

QNAP

# vmware<sup>®</sup> with QNAP NAS/ QTS/QES

High availability, flash, and  
virtualization solutions explained



# QNAP

## VMware Application

1

**Virtual Server**

Stable &  
Comprehensive

2

**Backup &  
Disaster Recovery**

File & Service Backup

3

**Modern  
Application**

Performance & Space

**QTS (Basic Plan) /  
QES (Advanced Plan)**

High-availability, Pool over-provisioning, Assistance  
kit, SnapSync, SRM, Qtier,  
Data saving, iSER (RDMA)



# The trend of virtualization storage

## Enterprise storage – The fundamentals of digital transformation



You might encounter ...



- Needs for new app
- A lots of VMs grow
- Data increases rapidly
- I/O bottleneck

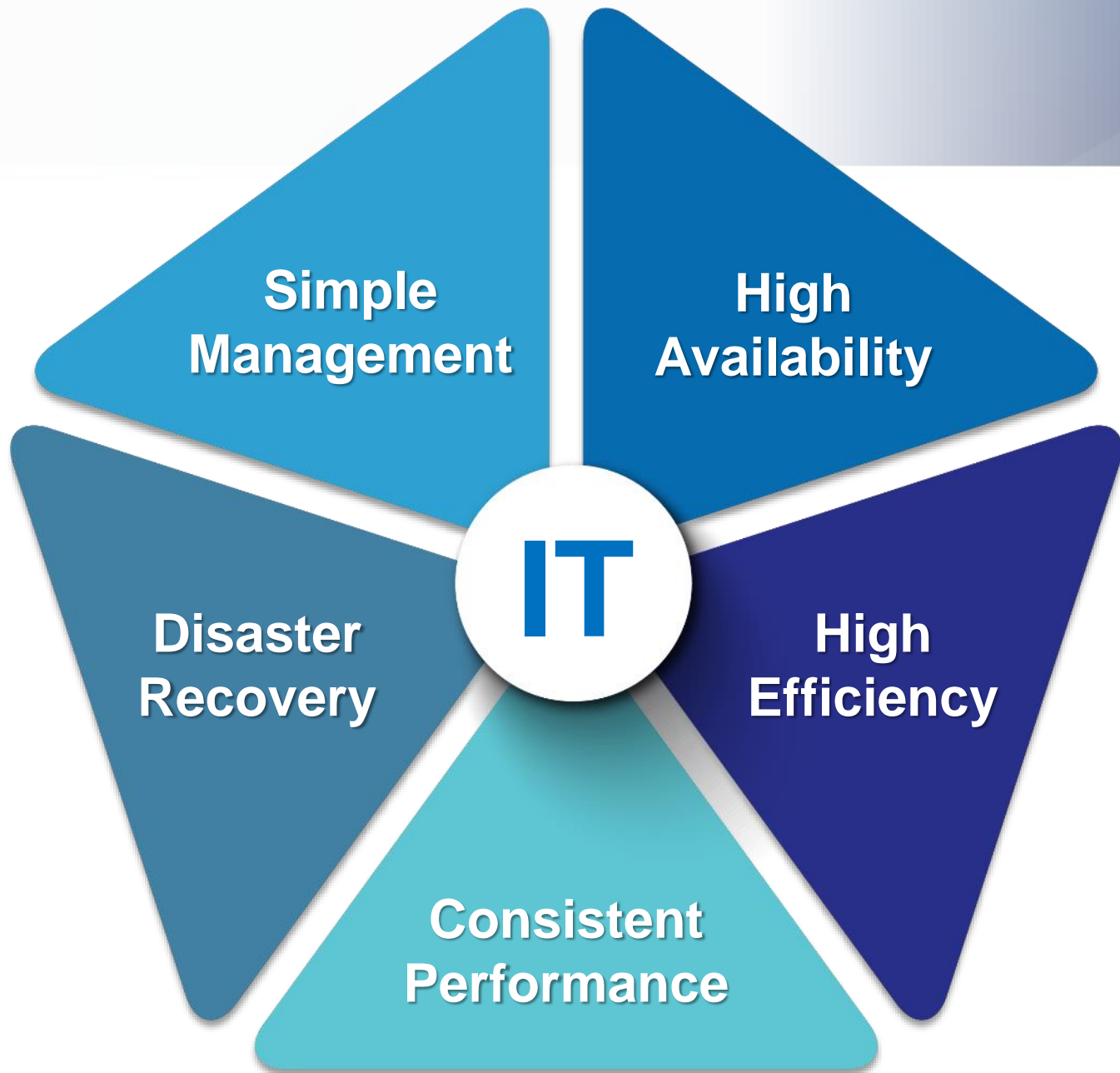


- Non-flexible configuration
- Complicated operation



- Non-available design
- Failure to recover service

The megatrend of enterprise storage is moving toward **high availability, flash** and **integration with virtualization**.



