

**Quantum**<sup>®</sup>  
CREATE. INNOVATE. PROTECT. ON QUANTUM.

# HSM Konferenz 2019 StorNext Filesystems and Storage Manager

Michael Schröder, Regional Sales Manger  
Ines Wolf, Manager Presales CE



# Quantum Overview – Who We Are

**39+**

Years storing and protecting data

**20+**

Years of expertise working with video in Hollywood

**20,000**

Active support contracts around the world

**24/7/365**

World-class service and support organization

## WHO WE ARE

Quantum technology and services help customers capture, create and share digital content – and preserve and protect it for decades.

## WHAT WE DO

We deliver solutions built for every stage of the data lifecycle - Quantum's platforms provide the fastest performance for high-resolution video, images, and industrial IoT, and the lowest cost long-term storage for archiving and preservation.

## WHO WE WORK WITH

The world's leading entertainment companies, sports franchises, researchers, government agencies, enterprises, and cloud providers are making the world happier, safer, and smarter on Quantum.

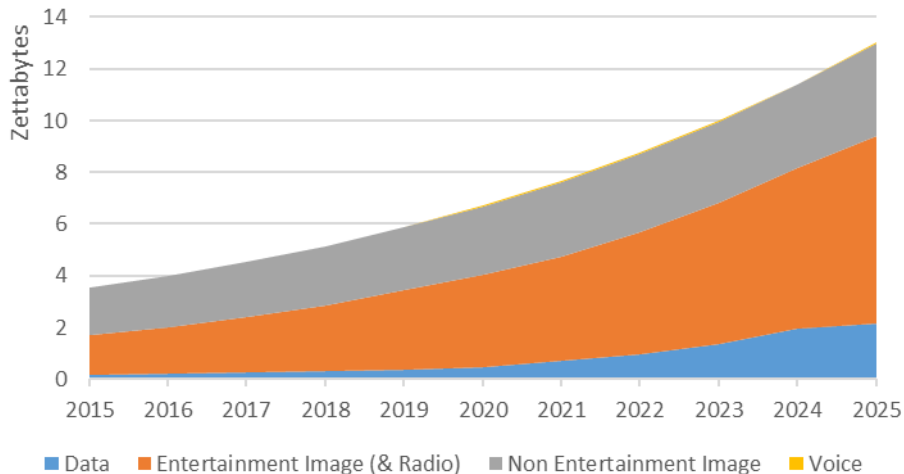


# Video – and Video-Like Data – is Everywhere



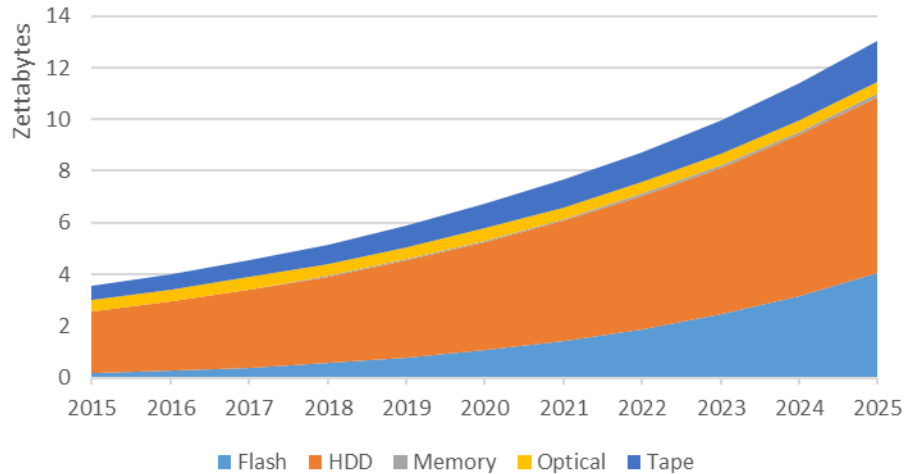
# This Digital Content Will be 80% of the Data on the Planet

Datasphere 2025 by Data Type Stored



**>80% Data stored in 2025 will be video**

Datasphere 2025 by Media Stored



**Flash, HDD, Tape all play a key role**

# Focus Markets and Use Cases



**MEDIA AND  
ENTERTAINMENT**



**SURVEILLANCE  
AND IoT**



**AUTONOMOUS  
VEHICLE  
DEVELOPMENT**



**RESEARCH AND  
ANALYTICS**



**ENTERPRISE  
BACKUP AND  
ARCHIVE**



# Quantum Technology and Services

For high-performance video editing and large unstructured data sets

StorNext 



## StorNext Products

The # 1 choice of leading broadcast, post-production, sports production, and corporate video entities around the world.

For surveillance and industrial IoT



## VS-Series

Retain more surveillance footage at the lowest cost, and converge and run entire building operations on a single box.

For archive and long-term storage



## Scalar Series

The lowest-cost long-term storage used by the biggest clouds and leading enterprises to preserve digital content for decades.

For in-vehicle data capture



## R-Series

Ruggedized removable storage designed for fast ingest and easy upload/offload.

