Enterprise ZFS NAS

ES1642dc / ES1640dc

QNAP Marketing

ES NAS Sneak Peek

- Intel Xeon E5-2420 v2 series processor
- Active-Active HA dual controller
- QES Enterprise Operating System
- ZFS (Zettabyte File System) File System
- 40GbE Ready
- HPE Helion support
- Block-level SnapSync for disaster recovery
- NVRAM w/Cope-to-Flash

Why ES NAS

The Challenges Enterprise Face Today

The Challenges Enterprise Face Today

Platform virtualization that was once only possible on expensive mainframes has become an indispensable core technology for enterprise IT

Using OpenStack to build a private cloud has become a recent trend in corporate IT architecture

Dilemma of high-cost SSD and high-capacity NL-SAS

The pursuit of uninterrupted operation and high data availability

Enterprises spend massive amounts of money to build out baseline architecture suitable for a VDI deployment

Segment Shifts !!

The Enterprise and person storage segments will be more than 60% of HDD industry revenue by 2019, up from 43.6% in 2014

Storage in CSP infra, private cloud build-out and Big data, $28B/$65B in 2015

Today’ s Storage Requires more Intelligence

What is ES NAS

Built for Business-critical Applications

The Enterprise ZFS NAS, featuring the brand-new QES (QNAP Enterprise System) operating system. Both the software and hardware architecture were built from the ground up to completely support virtualization environments. It is easy to use, has a low learning curve, and the fastest deployment speed.

The Essencials of QNAP ES NAS

Active-Active HA Dual Controller

FreeBSD Core

ZFS File System

4 Reasons Why ZFS Rocks

Copy-on-write:

This technique ensures that data is always consistent on the disk, when data is changed it is not overwritten — it is always written to a new block and checksummed before pointers to the data are changed.

Data Integrity:

The file system uses a 256-bit checksum, which is stored as metadata, can detect phantom writes, misdirected reads and writes, DMA parity errors, driver bugs and accidental overwrites

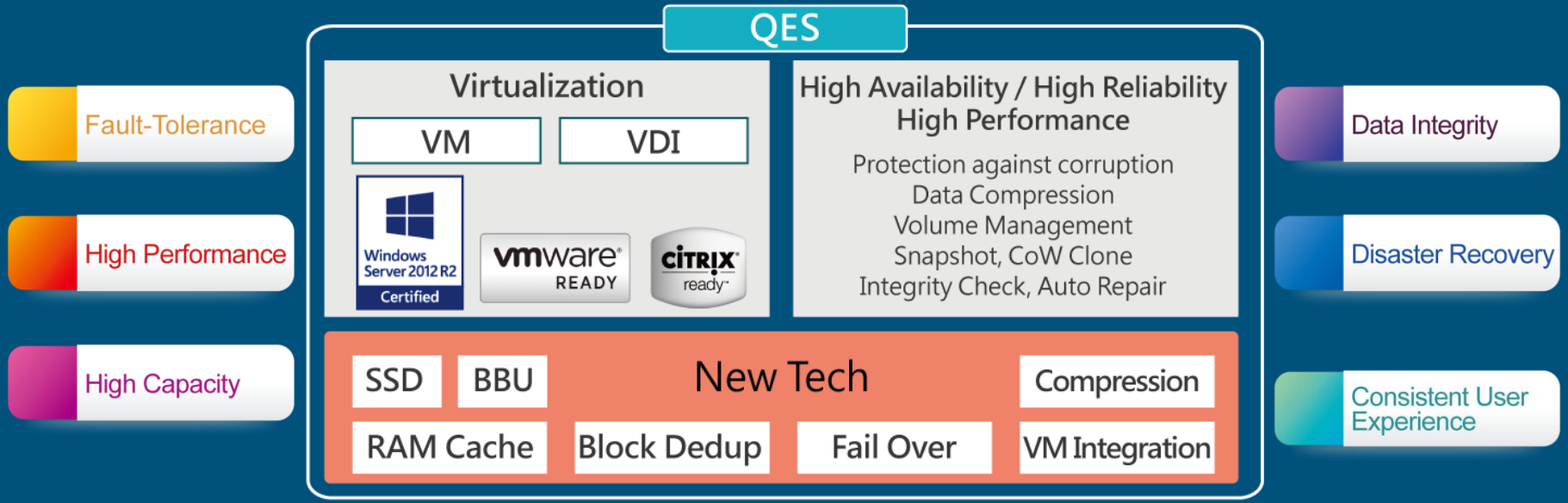
RAID-Z and Storage Pool:

RAID-Z gets around ”write hole” problem by using a variable width stripe, so every write is effectively a full stripe write. Zpool can be optimized for capacity, or I/O performance, or redundancy, using striping, mirroring or some form of RAID.

Data Deduplication:

Deduplication rates for VM deployments can range as high as 95% savings.Deduplicated data is cached for much better performance by reducing disk access.