**Apart from data protection,  
IT professionals also care ...**

**Maintain business continuity through  
the five cores of this infrastructure.**

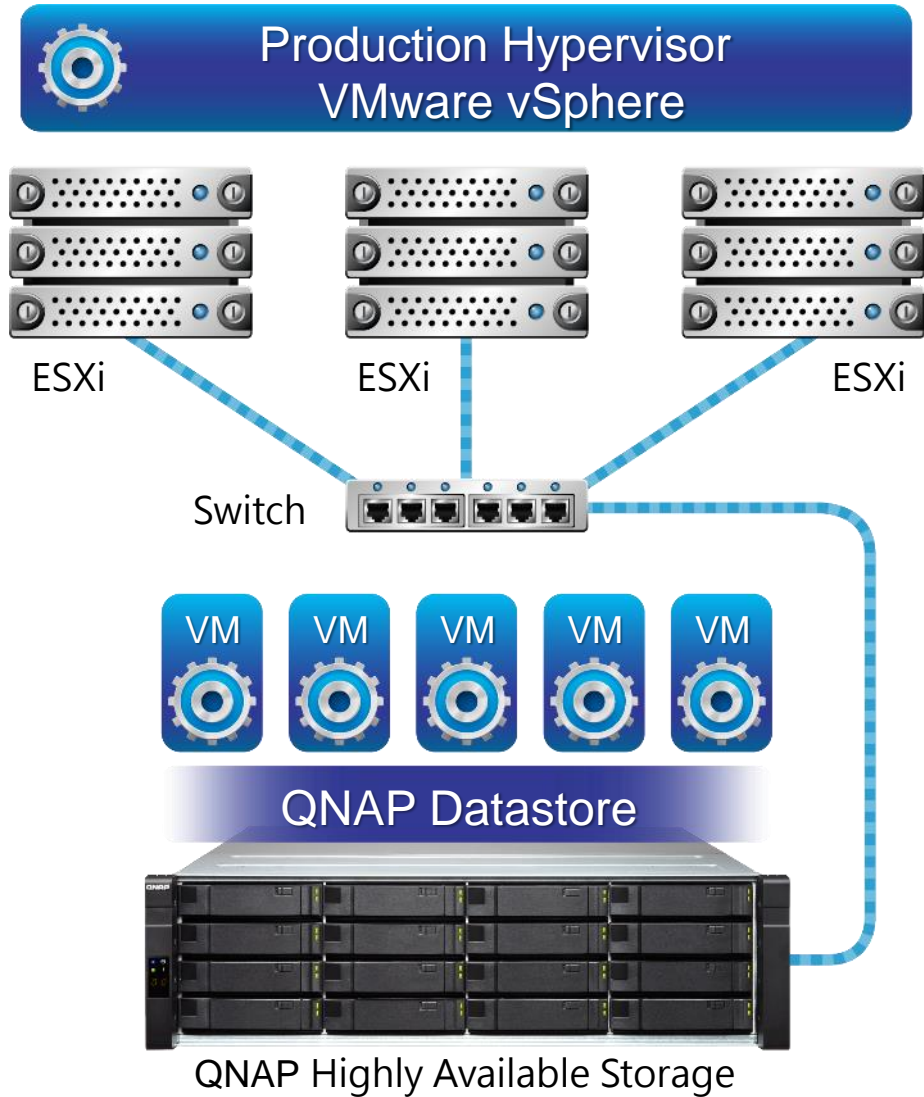
# VMware Virtual Server

- VM Storage
- Snapshot
- Offload
- Service Non-interrupt
- Management



# Case study – virtual server

## The basic architecture of virtual servers with QNAP storage



01

Up to 50TB VMware datastore for web-server / exchange

02

24x7 continuous and stable services

03

Snapshot backup scheme

04

vSphere centralized management

05

Storage device offload

# Highly available design for non-disruptive services

## QNAP ES1640dc - for critical applications on VMware



**Active-Active HA  
Dual controller**



01

**BBU & NVRAM cache  
protection**

02

**Dual-path mini-SAS link**

03

**Built-in 10GbE interface**

04

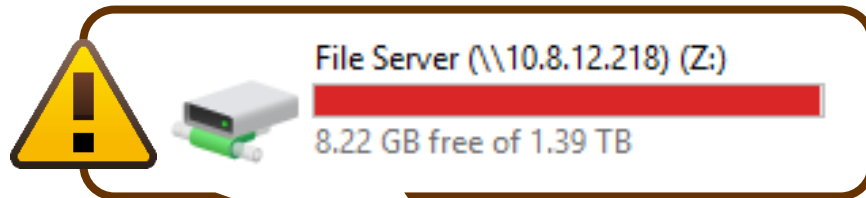
**Port trunking / Multipath**

05

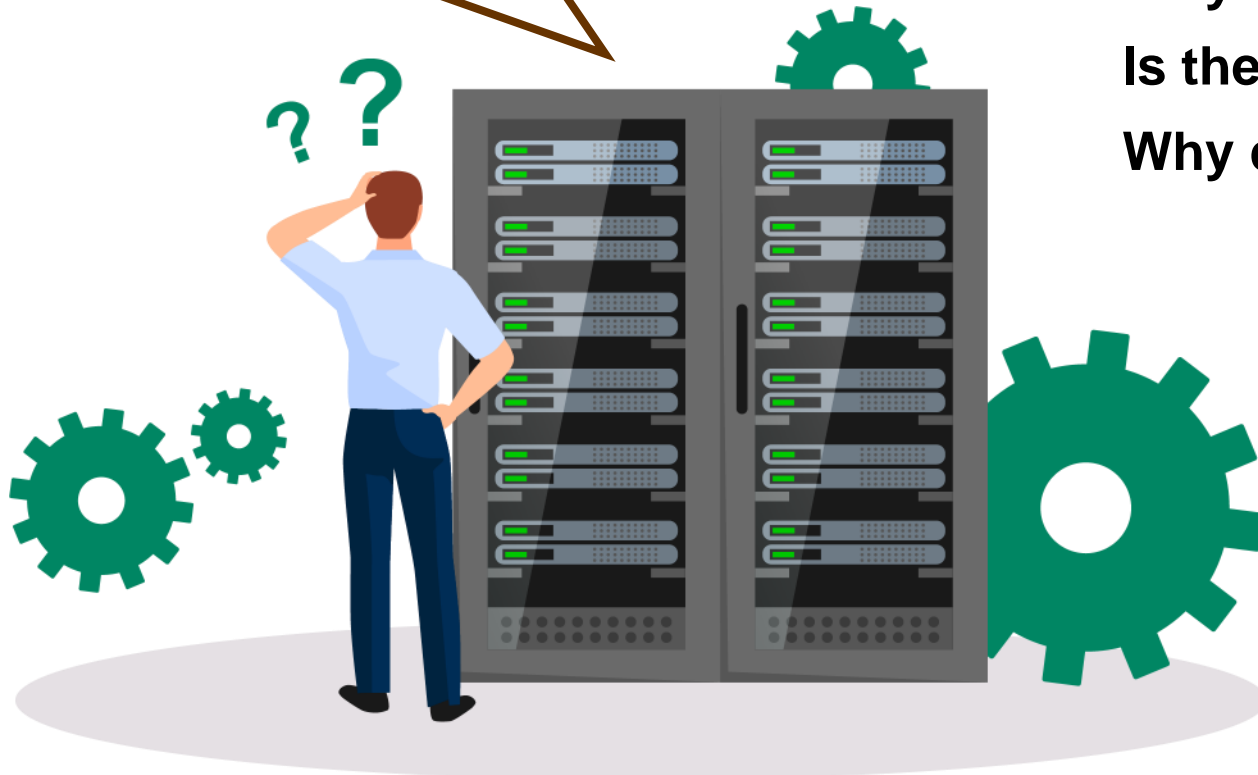
**ZFS end-to-end integrity**

# The glimpse of the performance of storage

## Why is my storage device slowing down?



**Why is the system getting slower and slower?  
Is the service starting to slow down?  
Why did the NAS slow down after a while?**





# Provide a more stable performance

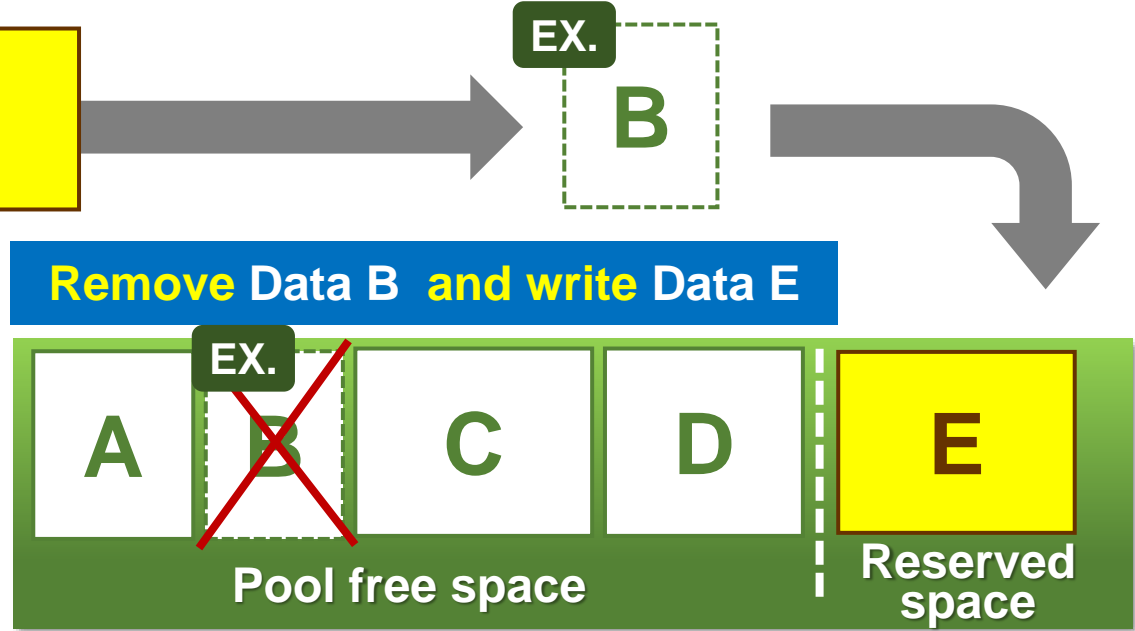
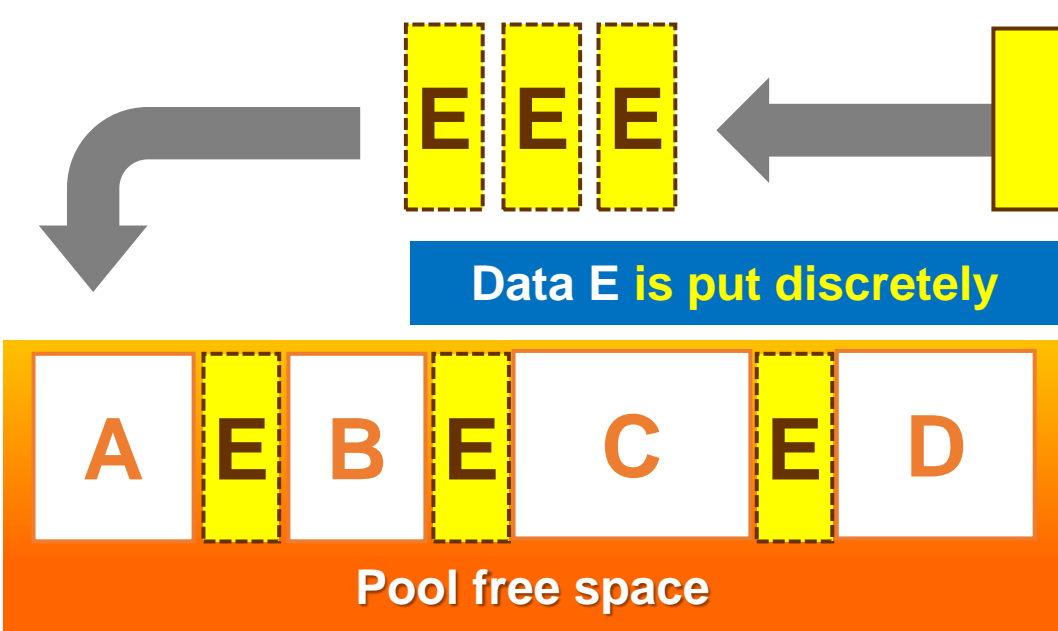
QES pool over provisioning decelerates the space fragmentation



