

QNAP

TDS-16489U *R2*

launched:

Features dual
processors and
QTS/QES systems
for computing
and storage



TDS-16489UR2

- 1 Product Features
- 2 Network Expansion
- 3 QES OS
- 4 QES Data Protection
- 5 QES Data Migration



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TDS-16489U *R2*

**Product
Features**



QNAP Dual OS Options Products



TES-3085U



TES-1885U

Conclusion

Choose your OS carefully as you can't just swap willy-nilly as this requires a complete system reset and full disk init. However, after backing up all our data and resetting the system to default, we swapped from QES to QTS in only 15 minutes.



Businesses that want plenty of choice for their storage networks will find the TES-1885U a worthy contender. Both QES and QTS offer an impressive range of storage features with data protection a high priority and if you don't like one OS you can swap over to the other at no extra cost.

ZFS – the best file system for business data storage

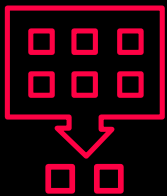
The TES-1885U NAS features ZFS, a combined file system and logical volume manager, to support various advanced functions for high-end enterprise storage, including powerful storage expansion, flexible storage pools, RAID-Z for data protection, simplified management, high-performance SSD cache, nearly limitless snapshots and cloning, data deduplication, in-line compression, self-healing, and thin provisioning with reclaim for optimized utilization for virtual machine storage. ZFS is designed with a focus on data integrity, and uses its erasure coding to protect against data loss caused by hardware defects, bugs in firmware or metadata.

NAS COMPARES

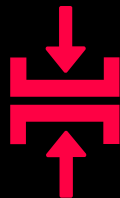
Simply Passionate About NAS

QES - QNAP Enterprise Storage OS

▶▶ Based on FreeBSD and ZFS ▶▶ Required more resources



Data
Deduplication



In-Line
Compression



Snapshot

TDS-16489U R2 Dual Processor NAS

- Dual Intel Xeon E5 processor
- DDR4 DIMM x16, Max. Up to 1TB



TDS-16489U R2 Front View



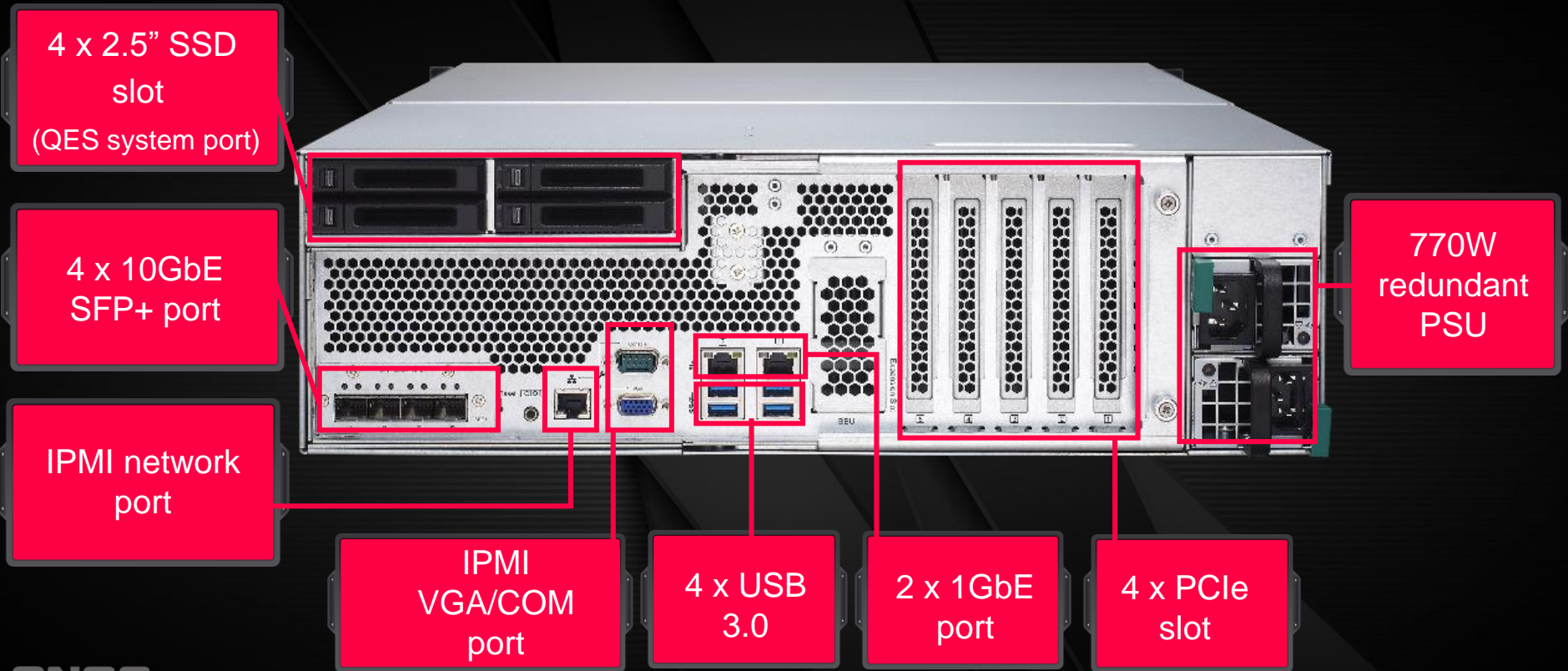
Power Button

LED Indicators

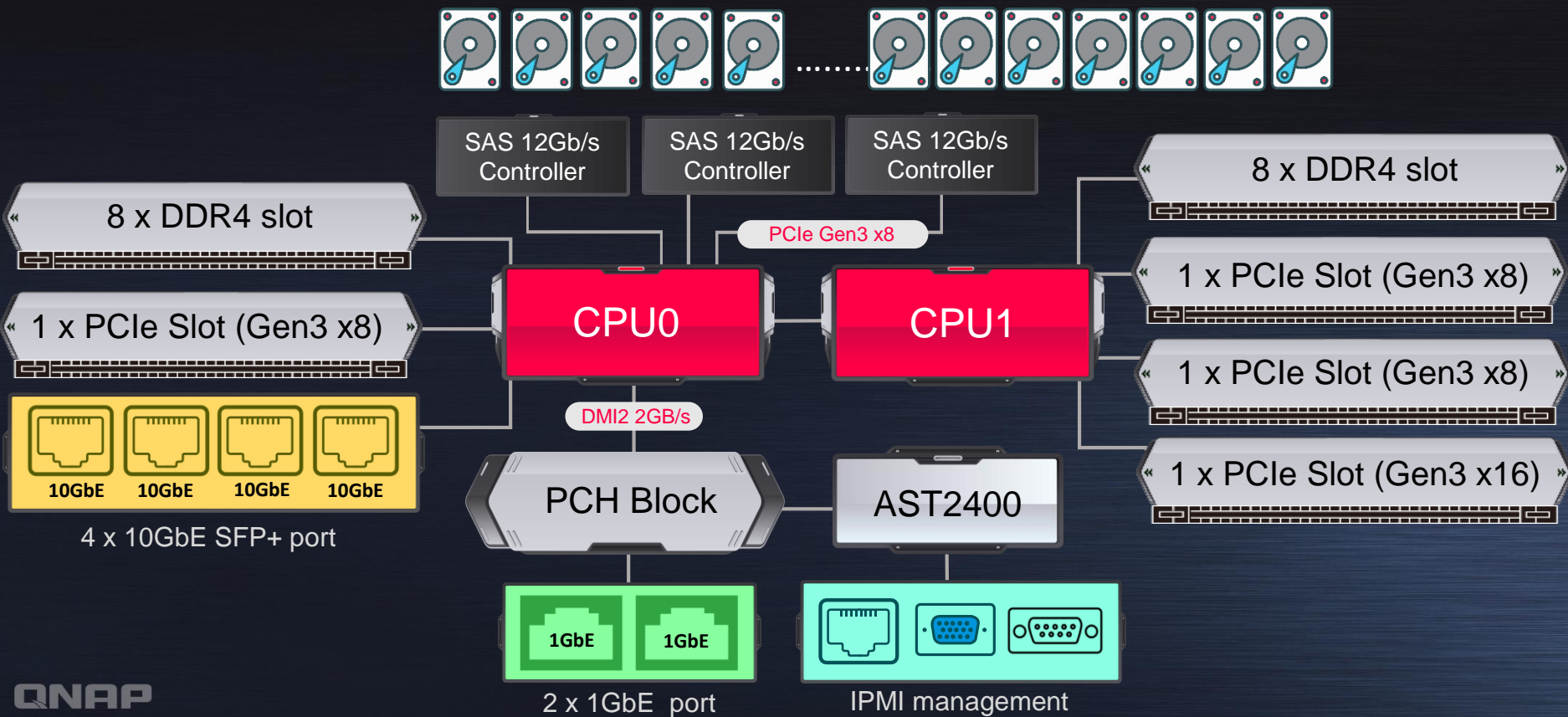
- 10GbE LAN
- System status
- 1GbE LAN
- Storage expansion