ES NAS: the key to success



High Availablity Architecture

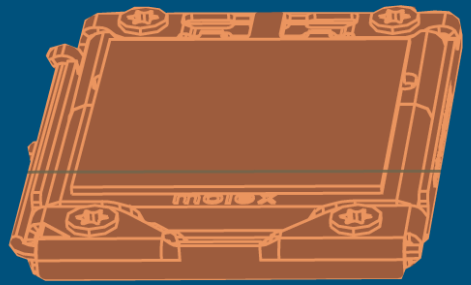
Fault-Tolerance

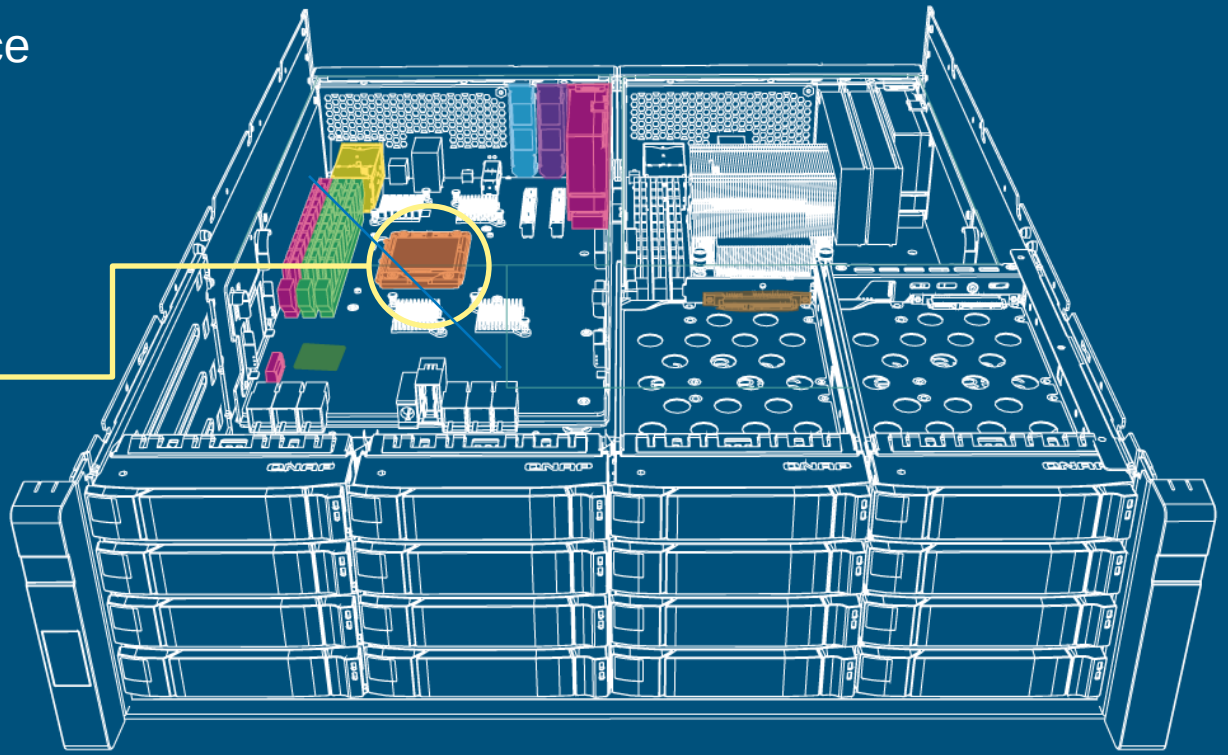
When one controller fails, another one will immediately take over to provide high availability with no downtime.

Intel Xeon E5-2400v2 Series Processor

High Performance

Provide sufficient performance required by software-defined storage and commercial mission-critical applications.



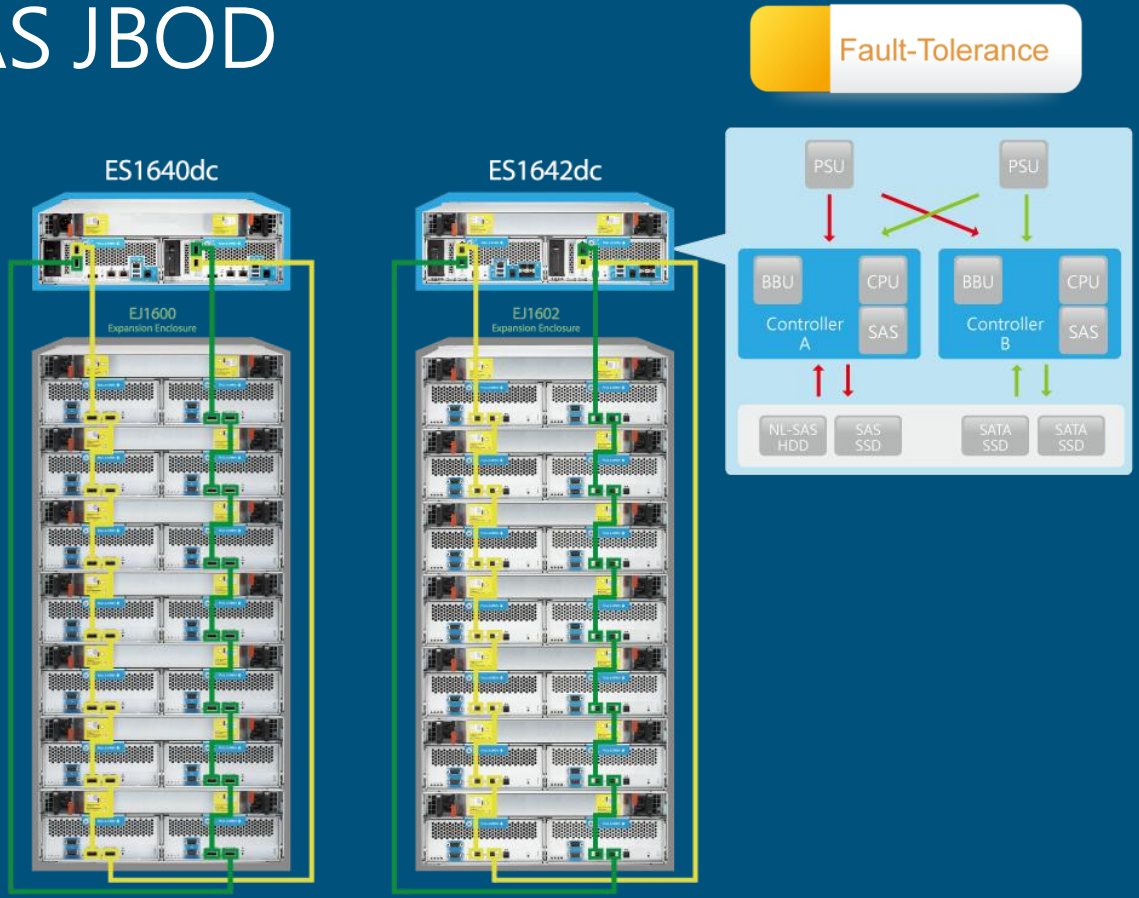


intel inside
Xeon

Dual Path Mini-SAS JBOD

Dual Active Controller model and the corresponding JBOD expansion enclosure all provide dual-channel (Dual Path) to prevent external damage to mini SAS.

Increase the storage capacity to over 1PB with expansion enclosures.

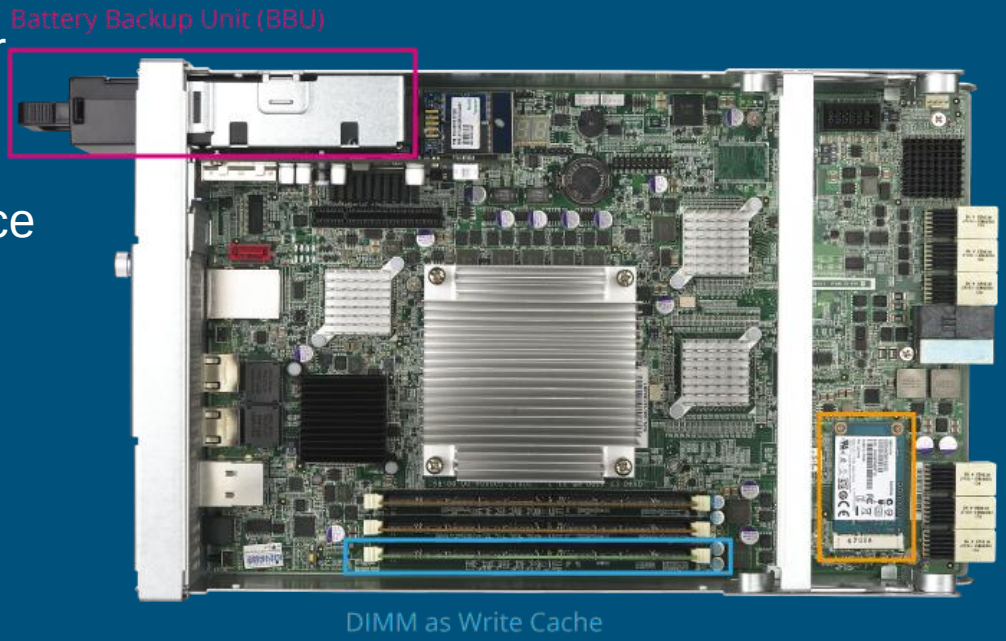


NVRAM w/Copy-to-Flash

Data Integrity

High Performance

Battery-protected DRAM for write cache and flash read acceleration provides industry-leading performance of random access.