In general : Not enough space to put **Data E**



Over provisioning : No space for **Data E**



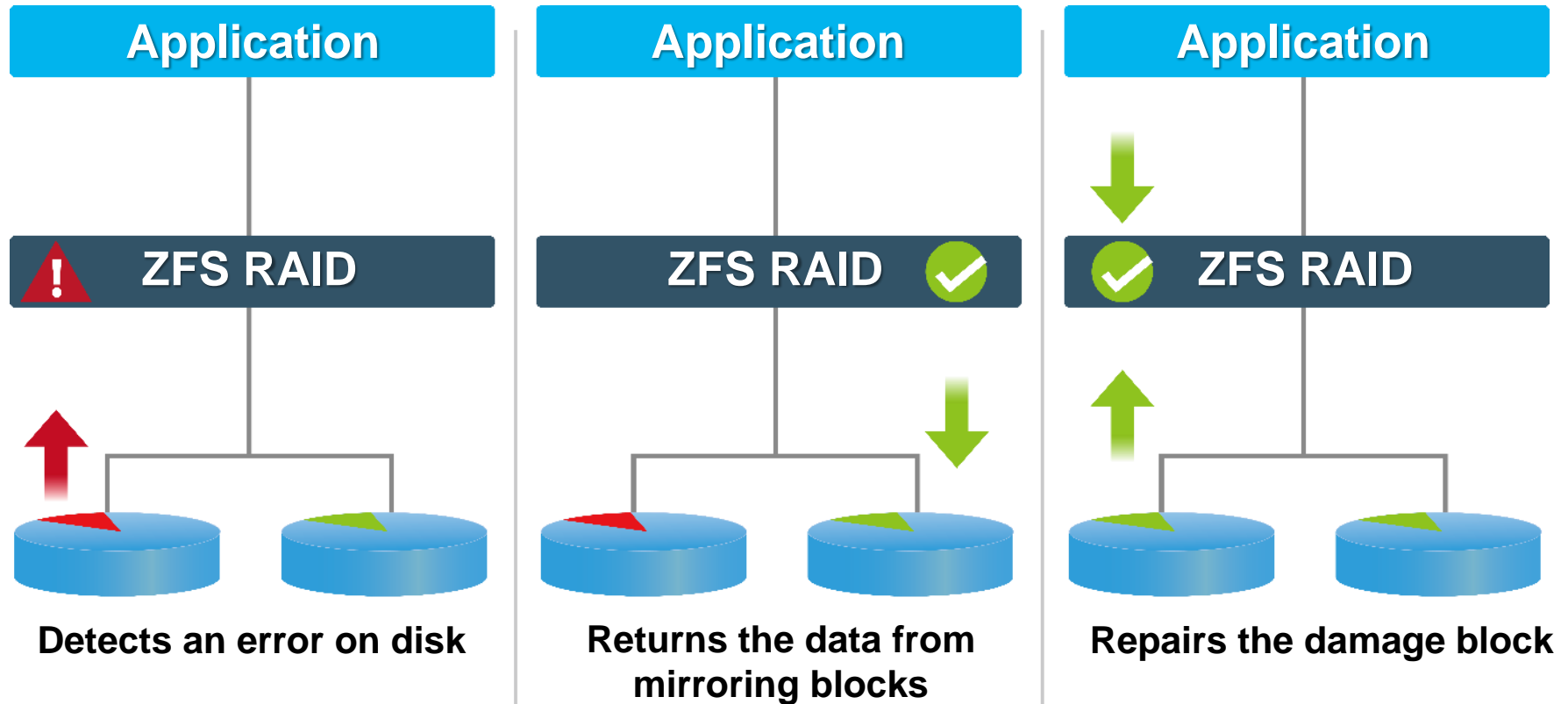
# QES no-worry data protection



## Data integrity

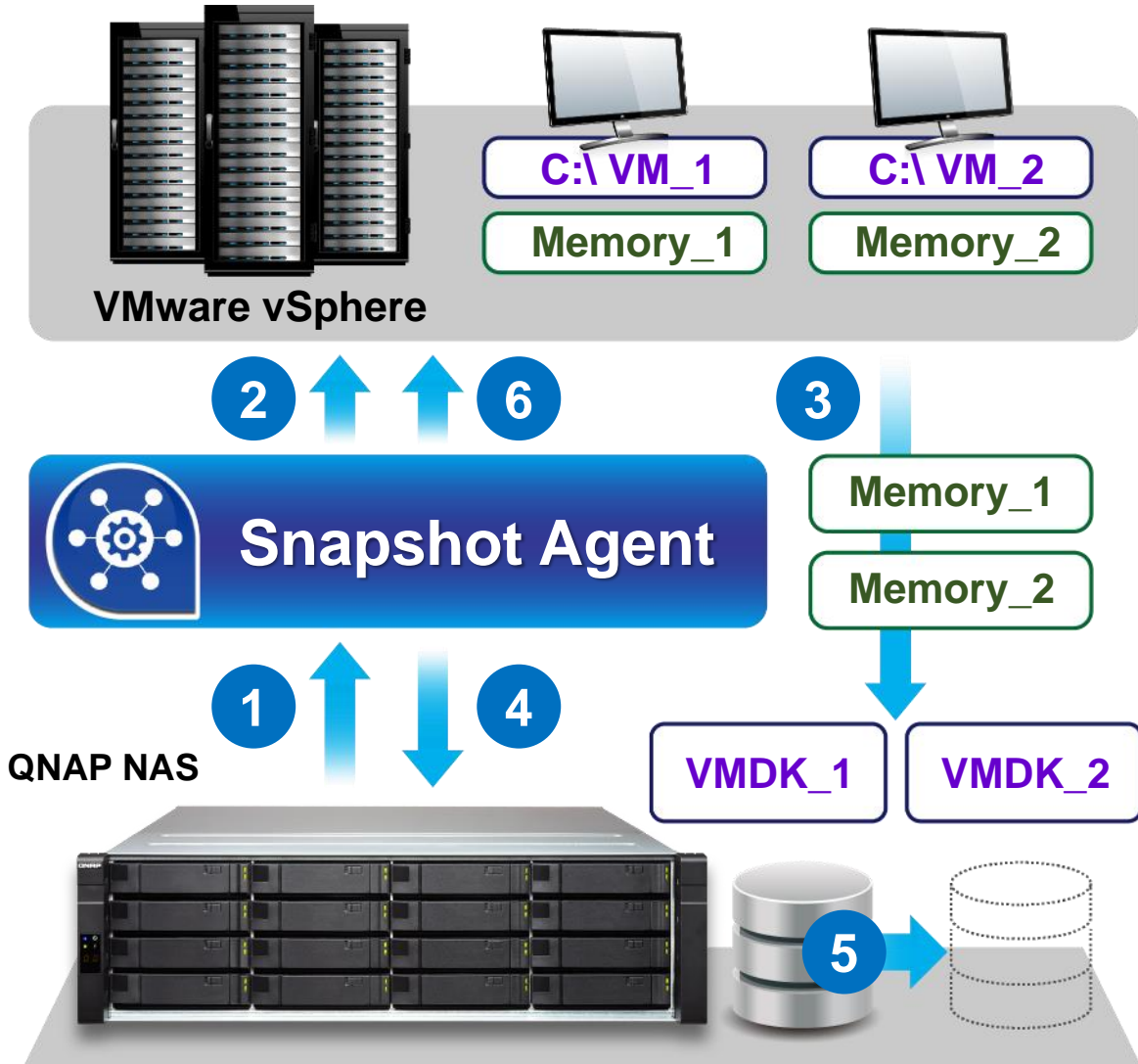
Checksum ensures data correctness by **detecting error & repairing damage**

Silent data corruption is not an issue anymore



# Backup tool – Snapshot Agent

Provide VMware point-in-time backup to ensure the consistency



- 01 NAS initiates the request and notifies Snapshot Agent to create the snapshot
- 02 Snapshot Agent notifies VMware server to stop any I/O transaction
- 03 Flush application data from cache to NAS
- 04 Snapshot Agent asks NAS to create the snapshot
- 05 NAS snapshot is created
- 06 Applications are free to resume writing data

