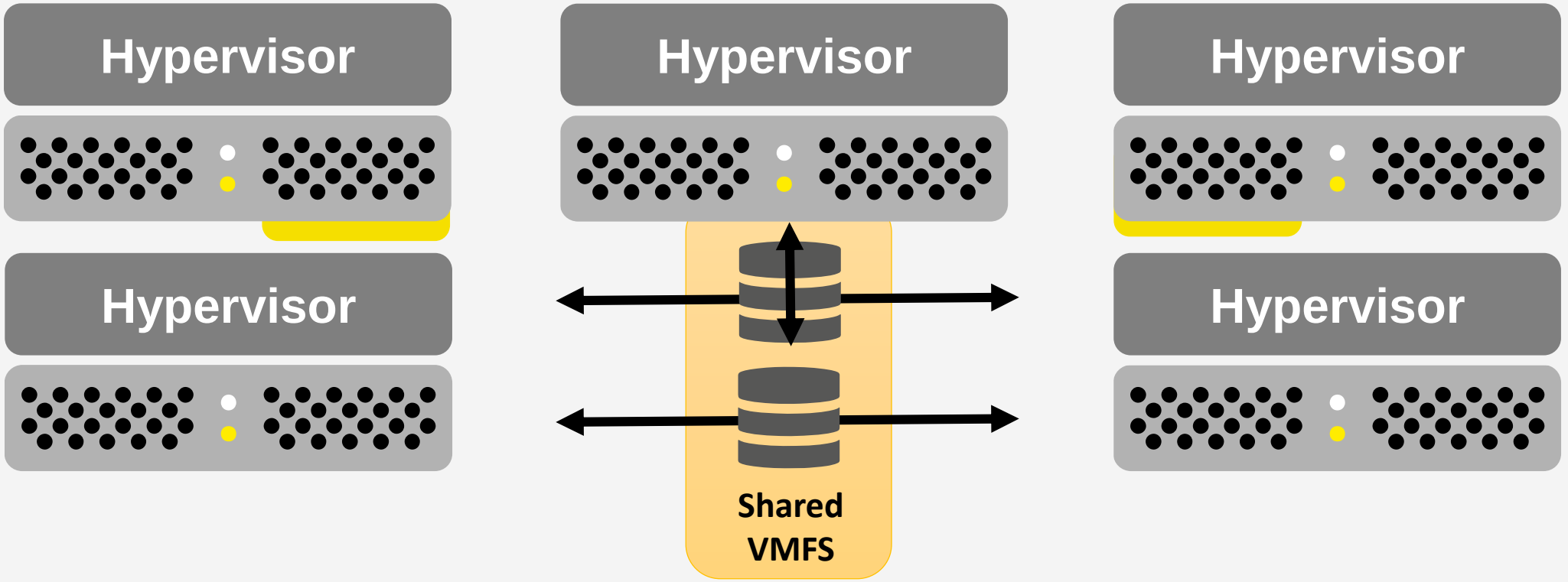
- Simplified networking
  - Direct connect storage network
  - Reduce network hardware
- Intelligent storage links
  - Storage links aggregated to provide higher throughput
  - Link failure and fail back handled automatically