For enterprise backup and DR



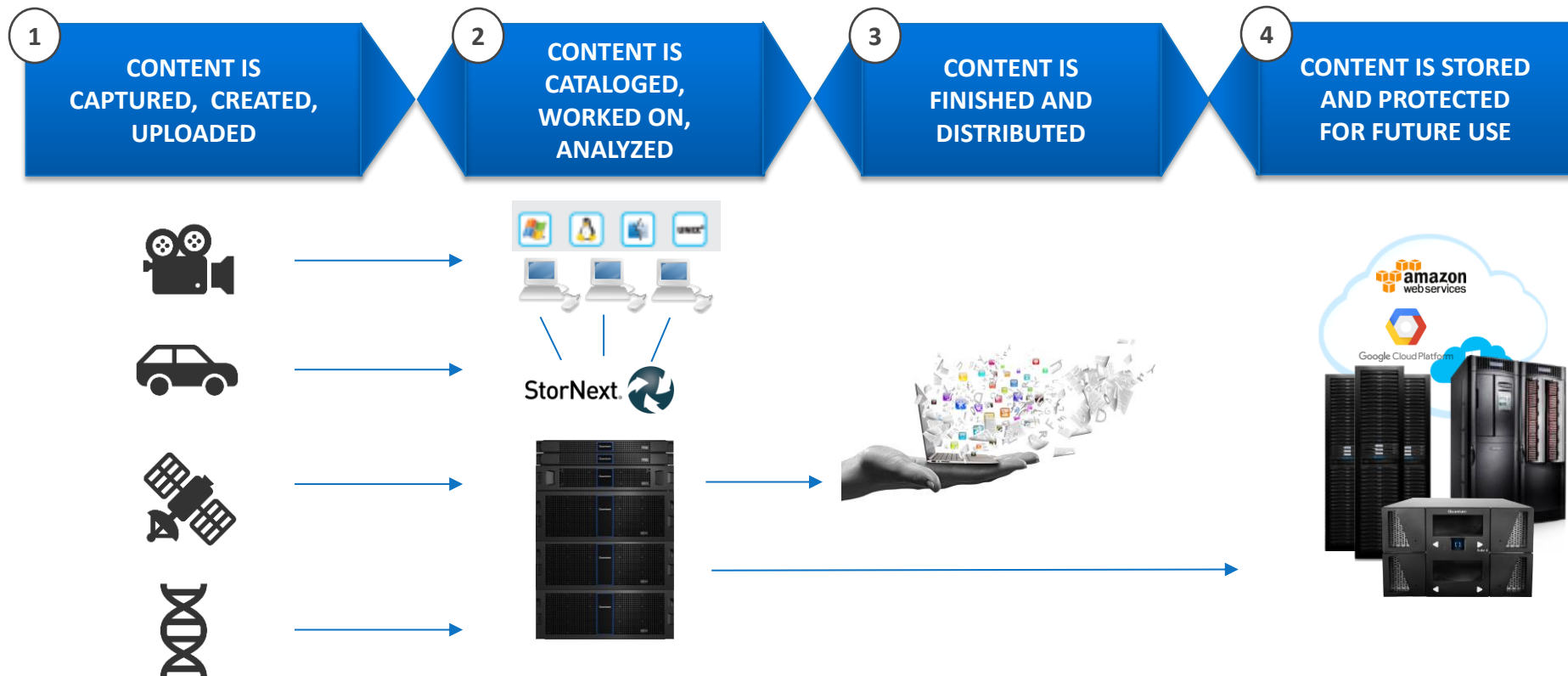
## DXi-Series

The most efficient solution for protecting business-critical applications.

## Quantum Distributed Cloud Services

We'll handle the technology, so you can focus on what you do best.

# Video and IoT Data Sets Have a Common Workflow



# Deliver a Portfolio for All Phases

1

CONTENT IS  
CAPTURED, CREATED,  
UPLOADED



## In-Vehicle Storage

Ruggedized removable storage designed for fast ingest and easy upload/offload.

**Use Cases:** Autonomous vehicle design, rolling stock surveillance capture, military.

2

CONTENT IS  
CATALOGED,  
WORKED ON,  
& ANALYZED

StorNext



## High-Performance Video Platforms

Fastest streaming performance on the planet, IP and SAN support, specifically designed for video and rich media use cases.

**Use Cases:** High-performance storage for video and rich media workflows, hyperconverged surveillance systems.

3

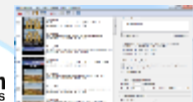
CONTENT IS  
FINISHED AND  
DISTRIBUTED



amazon  
web services

Azure

Google Cloud Platform



## Archive Storage and Cloud Managed Services

Lowest-cost, massively scalable long-term storage of video and rich media content and assets, on prem and in the cloud.

**Use Cases:** Digital media archives for broadcast and post, PB-scale archives for HPC/research rich media, exa-scale cloud archives.



# What is StorNext?

- Architecturally, StorNext is comprised of two parts:

- SNFS – A **high performance** clustered file system, designed for big unstructured files

- Mature file system tested to **many hundreds of nodes** and available on all **major OSes**
- Heterogeneous, split-metadata clustered implementation
- Supports access via IP, fibre channel ...:
- Can grow, migrate, and shrink **file** systems

