QNAP

QES: ZFS Based, Enterprise Class Storage

Complete solution for data store, protection, and migration

Agenda

- IT FAQs
- Storage, the key of IT infrastructure
- What do enterprises need?
  - Data Store
  - Data Protection
  - Data Migration
- QNAP QES Products

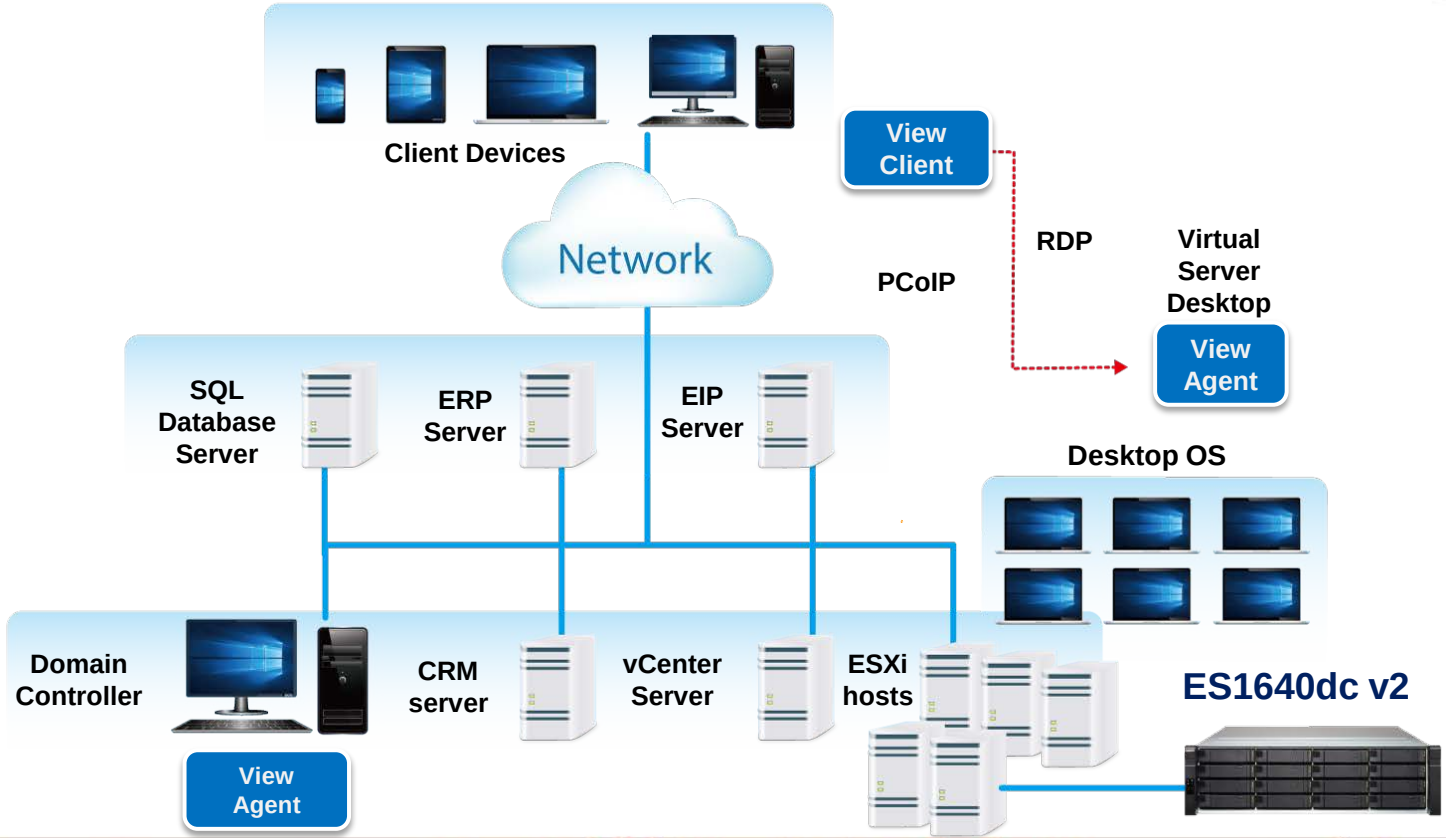
IT FAQs

Have you experienced before...?

- The number of snapshots that can be kept is limited.
- System update is needed but critical services need to stay online.
- Storage efficiency is not optimized due to data duplication.
- Archived data is silently corrupted.

Let QES deal with them!

What‘s inside a server room ?



Storage, the key of IT infrastructure

QNAP

When services are down…

FedEx said TNT Petya attack financial hit will be material, some systems won't come back – zdnet.com 2017

Many Atlantic Canadians lose cellphone, internet service in widespread outage – CityNews.ca 2017

WhatsApp services down, users take to Twitter to share ordeal

– hindustantimes.com 2017

What do enterprises need ?

Data Store

Data Integrity

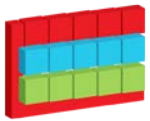
Access Efficiency

Protection

Snapshots Protection

Dual Active-Active

Migration



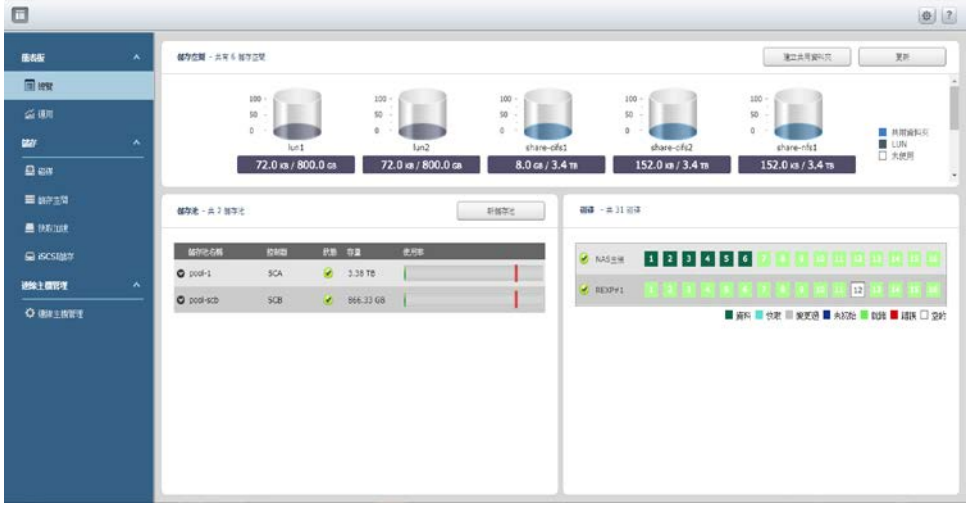
Disaster Recovery

Remote Replication

QES - designed for enterprises

- **Data integrity**
  - Self-Healing for Data Availability
  - Compression & Deduplication
- **Data protection**
  - Snapshot Local Protection
- **Data migration**
  - SnapSync Remote Protection

QNAP ZFS Based Storage System



Data Store What do enterprises need ?