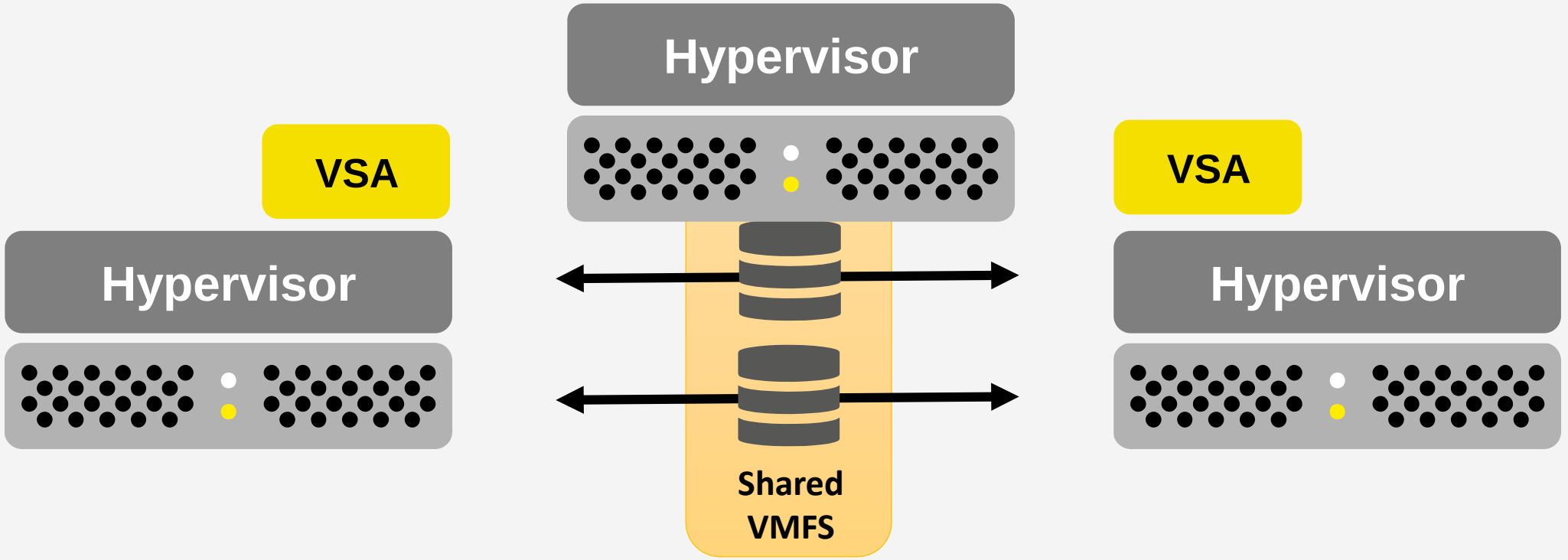
SvSAN Scale-up Architecture



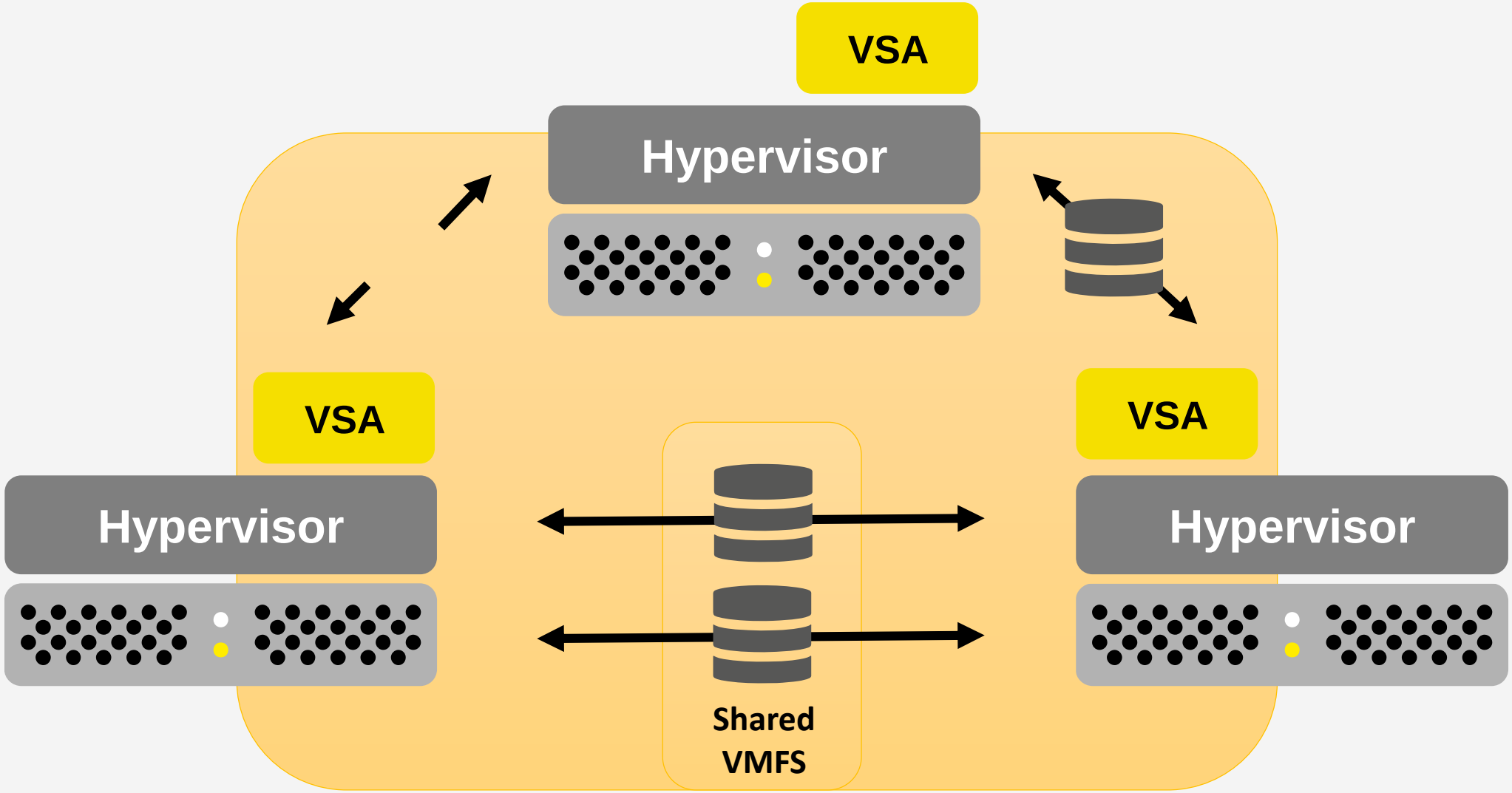
SvSAN Scale-out Architecture- compute only