# Storage management

QNAP vSphere Web Plug-in helps you to manage storage devices



**QNAP  
vSphere Web Plug-in  
manage and operate  
together all in one place**



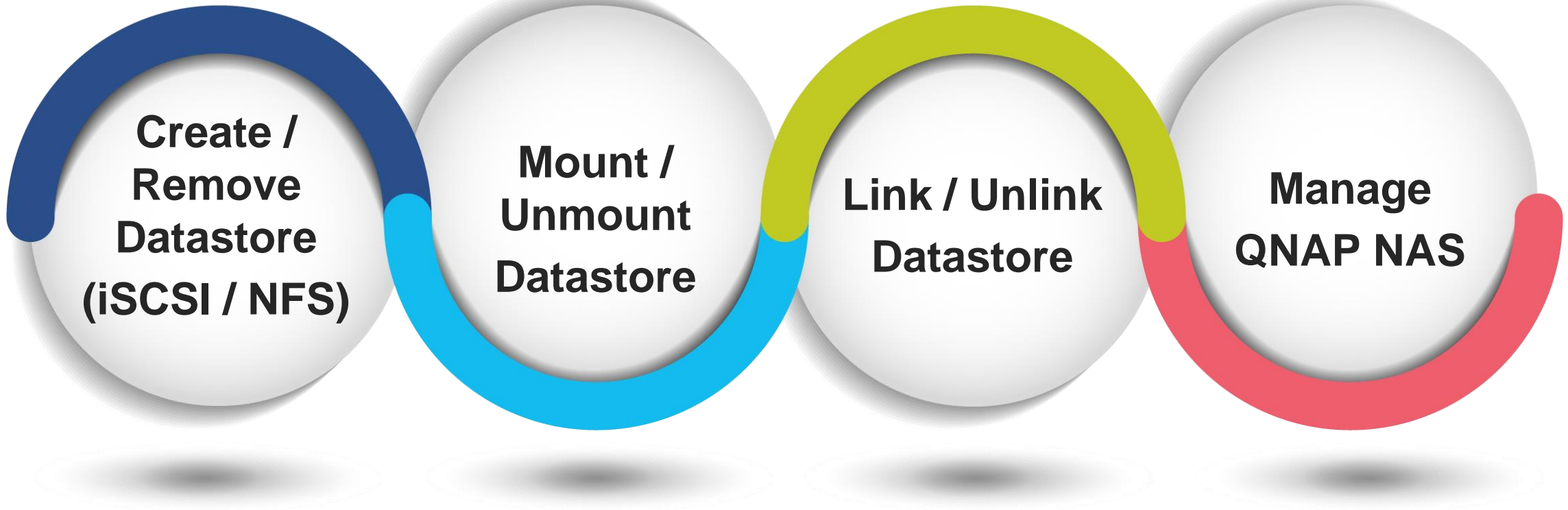
**VMware  
ESXi host**



QNAP Storage

# QNAP vSphere Web Plug-in

Single interface for server and storage management



**QNAP**

**Demo**

**vSphere Web Plug-in  
(Conveniently Manage  
QNAP Storage device)**



# Do your storage devices integrate with virtualization?

## vStorage APIs for Array Integration – VAAI fast clone VM



VMware Server



QNAP NAS VAAI Plugin



Read copy ↑  
↓ Write copy



QNAP Storage Pool

w/o VAAI



Copy



QNAP Storage Pool

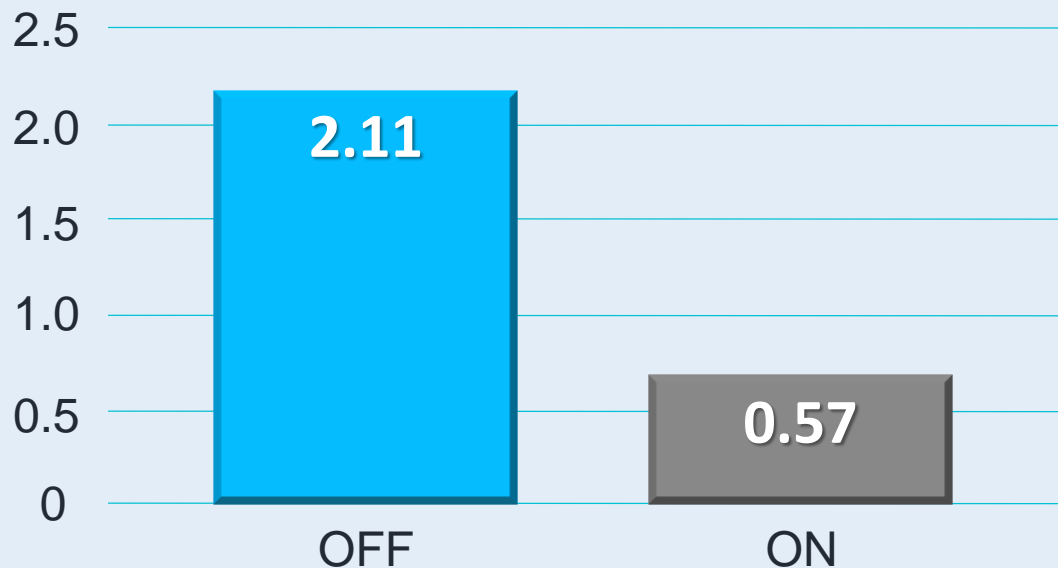
with VAAI

# VAAI is a good partner (QTS/QES)

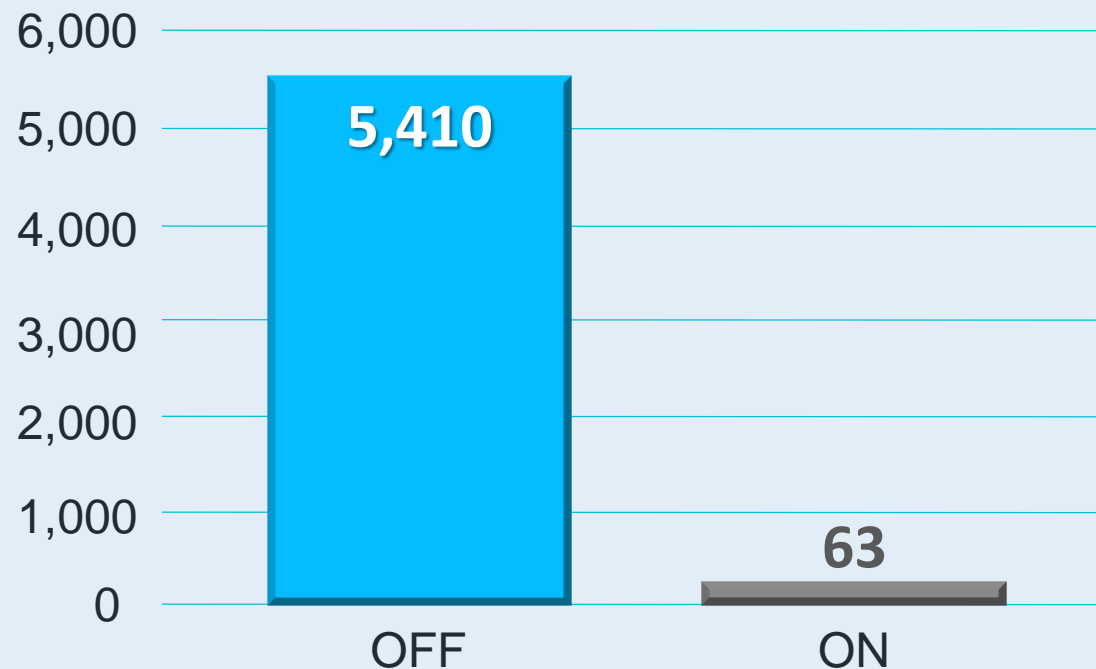


ESXi completely clone VMs of 40GB

Save **73%** computing



CPU (%)



Total IOPS



# An arsenal of VMware integration tools



## **vSphere (Web) Client Plug-in**

Admin can directly manage datastores on QNAP NAS by vSphere (Web) Client.



## **QNAP Snapshot Agent**

Admin can create consistent snapshots of iSCSI LUN on QNAP NAS.



## **QNAP VMware vStorage API for Array Integration (VAAI)**

Admin can optimize the performance when deploying virtualization.



# VMware And QNAP ES series

Comprehensive fault tolerance

A 3D pyramid diagram is positioned on the left side of the slide. It consists of three stacked levels: a small blue pyramid at the top, a medium teal pyramid in the middle, and a large green pyramid at the base. Each level is connected to a corresponding horizontal arrow-shaped box on the right.

