



# Trends in Storage and Data: New Directions for Industry Standards

SNIA @ APTS 2023

Presented by Richelle Ahlvers, SNIA Vice-Chair

# About the Presenter



## **Richelle Ahlvers**

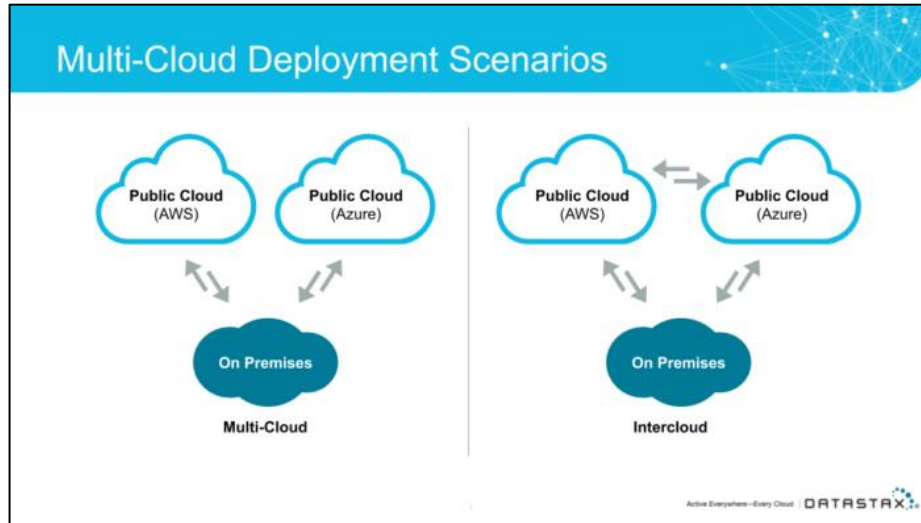
Storage Technology  
Enablement Architect, Intel

Richelle is a Storage Technology Enablement Architect at Intel, where she promotes and drives enablement of new technologies and standards strategies. Richelle has spent over 25 years in Enterprise R&D teams in a variety of technical roles, leading the architecture, design and development of storage array software, storage management software user experience projects including mobility, developing new storage industry categories including SAN management, storage grid and cloud, and storage technology portfolio solutions.

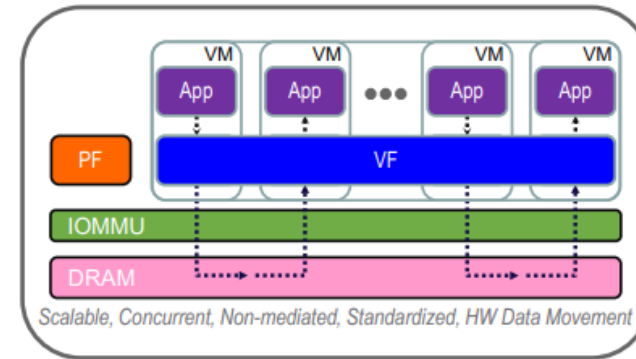
Richelle has been engaged with industry standards initiatives for many years and is actively engaged with many groups supporting manageability including SNIA, DMTF, NVMe, OFA and UCle. She is Vice-Chair of the SNIA Board of Directors, Chair of the Storage Management Initiative, leads the SSM Technical Work Group developing the Swordfish Scalable Storage Management API, and has also served as the SNIA Technical Council Chair and been engaged across a breadth of technologies ranging from storage management, to solid state storage, to cloud, to green storage. She also serves on the DMTF Board of Directors as the VP of Finance and Treasurer.

# Standards-based Technology Trends in Storage and Data

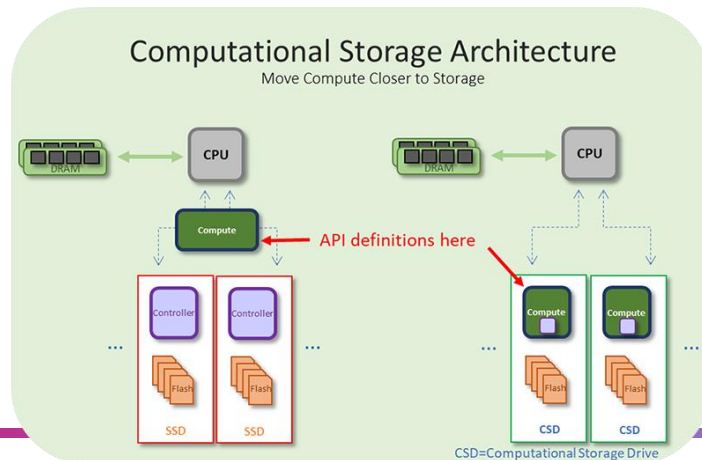
Cloud: Expanding from hybrid to multi-cloud