Potential risks

Silent Data Corruption (Expected Bit Error Rate)

- **NIC: 10^{-10}**

  (In average 1 bit error per 1.1 GB data.)
- **Memory：10^{-12}**

  (In average 1 bit error per 116 GB data.)
- **Desktop Disk：10^{-14}**

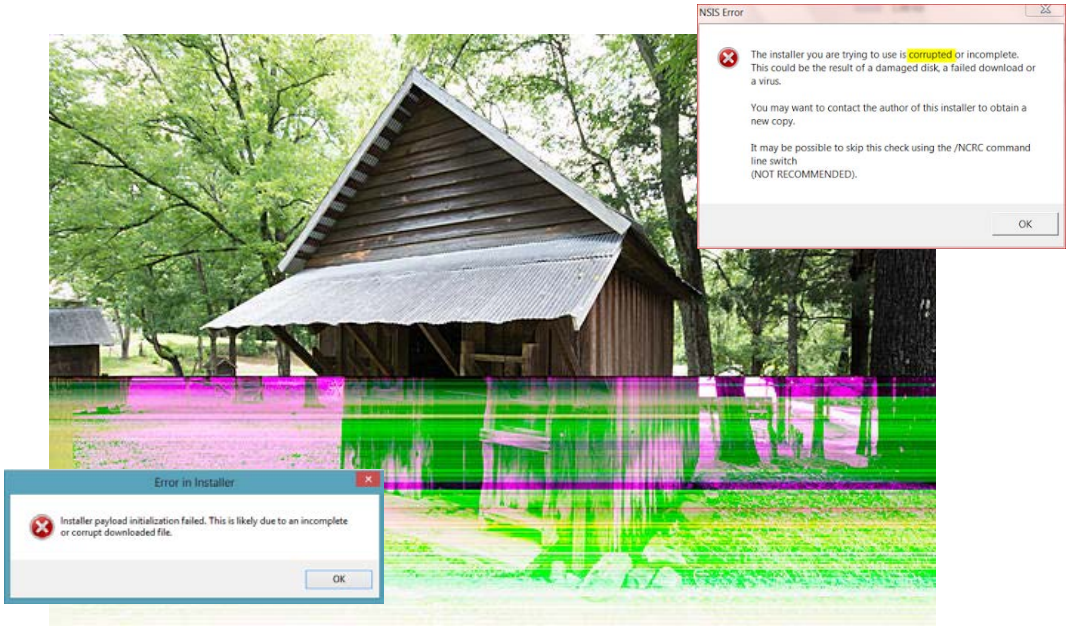
  (In average 1 bit error per 11.3TB data.)
- **Enterprise Disk：10^{-15}**

  (In average 1 bit error per 113TB data.)

http://openlab.web.cern.ch/sites/openlab.web.cern.ch/files/presentations/Disk%20corruption%20issues.pdf

Is your data really safe ?

Everything looks fine, BUT……



Watch out !

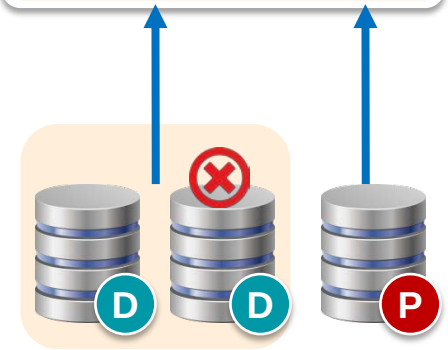
- Errors may result from the transmission reliability and the amount of data.
- The probability seems very low, yet not ignorable.
- QTS EXT4 for SMB protects the data by snapshots and backups.

Scrubbing: Checking & Correction

Filesystem Level Pool Scrubbing

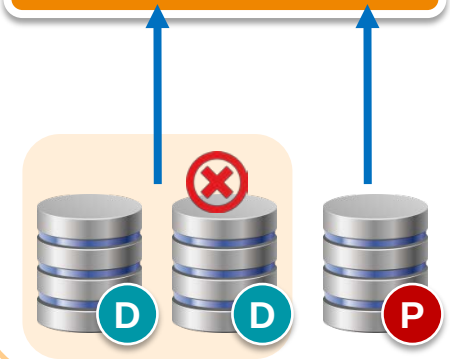
RAID Scrub (QTS) enables user to schedule the scanning for RAID blocks and tries to restore the corrupted data. In contrast, QES scrub not only scans bad block but also corrects it in filesystem layer.

RAID Scrub



Schedule the scanning for bad blocks and tries to restore the corrupted data.

Filesystem Scrub



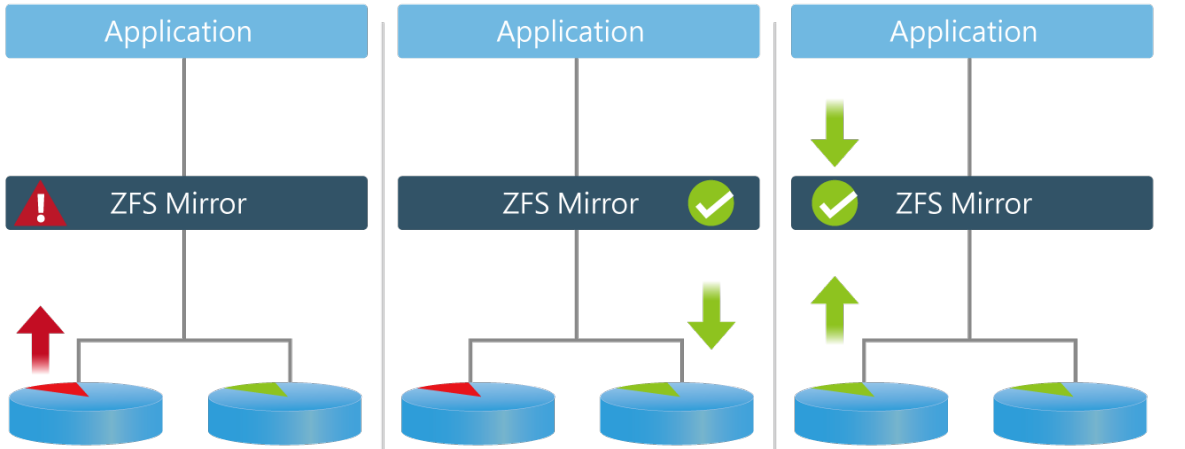
Not only scan bad blocks, but also correct them in filesystem level.

Keep data away from corruption

Data Integrity

ZFS uses its end-to-end checksums to **detect and correct** silent data corruption.

Worry-free data storage (Silent data corruption)



Besides data integrity…

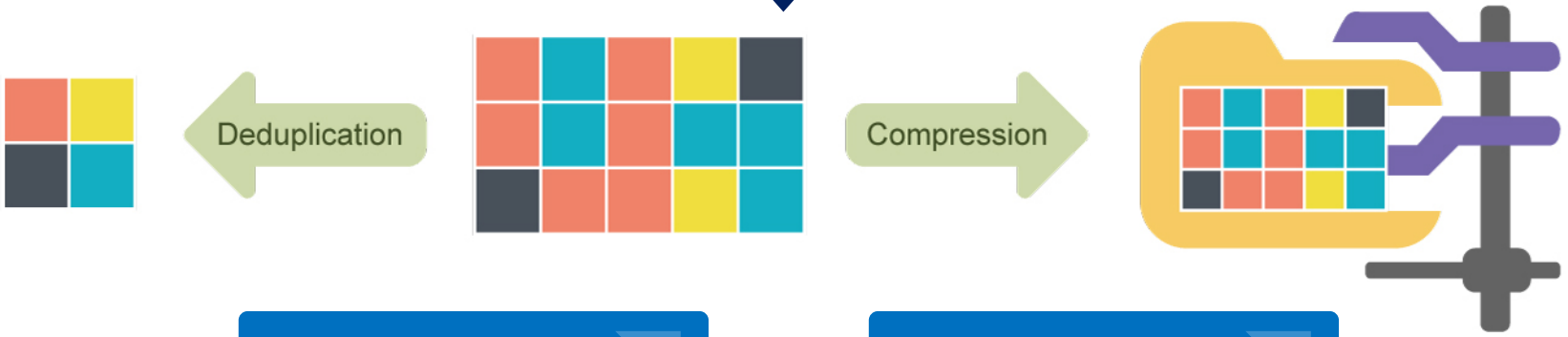
Embrace the trend of high performance storage!