16 x 3.5"/2.5" HDD Tray

TDS-16489U R2 Rear View



System Block Diagram



Up to 1TB Memory

- Supports 4-channel DDR4 RDIMM/LRDIMM memory and long-DIMM x16
- Installing memory in multiple of 4 to take advantage of 4-channel

4 module

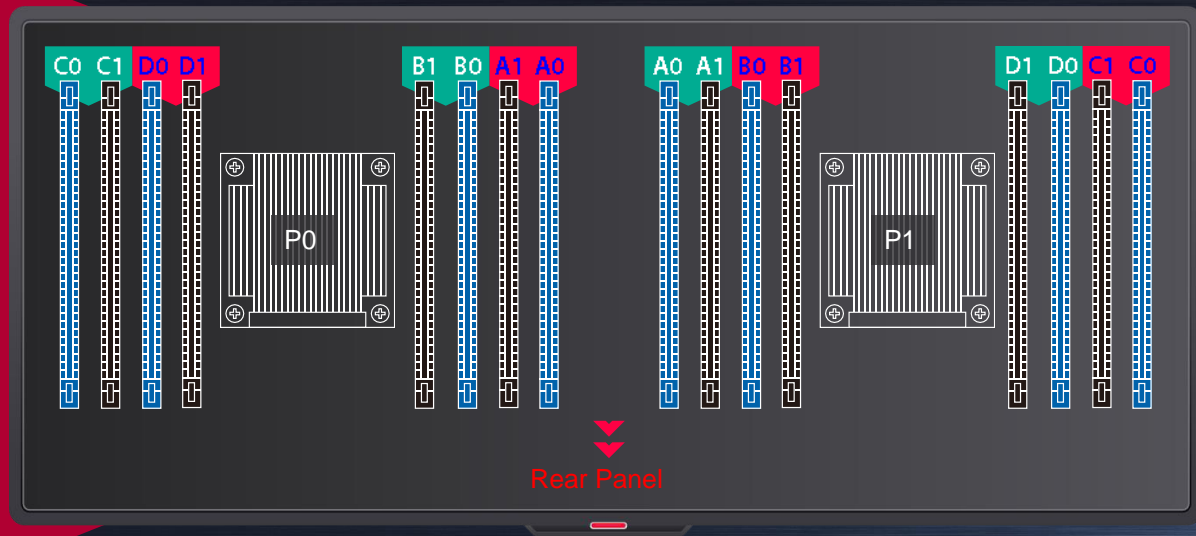
- P0 CPU: A0, C0
- P1 CPU: A0, C0

8 module

- P0 CPU: A0, B0, C0, D0
- P1 CPU: A0, B0, C0, D0

12 module

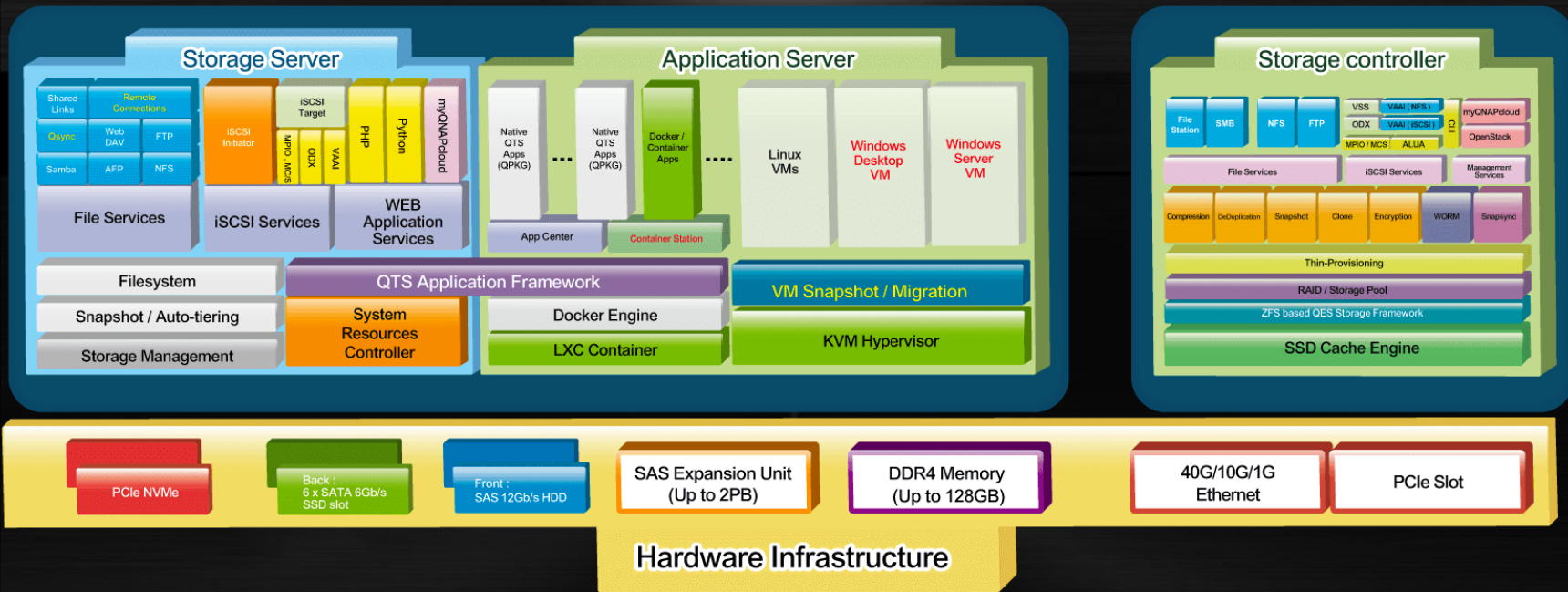
- P0 CPU: A0, B0, C0, D0, A1, C1
- P1 CPU: A0, B0, C0, D0, A1, C1