Production

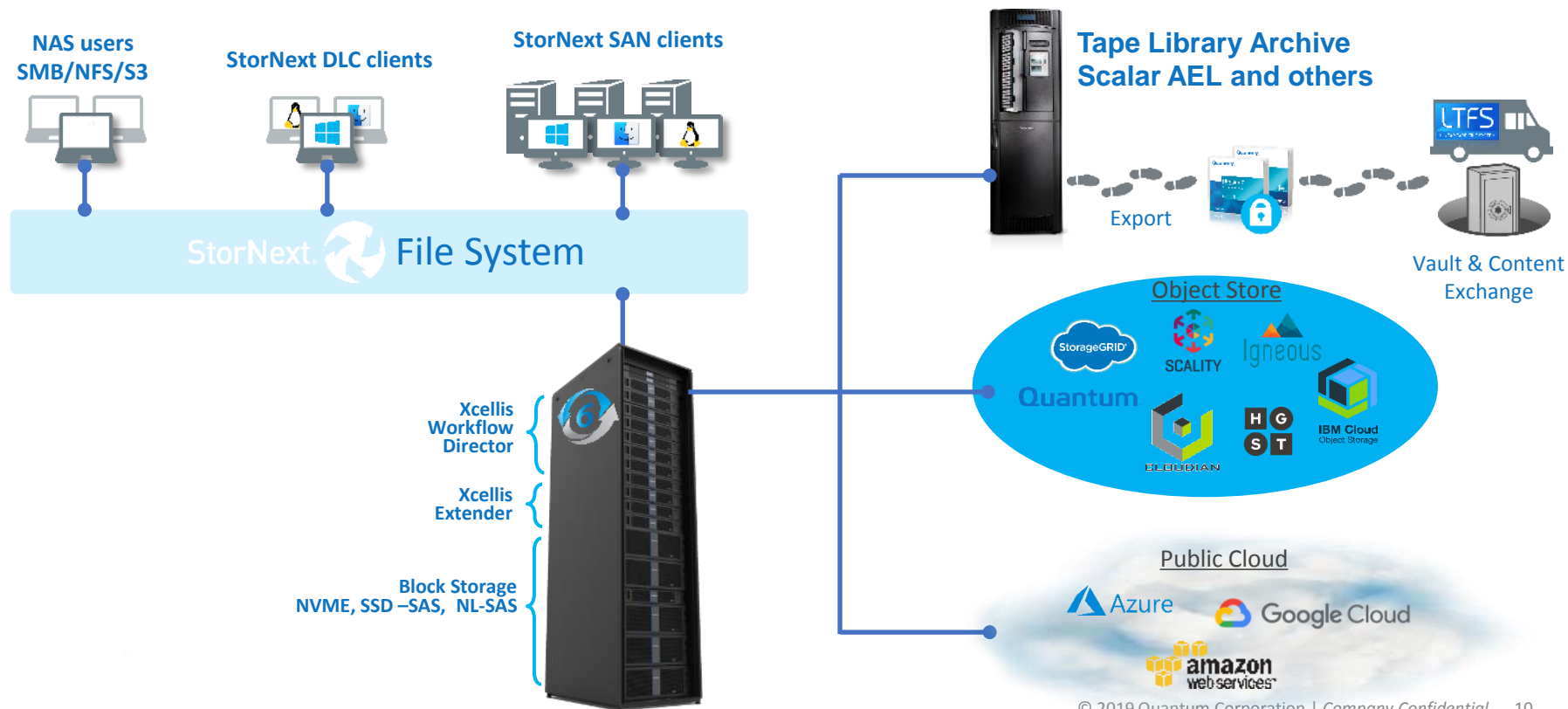
- SNSM – Tiered storage & archive

- Set of modules that extend SNFS to provide tiered storage lifecycle management
- Supports:
  - Lower cost disk
  - Tape erasure code (deep store)
  - S3/ Storage Object Lattus
  - Scalable tiered data movement