Interface	Cost per Gigabyte	Cost for 10TB
SAS HDD	0.08 USD/GB	820USD
SAS SSD	0.83 USD/GB	8500USD

10 Times !

Not only safe, but more efficient

QES makes the storage space more efficient

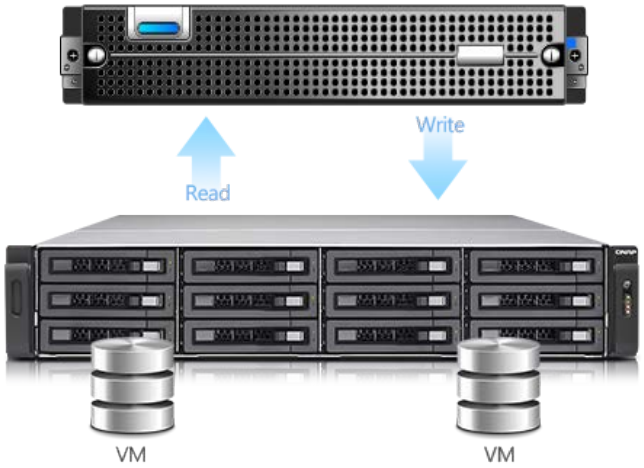


In-line Deduplication

In-line Compression

Have you experienced this ?

Traditional Copy

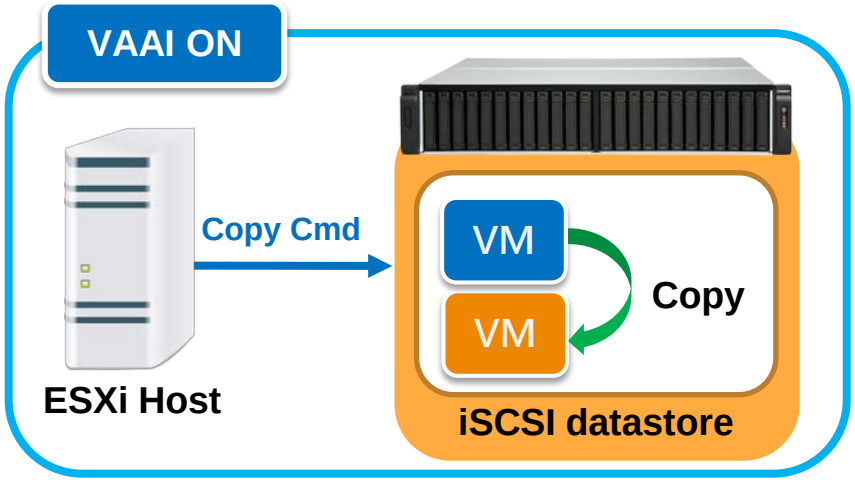


- Take Client Resource
- Data Clone Slowly
- Extra Space Requirement

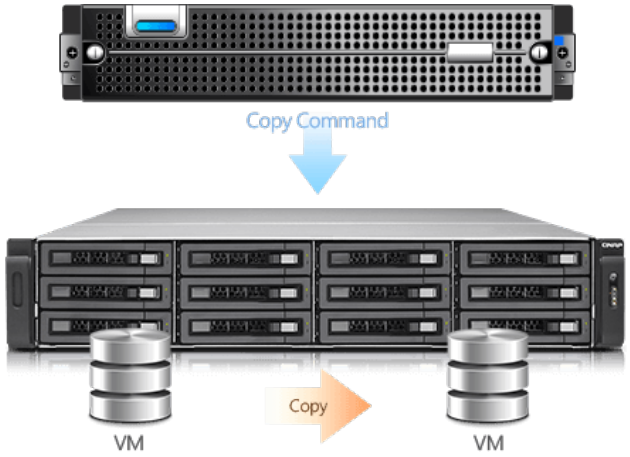
Conventional solutions

Common storage provides

- Server side copy
- Microsoft ODX / VMware VAAI



Server-Side Copy
Storage Offload



Extra Space Requirement

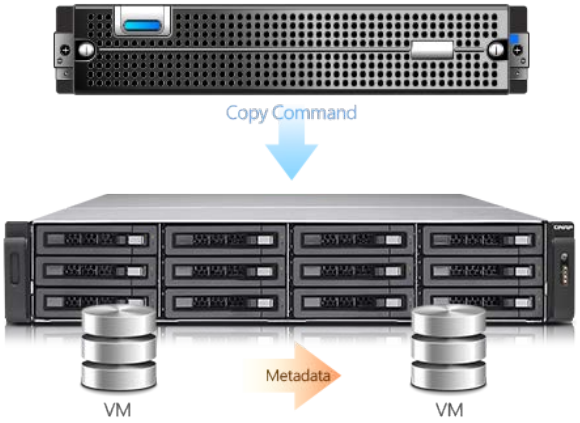
Slowly Data Clone

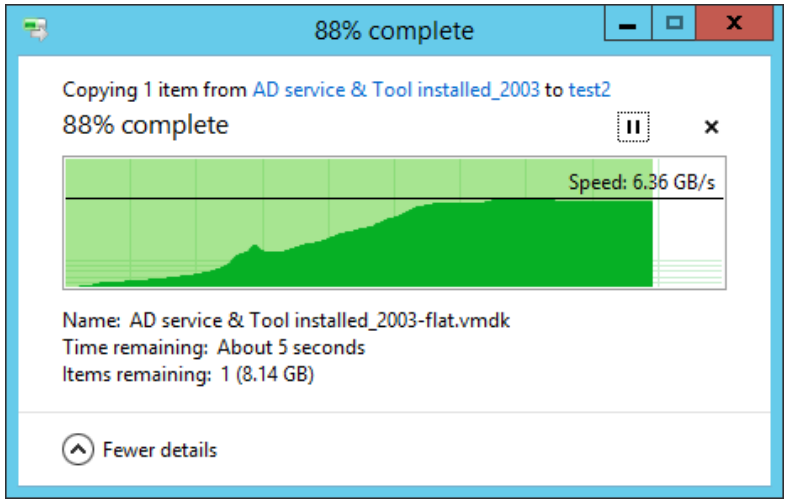
QES does it better

QES Fast Clone

Clone quickly, No extra space needed

QES Dedup-based Fast Clone





Clone a 70GB file in 20 seconds

QES Fast clone

Amazing data compression

SSD Pool

NFS Shared

TES-3085U

Switch

200 Servers

Apache Web Server | Oracle DB | Applications

Citrix

10TB Space

80% Compress rate

(For specific data type)

8500 x 0.8 = 6800 USD

Data Protection

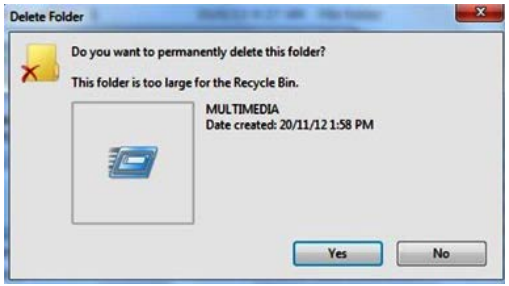
What does enterprises need?