SvSAN Scale-out Architecture – compute & storage



SvSAN Scale-out Architecture – compute & storage



SvSAN – Write Caching

SSD Write Back Caching

- Data acknowledged once written to Flash storage enabling for high random IO performance
- Sequentially written back to magnetics at a later time to minimize disk head movements

Hot Blocks

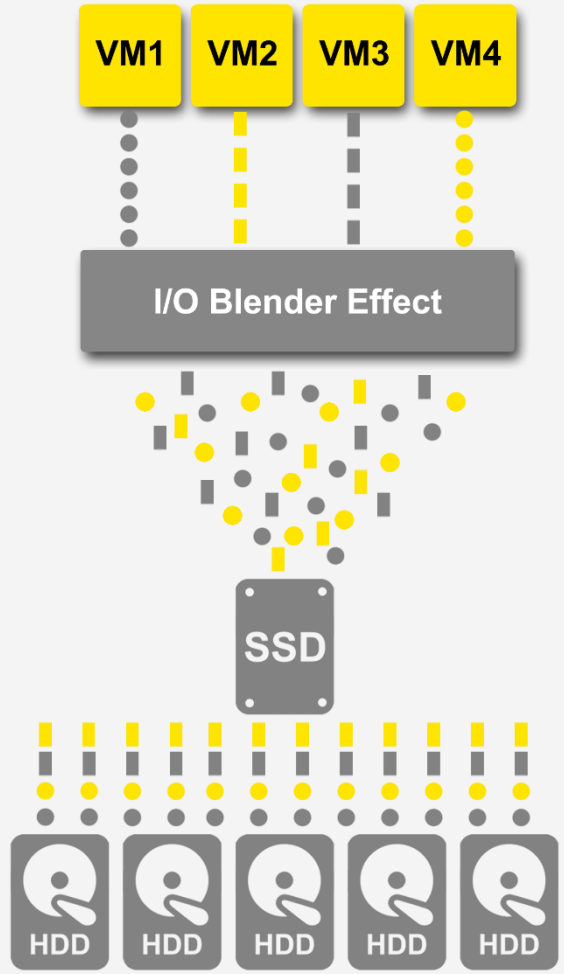
- Clean flushed data persists until space is required enabling read performance increase

Increase Performance and Efficiency

- IO tracked to promote into cache tiers over time
- Less workload on spinning disks enables greater efficiency

Sizing and Configuration

- Single SSD or hardware and software RAID for protection
- Recommended cache capacity 10% of pool storage
- *Example - 200GB cache, 2TB pool storage.*