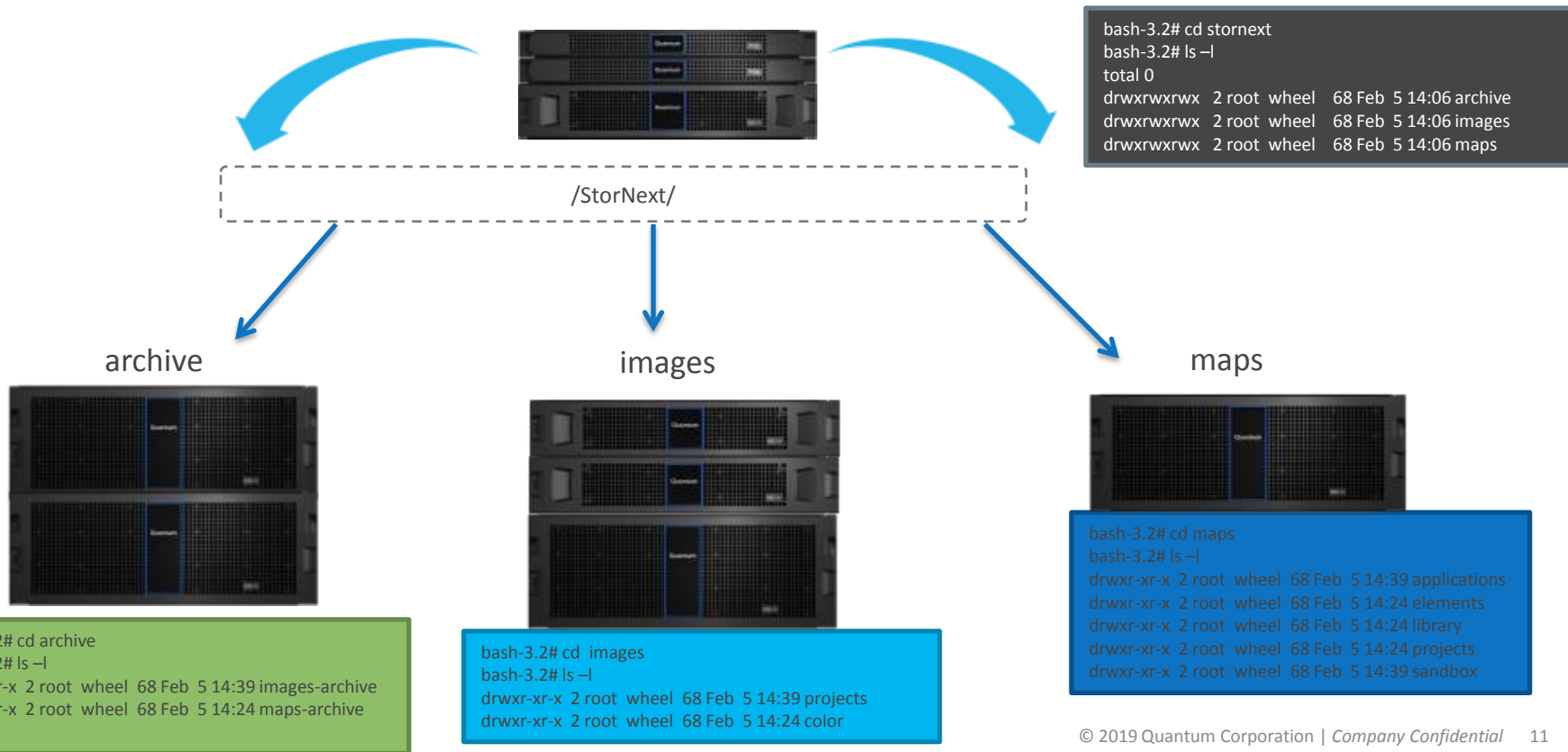
Archive

Single Name Space

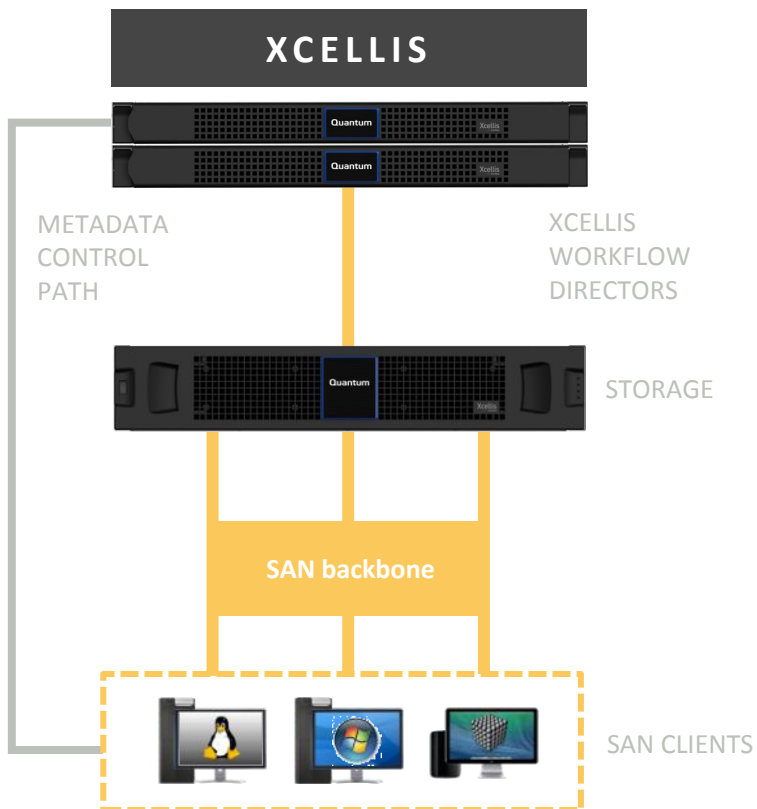
# The Quantum StorNext Platform



# Single name space

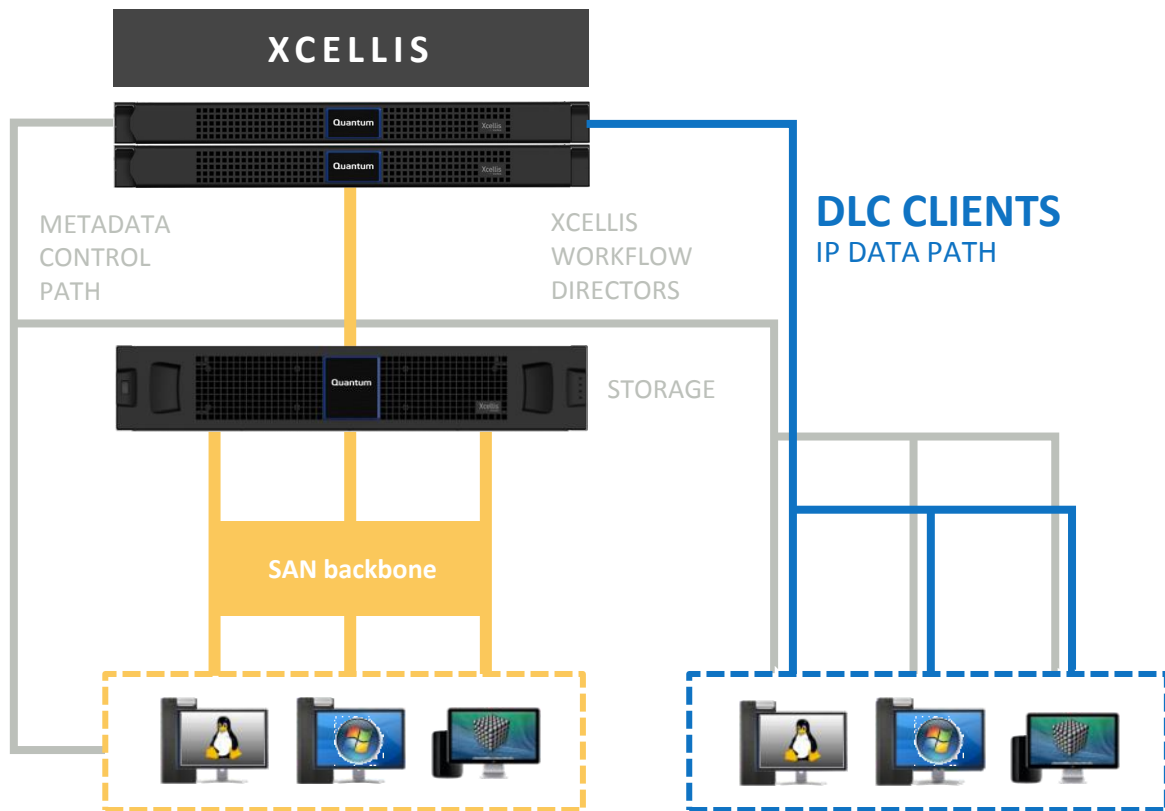


# Unified Access

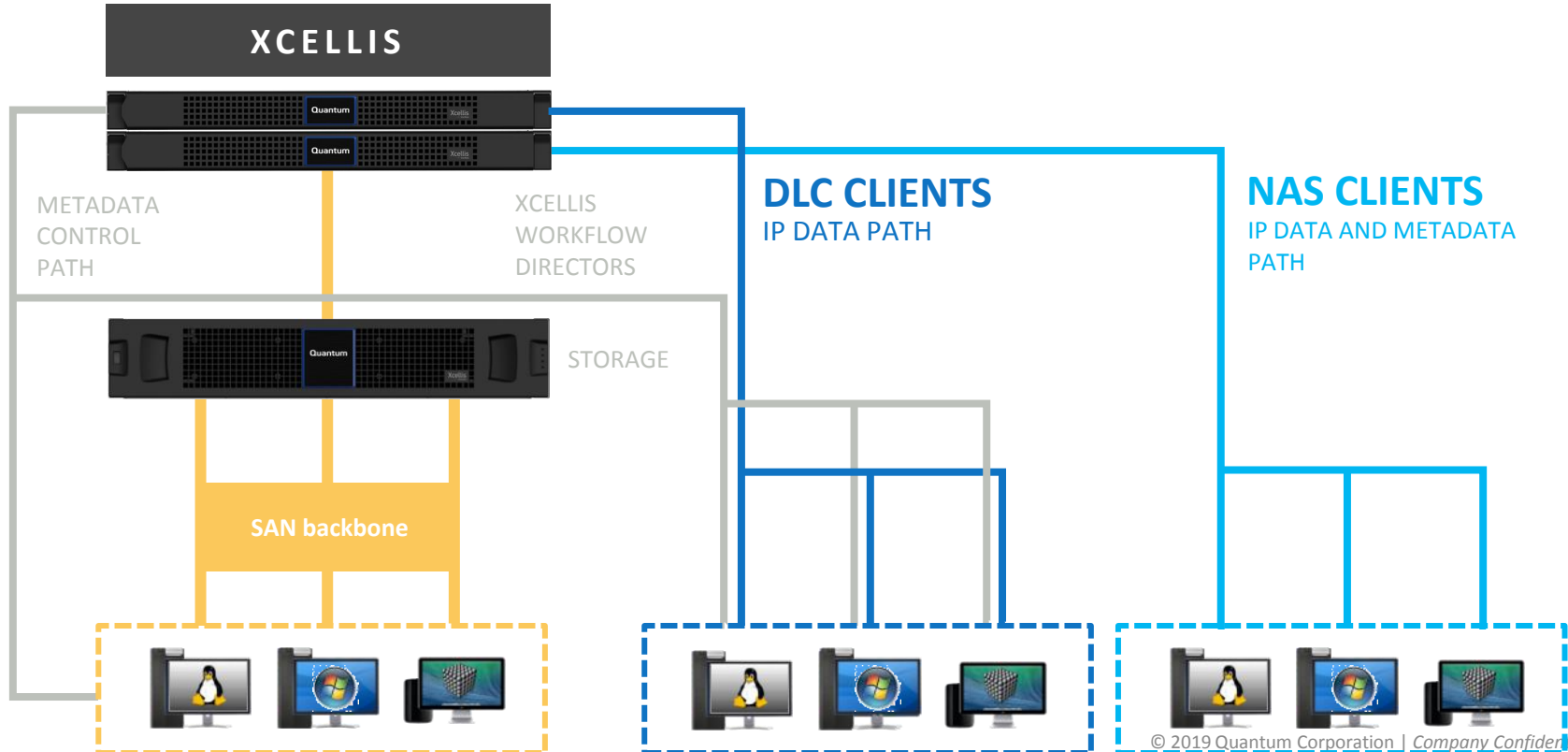




# Unified Access

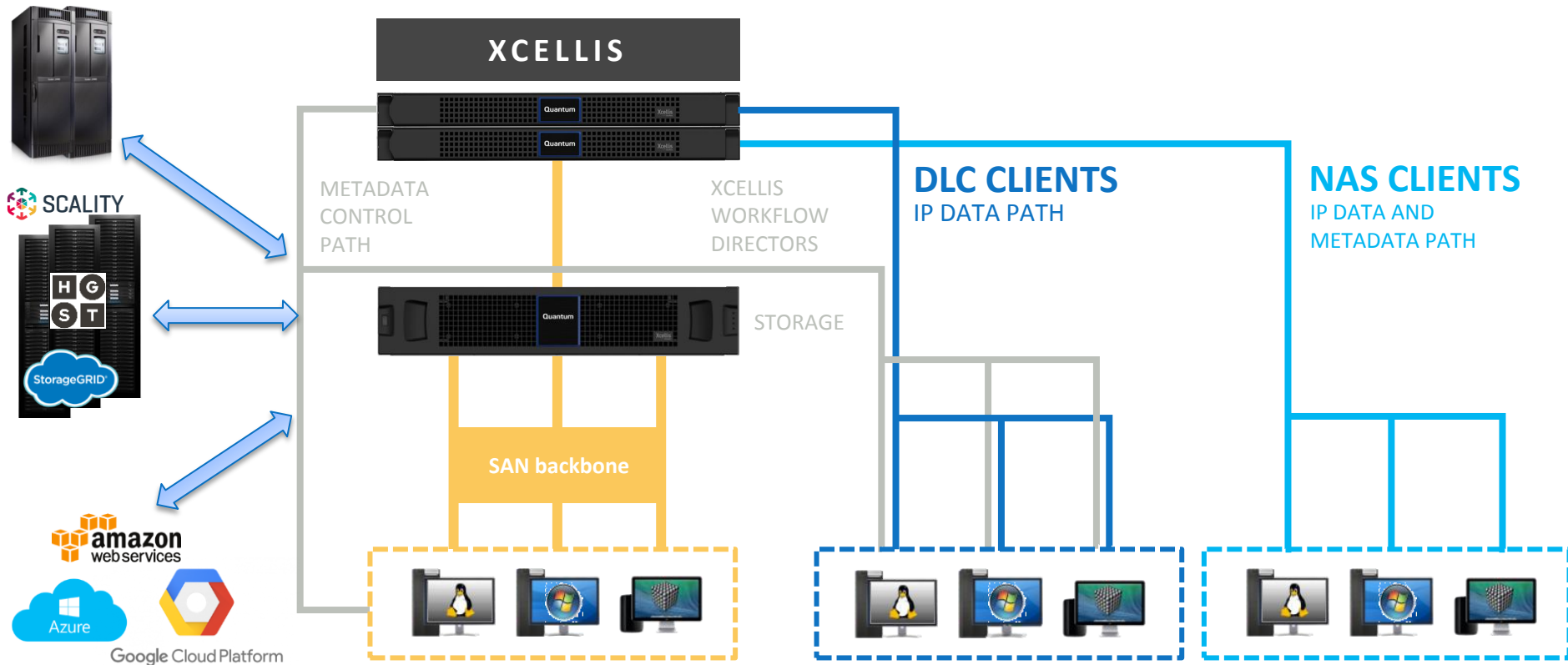