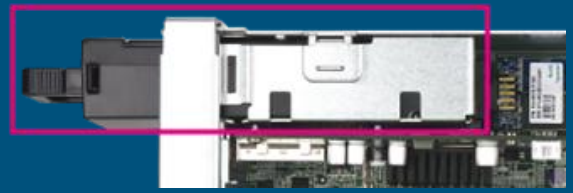
NVRAM w/Copy-to-Flash

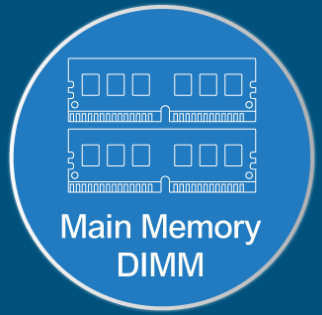
Data Integrity

High Performance

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

Battery Backup Unit (BBU)





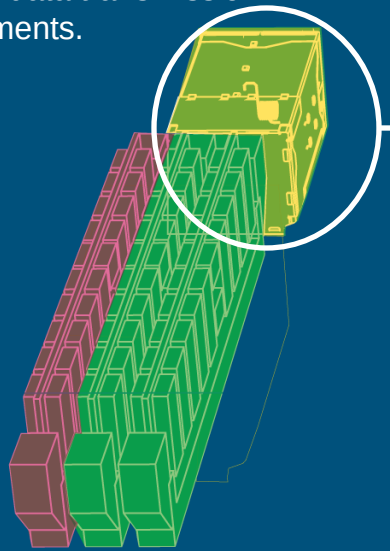
DDR3 memory modules dedicated to NVRAM - supports 16/32GB, power required by C2F is supplied by BBU.

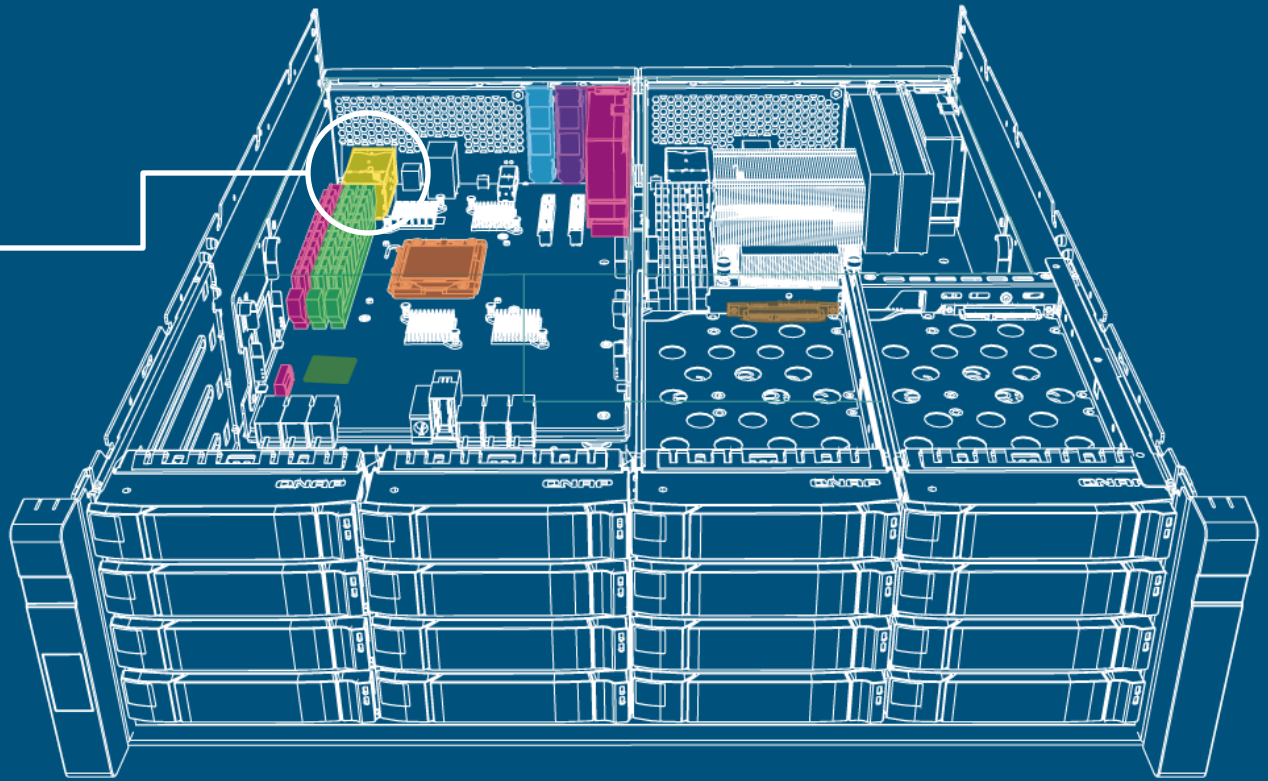
Dual-channel DDR3 system main memory - each channel supports 16/32GB, providing up to 32/64GB capacity.

10GbE SFP+ Network Interface & 40GbE NIC

High Performance

Built-in 4-port 10GbE SFP+, to meet various iSCSI/NFS/CIFS network data transmission requirements.