## Application

VMware vSphere Fault Tolerance ensures continuous availability for applications in the event of server failures.

## Server

VMware vSphere High Availability (HA) protects your virtualized environment from failures at the server and OS level.

## Storage

QNAP ES1640dc ensures data availability of VMware application at the storage level.

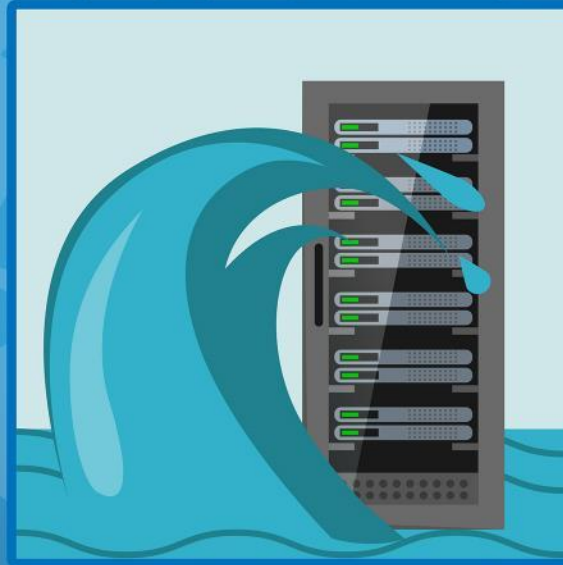
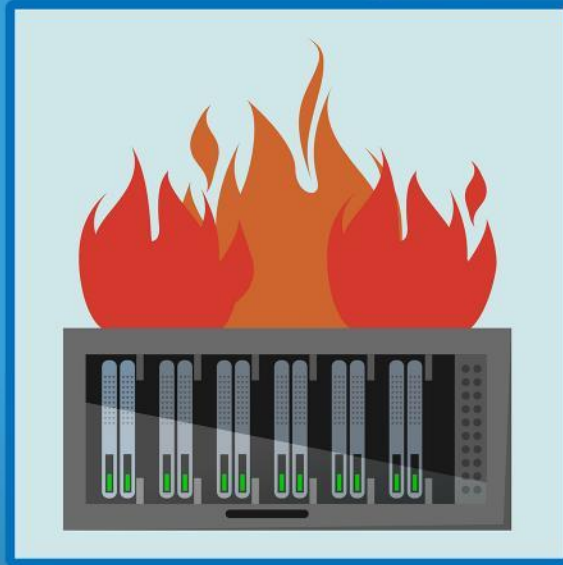
**QNAP**

# Backup Solution

**Basic** Data Replication

**Advanced** Service Replication



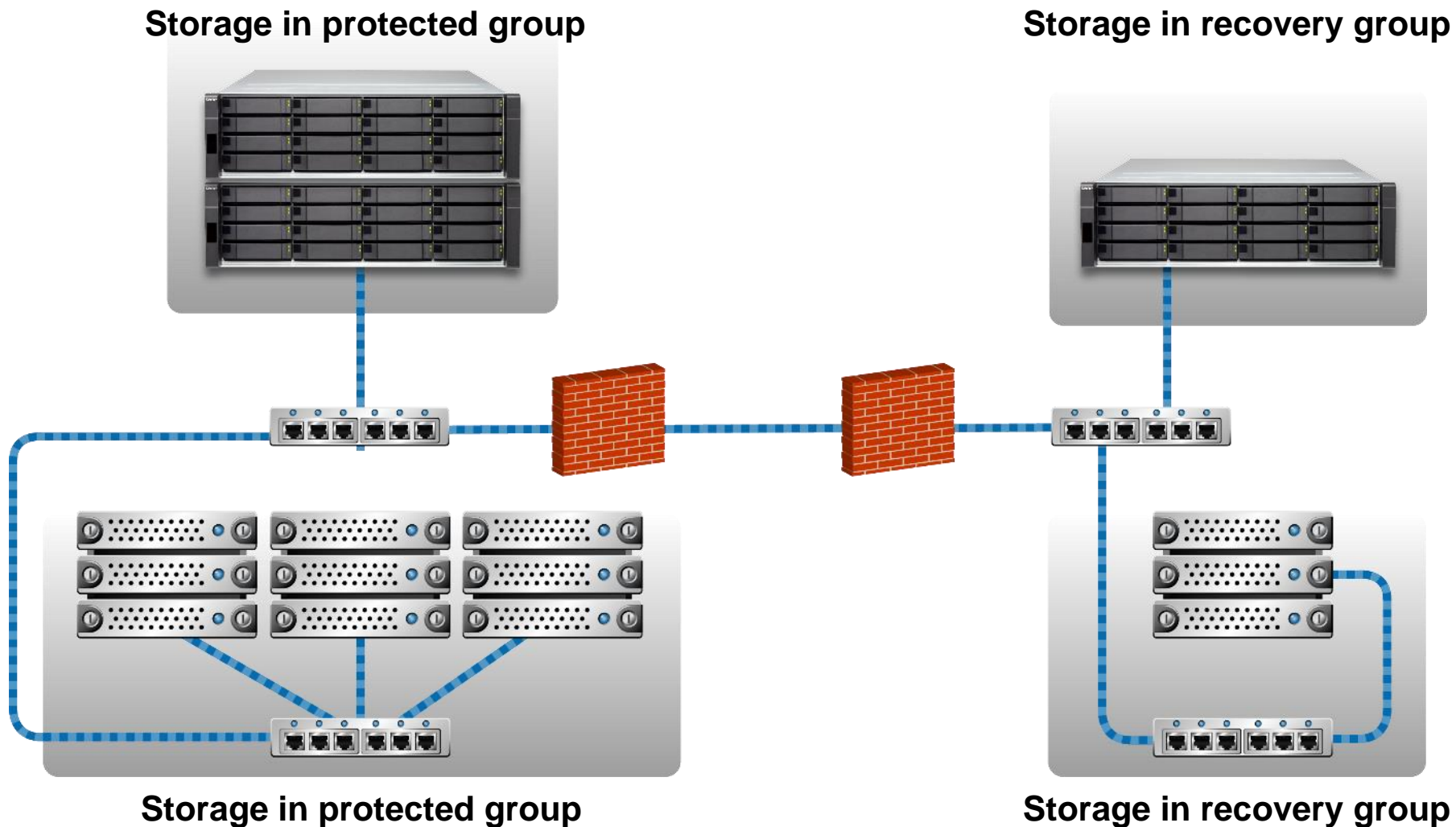


Computer system failure / fire / flooding ...