# Unified Access



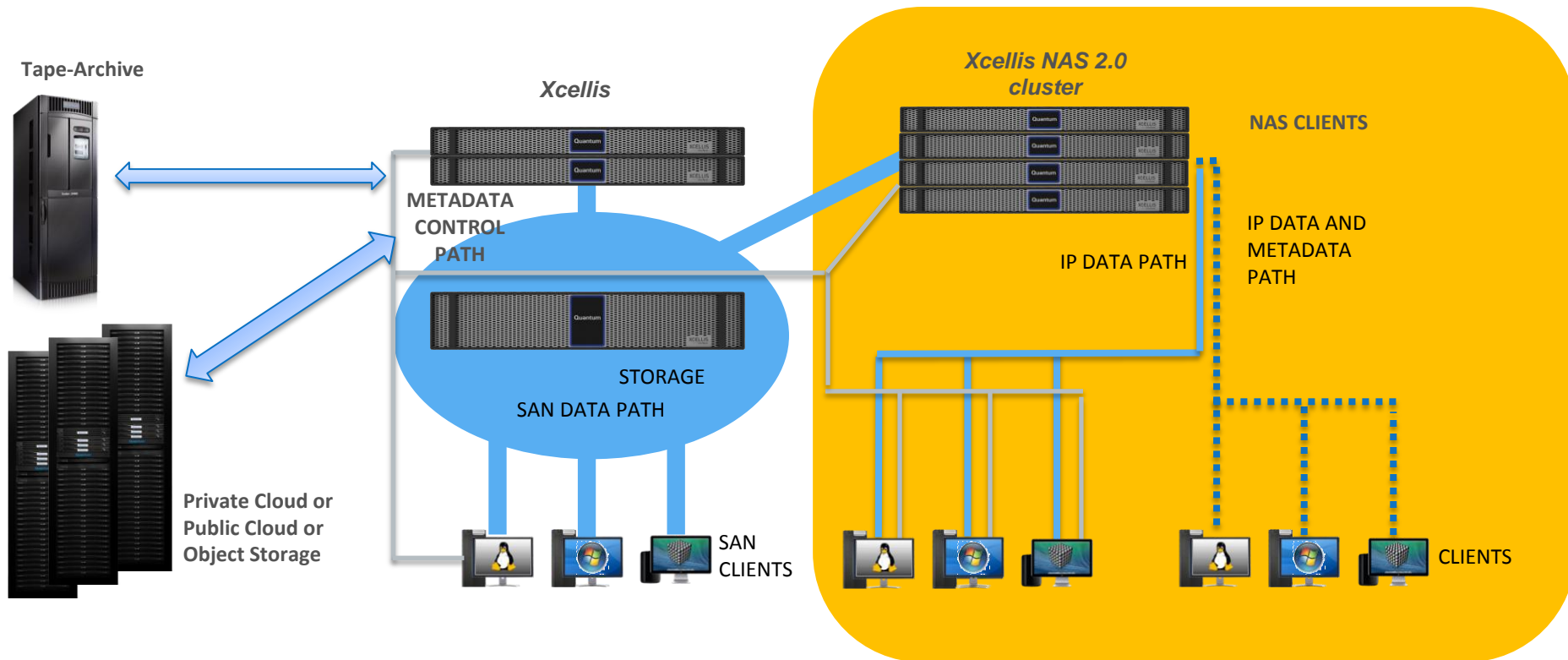
# Extend to Tier2/3

Extensible to Tape, Object, Cloud / on or off premise



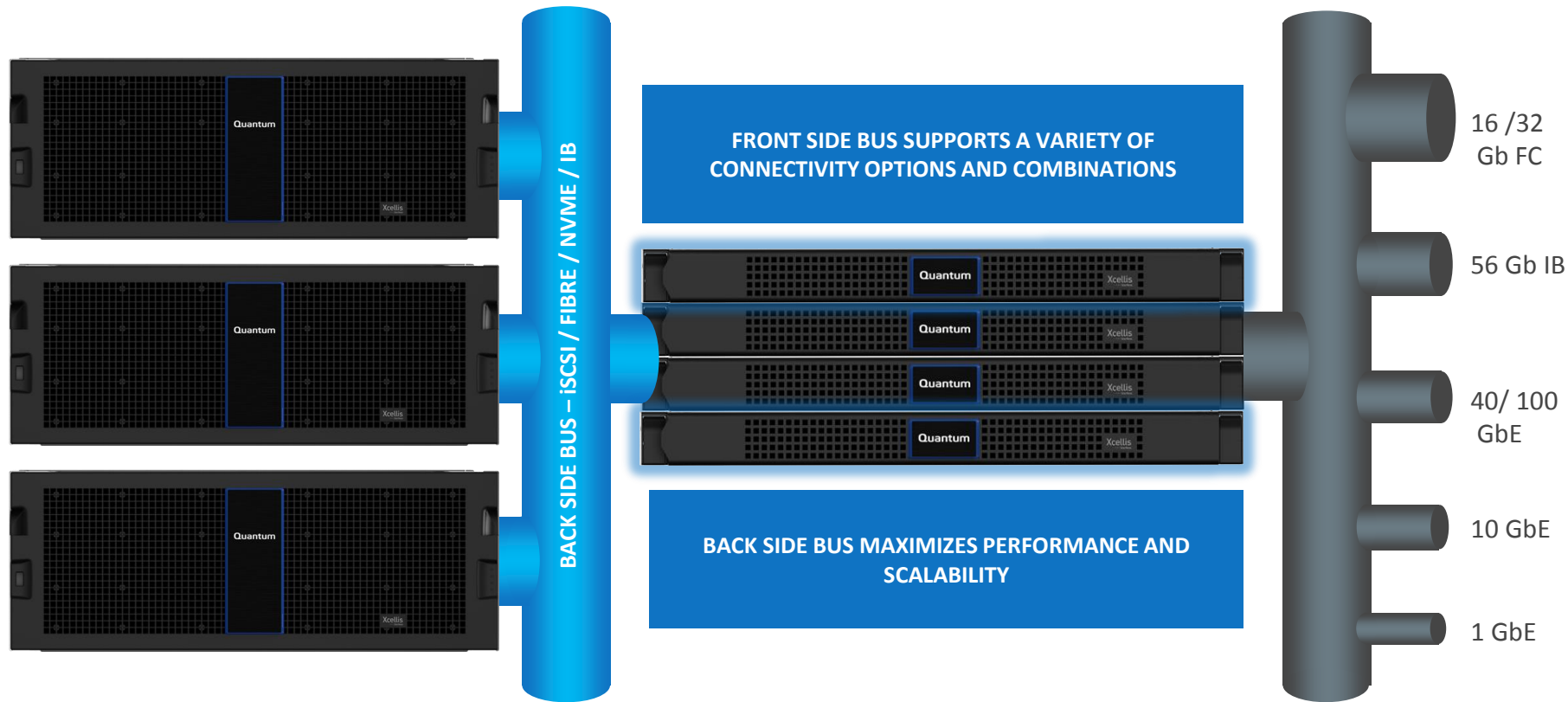
# Xcellis StorNext NAS solution

- File, Directory, and Volume level access control via StorNext, Active Directory, and LDAP





# Flexible Front Side and Back Side Connectivity



# StorNext Topology

Native, SMB, and NFS clients connect through the client network via Ethernet



Ethernet Network

Performance of the gateways scales linearly with additional gateways

MDC/Gateway Node  
DLC/NAS

MDC/Gateway Node  
DLC/NAS

Gateway Node  
DLC/NAS

Gateway Node  
DLC/NAS



Fibre Channel or Ethernet Network

StorNext SAN Clients can connect directly to the storage network for maximum performance



Performance of the storage back end scales linearly with additional arrays



Quantum NVMe



Quantum QXS



Quantum QXS



Quantum QXS

StorNext provides policy-based data management to protect and archive data on a wide variety of low-cost storage options

