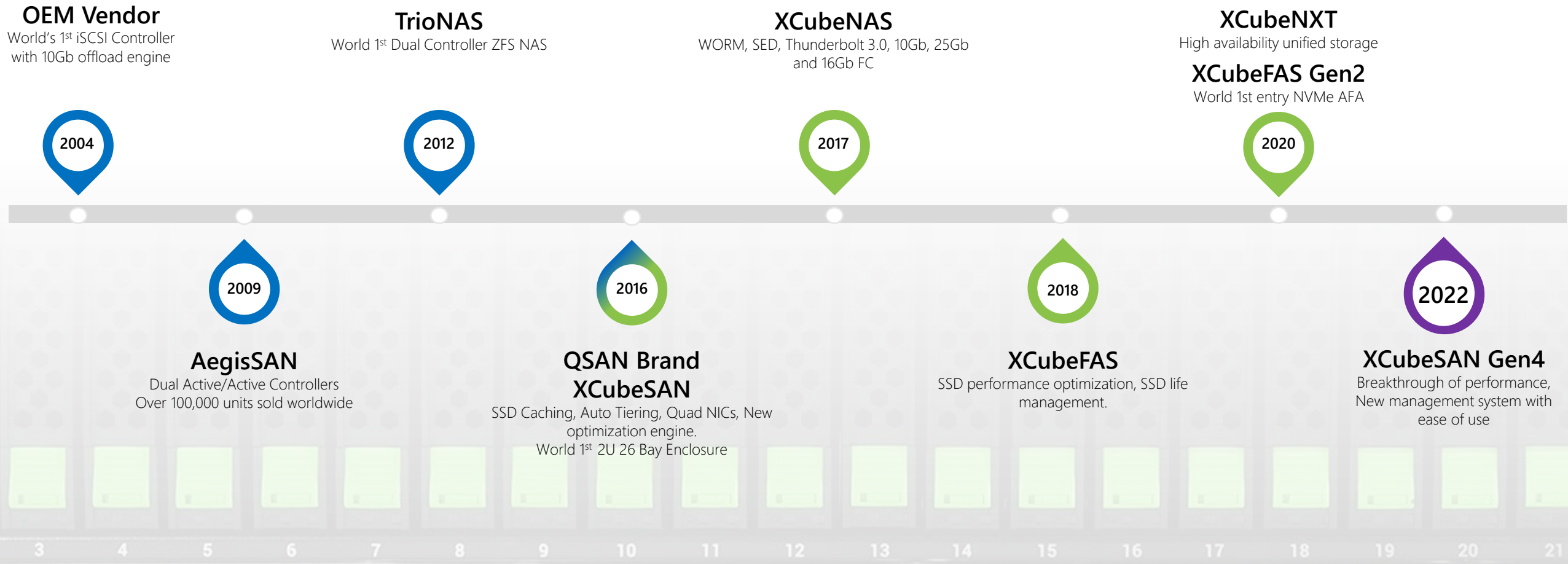# ENTERPRISE DATA STORAGE REDEFINED

Freedom in IT Infrastructure: uncompromised reliability, performance, support, cross-vendor platform integration

QSAN
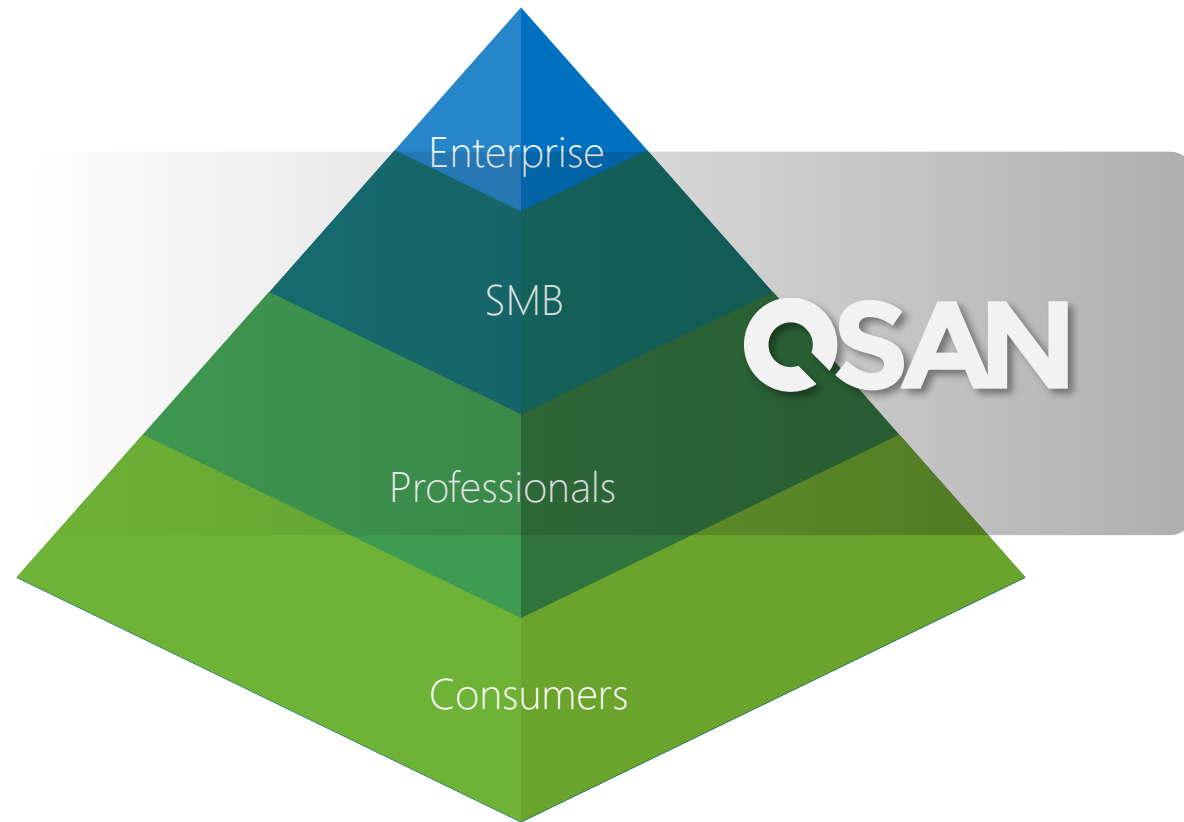
Key Milestones

OEM Vendor
World's 1st iSCSI Controller with 10Gb offload engine

2004

TrioNAS
World 1st Dual Controller ZFS NAS

2012

XCubeNAS
WORM, SED, Thunderbolt 3.0, 10Gb, 25Gb and 16Gb FC

2017

XCubeNXT
High availability unified storage

XCubeFAS Gen2
World 1st entry NVMe AFA

2020

2009

AegisSAN
Dual Active/Active Controllers
Over 100,000 units sold worldwide

2016

QSAN Brand
XCubeSAN
SSD Caching, Auto Tiering, Quad NICs, New optimization engine.
World 1st 2U 26 Bay Enclosure

2018

XCubeFAS
SSD performance optimization, SSD life management.

2022

XCubeSAN Gen4
Breakthrough of performance, New management system with ease of use

3   4   5   6   7   8   9   10   11   12   13   14   15   16   17   18   19   20   21
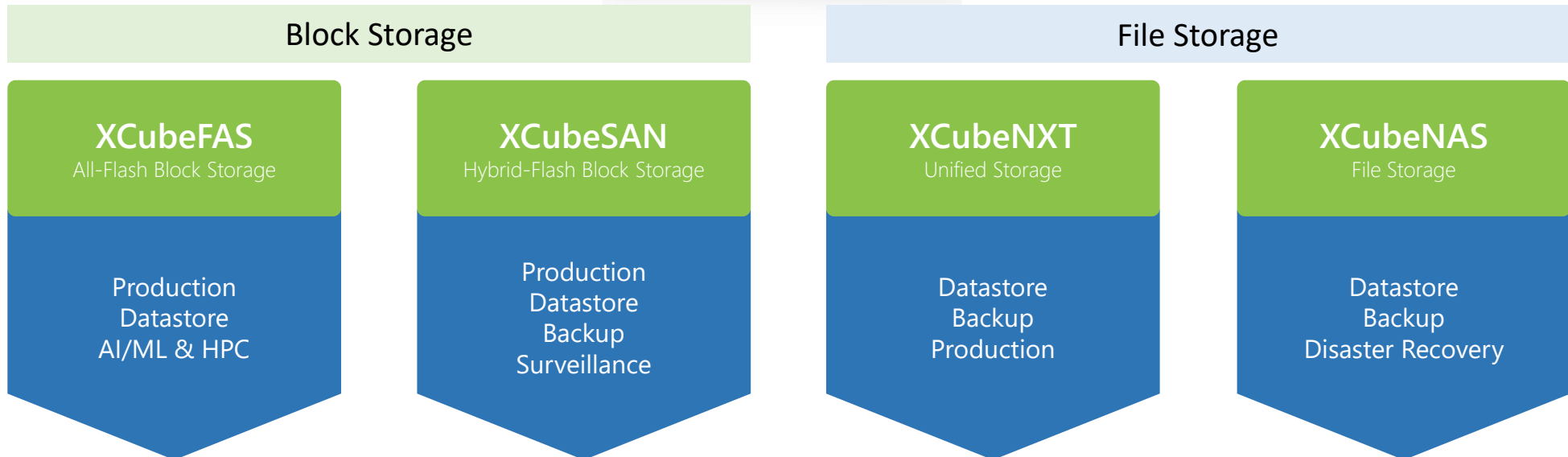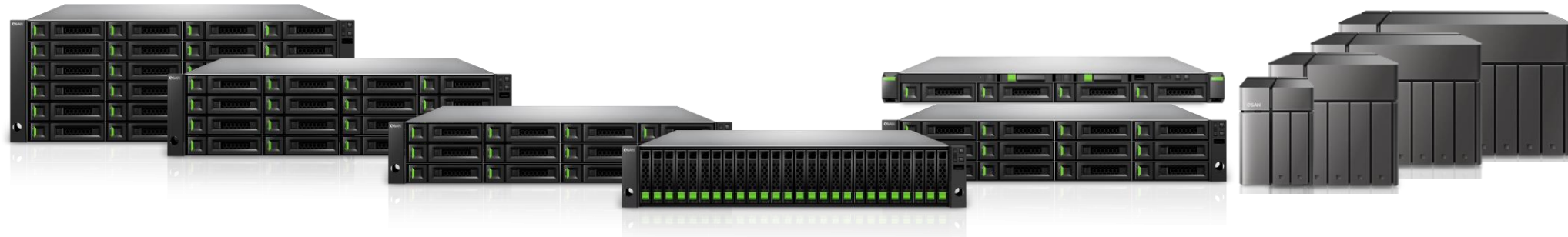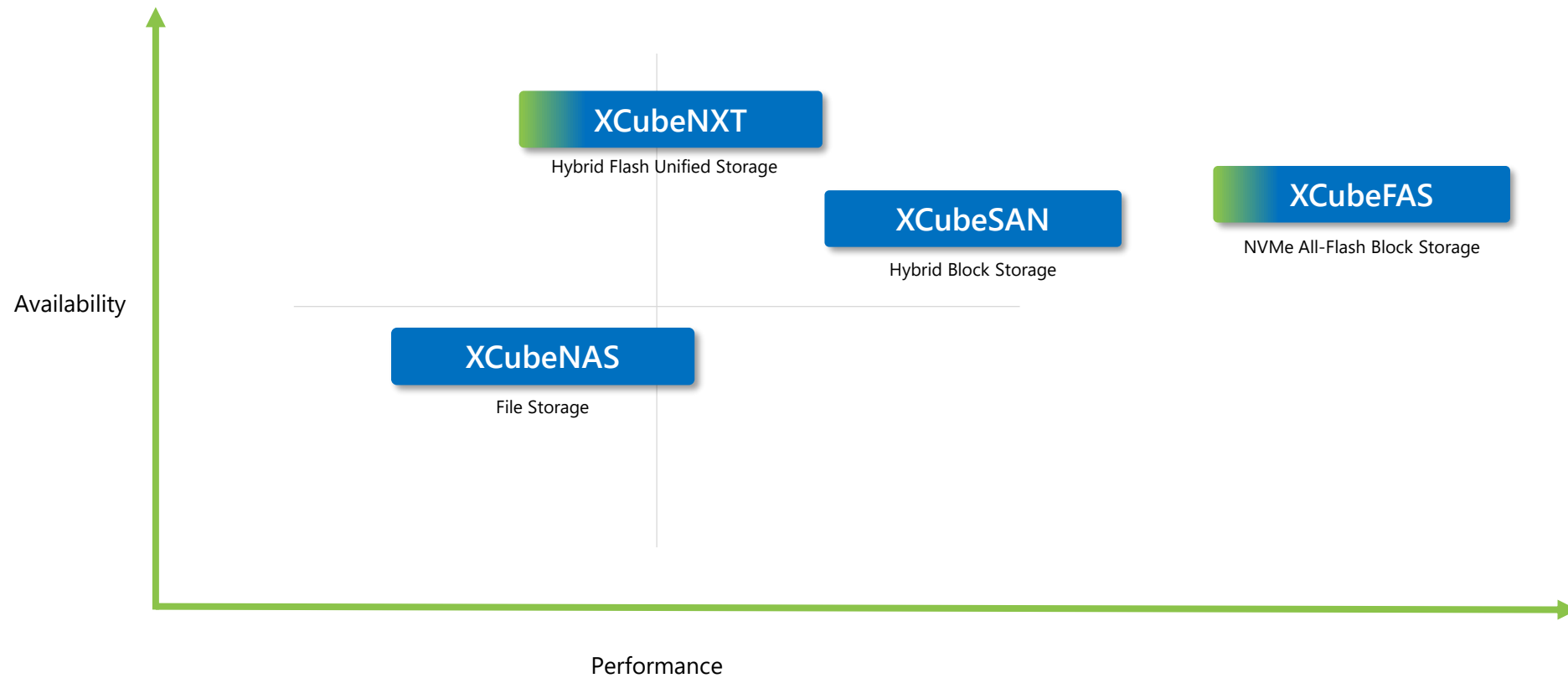
Follow the Marketing Position
Leading price-performance enterprise storage