# Tragedies happen!

15:00

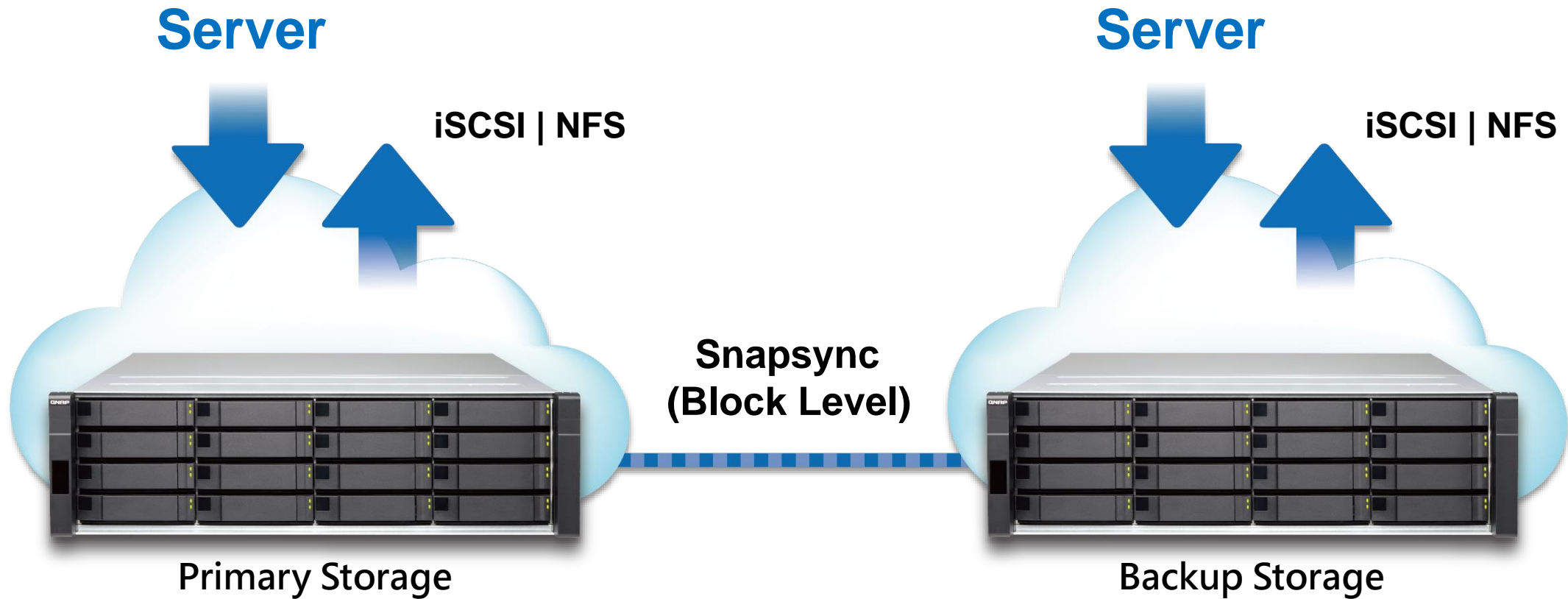
# Case Study – Disaster Recovery



# SnapSync Breakthrough data replication

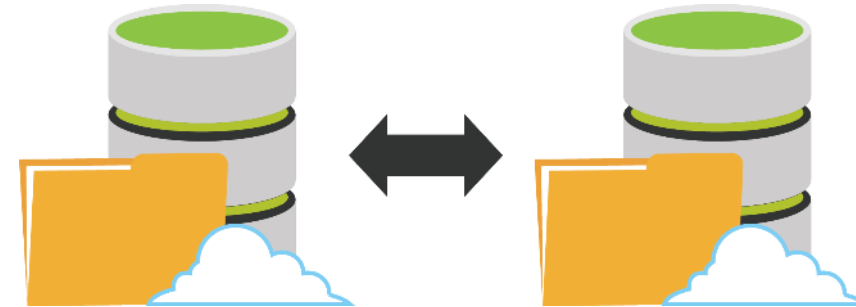
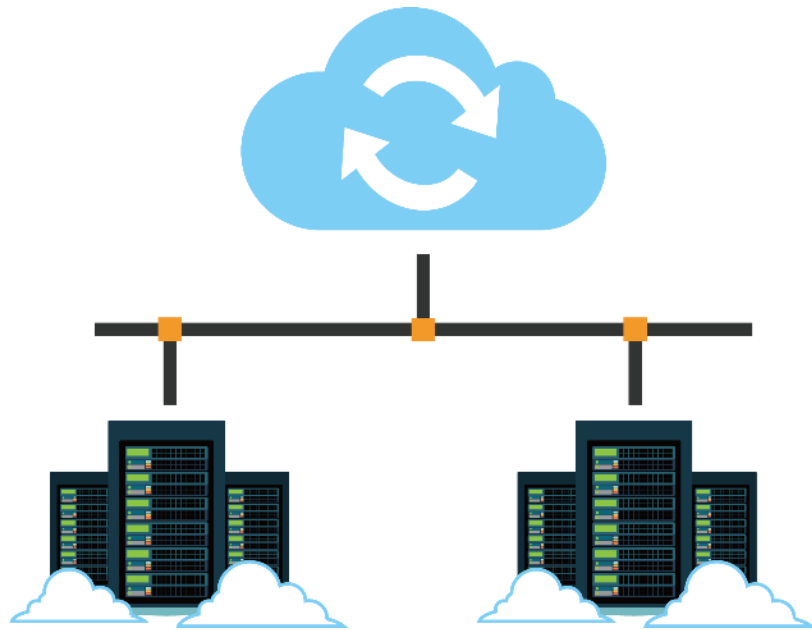


Easy and fast data replication



# VMware Site Recovery Manager (SRM)

## QNAP VMWare Storage Replication Adapter



### QNAP VMWare Storage Replication Adapter (SRA)

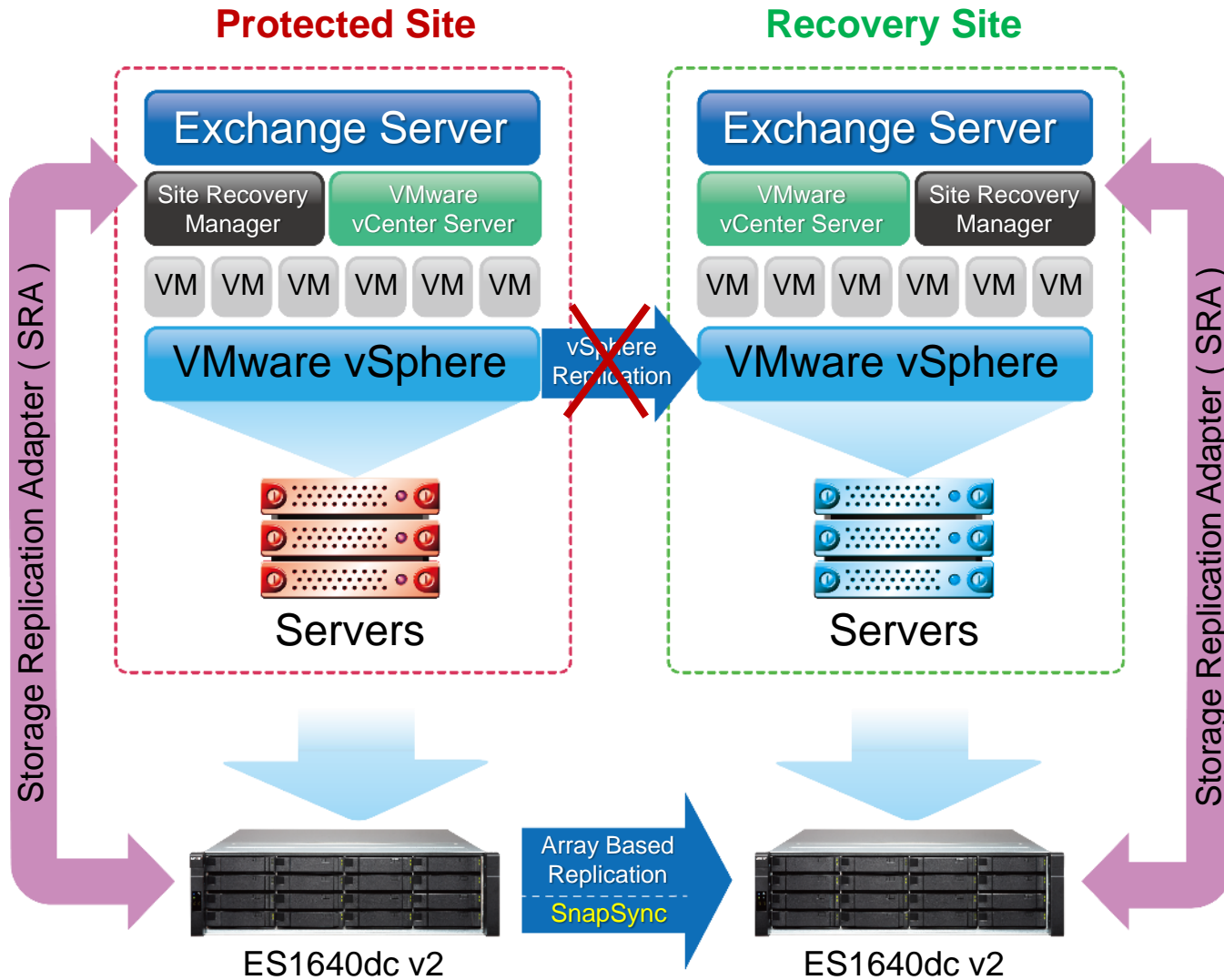
Integrating with VMware SRM to protect mission critical service

### QNAP QES SnapSync

QES block level LUN / shared folder remote replication

# Comprehensive VMware DR solution

Enable your service in recovery site just in time



QNAP Storage Replication Adapter (SRA) integrate with VMware Site Recovery Manager (SRM) to enable Array Based Replication through QES SnapSync.

**Certified**  
QNAP SRA certify to VMware SRM 6.5

The VMware Ready logo, featuring a silver button with the text "vmware READY" inside.



# Modern Application

- VDI application
- Performance & Capacity
- SSD utilization
- iSER network boosting





# About Performance...



Virtualization is all about  
**User experience.**

## IOPS requirement for VDI

Must provide similar (or better) user experience than a traditional desktop.

A normal desktop/laptop or physical server can provide an average of **150 IOPS**.