Dual OS options inside a NAS

QTS Application / Storage OS

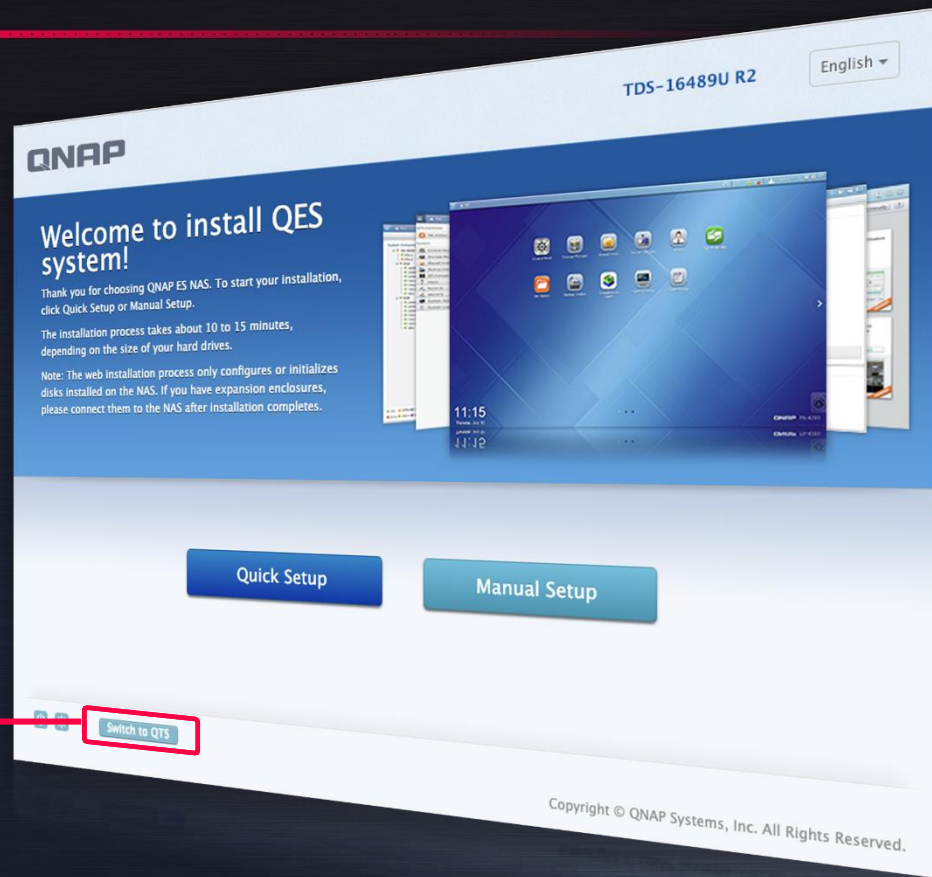
QES Business
(FreeBSD, ZFS)



Select an OS to Meet Your Needs

Choose to install QTS or QES
in Quick Setup Wizard

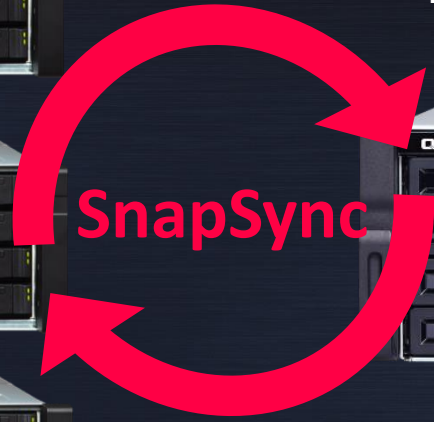
1. Either QES or QTS can be installed
2. Switching to a different operating system will delete all of data stored on the NAS



Best Backup NAS for Multiple ES NAS



- Dual-processor + large memory
- Cost effective backup solution for multiple ES NAS



TDS-16489U R2 (QES)

Build up an Application Storage Server

QTS Application App



Virtualization
Station



Container
Station



App Centre

2 in 1
Application Server
⊕
Storage Server



TDS-16489U R2

QES vs QTS

	QES QNAP Enterprise System	QTS QNAP Turbo NAS System
CIFS/FTP/NFS/iSCSI	✓	✓
Snapshot	✓	✓
SnapSync	✓	✗
Data Deduplication	✓	✗
Online Data Compression	✓	✗
Qtier (Auto Tiering)	✗	✓
Application Service (Virtualization Station, Web Server, Multimedia Service...)	✗	✓
App Center	✗	✓

5 year warranty - Global warranty inclusive



Ordering Information

TDS-1 6489U-S **A** **1** -R 2

HDD/SSD
Interface

S: SAS interface

CPU

A: E5-2620 V3

B: E5-2630 V3

C: E5-2623 V3

D: E5-2640 V3

Memory

1: 64GB (8GB x 8 = 64GB RDIMM)

2: 128GB (16GB x 8 = 128GB RDIMM)

3: 256GB (32GB x 8 = 256GB RDIMM)

4: 512GB (64GB x 8 = 512GB RDIMM)

5: 1TB (64GB x 16 = 1TB RDIMM)

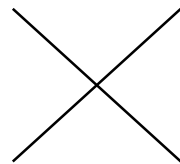
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**Network
Expansion**



SmartNIC with Offload Function

The QNAP logo is displayed in a large, bold, blue font. It features a stylized 'Q' with a red and white swoosh underneath it. A registered trademark symbol (®) is located to the upper right of the 'P'.

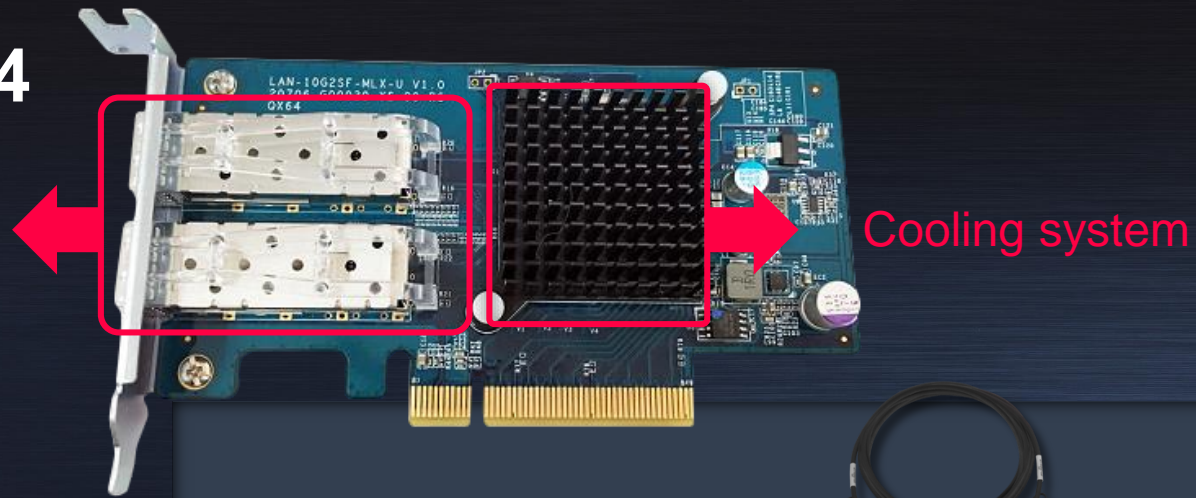
- Supports Mellanox ConnectX 10GbE SmartNIC
- Supports **10GbE/ 25GbE/40GbE** network adapter via PCIe expansion slot
- Supports iSER



QNAP Dual-port 10GbE NIC

QXG-10G2SF-CX4

- Mellanox ConnectX[®]-4 Lx NIC
- 2 x 10GbE SFP+ port
- Supports iSER/RoCE Hardware Offload