XCube Platform – One Architecture

Block Storage		File Storage	
XCubeFAS All-Flash Block Storage	**XCubeSAN** Hybrid-Flash Block Storage	**XCubeNXT** Unified Storage	**XCubeNAS** File Storage
Production Datastore AI/ML & HPC	Production Datastore Backup Surveillance	Datastore Backup Production	Datastore Backup Disaster Recovery

QSAN

QSAN Product Positioning

Availability

Performance

XCubeNXT
Hybrid Flash Unified Storage

XCubeSAN
Hybrid Block Storage

XCubeFAS
NVMe All-Flash Block Storage

XCubeNAS
File Storage

Our Customers

	Public Defense, Healthcare, Education	Global Enterprise	Oil and Gas	MSP, Hosting	Sports and Entertainment
Production/Primary	QinetiQ · UNIVERSITY OF CAMBRIDGE	Saputo Dairy UK · Holiday Inn	GAZPROM	hoster.by · tas group an owl company	MANCHESTER CITY · COMEDY CLUB PRODUCTION
Shared Storage	LUCE CINECITTÀ · BMA	Santander · KLA	aramco · HP HINDUSTAN PETROLEUM CORP. LTD.	Daily Mail	CAPA · LIVERPOOL FOOTBALL CLUB
Backup	RYDYGIER · UMBERTO I POLICLINICO DI ROMA	etstur · GENERALI	ROSNEFT	SAFEDATASTORAGE · VIRTUS Data Centres	antenne BAYERN
Surveillance	Khalifa University	Continental	ADNOC		AL NASSR

Target Application – Enterprise IT

Clients

Application Servers

File sharing & Client backup

Unified & NAS (File Storage)

Could backup

Primary Storage – AFA & SAN
(Block Storage)

Local Backup – SAN, Unified & NAS
(Block or File Storage)

Remote Site

Remote Backup – SAN, Unified & NAS
(Block or File Storage)
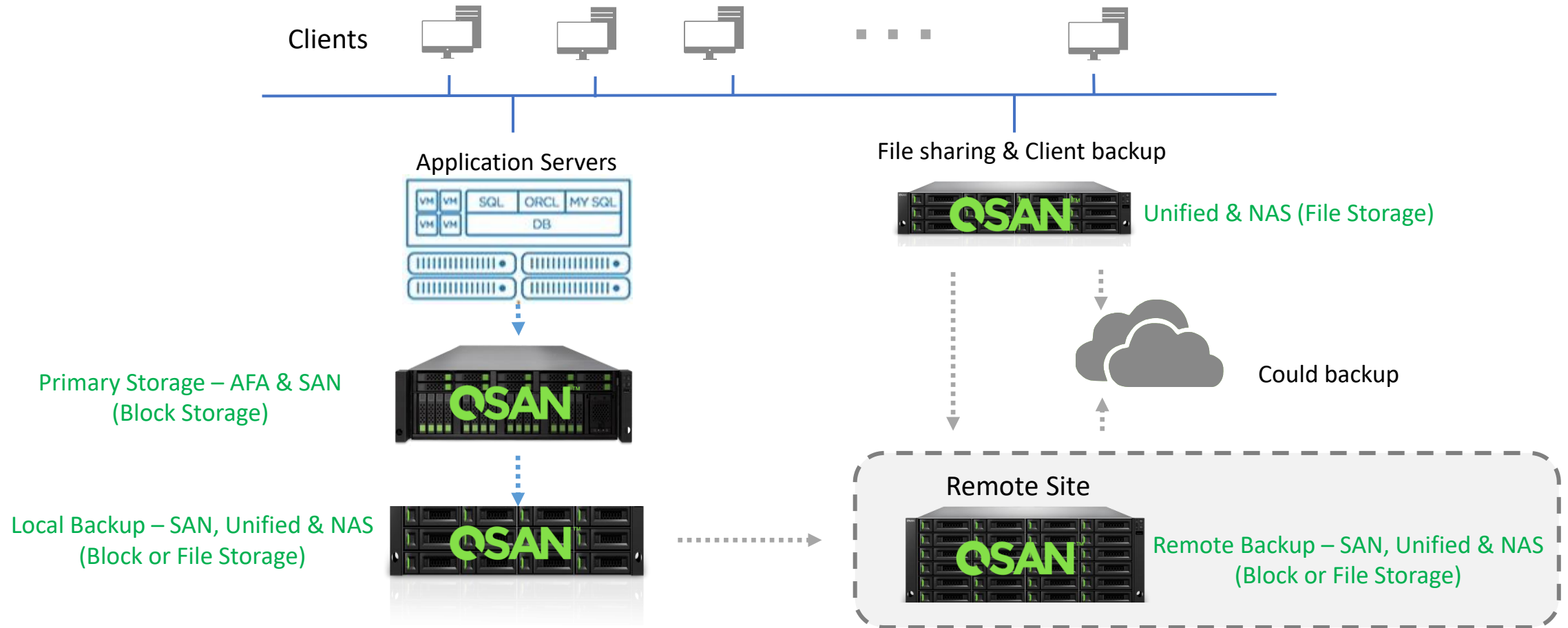
Target Application – Large Surveillance

IP Cameras *200   IP Cameras *200   IP Cameras *200   ...

POE Switch   POE Switch   POE Switch   ...

Ethernet switch   Ethernet switch

VMS Server   VMS Server   VMS Server   ...

Centralized Share Storage – up to 2048 iSCSI connections (Block Storage)

Expansion units – Up to 16PB
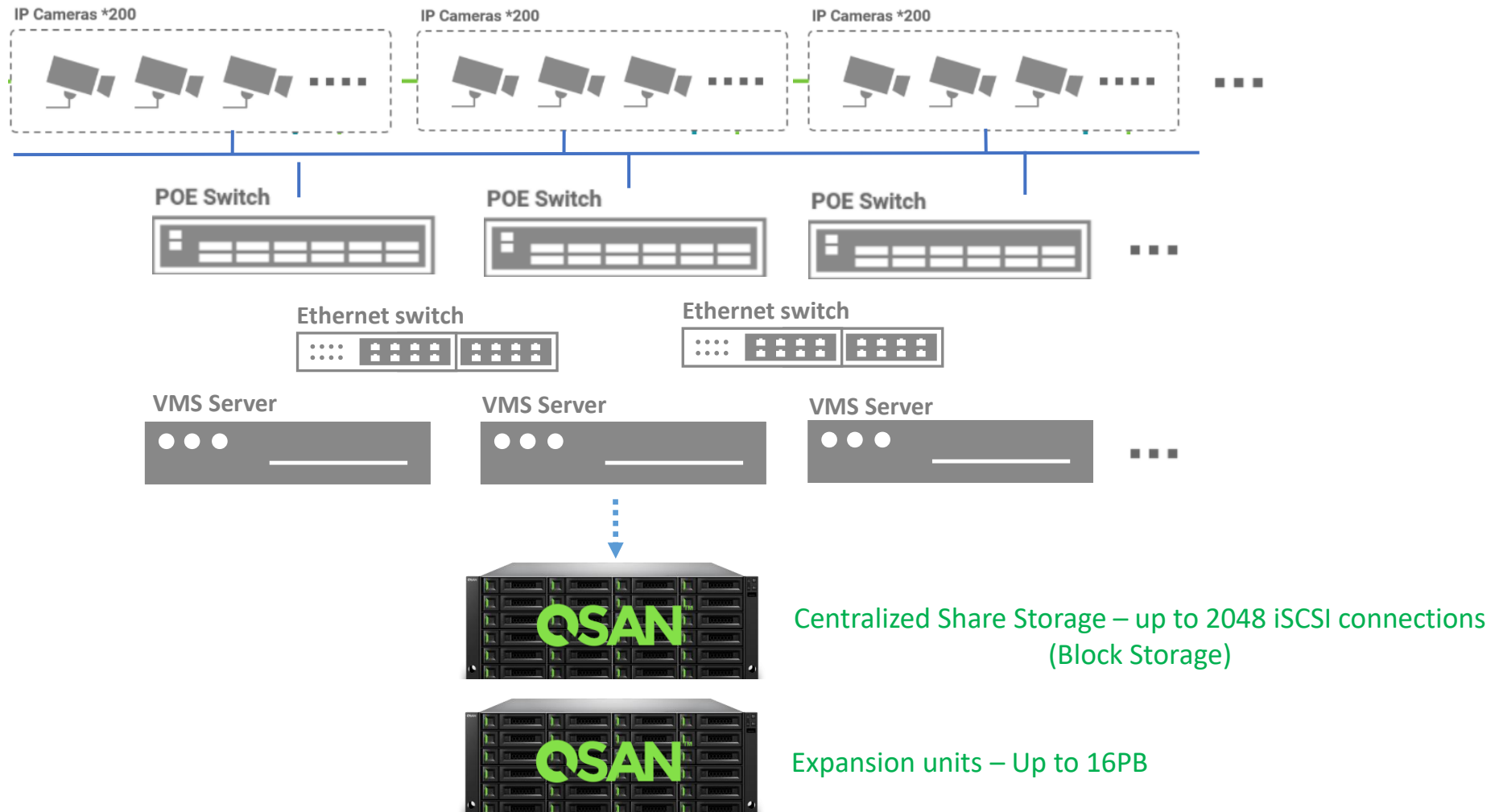
Target Application – Media Editing