Snapshot to the rescue

Fast recovery from ransomware attacks

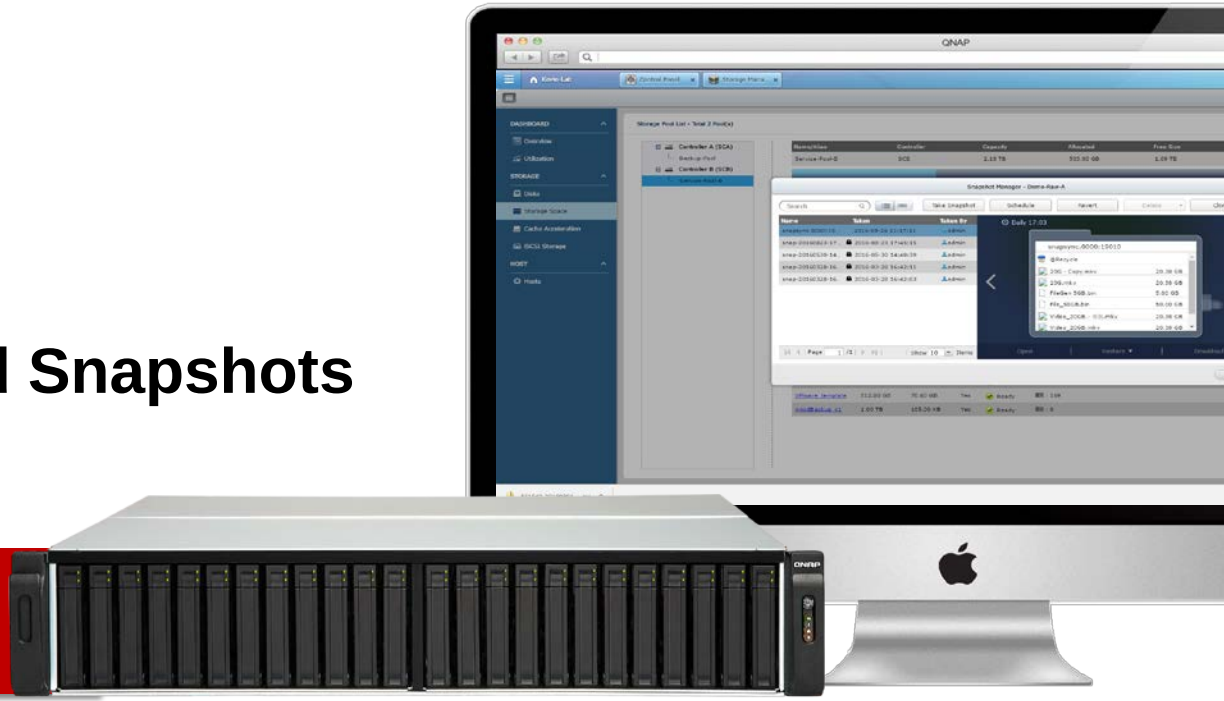
Backup versioning

Recovery from human errors



You need a lot of Snapshots

QES near-unlimited Snapshots

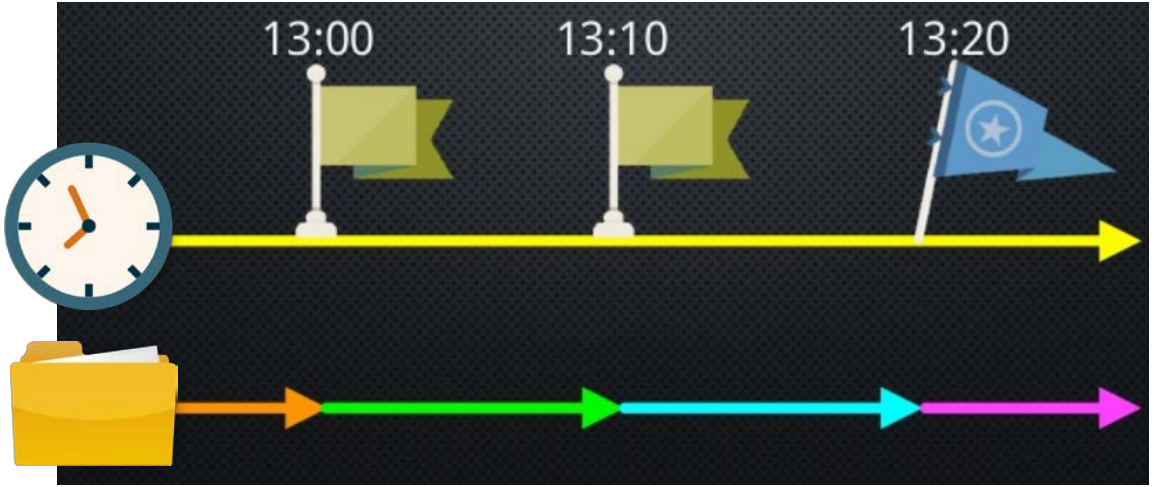


65535 Snapshots

QES Snapshot protects you

Near real-time
- Data Protection

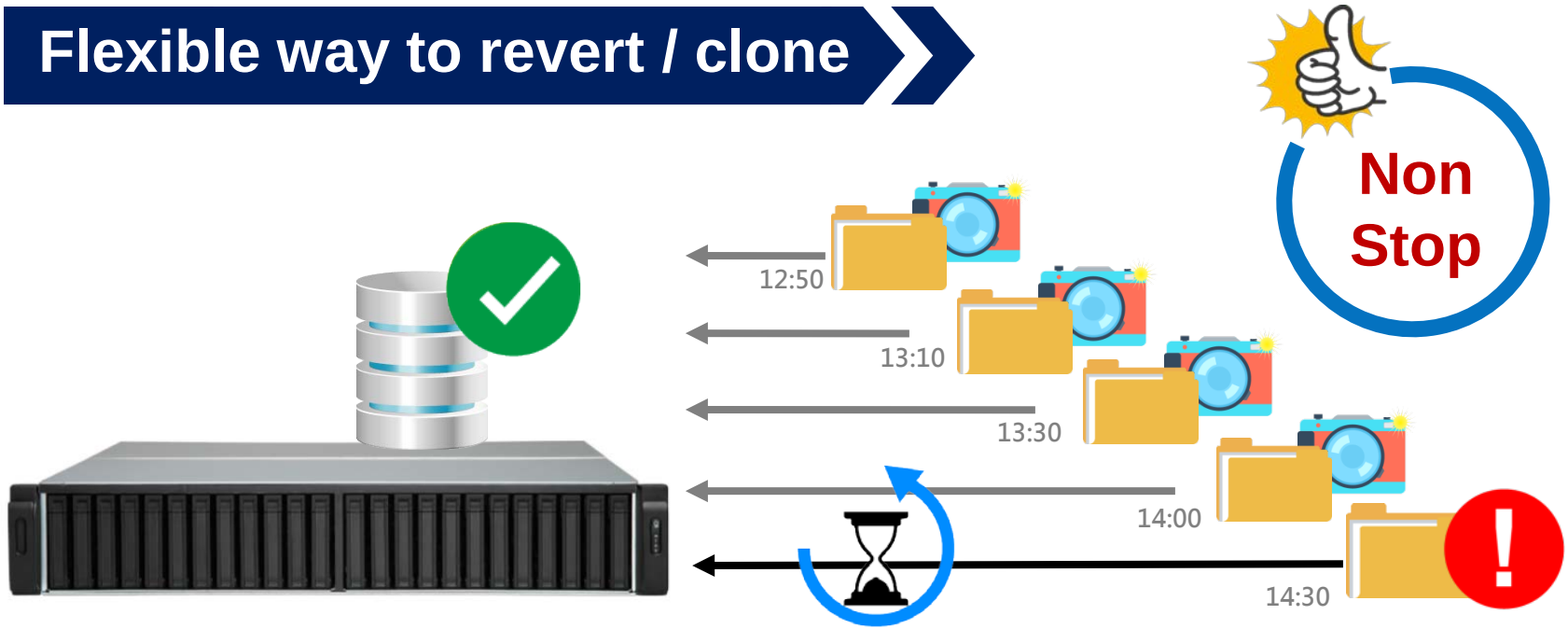
Fast recovery
- Review & Access



Insert timestamp, and then keep writing

Of course, services non-stop

Flexible way to revert / clone