Accessory

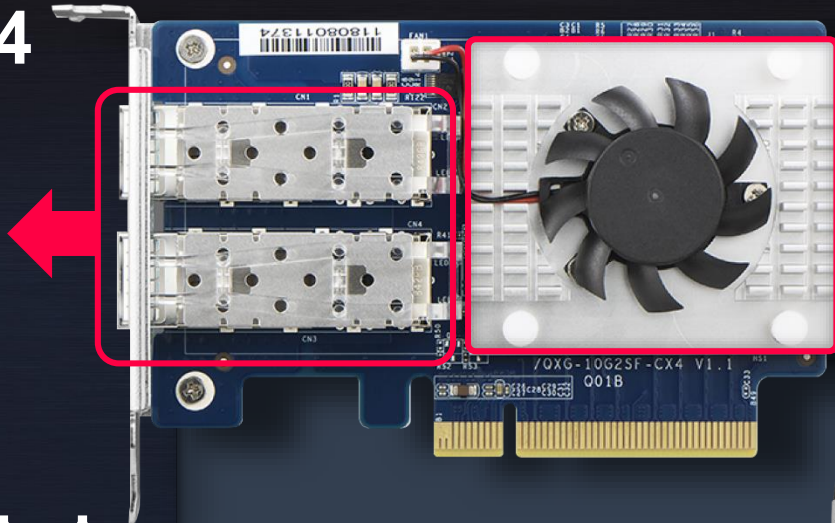
SFP+ 10GbE DAC cable
or TRX-10GSFP-SR-MLX
optical transceiver



QNAP Dual-port 25GbE NIC

QXG-25G2SF-CX4

- Mellanox ConnectX[®]-4 Lx NIC
- 2 x SFP28 ports
- Supports 25GbE/10GbE
- Supports iSER/RoCE Hardware Offload



Cooling system

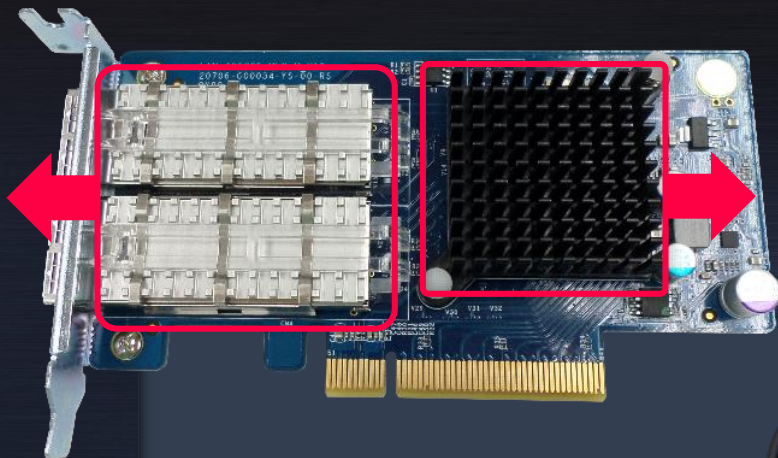
Compatible cable
SFP28 25/10GbE DAC
cable



QNAP Dual-port 40GbE NIC

LAN-40G2SF-MLX

- Mellanox ConnectX[®]-3 Pro NIC
- 2 x 40GbE QFP+ port
- Supports iSER/RoCE Hardware Offload



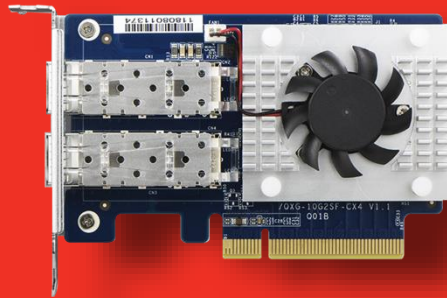
Cooling system

QSFP+ 40GbE
DAC cable



Integrating Fibre Channel SAN services

- **QTS 4.4.1 and QES 2.2** will support FC SAN: single NAS to provide SAN, NAS and cloud storage for unified storage solution
- Partnering with FC card vendor Marvell & ATTO for the most economical FC SAN storage solution



Support Marvell
Qlogic 32Gb/16Gb/8Gb FC card



Support ATTO
Celerity 32Gb/16Gb/8Gb FC card

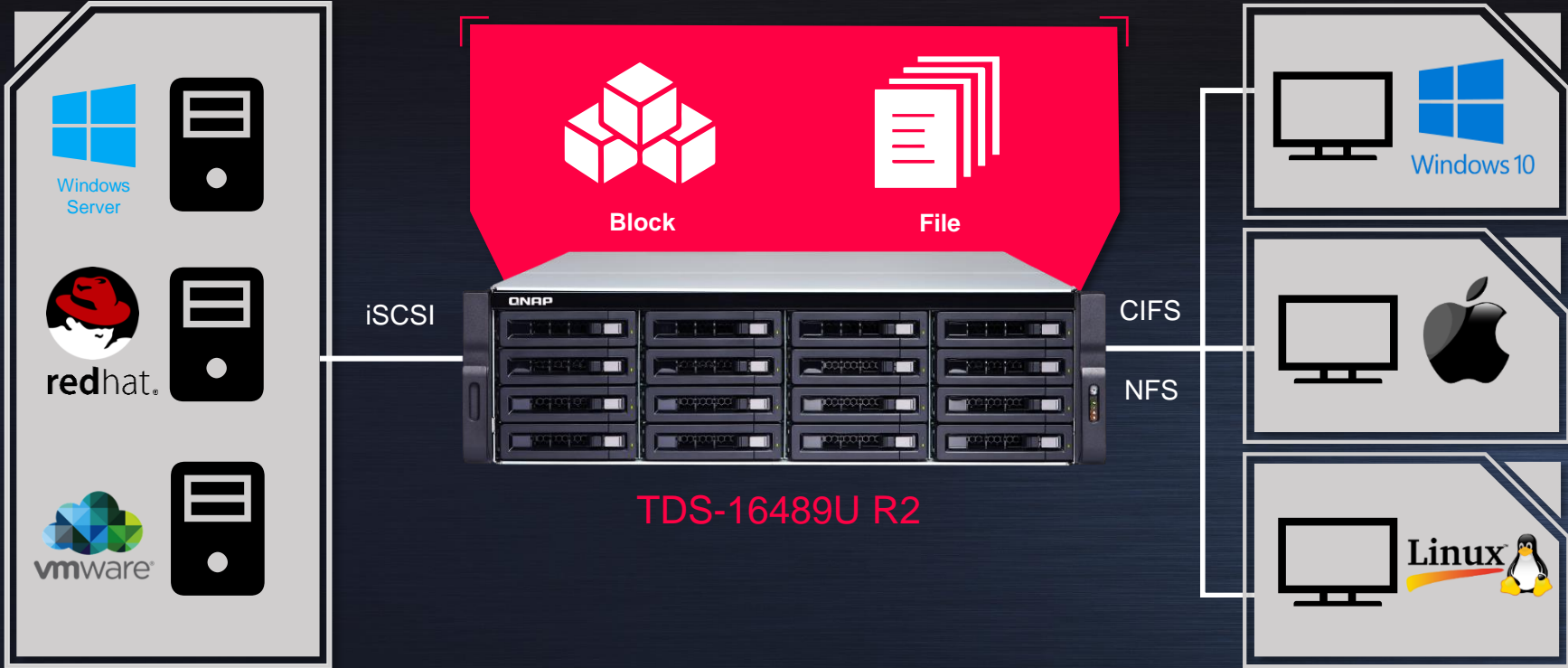
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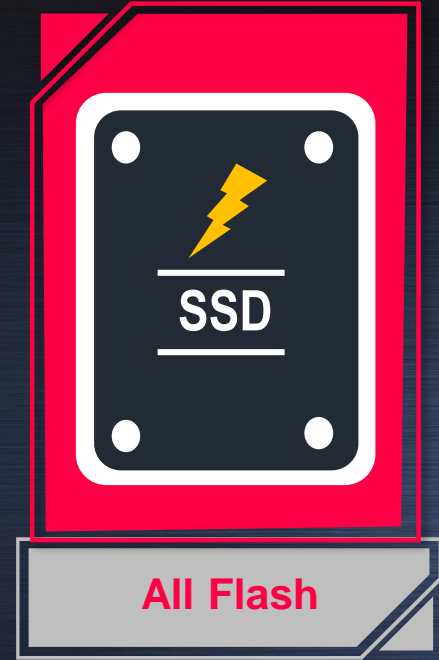
QES OS