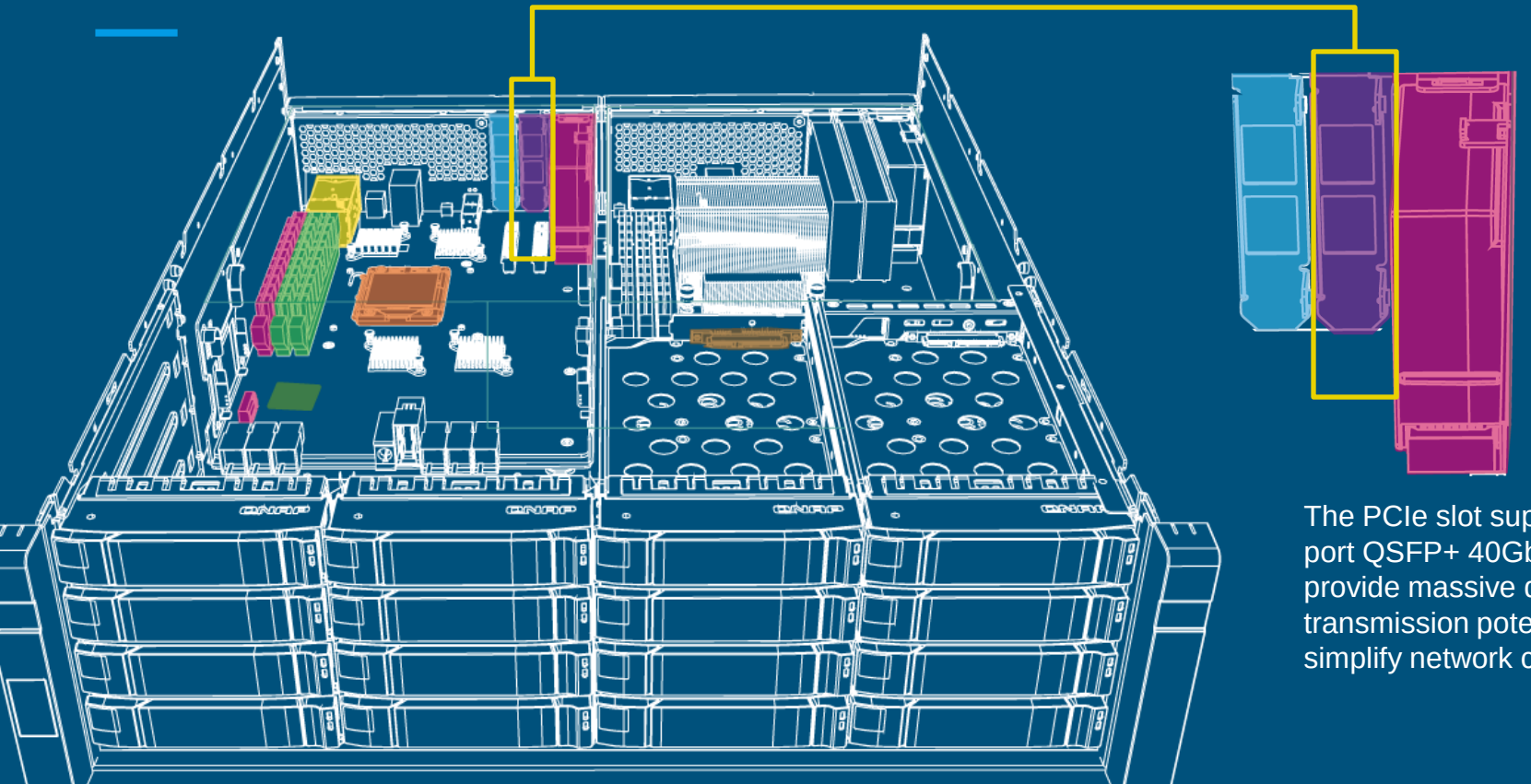




ES1642dc: built-in 4-port 10GbE SFP+
ES1640dc: built-in 2-port RJ45

10GbE SFP+ Network Interface & 40GbE NIC

High Performance

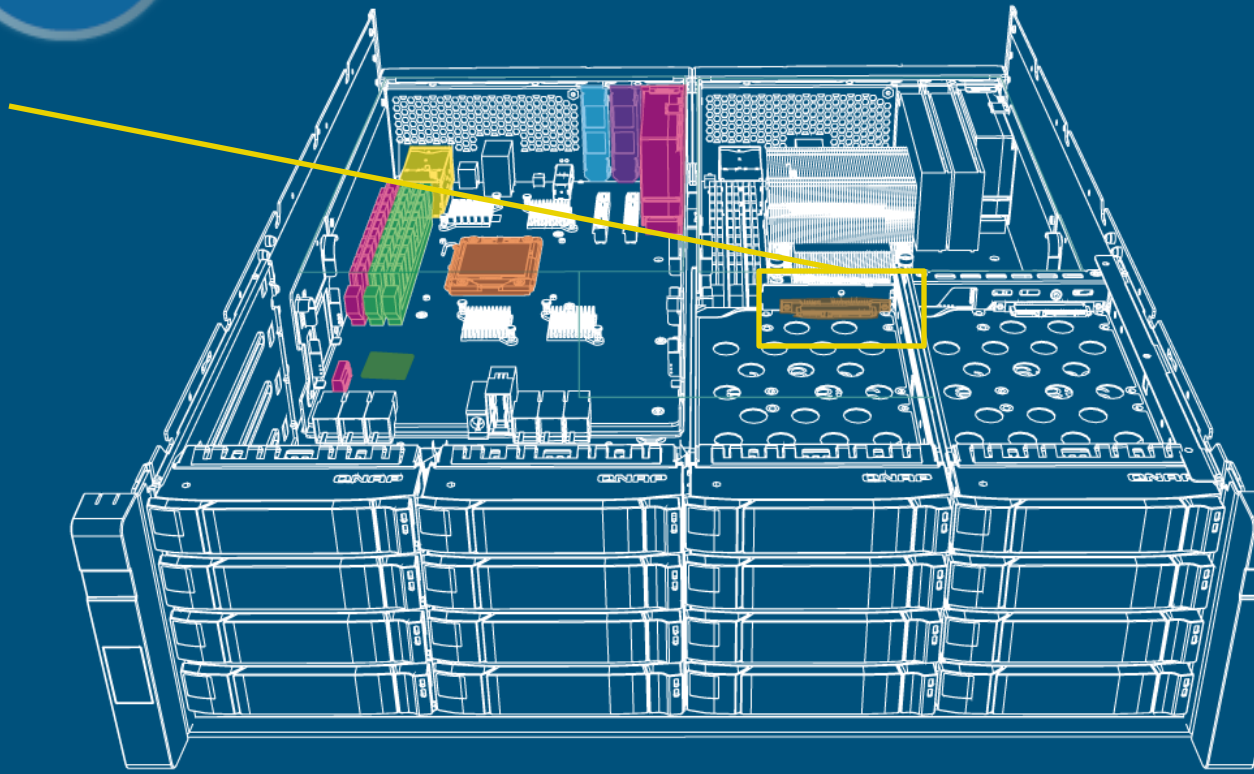


The PCIe slot supports a dual-port QSFP+ 40GbE NIC to provide massive data transmission potential and to simplify network cabling.

SATA to SAS

High Capacity

The LSISS9252 interposer board features the LSISS2520 device, which provides SAS-to-SATA bridging functionality. The LSISS9252 interposer supports communications between two SAS ports operating at up to 6Gb/s with one SATA port operating at up to 6Gb/s. For maximum performance, each port independently sends and receives data at the highest link rate achievable.