Demo - QES Snapshot

Data Migration

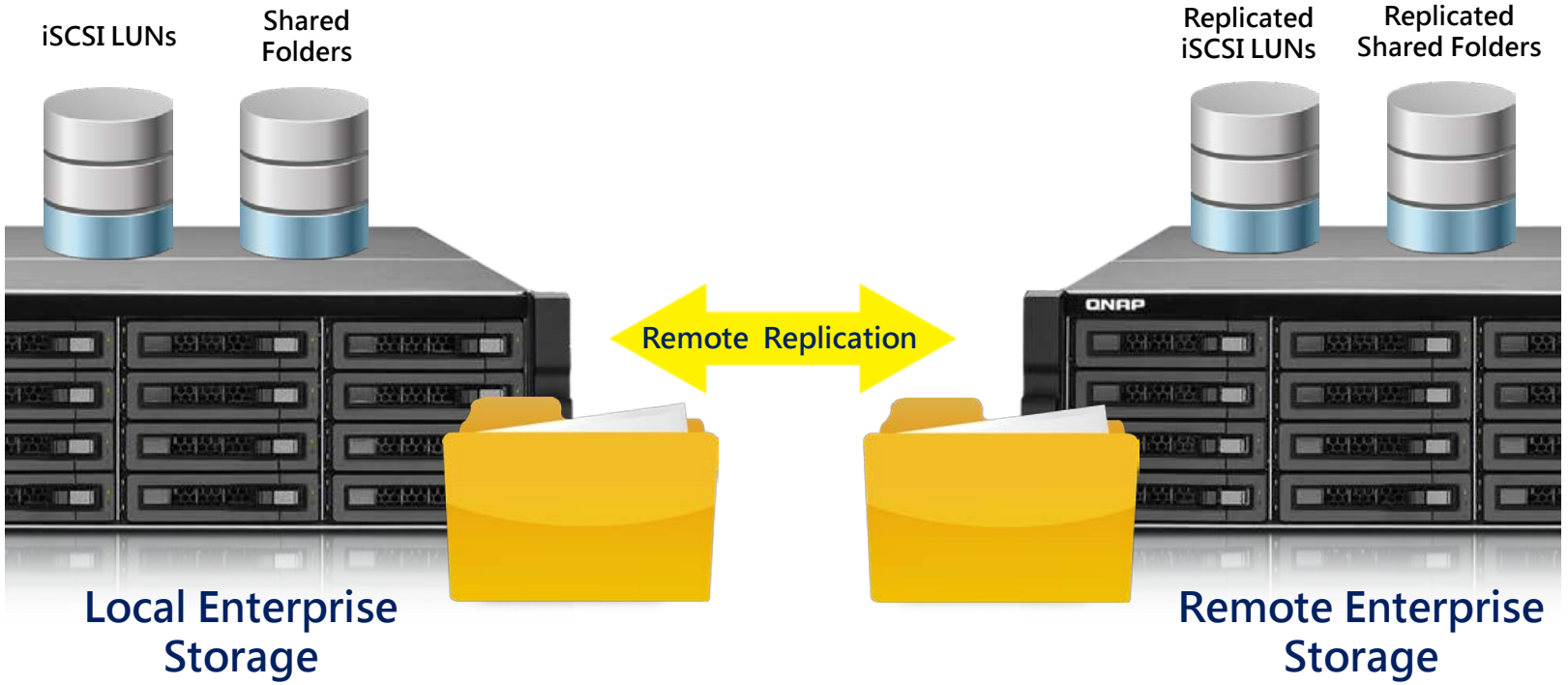
What does enterprises need?

Accidents do happen

Fire in Loudoun County's 'Data Center Alley' causes $150K in damage

Saturday, Nov. 18, 2017 by Times-Mirror Staff | 7 comments | Email this story

You need remote backups

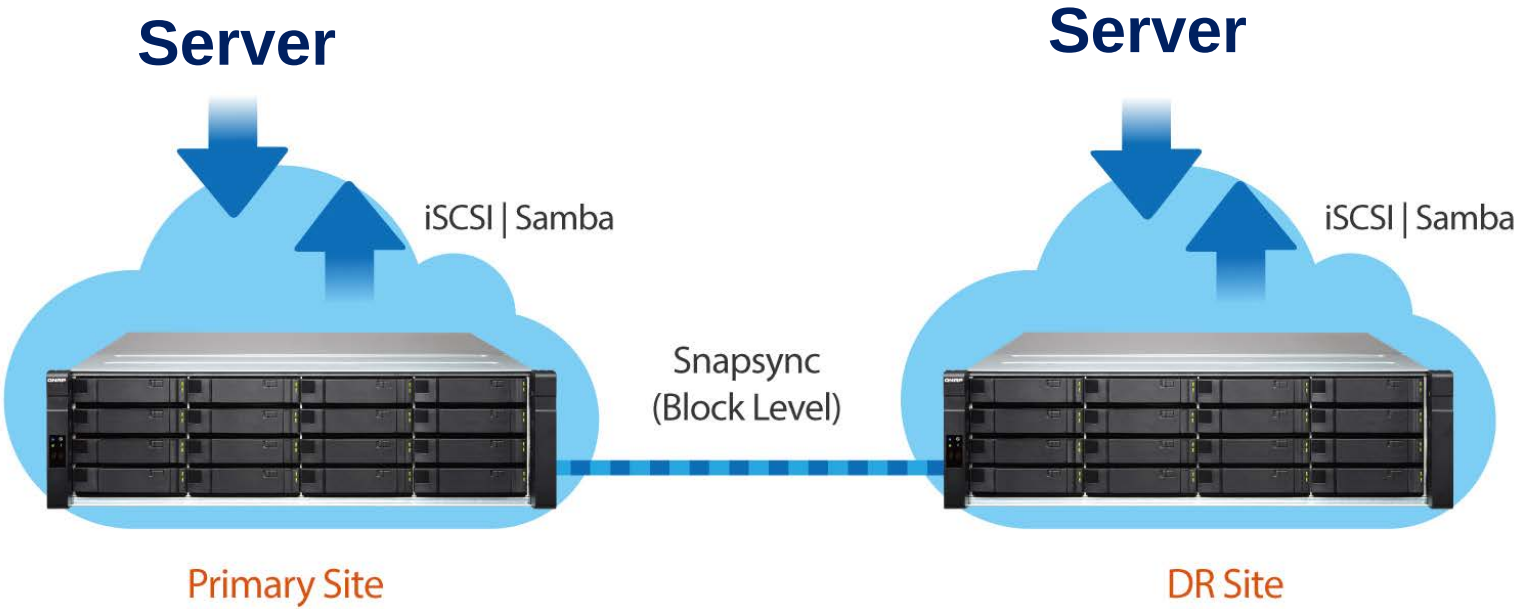


But… it takes forever

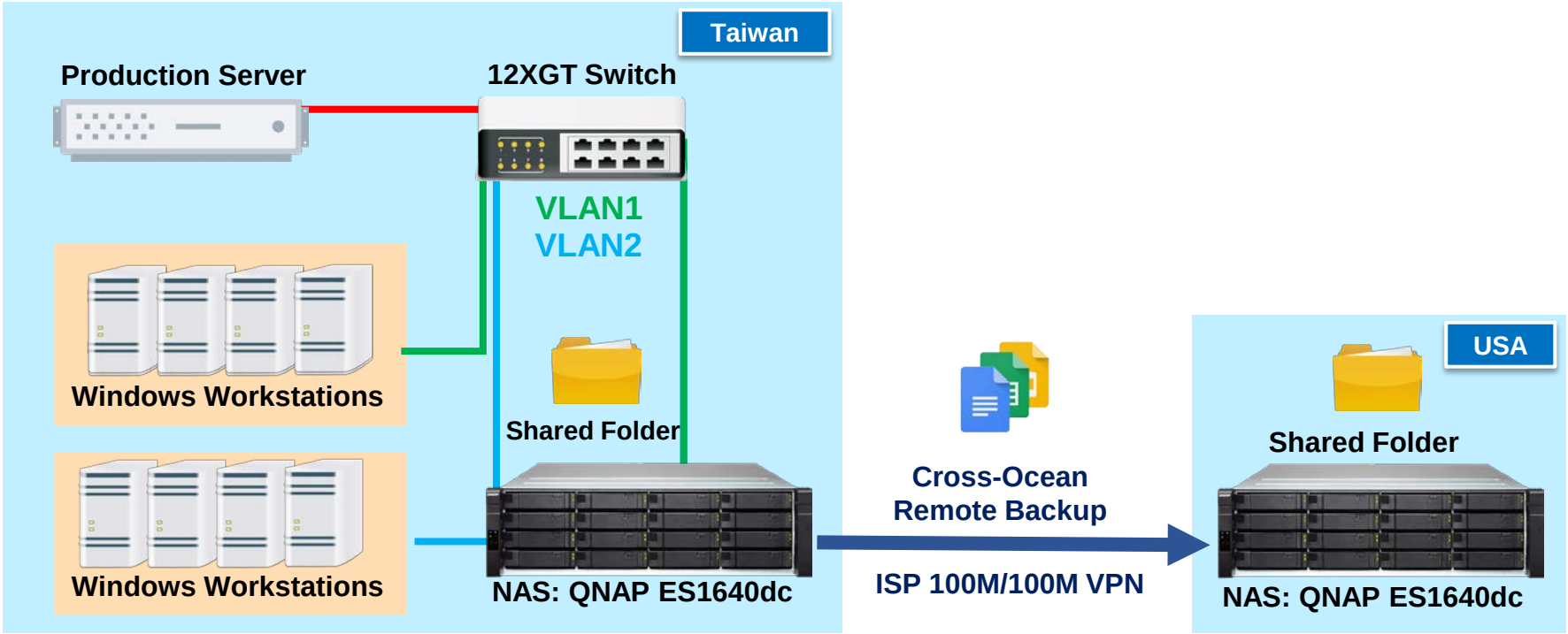
Backup level	File Size	Modify	Time (s)
File level	20GB	<10MB	~270
Block Level	20GB	<10MB	<10