Content Acquisition

Film Camera

Telecine

Digital Camera

Network and Other Digital Sources

DI

Render Farm

NLE/Post Production

NLE   Compositing

Shared Storage – AFA, SAN, Unified & NAS
(Block or File Storage)

QSAN

Color Correction   Grain and Noise   Conform and Assembly

Content Distribution

Film Print

Digital Cinema

Broadcast

Cable/Satellite

Internet/Phone

Transcode

Archive or Backup

QSAN

QSAN

SAN, Unified & NAS
(Block or File Storage)

Expansion units –
Up to 16PB
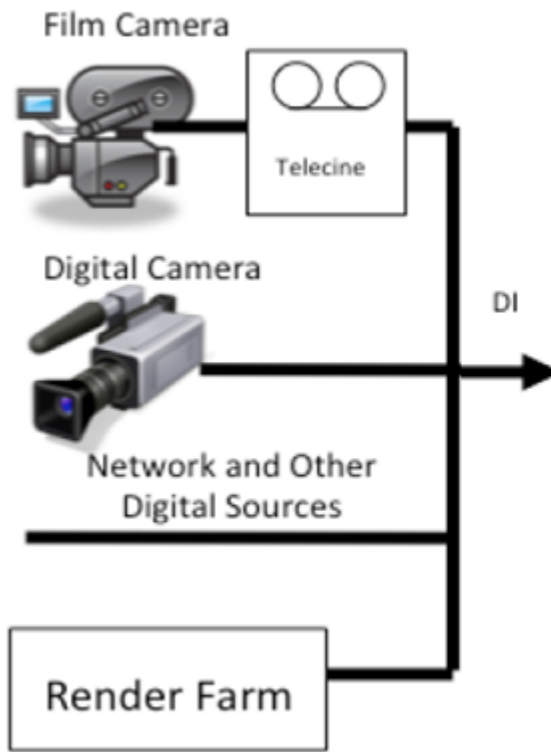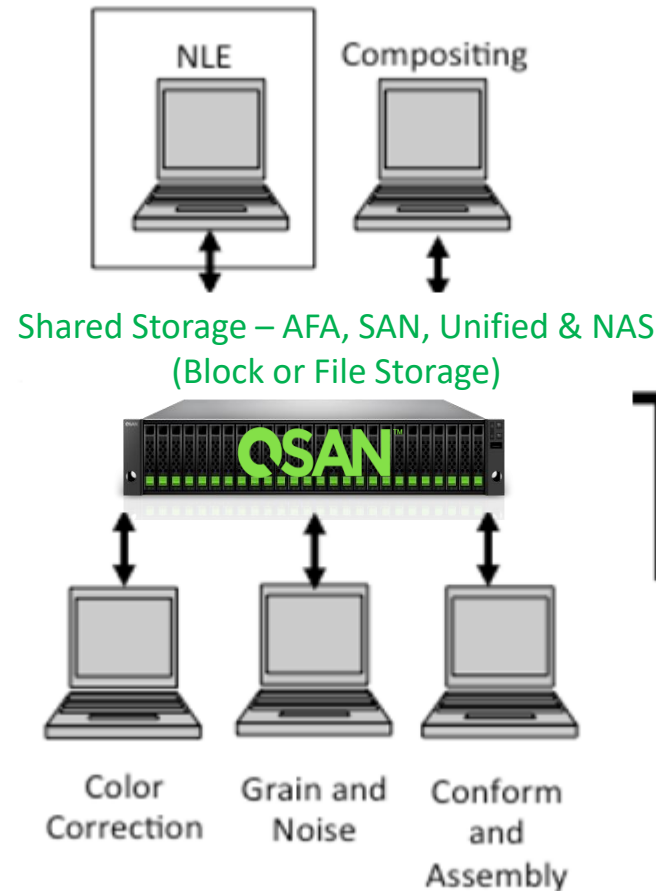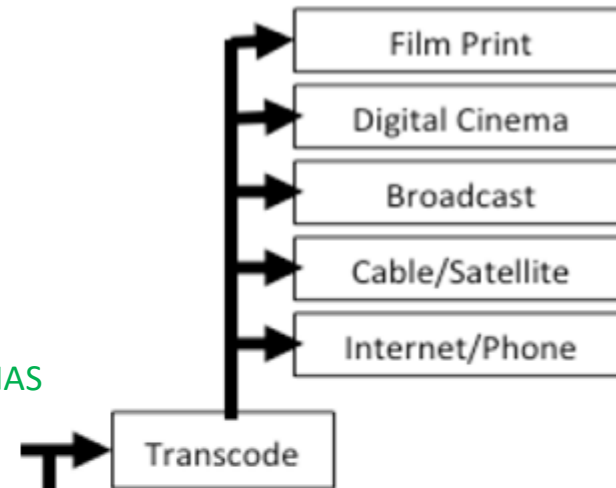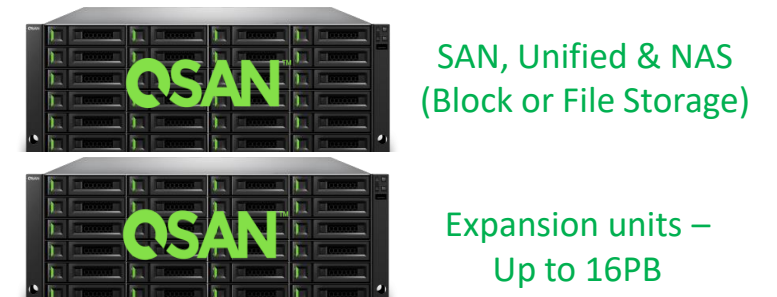
Ideal Application – HPC & AI

Performance Optimized

Cost Optimized

https://blog.qsan.com/best-storage-for-ai/
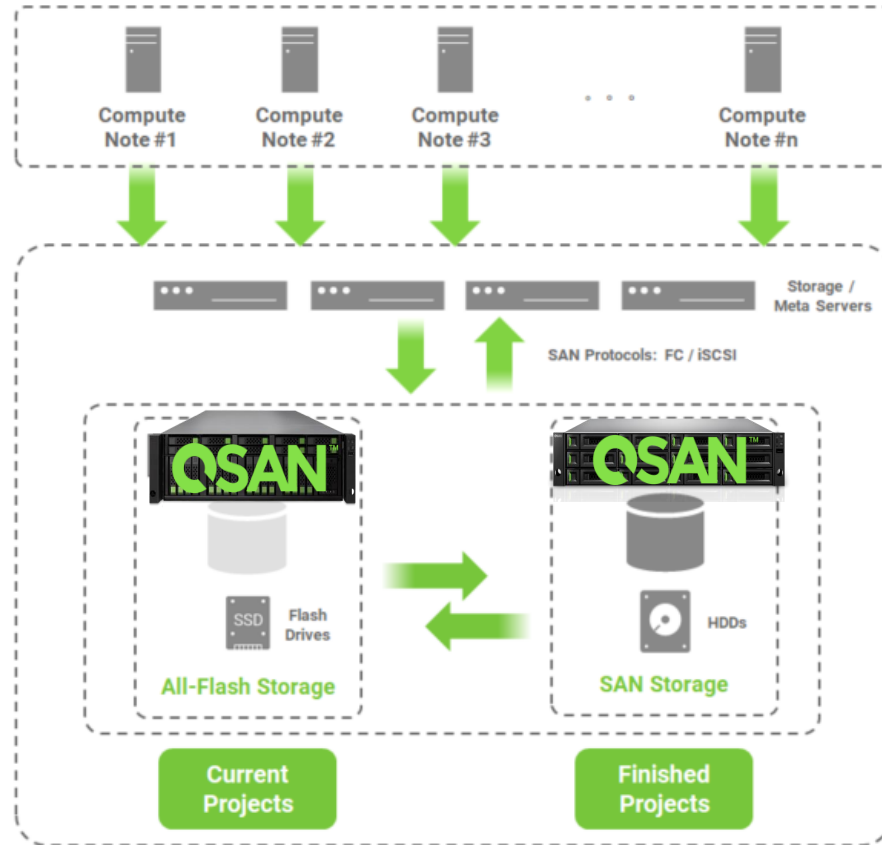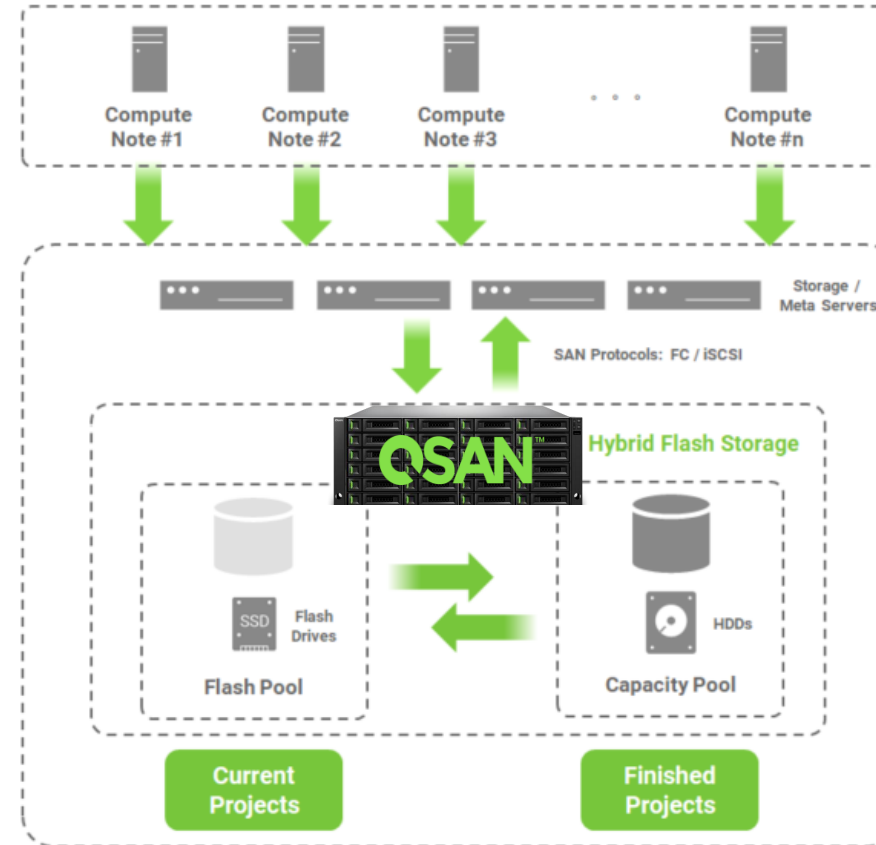
Expanding Ecosystem Partners

Connectivity	Drive and Expansion	Virtualization	Backup	Surveillance	Media & Entertainment

