Dip your Toe in the Water: A Swordfish Introduction

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Abstract

- The SNIA’s Scalable Storage Management Technical Work Group (SSM TWG) has created and published an open industry standard specification for storage management that defines a customer centric interface for the purpose of managing storage and related data services. This specification builds on the DMTF’s Redfish specification using RESTful methods and JSON formatting.
- This presentation shows how Swordfish extends Redfish and provides an overview of basic Swordfish concepts.
Disclaimer

- The information in this presentation represents a snapshot of work in progress within SNIA
- This information is subject to change without notice.
- For additional information, see the SNIA website: www.snia.org/swordfish
What are the Drivers for SNIA Swordfish™?

- Customers (and vendors) are asking for improvements in storage management APIs
  - Make them simpler to implement and consume
  - Improve access efficiency
    - Fewer transactions, with more useful information in each
  - Provide useful access via a standard browser
  - Expand coverage to include converged, hyper-converged, and hyper-scale
  - Provide compatibility with standard DevOps environments
The SNIA Swordfish™ Approach

- **The What:**
  - Refactor and leverage SMI-S schema into a simplified model that is client oriented
  - Move to Class of Service based provisioning and monitoring
  - Cover block, file and object storage
  - Extend traditional storage domain coverage to include converged environments (covering servers, storage and fabric together)

- **The How:**
  - Leverage and extend DMTF Redfish Specification
  - Build using DMTF’s Redfish technologies
    - RESTful interface over HTTPS in JSON format based on OData v4
  - Implement Swordfish as an *extension* of the Redfish API
Who is Developing Redfish and Swordfish?

Redfish
- AMI
- Barcelona Supercomputing Center
- Brightleaf Group
- Cisco
- Ericsson AB
- Foxconn
- Insyde Software
- Majec
- Mellanox
- Open Grid Forum
- Qlogic
- Quanta
- Supermicro
- Vertiv

Both
- Broadcom
- Dell Inc.
- Fujitsu
- HPE
- Huawei
- IBM
- Intel
- Lenovo
- Microsemi
- Microsoft
- NetApp
- Texas Tech University
- Toshiba
- VMware
- Western Digital

Swordfish
- Brocade
- HDS (Hitachi Data Systems)
- Inova Development
- Micron
- NEC
- Pure Storage
- Quest Software
- Red Hat, Inc
- Seagate
- ScienceLogic
- SK Hynix
- Tintri
- Turbonomic

Both
- Broadcom
- Dell Inc.
- Fujitsu
- HPE
- Huawei
- IBM
- Intel
- Lenovo
- Microsemi
- Microsoft
- NetApp
- Texas Tech University
- Toshiba
- VMware
- Western Digital
Swordfish Growth

- SNIA Scalable Storage Management Technical Work Group (SSM TWG) (SSM is the group, Swordfish is the Spec)
  - Scalable Storage Management (SSM) TWG chartered in December 2015
  - v1.0 Spec Released September 2016
- 2017 Focus: validating spec, initial implementations
  - Swordfish Functionality Enhancements: Specification and Technical Content
    - Releases / Work in progress
  - Documentation and Supporting Materials
  - Open Source Tools and Infrastructure Development
  - Implementation Support
    - Plugfests
Functionality Included in the Swordfish v1.0 API Specification

- Block storage
  - Provisioning with **class of service** control
  - Volume Mapping and Masking
  - Replication
  - Capacity and health metrics
- File system storage
  - Adds File System and File Share
  - Leverages all other concepts – provisioning with class of service, replication, …
- Additional content
  - Object drive storage
Starting with Redfish: An Overview

Redfish Resource Map
Adding Storage to Redfish…
Adding Storage to Redfish…

/redfish/v1
Root Resource
Links to all content

/redfish/v1/Managers
Collection of Managers
BMC functionality

/redfish/v1/Managers/<id>
BMC
System Manager operations

/redfish/v1/Chassis
Collection of Chassis
“Physical” view of the system

/redfish/v1/Chassis/<id>
Chassis
Chassis global physical asset info

/redfish/v1/Systems
Collection of Systems
“Logical” view of general purpose systems

/redfish/v1/Systems/<id>
System Manager operations

/redfish/v1/Systems
Collection of Systems
“Logical” view of general purpose systems

/redfish/v1/StorageSystems
Collection of StorageSystems
“Logical” view of dedicated systems

/redfish/v1/StorageSystems/<id>
StorageSystem Information
Model #, Serial #, UIDs, status, etc.

