Accelerating the adoption of next-generation storage technologies
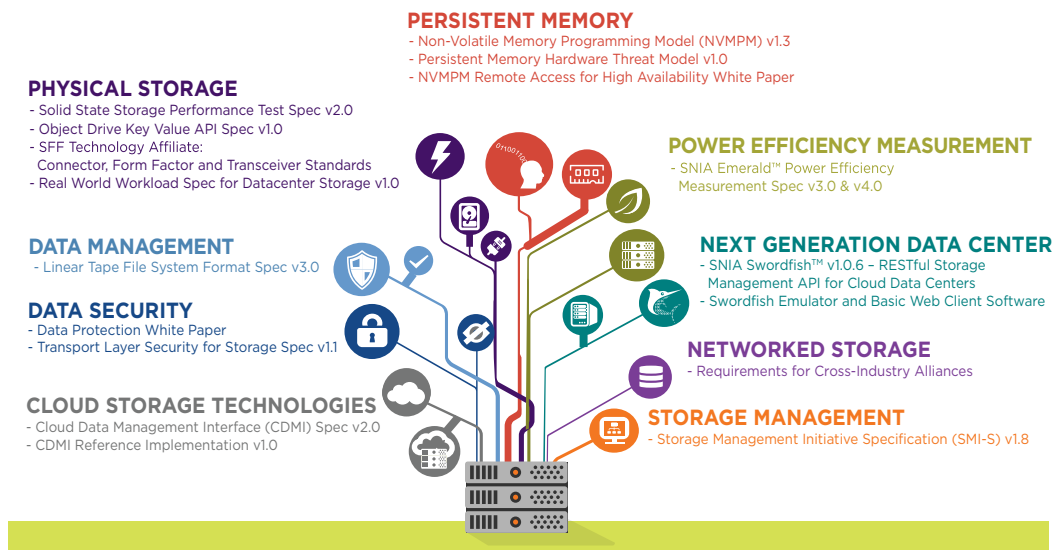
SNIA

The Storage Networking Industry Association (SNIA) is the largest storage industry association in existence, and one of the largest in IT. It is comprised of 180 leading industry organizations, over 2,000 active contributing members along with more than 50,000 IT and storage professionals worldwide.

By Michael Oros, SNIA Executive Director.

Today, SNIA is the recognized global authority for storage leadership, standards and technology expertise. As such, our mission is to develop and promote vendor-neutral architectures, standards, best practices and educational services that facilitate the efficient management, movement and security of information.

These initiatives are vital in the dynamic fields of data and information. IT is constantly evolving and shifting to provide new efficiencies and valuable business insight with increased data set sizes and larger pools of computational and storage resources. Virtualization, Persistent Memory, the cloud, software-defined data center, hyperconvergence, computational storage, the Internet of Things (IoT), Artificial Intelligence (AI) and machine learning are just a few of the latest waves of innovation that are disrupting traditional IT approaches and are continuing to transform all industries. SNIA stays alert to these trends and is involved on the leading edge of such standards and innovation needs. That enables us to isolate areas that need attention such as omitted interoperability standards or nascently understood technology areas that require industry education. In some cases, it is up to SNIA to champion technologies that open up new vistas for the storage industry and beyond.

PERSISTENT MEMORY
- Non-Volatile Memory Programming Model (NVMPM) v1.3
- Persistent Memory Hardware Threat Model v1.0
- NVMPM Remote Access for High Availability White Paper

PHYSICAL STORAGE
- Solid State Storage Performance Test Spec v2.0
- Object Drive Key Value API Spec v1.0
- SFF Technology Affiliate:
  Connector, Form Factor and Transceiver Standards
- Real World Workload Spec for Datacenter Storage v1.0

POWER EFFICIENCY MEASUREMENT
- SNIA Emerald™ Power Efficiency
  Measurement Spec v3.0 & v4.0

DATA MANAGEMENT
- Linear Tape File System Format Spec v3.0

NEXT GENERATION DATA CENTER
- SNIA Swordfish™ v1.0.6 – RESTful Storage
  Management API for Cloud Data Centers
- Swordfish Emulator and Basic Web Client Software

DATA SECURITY
- Data Protection White Paper
- Transport Layer Security for Storage Spec v1.1

NETWORKED STORAGE
- Requirements for Cross-Industry Alliances

CLOUD STORAGE TECHNOLOGIES
- Cloud Data Management Interface (CDMI) Spec v2.0
- CDMI Reference Implementation v1.0

STORAGE MANAGEMENT
- Storage Management Initiative Specification (SMI-S) v1.8

These nine technology focus areas are actively supported by Technical Work Groups and Storage Communities that we refer to as Forums and Initiatives. Individuals from all facets of IT dedicate themselves to programs that unite the storage industry with the purpose of taking storage technologies to the next level.

- **Cloud Storage Technologies**: The SNIA Cloud Storage Technologies Initiative (CSTI) is committed to the adoption, growth and standardization of storage in cloud infrastructures. This encompasses data services, orchestration and management, as well as the promotion of portability of data in multi-cloud environments. The SNIA Cloud Data Management Interface (CDMI), for example, is an open ISO/IEC standard that enables cloud solution developers to meet the growing need of interoperability for data stored in the cloud. This standard is applicable to all types of clouds – private, public and hybrid – with multiple commercial open source implementations in use worldwide.