SnapSync backup is easy and fast

Easy backup through SnapSync



Case study

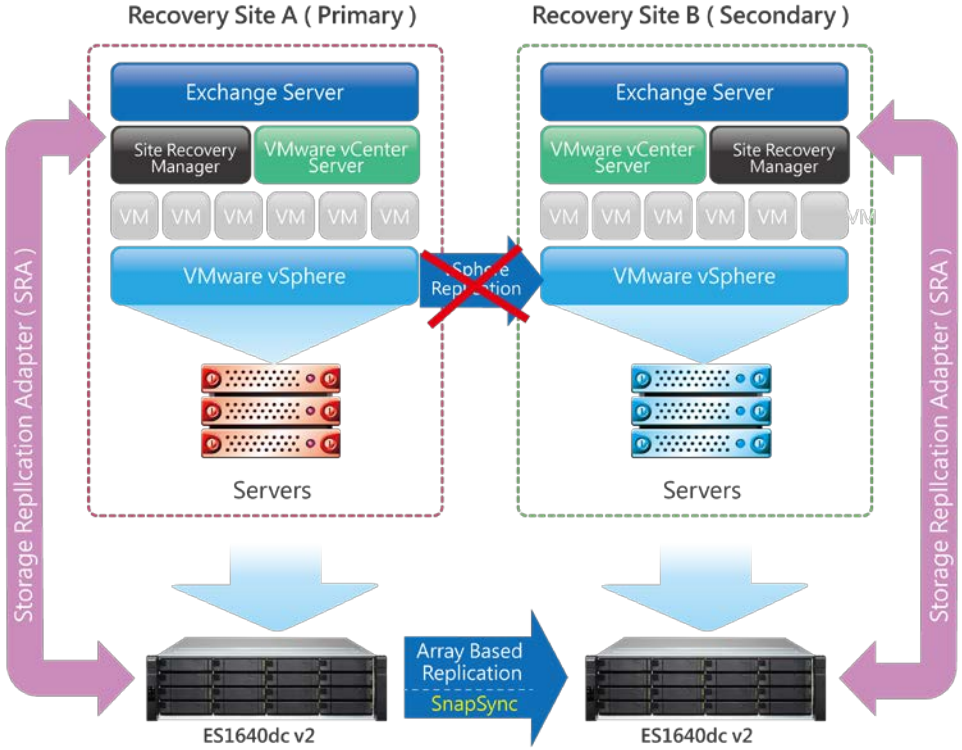

Taiwan
Production Server
12XGT Switch
VLAN1
VLAN2
Windows Workstations
Shared Folder
Windows Workstations
NAS: QNAP ES1640dc
Cross-Ocean
Remote Backup
ISP 100M/100M VPN
USA
Shared Folder
NAS: QNAP ES1640dc

Real disaster recovery

SRA* & SnapSync
make backups
and disaster recovery
easy and quick

vmware READY

Certified for VMware SRM program



QNAP QES Products

TES-x85U / ES1640dc v2

TES-3085U

TES-3085U

Best Choice for All Flash Storage

Specification

- 2U rack mount
- 24 x 2.5” SAS 12Gb/s, 6Gb/s SATA 6Gb/s Disk and SSD
- 6 x 2.5” SATA 6Gb/s SSD

TES-1885U

TES-1885U

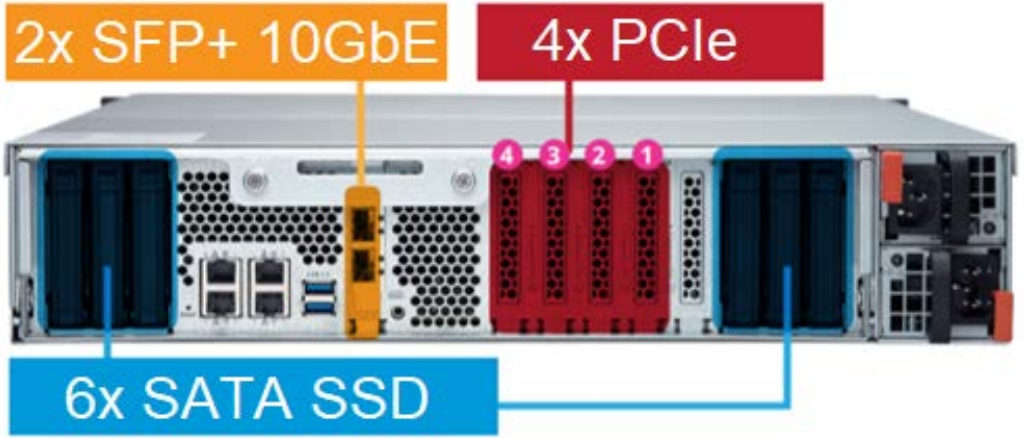
Best Choice for Data Backup

Specification

- 2U rack mount
- 12 x 3.5”/2.5”
  SAS 12Gb/s, 6Gb/s,
  SATA 6Gb/s Disk and SSD
- 6 x 2.5” SATA 6Gb/s SSD

TES-x85U Series

- **Built-in 2 x 10 GbE SFP+ ports**
- **4 x PCIe 3.0 slots**
- **6 x 2.5” SSD bays**



Dual QNAP OS

QTS

QNAP Turbo NAS System

Complementary

QES

QNAP Enterprise NAS System

Application diversity

Business Continuity

ES1640dc v2

ES1640dc v2

Best Choice for Non-stop Service

Specification

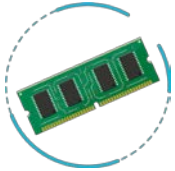
- 3U rack mount
- 16 x 3.5” SAS 12Gb/s Disk/SSD
- Dual Controller

ES1640dc v2

- **Dual controllers**
- **Built-in 8 x 10 GbE SFP+ ports**
- **Built-in 4 x 10GBASE-T ports**
- **Built-in 4 x SAS 12Gbps ports**

ES1640dc v2 HW design

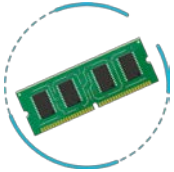
Main Memory DIMM



DDR3 Memory

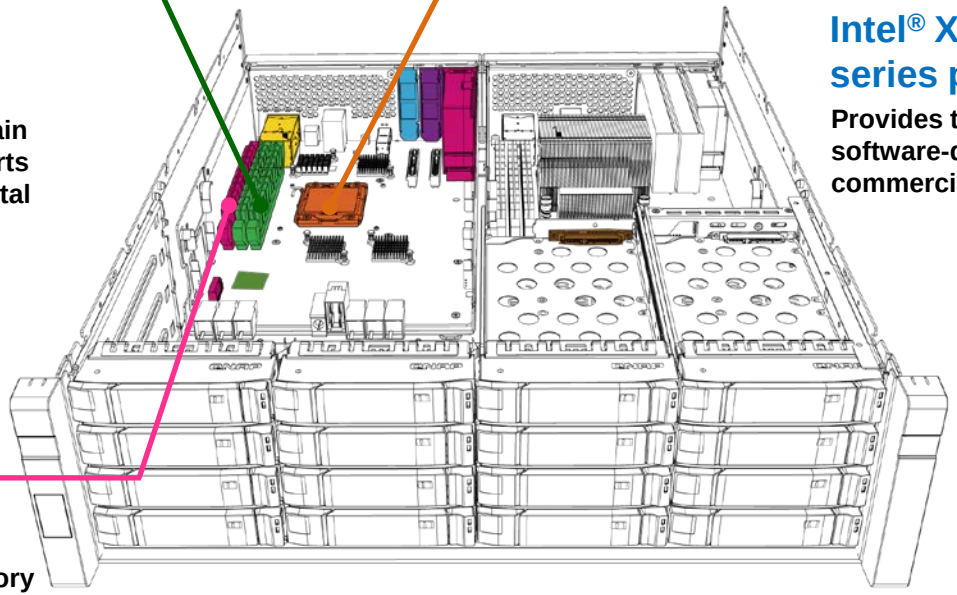
Dual-channel DDR3 system main memory - each channel supports 16GB, providing up to 32GB total capacity