Data Accelerators

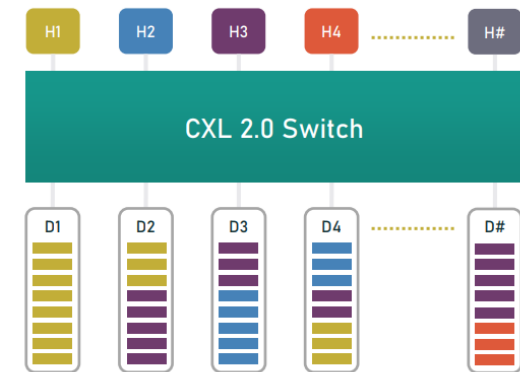


Computational Storage

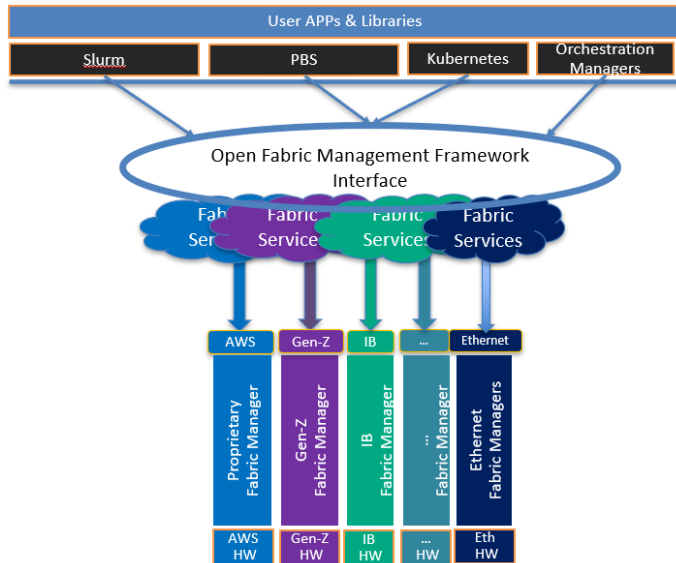


Cache coherent disaggregation:  
Memory, Accelerators,  
memory-based storage

Memory Pooling with Multiple Logical Devices



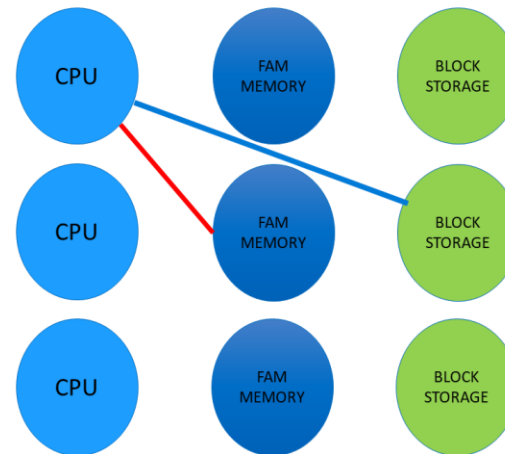
# Manageability Standards-based Technology Trends



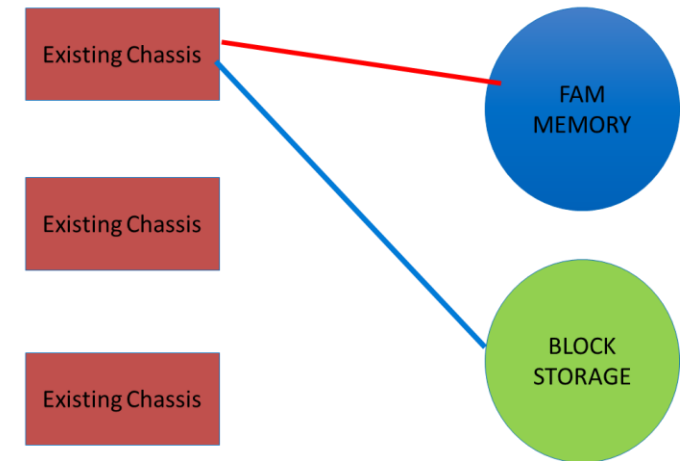
Expanding storage fabric technologies:  
Dedicated fabrics to shared fabrics  
AND  
Managing heterogeneous fabrics

Composable Disaggregated Infrastructures (CDI): Expanding pool-based resource management beyond storage

## SPECIFIC OR CONSTRAINED COMPOSITION



## EXPANDABLE COMPOSITION



# SNIA

- Founded 25 years ago with a focus on Storage Networking
- Evolved from Storage Networking to Storage
- DATA is now front and center
- Vision and mission reflects SNIA's expertise and technical work to:
  - Accelerate data
  - Format data
  - Transport data
  - Store data
  - Protect data
  - Optimize infrastructure for data



# SNIA's Vision and Mission Reflect a Data-Centric Focus

## VISION:

- Be the global experts and trusted authority for technologies related to handling and optimizing data.