QES-Based Unified Storage



One Architecture & Three Configurations



QNAP

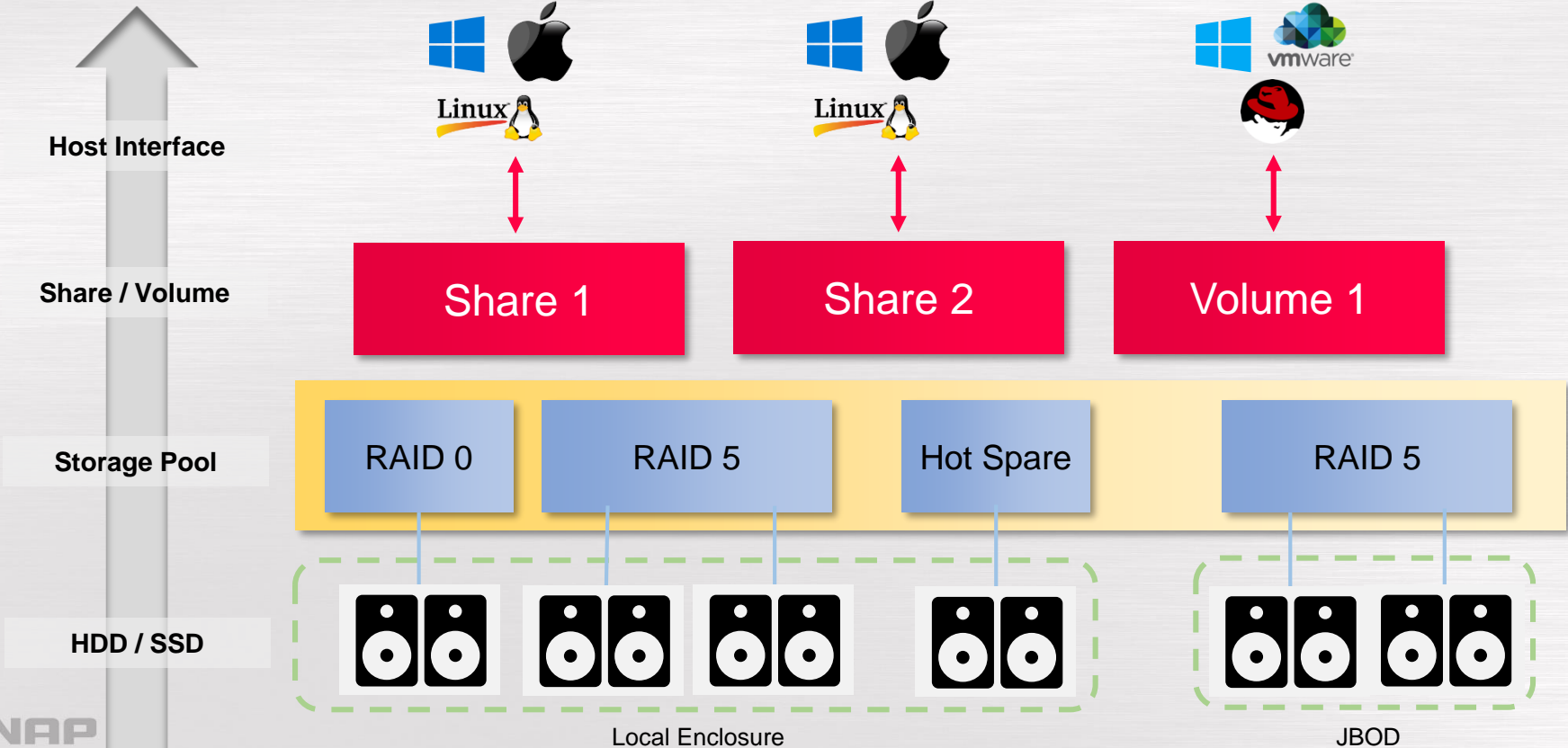
TDS-16489UR2

QES

Data Storage

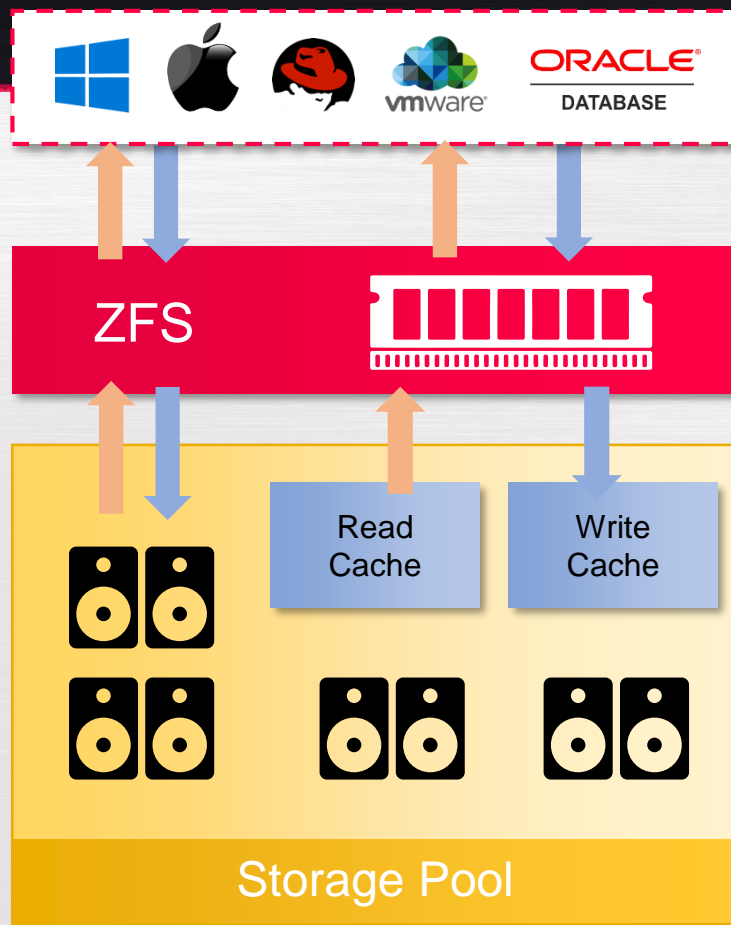


Storage Pool Provides Flexible Capacity Management



SSD Cache

- Better random read/write performance
- Accelerate both block and file access
- More RAM, Larger SSD cache space
- Support RAID 1 write cache