XCube Platform – One Architecture

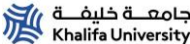| Block Storage		File Storage	
XCubeFAS All-Flash Block Storage	**XCubeSAN** Hybrid-Flash Block Storage	**XCubeNXT** Unified Storage	**XCubeNAS** File Storage
Production Datastore AI/ML & HPC	Production Datastore Backup Surveillance	Datastore Backup Production	Datastore Backup Disaster Recovery
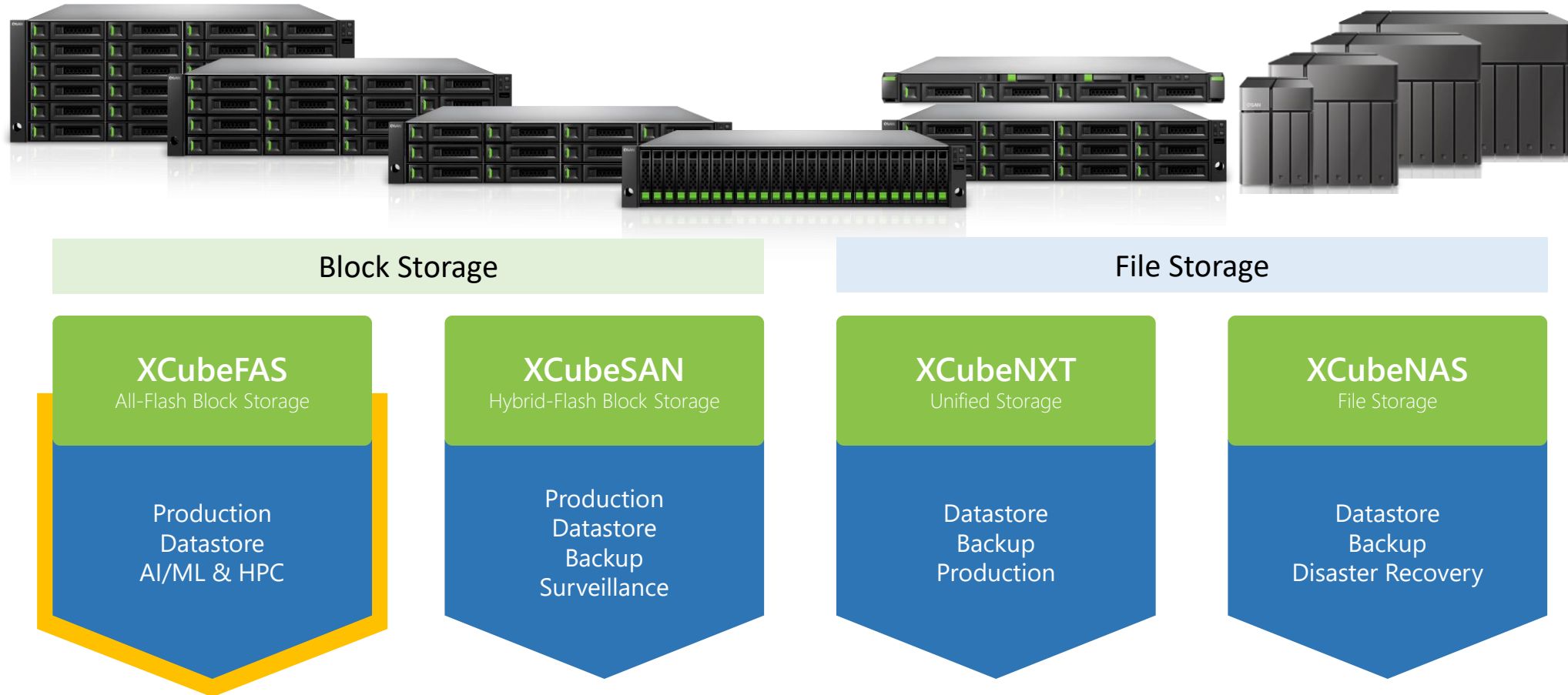
Media Awards

"QSAN's 3126D is **one of the better** entry-level all-flash arrays we've come across"

FIVE STARTS - "Qsan delivers an enterprise-class NVMe AFA at an SMB price"

GAME CHANGER- "As the first native NVMe AFA with a price tag below $20K, the XCubeFAS XF3126D is a game changer."

XCubeFAS Gen2, Product Line

XF3000-Series

(Intel® Xeon 6-Core, 16GB DDR4 RDIMM with Max 392GB Per Controller)

3U 26-bay

XF3126D

Flash-Based Management System

XCubeFAS XF3126D

6-Core Xeon Bronze (12-Cores per Array)

Dual PSU

Up to 768GB RDIMM

4x 10Gb iSCSI SFP+

4x PCIe 3x8 Slots

4x FAN per Controller (8 Per System)
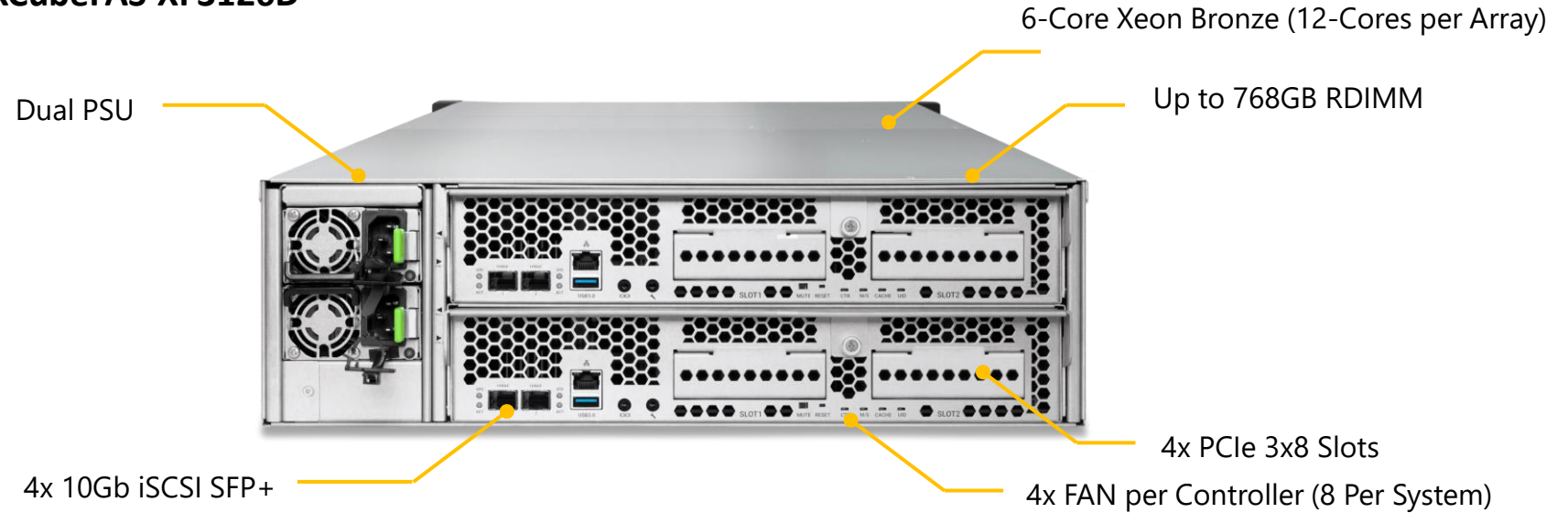
Optional Host Cards

| 2 port 32Gb FC | 2 port 25Gb SFP28 | 2 port 10GbE Base-T |
| 2/4 port 16G FC | 4 port 10GbE SFP+ | |

XEVO 2.0
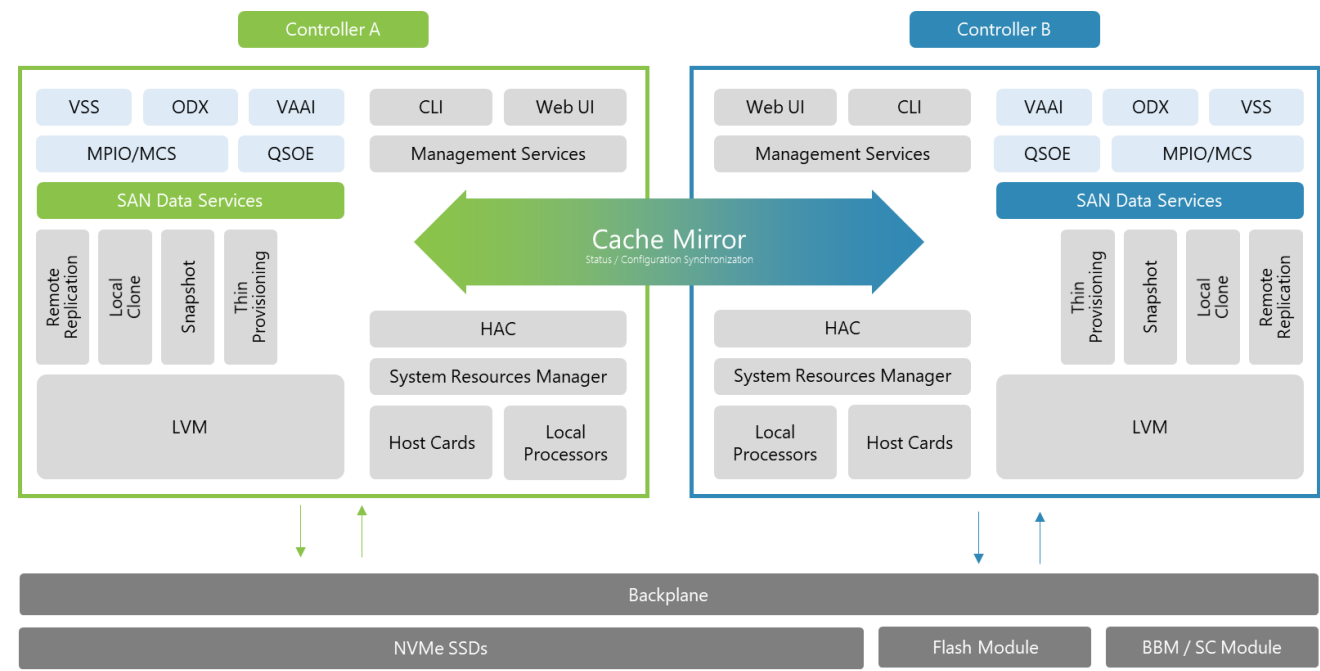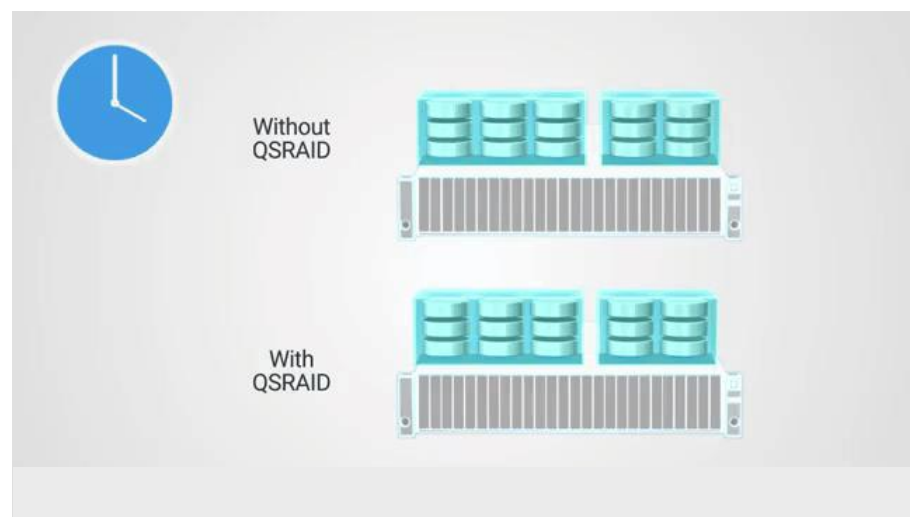
XCube Platform – One Architecture