## MISSION:

- Develop and promote architectures, standards, and education through vendor-neutral collaboration of experts on data technologies that lead the industry worldwide.



SNIA®

Experts  
on  
Data

# What is SNIA?



- An industry organization that focuses on technologies related to handling and optimizing data
- A collaboration of experts on data that
  - Develops global standards
  - Delivers vendor-neutral education



# The SNIA Community



**200**  
Corporations,  
universities, startups,  
and individuals



**2,500**  
Active  
contributing  
members

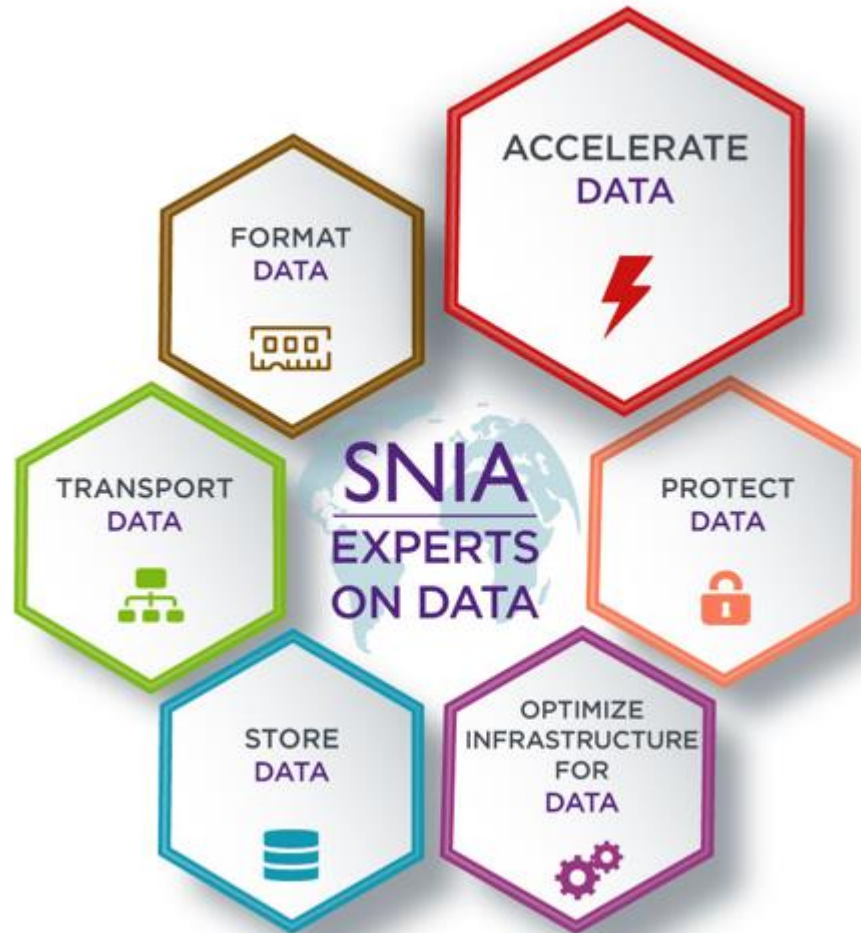


**50,000**  
Worldwide  
IT end users and  
professionals

# Data-Centric Focus Areas



# Data-Centric Focus Area: Accelerate



## Accelerate: Move processing to the data

**Accelerate Data:** Technologies that move processing closer to the data, enabling improvements in application performance and/or infrastructure efficiency through the integration of compute resources (outside of the traditional compute & memory architecture) either directly with storage or between the host and the storage.

### Areas of Interest:

- Data Accelerator (SDXI)
- Computational Storage
- DPU

# Data-Centric Focus Area: Protect



## Protect: Secure and protect data

**Security** is concerned with securing data storage systems and ecosystems and the data that resides on these systems. Storage security represents the convergence of the storage, networking, and security disciplines, technologies, and methodologies for the purpose of protecting and securing digital assets.

**Data protection** is the process of safeguarding important data from corruption, compromise or loss and providing the capability to restore the data to a functional state should something happen to render the data inaccessible or unusable.

### Areas of Interest:

- Storage Security
- TLS for Storage Systems
- Encryption and Key Management
- Sanitization
- Privacy
- Storage Management Security
- Fibre Channel Security

# Data-Centric Focus Area: Optimize Infrastructure



**Optimize Infrastructure: Optimize how data environments are configured and managed.**

**Optimize Infrastructure** for configuration, management, and monitoring of data environments to reduce the consumption of space, power, and other resources required.