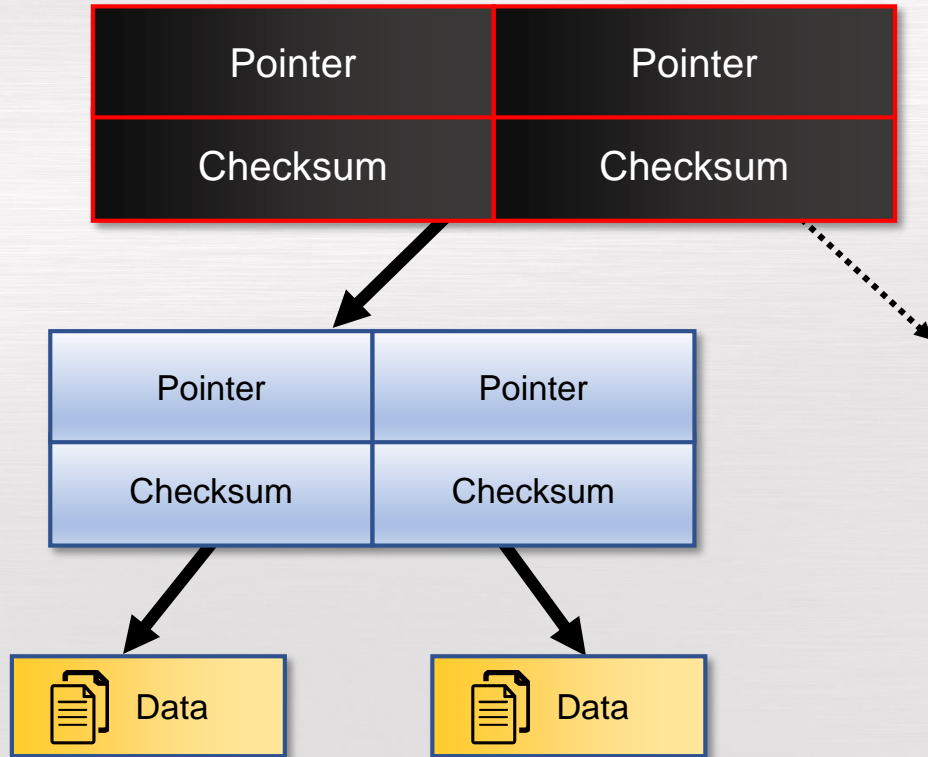


Trends in Storage Integrity

- **Uncorrectable bit error rates have stayed roughly constant**
 - 1 in 10^{14} bits (~12TB) for desktop-class drives
 - 1 in 10^{15} bits (~120TB) for enterprise-class drives
 - Bad sector every 8-20TB in practice (desktop and enterprise)
- **Drive capacities doubling every 12-18 months**
 - Number of drives per deployment increasing
 - Both silent and “noisy” data corruption becoming more common
 - Cheap flash storage will only accelerate this trend

Source: https://wiki.illumos.org/download/attachments/1146951/zfs_last.pdf

ZFS – Hierarchical Checksum

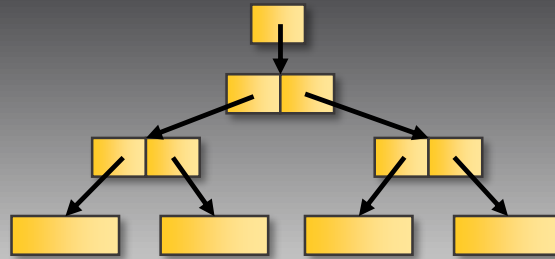


- **Separate checksum and data**
- **Validate the entire I/O path**
- **Detect any form of silent data corruption**

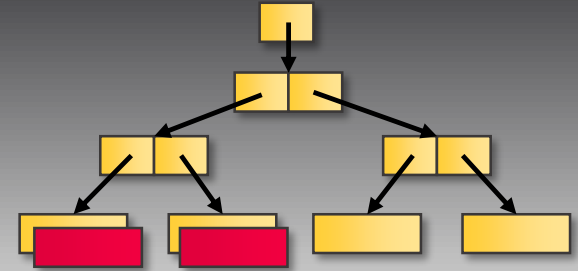
ZFS – Copy on Write

- Always on-disk consistent
- Immune to power failure

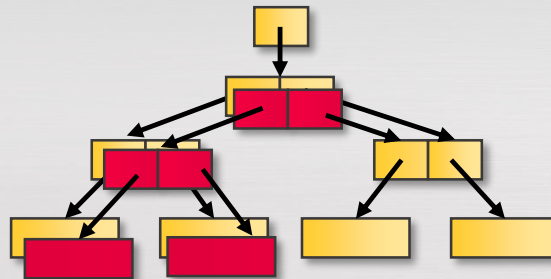
1. Initial block tree



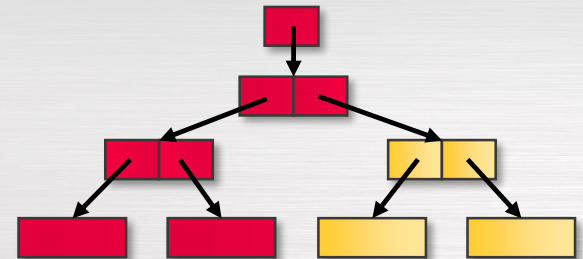
2. COW some blocks



3. COW indirect blocks

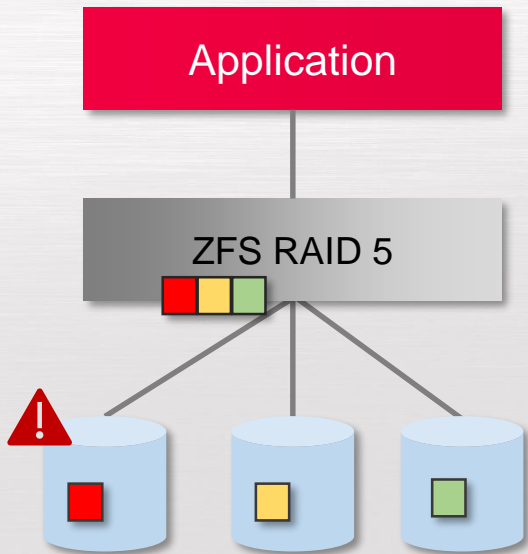


4. Rewrite uberblock (atomic)

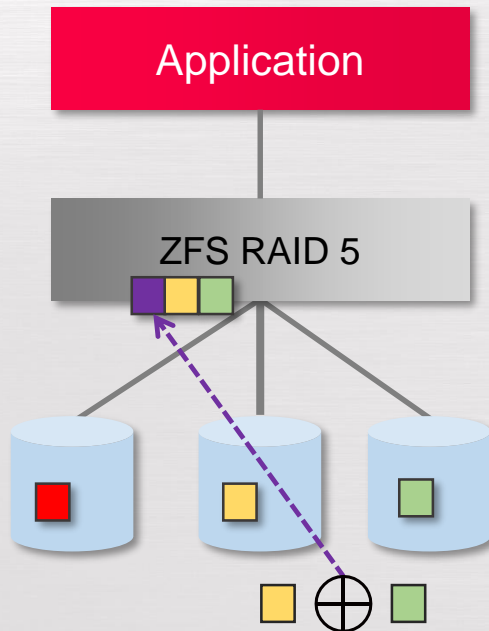


ZFS – Self Healing

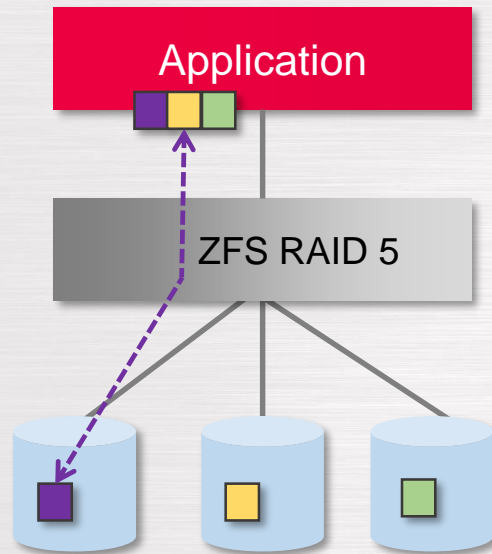
1 The application issues a read. ZFS RAID detects a block on disk.