Write Cache DIMM



DDR3 RAMDISK

NVRAM dedicated DDR3 memory modules Supports 16GB



Intel® Xeon® E5-2400 v2 series processor

Provides the performance required by software-defined storage and commercial mission-critical applications

ES keeps data integrity with NVRAM

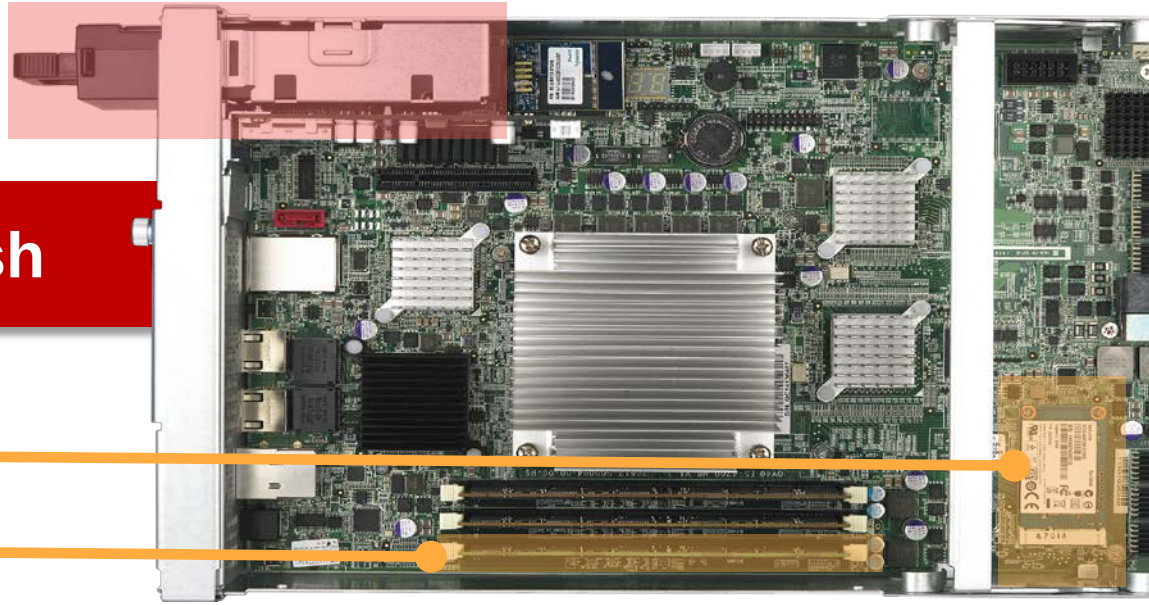
Battery Backup Unit (BBU)

BBU battery pack - to supply sufficient power to maintain NVRAM during power outages.

NVRAM w/ Copy-to-Flash

DDR3 RAM DISK Module

Supports 16GB, power required by C2F is supplied by BBU.

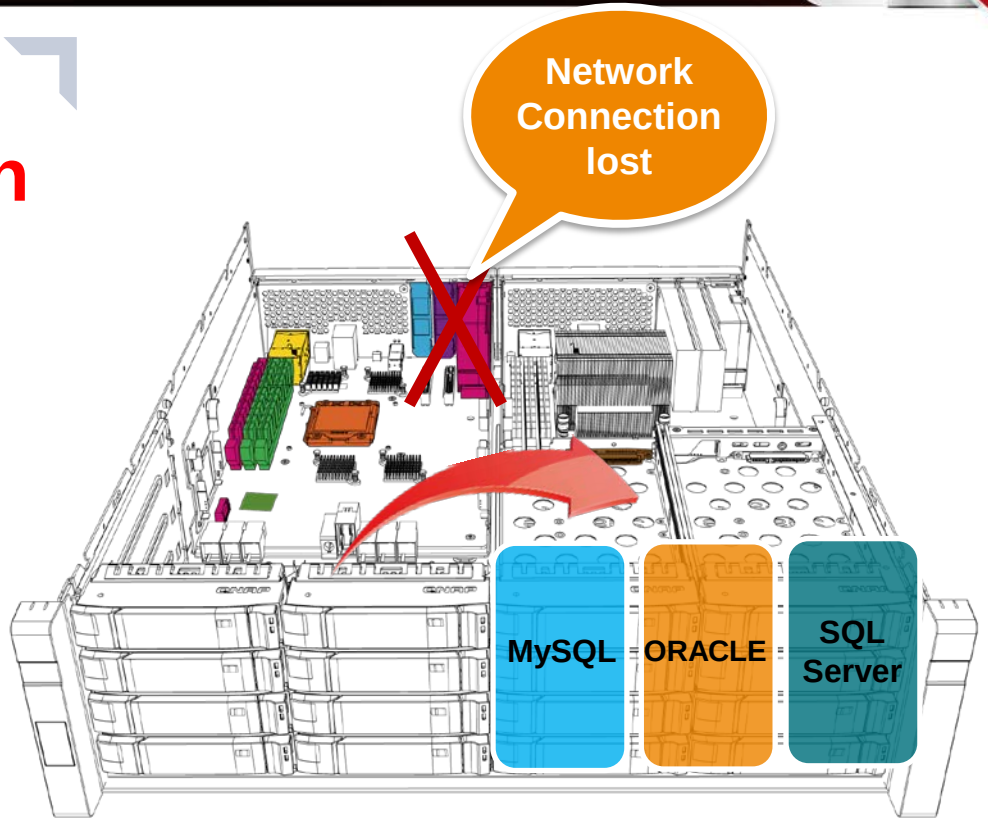


High availability– (network failure)