- **Data Management:** SNIA has long undertaken work on data protection, capacity optimization, and long-term data retention, including the Linear Tape File System (LTFS) and the Self-contained Information Retention Format (SIRF) standards. A recent addition is a Storage Security: Data Protection whitepaper that provides an overview of data protection, data management and the associated guidance for ISO/IEC 27040:2015 (Information technology - Security techniques - Storage security). This standard provides detailed technical guidance on controls and methods for data protection within storage systems. It covers topics such as data classification, retention and preservation, data authenticity, and data disposition.

- **Data Security:** Issues related to security have great importance in IT today. SNIA is participating in international standards with leading security-focused industry organizations. Our Security TWG consists of storage security subject matter experts working together to increase the security, privacy, data protection and management of information residing within storage ecosystems. For instance, they are addressing the security of stored information in heterogeneous environments to define requirements for storage security, and create any needed architectures, interfaces and best practices relative to this field.

- **Next-Generation Data Centers:** Software Defined Storage (SDS) underpins the Software Defined Data Center and provides a foundation for the Next Generation Data Center. It

represents a new evolution in the storage industry that changes how storage is managed and deployed. SNIA defines SDS as virtualized storage with a service management interface, which includes pools of storage with data service characteristics that may be applied to meet the requirements specified through a service management interface. These capacity pools can be structured into tiers and presented over an appropriate medium and protocol. The benefits of SDS include automation, interface standardization, virtual data paths, improved scalability and transparency.

SNIA Swordfish™provides an SDS-ready interface to automate the management of the storage resources and discovery of their capabilities for use in various pools. An extension to the DMTF Redfish® specification, Swordfish provides a unified approach for the management of storage and servers in hyperscale and cloud infrastructure environments.

- **Networked Storage:** This focus area deals with data access protocols and various networking technologies for storage. The SNIA Ethernet Storage Forum (ESF), for example, is committed to providing vendor-neutral education and best practices for Ethernet networked storage, block (iSCSI, FCoE) and file (NFS, SMB), and object storage protocols. It is also advancing the scope of emerging areas that impact Ethernet Storage such as NVMe & NVMe over Fabrics, RDMA, containers and more.
- **Persistent Memory:** Non-Volatile Memory (NVM) features and performance are outgrowing existing storage models. In many ways, NVM is less like storage, and more like memory. The SNIA Persistent Memory (PM) and NVDIMM Special Interest Groups (SIG) have developed an NVM Programming Model to define software programming models for NVM so designers can develop APIs that take advantage of NVM features and performance. In addition, a Non-Volatile Dual In-line Memory Module (NVDIMM) has been created that operates from DRAM with flash as backup. This functions as a high-performance non-volatile storage device that plugs directly into the memory bus.
- **Physical Storage**: SNIA Technical Working Groups (TWGs) are actively working on solid state storage, hyperscale storage, and object drives, as well as related connectors, form factors and transceivers. Our Solid State Storage Initiative (SSSI), for example, is dedicated to fostering the acceptance and growth of solid state storage and persistent memory in the marketplace. To achieve those goals, SSSI provides education, performs market outreach, and influences/promotes standards.
- **Power Efficiency Measurement:** In this era of ever higher performance, attention must be paid to power efficiency. Added performance must be achieved responsibility – if power usage soars, the boost in performance may not be viable or sustainable. The SNIA Green Storage Initiative (GSI) is dedicated to advancing energy efficiency and conservation in all networked storage technologies and minimizing the environmental impact of data storage operations. An essential part of its mission is the SNIA Emerald™ Program for SNIA Emerald Energy Efficiency Measurement. This program provides public access to storage system power usage and efficiency through use of a well-defined testing procedure, and additional information related to system power.

- **Storage Management:** There is more data to manage and more applications accessing it than ever before. The Storage Management Initiative (SMI) within SNIA unifies the diverse elements that co-exist within the storage industry to develop and standardize interoperable storage management technologies. SNIA aggressively promotes standards such as Swordfish and SNIA's Storage Management Initiative Specification (SMI-S) home to the storage, networking, and end user communities to simplify the process of device and system management.

Through these nine focus areas, SNIA leads the storage industry in the development of standards and driving broad adoption of new technologies. Our members pave the way enabling innovation by establishing the best way for platforms to interoperate. It is up to SNIA to provide a forum that aligns the strategic business objectives of the diverse storage vendor community with the need for interoperability and worldwide standards. By contributing to these standards and interoperability initiatives, our members are fostering timely technology adoption that delivers real value and benefit to IT organizations globally.

To stay informed and updated on how SNIA is accelerating the adoption of next-generation storage technologies, please visit www.snia.org. You can also hear the latest from SNIA by regularly viewing our storage blogs at www.sniablog.org, SNIA YouTube channel and to learn about SNIA global events and meet-ups please visit www.snia.org/snia_events.