2 ZFS RAID5 will calculate the correct data based on other blocks.



3 ZFS RAID5 returns the data to the application and repairs the damage block.



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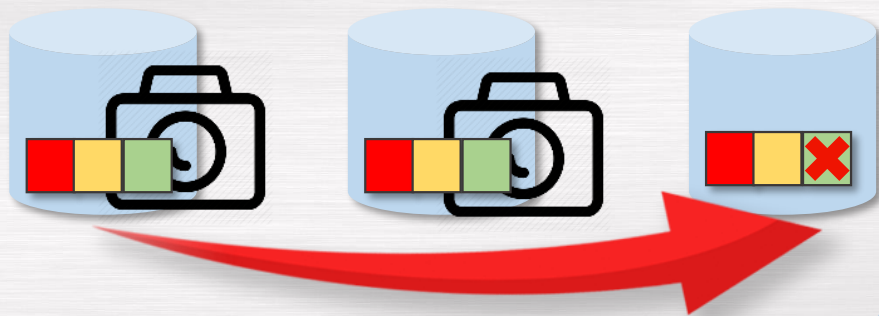
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QES

Data Protection



Snapshots Protect Both Block and File Data

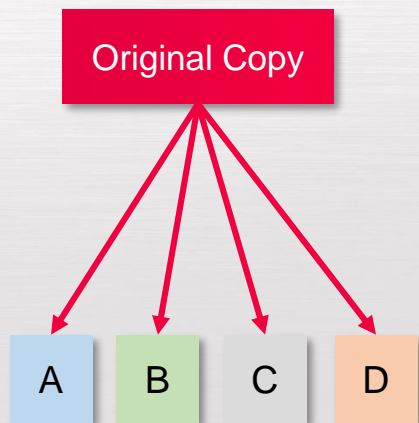


- ▶▶ Simple and easy to recover valuable data from virus attack or accidental deletion and modification.
- ▶▶ Instant creation, near-unlimited number “65535”

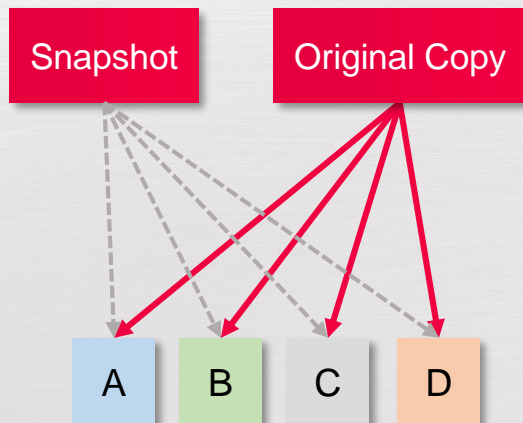
Efficient Snapshot and Clone

- ▶▶ Copy-on-write transaction requires no additional space – record different data only

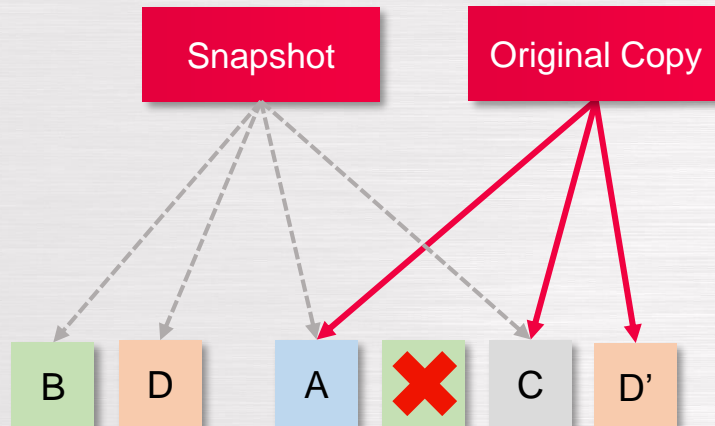
Before Snapshot



After Snapshot



After Modification



QES – Space Saving Technology

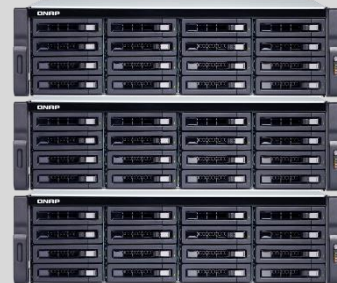
➤➤ QES makes storage more efficient

3 x 42U
Traditional
Storage

Space Saving Technology

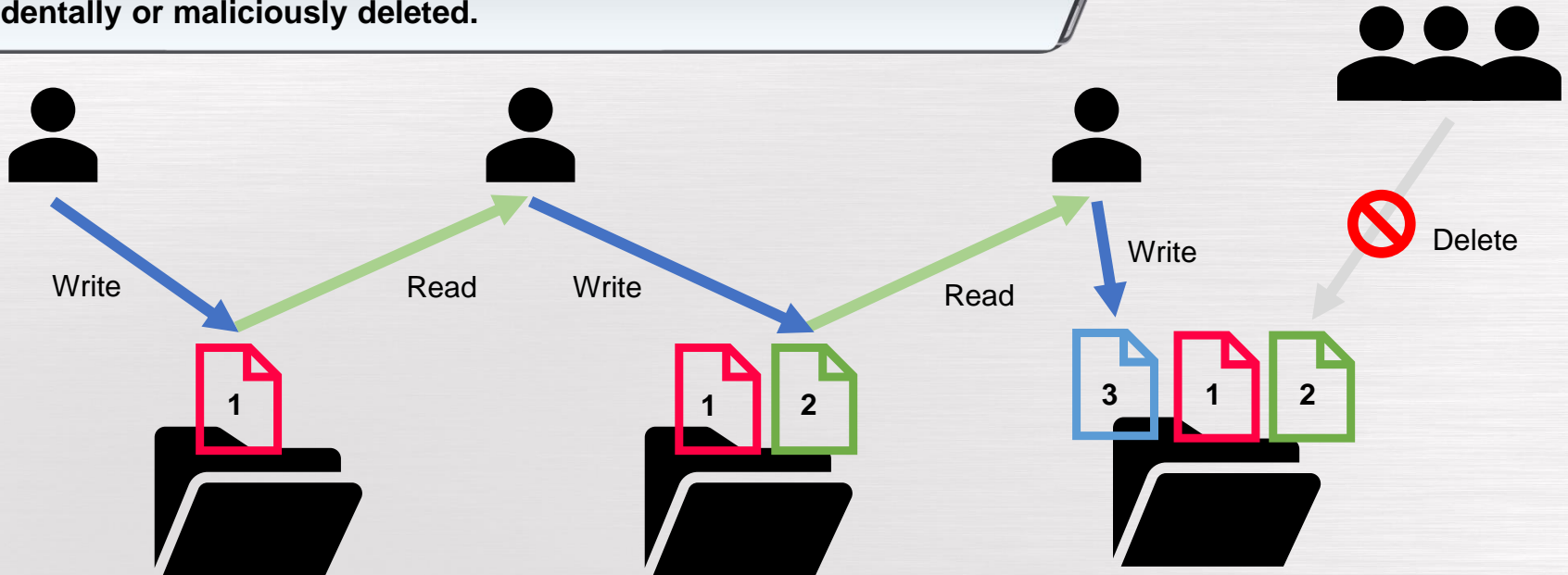
- Deduplication
- Compression
- Thin provisioning
- Snapshot
- Fast Clone