PREDICTIVE STORAGE **CACHING**

400% PERFORMANCE IMPROVEMENT MANAGING ‘HOT’ DATA

AUTOMATED

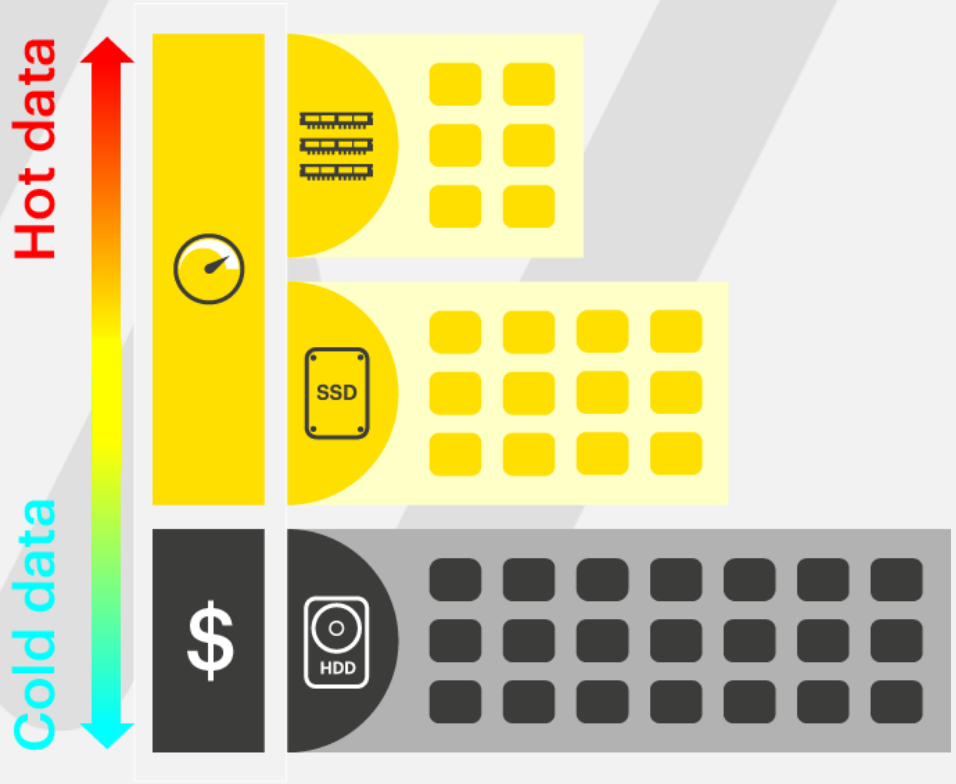
- System memory and/or SSD
- Patent-pending algorithms

BUILT FOR PERFORMANCE

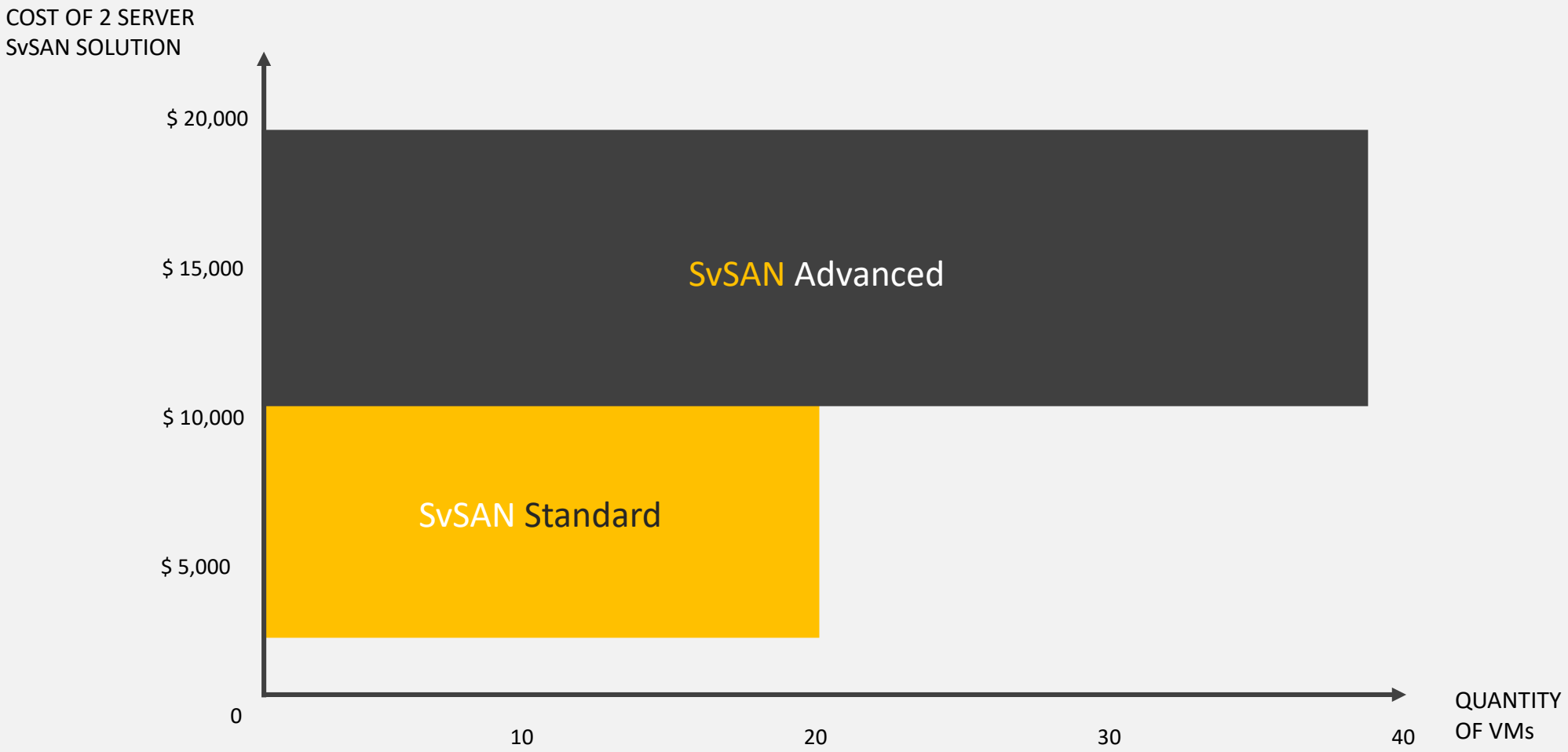
- Lower latency
- Data pinning mode
- Solves the “IO blender effect”