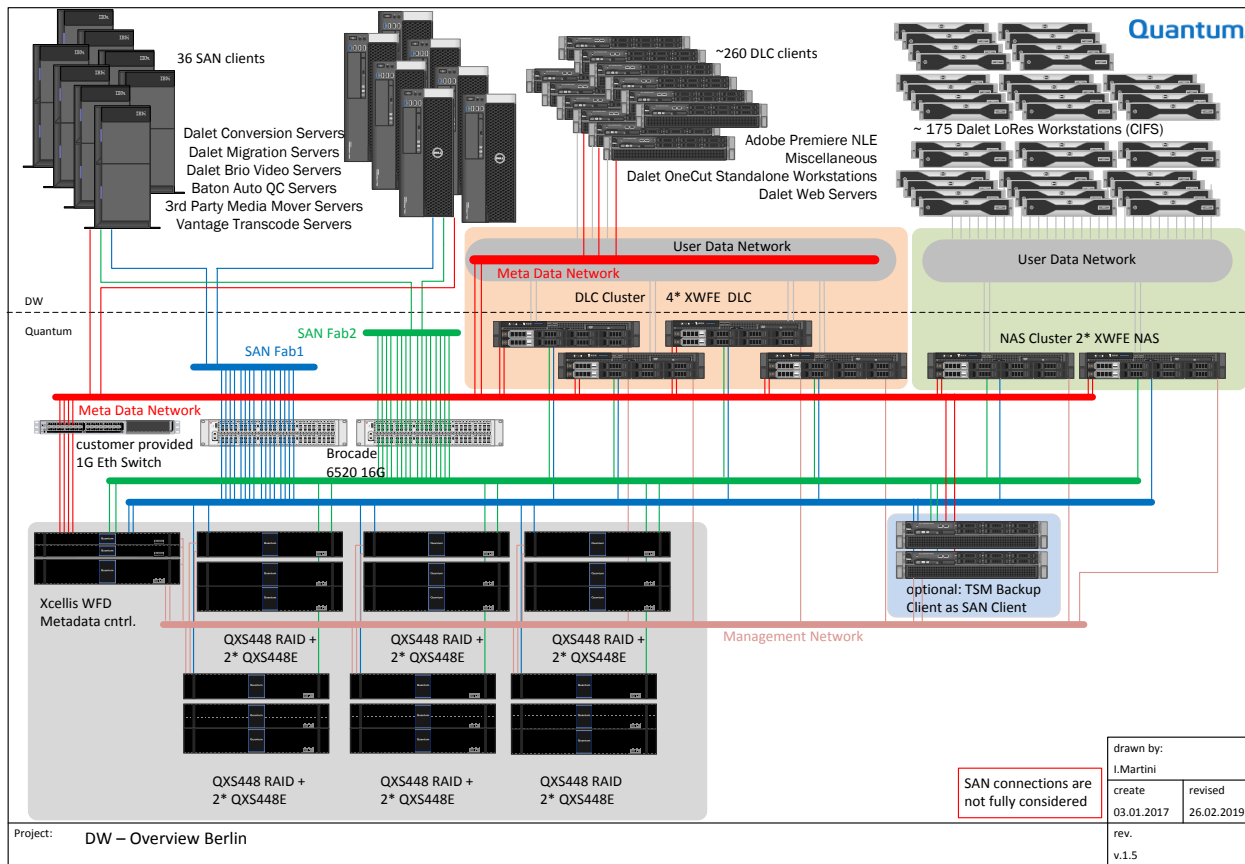


Public cloud



StorNext makes it easy to combine NVMe and low-cost disk in the same solution

# Customer solution DW



- 4 Xcellis
- 2 AEL6000
- 6 QXS448
- +800TB usable
- 3+ PB on tape
- Async. Mirroring
- Multi site
- + 300 clients

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## Use Cases - Geospatial





# ACRI-ST

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Specializing in remote sensing & modeling of physical & environmental phenomena, ACRI-ST plays a key role in processing & archiving critical European Space Agency (ESA) satellite data.

- **Challenge:** To prepare for the Sentinel-3 ESA satellite, ACRI-ST needed new storage to handle petabytes of data, not the tens of terabytes typical of earlier projects.
- **Solution:** StorNext® Scale-out Storage, Q-Series Disk Storage, AEL Tape Archive, and Xcellis™ Workflow Storage
- **Results:** The StorNext tiered storage solution archives satellite data, enables access for researchers, and supports the ACRI-ST value-added workflows with an optimal combination of scale and high-speed access.

“With StorNext, we knew we could meet our immediate need to store 400 TB of satellite data while gaining the ability to expand to several petabytes over the next decade.” **Gilbert Barrot, CIO, ACRI-ST**



# Center for Remote Sensing of Ice Sheets (CReSIS)

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Supporting scientific research addressing climate change, the CReSIS IT group stores, manages, and provides access to large volumes of data collected through ice sheet exploration.

- **Challenge:** Needed a new approach to store large and growing data volumes - up to 150TB per mission - while continuing to use existing storage.
- **Solution:** StorNext File System, Scale-out SAN & NAS
- **Results:** Storage scales to support exponential data growth as scientists collect more ice data per mission; triples storage performance to speed workflows as data grows; economical use of tape archives saves money.

“With the StorNext platform, we now have a single file system that manages our entire multitier storage solution, from tape to primary disk to the HPC cluster.” **Riley Epperson, IT Engineer, Center for Remote Sensing of Ice Sheets, University of Kansas**



# NASA's Earth Observing System (EOS)

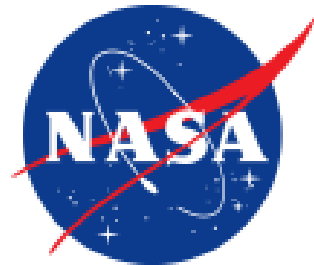
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The centerpiece of NASA's Earth Science Enterprise, EOS supports a series of polar-orbiting and low inclination satellites for long-term global observations of the land surface, biosphere, solid Earth, atmosphere, and oceans.

- **Challenge:** Needed a robust storage system that could scale to handle massive data sets stored on multiple types of media; required a stable solution to support 24/7 operation.
- **Solution:** StorNext Data Management Software and Scalar LTO Tape Storage to automated storage and access of satellite data
- **Results:** A high-performance, resilient storage environment, with easy access to the data from all applications, resulting in massive resource leverage.

“We needed a robust storage system that could scale to handle massive data sets stored on multiple types of media. We also needed a stable solution that could support 24/7 operation.”

**Raytheon EOSDIS Project Technical Director, NASA**



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