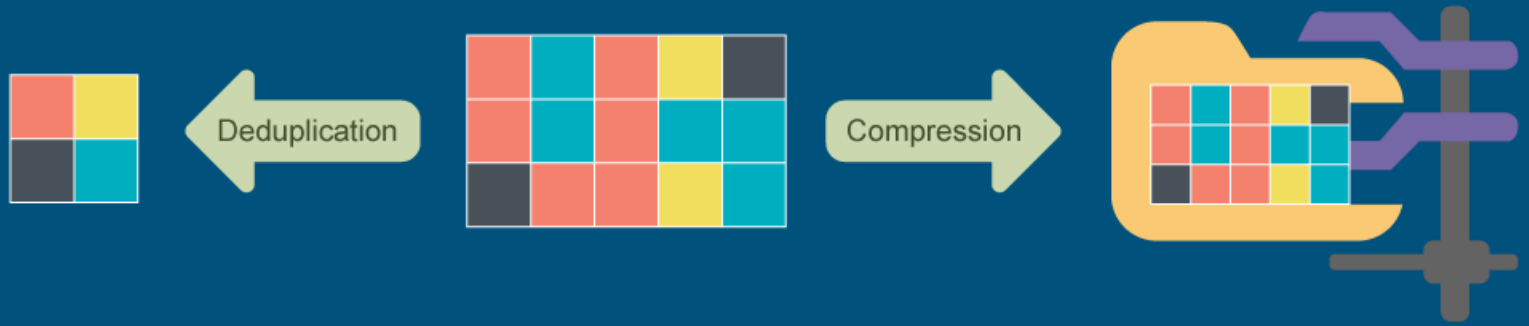


Data Deduplication & Compression

High Performance

High Capacity

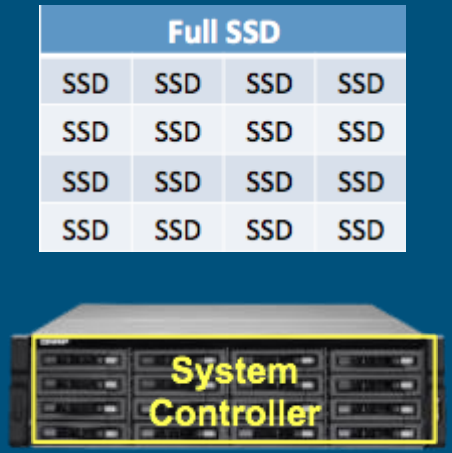
Block-level deduplication, real-time data compression, and Thin Provisioning with Reclaim makes it easy to create the most cost-effective remote virtual desktop platform and mission-critical information warehousing.



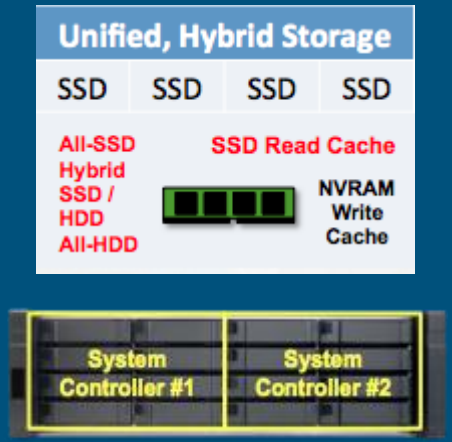
Reach a balance between cost and performace

High Capacity

VDI and other virtual applications need highly-efficient random access. High-performance enterprise-class SSD is expensive, high-capacity NL-SAS hard disks are too slow, so Enterprise ZFS NAS hybrid storage technology is the best solution in terms of both performance and capacity. The Enterprise ZFS NAS uses high-performance enterprise-class SSD as read/write cache, thus providing highly-efficient random access speeds.



