

2021 OFA Virtual Workshop STANDARDS BASED SCALABLE FABRICS MANAGEMENT: NOW AND INTO THE FUTURE

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The SNIA Swordfish[™] specification helps provide a unified approach for the management of storage in hyperscale and cloud infrastructure environments, making it easier for IT administrators to integrate scalable solutions into data centers.

Swordfish now ensures efficient management of NVMe and NVMe oF technology environments.

The Swordfish ecosystem includes a family of open source tools and a vendor neutral conformance test suite both designed to accelerate implementations and adoptions of the standard.

SNIA is partnering with other industry organizations to expand the scope covered in Swordfish management to meet client workloads and use cases covering everything from direct attached storage (DMTF) to QOS based resource orchestration (SODA), to fabric technology management and administration (OFA).



WHAT IS SWORDFISH, AND HOW DOES IT MANAGE NVME / NVME OF?

WHAT IS SWORDFISH?

- SNIA Swordfish[™]: Storage Management Specification with REST Based API
 - Extends DMTF's Redfish Specification: REST API with JSON payloads; choice of CSDL, JSON and YAML schema for development
- Redfish covers server, data center, fabric management
- 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

What's New?

Through Alliance partnerships with NVM Express®, RF/SF (Redfish and Swordfish) have added NVMe / NVMe oF manageability







SWORDFISH HIERARCHY



SWORDFISH HIERARCHY: ADDING FABRICS





SWORDFISH TOOLS ECOSYSTEM: WHAT'S NEW

REDFISH AND SWORDFISH HAVE A BROAD OPEN SOURCE TOOLS ECOSYSTEM

SNIA

Swordfish

Swordfish Open Source Tools

- Swordfish PowerShell Toolkit
- Swordfish to RestAPI Map
- Swordfish PowerShell Provider Framework
- Swordfish Emulator
- Swordfish Mockup website
- Swordfish API Emulator
- Swordfish Basic Web Client
- Swordfish DataDog Sample Dashboard Integration
- Swordfish PowerBI Sample Integration
- Swordfish GOLang Library (Gofish)



- Redfish Mockup Creator
- Redfish Mockup Server
- Python redfish library
- Redfish Interface Emulator
- Redfish Interop Validator
- Redfish Service Conformance Check
- Redfishtool (cli)
- Redfish Usecase Checkers
- YANG to Redfish Converter
- Redfish Schema Creator
- Redfish Service Validator
- Redfish Tacklebox
- Redfish Schema C Struct Generator
- libredfish
- Redfish URI Validator
- Redfish Profile Simulator
- Redfish Event Listener
- Redfish Reference Checker
- Redfish Json Schema Response Validator
- Python redfish utility
- Redfish Ansible Playbooks
- Redfish Tools:
 - Odata Validator
 - CSDL to JSON Converter, JSON to OpenAPI Converter
 - Doc Generator



Swordfish Basic Web Client Screen (StorageServices)

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Swordfish Datadog Sample Dashboard Integration

- Basic dashboard for the Datadog monitoring service
- Connects to a Swordfish service and provides an integration to the Datadog User Interface
- Displays storage system capacity information and the available storage capacity thresholds
- Can be a starting point for a customized Datadog plugin
- Link: <u>https://github.com/SNIA/Swordfish-datadog-sample-dashboard-integration</u>
- Includes installation, user, and developer documentation

Swordfish Datadog Sample Dashboard Output

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Swordfish Power BI Sample Dashboard Integration

- Basic dashboard for the Power BI monitoring system
- Connects to a Swordfish service and provides an integration to the Power BI User Interface
- Displays storage system capacity information and the available storage capacity thresholds
- Can be a starting point for a customized Power BI plugin
- Link: <u>https://github.com/SNIA/Swordfish-powerBI-sample-dashboard-integration</u>
- Includes installation, user, and developer documentation

Swordfish Power BI Sample Dashboard (Main)



NEW TOOLS COMING: DEM SWORDFISH ENABLEMENT

- DEM (Distributed Endpoint Manager) is an opensource tool for managing NVMe/NVMeoF resources
- DEM is adding a Swordfish interface, so that resources can be managed with Swordfish APIs
 - DEM as of today can GET NVMe resources through Swordfish APIs

DEM has/will have the following capabilities:

- Can take Swordfish requests and process them to fetch NVMe resource information either from Emulator or actual device or can add/update the resources or related properties
- At the lower layers DEM shall send NVMe/NVMe oF/MI commands to the hardware to configure the resources
- Shall provision access control

Open source

• Shall comply with SNIA Swordfish CTP – helping to "test the tests" with simulation environment



ACCELERATING ADOPTION USING CONFORMANCE TESTING

CONFORMANCE TESTING VALUE

Why Do Conformance Testing?

- Vendor/Manufacturer benefits:
 - Reduced integration costs with partners
 - · Meet customer demand for standards based solutions
- End User/Customer benefits:
 - Objective testing verified in a vendor neutral manner
 - Ensured product conformance to industry standards
 - Lower cost of ownership
 - Help to prevent vendor lock in
 - Improved interoperability of multi vendor products

What is SNIA Swordfish CTP?

- A vendor neutral test suite to validate conformance to the SNIA Swordfish Specification
- Uses the Redfish specification, Swordfish Specification and published Swordfish Profiles to determine compliance
- Profiles define required subsets of functionality that implementations can advertise as customer "Features"
- Each Feature corresponds to key customer functionality





EXPANDING STORAGE FABRIC MANAGEMENT THROUGH ALLIANCES

SNIA, OFA, AND DMTF TOGETHER

Through the Alliance agreements, we bring the technical teams from the 3 organizations together to align existing work, then create new content in each area as needed.



PLANNED WORK ITEMS

Planned / expected work progression:

Storage fabric management use cases

- Use OFA identified Use Case Descriptions and Flow Diagrams to confirm property / object completeness
- Map together RF/SF management I/F with OFA Fabric Manager functionality
 - Redfish and Swordfish provide the OFA Fabric Manager with NVME-oF instantiation for current fabric conditions.

General fabric management coverage

 NVMe-oF management implemented using fabric specific providers, such as, Gen Z, Slingshot, InfiniBand, OmniPath, RoCE, iWarp, Ethernet, FC



KEY TAKEAWAYS

- 1. An overview of SNIA Swordfish NVMe/NVMe oF storage fabrics management functionality
- 2. An understanding of the expanding ecosystem of open source Swordfish and NVMe tools for standards development and implementation acceleration
- 3. How to accelerate standards based storage fabric management adoption through vendor neutral conformance testing
- 4. How expanding the scope of the strategic alliances between OFA, SNIA, and DMTF will enable efficient access to high performance fabric interfaces and services as part of a broader standards based system and data center management ecosystem
- 5. Understanding the planned work of SNIA and the OFA OFMF TWG to develop a hierarchical fabric access model that works across multiple fabric technologies

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THANK YOU

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