XCubeSAN Product Line
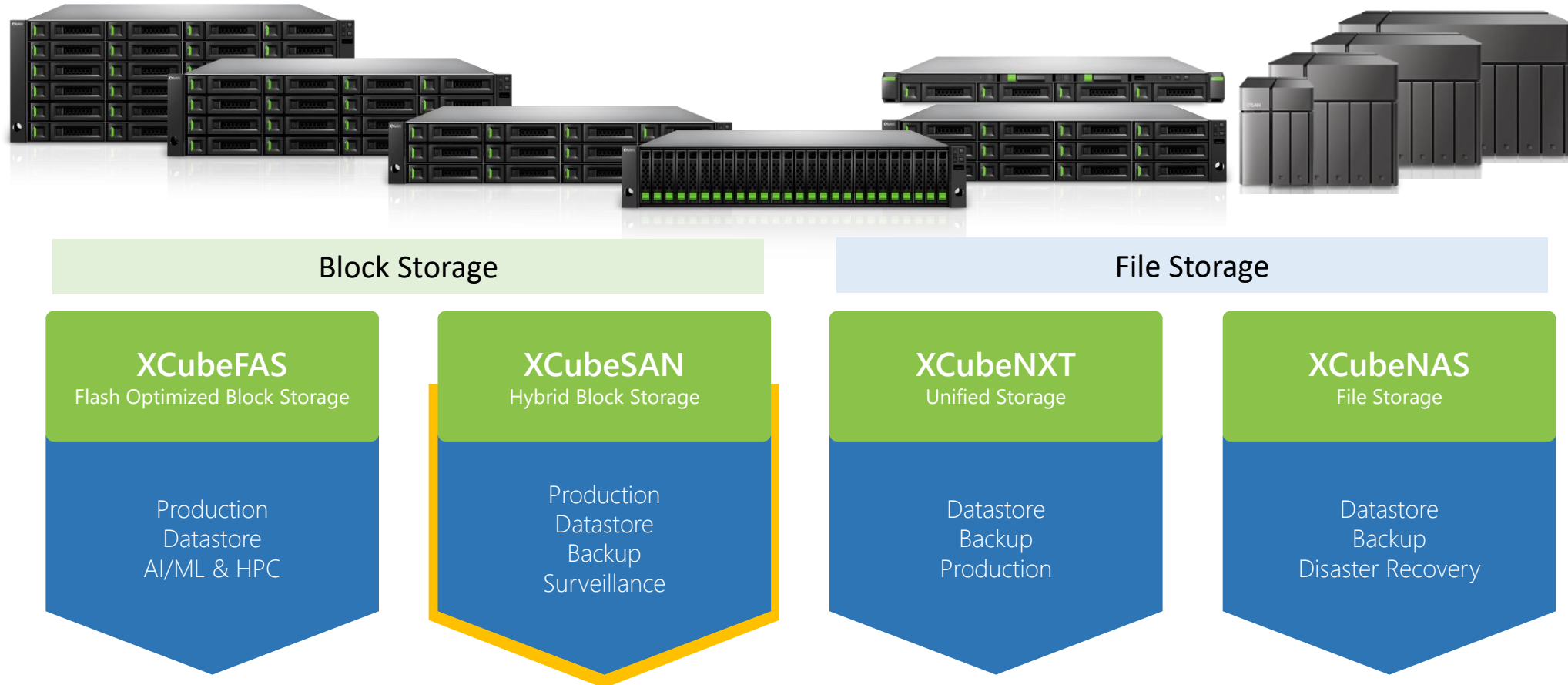
	2U 12-bay	3U 16-bay	4U 24-bay	2U 26-bay
XS5300 Series (Intel® Ice-Lake D, XEON 8/4 Cores, 16GB to 256GB DDR4 Memory Per Controller)	XS5312D XS5312S	XS5316D XS5316S	XS5324D XS5324S	XS5326D XS5326S
XS3300 Series (Intel® Ice-Lake D, XEON 4 Cores, 8GB to 256GB DDR4 Memory Per Controller)	XS3312D XS3312S	XS3316D XS3316S	XS3324D XS3324S	XS3326D XS3326S
Expansion Enclosures				
XD5300 Series (Expansion unit, SAS 12G)	XD5312D XD5312S	XD5316D XD5316S	XD5324D XD5324S	XD5326D XD5326S

D: Dual Controller
S: Single Upgradable

LFF   SFF

2x 12Gb SAS Expansion Ports

Flash Module Slot

4x 10GbE iSCSI SFP+ Ports

FC Module Slot

PSU 1

Management Port   Host Slot 1   Host Slot 2   PSU 2
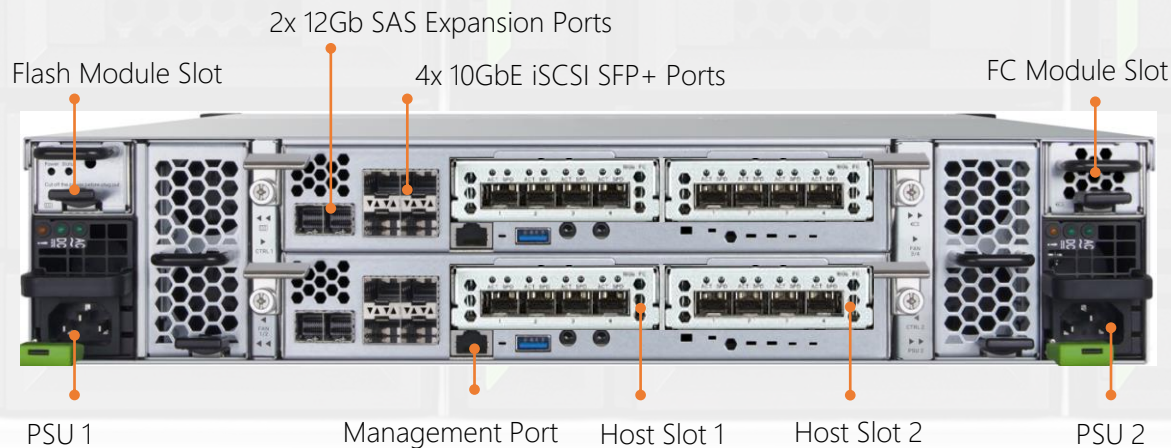
Optional Host Cards and Accessories:

2/4 port 16Gb/32Gb FC   2 port 25Gb iSCSI

2 port 10GbE iSCSI RJ45   4 port 10GbE iSCSI SFP+

C2F 256G SC

XCube Platform – One Architecture
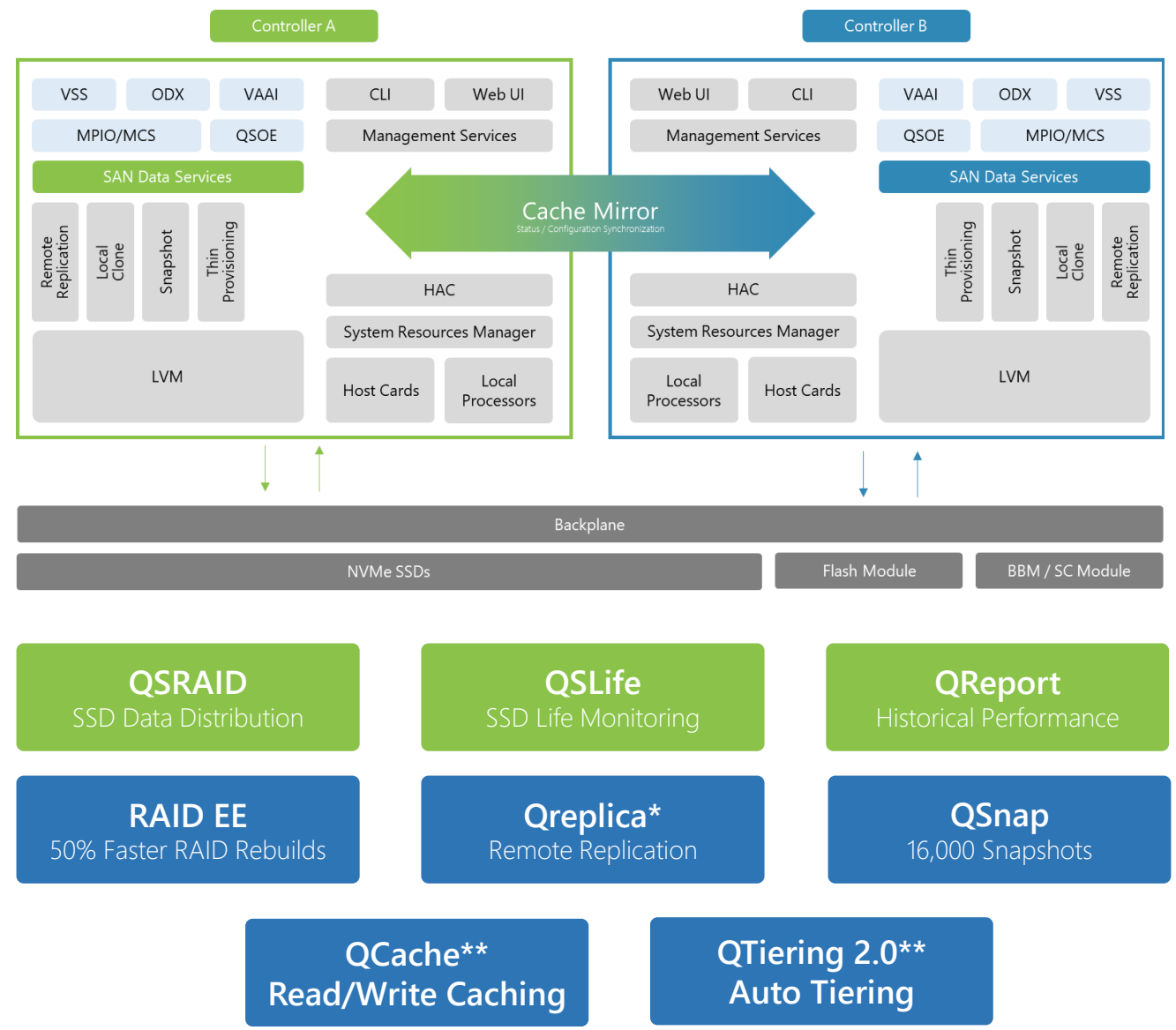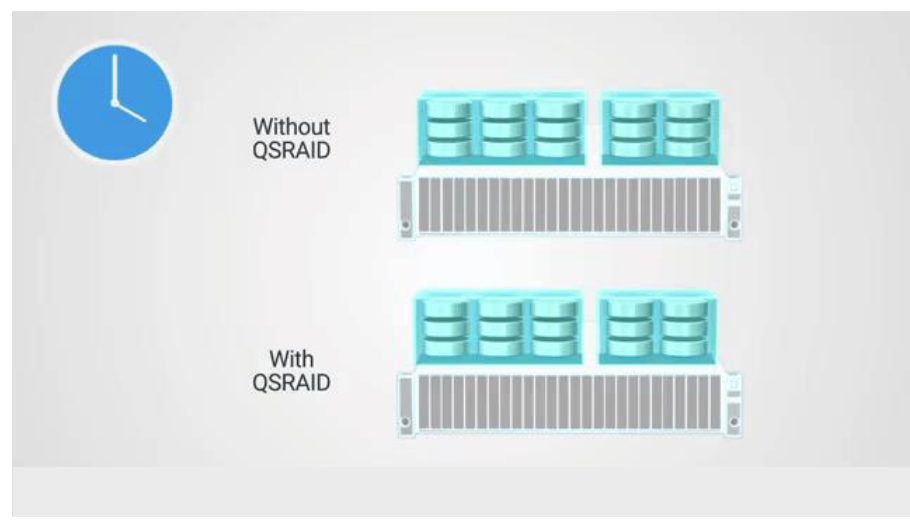
Block Storage		File Storage	
XCubeFAS Flash Optimized Block Storage	**XCubeSAN** Hybrid Block Storage	**XCubeNXT** Unified Storage	**XCubeNAS** File Storage
Production Datastore AI/ML & HPC	Production Datastore Backup Surveillance	Datastore Backup Production	Datastore Backup Disaster Recovery
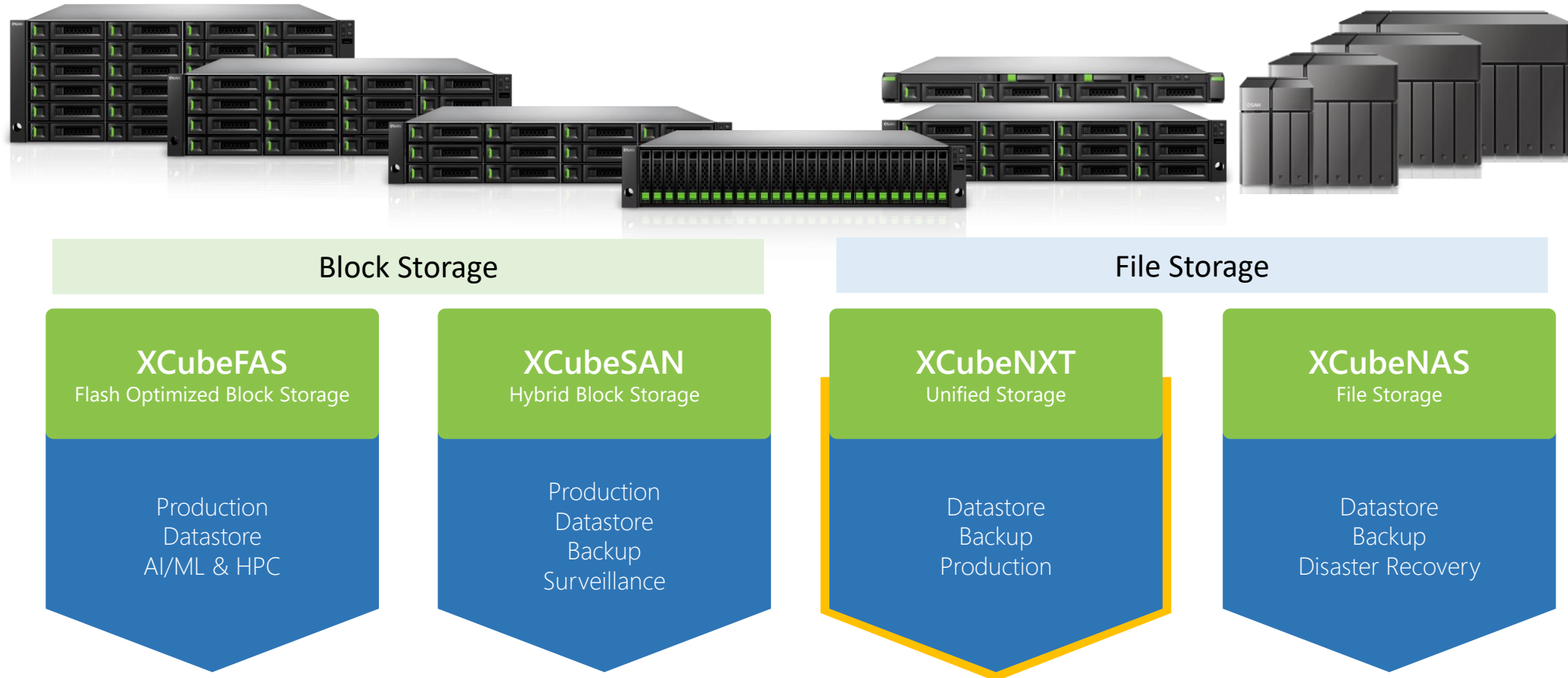
HA Unified Storage