/redfish/v1/StorageServices
Collection of StorageServices
Storage functionality: block, file, object

/redfish/v1/StorageServices/<id>
StorageService Information
Class of Service, Pools, Groups, Endpoints, Volumes/Files, Drives

1..n
Volumes
Files
Replicas

1..n
Controllable

Control
Disks

Disks
FC or NIC

NICs

Events
Sessions
Accounts

Schemas
What Will a Swordfish Implementation Look Like?

- As a work tool, the Technical Work Group (TWG) works with “mockups” (snapshots of a state in time) of different types of systems
  
  See swordfishmockups.com (/redfish/v1/)

- These are available as part of the WIP releases and are published on an ongoing basis as new functionality is added to show samples to supplement documentation
  
  Note: Mockups are representations of implementations, not normative
Overview of Swordfish

- Explore the Swordfish data model to see a potential / typical implementation
- Navigate through the model to learn about and see various resources
- SNIA mockups show two examples of block storage systems
  - Simple: A small external array
  - Complex: all of the elements in the block storage model, with remote replication
- ... and an example of a file server with multiple file shares
Navigating through the Mockups…

- Select the `../redfish/v1/Storage/Services` link to see the “Collection” of Storage Services
- Click the “../StorageServices/Simple” link to see the details of the Simple mockup or “../StorageServices/1” to see the details of the complex storage service mockup
- “../StorageServices/FileService” to see the filesystem mockup
What’s in a Storage Service? (Block)

- Available Classes Of Service
  - Lines of Service that are used to compose the Classes of Service
- Volumes
- Pools
- Groups
- Endpoints
- ...
- Pointer to related resources (system, chassis,..)
What’s in a Storage Service? (File)

Same structure:

- Available Classes Of Service
- **File systems**
- Pools
- Groups
- Endpoints
- ...
- Pointer to related resources (system, chassis, **block service** or drives)
Discovery…

Let’s discover something:
Do I have space to…?

1. Check the capacity in a storage pool that I have permission to allocate storage from.
2. Navigate down into “SpecialPool” and check its remaining capacity.
Swordfish Specs and Technical Content...
In 2017

- v1.0.3 Release in January 2017
  - Schema updates, Spec section additions, User’s guide updates: new use cases
- v1.0.4 Release in May 2017
  - Schema updates, Mockup Updates, Spec section additions
- Targeted Fall 2017:
  - v1.0.5: Initial Swordfish Event Registry, Initial Block Performance Metrics, Bug fixes
- Work-in-progress
  - FC Fabric Model
  - Joint Redfish/Swordfish Profiles
- Future Functionality
  - Object Storage
  - Storage-specific security roles
Documentation and Supporting Materials

- NEW! Online Practical Guide
  - SNIA Swordfish Practical Guide
- NEW! Swordfish School:
  - Swordfish School Playlist (YouTube)
- Enhancements to Spec introductory sections, ...
- Marketing Materials
Open Source Tools and Infrastructure Development

- Swordfish Emulator Extensions
  - Extends the Redfish emulator – adds all Swordfish schema
- Basic Swordfish Web client
  - Discover / display Swordfish services; uses schema to overlay “Add / Edit” details
- DataDog and Power BMI Client Sample Dashboards
  - Sample implementations to show integration concepts
Implementation Support

- **Plugfests**
  - **Swordfish plugfest June 2017**
    - Open participation (no SMI / SNIA membership required)
    - Participants from 6 companies, contributing work on open source clients, open source emulators, and multiple swordfish services (providers)
  - **SMI-Lab Plugfest (SMI-S and Swordfish): August 14-17**
    - Hosted at Dell Inc. Santa Clara site
    - Swordfish portion will be “open” (no SMI / SNIA memberships required)
  - **Plugfest at SDC: September 11 – 14, Santa Clara**
    - Open participation, invitations also extended to Redfish
How to Participate: Shaping the Standard

- Find pointers to the latest technical content:
  - http://snia.org/swordfish
  - http://www.snia.org/publicreview#swordfish
- Join the SSM TWG
  - By Joining the SNIA and SSM TWG, you can shape the standard: https://members.snia.org/apps/org/workgroup/ssmtwg
- Through the SNIA feedback portal, providing feedback on “Work In Progress”
  - As the group produces “Works In Progress”, you can provide feedback at http://www.snia.org/feedback
THANK YOU