COST EFFECTIVE

- Use fewer and less expensive drives
- Less power, cooling, maintenance



FLEXIBLE TO MEET NEEDS



WHY SvSAN ADVANCED?

Customer Workload

- 12 Virtual Machines
- 78 applications
- Back up service

	Read	Write
Read/Write %	77%	23%
Sequential %	49%	39%
Average Per Day	991 GB	294 GB
Average Block Size	58 KB	54 KB
Average IOPS	212	138

HDD Only

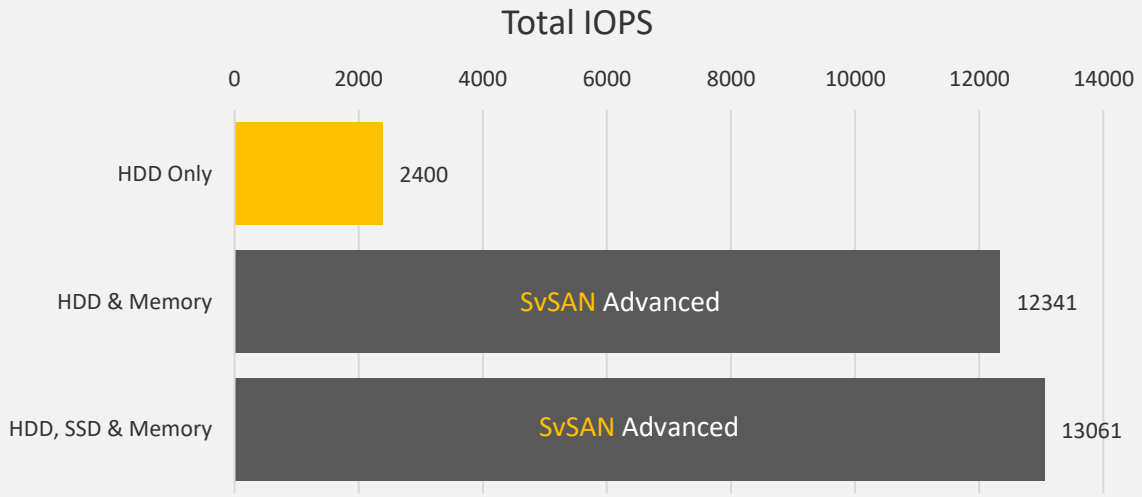