Traditional HA Cluster

Clients, VMs

Switch 1

Switch 2

Heartbeat

Volume Replication

Server 1 + Cluster Software
+ File Storage

Server 2 + Cluster Software
+ File Storage

SAN Array (Block Storage)

Unified Storage

Clients, VMs

Switch 1

Switch 2
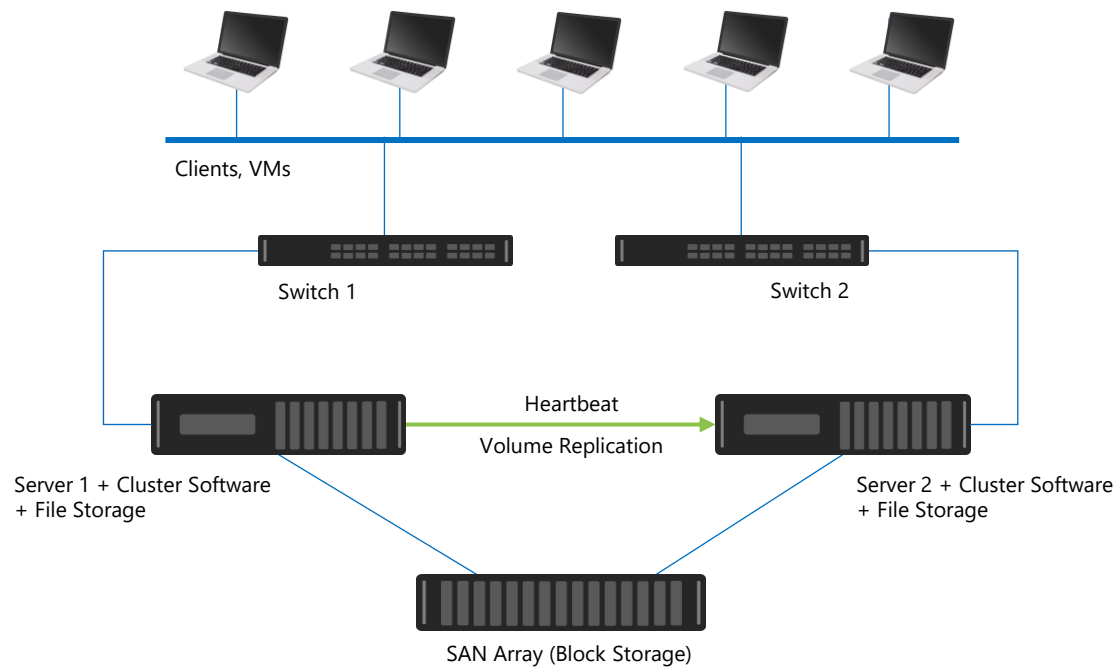
XCubeNXT: HA Block and File Storage
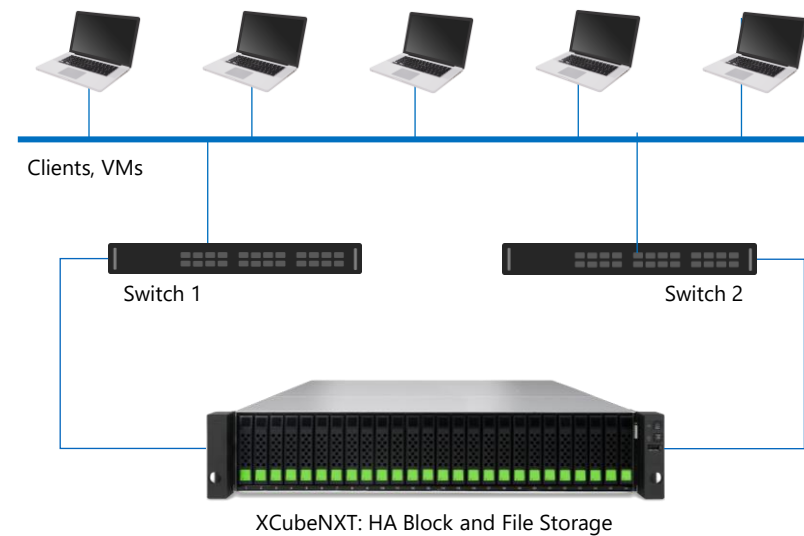
Applications:

- File Sharing
- Backup and Archive
- NLE/Post Production
- Light-loaded Virtualization

XCubeNXT Product Line

	2U 12-bay	3U 16-bay	4U 24-bay	2U 26-bay
XN8000_8C-Series (Intel® Xeon D-1537 8 Cores, 8GB to 128GB DDR4 Memory Per Controller)	XN8012D_8C	XN8016D_8C	XN8024D_8C	XN8026D_8C
XN8000-Series (Intel® Xeon D-1527 4 Cores, 8GB to 128GB DDR4 Memory Per Controller)	XN8012D	XN8016D	XN8024D	XN8026D
		Expansion Enclosures		
XD5300 Series (Expansion unit, SAS 12G)	XD5312D XD5312S	XD5316D XD5316S	XD5324D XD5324S	XD5326D XD5326S

D: Dual Controller
S: Single Upgradable

LFF   SFF

Built-in Flash Module

2x 10GbE iSCSI (BASE-T) Ports   2x 12Gb SAS Expansion Ports

PSU 1   Host Slot 1   Host Slot 2   Management Port   PSU 2
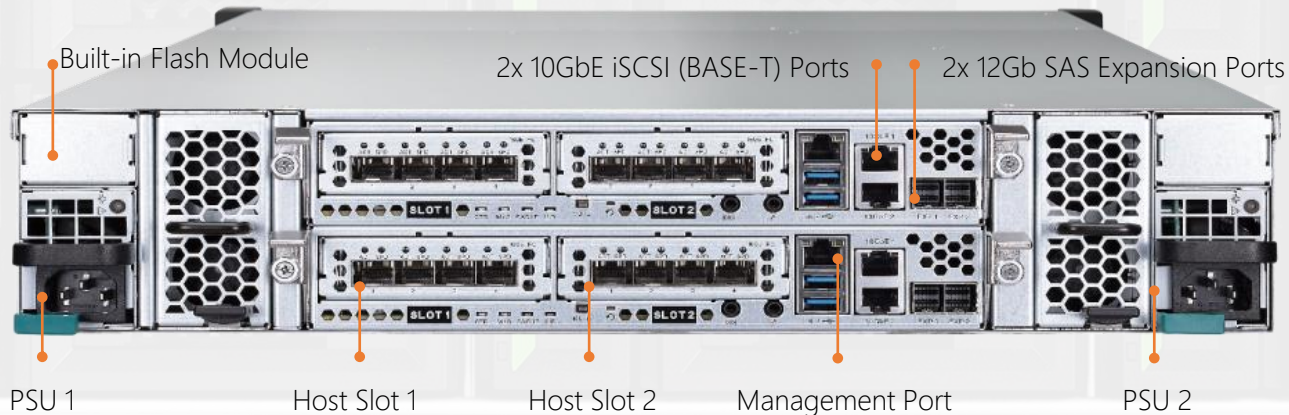
Optional Host Cards and Accessories:

2/4 port 16G FC   2 port 25Gb SFP28

2 port 10GbE Base-T   4 port 10GbE SFP+

4 port 1GbE Base-T

XCubeNXT – Ultra High Availability 99.9999%

XCubeNAS

XCubeNXT

Active – Active Controller Design

Redundant Everything
FAN, PSU, Drives

Built-In Cache Protection
256GB wo SC or Battery

Online Hardware Upgrades
RAM, Host Cards, Controllers

QSAN Storage Manager (QSM) - Data Management System

Copy on wirite

QSM 128 bit file system

ZFS checksuum

▌ ZFS Checksum

Every read/write is checksumed. ZFS will calculate the checksum and compare it with the original, checksum, if not match, it automatically repairs the damage, using data from the other mirror to ensure the correctness of the data.

