DIVING INTO THE NEW WAVE OF STORAGE MANAGEMENT
WITH NVME 2.0

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As the NVM Express® (NVMe®) family of specifications continue to develop, the corresponding Swordfish management capabilities are evolving: the SNIA Swordfish™ specification has expanded to include full NVMe and NVMe-oF™ enablement and alignment across DMTF™, NVMe, and SNIA for NVMe and NVMe-oF use cases.

If you haven’t caught the new wave in storage management, it’s time to dive in and catch up on the latest developments of the SNIA Swordfish specification. These include:

- Expanded support for NVMe and NVMe-oF Devices using the NVMe 2.0 family of specifications
- Managing Storage Fabrics
- Extending Storage Management into Composable Managed Infrastructure

This presentation provides an update on the latest NVMe-oF configuration and provisioning capabilities available through Swordfish, and an overview of the most recent work adding detailed implementation requirements for specific configurations, ensuring NVMe and NVMe-oF environments can be represented entirely in Swordfish and Redfish environments.
WHAT IS SWORDFISH?

- **DMTF Redfish™ covers server, data center, fabric management**
  - REST API with JSON payloads; choice of CSDL, JSON and YAML schema for development

- **SNIA Swordfish™: Storage Management Specification with REST Based API**
  - Extends DMTF’s Redfish Specification

- **Swordfish adds storage management to all of these use cases, plus storage fabric management:**
  - Covers block, file, and object storage
  - Extend traditional storage domain coverage to include converged environments (servers, storage and fabric together)
  - Provides the option for implementation to utilize Class of Service (intent or service level) based provisioning, management, and monitoring
In v1.2.5 – releasing this week!
• Expanded support for Swordfish profiles, including the new Swordfish Interoperability Guide.
• Support for NVMe 2.0c
• Added NVMe SMART Metrics
• Enhanced Discovery Controller Capabilities

NVMe and NVMe-OF specific content represented broadly
• Spec / schema updates for new properties
• NVMe specific use cases in User’s Guide
• NVMe Model Overview and Mapping Guide
  • Detailed descriptions for developers to implement NVMe management interfaces
  • NVMe and NVMe-OF management models: Models reflect a unified view of all NVMe device types (universal model).
  • Mockups: swordfishmockups.com
• Profiles: NVMe Drives, Ethernet-attached drives, advanced NVMe drive features; NVMe Front-End (used for complex devices such as arrays)
  • Profiles feed Swordfish Conformance Test Program
  • CTP Testing available for NVMe Drives
EXPANDING STORAGE FABRIC MANAGEMENT

- Working with DMTF and OFA to apply (and extend) Redfish Fabric Model to multiple fabric types
  - Redfish: basic technology instrumentation

- When basic fabric management in place, add storage-specific capabilities
  - Storage fabric management
  - Workload optimization
  - Performance instrumentation
REDFISH/SWORDFISH HIERARCHY: MANAGING EXTENDED CONNECTIVITY

Fabric representation for connectivity:
Switch / Endpoint / Zone
REDFISH/SWORDFISH HIERARCHY: ADDING MULTI-SYSTEM ACCESS MANAGEMENT

Access Management
Connections / Endpoints / Zones
DEVELOPING THE OPENFABRICS FRAMEWORK AND MAPPING TO REDFISH AND SWORDFISH
DEMONSTRATING FABRIC CONNECTIVITY: EBOF
WORKING WITH COMPOSABILITY: MEMORY & STORAGE
RESOURCE ALLOCATION FOR CONTAINER PROVISIONING

- Container Engine
- Message Queue
- RESTful API (RPS)
- OFM Services
  - Resource Inventory
  - RF Tree Management
  - Resource Configuration
  - Fabric Configuration
  - Authentication
  - Access Control
  - Events & Logs

- CXL Switch
- Fabric Agent
- Fabric-specific API
- Redfish API
- Swordfish API
- High Speed Memory-Fabric Links
- High Speed Storage-Fabric Links

CPU !

Container 1

CPU !

Container 2

CPU !

Container N

Data Store

Composability Layer
A key area for simplification: automating discovery across NVMe-oF environments.

- NVMe-oF configuration supports two types of discovery controller infrastructure. For centralized discovery controllers, NVMe-oF environments cooperate.
- Swordfish API can further abstract this from the storage clients; no need to see the fine-grained details.
- Clients don’t need to configure the discovery information; they only need to see the relationships.

WHERE TO FIND MORE INFO..

**SNIA Swordfish™**
- **Swordfish Standards**
  - Schemas, Specs, Mockups, User and Practical Guide`s, …
    [https://www.snia.org/swordfish](https://www.snia.org/swordfish)
- **Swordfish Specification Forum**
  - Ask and answer questions about Swordfish
- **Scalable Storage Management (SSM) TWG**
  - Technical Work Group that defines Swordfish
  - Influence the next generation of the Swordfish standard
  - Join SNIA & participate: [https://www.snia.org/member_com/join-SNIA](https://www.snia.org/member_com/join-SNIA)
- **Join the SNIA Storage Management Initiative**
  - Unifies the storage industry to develop and standardize interoperable storage management technologies
  - [https://www.snia.org/forums/smi/about/join](https://www.snia.org/forums/smi/about/join)

**DMTF Redfish™**
- **Redfish Standards**
  - Specifications, whitepapers, guides,…
    [https://www.dmtf.org/standards/redfish](https://www.dmtf.org/standards/redfish)

**Open Fabric Management Framework**
- **OFMF Working Group (OFMFWG)**
  - Description & Links: [https://www.openfabrics.org/working-groups/](https://www.openfabrics.org/working-groups/)
  - OFMFWG mailing list subscription
    - [https://lists.openfabrics.org/mailman/listinfo/ofmfwg](https://lists.openfabrics.org/mailman/listinfo/ofmfwg)
  - Join the Open Fabrics Alliance
    - [https://www.openfabrics.org/membership-how-to-join/](https://www.openfabrics.org/membership-how-to-join/)

**NVM Express**
- **Specifications** [https://nvmexpress.org/developers/](https://nvmexpress.org/developers/)
- **Join** [https://nvmexpress.org/join-nvme/](https://nvmexpress.org/join-nvme/)
THANK YOU
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