- 1 x RAID5 = 3 x 1.2TB 10K SAS disks

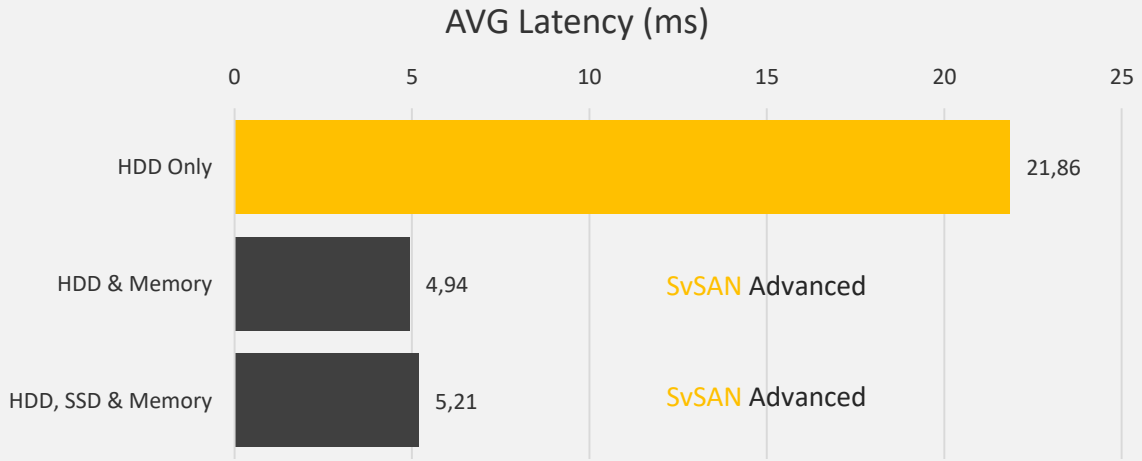
HDD & Memory

- 12GB of memory per host for caching
- 1 x RAID5 = 3 x 1.2TB 10K SAS disks

HDD, SSD & Memory

- 12GB of memory per host for caching
- 1 x 200GB Samsung SSD
- 1 x RAID5 = 3 x 1.2TB 10K SAS disks





SvSAN - management & integration

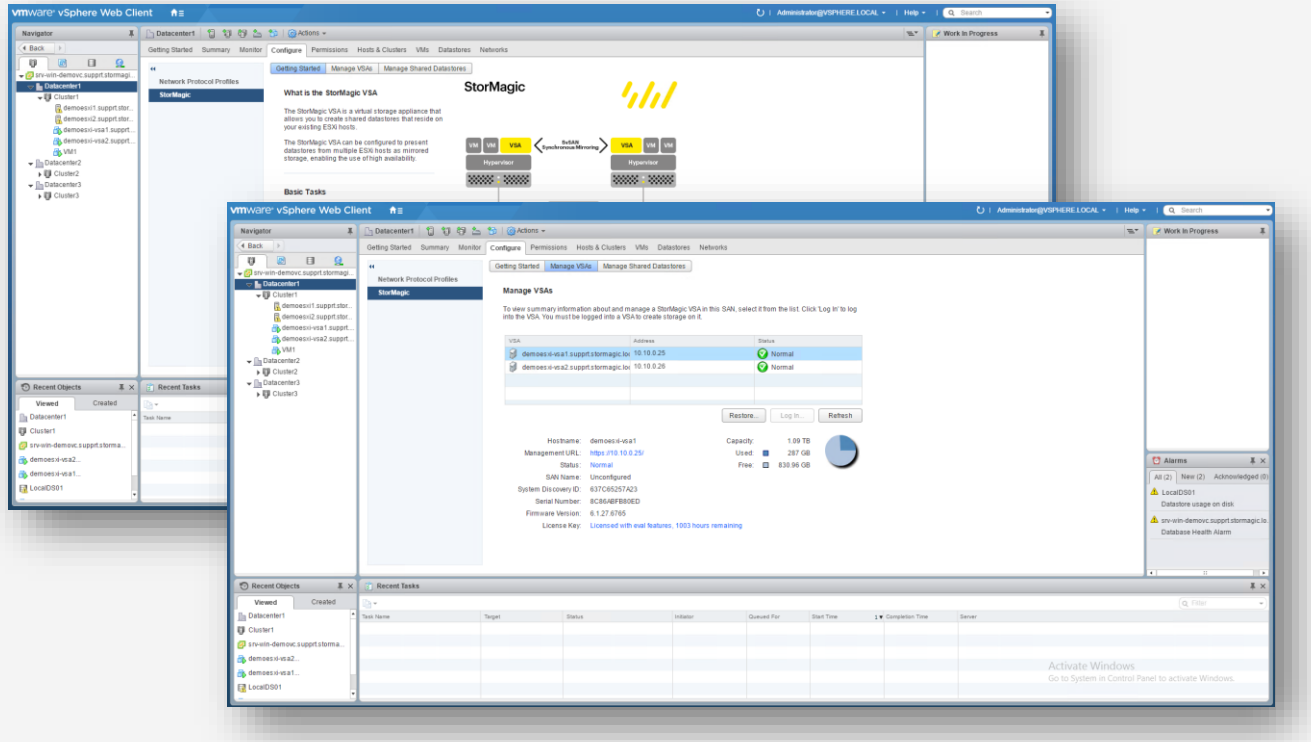
- **Centralized Management & Monitoring from the Datacenter**