QTS NAS

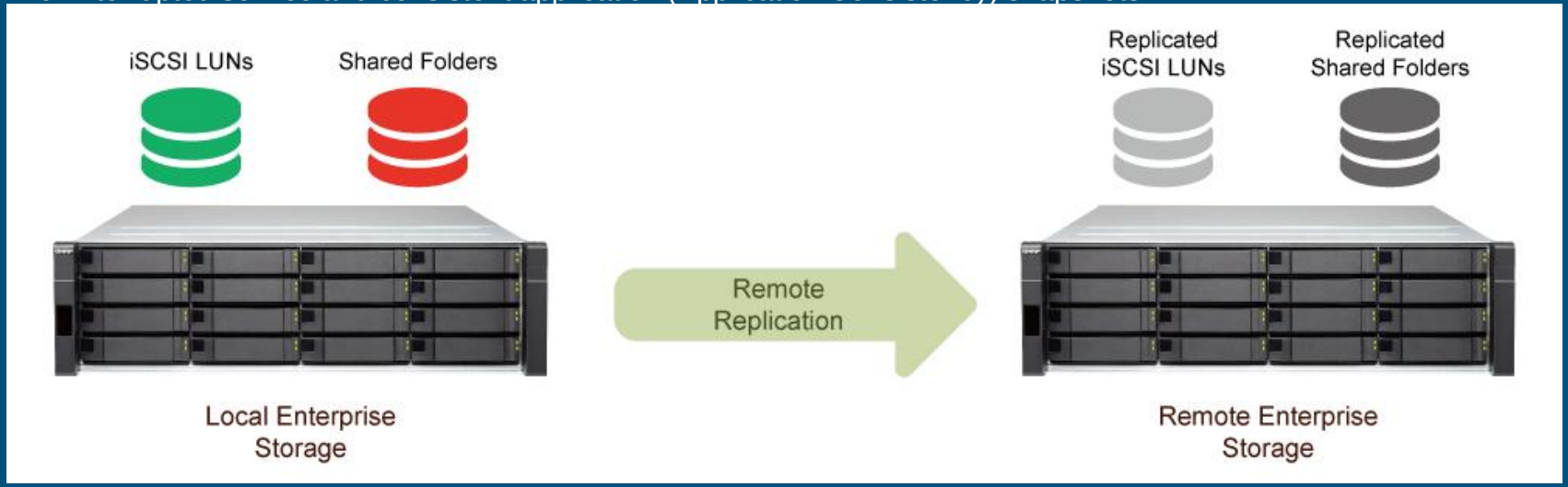


QES NAS

Snapshot for continous business

Disaster Recovery

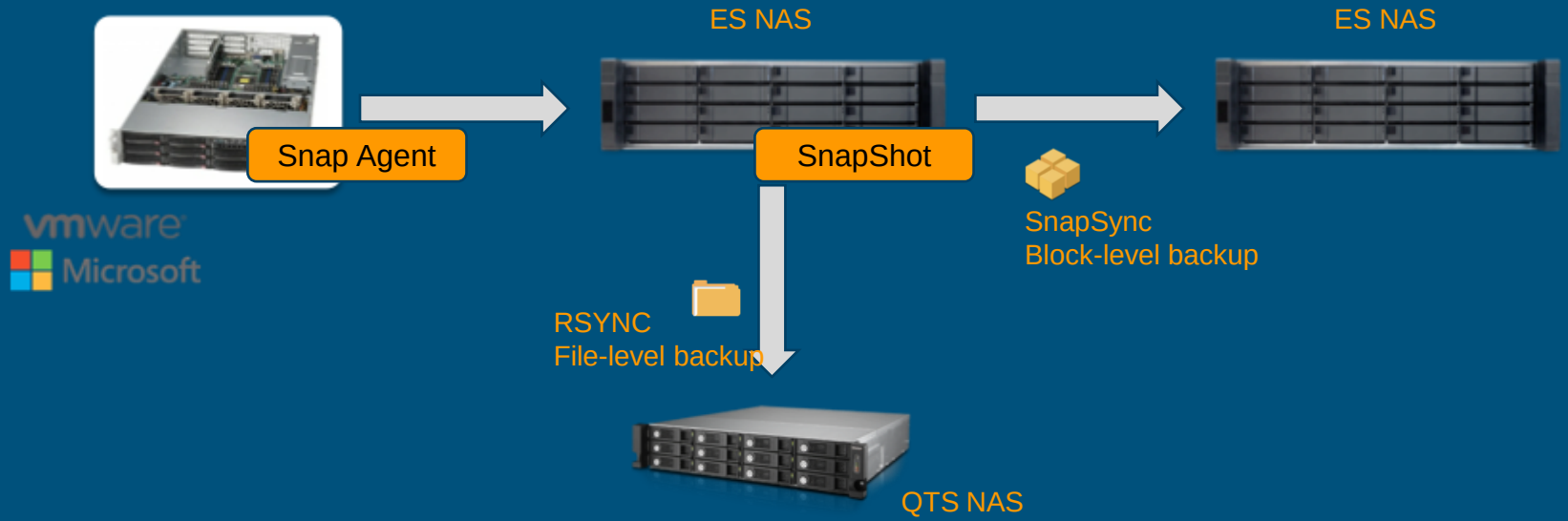
In comparison with previous high-end storage devices that can only provide a limited number of copies and traditional snapshots with a loss of storage efficiency over time, the Enterprise ZFS NAS provides lossless storage performance, almost unlimited amounts of high-performance real-time snapshots, and uninterrupted service. The Enterprise ZFS NAS's Snapshot Agent technology provides continuous and uninterrupted service snapshots while a user is still in the read write access process. Snapshot Agent is installed on the operating system side of the service application. When a snapshot is needed, the Snapshot Agent will notify the system to prepare and process the snapshot, thus providing continuous and uninterrupted service and consistent application (Application Consistency) snapshots.



Well-Rrounded Backup Solution

Disaster Recovery

When an Enterprise ZFS NAS executes a remote snapshot backup, it only needs to transfer the changed data, and can use deduplication and compression to significantly reduce the amount of transferred data. The Enterprise ZFS NAS can provide remote backup SnapSync for snapshots at the shortest interval of every five minutes, fully supports VMware vCenter Site Recovery (SRM) technology, provides Storage Replication Adapter (SRA) for SRM, and provides enterprise-class remote backup solution.



Powerful, but still easy to use

Consistent User Experience

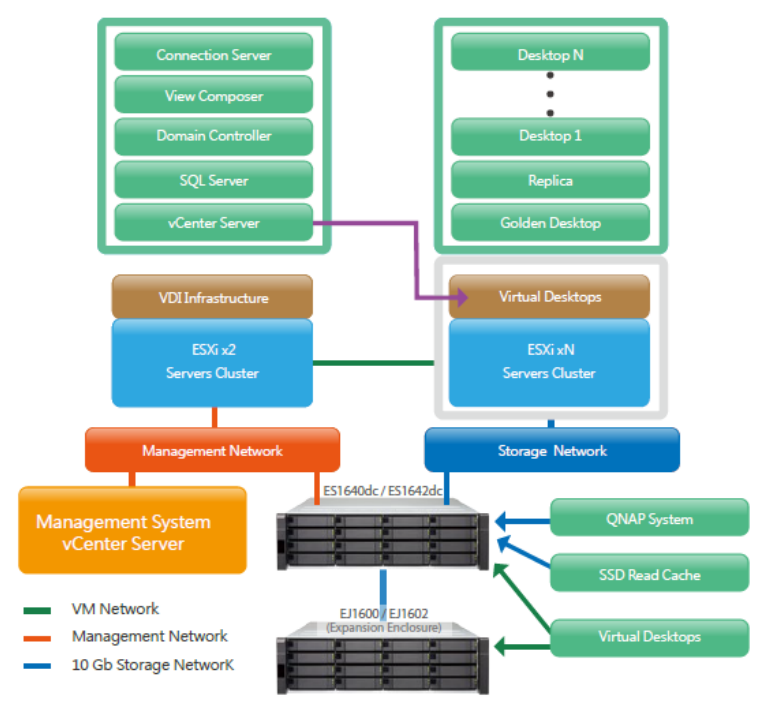
Inherited from well-reputed QTS, the intuitive, multi-window and multi-tasking GUI make current QTS users incredibly easy to get started and then master enterprise-class storage systems along with the shortest learning curve.

Overview of the QES and QTS operating systems

	QES	QTS
Operating System	FreeBSD	Linux
File System	ZFS	Ext4
App Station	No	Yes
Virtualizatoin Station	No	Yes
Dual active controller	Yes	No
NVRAM	Yes	No
40GbE network	Yes	Yes
SnapShot upper limit	65535	1024
Deduplication	Yes	No
Real time data compression	Yes	No
Remote disaster backup and recovery	SnapSync	Snap Replica

Applications

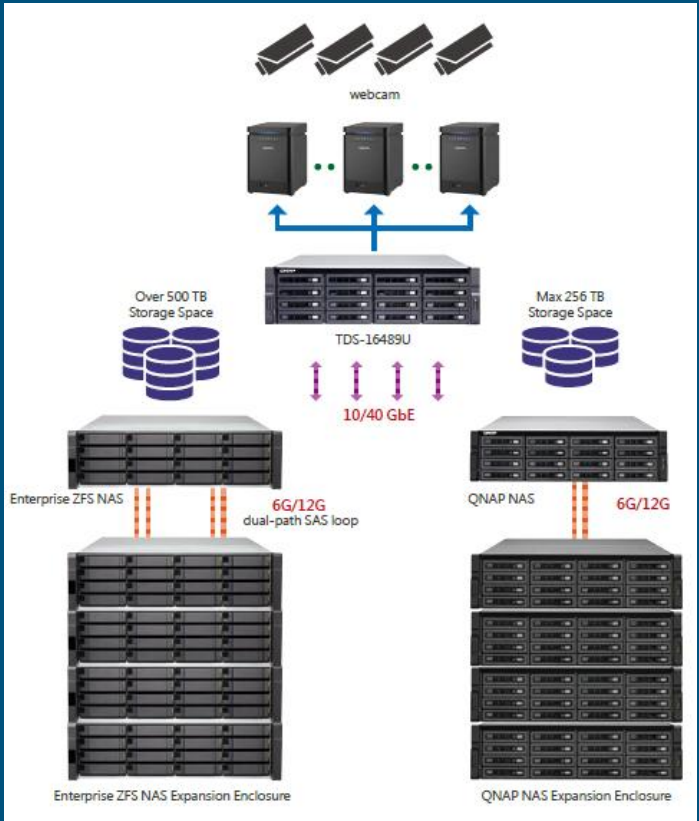
Case 1: Deploying a 250 seat remote virtual desktop infrastructure (VDI)