3 x 3U TDS-16489U R2



WORM – Write Once, Read Many

Once the data is written to the folder, only the data can be read during the scheduling period to prevent important data from being accidentally or maliciously deleted. >>



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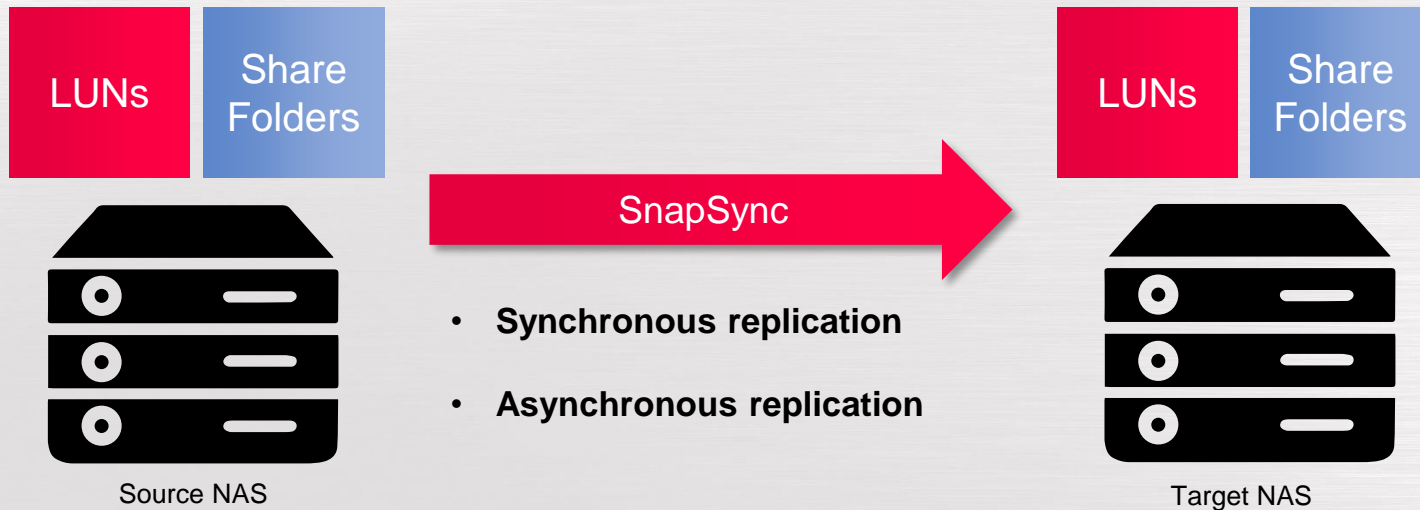
QES

Data Migration



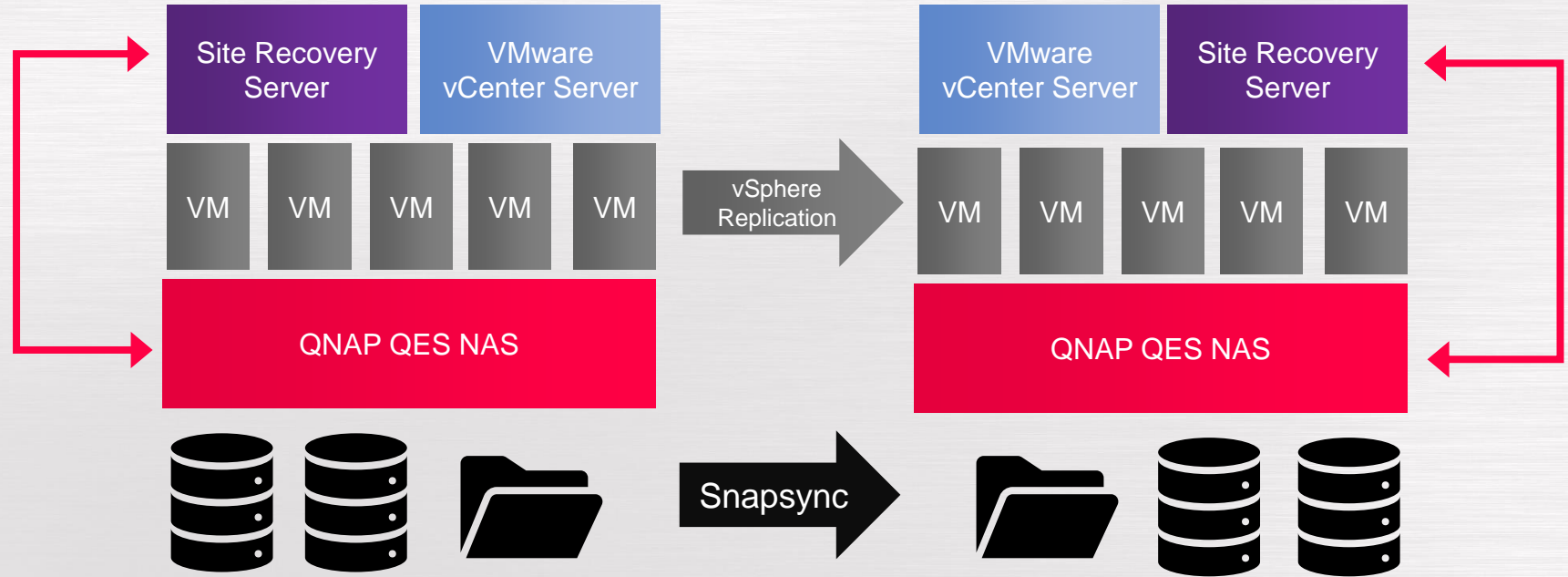
SnapSync for Data Migration

- ▶▶ SnapSync allows you to sync local enterprise storage iSCSI LUNs and shared folder volumes to remote enterprise storage, which provides an efficient backup solution for IT department.
- ▶▶ Using block-level differential backup provides quicker recovery, as it only requires a full backup and the last differential backup to restore the entire data repository.



VMware vCenter SRM – QES Storage Replication

▶▶ Enable application availability and mobility across sites in private cloud environments.



Snapsync can replicate iSCSI LUN & shared folder snapshot

QES NAS - Virtualization-ready Storage Solutions

QES NAS is a virtualization-ready Storage Solutions

Virtualization Solutions	VMware vSphere	Microsoft Hyper-V	Citrix XenServer
Certifications	VMware Ready	Certified for Windows 2012 R2	Citrix Ready
Virtualization Application	VAAI for iSCSI <ul style="list-style-type: none">• Full Copy• Block Zeroing• Hardware-assisted locking• Thin provisioning• Space reclamation	Microsoft ODX (Offload Data Transfer)	iSCSI and NFS Storage Repository
	VAAI for NAS <ul style="list-style-type: none">• Full file clone• Extended statistics• Reserve space		
Management Tool	QNAP vSphere Client plug-in	<ul style="list-style-type: none">• QNAP SMI-S provider for SCVMM• QNAP Snapshot Agent	



QNAP

TDS-16489UR2

is your best choice!