HA

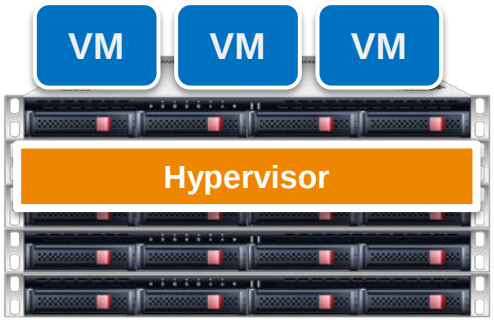
Network connection

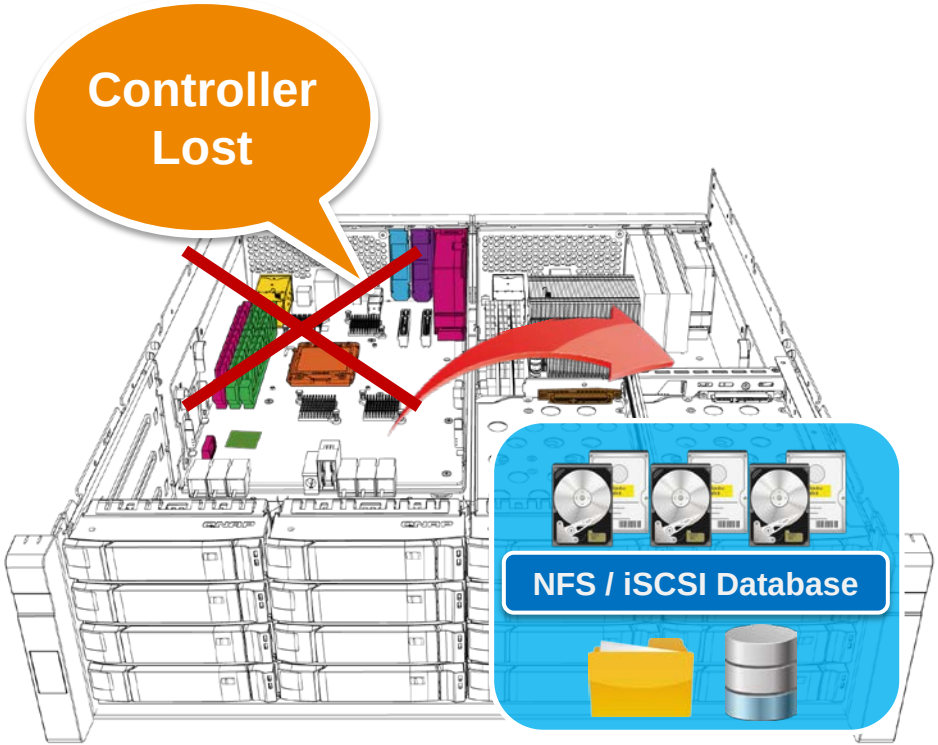
is LOST



High availability– (Controller failure)

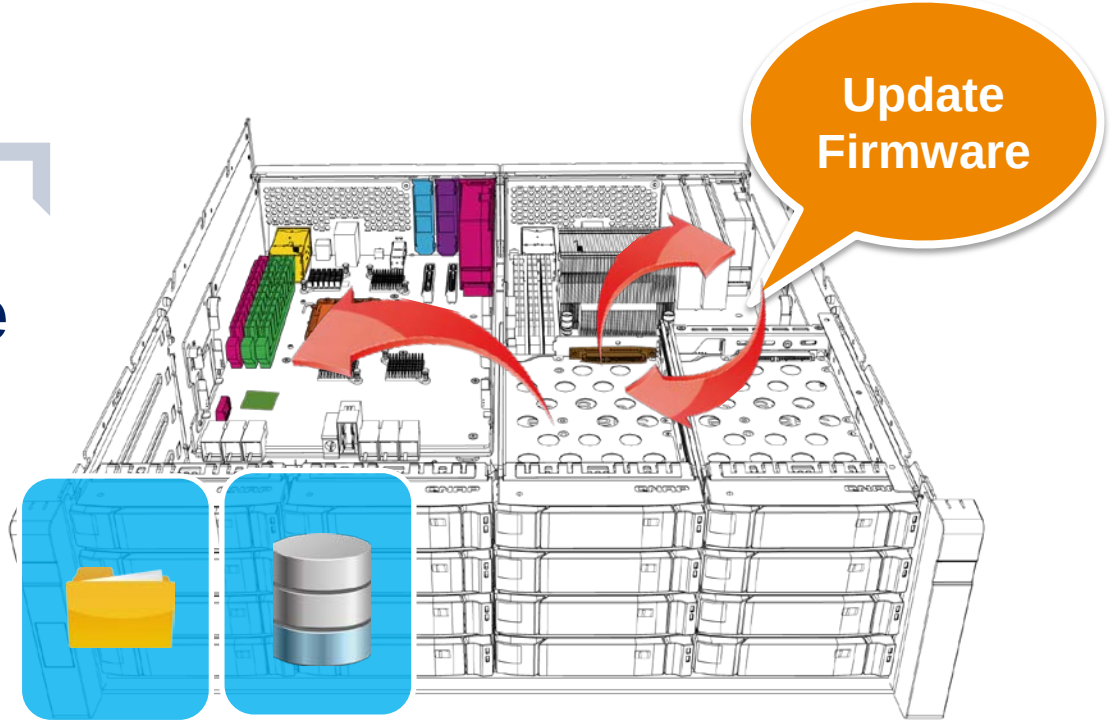
HA
Controller is LOST





Rolling upgrade/update

Non-stop firmware update



Best choice for enterprises

Enterprise-class Storage System

High-performance yet cost-effective enterprise storage center

ES1640dc v2

Enterprise High-Availability NAS

(QES Ready)

- Intel® Xeon® E5
- dual active-active controllers
- 40GbE Ready
- 96G Memory

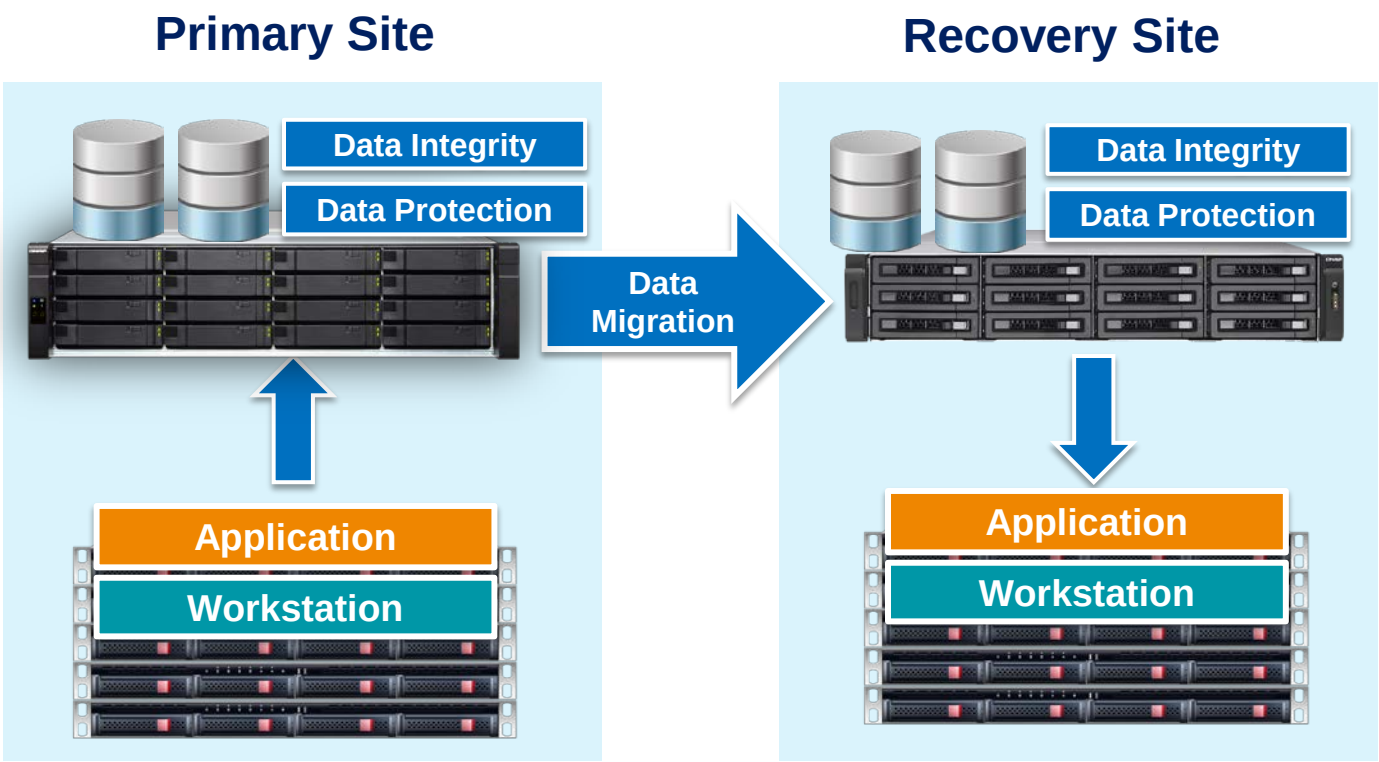
TES-x85U Series

TES-1885U
TES-3085U

(QTS / QES Ready)

- Intel® Xeon® D processor
- Up to 128G DDR4 Memory
- Dual QNAP OS ready to use
- 40GbE Ready

Perfect infrastructure for enterprises



QNAP

QES: ZFS Based, Enterprise Class Storage

Your best choice!