Implementing a read cache across an array of SSDs is the most common remedy to resolve the increased workload during workload ramp-up, and unexpected resource spikes in a short period. The QNAP ES1642dc and ES1640dc with the QES operating system fully support an SSD read cache to maintain the required IOPS.

Additionally, where VDI creates a great deal of data redundancy (hundreds of operating systems connect to a single clone) QES fully supports block-level de-duplication and compression to further improve disk utilization and reduce power requirements, reducing overall TCO significantly.

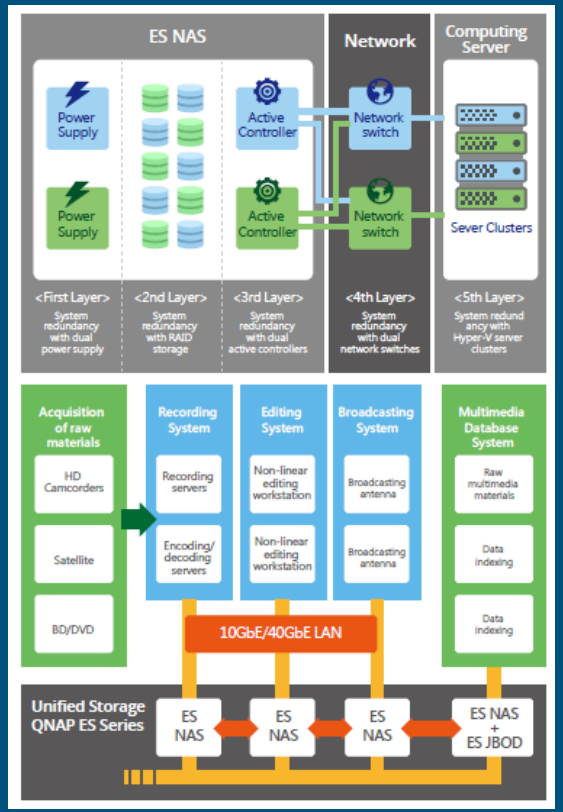
Case 2: Easily build a professional surveillance system with over 500TB storage capacity



Robust IP camera surveillance systems have become increasingly popular across the entire spectrum of business. The QNAP Enterprise ZFS NAS series (with high-availability, fault-tolerant, dual-active controllers) deliver uninterrupted services, providing the ideal foundation for building a robust surveillance system.

To safeguard business assets and property requires flexible and expandable storage with a near-zero downtime file system. The robust, scalable, and easy to administer ZFS file system of the QES operating system can instantly build over 500TB storage capacity and is capable of automatic Silent Data Corruption healing for persistent high levels of availability. Built-in 256-bit checksums end-to-end validate data stored further ensuring data integrity, while, the Copy-On-Write (CoW) mechanism employed by snapshots facilitate enterprise-class backup and recovery.

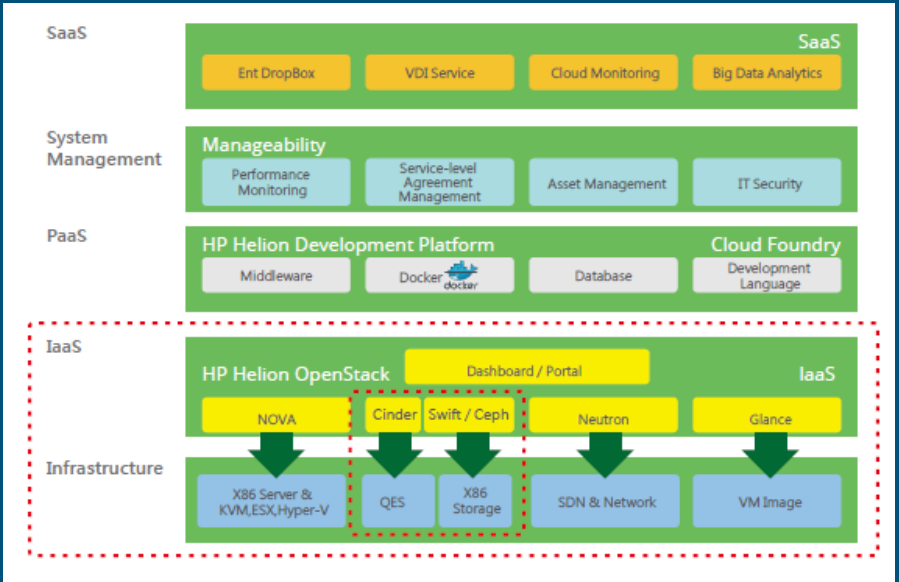
Case 3: Building a high-performance and reliable video editing station



No matter in a large media studio or small or medium TV broadcasting station, it requires different professionals to contribute in the entire process- in or post-production. Not only powerful and reliable work stations are necessary in each production node but a shared storage device with huge capacity and high availability is of more importance for a smooth production process.

QNAP ES1642dc / ES1640dc equipped with dual-active controllers provides near zero-downtime to fulfill the demand for business-critical storage. It will be a big aid for media professionals who have a busy lifestyle. Moreover, ES1642dc/ES1640dc offers plenty of opportunities for expansion with the QNAP EJ expansion units, i.e., EJ1602/EJ1600, which is capable of attaining 500TB capacity of a single storage pool.