# Without Compromise Virtualized Storage



## Performance



- **IOPS** Application Requirement
- **Latency** User Experience

## Capacity efficiency

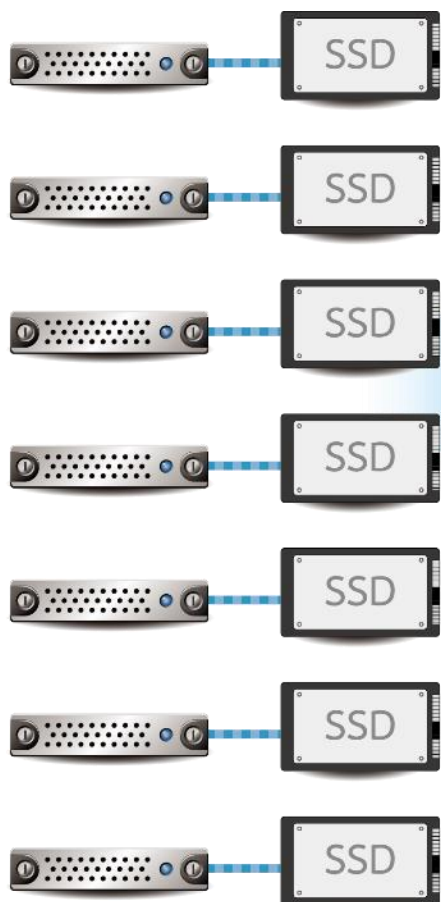


- **Compression** shrinking your space
- **Deduplication** keep purely data

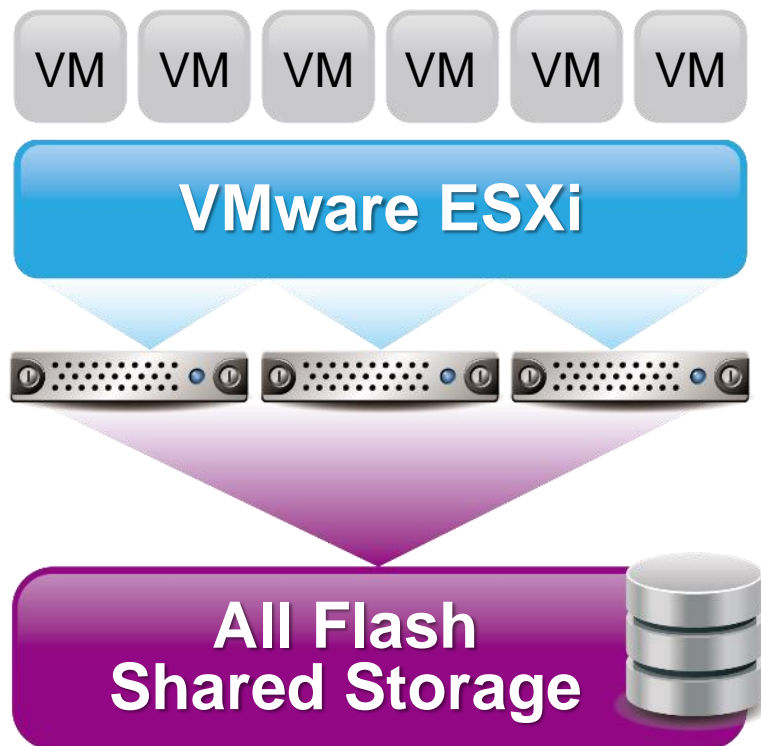
# Sharing All Flash array for VMware



Old Model :  
Dedicated Storage Per Workload



Virtual Model:  
Shared Storage Across Workloads



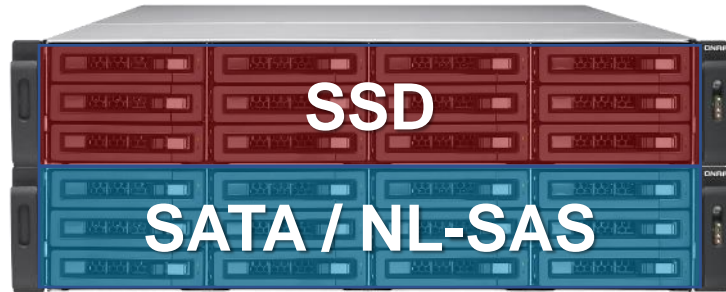
- Virtualize 100% of applications
- Run a fully-shared infrastructure
- Virtualization speed bumps
- Storage contributes to the space and power savings

# Well configuration in your storage



## Full of SATA or NL-SAS HDD

With high capacity but limited I/O performance.



## Hybrid SSD and HDD

Combine SSD and HDD drives advantage for capacity and performance.



## Full of SSD

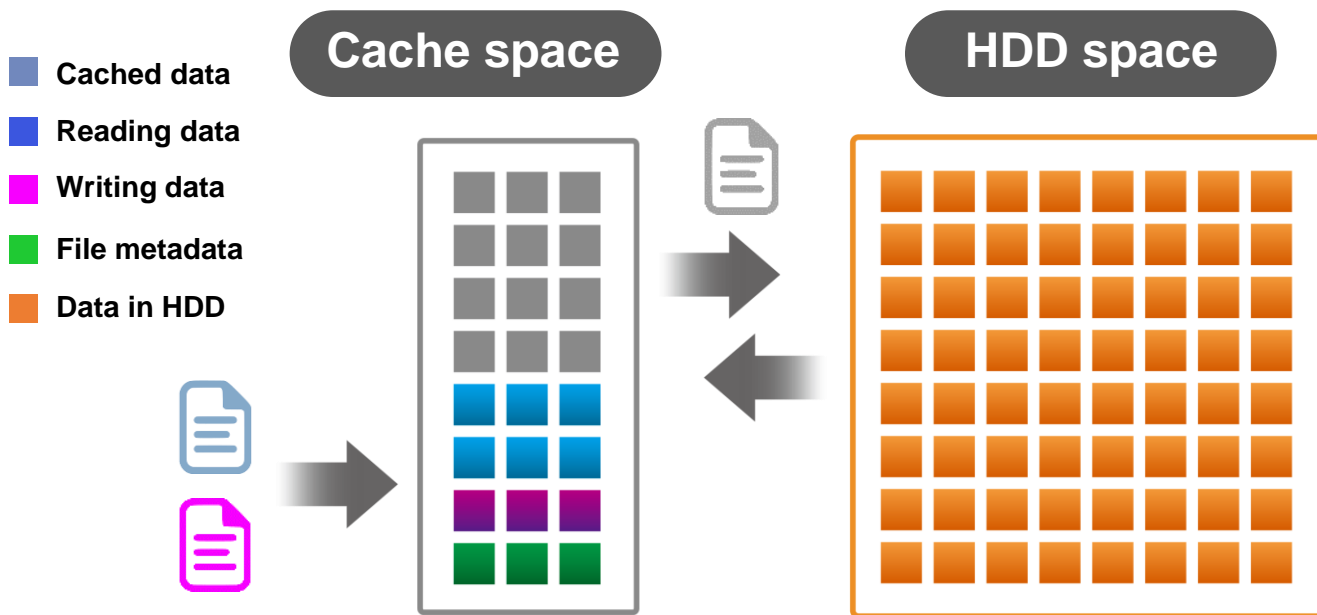
Maximum I/O for extremely performance scenario.