- **vCenter StorMagic Integration**
  - StorMagic Dashboard
  - Single/Multi VSA Deploy
  - NSH Deploy
  - VSA Restore
  - Create, expand and migrate storage

- **Hyper-V Integration**
  - StorMagic Deployment Wizard

- **Monitoring**
  - SNMP v2 & v3
  - SMTP
  - vCenter Event Forwarding
  - System Center Operations Manager

- **Scripting tool box**
  - Powershell module
  - Deployment, configuration, firmware upgrades
  - Plugin script generation



SvSAN | STANDARD vs ADVANCED

	STANDARD	ADVANCED
Minimum cluster size	2	2
Synchronous mirroring/high availability	✔	✔
Stretched/metro cluster support	✔	✔
Volume migration	✔	✔
VSA restore	✔	✔
VMware vSphere storage API (VAAI) support	✔	✔
I/O performance statistics	✔	✔
Multiple VSA GUI deployment & upgrade	✔	✔
PowerShell script generation	✔	✔
SSD read/write caching	-	✔
Memory based read caching	-	✔
Data pinning	-	✔
Read ahead caching	-	✔
Intelligent auto cache tiering	-	✔
Data-at-Rest-Encryption	-	✔

Standard Edition

- Rich features for Software-Defined Storage

Advanced Edition

- Adds powerful cached auto-tiering
- Disk, Flash and Memory

License, Maintenance & Support (M&S)

- Perpetual License based on capacity
- 1 year M&S included
- M&S can be extended to 3 or 5 years

Capacity Levels

- 2TB
- 6TB
- 12TB
- Unlimited TB

ACROSS MANY **VERTICALS**

E.ON | REMOTE RENEWABLE ENERGY FACILITIES

Profile

- Largest private investor-owned power & gas company
- 100+ sites (wind turbines, solar farms & biomass plants)
- 2+ servers per site

Customer challenges

- No onsite IT – downtime resolution approx. 6 days
- Limited floor space for hardware

Business requirements

- High availability
- Central management of storage
- High performance for production critical applications
- Reduce hardware infrastructure complexity
- Reduce management costs
- Low capex investment

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GERMAN ARMY | BATTLEFIELD COMMUNICATIONS

Profile & challenges

- National army of Germany
- Virtualizing entire infrastructure
- Deliver a military-grade IT infrastructure for battlefield communications
- Offer superior service any time, any place

Business requirements

- Small footprint, light weight & portable
- Highly available and operation independence
- Quick to deploy with simple management

Solution

2 x Servers

SvSAN Software Defined Storage

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- Lightweight requirements

FLEXIBLE

Today's needs, future proofed

- Adapt to any environment
- Multiple deployment options

PRICING & SUPPORT

- Licensed by useable capacity only
  - One perpetual license per 2 node cluster
  - Standard Edition – including HA and management
  - Advanced Edition – adds Predictive Storage Caching
  - Add compute-only nodes for free

- Support Options
  - Gold – 9 hours x 5 days
  - Platinum – 24 hours x 7 days
  - 1, 3, 5 year options

"In minutes we were able to present datastores to our environment. Working with the technical support was nothing short of awesome."

George Knops,
Network Administrator,
City of Milwaukee Water Works

THE STORMAGIC **DIFFERENCE**

- **Designed** for edge environments and SMB
- Lightweight – less hardware to buy
- Remote witness – manages up to 1,000 sites
- Eliminate over-provisioning with analytics engine
- Scale compute nodes for free
- Predictive Storage Caching for even more performance

SvSAN | Q&A

bei Fragen …

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StorMagic

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