Case 4: Cost-efficient enterprise storage solutions



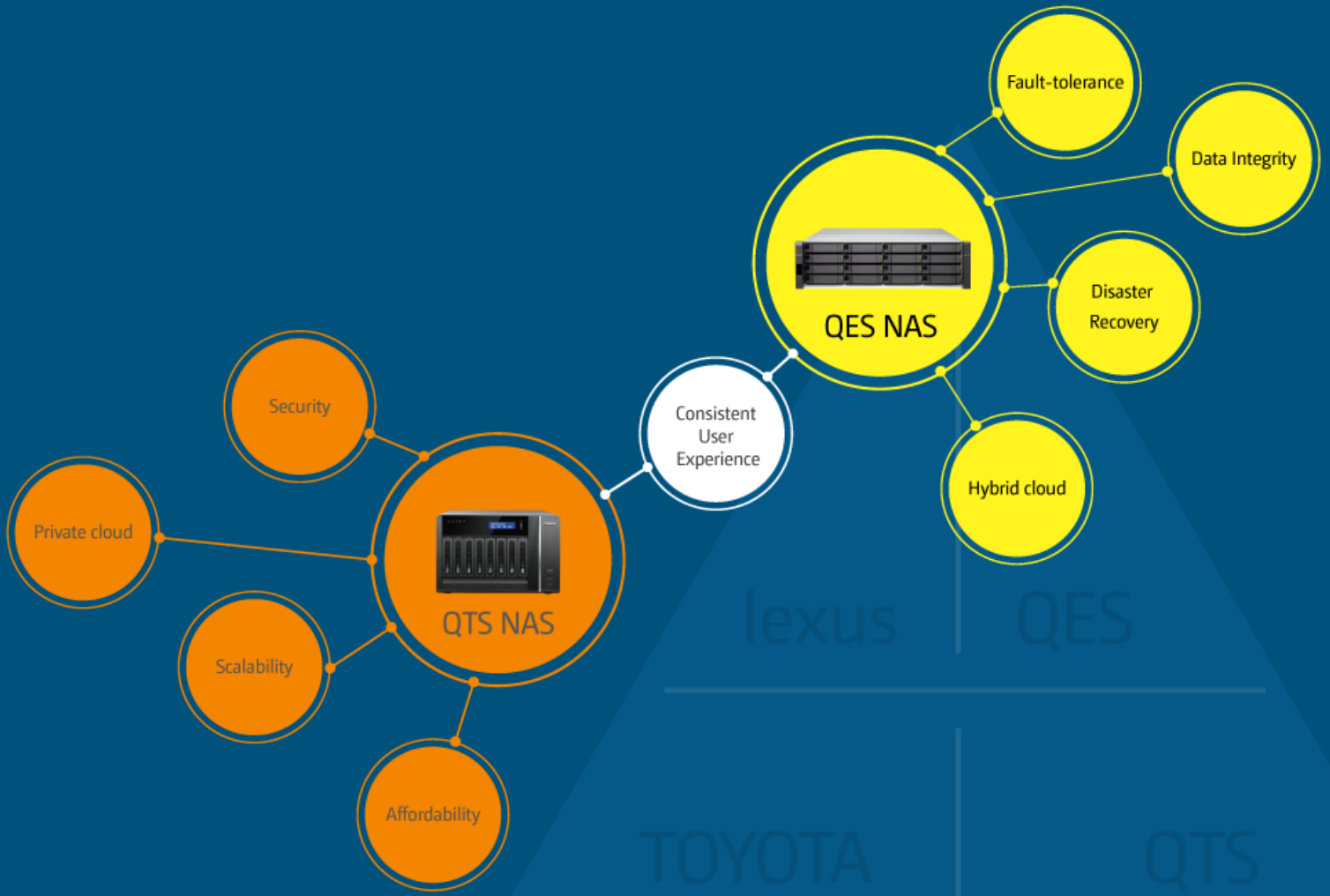
The ES NAS series provides Cinder driver to enable the ES NAS to be used seamlessly as block storage resource for Cinder. It enables rapid IT response to ever-changing demands of business via self-service provisioning of infrastructure services. It has far more advantages than any other open-source distributed storage architecture and the performance is about 5 to 10 times. QES can be easily coupled with HPE Helion to provide simpler and more reliable enterprise private hybrid cloud solutions, to ensure that enterprises can still enjoy uninterrupted, highly available, highly-stable services in dense virtualized environments. In addition, QES supports a range of implementations of Virtual Desktop Infrastructure (VDI) using Remote Desktop Protocol (RDP). For example, the QES can be used with HP Helion OpenStack® to build OpenVDI Cloud Desktop, a on-demand agile cloud desktop.

Hardware specification - ES1642dc

CPU	Intel Xeon E5-2400 v2 family processor Intel Xeon 6-core Processor E5-2420 v2 (15M Cache, 2.20GHz)
Memory	System memory: DDR3 RDIMM Total memory slots: 6 (Dual controllers; 2 x main memory DIMM and 1 x write chache DIMM for NVRAM for each controller. 32GB for main memory DIMM and 16GB write chache DIMM per controller.)
USB	2 x USB 3.0/2.0 port
Hard Drive	16 x 3.5” SAS (12Gbps/6Gbps), SATA (6Gbps/3Gbps) HDD, or 2.5" SAS/SATA SSD (LSISS9252 6Gb/s SAS/SATA Interposer is required)
Hard Drive Interface	SAS 12Gb/s, backward compatible with SAS/SATA 6Gbps (LSISS9252. 6Gb/s SAS/SATA Interposer is required for SATA)
10Gbps LAN Port	4 x SFP+, Intel XL710-AM1 per controller
PCIe Slot	PCIe Slot x8 (Gen3 x8): reserved for 40GbE LAN card PCIe Slot x4 (Gen2 x4): reserved for dual path Mini-SAS
Cache	M.2 2280 for NVRAM

Hardware specification - ES1640dc

CPU	Intel Xeon E5-2400 v2 family processor Intel Xeon 6-core Processor E5-2420 v2 (15M Cache, 2.20GHz)
Memory	System memory: DDR3 RDIMM Total memory slots: 6 (Dual controllers; 2 x main memory DIMM and 1 x write chache DIMM for NVRAM for each controller. 32GB for main memory DIMM and 16GB write chache DIMM per controller.)
USB	2 x USB 3.0/2.0 port
Hard Drive	16 x 3.5” SAS (12Gbps/6Gbps), SATA (6Gbps/3Gbps) HDD, or 2.5" SAS/SATA SSD (LSISS9252 6Gb/s SAS/SATA Interposer is required)
Hard Drive Interface	SAS 6Gb/s, backward compatible with SATA 6Gbps (LSISS9252. 6Gb/s SAS/SATA Interposer is required for SATA)
10Gbps LAN Port	2 x RJ45, Intel X540-BT2 per controller
PCIe Slot	PCIe Slot x8 (Gen3 x8): reserved for 40GbE LAN card PCIe Slot x4 (Gen2 x4): reserved for dual path Mini-SAS
Cache	mSATA for NVRAM


Fault-tolerance
Data Integrity
QES NAS
Disaster Recovery
Hybrid cloud
Consistent User Experience
Security
Private cloud
QTS NAS
Scalability
Affordability
lexus
QES
TOYOTA
QTS

The Best Choice

It is the best choice for both small and medium enterprises with limited budgets and large IT departments with mission-critical business applications.