# SSD, produce the best performance results

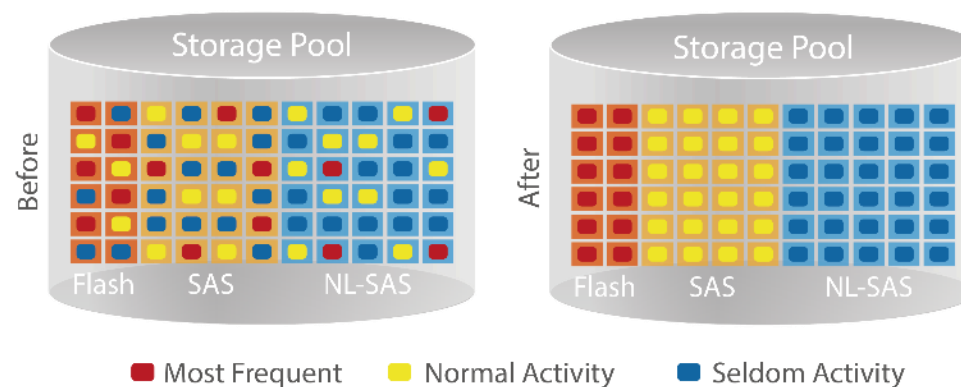


## How to fully utilize SSD ?

### Cache (QTS / QES)



### Qtier (QTS)

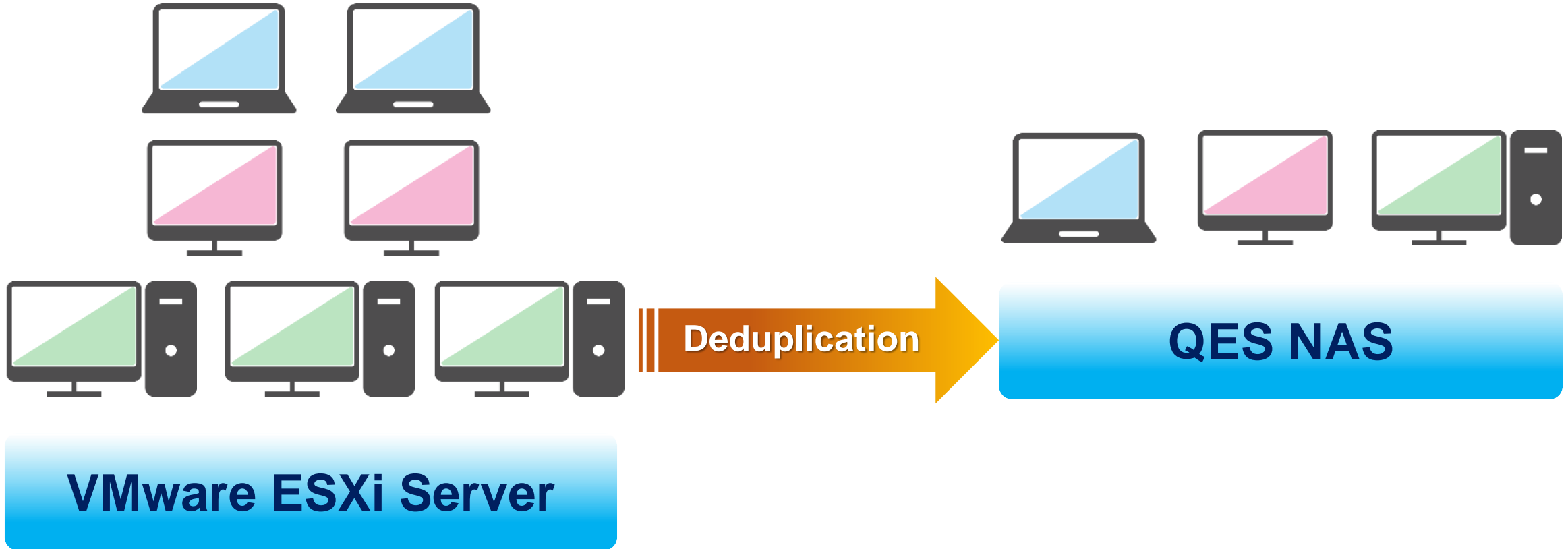


# Not only performance, but more efficiency

QES Deduplication makes the storage space efficient

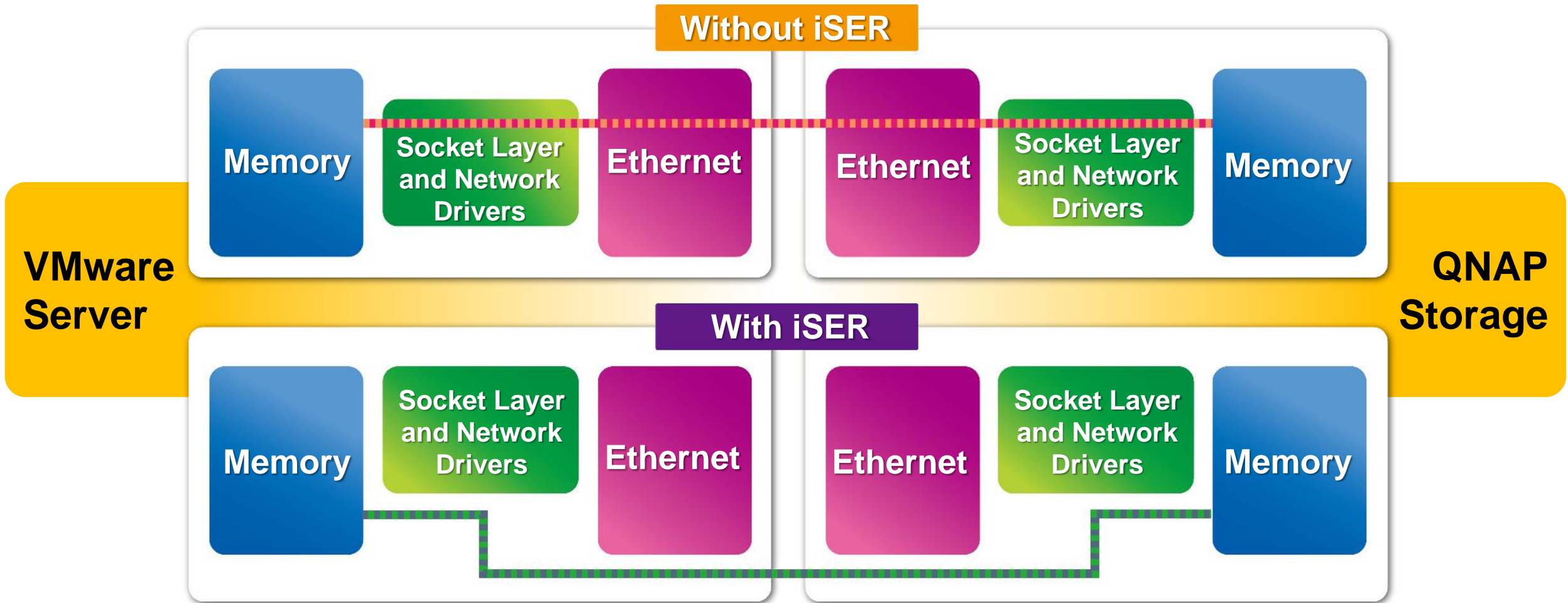


Deduplication can save up to 95% space in the environment of 500 VDI deployment.





# Boosting network Stack, RDMA (QTS/QES)



# VMware Certified QNAP Storage



More on compatibility information please refer to QNAP web-site or VMware HCL list as follow:

- [VMware Hardware Compatibility \(HCL\)](#)

NAS Series	VMware Ready 6.7				SRM 6.5	FW version
	iSCSI	NFS	VAAI iSCSI	VAAI NFS		
ES1640dc Series	yes	yes	yes	yes	yes	QES 2.1.0 VAAI 3.0-2 SRA 5.5.248
TES-x85 Series	yes	yes	yes	yes	yes	QES 2.1.0 VAAI 3.0-2
TS-x32XU	yes	yes	yes	N/A	N/A	QTS 4.3.5
TS-x77XU	yes	yes	yes	N/A	N/A	QTS 4.3.5
TS-x83XU	yes	yes	yes	N/A	N/A	QTS 4.3.5
TS-x72XU	yes	yes	yes	N/A	N/A	QTS 4.4.0

# VMware Certified QNAP Storage



## Ready to certify

NAS Series	VMware Ready 6.7				SRM 6.5	FW version
	iSCSI	NFS	VAAI iSCSI	VAAI NFS		
TDS-16489U R2 QES	Complied by 2019/03	Complied by 2019/03	Complied by 2019/03	Complied by 2019/03	Complied by 2019/03	QES 2.0.0 VAAI 3.0-2 SRA 5.5.248
TDS-16489U R2 QTS	Complied by 2019/04	Complied by 2019/04	Complied by 2019/04	N/A	N/A	QTS 4.3.5
TS-2888X	Complied by 2019/05	Complied by 2019/05	Complied by 2019/05	N/A	N/A	QTS 4.3.5
ES-1648dc	Complied by 2019/06	Complied by 2019/06	Complied by 2019/06	Complied by 2019/06	Complied by 2019/06	QES 2.2.0 VAAI 3.0-2 SRA 5.5.248

# QNAP NAS makes VMware safe and easy



01

## HIGH AVAILABILITY

Hardware and software technologies enable IT systems durable and likely to operate continuously without failure for a long time.

02

## CONSISTENT PERFORMANCE

Software design to scale the service and access the data by multiple machines without impacting production SLA.

03

## DISASTER RECOVERY

The process related to preparing for recovery or continuation of IT infrastructure after a natural or man-made disaster.

QNAP

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QNAP NAS

Your Best Choice!



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