▌ Copy on Write (COW)

Find free blocks to write new data instead of overwrite the blocks of existing data. The existing data will be kept intact in the cases of power loss or system crash when write operation is not completed.

▌ 128-bit File System

No practical limit for single volume or single file size (Max.16EB). Futureproof scale-up capability

XCubeNXT Highlights

Always-on

Active – Active Controller Design

Online Hardware Upgrades
RAM, Host Cards, CPU

Built-In Cache Protection
256GB wo SC or Battery

Simple

Intuitive UI
Easy setup, management

Multi-Backup Options
Rsync, Snapshot, XMirror, Cloud & Backup

Scale-up
Scale up to 7PB with JBOD solution

Secure

Data Retention
File/Folder Auto Removal

WORM
Write Once Read Many

AES-256 Pool Encryption and SED Support

Smart

Intuitive Load Balancing
Best Path Selection

Hybrid SSD Caching
Read/Write Caching in single SSD

Inline Data Reduction
Compression /Dedupe

ZFS File System
Silent Corruption Prevention

XCube Platform – One Architecture

Block Storage		File Storage	
XCubeFAS Flash Optimized Block Storage	**XCubeSAN** Hybrid Block Storage	**XCubeNXT** Unified Storage	**XCubeNAS** File Storage
Production Datastore AI/ML & HPC	Production Datastore Backup Surveillance	Datastore Backup Production	Datastore Backup Disaster Recovery

XCubeNAS Product Line

	2 Bay	4 Bay	8-12 Bay	16-24 Bay
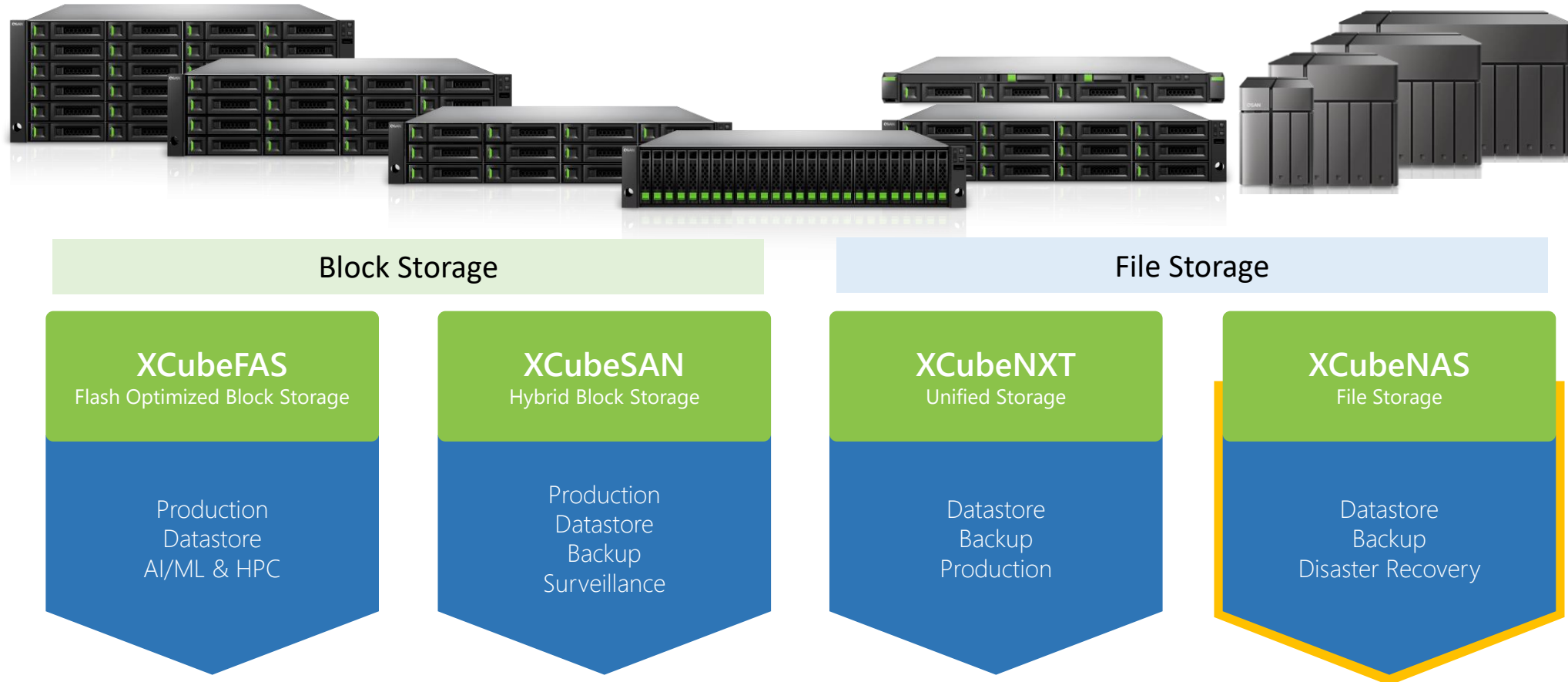
XN8000-Series
Rack Models: Intel Kaby Lake Xeon E3,
Tower Models: Intel Kaby Lake i5

XN7000-Series
Rack Models: Intel Kaby Lake i3
Tower Models: i3 / Pentium Q-Core

XN5000-Series
Rack Models: Intel Kaby Lake Celeron
Tower Models: Intel Kaby Lake Celeron

XN3000-Series
Tower Models: Intel Apollo Lake Celeron

- XN8012S
- XN8024R
- XN8012R / XN8008R/T [RE] [6]
- XN8016R
- XN7004R/T [2]
- XN7012R / XN7008R/T [RE] [6]
- XN7024R / XN7016R
- XN5004R/T [2]
- XN5012R / XN5008R/T [6]
- XN3002T
- XN3004R/T

N Rack models with N-number of additional SSD bays

RE New 8-12 Bay Rack series without additional SSD Bays

T All tower models are equipped with 1 additional SSD bay

* All Rack models come with redundant PSUs

Integrated Storage Platform

NOW IT'S POSSIBLE
with QSAN and WD

QSAN XCube

WD JBOD

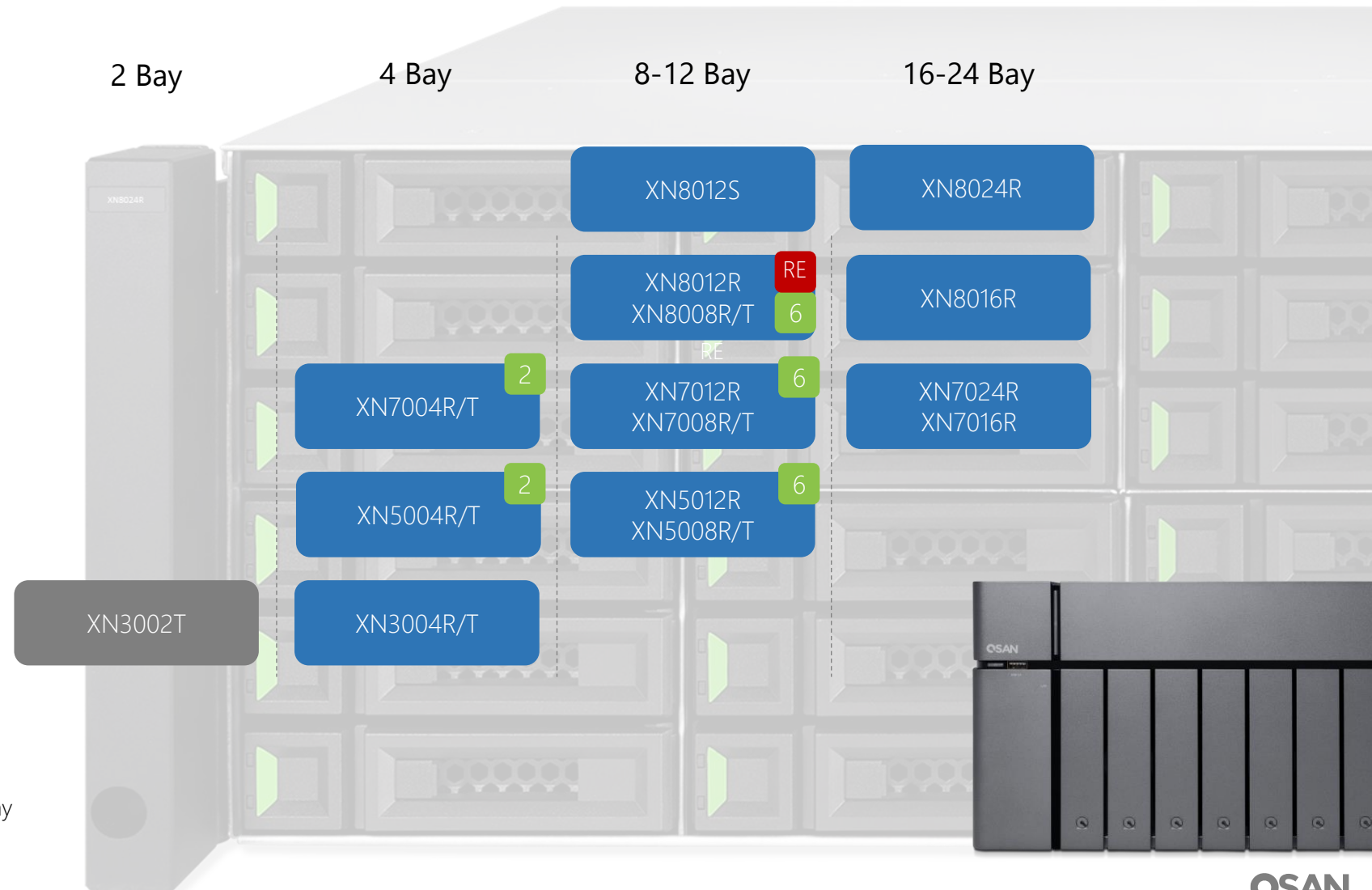| **Form Factors** | **Capacity** | **Interfaces** | **SSD Support** |
| 4U60, 4U102 | Up to 7PB | 12x Mini SAS Ports | Up to 24 per JBOD |

QSAN

Scale-up with WD JBODs

JBOD Form Factors	Capacity
4U60, 4U102	Up to 7.78PB

QSAN Models (XCubeSAN/XCubeNXT/XCubeNAS)	WD Expansion Enclosure	Max. No. of Enclosure	Max. No. of Disk Drives	Rack Space (U)	Max. Raw Capacity (LFF 22TB, SFF 15.36TB)	Capacity Density (TB/U)
LFF 2U 12-bay	Ultrastar Data102 (4U 102-bay)	4	12 + 4 x 102 = 420	18	9.24 PB	513 TB/U
LFF 3U 16-bay	Ultrastar Data102 (4U 102-bay)	4	16 + 4 x 102 = 424	19	9.33 PB	491 TB/U
LFF 4U 24-bay	Ultrastar Data102 (4U 102-bay)	4	24 + 4 x 102 = 432	20	**9.50 PB**	475 TB/U
SFF 2U 26-bay	Ultrastar Data102 (4U 102-bay)	4	26 + 4 x 102 = 434	18	9.37 PB	**520 TB/U**