## Areas of Interest

### Storage Management

- SNIA Swordfish™
- iSCSI Management
- SMI-S
- IP Based Drive & Management

### Green Storage

- SNIA Emerald™
- Power Efficiency

### Containers

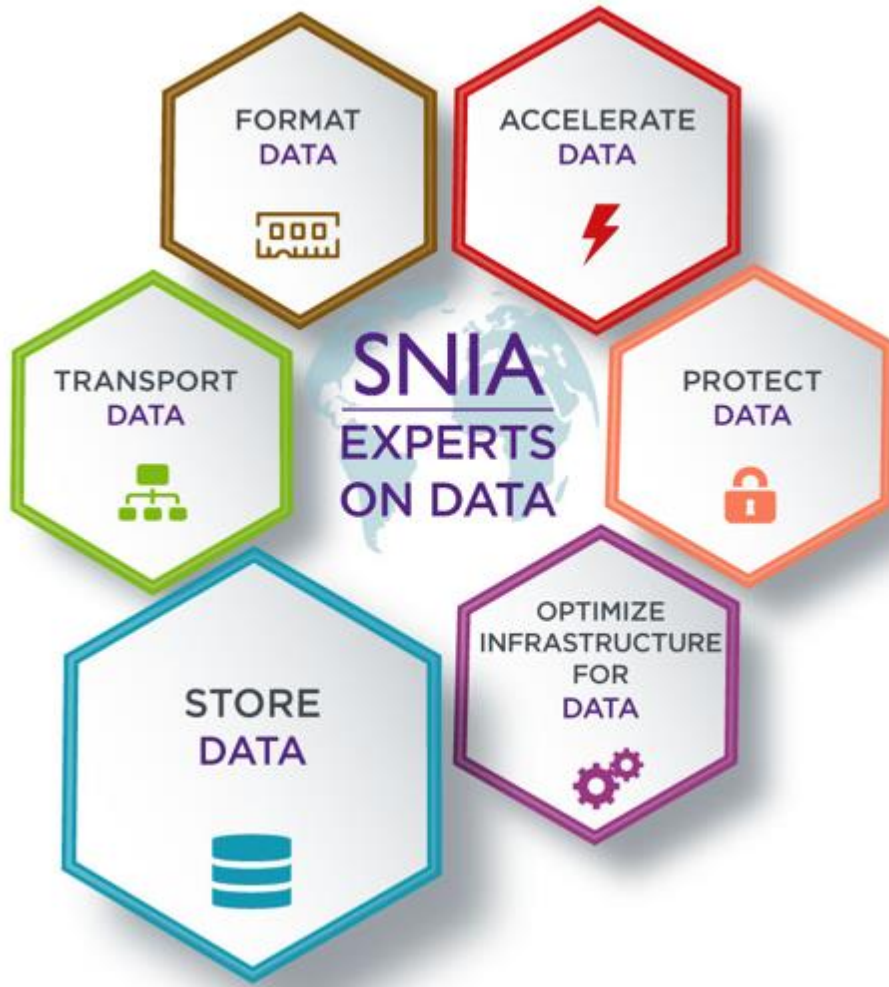
### Performance

- Real World Storage Workload
- IO Capture and Test

### IoT

### Software Defined Storage

# Data-Centric Focus Area: Store



**Store: Representation of data on storage media.**

**Data Storage** is a function that records data and supports retrieval, enabling technologies for the storage of data and supporting representation of data on various types of storage media.

## Areas of Interest:

- Non-Volatile Memory
- Zoned Storage
- Cloud / Hyperscaler Storage
- Key Value
- DNA Data Storage
- Persistent Memory
- Serial Attached SCSI
- Automotive

# Data-Centric Focus Area: Transport



**Transport: Move data between physical locations.**

**Data Transport** is concerned with the specification of mechanisms and technologies that define how data can be moved between physical locations, such as via connectors, cables, transceivers, and protocols.

## Areas of Interest:

- Physical Connections and Transceiver Standards
  - SFF and EDSFF
- Native NVMe-oF™
- Memory Fabrics
  - CXL®
- Networked Storage Technologies
  - FC, iSCSI, SMB3
- Serial Attached SCSI

# Data-Centric Focus Area: Format



**Format: Different formats to access stored data.**

**Data Formats** cover different formats for the format and structure of data, together with its associated metadata.

**Areas of Interest:**

- Linear Tape Format Specification (LTFS)
- Filesystems
- Cloud Data Management Interface / Reference Implementation
- SIRF
- DDF – common RAID Disk Data Format



# Standards Development, Consortia, and Open Communities Work Together



# SNIA's Global Events



SDC is focused on providing storage developers a forum for technical discussions and education on the latest technologies and standards.



The Summit is focused on compute, memory, security, and storage architectures, solutions, and community building.



Visit: [snia.org/news-events](https://snia.org/news-events)



SNIA<sup>®</sup>

**Thank You!**