Large Scale Surveillance

YAS ISLANDS

>1000 IP cameras in a single array

Network Switch

Network Switch

NVR

NVR

NVR

NVR

NVR

NVR

SAN Switch

SAN Switch

QSAN XS1212D

Western Digital Ultrastar Data102

Over 1PB usable capacity

Powerful VM Backup

etstur

VM **VM** **VM** **VM** **VM** **VM**   200+ VMs

VMware vSphere Production Cluster

VMware ESXi Host   VMware ESXi Host

VMware ESXi Host   VMware ESXi Host

VMware ESXi Host   VMware ESXi Host

SAN Switch   SAN Switch

Primary Storage
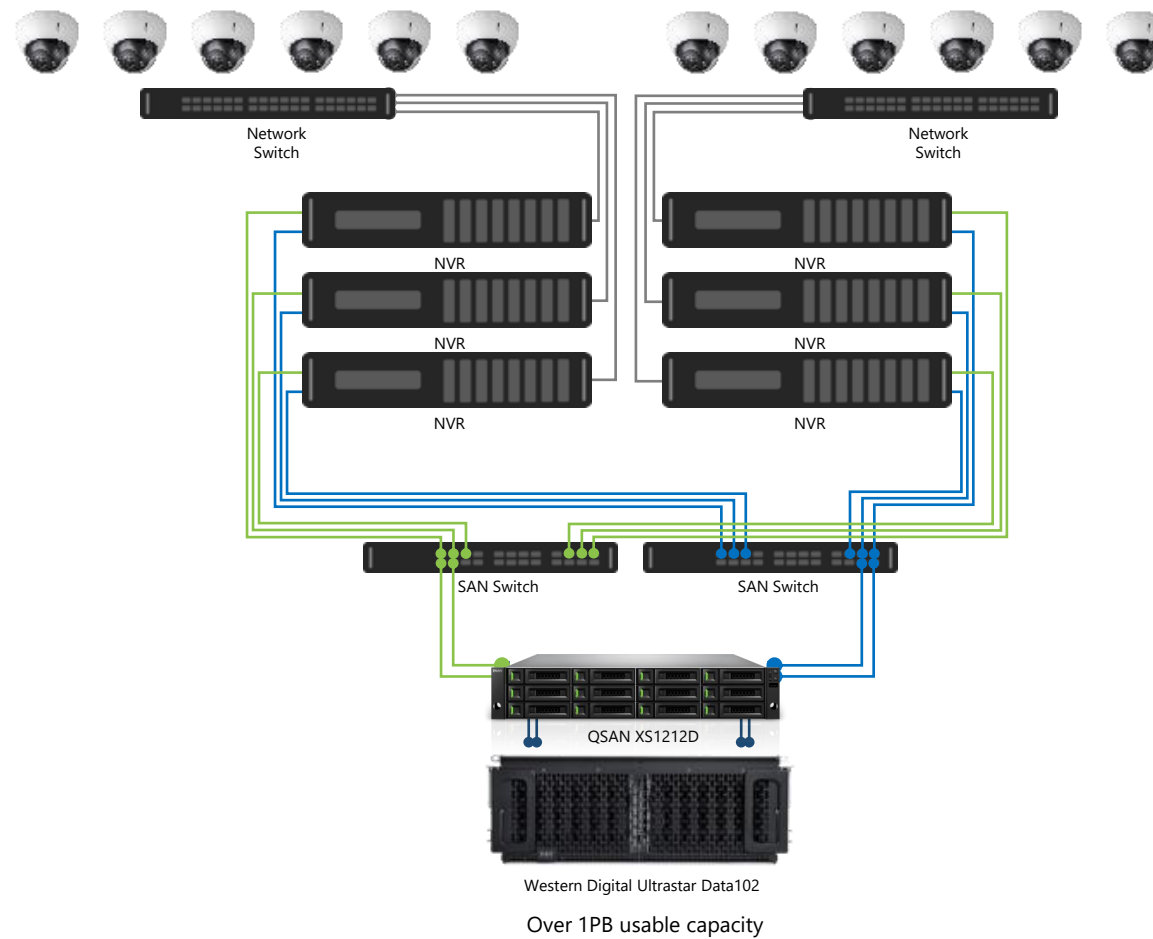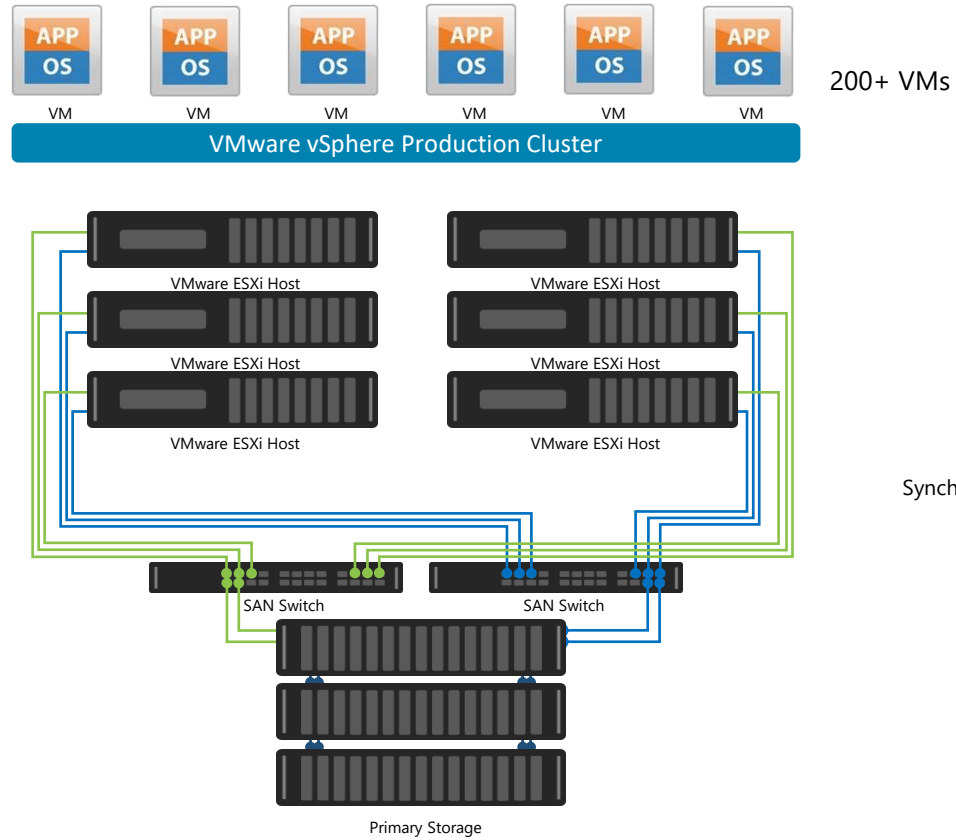
Synchronous Replication at 2GB/s+ Veeam

Test/Dev **Test/Dev** **Test/Dev** **VM Replica** **VM Replica** **VM Replica**

VMware vSphere DR Cluster

VMware ESXi Host   VMware ESXi Host

VMware ESXi Host   VMware ESXi Host

Test and Development VMs working on full flash VMFS storage provided by QSAN

SAN Switch   SAN Switch

QSAN XS5226D

High performance hybrid-flash SAN with Auto-Tiering

1.4 PB Capacity in 4U

WD Data60/Data102
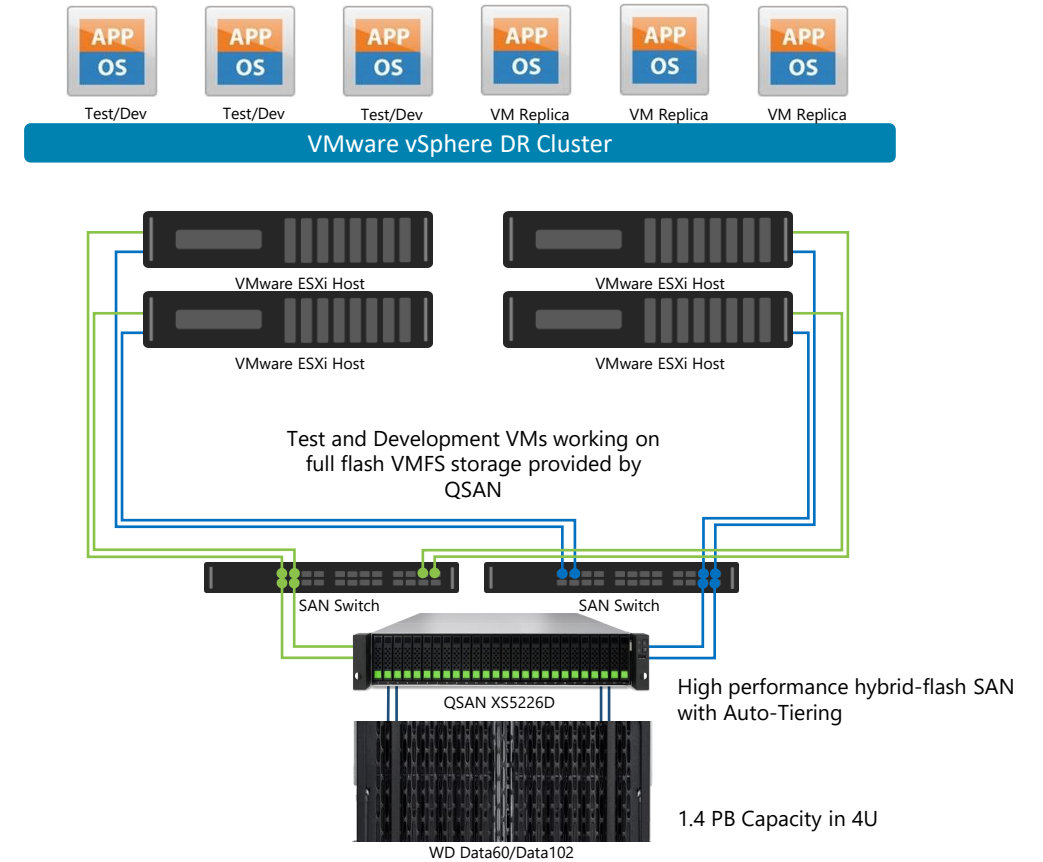
QSAN

Disaster Recovery

Universität Konstanz

Host Servers

Host Servers

Server Location A

Server Location B

MPIO

MPIO

QSAN XS5226D

QSAN XS5226D

Synchronous Replication
QSAN Native
Minimal Cost, RPO, RTO

WD DATA60

WD DATA60

WD DATA60

WD DATA60

Primary Storage 1 (1.44PB RAW)
XS5226D with 2x WD DATA60 (Source and Target)
750TB Usable with RAID60

Primary Storage 2 (1.44PB RAW)
XS5226D with 2x WD DATA60 (Source and Target)
750TB Usable with RAID60

16Gb FC

10Gb iSCSI

Thank you for your attention.

QSAN

071 082 079 087 073 078 071 032 087 073 084 072 032 080 065 082 084 078 069 082 083
068 069 076 073 086 069 082 073 078 071 032 085 078 073 081 085 069 032 080 082 079 068 085 067 084 032 086 065 076 085 069 013 010